



AGRICULTURAL WATER MANAGEMENT PLAN

Prepared Pursuant to Water Code Section 10826

**Prepared for
WHEELER RIDGE-MARICOPA WATER
STORAGE DISTRICT**

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SUBMITTED TO THE
CALIFORNIA DEPARTMENT OF WATER RESOURCES
IN ACCORDANCE WITH THE
**AGRICULTURAL WATER MANAGEMENT PLANNING
ACT OF 2009 (SBx7-7) and
Executive Order B-29-15**

Adopted on July 14, 2021

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Abbreviations and Acronyms

AF	acre-feet
AWMC	Agricultural Water Management Council
AWCP	Agricultural Water Conservation Plan
AWMP	Agricultural Water Management Plan
Cfs	cubic feet per second
CIMIS	California Irrigation Management Information System
CVP	Central Valley Project
CVRWQCB	Central Valley Regional Water Quality Control Board
DWR	Department of Water Resources
EPA	U.S. Environmental Protection Agency
ET	Evapotranspiration
ET _c	Crop Evapotranspiration
ET _o	Reference Evapotranspiration
EWMP	Efficient Water Management Practice
GHG	Greenhouse Gas
ID	Irrigation District
ILRP	Irrigated Lands Regulatory Program
ITRC	Irrigation Training & Research Center (Cal Poly)
IRWM	Integrated Regional Water Management
GWMP	Groundwater Management Plan
KCWA	Kern County Water Agency
KRWCA	Kern River Watershed Coalition Authority
NWKRC	North West Kern Resource Conservation District
M&I	Municipal and Industrial
MOU	Memorandum of Understanding
NPDES	National Pollutant Discharge Elimination System (EPA)
OCAP	Operations Criteria and Plan for CVP Deliveries (USBR)
ppm	parts per million
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
SBx7-7	Water Conservation Act of 2009
SCADA	Supervisory Control and Data Acquisition
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
WSD	Water Storage District
WRMWS	Wheeler Ridge-Maricopa Water Storage District

1.0 Introduction

Water Code §10800 – 10853 (the Agricultural Water Management Planning Act) requires agricultural water suppliers to submit to the California Department of Water Resources (DWR) an Agricultural Water Management Plan (AWMP) that addresses the elements listed in Water Code §10826. An agricultural water supplier is defined as a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding the acreage that receives recycled water.

Wheeler Ridge-Maricopa Water Storage District (WRMSD or District) is a publicly owned water supplier that was formed with the purpose of providing reliable agricultural water supply for its landowners. The District covers approximately 238,430 acres in the southern end of the San Joaquin Valley in Kern County; the White Wolf Subbasin accounts for approximately 91,430 acres. As such, and in accordance with Water Code §10820, the District has prepared this 2020 AWMP as an update to their 2015 AWMP. This 2020 AWMP complies with current regulations, including AB 1668 (Friedman, Statute of 2018), and generally conforms with DWR's *A Guidebook to Assist Agricultural Water Suppliers to Prepare a 2020 Agricultural Water Management Plan* (August 2020).

Much of this AWMP is based on information contained in the District's 2015 Groundwater Management Plan (GWMP), the 2019 Groundwater Sustainability Plan - Management Area Plan (MAP), and the District Engineer-Manager's monthly and annual reports, and information based on several studies the District has undertaken over time. The past studies are related to increasing the reliability and quality of the water supply for the benefit of District customers, while also sustainability managing the groundwater basin (per the Sustainable Groundwater Management Act (SGMA)). The District's location and service area are shown on Figure 1-1.

1.1 Purpose

The purpose of the 2020 AWMP is to describe and document the District's existing and proposed agricultural water management programs and activities. In particular, the 2020 AWMP compliance with the requirements of the SBx7-7, the Agricultural Water Management Planning Act (Section I, Part 2.8, Division 6 (commencing at Section 10800) of the Water Code), the subsequent Agricultural Water Measurement Regulation requirements (described in Title 23 California Code of regulations), and AB 1668 Water Management Planning, notwithstanding such regulations go beyond that required by the statute and in many instances are not applicable to areas such as this District.

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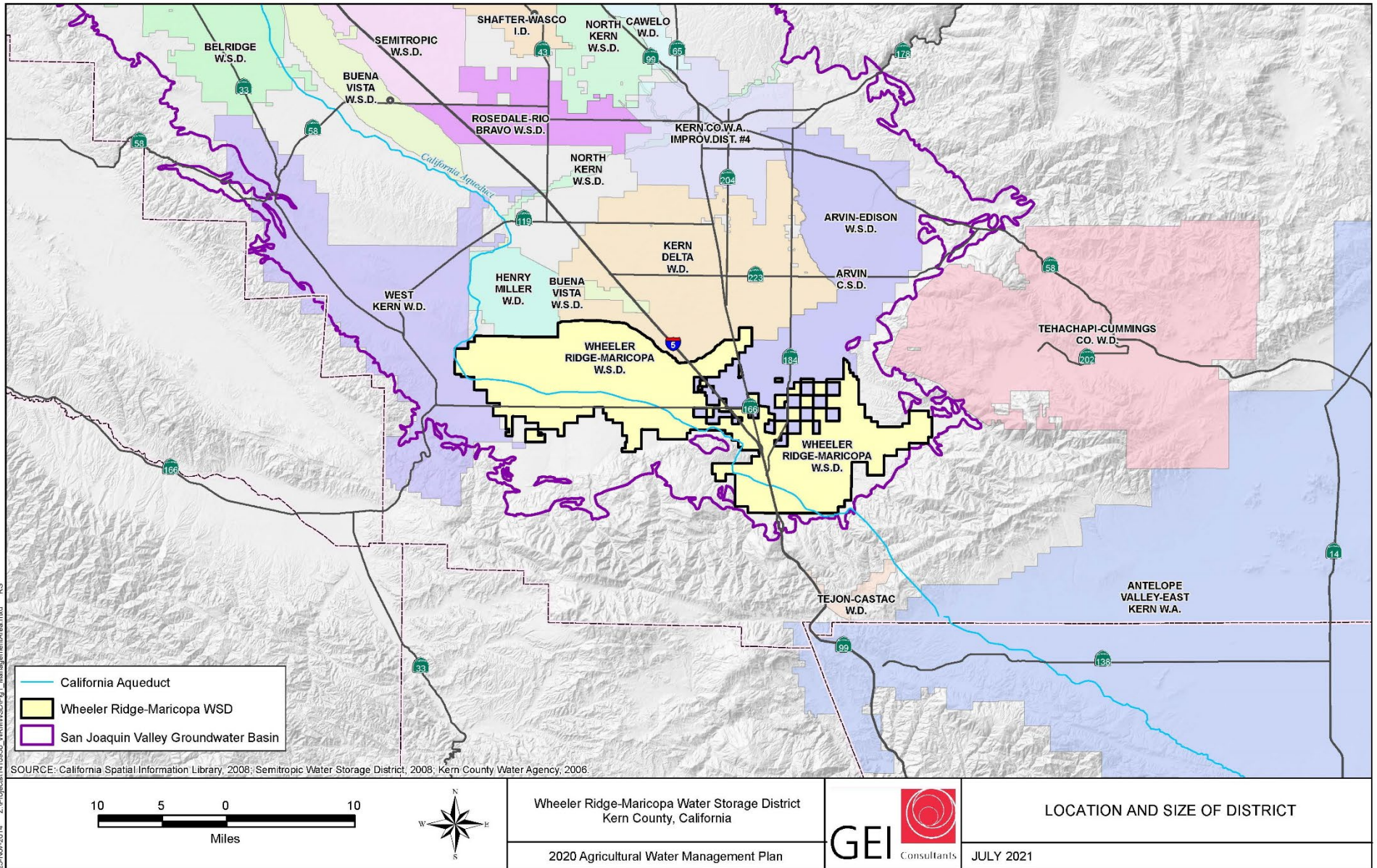


Figure 1-1. Wheeler Ridge-Maricopa Water Storage District Location

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1.2 Description of Previous Water Management Activities

The District and growers within the District have continually improved on-farm water management practices since formation of the District in 1959. Improvements have been driven by technology improvements, increased crop values, and increasing scarcity and costs of State Water Project (SWP) supplies. The District's water management has also improved over time with the advancement of technology, conjunctive use facilities and practices, and grower's on-farm irrigation application method improvements. Compliance with SGMA, required that the District prepare a MAP as an element of the Kern Groundwater Authority's (KGA) Groundwater Sustainability Plan (GSP), which covered a portion of the Kern County Subbasin (Basin No 5-022.14)

This AWMP identifies several previously implemented and ongoing water management activities, which include:

- In compliance with SGMA, the District prepared a Management Area Plan in 2019, as an element of the KGA's GSP. The MAP identifies Sustainable Management Criteria and Minimum Thresholds for sustainable management of the groundwater basin. Development of the MAP was done in coordination with the KGA and its member agencies. The District's Management Area Plan is included as Appendix A to this AWMP.
- Acquire surface water supplies from the SWP, and construct irrigation distribution system facilities to lands which previously relied exclusively on pumped groundwater for the purpose of District delivery of surface water.
- Participates in groundwater banking and recovery projects (Kern Water Bank, 2800 Acres, Pioneer Project, and Berrenda Mesa Project) that allows for the storages of wet years surplus water and recovery of stored water during dry years.
- Secure additional water supplies to mitigate water shortages from the SWP.
- Manage imported water and groundwater conjunctively to increase water supply reliability.
- Metered and tiered water pricing, and
- Financial support of the North West Kern Resource Conservation District's (NWKRCDD) Mobile Laboratory and encouraging landowners to take advantage of this resource by requesting field irrigation evaluations.
- Actively participate in local water resource management forums, including the Water Association of Kern County, Kern County Integrated Regional Water Management Plan (Kern IRWM Plan), the Kern River Watershed Coalition Authority (KRWCA), and the Kern Groundwater Management Committee (now the KGA).
- Require installation of flow meters on private landowner wells that pump into the District facilities.

1.3 Plan Coordination and Adoption Activities

The following coordination activities were performed by the District in preparing the 2020 AWMP.

1.3.1 Notification of Preparation

In compliance with Water Code §10821(a), the District notified the entities shown in Table 1-1 about the preparation of this plan. Appendix B includes the public notice of plan preparation.

Table 1-1. Summary of Coordination, Adoption and Submittal Activities

Potential Interested Parties	Notified of Plan Preparation	Assisted in Preparation	Received Draft Plan	Notified of Public Meetings	Sent Copy of Adopted Plan
Local City(s)					
Local County(s)					
County of Kern					
Water Management Entity					
Kern County Water Agency					
Arvin Edison Water Storage District					
Kern Delta Water District					
Henry Miller Water District					
DWR					
Local Newspaper					
California State Library					
Other					
Website					

1.3.2 Plan Adoption and Submittal

The 2020 AWMP was adopted during a Public Hearing held on June 9, 2021. A copy of the WRMWSD Board Resolution of Adoption for this AWMP is included in Appendix B. During the Public Hearing, the public and District landowners were provided an opportunity to provide comment on the AWMP.

The 2020 AWMP, as adopted by WRMWSD, is available on their website for review (<https://www.wrmwsd.com/>). This plan is available along with previous AWMPs and the District’s GSP for reference.

1.4 Implementation Schedule

The District will implement the requirements of this AWMP, consistent with Water Code §10800 – 10853, according to the descriptions, schedules and operating practices of the District. Additionally, implementation of SGMA requirements for achieving sustainable groundwater management will achieve many of the requirements of this AWMP and will be coordinated accordingly.

2.0 Description of Service Area

The District was formed on August 11, 1959 under California Water Storage District law for the purpose of securing a surface water supply for agricultural purposes from the Feather River Project (presently known as the State Water Project). The District's Project, including authority to execute a water supply contract for SWP supplies, and construct a water distribution system, was approved by the District's landowners at an election on November 14, 1967. The District is governed by an elected nine-member Board of Directors and operated by a staff of approximately 40 employees.

The District delivers a combination of imported water from the SWP, previously imported water recovered from several Kern County banking projects, local groundwater, and other water supplies to agricultural customers using District facilities. In addition, some agricultural water users in the District provide their own irrigation water through groundwater pumping.

The District's primary source of water is from the SWP through a contractual agreement with the Kern County Water Agency (KCWA). KCWA was formed to contract with the State of California for delivery of SWP Table A contract entitlement water to 13 water districts in Kern County. Delivery to the District from the SWP began in 1971.

Since the 1990's the District's SWP supply has become increasingly unreliable. To compensate for this loss of reliability, the District acquires and delivers several sources of water through the California Aqueduct in addition to their SWP contract amount. Since the 1990's the District has secured additional dry year water supplies for its landowners from sources in the San Joaquin Valley and from water districts north of the Sacramento-San Joaquin Delta. The District also stores surplus water in wet years in the Kern Water Bank, 2800 Acres, Pioneer Project, Berrenda Mesa Project, which is recovered in dry years when SWP allocations are not sufficient to meet the District's demands.

2.1 Physical Characteristics

The District is located in the southern portion of the Kern County Subbasin (Basin No 5-022.14) in the San Joaquin Valley region of California. The southern boundary of the district abuts the foothills of the Tehachapi Mountains. The California Aqueduct traverses the District west to east for approximately 34 miles, beginning about midway between the District's northern and southern boundaries and exiting the south eastern boundary (as shown in Figure 1-1).

Neighboring districts include:

- West Kern Water District to the west,
- Henry Miller Water District and portions of Buena Vista Water Storage District and Kern Delta Water District to the north,

- Arvin-Edison Water Storage District to the north and east, and
- Tejon-Castac Water District to the south, which partially overlays a portion of the District.

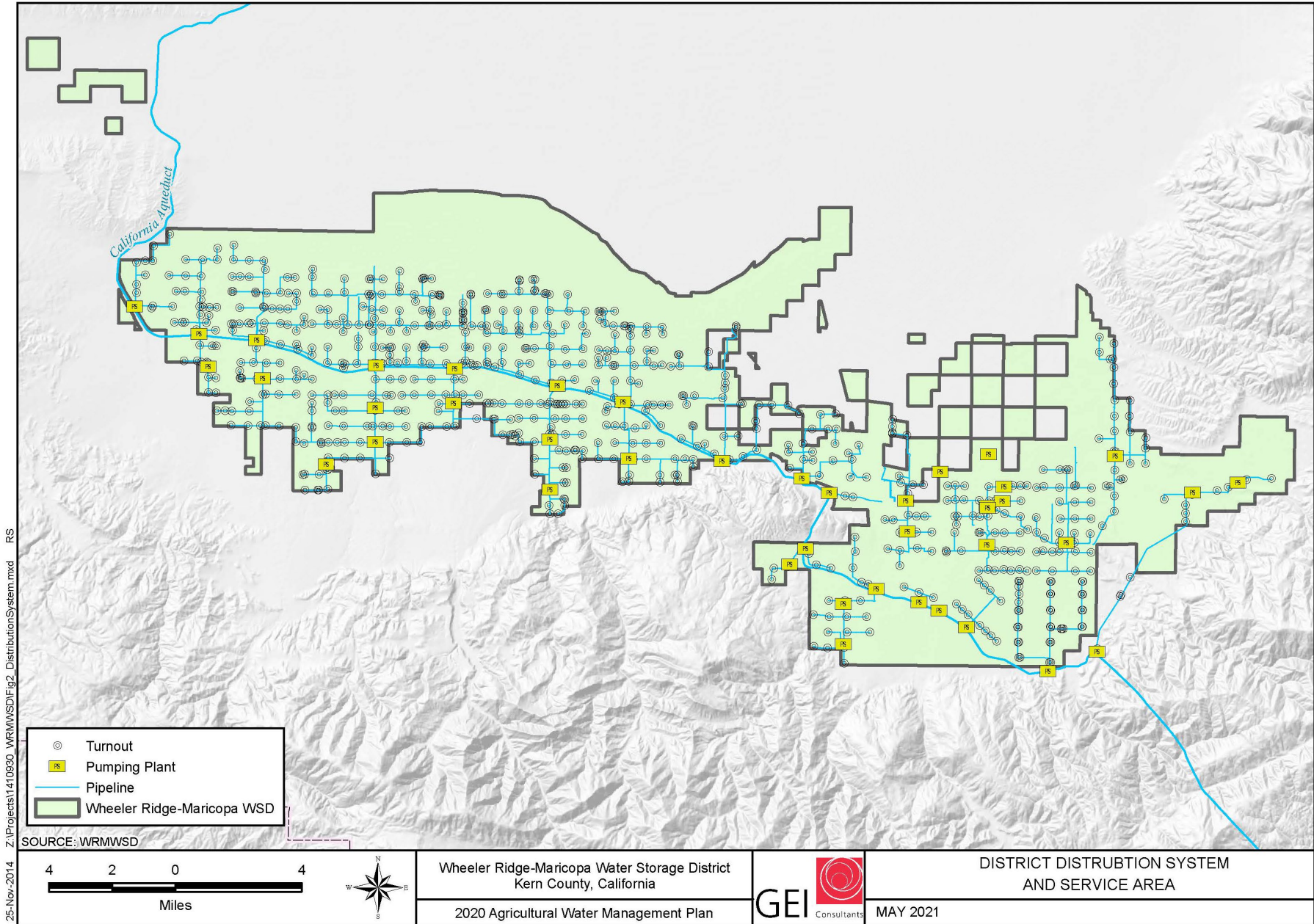
Most of the land within the District slopes to the north. Elevations range from 295 feet above sea level at its northwesterly boundary to 1,865 feet at its eastern boundary. Access is obtained via State Route 99 and Interstate 5 highways in the north-south direction, and State Route 166 (Maricopa Highway) in the east-west direction. For additional details on the physical characteristics of the District and the underlying groundwater basin, see Section 2.0 Basin Setting the District’s MAP (Appendix A).

2.1.1 Size of the Service Area

Farmlands in the District are approximately 30 miles or more from any urban areas, such as the City of Bakersfield, and there is limited interest in converting these lands to urban uses. However, some urbanization is occurring in other areas of Kern County resulting in the conversion of agriculture lands to urban use. The current irrigated land area within the District is expected to remain relatively stable for the foreseeable future, as indicated in Table 2-1. While there is a minor potential for some increase in the amount of irrigated acreage since there are undeveloped or un-irrigated lands within the District, the District expects the more likely change would be a decrease in irrigated acreage due to the decreasing reliability of imported supplies from the SWP and sustainable management requirements of local and regional groundwater resources. The District’s distribution system and service areas are shown on Figure 2-1.

Table 2-1. Expected Changes to Services Area

Change to Service Area	Estimated Magnitude of Change	Cause(s) of Change	Estimated Effect on Water Supplier
Reduced Service Area	Negligible	Change in District Contract Acres	No substantial impact
Increased Service Area	Negligible	Change in District Contract Acres	None
Reduction in Irrigated Acreage	Negligible	Potential reduction in available water supply.	None
Increase in Irrigated Acreage	Negligible	Limited water supply may limit potential increase in Irrigated Acreage.	None



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Figure 2-1. District's Distribution System and Service Areas

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The District’s water supplies are comprised of the SWP (197,088 acre-feet of SWP Table A entitlement), local groundwater, and other imported supplies. From 1971 to 2020 the District delivers on average 169,000 acre-feet annually, totaling 7.5-million-acre feet delivered. Current grower demands vary from 175,000 to 185,000 acre-feet per year of supply to farmlands within the District's Surface Water Service Area (SWSA) (under the terms of recorded long-term agricultural water service contracts). In 2020, about 92,000 acres of farmland within the District were irrigated. Approximately 72,074 acres were irrigated acres within the SWSA and 20,000 acres were irrigated acres of farmland outside of the SWSA, but within the District’s boundaries. Current District facilities can also provide temporary water service to about 18,000 acres of additional farmlands. Approximately 27,000 acres are undeveloped and used primarily for grazing. Except for a few locations along Interstate 5, the District is exclusively rural. There are no cities or towns within the District's boundaries. Table 2-2 provides an overview of the District history and size.

Table2-2. Water Supplier History and Size

Date of Formation	1959
Sources of Water	State (DWR) Regulated Water, Local Surface Water ³ , Local Groundwater
Gross Acreage (at Formation ¹)	134,190
Total Acreage (Current ²)	147,000
Irrigated Acreage (Current ²)	72,074 SWSA; 30,000 Groundwater Area; 102,074 Total.

¹ Kern County Water Agency Report 1969-1971, by KCWA.

² WRMWSD website (<https://wrmwsd.com/>)

³ Occasional surface water supplies and runoff from the Southern Stream Group, local creeks (e.g. El Paso, Tunis, and Pastoria) and Tejon Reservoir releases that occur during wet hydrologic years and some normal hydrologic years.

2.1.2 Water Management Facilities

The District owns and operates a system of pipelines, surface water turnouts, canals, and wells to provide a reliable water supply to the service area. An overview of this system is presented in Figure 2-1.

Piping

The District has constructed extensive facilities for the purpose of conveyance and distribution of imported surface water supplies to lands within the District, including canals, pipelines, and pumping plants. The District owns and operates a distribution system of 294 miles of pipelines, 137 booster pumps, 16 wells and over 7 miles of concrete-lined canal. Depending on land leasing patterns each year, the District serves between 100 and 150 customers. A summary of the existing irrigation distribution facilities located within the District is identified in Table 2-3.

Table 2-3. Water Conveyance and Delivery System

System Type	Number of Miles ²	Percentage of System
Unlined Canals	None	0%
Lined Canals ¹	7. miles	2.2%
Pipelines	294 miles	97.8%
Drains	None	0%
Total	301. miles	100%

¹ Specifications No. WRM 620 for constructing 850 Canal, 1971.

² Based on Wheeler Ridge GIS data and the District Engineer-Manager's Inventory Binder.

Surface Water Turnouts

The District delivers the SWP water through 15 turnouts within Reaches 14, 15 and 16 of the California Aqueduct. Water is transported through District owned lined canals and pipelines to farm turnouts.

The District's delivery system is automated with pressurized pipelines delivering to 746 farm turnouts, basically eliminating operational spills. Pumps are monitored and controlled remotely through the District's Supervisory Control and Data Acquisition (SCADA) system. Each turnout is equipped with a totalizing and indicating flow meter. Since surface water is delivered from the California Aqueduct into pressurized pipeline delivery systems regulating reservoirs are not necessary for the system to operate efficiently.

Canals and Spill Basins

The District owns one 12-acre Spill Basin (reservoir) to capture operational spills at the end of its 7-mile 850 Canal system. However, the District's real-time SCADA control systems results in virtually no spill, and operation of the pumps at the Spill Basin for recovery of any spilled water has not been necessary for many years. The majority of land within the District's service area is well drained which reduces surface runoff. Virtually all on-farm irrigation in the District's service area is made with high-efficiency irrigation systems (micro drip, micro sprinkler, and sprinkler). Therefore, the need for on-farm surface tail-water recovery systems is low. A few vegetable growers use surface tail-water recovery systems to capture and reuse runoff from sprinkler systems.

2.1.3 Terrain and Soils

Most of the land within the District covers the valley floor and the gently sloping foothills at the valley's southern edge, where the Coast Ranges and Tehachapi Mountains meet. Elevations within the District range from 295 feet above mean sea level (msl) at the northwesterly boundary to 1,865 feet msl at its eastern boundary. The land surface within the District generally slopes from the foothills along its southern and eastern boundaries to the lower elevation along its northern boundary near historical dry lake beds in the west-central portion of the valley. Grades are generally less than 4 percent and the topography can generally be characterized as flat. The

California Aqueduct crosses the District from west to east along an approximate ground surface elevation of 500 feet msl, rising to 1,250 feet msl as it extends over the District and eventually exits the basin to the southeast (Figure 2-1). The Tehachapi Mountains and San Emigdio Mountains rise from the valley floor to the south of the District, while the Temblor Range of the Coast Ranges and the Sierra Nevada Foothills rise up to the west and east of the District, respectively. Ground surface elevations within the contributing watershed of the District rise to above 7,000 feet msl in the San Emigdio Mountains south of the District boundary.

The primary land use within the District is agriculture. About 97% of the land within the District is irrigable, with 90% of the soils within the Surface Water Service Area classified as having wide crop adaptability with no limitations. A wide variety of crops are grown. Crops with a total acreage of over 1,000 acres within the District are cotton, safflower, wheat, alfalfa, carrots, lettuce, melons, onions, peppers, potatoes, tomatoes, wine and table grapes, almonds, pistachios, lemons, and oranges. Among other crops grown are asparagus, walnuts, plums, and grapefruit.

Soils

The soil types in Kern County vary in structure, texture, and chemistry with geographical location. Valley floor soils are derived mostly from mixed granitic and sedimentary rocks and are characterized as saline alkaline. The generalized soils map units or soil associations underlying the area, shown in Figure 2-2, are described in the soil surveys for Kern County, prepared by the U.S. Natural Resources Conservation Service. Soils within the District do not have any identifiable impacts upon water operations and management in the service area.

2.1.4 Climate

The District experiences a semi-arid climate. The growing season is among the longest in the San Joaquin Valley, averaging about 300 days above 32 degrees Fahrenheit (°F). Temperatures exceed 90 degrees Fahrenheit about 110 days per year. The average precipitation of about 7.5 inches per year falls almost entirely in the winter and spring.

Figure 2-3 shows annual peak, average, and low temperatures over time at CIMIS Station 125 at Arvin-Edison since March 1995. Each series was fitted with a linear regression line to examine trends in these temperatures over time. As shown by the trendlines, gradual long-term increasing trends are observed in all three series. Over the 25-year period of record, the trendlines show that annual peak and average temperatures has increased at rates of approximately 0.12 and 0.05 degrees, respectively. The annual low temperature has decreased at a rate of 0.08 degrees over the same period.

The 5-year mean monthly precipitation within the District is shown on Figure 2-4, based on the data collected at seven (7) rain gauges from within the District. January through March are typically the wettest months with average rainfall amounts above 1 inch per month. The driest months are typically June through September with average rainfall amounts of less than 0.2

inches per month. Average precipitation during the wet season (October through March) for the 2015 to 2020 period is approximately 5.7 inches.

Given the District's location at the southern end of the San Joaquin Valley in a portion of the valley that is partially surrounded by a horseshoe-shaped ring of mountains, the Sierra Nevada Mountains to the east shut out most of the cold air that flows southward over the continent in the winter. Summers in the southern portion of the valley are typically hot and dry. Winters are typically cooler and are characterized by frequent fog or low clouds which occur mostly at night. These conditions prevail when cold, moist air is trapped in the valley by high pressure systems. The depth of fog or clouds is usually less than 3,000 feet above ground level. There are usually clear skies and mild temperatures in the surrounding foothill and mountain areas.

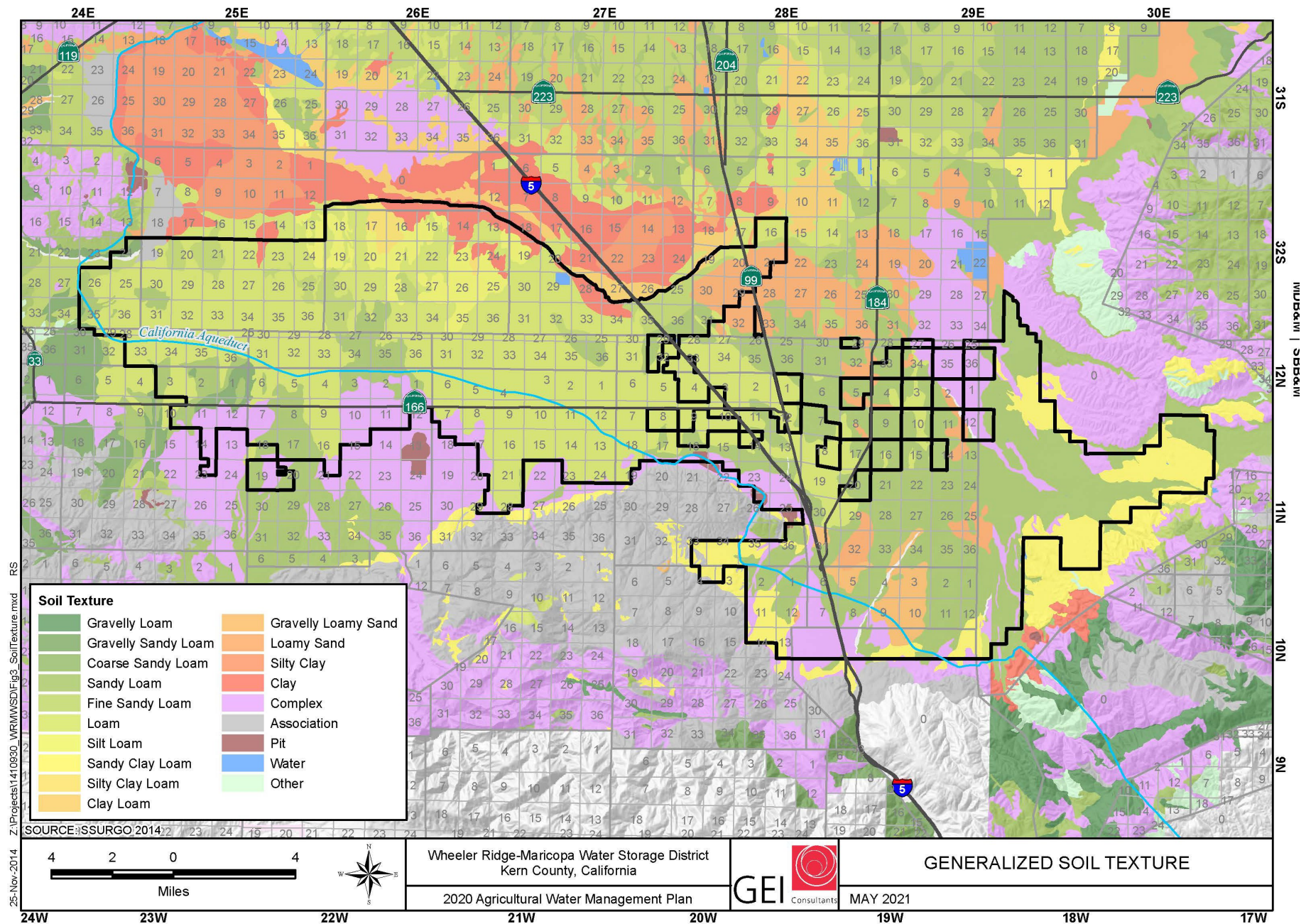


Figure 2-2. Generalized Soil Texture Map

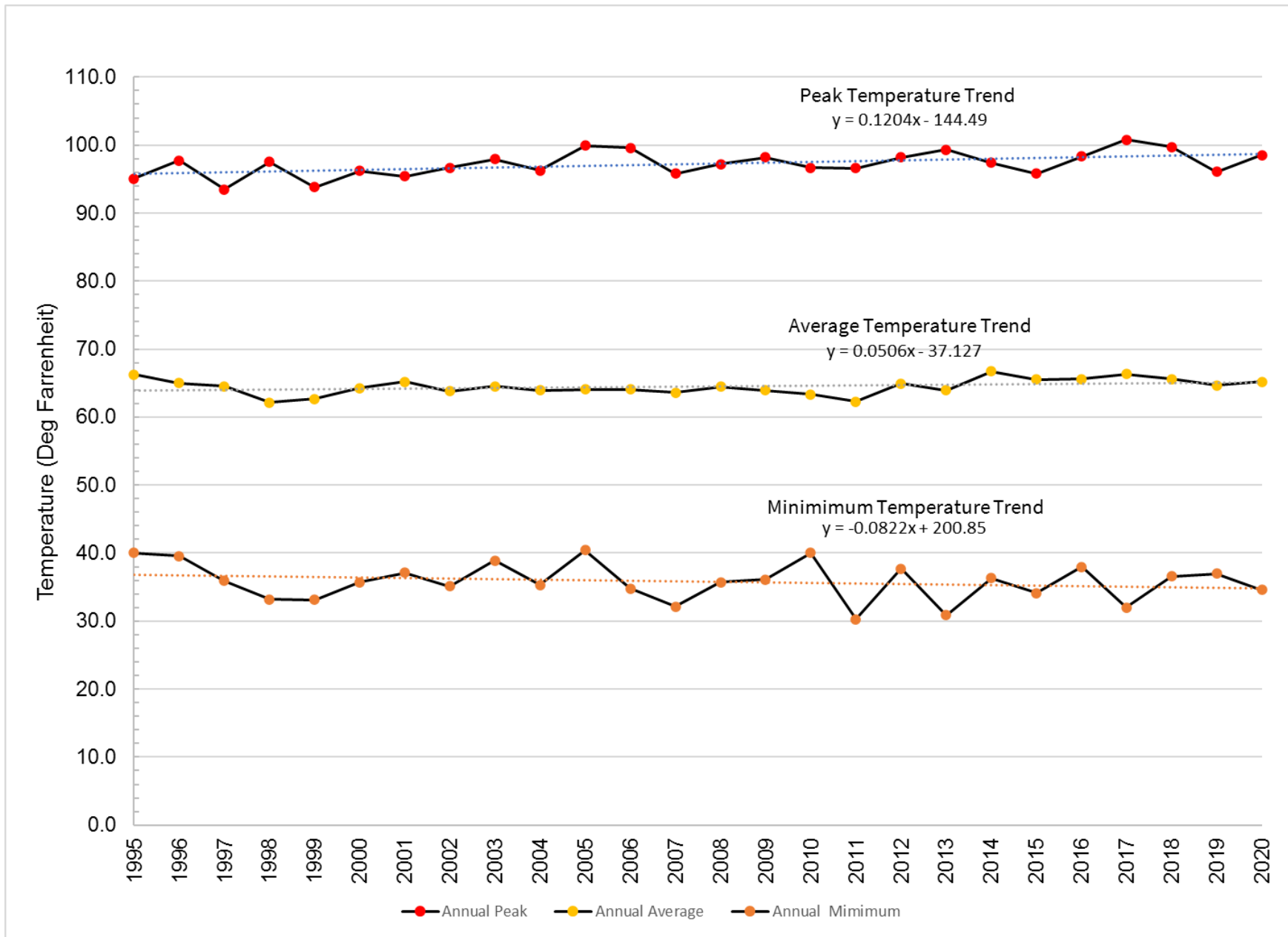


Figure 2-3. Annual Precipitation Pattern 2015 to 2020.

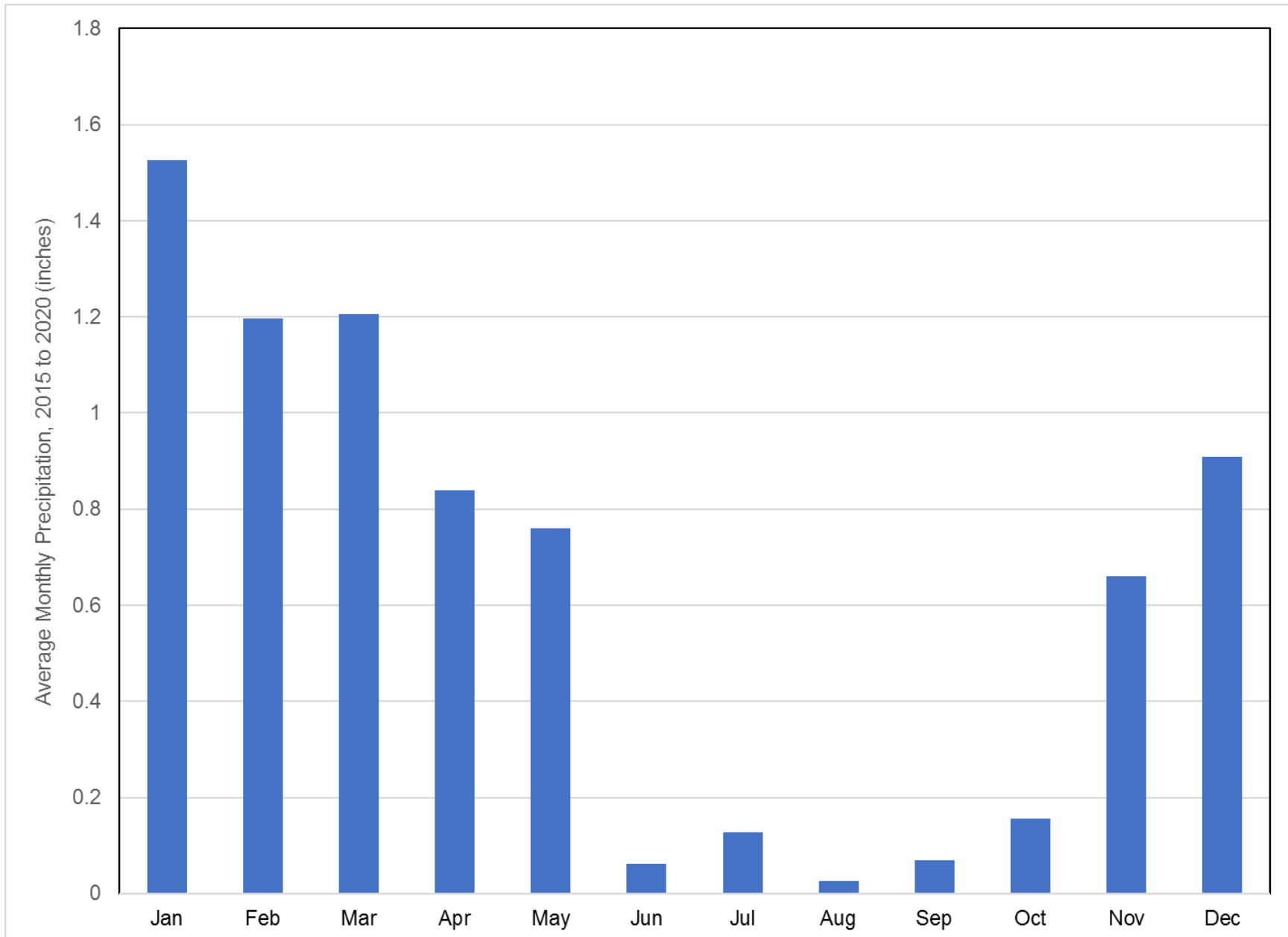


Figure 2-4. Mean Monthly Precipitation at CIMIS Station 125 (Arvin-Edison) 1995 to 2020.

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2.2 Operational Characteristics

Operations performed by the District are based on the principal of efficient, flexible, and equitable water supplies to further resiliency and sustainable management under SGMA. Various programs and projects have been implemented by the District since its establishment to enhance water sustainability of the region. With the completion of the District’s MAP under SGMA, it will now begin implementation of identified project and management actions designed to reach sustainable groundwater management by 2040.

2.2.1 Operating Rules and Regulations

The District has adopted Rules and Regulations for Distribution and Use of Water (“Rules and Regulations”; copy included in Appendix C) that serve as the guideline for District operations and delivery of water. The Rules and Regulations cover the procedures which are followed to distribute irrigation water in an orderly, efficient, and equitable manner.

2.2.2 Water Delivery Measurements and Calculations

All farm delivery points, or “turnouts”, for water delivered by the District to the landowner are equipped with flowmeters that indicate instantaneous flow and accumulate the quantity delivered with a totalizer. District staff read the meters every Tuesday and observe each meter for any sign of abnormal reading. Table 2-4 provides water delivery measurement information in tabular form, along with the typical levels of accuracy for measurement devices which are in use.

District staff routinely monitors each meter for abnormalities and District policy is to replace a meter if the abnormal reading cannot be rectified in the field (see Section 10 of the plan). The District uses the same manufacturer for all meters to help with consistency in measurement. In addition to District Staff monitoring for any abnormal performance, landowners can request the meter be tested.

Table 2-4. Water Delivery Measurements

Measurement Device	Frequency of Measure	Frequency of Calibration	Frequency of Typical Maintenance	Est. Level of Accuracy
Propeller Meters with Totalizers ¹	Read Weekly	Infrequently	As needed	± 2%
Venturi Meters ²	Continuous	As needed	As needed	± 2%

¹ Propeller Meter manufacturer (MC Model MG900; McCrometer, Hemet, CA) specifies ±2% accuracy reading guaranteed, throughout range of 40 gpm to 8500 gpm depending on nominal pipe size (±1% accuracy over reduced range), and a repeatability 0.25% or better.

² Venturi Meters are used for deliveries off the California Aqueduct to the District’s conveyance system. These meters are operated and maintained by the DWR.

2.2.3 Water Rate Schedules and Billing

The District Board of Directors annually establishes water rates. The District has several service areas that have different energy charges associated with them resulting in some variation in rate based on the pumping lifts required to deliver water to service areas.

Although the District’s pricing structure is quite complicated, it is basically split into two areas; fixed charges (typically based upon Contract Acres), and variable charges based upon the quantity of water ordered or delivered. The costs associated with the District infrastructure and personnel are charged through the acreage charge, and the water costs and power costs associated with the delivery are charged on a per acre-foot basis. Table 2-5 provides a summary of the water rates basis employed by the District.

Table 2-5. 2020 Water Rate Basis

Type of Billing Rate Basis	Type Used? Yes/No	Approx. % of Water Deliveries	Description
Volume of Water Delivered	Yes	100%	A portion of each water bill is based on volume of water delivered.
Area (acres)	Yes	100%	A portion of each water bill is based on an acreage charge.
Land Assessment	Yes	-	Lands benefitting from the District’s Project that are outside the Surface Water Service Area pay a small fixed per acre charge regardless of availability of surface water delivered by the District.
Crop	No	-	-

Under conditions of Contract Water Service, Water Users pay the Water Availability Charge and Water Use Charge as provided in the Water Service Contract. On or before July 1 of each year, the District mails to each Contract Water User a final accounting of water charges for the previous year which corrects the budgeted rates and deliveries to actual values

On or before December 1 of each year, District will notify each Water User in writing of the estimated total amount of water charges for the year. The total amount shall be paid by Water User in eight equal installments due and payable on the tenth day of the months of February through September of each year, which includes all water allocated for the year.

2.3 Drought Plan

This Drought Plan section details how the District would prepare for droughts and manage water supplies and allocations during drought conditions. Some components or actions may require review of conditions, policy changes, and long-term capital improvements. Additionally, as conditions change and new technology and knowledge becomes available, opportunities and constraints will change. The drought management plan describes the following components prescribed in the Guidebook:

- Water Shortage Allocation Policy
- Resiliency Planning
- Drought Actions and Response Planning

2.3.1 Water Shortage Allocation Policy

The District's Water Shortage Allocation Policy is stated in Section 3(l) of the Water Service Contracts and Section 8 Water Shortages of the District's Rules and Regulations (see Appendix C). Required drought planning elements are satisfied through the District's Water Shortage Allocation Policy and other planning documents including the MAP developed in compliance with SGMA, which forms the basis for the following sections.

2.3.2 Resiliency Planning

Resiliency planning for the District is largely dependent on external factors that affect resources within the service areas of the District. The District will manage during drought and water shortages using best available technology and information. The following sections set the foundation for drought resiliency planning within the District and help guide implementation of drought response actions herein and projects as developed under SGMA.

Data and Indicators

The primary source of surface supply for the District is its allocation of SWP water through the KCWA. Hydrologic conditions affecting supply and operations of the SWP are heavily monitored by DWR and used to forecast allocations to each of the project's contractors. These allocations then determine the quantity of SWP water available to the District. Deliveries from the California Aqueduct into the District's system are then measured and appropriately allocated to users within the service areas.

In addition, the District participates in several water purchase and transfer programs that acquire water supplies when SWP allocations are low for direct use within the District and during wetter periods for storage outside the District, which can be recovered for in-District use during dry years. The District also monitors groundwater elevations for compliance with DWR's CASGEM program and requirements set forth under SGMA. Therefore, data and indicators used to determine drought are external to the District and will be monitored closely to determine state of drought and how to manage accordingly.

Drought Vulnerability

Drought vulnerabilities are potential impacts to water systems or water users susceptible to conditions resulting from droughts, climate change, and other uncontrollable factors, resulting in the reduced water supplies available to the District. Such vulnerabilities form the basis for developing drought actions and response planning. Assessed vulnerabilities are also based on a range of potential future conditions, including consideration of the effects of climate change. This evaluation takes into account vulnerability information already identified in other planning efforts such as the District's MAP under SGMA.

As previously stated, the District relies on external factors such as SWP allocations and availability of transfers/purchases from outside of the District to meet current and future District demands. The following vulnerabilities have been identified.

- Potential reduction in imported surface water supplies (SWP) and surplus water.
- Decrease in groundwater elevations leading to increased pumping costs and well impacts.
- Permanent crops which may be climate-sensitive or impacted by prolonged (multi-year) deficit irrigation.
- Decrease in groundwater elevations leading to land surface subsidence impacting water delivery infrastructure.

Opportunities and Constraints

For the past several years, the District has made an effort to optimize technological advances, secure additional water supplies, and improve drought resiliency planning to navigate the opportunities and constraints of managing during drought years. The most critical factor for identifying opportunities and constraints related to drought is DWR forecasting for annual SWP supply allocations and DWR’s long-term forecasting of SWP delivery capacity. Because nearly 100-percent of the District’s water supply is dependent on the SWP, it is the most critical drought indicator for the District.

Water users within the District rely heavily on imported SWP water, which is often constrained or limited during dry or drought years. To mitigate shortage affects, the District has developed groundwater banking programs that build capacity to store, recover, and convey banked surface water to the District to increase supplies during dry years. For further information on drought related projects, see Section 17 of the District’s MAP developed in compliance with SGMA.

The District’s development of groundwater banking programs and its success in acquiring transfer water from sources outside of the SWP in wet years provides the District with the opportunity to store wet year water for use in dry years. Just as DWR’s annual SWP forecasting is important to identify upcoming drought conditions, it is equally important for identifying surplus conditions which are critical for managing dries conditions.

2.3.3 Drought Actions and Response Planning

Drought response in the District is a responsibility shared by the District and its growers. The District’s drought response policies are intended to allocate available surface water, augmented by delivery of previously stored water in groundwater banks located outside of the District and from groundwater pumped from District-owned wells. These actions will be conducted in a manner that is equitable and consistent with the District’s operational policies while maintaining the District’s financial viability. An important objective of this approach is to provide growers with an accurate assessment of the volume and cost of water that will become available to them so they can utilize this water in a manner that is best suited to the requirements of their farming operations.

Because the quantity of SWP water available to the District in any given year is beyond the District’s control, the District’s drought response actions center on managing water previously stored in groundwater banks and opportunities to purchase or transfer water during the dry

periods. Reduced allocations of District-supplied water have placed the responsibility of managing these reduced supplies on growers to determine how best to utilize limited water supplies through deficit irrigation, fallowing of annual crops and other water conservation measures. The following sections describe how these water shortage allocation policies and associated response actions will be implemented.

Water Shortage Policies Implementation

Upon a water shortage, the District and its Board of Directors will follow the policies and processes for declaring a water shortage and for implementing water shortage allocations and related response actions as specified in Appendix C. Water supplies available from the SWP are governed by watershed precipitation, snow melt runoff, and other hydrologic factors that affect the yield of the SWP. When shortages occur, the following types of response actions as specified in Table 2-6 will take place. These response actions will be implemented as needed when water supply from KCWA is less than total contract amounts for all water users in the service area.

Table 2-6. Drought Response Actions

Response Action	Description of Response Action
Prorated SWP Allocations	District allocation of a pro-rated share of the District's total water supply to each water user.
Pumping of District-owned Wells	District pumping of groundwater from District-owned wells as part of the District's conjunctive management strategy.
Demand Management	District operation of a pressurized delivery system that delivers conjunctively managed water to on-farm, drip irrigation systems. Approach provides a high degree of flexibility and responsiveness to enable growers to manage water efficiently under all conditions.
	District will provide clear estimates of water allocations so that growers can make well-informed farming decisions.
Operational Adjustments	District will increase extraction of banked water located outside the District and increase extraction for District- and privately-owned wells to compensate for reduced deliveries of surface water.
Use of Alternative Water Supplies	District allocation of supplies obtained through active purchase and transfer programs and from surface supplies retrieved from previously stored water in groundwater banks.

Monitoring and Evaluation

As previously stated, hydrologic conditions affecting supply and operations of the SWP are heavily monitored by DWR and used to forecast allocations to each of the project's contractors. The District will use forecasted allocations to determine the quantity of SWP water available to the District and manage accordingly. If allocations fall short of total contract amounts, the District will implement response actions to mitigate the effects of drought to the service areas within the District. Further, the District will monitor for other drought vulnerabilities including groundwater elevation in accordance with monitoring protocols outlined in the MAP developed in compliance with SGMA.

In addition, the District has participated in drought programs through coordination and collaboration with the KCWA and the Westside 5 (a group of five water districts comprised of Belridge Water Storage District, Berrenda Mesa Water District, Dudley Ridge Water District,

Lost Hills Water District, and the District) to enhance water supplies available to growers. Implementation of the Sustainable Groundwater Management Act (SGMA) will provide yet another mechanism for regional collaboration and coordination. Regional efforts to implement this legislation will provide a firm, cooperative basis for management of groundwater during all conditions, but will be particularly important as a tool for drought response.

Financial Impacts

The District's Board of Directors annually establishes a water allocation of available supplies and establishes water rates. Water and the cost for the water is applied on a per-acre basis and is based on budget requirements and Board policy.

Since SWP water is delivered into the District's distribution system and distributed using pressurized laterals, the cost of distributing surface water in the pressurized distribution system is attributable to the fixed costs of operating and maintaining the canal and pipeline distribution system.

The District's Service Charge is based on the volume of surface water projected to be available to the District during the coming irrigation season, and uncertainties in these projections can result in unexpected expenditures to both the District and to its water users.

The District's SWP costs are Basic Obligation costs from the KCWA, reflective of the District's proportionate Member Unit percentage makeup of KCWA's Table 1 amounts (18.5202%). These costs are fixed annually, regardless of total SWP allocation. Therefore, as the SWP allocation decreases, the per acre-foot cost increases.

The District makes efforts to mitigate these high-cost dry years by banking substantial supplies in wet years. These wet year supplies are generally acquired at relatively low costs by comparison and can be recovered during dry years at a cost lower than the per acre-foot Fixed Obligation costs of the Table 1 supplies. When the District sets the annual water rates, it considers the F.O. equivalent costs for each supply available (SWP and Supplemental) and determines if a melded per acre-foot rate is of benefit to the District.

If the SWP F.O. is lower than the Supplemental F.O., then the Water Service Contracts require the SWP allocation and F.O. to stand alone i.e., not be melded with other supplies. However, if the Supplemental F.O. is lower than the SWP F.O., the effect of melding Supplemental supplies with the SWP supplies lowers the melded F.O. to the benefit of all Water Users.

3.0 Description of the Quantity of the Water Uses

The total demand for District water is fairly constant from year to year. The following section describes the quantity of water used by the District to meet its demands, which are primarily for agricultural water uses. Regarding agricultural water use, “Applied water” refers to the amount of water that must be applied in addition to rainfall to meet crop water requirements. The applied water requirement which is not met with supplies delivered into the District is met with pumped groundwater, either by the District or by landowners.

3.1 Agricultural

The primary land use within the District is agriculture. Historically, the District’s agricultural development expanded significantly in the 1940’s, peaked in total acres by the mid-1970’s, and since the 1990’s shifted from field crops to more permanent crops. Permanent crops, primarily almonds, citrus, and grapes, account for slightly more than 75 percent of the total area of the crops planted in the District’s service area in 2020. The current crop makeup of the District has evolved with the conversion from annual crops to high value permanent crops over time, which has led to a “hardening” of the total water requirement.

An estimate of overall agricultural demand for 2016 to 2020 is tabulated in Tables 3-1, 3-2, 3-3, 3-4, and 3-5, respectively.

Tables 3-1 through 3-5 represent the water requirement for specific crops grown on the irrigated lands within the service area of the District for 2016 to 2020. Total crop acreage is based on the District’s crop surveys for the each of the years. The District has an overlap area with neighboring Arvin-Edison Water Storage District (AEWSD) that appears as a checkerboard pattern as shown in Figure 1-1. Accordingly, the District’s crop survey acres necessarily include some AEWSD acres in the overlap area. Water requirements are calculated for all the WRMWSD acres, although AEWSD could potentially “double count” some of these crop water needs when it prepares its Agricultural Water Management Plan. Moreover, the overlap area includes roughly 1,666 acres of AEWSD surface water service area; this report did not attempt to account for AEWSD surface water deliveries to the overlap.

ET values are estimates based on Report on Investigation of Optimization and Enhancement Water Supplies of Kern County, Table 2, by Associated Engineering Consultants, dated 1983. This set of values, representing long-term average crop consumptive use, is also utilized in the Kern Fan Operations and Monitoring Report, which is prepared annually by the Kern Fan Monitoring Committee. Actual consumptive use of irrigation water will vary from year to year depending on rainfall and temperatures.

Table 3-1. Agricultural Crop Data for the Year 2016

Crop	Total Crop Acres¹	% of Total	Est ET_c (ft)²	Water Req. (AF)
Alfalfa Hay and Clover	2,486	3%	3.5	8,701
Almonds	16,084	18%	2.5	40,211
Apple, Pear, Cherry, Plum, and Prune	1,211	1%	3.2	3,875
Carrots	2,389	3%	1.6	3,823
Citrus	23,282	27%	2.6	60,534
Cotton	81	0%	2.6	209
Flowers, Nursery and Christmas Tree	0	0%	2	0
Grain and Grain Hay	759	1%	2	1,518
Grapes	28,924	33%	2.3	66,525
Melons, Squash, and Cucumbers	858	1%	1.6	1,373
Misc. Subtropical Trees	1,969	2%	3.2	6,300
Misc. Deciduous	0	0%	3.2	0
Misc. Field Crops	0	0%	2	0
Onions and Garlic	1,421	2%	1.7	2,415
Pasture and Misc. Grasses	210	0%	3.7	778
Peach, Nectarine, and Apricots	297	0%	3.2	951
Pistachio	4,996	6%	3.2	15,987
Potatoes	469	1%	2	938
Small Vegetables	618	1%	1.6	988
Tomatoes and Peppers	1,636	2%	1.6	2,618
Turnips and Misc. Vegetables	81	0%	2	163
Totals³	87,772	100%		217,908

¹ Total acres including double cropped acres, District's *Crop and Land Use Surveys*.

² From *Report on Investigation of Optimization and Enhancement Water Supplies of Kern County*, (1983), Table 2, by Associated Engineering Consultants.

³ Idle acres of 63,827 acres not included in the total for crop acres for 2017

Table 3-2. Agricultural Crop Data for the Year 2017

Crop	Total Crop Acres¹	% of Total	Est ET_c (ft)²	Water Req. (AF)
Alfalfa Hay and Clover	2,315	3%	3.5	8,102
Almonds	16,259	19%	2.5	40,649
Apple, Pear, Cherry, Plum, and Prune	1,211	1%	3.2	3,875
Carrots	3,345	4%	1.6	5,351
Citrus	23,965	27%	2.6	62,308
Cotton	237	0%	2.6	615
Flowers, Nursery and Christmas Tree	0	0%	2	0
Grain and Grain Hay	668	1%	2	1,337
Grapes	29,899	34%	2.3	68,767
Melons, Squash, and Cucumbers	607	1%	1.6	972
Misc. Subtropical Trees	2,009	2%	3.2	6,428
Misc. Deciduous	0	0%	3.2	0
Misc. Field Crops	0	0%	2	0
Onions and Garlic	858	1%	1.7	1,459
Pasture and Misc. Grasses	170	0%	3.7	629
Peach, Nectarine, and Apricots	297	0%	3.2	951
Pistachio	5,393	6%	3.2	17,259
Potatoes	981	1%	2	1,963
Small Vegetables	460	1%	1.6	736
Tomatoes and Peppers	1,949	2%	1.6	3,119
Turnips and Misc. Vegetables	0	0%	2	0
Totals³	90,624			224,519

¹ Total acres including double cropped acres, District's *Crop and Land Use Surveys*.

² From *Report on Investigation of Optimization and Enhancement Water Supplies of Kern County*, (1983), Table 2, by Associated Engineering Consultants.

³ Idle acres of 59,916 acres not included in the total for crop acres for 2017.

Table 3-3. Agricultural Crop Data for the Year 2018

Crop	Total Crop Acres¹	% of Total	Est ET_c (ft)²	Water Req. (AF)
Alfalfa Hay and Clover	2,315	3%	3.5	8,102
Almonds	16,259	19%	2.5	40,649
Apple, Pear, Cherry, Plum, and Prune	1,211	1%	3.2	3,875
Carrots	3,345	4%	1.6	5,351
Citrus	23,965	27%	2.6	62,308
Cotton	237	0%	2.6	615
Flowers, Nursery and Christmas Tree	0	0%	2	0
Grain and Grain Hay	668	1%	2	1,337
Grapes	29,899	34%	2.3	68,767
Melons, Squash, and Cucumbers	607	1%	1.6	972
Misc. Subtropical Trees	2,009	2%	3.2	6,428
Misc. Deciduous	0	0%	3.2	0
Misc. Field Crops	0	0%	2	0
Onions and Garlic	858	1%	1.7	1,459
Pasture and Misc. Grasses	170	0%	3.7	629
Peach, Nectarine, and Apricots	297	0%	3.2	951
Pistachio	5,393	6%	3.2	17,259
Potatoes	981	1%	2	1,963
Small Vegetables	460	1%	1.6	736
Tomatoes and Peppers	1,949	2%	1.6	3,119
Turnips and Misc. Vegetables	0	0%	2	0
Totals³	90,624	100%		224,519

¹ Total acres including double cropped acres, District's *Crop and Land Use Surveys*.

² From Report on Investigation of Optimization and Enhancement Water Supplies of Kern County, (1983), Table 2, by Associated Engineering Consultants.

³ Idle acres of 59,916 acres not included in the total for crop acres for 2018.

Table 3-4. Agricultural Crop Data for the Year 2019

Crop	Total Crop Acres¹	% of Total	Est ET_c (ft)²	Water Req. (AF)
Alfalfa Hay and Clover	2,637	3%	3.5	9,228
Almonds	17,285	20%	2.5	43,211
Apple, Pear, Cherry, Plum, and Prune	1,243	1%	3.2	3,977
Carrots	1,711	2%	1.6	2,738
Citrus	23,467	27%	2.6	61,013
Cotton	0	0%	2.6	0
Flowers, Nursery and Christmas Tree	0	0%	2	0
Grain and Grain Hay	261	0%	2	522
Grapes	28,431	32%	2.3	65,392
Melons, Squash, and Cucumbers	729	1%	1.6	1,166
Misc. Subtropical Trees	1,905	2%	3.2	6,097
Misc. Deciduous	0	0%	3.2	0
Misc. Field Crops	0	0%	2	0
Onions and Garlic	1,697	2%	1.7	2,885
Pasture and Misc. Grasses	1,917	2%	3.7	7,093
Peach, Nectarine, and Apricots	297	0%	3.2	951
Pistachio	5,192	6%	3.2	16,616
Potatoes	1,565	2%	2	3,130
Small Vegetables	503	1%	1.6	805
Tomatoes and Peppers	1,136	1%	1.6	1,818
Turnips and Misc. Vegetables	0	0%	2	0
Totals³	89,976	100%		226,642

¹ Total acres including double cropped acres, District's *Crop and Land Use Surveys*.

² From Report on Investigation of Optimization and Enhancement Water Supplies of Kern County, (1983), Table 2, by Associated Engineering Consultants.

³ Idle acres of 60,813 acres not included in the total for crop acres for 2019.

Table 3-5. Agricultural Crop Data for the Year 2020

Crop	Total Crop Acres¹	% of Total	Est ET_c (ft)²	Water Req. (AF)
Alfalfa Hay and Clover	2,637	3%	3.5	9,228
Almonds	17,285	20%	2.5	43,211
Apple, Pear, Cherry, Plum, and Prune	1,243	1%	3.2	3,977
Carrots	1,711	2%	1.6	2,738
Citrus	23,467	27%	2.6	61,013
Cotton	0	0%	2.6	0
Flowers, Nursery and Christmas Tree	0	0%	2	0
Grain and Grain Hay	261	0%	2	522
Grapes	28,431	32%	2.3	65,392
Melons, Squash, and Cucumbers	729	1%	1.6	1,166
Misc. Subtropical Trees	1,905	2%	3.2	6,097
Misc. Deciduous	0	0%	3.2	0
Misc. Field Crops	0	0%	2	0
Onions and Garlic	1,697	2%	1.7	2,885
Pasture and Misc. Grasses	1,917	2%	3.7	7,093
Peach, Nectarine, and Apricots	297	0%	3.2	951
Pistachio	5,192	6%	3.2	16,616
Potatoes	1,565	2%	2	3,130
Small Vegetables	503	1%	1.6	805
Tomatoes and Peppers	1,136	1%	1.6	1,818
Turnips and Misc. Vegetables	0	0%	2	0
Totals³	89,976			226,642

¹ Total acres including double cropped acres, District's *Crop and Land Use Surveys*.

² From Report on Investigation of Optimization and Enhancement Water Supplies of Kern County, (1983), Table 2, by Associated Engineering Consultants.

³ Idle acres of 60,813 acres not included in the total for crop acres for 2020.

Cropped acres as shown in Tables 3-1 through 3-5 contain all the District service irrigated acres, including double cropped acres and the fall net irrigated acres. The amount of irrigated land not cropped at any time during the year is indicated as idle land in Tables 3-3 through 3-7 footnotes. Inter-cropping is not a common practice within the District service area. District crop surveys were used to assess cropping acreage for the selected years and the surveys indicated some acres as being double cropped.

3.2 Environmental

While the District does not make direct delivery of water specifically for environmental purposes within the District Service Area, a portion of the District's contract water is contributed to environmental needs outside of the District's Contract Service Area. To the extent that the

District’s SWP contract water supply is reduced in reliability to meet the environmental and water quality needs of the Delta, a portion of the contract water intended for delivery to the District Service Area goes to meet environmental water uses outside of the District Service Area, supposedly benefiting fish and wildlife outside of the District.

To the extent water is in the District’s 850 Canal that is incidental to operations, a negligible benefit to local wildlife may occur. Since this is an incidental environmental use, it is not a consumptive environmental water use applicable to the AWMP water balance. Additionally, the District is a 24 percent participant in the Kern Water Bank Authority, which provides significant environmental benefits, including for uplands terrestrial species and waterfowl.

3.3 Recreational

The District does not supply water to recreational facilities within the service area.

3.4 Municipal and Industrial

The District delivers only raw (non-potable) water to industrial water use within the District (Table 3-6). Additionally, it is noted that a portion of the District overlaps the Tejon-Castaic Water District (TCWDS) which provides primarily industrial water to the Tejon Industrial Complex along the I-5 corridor in the southern most portion of the District. The District does not provide water service to TCWD which has its own surface water supplies and groundwater banking assets for its area.

Table 3-6. Municipal and Industrial Water Uses for Presented Years

Municipal/Industrial Water Uses	Total Deliveries, per Year (AF)				
	2016	2017	2018	2019	2020
Municipal Entities	0	0	0	0	0
Industrial Entities ¹	2,944	2,595	3,001	2,618	2,620
Total	2,936	2,595	3,001	2,618	2,620

¹ Specific industrial entities receiving water supplies are generally listed in the District’s monthly and annual water use reports.

Additionally, it is noted that a portion of the District overlaps the Tejon-Castaic Water District (TCWDS) which provides primarily industrial water to the Tejon Industrial Complex along the I-5 corridor in the southern most portion of the District. The District does not provide water service to TCWD which has its own surface water supplies and groundwater banking assets for its area.

3.5 Groundwater Recharge

Some indirect recharge occurs within the District to the extent that the District delivers surface water in lieu of pumped groundwater to satisfy irrigation water requirements. In addition, surface water supplies which are surplus to immediate irrigation requirements within the District are available for direct groundwater recharge to locations outside of the District. In this regard, the District participates in the Kern Water Bank, the Pioneer Project, and North Kern banking projects; all these banking projects rely on direct recharge, are located outside of the District on

the Kern River alluvial fan and provide a source of supply in “dry” periods. Table 3-7 shows the volume of water recharged for the years selected, which indicates the District recharge occurs optimistically during particularly wet years when recharge using spreading ponds outside of the District within banking facilities is significant.

Table 3-7. Groundwater Recharge Uses for Presented Years

Groundwater Recharge Water Uses (Locations)	Delivery or Recovery from Out-of-District Banking Facilities, per Year (AF) ¹				
	2016	2017	2018	2019	2020
Kern Water Bank	6,283	0	26,125	0	37,788
North Kern Recovery	490	0	0	0	
Pioneer Project	1,719	0	4,032	0	12,212
Total	8,492	0	30,157	0	50,000

¹From District Engineer-Manager’s Monthly Reports.

The District participates in four long-term “Water Banking” programs, which are located out-of-district, allowing the District to store then current “surplus” water and to recover their water when needed. Water banking involves the regulation of surplus surface water supplies, by placing the water into groundwater storage for subsequent recovery. The storage is achieved through either indirect or direct recharge. Indirect recharge is based on the delivery of surface water in-lieu of pumping groundwater. Direct recharge is based on the surface spreading and percolation of water supplies in basins or ponds, which is the method used in the Banking Projects.

The advantage of in-lieu recharge is that the recharge is essentially immediate, as the delivery of one acre-foot of water on the surface immediately displaces one acre-foot of groundwater pumping and does not depend upon percolation and the movement of water in the aquifer. One disadvantage is the fact that the surface water supply must be available on an irrigation demand schedule, with irrigation demands being relatively low during winter months. In contrast, direct recharge through use of the banking project facilities can be accomplished during any time of the year, which increases the likelihood of being able to capture unregulated supplies that become available from time to time.

4.0 Description of Quantity of Water Resources

4.1 Water Supply Quantity

4.1.1 Surface Water Supply

As previously discussed, surface water deliveries to the District began in 1971. All water delivered is in a raw untreated condition, suitable for irrigation, and is not suitable for human consumption without treatment. The primary source of surface water is SWP water delivered through the California Aqueduct. Besides SWP supplies, the District supplements deliveries with water originating from other sources.

State Water Project

The District imports SWP water under a contract with the KCWA for 197,088 acre-feet per year. The contract with the KCWA was signed in 1967. Under its contract with the KCWA, the District receives an annual allocation of SWP water which is delivered from the California Aqueduct. The amount of water available from this source varies with the type of year (“dry” versus “wet”) and constraints on the amount of pumping allowed from the Sacramento-San Joaquin River Delta. Similarly, additional contract water supplies vary from year-to-year, as additional contract supplies are dependent on purchases made by the District.

From time to time, additional SWP supplies, referred to as “Article 21” water, are made available. Historically, the District has been able to receive Article 21 water; however, due to the restrictions on pumping water from the Delta, Article 21 water is becoming less available to the District and other districts over time.

Tables 4-1 contain a summary the surface water supplies delivered to the District that consist of various SWP sources plus water delivered that was recovered as previously banked supply from one of the water banks located outside of the District. Additional detail of the distribution and quantities of surface water that has been developed by the District for the 2016 to 2020 period is provided in Table 4-2.

Table 4-1. Surface Water Supplies for Presented Years

Source of Water Supply	Type of Supply	Total Deliveries, per Year (AF)				
		2016	2017	2018	2019	2020
SWP Surface Supplies	Surface	106,294	149,911	56,074	140,452	40,988
Kern River Supplies	Surface		13,640		13,005	
Water Transfers	Surface	5,214	22,893	48,212	7,741	22,706
Banking Recovery	Bank Return	8,492		30,157		50,000
Kern Water Bank / Pastoria	Surface	2,936		2,965	2,588	2,569
Total		122,936	186,444	137,408	163,786	116,263

¹ Represents all water supplies from the SWP, including District Table A Allocation, Annual Carryover, DWR Turnback Pool, Article 21 water supplies, see Table 4-2 for details

Table 4-3 lists restrictions or imposed limitations on sources of the District’s surface water supply, including the largest component of the District’s supply, SWP water via the California Aqueduct. Restrictions on this supply generally result from regulatory actions of wildlife agencies related to endangered species actions and actions of the SWRCB that restrict the pumping operations managed by the DWR, and related judicial proceedings. Pumping restrictions have adversely affected the reliability of SWP supply, caused groundwater levels to decline and generally result in application of lower quality groundwater to grow crops. The quantity of transfer water that can be delivered into the District or into banking programs outside of the District has also been restricted due to the imposed limitations shown in Table 4-3. Additionally, these restrictions result in significant financial burdens to the District and its water users because (i) the fixed costs of DWR and the District must be paid even with reduced quantities to be delivered, and (ii) banked supplies and programs to buy limited additional supplies can only be secured at much greater expense.

Table 4-2. Distribution of Surface Water Supplies for Presented Years

Water Source	Surface Water Deliveries, per Year (AF) ¹				
	2016	2017	2018	2019	2020
Year Type	Below Normal	Wet	Below Normal	Wet	Critically Dry
SWP Supplies					
Current Allocation	61,241	132,054	48,024	130,434	26,319
Article 21		11,158		2,306	
DWR Turnback Pool		2,248			
SWP Carryover	45,053	4,451	8,050	7,712	14,669
Transfer Water					
Kern River		13,640	0	13,005	
Butte County	2,553	4,330	1,489		489
Castaic Lake Water Agency		2,967			
Common Landowner Transfer		592			
CV Communities	632				
DYTP - Yuba Program			30,973		15,902
Fresno ID / City of Fresno		13,629	1,854		
Friant Exchange Supplies	1,038				1,959
Friant Recirc Water			345	468	
KCWA Lease Water	971	1,375			
Kern Delta			1,349		
Landowner Transfers	20		6,934	3,200	3,488
Mettler Recharge					847
Napa Exchange			1,726		
SCVWD			1,349	2,670	
TCCWD / Granite				9	21
TCWD			2,193		
Western Hills				1,394	
Pastoria	2,936		2,965	2,588	2,569
Banking Recovery					
Banking Recovery	8,492	0	30,157	0	50,000
Total	122,936	186,444	137,408	163,786	116,263

¹From Engineer-Manager's Monthly Reports.

Table 4-3. Potential Restrictions on Water Sources

Impacted Source	Restrictions or Imposed Limitations	Name of Agency Imposing Restrictions	Operational Constraints
State Water Project (SWP)	Delivery Schedule and Volume	USFWS, NMFS, Federal Courts, and SWRCB	Reduced reliability of SWP deliveries south of the Sacramento-San Joaquin River Delta due to constraints on pumping.
Transfers	Conveyance through Sacramento-San Joaquin River Delta	USFWS, NMFS, Federal Courts, and SWRCB	Reduced amount of time during the year for which conveyance through the Delta is allowed.

4.1.2 Groundwater Supply

The District overlies the southern portion of the Kern County Subbasin (DWR 5-022-14) and the newly designated White Wolf Subbasin (DWR 5-022-18) within the larger San Joaquin Valley Groundwater Basin, which is a portion of the Central Valley aquifer system. The DWR subbasins are shown in relation to the District’s service area on Figure 4-1, and the size of the basin (as published by DWR) is indicated in Table 4-4.

Table 4-4. Local Groundwater Basin

Basin Name	Size (Sq. Mi.)	Est. Capacity (AF)	Safe Yield (AFY)
Kern County Groundwater Subbasin ¹	3,040	40,000,000	Unknown

¹ DWR San Joaquin District Kern County Groundwater Subbasin information available at following address: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/5-22.14.pdf

Information on groundwater management in the District, as well as the geology of the aquifer underlying the District’s service area, is presented in the WRMWSD’s MAP developed under SGMA.

The District, DWR, KCWA, and AEWSO conduct groundwater monitoring within the District boundaries. Water level monitoring has been conducted in the District since the 1950’s. Additionally, groundwater is monitored according to the District’s MAP to achieve sustainable groundwater management by 2040.

Although the water supply provided by the District meets most of the water demand, there remains some water users within the SWSA who supplement surface deliveries with groundwater pumped from private wells. In addition, there are water users outside of the SWSA but within the District boundary whose entire water supply is drawn from private wells. The total volume of groundwater extraction within the District is the combination of water pumped from these private wells and pumping at the 17 District wells. While the District maintains records of the volume of water pumped from its own wells, data are not available on the number of private wells in operation, nor the volume of groundwater pumped from these wells. Table 4-5 summarizes the surface water and groundwater supplies used in the within the District for 2016 to 2020.

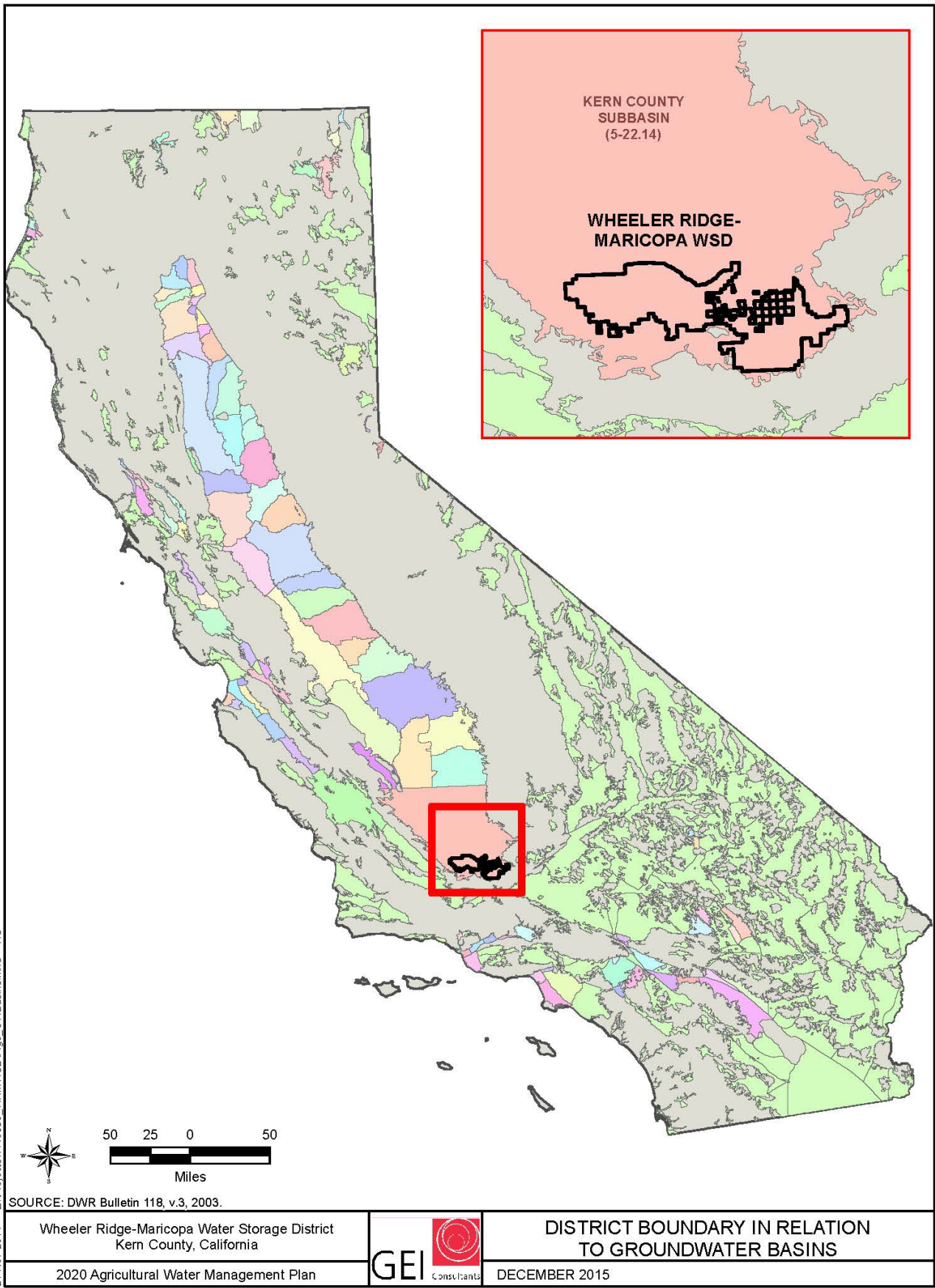


Figure 4-1. Map of District in Relation to Groundwater Basins

Table 4-5. Groundwater Supplies for Presented Years

Groundwater Supply Source ¹	Total Deliveries, per Year (AF)				
	2016	2017	2018	2019	2020
District-owned Wells	12,648	7	10,218	328	7,041
Private Wells pumped into District	64,314	11,999	76,735	22,133	119,673
Total	76,962	12,006	86,953	22,461	126,714

¹Based on the District's *Summary of Deliveries*.

4.1.3 Drainage from the Surface Area

Drainage wells and surface drainage systems are not employed by the District. In some areas, groundwater below the root zone from excessive deep percolation is recoverable and can be used to supplement surface water. In these areas, the recovered water is generally of poorer quality than surface water and is not suitable for irrigation unless blended with better quality surface water. As Table 4-6 summarizes, there are some minimal flows to saline sinks or perched water tables based on estimates provided by the District Engineer.

Table 4-6. Drainage Discharges

Surface/Subsurface Drainage Path	Water Uses, per Year (AF)				
	2016	2017	2018	2019	2020
Flows to Saline Sinks ¹	1,200	1,300	1,500	1,400	1,300
Flows to Perched Water Table	1,300	1,300	1,400	1,200	1,200
Sub-Total	2,500	2,600	2,900	2,600	2,500

¹Based on deliveries to certain WRM2, WRM4, and WRM5 System turnouts outside usable GW basin, assuming 5% of deliveries go to return flows.

²Assuming 15% of these turnouts deliver to perched water lands and 5% of deliveries go to return flows

4.1.4 Effective Precipitation

Effective precipitation within the District's service area is calculated as the total rainfall over the developed or irrigated acres of the District. It assumes that all precipitation is effective and available to meet crop consumptive used due to several local conditions: 1) precipitation is rarely significant enough to cause runoff from developed fields; and 2) the volume of precipitation is assumed to remain in the shallow vadose zone and, therefore, is available for uptake by crops. Precipitation data is monitored by the District at 6 locations within its service area. The District, then calculate the Thiessen average for precipitation across its service area. These monitoring stations are:

- Greenlee's Pasture
- District Headquarters
- WRM-2 Pumping Plant
- 5P-P2 Pumping Plant
- PA-2 Pumping Plant
- Spillway Basin

Table 4-7 provides the annual effective precipitation over the irrigated acres of the District for 2016 to 2020.

Table 4-7. Effective Precipitation (2016 to 2020)

	2016 ¹	2017	2018	2019	2020	Period Average
Irrigated Acres	87,772	90,624	90,624	89,976	89,976	89,794
Precipitation (inches)	8.21	8.99	6.26	10.63	4.56	7.73
Effective Precipitation (acre-feet)	60,035	67,915	47,263	79,710	34,192	57,823

¹2016-2020 rainfall calculated as the Thiessen Average using the District's 6 rain gauges.

4.1.5 Future Water Supplies

The District receives surface water from the SWP, which is delivered to the District via the California Aqueduct. Historically, Article 21 and Turnback water available for purchase were used to supplement the District's contract water supply. Recently, SWP supplies, including Article 21, have been significantly reduced and there is the potential for additional reductions in the future; however, the amount and timing of the reduction is somewhat uncertain. In most years, the District purchases supplemental water supplies from KCWA and other sources.

The District SWP water has been and will continue to be subject shortages in this source of supply have been more frequent and larger than originally envisioned. This observation is largely due to the increased regulatory restrictions on exports from the Sacramento-San Joaquin River Delta. In this regard, DWR Bulletin 160-09 (2009) articulated some of the water supply "challenges" facing the Tulare Lake Basin, of which the District is a part. These challenges include the following:

- Water quality and environmental needs for the Delta are reducing the export volume of water pumped and available for delivery. For example, new biological opinions for endangered species and statutory requirements in December 2008 reduced export pumping by around 20-30 percent.
- Changes in the OCAP (Operations Criteria and Plan, USBR) could worsen delivery reliability issues of imported water from the CVP and SWP.
- The San Joaquin River Settlement will reduce CVP water diverted into the Friant-Kern Canal, possibly by as much as 15 percent (on average) as interim flows began October 1, 2009, which also affects the availability of CVP 215 water.
- According to the 2011 State Water Project Delivery Reliability Report (DWR 2012), the long-term reliability of surface water supplies to Southern California from the Delta is expected to average 61 percent of the contractual amounts.

Future groundwater availability is determined by the District's governance under the implementation of SGMA, which (absent augmentation) will severely limit the amount of

pumping to reach sustainability by 2040. Additional details on the District’s future water supply reliability can be found in Section 9.4.3 of the District’s MAP, which includes analysis of DWR provided climate change scenarios.

4.2 Water Supply Quality

4.2.1 Surface Water Quality

Recall that the District’s principal source of surface water is SWP water delivered by the California Aqueduct. Other sources are delivered using the same conveyance facility. Regarding the quality of the water delivered to the District from the California Aqueduct, few water quality problems have been noted that limit the use of the water for irrigation in the District; the water is relatively good quality and suitable for irrigation. Water quality measurements are collected at Check 29 of the California Aqueduct which is located upstream of the turnouts used for deliveries to the District. Water quality data collected from Check 29 over a five-year period extending from 2012 to 2016 are presented in Table 4-8.

Table 4-8. Surface Water Quality (SWP)

Parameter	Units	Concentration
Boron	mg/L	0.2
Calcium	mg/L	24.6
Magnesium	mg/L	9.9
Sodium	mg/L	62.1
Chloride	mg/L	73.9
Sulfate	mg/L	45.4
Nitrate	mg/L	3.2
TDS	mg/L	289

¹ Based on data taken from Check 29 of the California Aqueduct, available at following address: http://www.water.ca.gov/waterdata/library/waterquality/station_county/gst_report.cfm

4.2.2 Groundwater Quality

Groundwater quality within the District’s service area is evaluated in their MAP under SGMA by comparing concentrations of individual wells for a selected set of constituents between 2012 and 2016. Constituents evaluated included total dissolved solids (TDS), nitrate, arsenic, boron, iron, manganese, and sulfate. Of the seven constituents evaluated, TDS, arsenic, boron, and sulfate are constituents of concern within the District. While several wells southeast of the District show nitrate exceedances and some wells exceed secondary maximum contaminant levels (MCLs) for iron and manganese, these are not a concern within the District. At this time, chloride and uranium are potential constituents of concern and will be monitored under implementation of the MAP.

Generally, groundwater quality is not suitable for irrigation use in the western 6 miles of the District due to higher levels of salts and born. However, east of this area, such quality is generally suitable for irrigation use, although significant water quality changes are noted from one subarea to another. Additional efforts will be made to expand groundwater quality

monitoring under SGMA as part of MAP implementation. For further information on groundwater quality within the District, refer to Section 8.5 Groundwater Quality of the MAP.

4.2.3 Source Water Quality Monitoring Practices

The District conducts some water quality monitoring in key wells across their service area. Much of the water quality information the District obtains is from private wells that is provided under condition of confidentiality and is not public information. Currently 14 active agriculture wells are included in the program with several alternate locations if a program well cannot be sampled. Water samples are collected from these wells in June or July of each year and analyzed for general minerals, boron, SAR and Langlier indices, a program designed to evaluate the suitability of water quality for irrigation.

The District maintains these data in an Access database. In addition to data from their ongoing monitoring program, the District has also compiled and entered historical water quality data into their database. These data generally date back to the 1960s but contain data from one well sampled in 1910 and five wells sampled in the 1950s.

Included in the database are 133 different water quality parameters including metals, volatile organic compounds (VOC) and fuel oxygenates, major and minor anions and cations, total hardness, conductivity, total alkalinity, pH, and TDS. The number of constituents analyzed varies from well to well. Many of the wells in the database contain at least one complete analysis for the major anions and cations, except for potassium, which is absent from many of the cation analyses. Almost all the wells have at least one value for TDS, total hardness, and pH.

4.2.4 Drainage from the Water Supplier's Service Area

The District is a member of the Kern River Watershed Coalition Authority (KRWCA), which is in turn a member of the Southern San Joaquin Valley Water Quality Coalition (SSJWQC) and in that capacity, participates in, and contributes financially to, a Regional Water Quality Control Board program to monitor and improve surface water and groundwater quality associated with agricultural activities. The Regional Board has promulgated a broader Irrigated Lands Regulatory Program (ILRP) to address both surface water and groundwater quality. As a service to its landowners, the District does participate in and help facilitate the ILRP in cooperation with the KRWCA.

Since the District does not provide drainage facilities or assessment of on-farm subsurface drainage systems, the limitations associated with drainage reuse are not applicable to District operations.

5.0 Annual Water Budget

5.1 Inflows

The District's water budget components have been described in previous sections of this plan. Inflow elements of the water budget include the surface water elements described in Section 4.1.1 and the and groundwater elements described in Section 4.1.2. The District's water budget inflow components are provided in Table 5-1 for the period 2016 to 2020.

Table 5-1. Water Budget Inflow Components – WRMWS, Kern County Subbasin (5-22-14)

Inflow Component	AWMP Location for Supporting Calculations	Uncertainty	How Quantified?	Calendar Year 2016	Calendar Year 2017	Calendar Year 2018	Calendar Year 2019	Calendar Year 2020
Units	Page number or Section	Percent		Acre-feet per year	Acre-feet per year	Acre-feet per year	Acre-feet per year	Acre-feet per year
Effective Precipitation	Section 4.1.4	10%	Measured	60,035	67,915	47,263	79,710	34,192
Water Supplier surface water diversions	Section 4.1.1	15%	Measured	122,936	186,444	137,408	163,786	116,263
Water Supplier groundwater pumping				12,648	7	10,218	328	7,041
Private groundwater pumping	Section 4.1.2	15%	Calculated	64,314	11,999	76,735	22,133	119,673
Total				260,320	266,265	271,834	265,993	277,375
User Notes & Explanations:								
All data provided on a calendar year basis, consistent with District and landowner water budget accounting.								

5.2 Outflows

The District’s water budget components have been described in previous sections of this plan. Outflow elements of the water budget include the surface water elements described in Section 4.1.1 and the and groundwater elements described in Section 4.1.2. The District’s water budget outflow components are provided in Table 5-2 for the period 2016 to 2020.

Table 5-2. Water Budget Outflow Components – WRMWSD, Kern County Subbasin (5-22-14)

Inflow Component	AWMP Location for Supporting Calculations	Uncertainty	How Quantified?	Calendar Year 2016	Calendar Year 2017	Calendar Year 2018	Calendar Year 2019	Calendar Year 2020
	Page number or Section	Percent		Acre-feet per year	Acre-feet per year	Acre-feet per year	Acre-feet per year	Acre-feet per year
Crop Consumptive use	3.1	15%	Calculated	217,908	224,519	224,519	226,642	226,642
Municipal Demand	3.4	5%	Measuref	2,944	2,595	3,001	2,618	2,620
Deep Percolation		15%	Calculated	39,468	39,151	44,314	36,733	48,113
Total				260,320	266,265	271,834	265,993	277,375
User Notes & Explanations:								
All data provided on a calendar year basis, consistent with District and landowner water budget accounting.								

6.0 Quantification of the Efficiency of Agricultural Water Use

6.1 Total Water Use Fraction

The efficiency of agricultural water use within the District was quantified using the Total Water Use Fraction method as detailed in “A Proposed Methodology for Quantifying the Efficiency of Agricultural Water Use” (DWR, 2012). The evapotranspiration of applied water (ETAW) was first calculated using evapotranspiration (ET) and agricultural irrigated acreage data and precipitation data from CIMIS Station 5 for 2016-2019 and in-District measurements for 2020 using the following equation:

$$ETAW = ET_{Total} - P_e$$

Where:

ET_{total} = total crop evapotranspiration of all agricultural irrigated land uses within the District

P_e = effective precipitation on all agricultural irrigated lands within the District

Due to the limited amount of rainfall recorded in the area, the relatively flat topography, and relatively permeable soil types in the District, all precipitation was considered effective precipitation. Therefore, P_e was calculated as the measured total annual rainfall multiplied by the total acreage of agricultural irrigated lands. ET, P_e , and the calculated ETAW for each plan year are shown in Table 6-1. Within the District, the irrigated lands represent those lands actively irrigated within a calendar year, which differs from the District’s developed agricultural lands, which are those lands that pay the General Project Service Charge. Differences result from changes in cropping practices, temporary land fallowing, and other landowner management decisions.

Table 6-1. Evapotranspiration of Applied Water for Agricultural Lands

Plan Year	Total ET (af)	Effective Precipitation (af)	ETAW (af)
2016	217,908	60,035	157,873
2017	224,519	67,915	156,604
2018	224,519	47,263	177,256
2019	226,642	79,710	146,932
2020	226,642	34,192	192,450

The total water use fraction (TWUF) was then calculated using the following equation:

$$TWUF = (ETAW + AU + EU)/AW$$

Where:

ETAW = the calculated evapotranspiration of applied water

AU = the portion of applied water directed for salinity management, climate control, seed germination, etc.

AW = the total quantity of water that was applied within the District service area

As there is no significant agronomic use within the District, this value was set to zero. The ETAW, AU, EU, AW and calculated TWUF for each plan year are in Table 6-2.

Table 6.2. Total Water Use Fraction

Plan Year	ETAW (af)	Agronomic Use (af)	Environmental Use (af)	Applied Water (af)	Total Water Use Fraction
2016	157,873	0	0	197,342	0.80
2017	156,604	0	0	195,755	0.80
2018	177,256	0	0	221,570	0.80
2019	146,932	0	0	183,664	0.80
2020	192,450	0	0	240,563	0.80

7.0 Climate Change

In accordance with the 2020 Guidebook, WRMWSD has updated the Analysis of the Effects of Climate Change to discuss expanded climate impacts and the vulnerability assessment.

Disclaimer: The District has prepared this Section, Climate Change, in accordance with the requirements of the DWR Guidebook for Preparing AWMPs. The District does not endorse the statements contained in the references regarding the validity or the extent of global warming and/or climate change.

7.1 Effects of Climate Change on Water Demand

Several investigations were conducted by the USGS California Water Science Center (CAWSC) regarding hydrological effects of climate scenarios in the Sierra Nevada Mountain Range (USGS 2009; Water Resources Research, 2012). Each of these investigations predict that California's climate will become warmer (+2° to +4° C) and drier (10-15 percent) during the mid- to late-21st century, relative to historical conditions. These scenarios were based on a commonly accepted projection of 21st century climate from the GFDL CM2.1 (Geophysical Fluid Dynamics Lab Climate Model 2.1) global climate model, responding to assumptions of rapidly increasing greenhouse-gas emissions (GHGs). The California Energy Commission's Cal-Adapt web site predicts temperature differences in the District service area from a baseline historical average (1961 to 1990) to a projected average (2070 to 2090). The projection shows an increase in annual average temperature of about 3.8°F to 6.5°F under a low carbon and high carbon emission scenario, respectively. If these predictions materialize, the level of runoff from the Sierra Nevada Mountains is expected to be much less reliable with quantities presumably declining over time. Reduced surface water deliveries for agriculture in the Central Valley, combined with increased demands for irrigation water due to the increasingly warmer, drier climate, will result in increased use of groundwater, the impacts of which could include the following:

- Reduced base flow in streams;
- Reduced groundwater outflows;
- Increased depths to groundwater, and
- Increased land subsidence.

Should climate change result in a reduction in water available from surface supplies, the increased frequency of groundwater pumping from agricultural water districts and other users will lead to a decrease in groundwater storage without the necessary means of replenishing the depleted storage. According to another CAWSC study (Proceedings of the Eighth International Symposium on Land Subsidence, 2010), Kern County may expect land subsidence due to the increased demand on groundwater that will result from climate change.

Climate change is also expected to increase both daytime and nighttime temperatures in the Central Valley resulting in lengthening of the growing season. Cal-Adapt predicts that the number of days exceeding the “extreme heat threshold” of 104°F for the District service area will increase from a historical baseline average of 4 extreme heat days (1961-1990) to a projected average of 30 extreme heat days (2070-2090). Using the same baseline and projection years, the number of nights exceeding the “warm night threshold” of 73°F is expected to increase from 4 nights to about 24 nights. This general increase in temperatures coupled with greater variability and unpredictability in precipitation (depicted in decadal average projections by Cal-Adapt) is expected to lead to increases in evapotranspiration resulting from warmer seasons, thereby creating an increase in demand for irrigation water and an increase in the year-to-year variability of demand.

As previously discussed in Section 3.1, permanent crops (e.g. temperate fruit and nut trees) account for over 70 percent of the total irrigated area in the District. Areas with predominately permanent crop acreage may have reduced flexibility for adapting to changing climatic conditions since they require water in all types of water years, therefore “hardening” the demand. In addition, these types of crops generally require adequate winter chill to produce economically viable yield. Increased temperatures in the Central Valley are expected to reduce winter chill hours, thus causing adverse effects on crop yield. Today, the number of hours of winter chill in the San Joaquin Valley has shrunk from about 1,500 a few decades ago, to approximately 1,000 to 1,200 hours (PLoS ONE, 2009). By the end of the century, the winter chill needed for these crops is predicted to disappear.

7.2 Effects of Climate Change on Water Supply

The effects of climate change, particularly changes in the volume, nature, and timing of precipitation on the future of the District’s surface water supply will be driven by changes in hydrology in the Sacramento-San Joaquin Delta, which affects the watershed of Lake Oroville since the District’s main source of surface water is the SWP. In addition, climate change effects may exacerbate pumping restrictions or constraints to convey water south of the Sacramento-San Joaquin River Delta, thus further reducing reliability. This section describes the potential effects of climate change and how it may affect the hydrology for the southern portion of the Central Valley and the statewide changes that could affect the District and its water supplies.

The DWR examined 12 future climate scenarios in a report titled Using Future Climate Projections to Support Water Resources Decision Making in California (Chung et al. 2009) to assess future reliability issues with the SWP and the CVP due to climate change. The 12 scenarios represent projections from six Global Climate Models for higher and lower GHG emissions while taking into account potential Delta salinity intrusion due to sea level rise. For all climate projections studied, the reliability, and thus volume of water delivered, by the SWP and CVP water supply systems is expected to be reduced. For instance, average annual SWP exports under future climate scenarios from 2013 to 2033 conditions are projected to decrease 5.6 percent (DWR, 2013). Current long-term reliability predictions of SWP 7Table A deliveries,

modeled under historic (1921-2003) precipitation and runoff patterns and accounting for future conditions such as land use and climate change, are expected to decrease 6 percent from the historic average (DWR, 2013).

The District also participates in and receives previously imported water recovered from several Kern County banking projects located outside of the District. Groundwater banking offers the flexibility to respond to climate variability, as water can be stored during “wet” periods for use in “dry” ones. This will become increasingly important as climate change is projected to increase the frequency and intensity of extreme weather events, including floods and droughts. Banking may also become more challenging as it will require additional monitoring and assessment of groundwater levels and quality, especially if the District is limited by constraints on conveyance that reduce reliability of available surface supplies to shift use to groundwater as its reliable water source.

7.3 Regional Vulnerability Assessment

The matrix shown Table 7-1 provides an assessment of the regional vulnerability to the potential climate change impacts, using the ‘Vulnerability Assessment Checklist’ found in the ‘Climate Change Handbook for Regional Water Planning’ (DWR, 2011) consistent with climate change requirements in the Proposition 84 IRWMP Guidelines (June 2014). As mentioned previously, WRMWSD is a member of the Kern Region Regional Water Management Group (RWMG). This Matrix is a modified version of the checklist provided in the ‘Vulnerability to Climate Change Technical Memorandum’ (Kennedy/Jenks, 2014) written for the RWMG, gearing answers more specifically to the District. The Matrix provides a further evaluation of the effects on regional water demands and supplies, as well as water quality, flooding events, environmental and ecosystems, and hydropower systems.

The Matrix discusses a list of prioritized vulnerabilities to the District based on presumed level of impact to regional conditions according to climate change considerations given in the checklist. The sector vulnerability prioritization is defined as follows (1 being the sector most prioritized [high risk] and 7 being the sector least prioritized [low risk] with respect to climate change vulnerability):

- Water Supply
- Water Demand
- Flooding
- Ecosystem and Habitat
- Water Quality
- Sea Level Rise
- Hydropower

Based on the vulnerability assessment, “Water Supply” and “Water Demand” appear to have the highest level of vulnerability to potential Climate Change impacts to the District. This confirms the projected outlook for the District presented in Sections B and A, respectively. The remaining sections assessed in the Matrix, while important, do not pose as much of a projected risk to District water resources operations or management efforts.

7.4 Response to Effects of Climate Change

The District is committed to monitoring indicators of climate change that affect the hydrology of key surface water sources (e.g. Sacramento-San Joaquin River Delta and the Kern River watershed) and growing conditions in the District’s service area. The following are ways in which the District, as well as the RWMG, are responding to the above mentioned effects of climate change.

7.4.1 Water Supply

The goal of the District is to utilize the available surface water and groundwater resources as effectively as possible in meeting the requirements of the District’s water users. The District will work with the Department of Water Resources and applicable regulatory agencies to ensure that there are adequate surface water supplies available to meet the growing conditions in the District’s service area. Regional adaptation strategies to address potential reductions in water supply suggested in the Kern RWMG ‘Vulnerability to Climate Change Technical Memorandum’ and that may apply to the District include the following:

- Expand water storage and conjunctive management of surface and groundwater resources.
- Reduce reliance on imported SWP water, which depends on the Sierra snowpack for water supply.
- Enhance use of recycled water for appropriate uses as a drought-proof water supply.
- Enhance practices of water exchanges and water banking outside the Region to supplement water supply.
- Encourage local agencies to participate in development of Groundwater Sustainability Plans under the Sustainable Groundwater Management Act.
- Develop plans for local agencies in the Kern Region to monitor the elevation of their groundwater basins.
- Encourage cities and the county agencies in the Kern Region to adopt local ordinances that protect the natural functioning of groundwater recharge areas.

Table 7-1. Modified IRWMP Climate Change Vulnerability Assessments Matrix

List No. ¹	Checklist Item	Regional Conditions
<i>I. Water Demand Assessment</i>		
I.A	Are there major industries that require cooling/process water in your planning region?	Process water is required in packing plants and other locations for processing crops harvested from the field. However, requirements for cooling/process water are insignificant for the District.
I.B	Does water use vary by more than 50% seasonally in parts of your region?	Yes. The majority of water in the District is used for agricultural purposes, the demand for which fluctuates greatly in the summer compared to the winter.
I.C	Are crops grown in your region climate-sensitive? Would shifts in daily heat patterns, such as long heat lingers before night-time cooling, be prohibitive for some crops?	Yes. All crops grown in the District service area are climate-sensitive and several important crops could be prohibitively affected by shifts in daily heat patterns.
I.D	Do groundwater supplies in your region lack resiliency after drought years?	Groundwater is necessary to maintain a sufficient water supply for the District. The resiliency of the District's groundwater resource is directly related to the reliability of surface water supplies, primarily the availability of water from the SWP since groundwater is used to meet demands that are not fulfilled by surface water supplies. To this extent, "resiliency" has been reduced.
I.E	Are water use curtailment measures effective in your region?	The District may refuse to deliver water to irrigators as a consequence for wasting water, either willfully, carelessly, or on account of defective ditches or pipelines. The District may also refuse to deliver water to inadequately prepared land or to users who flood certain portions of their land to an unreasonable depth in order to properly irrigate other portions. Water service may be resumed when these conditions have been remedied.
I.F	Are some in-stream flow requirements in your region either currently insufficient to support aquatic life, or occasionally unmet?	No. All surface water flows are seasonal with the canals and drains dry most of the year. While there are no in-stream flow requirements within the District, SWP supplies which are available to the District may be affected by such requirements at the sources of these supplies.
<i>II. Water Supply Assessment</i>		
II.A	Does a portion of the water supply in your region come from snowmelt?	Yes. Both the SWP and the Kern River are fed by annual snowmelt from the Sierra Nevada.
II.B	Does part of your region rely on water diverted from the Delta, imported from the Colorado River, or imported from other climate-sensitive systems outside your region?	Yes. The District's primary source of imported surface water is the SWP, delivered through the Delta. As explained above, the SWP is vulnerable to climate change.
II.C	Does part of your region rely on coastal aquifers? Has salt intrusion been a problem in the past?	The District does not rely on coastal aquifers. While salt intrusion from coastal aquifers is not applicable, salt management is still an issue in the region with regard to increasing salinity in groundwater. Salt in imported water supplies such as the SWP is the major source of salt which circulates throughout the groundwater in Kern County.

¹ Numbers based on checklist shown in Section 4.3 of the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011).

7-1. Modified IRWMP Climate Change Vulnerability Assessments Matrix

List No.	Checklist Item	Regional Conditions
II. Water Supply Assessment		
II.D	Would your region have difficulty in storing carryover surpluses from year to year?	There is limited carryover available for the District's SWP water in San Luis Reservoir. Within the region, carryover of Kern River water in Isabella Reservoir is limited by the Reservoir's flood control purpose and US Army Corps of Engineer's regulations. However, there are opportunities to expand the Region's ² groundwater storage capabilities.
II.E	Has your region faced a drought in the past during which it failed to meet local water demands?	No. Water demands have been met through the use of groundwater which, during drought, can result in significant declines in groundwater levels. To the extent that surface water supplies are reduced in the future (as a result of climate change and/or regulatory constraints), recharge will be reduced, which will affect the availability of groundwater for meeting local water demands.
II.F	Does your region have invasive species management issues at your facilities, along conveyance structure, or in habitat areas?	Yes. The District in particular has very little invasive species to manage. Within the region, aquatic pests, including invasive plants have been fought on the Kern River for decades. Prevention and control of invasive species is an ongoing battle by many resource agencies such as the Kern River Preserve Audubon Society, and the Kern River Ranger District.
III. Water Quality Assessment		
III.A	Are increased wildfires a threat in your region? If so, does your region include reservoirs with fire-susceptible vegetation nearby which could pose a water quality concern from increased erosion?	Wildfires are not a threat within the District; however, parts of the Kern Region are prone to wildfires, which impact water quality when rain washes fire debris into waterways.
III.B	Does part of your region rely on surface water bodies with current or recurrent water quality issues related to eutrophication, such as low dissolved oxygen or algal blooms? Are there other water quality constituents potentially exacerbated by climate change?	Not within the District, however, yes within the region. The Kern River, a primary native surface supply to the region, is generally considered a high quality supply. However, Isabella Lake is listed on the 303(D) list for dissolved oxygen and pH. Climate change could exacerbate these water quality conditions from increased temperatures.
III.C	Are seasonal flows decreasing for some water-bodies in your region? If so, are the reduced low flows limiting the water-bodies' assimilative capacity?	Within the region, annual Kern River flows and flows in local ephemeral streams could be decreasing through time.
III.D	Are there beneficial uses designated for some water bodies in your region that cannot always be met due to water quality issues?	No. Water is intended for many beneficial uses including agricultural water supplies, groundwater recharge, water replenishment, recreation, wildlife habitat, rare and endangered species, and wetland ecosystems. Most of these are met within the District; however, outside of the District and within the region, there are two TMDLs for Lake Isabella with regard to DO and pH.
III.E	Does part of your region currently observe water quality shifts during rain events that impact treatment facility operation?	No.

² For the entirety of this checklist, "Region" refers to the Kern RWMG Region.

7-1. Modified IRWMP Climate Change Vulnerability Assessments Matrix

List No.	Checklist Item	Regional Conditions
IV. Sea Level Rise Assessment		
IV.A	Has coastal erosion already been observed in your region?	The District is located in the Southern San Joaquin Valley, and concerns regarding coastal regions are not applicable.
IV.B	Are there coastal structures, such as levees or breakwaters, in your region?	
IV.C	Is there significant coastal infrastructure, such as residences, recreation, water and wastewater treatment, tourism, and transportation at less than six feet above mean sea level in your region?	
IV.D	Are there climate-sensitive low-lying coastal habitats in your region?	
IV.E	Are there areas in your region that currently flood during high tides or storm surges?	
IV.F	Do tidal gauges along the coastal parts of your region show an increase over the past several decades?	
V. Flooding Assessment		
V.A	Does critical infrastructure in your region lie within the 200-year floodplain?	Yes for the region. The FEMA Flood Insurance Rate Map for the Kern Region designates multiple areas as “High Risk” areas with a 1 percent or greater risk of flooding in any year and a 26 percent chance of flooding over the life of a 30-year mortgage. Some parts of the region lie within these areas. Flooding can result in the inundation of structures, as well as impact damage to structures, roads, bridges, culverts, and other features from high velocity flows and from debris carried by floodwaters.
V.B	Does part of your region lie within the Sacramento-San Joaquin Drainage District?	No.
V.C	Does aging critical flood protection infrastructure exist in your region?	No.
V.D	Have flood control facilities (such as impoundment structures) been insufficient in the past?	Yes for the region. The primary flood control facility to the region is Isabella Dam on the Kern River. Kern River had an unregulated flow until 1954 when the Isabella Dam and Reservoir were constructed by the Army Corps of Engineers. Due to seepage and earthquake concerns, storage restrictions have been in place on Isabella Reservoir since 2006 and will remain in place until dam safety concerns are adequately addressed.
V.E	Are wildfires a concern in parts of your region?	As noted in III.A (above), wildfires are not a concern in the District service area; however, wildfires are a concern in other parts of the Kern Region and the watersheds that provide the region with its surface water supplies.

7-1. Modified IRWMP Climate Change Vulnerability Assessments Matrix

List No.	Checklist Item	Regional Conditions
VI. Ecosystem and Habitat Vulnerability Assessment		
VI.A	Does your region include inland or coastal aquatic habitats vulnerable to erosion and sedimentation issues?	Coastal aquatic habitats are not applicable to the District. However, aquatic pests, including invasive plants have been fought on the Kern River for decades.
VI.B	Does your region include estuarine habitats which rely on seasonal freshwater flow patterns?	No.
VI.C	Do climate-sensitive fauna or flora populations live in your region?	No.
VI.D	Do endangered or threatened species exist in your region? Are changes in species distribution already being observed in parts of your region?	Yes for the region. There are many threatened and endangered species in the Kern Region including the bald eagle, burrowing owl, California condor, California red-legged frog, least bell's vireo, and the San Joaquin kit fox. Whether or not changes in species distribution have occurred is unknown.
VI.E	Does the region rely on aquatic or water-dependent habitats for recreation or other economic activities?	Yes. Water-dependent recreation includes a wide variety of outdoor activities that can be divided into two (2) categories. The first category includes fishing, boating, swimming, and rafting, which occur on lakes, reservoirs, and rivers. The second category includes recreation that is enhanced by water features but does not require actual use of the water, such as wildlife viewing, picnicking, camping, and hiking.
VI.F	Are there rivers in your region with quantified environmental flow requirements or known water quality/quantity stressors to aquatic life?	No.
VI.G	Do estuaries, coastal dunes, wetlands, marshes, or exposed beaches exist in your region? If so, are coastal storms possible/frequent in your region?	No.
VI.H	Does your region include one or more of the habitats described in the Endangered Species Coalition's Top 10 habitats vulnerable to climate change?	No. The Central Valley of California, where the District is located, is not listed as one of the 'Top 10' habitats vulnerable to Climate Change according to the 'It's Getting Hot Out There: Top 10 Places to Save for Endangered Species in a Warming World' Report (Endangered Species Coalition, 2010).
VI.I	Are there areas of fragmented estuarine, aquatic, or wetland wildlife habitat within your region? Are there movement corridors for species to naturally migrate? Is there infrastructure projects planned that might preclude species movement?	Yes. There are many wildlife habitats in the Kern Region. However, there are no infrastructure projects planned in the District service area that are known to preclude species movement.

7-1. Modified IRWMP Climate Change Vulnerability Assessments Matrix

List No.	Checklist Item	Regional Conditions
VII. Hydropower Reliance Assessment		
VII.A	Is hydropower a source of electricity in your region?	Yes for the region. Within the Kern Region is the Rio Bravo Hydro Project Hydro Power Plant which has a design capacity of 14 megawatts (MWe). However, most of the energy provided in the Kern Region comes from its 37 high-efficiency cogeneration facilities that produce two sources of energy in the form of steam and electricity.
VII.B	Are energy needs in your region expected to increase in the future? If so, are there future plans for hydropower generation facilities or conditions for hydropower generation in your region?	Yes. Energy needs to the District may increase in the future as a result of increasing population and increases in groundwater pumping lifts. However, the Kern Region has a variety of efforts planned to reduce energy use, and to develop local energy supply sources. These efforts include utilization of renewable resources, such as WWTP digester gas recovery, hydropower, and solar power.

7.4.2 Water Demand

Some farmers are beginning to overcome climate changes, specifically reduced winter chill, by planting trees closer together and using new varieties. Studies are also now underway to prepare farmers for the likely impacts of climate change. These studies include breeding varieties of fruit trees which can withstand the decreased water chill hours, developing tools to aid crops in coping with insufficient chill, and researching the temperature responses of particular orchard crops to better understand potential long-term effects. However, some solutions such as replanting orchards with altered crop varieties may not be feasible for many irrigators.

Regional adaptation strategies to address potential increases in water demand suggested in the Kern RWMG ‘Vulnerability to Climate Change Technical Memorandum’ and that apply to the District include encouraging agricultural users to adopt efficient water management practices.

The District will work to implement these strategies as applicable. As the District’s control over water supplies is limited, management practices used to respond to climate change will need to be adaptive in nature.

8.0 Water Management Objectives

In the development of the District's MAP, the District identified projects and management actions that are designed to improve management of the District's water resources by directly improving water use efficiency, through facility improvement projects, and by incentivizing more efficient water use by District landowner, through management actions such as establishing water budgets and pricing structures. The projects and management actions in the MAP will serve as the water management objectives for this AWMP. In combination with EWMPs, identified in the following section, these water management objectives will promote water use efficiency improvements in the District and contribute to sustainable management of surface water and groundwater resources.

Table 8-1 provides the list of projects and management actions developed in the District's MAP and adopted here as water management objectives. The projects and management actions is list in order of priority.

8-1. WRMWS D SMGA Projects and Management Actions

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence					
Projects to Enhance Recharge / Banking										
1	On-Farm Recharge	Study and implement on-farm recharge where viable.	•	•		To be implemented upon adoption of WRMWS D GSP Chapter	Regular District Board meetings	CEQA	Not yet initiated	2020
2	In-District Banking Facilities	Program to promote private and/or District-owned banking facilities within the District.	•	•		To be implemented upon adoption of WRMWS D GSP Chapter	Regular District Board meetings	CEQA	Not yet initiated	2020
3	Increase Out-of-District Banking Operations	Increase size/participation in out-of-District banking facilities (i.e., Kern Water Bank and Pioneer Project). Increased banking of wet year supplies outside of the District would support deliveries of imported water into the District in normal/dry years.	•	•		To be implemented upon adoption of WRMWS D GSP Chapter	Regular District Board meetings	CEQA	Not yet initiated	2020
Projects to Increase Water Management Flexibility										
4	Expand District Distribution System	Project to expand District distribution system into area currently using only private groundwater.	•	•	•	upon modification of water service contracts	Regular District Board meetings	CEQA	Not yet initiated	TBD
Projects to Develop New Supplies										
5	Purchase Additional Supplies	Continue purchase of additional supplies, as available, for banking outside of the District or direct delivery within the District.	•	•	•	Ongoing	Regular District Board meetings	CEQA	Ongoing	Ongoing
6	Desalination Facilities	Desalination facilities to allow for use of additional poor quality groundwater for agricultural use, easing demand on principal aquifer.	•	•	•	Localized pumping lowering GW levels near MT	Regular District Board meetings	CEQA	Not yet initiated	TBD
7	"Thru Delta" Facility	Participation of some sort of "Thru Delta" Facility to increase access to contracted (SWP) supplies.	•	•	•	State-led effort underway	Prop 218	CEQA	State-led effort underway	Underway
Management Actions to Raise Funds to Support SGMA Compliance										
8	Acreage Assessment	Set policy to implement an acreage assessment to fund purchase of additional supplies, purchase of land for fallowing, and other investments to support SGMA compliance.	•		•	To be implemented upon adoption of WRMWS D GSP Chapter	Prop 218	CEQA	Not yet initiated	2020

8-1. WRMWS D SMGA Projects and Management Actions

P/MA Number	P/MA Name	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits				Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
				Primary		Secondary				One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
				Water Supply Augmentation	Water Demand Reduction	Water Quality Improvement	Water Management Flexibility / Efficiency					
Projects to Enhance Recharge												
1	On-Farm Recharge	TBD; depending on grower interest	First wet year after construction	approx. 2,000 AFY (10,000 AF every five years)		•	•	Additional wet-year imported water supplies	None	CEQA Costs <\$50K	Costs tied to water purchases plus pumping costs (~ \$50/AF)	WRMWS D
2	In-District Banking Facilities	construction duration: TBD	First wet year after construction	approx. 2,000 AFY (10,000 AF every five years)	approx. 2.75 AFY per acre of land converted to basins	•	•	Additional wet-year imported water supplies	None	Approx. \$40K per acre for land purchase and recharge basin construction	Costs tied to water purchases plus pumping costs (~ \$50/AF)	WRMWS D
3	Increase Out-of-District Banking Operations	construction duration: TBD	First wet year after construction	TBD; depends on recharge basin area		•	•	Additional wet-year supplies	None	Approx. \$40K per acre for land purchase and recharge basin construction	Costs tied to water purchases plus pumping costs (~ \$50/AF)	WRMWS D
Projects to Increase Water Management Flexibility												
4	Expand District Distribution System	construction duration: TBD	First wet year after construction	approx. 2,000 AFY		•	•	Additional wet-year imported water supplies	District authority as a Water Storage District	approx. \$18M for 2,000 acre SWSA expansion	Costs tied to water purchases plus pumping costs (~ \$50/AF)	WRMWS D; grants
Projects to Develop New Supplies												
5	Purchase Additional Supplies	Ongoing	Immediately	Increase purchases by 5,000 AFY		•		Additional imported water supplies	District authority as a Water Storage District	NA	District has been an active purchaser of additional supplies for some time. Average costs are approx. \$500/AF.	WRMWS D
6	Desalination Facilities	construction duration: 1-3 years	Immediately upon completion of construction	No net supply augmentation, but minimizes local GW pumping impacts		•		poor-quality (currently unused) groundwater	None	NA	Annual costs approximately \$600/AF	WRMWS D; grants
7	"Thru Delta" Facility	2035	1 year after completion	up to 25,000 AFY		•		State Water Project	None	NA; as this Project would be bonded through SWP, costs would occur on annual bills	TBD; estimates of Cal WaterFix Project were >\$600/AF	WRMWS D
Management Actions / Policies to Reduce Overall Water Demand												
8	Acreage Assessment	upon modification of water service contracts	1-3 years after completion			•		NA	District authority as a Water Storage District	approx. \$50,000 to set up program	This management action would be used to fund other P/MA	WRMWS D; grants

8-1. WRMWS D SMGA Projects and Management Actions

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence					
Management Actions / Policies to Reduce Groundwater Pumping										
9	Groundwater Allocation and Market	Develop a groundwater pumping allocation methodology, including a market system for trading and/or transferring of allocations.	•		•	To be implemented upon adoption of WRMWS D GSP Chapter	Regular District Board meetings	CEQA	Not yet initiated	2020
10	Voluntary Pumping Limitations	Set non-binding pumping limitations in conjunction with a fee for pumping above limits.	•		•	To be implemented upon adoption of WRMWS D GSP Chapter	Prop 218	CEQA	Not yet initiated	2020
11	Mandatory Pumping Limitations	Set binding pumping limitations in conjunction with a fee for pumping above limits.	•		•	if other PMAs are insufficient	Prop 218	CEQA	Not yet initiated	2030
12	Land Retirement	Purchase and permanently fallow previously irrigated acreage within District to reduce overall water demand and groundwater extractions.	•		•	if other PMAs are insufficient	Prop 218	CEQA	Not yet initiated	2035

8-1. WRMWSM SMGA Projects and Management Actions

P/MA Number	P/MA Name	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits				Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
				Primary		Secondary				One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
				Water Supply Augmentation	Water Demand Reduction	Water Quality Improvement	Water Management Flexibility / Efficiency					
Management Actions / Policies to Reduce Groundwater Pumping												
9	Groundwater Allocation and Market	upon modification of water service contracts	1 year after completion				•	NA	District authority as a GSA (KGA Member)	approx. \$50,000 to set up program	Minimal	WRMWSM; grants
10	Voluntary Pumping Limitations	upon modification of water service contracts	1-3 years after completion		up to 21,000 AFY			NA	District authority as a Water Storage District	approx. \$100,000 to set up program	approx. \$100,000/yr for monitoring costs; this management action would be used to fund other P/MAs	WRMWSM; grants
11	Mandatory Pumping Limitations	2030	1-3 years after completion		up to 21,000 AFY			NA	District authority as a GSA (KGA Member)	Minimal additional cost beyond Voluntary Pumping Limitations P/MA	Minimal additional cost beyond Voluntary Pumping Limitations P/MA	WRMWSM; grants
12	Land Retirement	TBD; depending on landowner interest	1 year after completion		up to 21,000 AFY			NA	District authority as a GSA (KGA Member)	approx. \$40,000 per acre for land purchase (incl. interest); 30 yrs of water savings at 2.75 AFY/ac gives net cost of ~\$500 per AF	\$250/yr per acre for maintenance	WRMWSM; grants

Abbreviations:

AFY = acre-feet per year
 CEQA = California Environmental Quality Act
 GSA = Groundwater Sustainability Agency
 GSP = Groundwater Sustainability Plan
 KGA = Kern Groundwater Authority
 NA = Not Applicable
 P/MA = Project/Management Action
 SGMA = Sustainable Groundwater Management Act
 TBD = to be determined
 WRMWSM = Wheeler Ridge-Maricopa Water Storage District

SWP = State Water Project
 GW = groundwater

9.0 Efficient Water Management Practices Information

CWC §10826(e) defines the water use efficiency information required of all agricultural water supplies to be included in an AWMP, per §10608.48. As such, this section addresses the water use efficiency improvements that have been implemented by the District and a listing of the Efficient Water Management Practices (EWMPs, CWC §10608.48(a) through §10608.48(f)) which have been implemented or plan to be implemented. Each of the EWMPs is also identified and referenced in the DWR Guidebook.

The District's annual budget contains funding for the personnel and materials necessary to operate, maintain, and improve the District's distribution system. This funding directly and indirectly supports the variety of EWMPs described below. The description of previous water management activities in this section is supplemented by key improvements made to the District's infrastructure and management previously described in this AWMP.

9.1 Water Management Activities and Efficiency Improvements

This AWMP identifies several previously implemented and ongoing water management activities, which include:

- Acquire surface water supplies from the State Water Project, and construct irrigation distribution system facilities to lands which previously relied exclusively on pumped groundwater for the purpose of District delivery of surface water.
- Secure additional dry year water supplies from groundwater banking and recovery projects (Kern Water Bank, Pioneer Project, and Berrenda Mesa Project) and local groundwater supplies (District wells and private wells).
- The District also helped facilitate the construction of the Mettler Recharge Bank. An in-District banking project. It was funded by a District Water User, but the District reserves 20% First Priority Capacity and 80% Second Priority.
- Secure additional water supplies to mitigate water shortages from the State Water Project.
- Manage imported water and groundwater conjunctively to increase water supply reliability.
- Promote water use efficiency through: Metered and tiered water pricing, and
- Continued financial support of the North West Kern Resource Conservation District's (NWKRC) Mobile Laboratory and encouraging landowners to take advantage of this resource by requesting field irrigation evaluations.

- Actively participate in local water resource management forums, including the Water Association of Kern County, Kern County Integrated Regional Water Management Plan (Kern IRWM Plan), the Kern River Watershed Coalition Authority (KRWCA), and the Kern Groundwater Management Committee (now Kern Groundwater Authority).
- Require installation of flow meters on private landowner wells that pump into the District facilities.

9.2 EWMP Overview

The EWMPs identified in SBx7-7 are grouped in two categories as shown below, from the DWR Guidebook. The numbers supplied for each EWMP are used as reference later in this section.

Critical Efficient Water Management Practices (CR)¹

- Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2) of the legislation [CWC §10608.48(b.1), 1999 AWMC MOU C-1].
- Adopt a pricing structure for water customers based at least in part on the quantity delivered [CWC §10608.48(b.2)].

Conditional Efficient Water Management Practices (CO)²

- Facilitate alternate land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage [CWC §10608.48(c.1), 1999 AWMC MOU B-1].
- Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils [CWC §10608.48(c.2), 1999 AWMC MOU B-2].
- Facilitate financing of capital improvements for on-farm irrigation systems [CWC 10608.48(c.3), 1999 AWMC MOU B-3].
- Implement an incentive pricing structure that promotes one or more of the following goals: (A) more efficient water use at the farm level; (B) conjunctive use of groundwater; (C) appropriate increase of groundwater recharge, (D) reduction in problem drainage; (E) improve management of environmental resources; (F) effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions [CWC 10608.48(c.4), 1999 AWMC MOU C-2].

¹ Implementation of Critical EWMPs (CWC Section 10608.48(b)) is required of all agricultural water suppliers.

² Other Conditional EWMPs (CWC Section 10608.48(c)) are required only if they are determined to be locally cost-effective or technically feasible by the agricultural water supplier.

- Expand line or pipe distribution system, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance and reduce seepage [CWC 10608.48(c.5), 1999 AWMC MOU B-5].
- Increase flexibility in water ordering by, and delivery to, water customers within operational limits [CWC 10608.48(c.6), 1999 AWMC MOU B-6].
- Construct and operate supplier operational outflows and tail-water recovery systems [CWC 10608.48(c.7), 1999 AWMC MOU B-7].
- Increase planned conjunctive use of surface water and groundwater within the supplier service area [CWC 10608.48(c.8), 1999 AWMC MOU B-8].
- Automate canal control structures [CWC 10608.48(c.9), 1999 AWMC MOU B-9].
- Facilitate or promote customer pump testing and evaluation [CWC 10608.48(c.10)].
- Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports [CWC 10608.48(c.11), 1999 AWMC MOU A-2].
 - Provide for the availability of water management services to water users [CWC 10608.48(c.12), 1999 AWMC MOU A-3].
 - Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage [CWC 10608.48(c.13), 1999 AWMC MOU A-5].
 - Evaluate and improve the efficiencies of the supplier’s pumps [CWC 10608.48(c.14), 1999 AWMC MOU A-6].
 - Improve communication and cooperation among water suppliers, users, and other agencies [1999 AWMC MOU A-4].
 - Facilitate voluntary water transfers [1999 AWMC MOU B-4].

Regarding the two Critical EWMPs and sixteen Conditional EWMPs listed above, the following information is addressed by the District in this AWMP per the DWR Guidebook (pages 70-75):

- A list of implemented and planned-to-be-implemented EWMPs.
- An estimate of the water use efficiency improvements estimated to occur in five and ten years.

9.3 Implemented and Projected EWMPs

Table 9-1, located on the following page, summarizes the status of implementation of EWMPs at the District.

Table 9-1. Report of EWMPs Implemented/Planned

EWM P No.	Description	EWMP Impleme nted	EWMP Planned
Critical EWMPs			
1	<p><i>Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2) of the legislation.</i></p> <p>Description: District water delivery points to Farm-gates or turnouts to customers are metered using McCrometer propeller meters ($\pm 2\%$ accuracy and $\pm 0.25\%$ repeatability) and are actively monitored by the District Staff. Delivery points into the District are metered by the DWR at turnouts from the California Aqueduct). Compliance with measurement standards (SBx7-7) is further discussed in Section 8.</p>	X	
2	<p><i>Adopt a pricing structure for water customers based at least in part on quantity delivered.</i></p> <p>Description: The District charges water users based on the volume of water delivered as described in Section 3.2.</p>	X	
Conditional EWMPs			
1	<p><i>Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.</i></p> <p>Description: The District does not actively facilitate alternate land uses within the District's service area, which is beyond its current jurisdiction. Lands have been taken out of production; however, this was due to the economics of farming and available water supplies.</p>	X	
3	<p><i>Facilitate financing of capital improvements for on-farm irrigation systems.</i></p> <p>Description: The District is a water purveyor, not a provider of on-farm capital. The District does, however, provide funds for irrigation efficiency evaluations (e.g. On-Farm Mobile Lab), which is a free service to landowners. The District will also provide information to landowners regarding grant programs, low interest loans, energy efficiency programs, etc. that may be available from time to time.</p>	X	

EWM P No.	Description	EWMP Implemente d	EWMP Planned
4	<p><i>Implement an incentive pricing structure that promotes one or more of the following goals: (A) more efficient water use at the farm level; (B) conjunctive use of groundwater; (C) appropriate increase of groundwater recharge, (D) reduction in problem drainage; (E) improve management of environmental resources; (F) effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.</i></p> <p>Description: As described in Section 2.2, the District does not apply tiered pricing nor follow a seasonal pricing schedule when charging water users.</p>	X	
5	<p><i>Expand line or pipe distribution system, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance and reduce seepage.</i></p> <p>Description: District conveyance system is predominantly piped network, as described in Section 2.1. Much of the infrastructure improvements facilitated by the District have involved the maintenance and continued operation of the piped network.</p>	X	
6	<p><i>Increase flexibility in water ordering by, and delivery to, water customers within operational limits.</i></p> <p>Description: The District's ability to distribute water supplies and operate on an on-demand basis is covered in the <i>Rules and Regulations for Distribution of Water</i> document, and is discussed in Section 2.2. The California Aqueduct acts as a regulating reservoir within the District and allows flexibility in timing and flows of water deliveries to growers.</p>	X	

EWM P No.	Description	EWMP Implemente d	EWMP Planned
7	<p><i>Construct and operate supplier operational outflows and tail-water recovery systems.</i></p> <p>Description: Irrigated lands are mostly planted with permanent crops using high-efficiency irrigation methods. Accordingly, there are very few drainage systems in the District and any farm tail-water is handled by individual growers through their own on-farm tail-water recovery systems (minimal use by growers). The California Aqueduct acts as a regulating reservoir to manage mismatches between supply and demand to avoid operational spills.</p>	X	
8	<p><i>Increase planned conjunctive use of surface water and groundwater within the supplier service area.</i></p> <p>Description: As described in Section 2, static groundwater levels in the District are deeper than most parts of Kern County meaning fewer District wells are operated (i.e. high pumping lifts and costs). As such, the District has participated in the Kern Water Bank, Pioneer Project and Berrenda Mesa Project to store and recharge excess surface water supplies, as described in Section 4.3. In addition, the District has practiced conjunctive use water management since 1971, primarily through incidental and in-lieu recharge.</p>	X	
9	<p><i>Automate canal control structures.</i></p> <p>Description: Since the District's conveyance system is predominately a piped network (Table 4) opportunities for additional automation of canal controls is minimal; all structures are presently automated. The piped network infrastructure is already largely automated and heavily monitored by the District. Canal structures for conveying SWP supplies into the District, are already automated and remotely monitored in real time. Canal structures on the District's 850 Canal are remotely controlled in real time and around the clock with a SCADA system to minimize operational spills and ensure sufficient water surfaces for steady on-farm deliveries.</p>	X	

EWM P No.	Description	EWMP Implemente d	EWMP Planned
10	<p><i>Facilitate or promote customer pump testing and evaluation.</i></p> <p>Description: Pump efficiency tests (measured kWh/AF) are performed by utilities and pump companies as requested by the landowners.</p>	X	
11	<p><i>Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.</i></p> <p>Description: The District considers the ‘Water Conservation Coordinator’ title as synonymous with the Manager/Assistant Engineer-Manager position within the staff. As such, the District allows the person holding this position to implement water management plans and progress reports.</p>	X	
12	<p><i>Provide for the availability of water management services to water users.</i></p> <p>Description: The District provides funds for irrigation efficiency evaluations (e.g. On-Farm Mobile Lab) and maintains weather stations around the District’s service area. Weather station climate data (evaporation and precipitation) are available on the District’s website and are encouraged to be used for irrigation scheduling purposes.</p>	X	
13	<p><i>Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.</i></p> <p>Description: The District receives surface water from the SWP, contracted through the KCWA, and is party to turn-in agreements and point-of-delivery agreements with the DWR. Reduced reliability of SWP deliveries south of the Sacramento-San Joaquin River Delta due to administrative and judicial constraints on pumping have limited the District’s ability to effectively manage and distribute surface water supplies to water users.</p>	X	

EWM P No.	Description	EWMP Implemente d	EWMP Planned
14	<p><i>Evaluate and improve the efficiencies of the supplier's pumps.</i></p> <p>Description: District pump tests are conducted as needed, and pump efficiency is monitored on a continuous basis. The District's Pump/Electrical Department performs routine pump and electrical equipment repairs and maintenance. Non-routine work is contracted. The District provides some funding for District pump testing by services outside of the District staff.</p>	X	
OTHER Optional EWMPs			
1999 AWM C MOU A-4	<p><i>Improve communication and cooperation among water suppliers, users, and other agencies.</i></p> <p>Description: The District cooperates directly with the Kern County Water Agency and is active in the Water Association of Kern County. Communication and cooperation among regional water suppliers are well established. It provides the on-going mechanism to build on established relationships and to enhance cooperation.</p>	X	
1999 AWM C MOU B-4	<p><i>Facilitate voluntary water transfers.</i></p> <p>Description: The District has supported the transfer of a landowner's SWP water from another district into the District service area; given the landowner operates in both districts (i.e. the water would be moved from the landowner's land in another district to landowner's holdings in the District). These transfers have been on a case-by-case and year-by-year basis and also require approval of KCWA.</p> <p>The District has also allowed landowners to move their SWP water around within the District and within common farming units. Water Users with excess supplies can make those supplies available to others via the District Pool (Rule 9. of the Rules and Regulations). The District also allows landowners to use the District's conveyance system to wheel water within the District in the same manner.</p>	X	

9.4 Efficiency Improvements and Non-Implemented EWMPs

The District has chosen to implement those EWMPs which were considered ‘technically feasible’, when considering district water management operations, and/or ‘cost-effective’ based on the District’s typical costs of operations and maintenance. Table 9-2 shows the implementation schedule of each EWMP. Non-implemented EWMPs are categorized as being “Not Applicable” and are shown in Table 9-2 and Table 9-3.

Table 9-2. Schedule to Implement Efficient Water Management Practices

EWMP No. ¹	Description	Implementation Schedule	Finance Plan ²	Budget Allotment
<i>Critical EWMPs</i>				
1	Water Measurement	Currently Implemented		Engineering, Operations & Maintenance
2	Volume-Based Pricing	Currently Implemented		Administration, Accounting, Engineering
<i>Conditional EWMPs</i>				
1	Alternate Land Use	Not Applicable		
2	Recycled Water Use	Currently Implemented		Engineering
3	On-Farm Irrigation Capital Improvements	Not Applicable		
4	Incentive Pricing Structure	Not Applicable		
5	Infrastructure Improvements	On-going Service		Administration, Engineering, Consultant Engineers
6	Order/Delivery Flexibility	On-going Service		Administration, Accounting
7	Supplier Operational Outflow and Tail-water Systems	Not Applicable		
8	Conjunctive Use	On-going Service/ Future Imp.		Administration, Engineering, Consultant Engineers
9	Automated Canal Controls	Currently Implemented		Engineering, Operations & Maintenance
10	Customer Pump Test/Evaluation	Not Applicable		
11	Water Conservation Coordinator	Currently Implemented		Administration

12	Water Management Services to Customers	On-going service		Administration, Engineering, Operations & Maintenance
13	Identify Institutional Changes	On-going service		Administration
14	Supplier Pump Improved Efficiency	On-going service		Administration, Engineering, Operations & Maintenance
NA	Improve Communication Among Suppliers	On-going service		Administration, Consultant Engineers
NA	Facilitate Voluntary Water Transfers	On-going service	Operations	Administration, Engineering, Consultant Engineers

¹ EWMP numbers correspond to Water Code §10608.48(c).

² The District has long been an efficient water provider since its inception. As such, the finance plan in providing water in an efficient manner is entwined completely within the District budget, which is available upon request.

Table 9-3. Non-Implemented EWMP Documentation

EWMP No. ¹	EWMP	(check one of both)		Justification/Documentation
		Technically Infeasible	Not Locally Cost-Effective	
1	Alternate Land Uses		X	Land use already follows the economics of farming and available water supplies and beyond the District's jurisdiction. The District does not provide capital for alternate land uses.
3	On-Farm Irrigation Capital Improvements		X	The District is not a provider of on-farm capital. All water conveyance facilities, including farm turnouts, are owned and operated by the District.
4	Incentive Pricing Structure		X	The District does not apply a tiered pricing structure for charging water users. Efficient water use is encouraged by the pricing contracted between the District and water users.
7	Supplier Operational Outflow and Tail-water Systems		X	Irrigated lands are mostly planted with permanent crops using high-efficiency irrigation methods, meaning there are few drainage systems and tail-water issues.
10	Customer Pump Test/Evaluations		X	District policy is to not provide funding for on-farm pump testing for efficiency; testing is conducted by the landowner.

¹ EWMP numbers correspond to Water Code §10608.48(c).

10.0 Water Measurement Documentation

10.1 Description of Water Measurement Best Professional Practices

As stated in CWC Section 10608.48(b), all governed agricultural water suppliers are required to, “Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10” of the legislation. Furthermore, Section 531.10(a) requires that, “An agricultural water supplier shall submit an annual report to the department (DWR) that summarizes aggregated farm-gate delivery data, on a monthly or bi-monthly basis, using best professional practices.”

The District receives SWP Water deliveries from 15 turnouts off the California Aqueduct (see Figure 2). Each turnout is equipped with a manufactured Venturi device operated and maintained by the DWR capable of directly measuring flow rate and accumulation of the total volume of water delivered. The accuracy of the Venturi-type measurement device is certified by the manufacturer to be accurate for volume measurements within +2 percent.

All District delivery points for water delivered from the District’s distribution system to each of the customers are called a “farm gate” or “turnout. Each turnout is equipped with a manufactured propeller-based flowmeters capable of directly measuring flow rate and accumulating the volume of water delivered over time with use of a totalizer device. The flowmeters are certified by the manufacturer, McCometer Model 900, to have an accuracy of +2 percent. [Vertical flowmeters are MW800s and horizontal are MG900s]

District Operations and Maintenance Staff read the meters once at least week and observe each meter for any sign of abnormal reading based on prior experience with a particular meter. The field collected data are reviewed by a supervisor as a quality control procedure. Farm-level water delivery data are assembled by the District and are available to water users upon request throughout the season enabling irrigators to monitor water usage.

Since all measurement flowmeters used by the District are manufactured, certified devices and equipped with totalizers, the District can equate the calibrated accuracy of the flow meter to volumetric accuracy. According to the publication SBx7-7 Flow Rate Measurement Compliance for Agricultural Irrigation Districts by the Irrigation Training & Research Center (ITRC) of the California Polytechnic Institute, San Luis Obispo, flowmeters with totalizers provide measurements that are sufficiently precise in monitoring flow duration to assume that the flow rate accuracy is equivalent to the calibrated volumetric accuracy. As a result, the flowmeters used by the District to measure delivery of water at the farm gates provide data that enables reliable computation of volumes of water delivered at each turnout.

As stated previously, the DWR maintains devices that measure the quantity of water delivered through each of the turnouts from the California Aqueduct. The District makes a comparison

between the total volumes delivered according to the DWR devices at the delivery points off of the California Aqueduct versus recordings of the total volume delivered to the landowners as determined by the District measurement devices at the farm gate delivery points, as shown in Tables 10-1, 10-2, 10-3, 10-4, and 10-5. The differences are compared within the delivery system by laterals and indicate system accuracy within the limits expected by the water code. This difference is typically less than 2 percent and demonstrates the flowmeters at the turnouts are well within the accuracy range expected by the water code of +12 percent for existing measurement devices and +5 percent for new or replacement measurement devices.

Table 10-1. District Meter Measurement Data for 2016

Meter Name	DWR Meas. Inflow (AF)	WRM Meas. Inflow (AF)	Difference (AF)	% Difference
WRM2	3,200	3,114	-86.0	-2.76%
WRM3	6,310	6,210	-100.0	-1.61%
WRM4	18,371	18,107	-264.0	-1.46%
WRM5	34,035	31,993	-2,042.0	-6.38%
WRM6	5,939	4,834	-1,105.0	-22.86%
WRM7	17,025	22,409	5,384.0	24.03%
WRM8	17,376	15,851	-1,525.0	-9.62%
WRM9	6,900	7,028	128.0	1.82%
WRM9A	5,016	5,028	12.0	0.24%
WRM10	10,357	10,717	360.0	3.36%
WRM11	12	1	-11.0	-
WRM12	0	0	0.0	0.00%
WRM13A	660	648	-12.0	-1.85%
WRM13B	2,671	2,718	47.0	1.73%
WRM14	9,092	8,511	-581.0	-6.83%
WRM15	2,634	3,942	1,308.0	33.18%
Total	139,598	141,111	1,513.0	1.07%
Average	8,725	8,819	94.6	0.73%

Table 10-2. District Meter Measurement Data for 2017

Meter Name	DWR Meas. Inflow (AF)	WRM Meas. Inflow (AF)	Difference (AF)	% Difference
WRM2	3,254	3,184	-70.0	-2.20%
WRM3	6,277	6,197	-80.0	-1.29%
WRM4	17,297	17,438	141.0	0.81%
WRM5	36,818	35,665	-1,153.0	-3.23%
WRM6	7,230	6,427	-803.0	-12.49%
WRM7	25,090	25,216	126.0	0.50%
WRM8	20,176	18,660	-1,516.0	-8.12%
WRM9	9,772	9,382	-390.0	-4.16%
WRM9A	6,071	6,100	29.0	0.48%
WRM10	38,486	38,971	485.0	1.24%
WRM11	9	0	-9.0	-
WRM12	0	0	0.0	0.00%
WRM13A	666	673	7.0	1.04%
WRM13B	2,974	3,087	113.0	3.66%
WRM14	9,296	9,068	-228.0	-2.51%
WRM15	3,026	3,121	95.0	3.04%
Total	186,442	183,189	-3,253.0	-1.78%
Average	11,653	11,449	-203.3	-1.55%

Table 10-3. District Meter Measurement Data for 2018

Meter Name	DWR Meas. Inflow (AF)	WRM Meas. Inflow (AF)	Difference (AF)	% Difference
WRM2	2,969	2,869	-100.0	-3.49%
WRM3	6,181	5,815	-366.0	-6.29%
WRM4	17,456	17,719	263.0	1.48%
WRM5	37,019	36,632	-387.0	-1.06%
WRM6	5,086	4,139	-947.0	-22.88%
WRM7	17,636	23,323	5,687.0	24.38%
WRM8	17,810	18,185	375.0	2.06%
WRM9	8,006	8,836	830.0	9.39%
WRM9A	4,488	4,265	-223.0	-5.23%
WRM10	13,786	14,118	332.0	2.35%
WRM11	14	0	-14.0	-
WRM12	0	0	0.0	0.00%
WRM13A	753	794	41.0	5.16%
WRM13B	3,066	2,916	-150.0	-5.14%
WRM14	9,303	8,701	-602.0	-6.92%
WRM15	3,351	3,604	253.0	7.02%
Total	146,924	151,916	4,992.0	3.29%
Average	9,183	9,495	312.0	0.06%

Table 10-4. District Meter Measurement Data for 2019

Meter Name	DWR Meas. Inflow (AF)	WRM Meas. Inflow (AF)	Difference (AF)	% Difference
WRM2	3,492	3,327	-165.0	-4.96%
WRM3	6,170	6,272	102.0	1.63%
WRM4	16,436	16,888	452.0	2.68%
WRM5	36,138	35,532	-606.0	-1.71%
WRM6	5,564	4,590	-974.0	-21.22%
WRM7	22,928	23,490	562.0	2.39%
WRM8	17,796	16,978	-818.0	-4.82%
WRM9	7,627	7,326	-301.0	-4.11%
WRM9A	4,688	4,975	287.0	5.77%
WRM10	29,910	30,229	319.0	1.06%
WRM11	0	0	0.0	-
WRM12	0	0	0.0	0.00%
WRM13A	420	518	98.0	18.92%
WRM13B	1,320	1,501	181.0	12.06%
WRM14	8,182	7,728	-454.0	-5.87%
WRM15	3,107	3,374	267.0	7.91%
Total	163,778	162,728	-1,050.0	-0.65%
Average	10,236	10,171	-65.6	0.65%

Table 10-5. District Meter Measurement Data for 2020

Meter Name	DWR Meas. Inflow (AF)	WRM Meas. Inflow (AF)	Difference (AF)	% Difference
WRM2	3,023	2,919	104.0	-3.56%
WRM3	5,298	5,272	26.0	-0.49%
WRM4	16,016	15,911	105.0	-0.66%
WRM5	33,419	32,978	441.0	-1.34%
WRM6	4,051	3,212	839.0	-26.12%
WRM7	13,170	18,202	-5,032.0	27.65%
WRM8	14,465	15,020	-555.0	3.70%
WRM9	7,559	8,793	-1,234.0	14.03%
WRM9A	3,585	3,573	12.0	-0.34%
WRM10	10,437	11,197	-760.0	6.79%
WRM11	15	0	15.0	-
WRM12	0	0	0.0	0.00%
WRM13A	0	14	-14.0	0.00%
WRM13B	1,526	1,543	-17.0	1.10%
WRM14	8,653	7,686	967.0	-12.58%
WRM15	2,350	2,483	-133.0	5.36%
Total	123,567	128,803	-5,236.0	4.07%
Average	7,723	8,050	-327.3	0.90%

The District uses various methods to check the field accuracy of the meters. One is the comparison of total volume delivered from the whole population of flowmeters used to deliver water at the farm headgate to the total volume delivered by the DWR’s devices that are used to meter water volume delivered into the District. This provides a method of comparing the volume of water delivered into the District and at the District’s delivery points to the customer. District Staff also routinely monitor each delivery point meter for abnormalities and District policy is to replace a meter if the abnormal reading cannot be rectified in the field.

In addition to the District Staff monitoring for any abnormal performance, customers can also request the meter be tested. These accurate measurement devices and methods support the District's volumetric pricing structure and compliance with volumetric measurement requirements.

10.2 Engineer Certification and Apportionment Requirement for Water Measurement

An Engineer Certification is not applicable since the District is not relying on measurement options upstream of the delivery points to farm gates. The District measures deliveries at the farm gate using manufactured devices (flow meters) that are equipped with a "totalizer" with certified accuracy of +2 percent of the volume, replaces any malfunctioning measurement devices with manufactured devices with certified accuracy of +2 percent, and implements a methodology for comparison of total volume delivered at the farm gate to total volume delivered off of the California Aqueduct. The methodology used to determine the accuracy of District flow-measurement devices complies with the requirements of Section 597.3(a) and 597.4(a).

10.3 Documentation of Water Measurement Conversion to Volume

All water suppliers required to implement agricultural water measurement must include a description of Best Professional Practices regarding:

- A. The collection of water measurement data – District Staff are trained and supervised by the operations superintendent. District Staff provide field-inspections and analysis for every existing measurement device. A comparison of total water delivered into the District with the total water delivered to all water delivery points to the customer is documented in a report approved by the District Engineer.
- B. Frequency of measurements – District Staff collects the "totalizer" value from each meter once a week.
- C. Method for determining irrigated acres – District surveys the irrigated acres each year as part of the contract service area.
- D. Quality control and quality assurance procedures – Compare the total volume of water metered at all District delivery points with the total water delivered into the District by the DWR. Investigate differences and recommend corrective measures. Replace meters not functioning properly if determined not repairable.

The District maintains records of water delivered from the California Aqueduct into the District and all water delivered to customers at the Delivery Point (Farm-gate or turnout).

SBx7-7 requires an annual volumetric accuracy of within ± 12 percent on existing devices and +5 percent for new and replacement devices. As previously stated, the District's flow measurement devices include totalizers (which directly record cumulative flow volume) with a manufacturer's

certified accuracy of +2 percent. Therefore, the District's measurement devices directly record volumes within accuracy range required by SBx7-7.

10.4 Legal Certification and Apportionment Required for Water Measurement Lack of Legal Access to the Farm-gate

District staff has access to install, measure, maintain, operate, and monitor flow-measurement devices at all customer water delivery points (Farm-gates and turnouts) from the District's irrigation distribution system. As such, there are no institutional or legal impediments that restrict access to turnouts or measurement of water and, for the purposes of satisfying SBx7-7, there is no need to measure water upstream of points of delivery to individual customers.

10.5 Device Corrective Action Plan Required for Water Measurement

As documented herein, the District's existing water measurement devices perform substantially better than the +12 accuracy standard and new meters perform substantially better than the +5 percent accuracy standard. No correct action is identified or planned. As noted previously, currently the District repairs or replaces flow meters when there is an obvious deficiency in their performance or when a water user questions the accuracy of a meter. The District will continue this practice on an ongoing basis since it also has the ability with the piped delivery system off of the California Aqueduct to compare the total water delivered into the District with the total volume of water delivered at the delivery points (Farm-gates and turnouts) to customers. New replacement meters will be manufactured devices, laboratory certified by their manufacturer prior to installation to have an accuracy of measurement within ± 5 percent by volume. The manufacturer presently used by the District has a certified accuracy of +2 percent by volume.

10.6 Farm Gate Measurement and Device Accuracy Compliance

10.6.1 Measurement Options at the Delivery Point or Farm-gate of a Single Customer

An agricultural water supplier shall measure the volume of water delivered at the delivery point or farm-gate of a single customer. If a device measures a value other than volume, for example, flow rate, velocity or water elevation, the accuracy certification must incorporate the measurements or calculations required to convert the measured value to volume. An existing measurement device shall be certified to be accurate to within ± 12 percent by volume.

10.6.2 Initial Certification of Device Accuracy

For existing measurement devices, the device accuracy shall be initially certified and documented by either:

- a. Field-testing that is completed on a random and statistically representative sample of the existing measurement devices. Field-testing shall be performed by individuals trained in the use of field-testing equipment and documented in a report approved by an engineer.*

- b. *Field-inspections and analysis completed for every existing measurement device. Field-inspections and analysis shall be performed by trained individuals in the use of field inspection and analysis, and documented in a report approved by an engineer.*

10.6.3 Protocols for Field Testing

Field-testing shall be performed for a sample of existing measurement devices according to manufacturer's recommendations or design specifications and following best professional practices. It is recommended that the sample size be no less than 10 percent of existing devices, with a minimum of 5, and not to exceed 100 individual devices for any particular device type. Alternatively, the supplier may develop its own sampling plan using an accepted statistical methodology.

If during the field-testing of existing measurement devices, more than one quarter of the samples for any particular device type do not meet the relevant accuracy criteria, the agricultural water supplier shall provide in its Agricultural Water Management Plan a plan to test an additional 10 percent of its existing devices, with a minimum of 5, but not to exceed an additional 100 individual devices for the particular device type. This second round of field-testing and corrective actions shall be completed within three years of the initial field-testing.

Field-inspections and analysis protocols shall be performed and the results shall be approved by an engineer for every existing measurement device to demonstrate that the design and installation standards used for the installation of existing measurement devices meet the relevant accuracy standards and that operation and maintenance protocols meet best professional practices.

11.0 Demonstration of Reduced Reliance on the Delta

The Delta Plan provides a regulatory process for activities that qualify as “covered actions.” The Delta Reform Act established a self-certification process for demonstrating consistency of “covered actions” with the Delta Plan. State and local agencies proposing “covered actions,” 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 must submit that certification to the Delta Stewardship Council (DSC).

As the District is anticipating participating in various projects that would be considered “covered actions”, including multi-year water transfers, conveyance facilities, or new diversions that involve transferring water through or exporting water from the Delta, it has elected to prepare a demonstration of its consistency with the Delta Plan and Delta Reform Act. The data and information provided herein is consistent with Section (c)(1) of Policy WR P1, Reduced Reliance on the Delta Through Improved Regional Water Self-Reliance.

To comply with WR P1, the regulation specifies that water suppliers have done the following: (see 23 CCR Section 5003 (c)):

- (A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the 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 management 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 following information provides “self-certification” of the District’s compliance with Delta Reform Act and each of the three criteria listed above from WR P1.

11.1 Completion of an Agricultural Water Management Plan (23 CCR Section 5003 (c)(1)(A))

The District has prepared this 2020 Agricultural Water Management Plan update, in compliance with Water Code §10800 – 10853 (the Agricultural Water Management Planning Act), which requires agricultural water suppliers to submit to the DWR an Agricultural Water Management Plan that addresses the elements listed in Water Code §10826. An agricultural water supplier is defined as a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding the acreage that receives recycled water.

The AWMP has been approved by the District’s Board of Directors and submitted to DWR according to the schedule presented in Table 1-1.

11.2 Implementation of Locally Cost-Effective Projects (23 CCR Section 5003 (c)(1)(B))

This update to the District’s AWMP demonstrates the District’s implementation of cost-effective programs and actions to maximize its efficient use of all available water supplies. This program and projects are listed and described in Section 8, Water Management Objectives and in Section 9, Efficient Water Management Practices Information.

As demonstrated in this AWMP the District is proactive in improving the efficient operation of this own water delivery and conveyance facilities, it also supports numerous programs that assist local landowners in improving their own efficient water management practices. Since the District’s formation in 1959 it has continually developed projects and programs to promote best water management. The District has actively participated in groundwater banking and conjunctive use program to improve the management of local and state-wide water supplies. Through the years the District has continued to make improvement to its conveyance and distribution facilities to increase the capacity of its conjunctive use program and interconnection with neighboring districts. The District has support increased efficiencies in its distribution facilities and in landowner irrigation systems.

11.3 Reduction in Delta Reliance and Improved Regional Self Reliance (23 CCR Section 5003 (c)(1)(C))

The information presented in this AWMP demonstrates the District’s compliance via a clear reduction in the District’s reliance on the Delta and improved regional self-reliance using the metric of production per unit of applied water. The increase in this metric over time demonstrates a reduction in the percentage of water used from the Delta for the production food crops and generation of revenue associated with food crops.

As documented in Section 4.1.1, Surface Water Supply, and Section 5.0, Annual Water Budget, the District has been and will continue to increase water supplies from local and other non-SWP sources. Even with an increase in such sources, however, the District will also need to maximize, whenever possible, deliveries of SWP contract water to opportunistically store surplus wet year water in local groundwater banking programs. Historic reductions in Delta exports, due to

regulatory constraints, have unfortunately increased local reliance on groundwater resources, which in turn triggered the passage of the Sustainable Management Act. As the District implements SGMA, its landowners may be required to reduce their reliance on groundwater. Without reliable deliveries of the District SWP contract entitlement, and absent the development of other non-Delta water supplies, landowners in the District may be forced to fallow prime and productive farmlands.

To demonstrate improvements to on-farm water use efficiency the District used crop production and valuation data from the Kern County Department of Agriculture and Measurement Standards and crop survey developed by the District. Estimates of improvements in crop production and value per unit of water from 2015 to 2019 are provided in Table 11-1.

As the Table 11-1 shows, the District has witnessed a reduction in water demand concurrent with an increase in production tonnage and crop value per acre-foot of water consumed. These three crops represent more than 70 percent of the irrigated acreage within the District. Crop tonnage has increased by 2.7 percent between 2015 and 2019 as a result of increased on-farm irrigation and water management efficiencies. Crop production values over the same period have increased 13.3 percent for the three major crops.

Table 11-1. Comparison of WRMWSD Crop Production and Valuation for 2015 and 2019.

	District Acreage	Total ET AF	ET AF/Ac	Percent of District Irrigated Acres	District Production (tons)	District Value (\$)	Production per (tons/af)	Revenue per af (\$/af)
2015 Almonds	14,502	38,069	2.63	16.87%	13,632	\$100,603,274	0.358	\$2,642.66
Citrus	21,788	56,623	2.60	25.34%	372,139	\$309,930,115	6.572	\$5,473.57
Grapes	25,654	59,003	2.30	29.84%	291,429	\$397,084,846	4.939	\$6,729.91
Subtotals	61,944	153,695	2.48	72.05%	677,200	\$807,618,235	4.406	\$5,254.68
2019 Almonds	17,285	43,211	2.50	19.21%	22,643	\$122,726,957	0.524	\$2,840.18
Citrus	23,457	61,013	2.60	27.28%	411,201	\$340,405,210	6.740	\$5,579.22
Grapes	28,431	65,392	2.30	31.60%	333,496	\$383,516,476	5.100	\$5,864.88
Subtotals	69,173	169,616	2.45	76.88%	767,340	\$846,648,643	4.524	\$4,991.56
Change Ratio (2015 to 2019)					1.133	1.048	1.027	0.950

Sources: Kern County Department of Agriculture and Measurement Standards, 2015 and 2019 Kern County Agricultural Crop Report

12.0 References

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- Wheeler Ridge-Maricopa Water Storage District. 1970. “Rules and Regulations for Distribution of Water.”

Wheeler Ridge-Maricopa Water Storage District. 2007. “AB3030 GM Plan”

Wheeler Ridge-Maricopa Water Storage District. 2019. “Management Area Plan”

Appendix A Wheeler Ridge-Maricopa Water Storage District Management Area Plan

The Wheeler Ridge-Maricopa Water Storage District Management Area Plan can be found here:
<https://wrmwsd.com/resources/>

Appendix B Public Hearing Notice and Resolution of AWMP Adoption

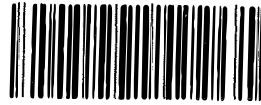
To be added

Appendix C Wheeler Ridge-Maricopa Water Storage District Rules and Regulation for Distribution of Water

WILL CALL

DOC#: 219006355

Stat Types: 1 Pages: 32



Fees	0.00
Taxes	0.00
Others	0.00
PAID	\$0.00

RECORDING REQUESTED BY:

WHEELER RIDGE-MARICOPA
WATER STORAGE DISTRICT, a
California Water Storage District

WHEN RECORDED RETURN TO:

WHEELER RIDGE-MARICOPA WSD
12109 HIGHWAY 166
BAKERSFIELD, CA 93313-9630

RECORDED PURSUANT TO WATER CODE SECTION 43003.5
FEE EXEMPT GOVERNMENT CODE SECTION 6103

WHEELER RIDGE-MARICOPA WATER STORAGE DISTRICT

**RULES AND REGULATIONS FOR
DISTRIBUTION OF WATER**

**AS AMENDED BY RESOLUTION NO. 2001-18
ADOPTED AUGUST 18, 2001**

**AS AMENDED BY RESOLUTION NO. 2004-19
ADOPTED NOVEMBER 10, 2004**

**AS AMENDED BY RESOLUTION NO. 2012-04
ADOPTED MARCH 14, 2012**

**AS AMENDED BY RESOLUTION NO. 2015-07
ADOPTED MAY 13, 2015**

**AS AMENDED BY RESOLUTION NO. 2016-14,
ADOPTED NOVEMBER 9, 2016**

**AS AMENDED BY RESOLUTION NO. 2017-16,
ADOPTED DECEMBER 13, 2017**

**AS AMENDED AND RESTATED BY RESOLUTION NO. 2018-16
ADOPTED DECEMBER 12, 2018**

**THE BOARD OF DIRECTORS OF
WHEELER RIDGE-MARICOPA WATER STORAGE DISTRICT**

IN THE MATTER OF:

RESOLUTION NO. 2018-16

**ADOPTING AMENDED AND RESTATED RULES AND REGULATIONS
FOR DISTRIBUTION OF WATER**

WHEREAS, pursuant to Section 43003.5 of the California Water Code, the Board of Directors of this District has the power to establish and amend Rules and Regulations for Distribution and Use of Water within the District; and

WHEREAS, with adoption of Resolution No. 70-89 on July 8, 1970, this Board established Rules and Regulations for Distribution of Water (hereinafter "Rules and Regulations") which have been amended from time to time, and were last amended and restated with adoption of Resolution No. 2017-16 on December 13, 2017; and

WHEREAS, because of changing circumstances and the need to update the Rules and Regulations, it is appropriate to adopt Amended and Restated Rules and Regulations, amending and readopting said Rules and Regulations in their entirety.

NOW, THEREFORE, BE IT RESOLVED BY THIS BOARD OF DIRECTORS OF THIS DISTRICT AS FOLLOWS:

1. The foregoing recitals and findings, and each of them, are true and correct.
2. The District's Rules and Regulations are amended and restated in their entirety and supersede the prior Rules and Regulations, and shall provide as set forth in attachment "A" hereto.
3. A certified copy of this resolution shall be recorded with the County Recorder of Kern County.
8. Copies of this resolution together with the District's Rules and Regulations as amended and restated shall be maintained on file and open for inspection and available to District Water Users.

ALL THE FOREGOING, BEING ON THE MOTION of Director Atkinson, seconded by Director Marin, and authorized and carried unanimously by the following vote:

AYES: Atkinson, Blaine, Cappello, Marin, Mullins, Reiter.

NOES: None

ABSENT: Fry, Mettler, Valpredo.

ABSTAIN: None.

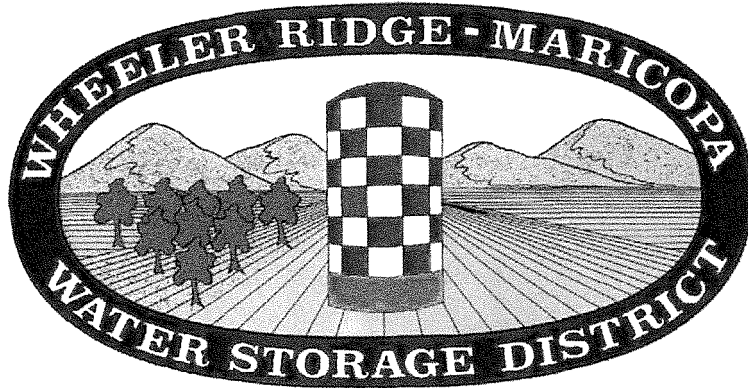
I HEREBY CERTIFY that the foregoing is a true copy of the Resolution of the Board of Directors of WHEELER RIDGE-MARICOPA WATER STORAGE DISTRICT as duly passed and adopted by said Board of Directors on December 12, 2018.

WITNESS my hand and seal of said Board of Directors this 12th day of December 2018.



Secretary of the Board of Directors

WHEELER RIDGE-MARICOPA WATER STORAGE DISTRICT



**RULES AND REGULATIONS FOR
DISTRIBUTION OF WATER**

RULES AND REGULATIONS
FOR
DISTRIBUTION OF WATER

Adopted by Resolution No. 70-89	July 8, 1970
Revised by Resolution No. 72-10	February 9, 1971
Amended by Resolution No. 73-40	September 12, 1973
Amended by Resolution No. 75-05	May 12, 1976
Amended by Resolution No. 76-14	June 9, 1976
Amended by Resolution No. 76-22	September 29, 1976
Amended by Resolution No. 76-23	September 29, 1976
Amended by Resolution No. 78-18	June 14, 1978
Amended by Resolution No. 79-35	October 10, 1979
Amended by Resolution No. 79-38	November 14, 1979
Amended by Resolution No. 81-25	October 14, 1981
Amended by Resolution No. 84-04	June 13, 1984
Amended by Resolution No. 85-03	January 9, 1985
Amended by Resolution No. 86-21	November 12, 1986
Amended by Resolution No. 88-10	April 13, 1988
Amended by Resolution No. 88-21	November 9, 1988
Interim Amend. Resolution No. 91-10	April 12, 1991
Interim Amend. Resolution No. 92-03	March 11, 1992
Interim Amend. Resolution No. 93-04	February 10, 1993
Amended by Resolution No. 93-13	June 9, 1993
Amended by Resolution No. 93-18	July 14, 1993
Amended by Resolution No. 2000-07	April 12, 2000
Amended by Resolution No. 2001-08	March 14, 2001
Amended by Resolution No. 2001-10	April 11, 2001
Amended by Resolution No. 2001-18	August 18, 2001
Amended by Resolution No. 2004-19	November 10, 2004
Amended by Resolution No. 2012-04	March 14, 2012
Amended by Resolution No. 2015-07	May 13, 2015
Amended by Resolution No. 2016-14	November 9, 2016
Amended by Resolution No. 2017-16	December 13, 2017
Amended and Restated by Resolution No. 2018-16	December 12, 2018

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WHEELER RIDGE-MARICOPA WATER STORAGE DISTRICT

**RULES AND REGULATIONS FOR
DISTRIBUTION OF WATER**

These Rules and Regulations are established pursuant to the requirements of the California Water Code by the Board of Directors of the Wheeler Ridge-Maricopa Water Storage District for the distribution and use of water within the District to enable the District to perform its functions most efficiently and to deliver water to Water Users at the least possible cost and are the Rules and Regulations mentioned in those certain water service contracts between the District and various landowners within the District. These Rules and Regulations were first adopted July 8, 1970, and have been amended from time to time. **This edition of the Rules and Regulations supersedes all Rules and Regulations previously adopted by the Board of Directors, and is recorded with the Official Records of Kern County pursuant to Water Code §43003.5.**

1. DEFINITIONS

Terms and expressions employed in these Rules and Regulations are as defined in the Water Service Contracts executed by the District and its landowners with the exception of certain terms or expressions used herein which do not appear in said contracts but which terms or expressions are defined or explained at the point where they are introduced in these Rules and Regulations. Where appropriate in these Rules and Regulations, words used in the singular shall include the plural and words used in the masculine shall include the feminine or an entity.

2. AUTHORITY OF THE ENGINEER-MANAGER AND EMPLOYEES

- a. **Engineer-Manager:** The District's Distribution System is under the exclusive management and control of the Engineer-Manager, who is the person appointed by the Board of Directors of the District to manage the affairs of the District pursuant to its direction. No other person except the Engineer-Manager or his designee shall operate any of the facilities of the District's Distribution System.
- b. **District Employees:** The Engineer-Manager shall supervise the activities of all District employees in connection with operation and maintenance of the District's Distribution System and all other activities of the District. The authority of the employees of the District shall be designated by the Engineer-Manager and any controversy between a Water User and a District employee that cannot be settled directly shall be appealed to the Engineer-Manager. In the event the Engineer-Manager is unable to reach a satisfactory decision, an appeal may be made to the Board of Directors. The decision of the Board of Directors shall be final and conclusive.
- c. **Right of Access:** District employees authorized by the Engineer-Manager shall have reasonable access to lands and irrigation facilities within the District for the purpose of conducting District business, which may include the following:
 - (1) Inspection of the lands upon which water delivered from the Project is being applied for the purpose of determining Water User's compliance with the terms of the Water Service Contract or other conditions of service provided by the District.

- (2) Operation, maintenance inspection, repair or modification of facilities of the District's water supply, conveyance and Distribution System.
- (3) Determination of improper use or wasting of water.
- (4) Measurement of ground water levels and obtaining water quality samples from wells.
- (5) Determination of the type and area of specific crops grown.

Except in cases of emergency or where otherwise considered impracticable by the Engineer-Manager, the landowner, lessee or person in possession shall first be contacted before entering landowner's property other than upon District easements.

3. **WATER SERVICE**

- a. **Surface Water Service Area:** Contract Water Service will be provided only to lands in the District's Surface Water Service, which service area has been amended by the Board of Directors from time to time. The lands included in said Surface Water Service Area at any given time are those certain parcels of real property described in the Exhibits A of those certain water service contracts, which have been executed by the District and landowners and are on file in the District office. Lands within the Surface Water Service Area are shown on a map on file at the District office designated as "Surface Water Service Area," as amended from time to time. In case of a conflict between the lands described in Exhibit "A" to said certain water service contracts and said map, the description contained in said Exhibits shall govern. Pursuant to provisions of Division 14 of the California Water Code, an Original Project Assessment in the amount of the estimated costs of the District's project for providing water service to the affected lands was levied upon the lands in the Surface Water Service Area as contemplated by Resolution No. 349 and upon certain other benefitted lands in the District and said assessment became final on October 18, 1968.
- b. **Additions of lands to Surface Water Service Area:** Lands may be added to the Surface Water Service Area pursuant to an application filed with the Board therefor by the owner or owners of said lands, only if: (1) such addition is determined by the Board to be feasible and in the best interests of the District and in accordance with the criteria established in Board Resolution No. 349; (2) the owner or owners of said lands execute a contract with the District for water service for said lands generally in the form established by Board Resolution No. 69-60; (3) the owner or owners of said lands pay a charge equal to the sum of all charges which would have been paid to the District if said lands had been included within the originally adopted Surface Water Service Area unless said charges have been paid by another parcel of land; and (4) the owner or owners of said lands agree in writing to pay any special charges at such time as calls might be made as hereinafter described, which special charges would be in lieu of calls on the Original Project Assessment on said lands, which charge will be the same as the amount which would be due if the lands subject hereto had received an Original Project Assessment by the same procedures whereby the Assessment was levied on all lands in the District's Adopted Surface Water Service Area and that, at such time as the project may be reassessed, the lands would receive the same treatment as all lands within the District's Adopted Surface Water Service Area.

Lands may also be added to the Surface Water Service Area by amendment of a Water Service Contract so as to increase the area described in Exhibit "A" therein provided the Contract Amount of Water is not increased and provided further that it is determined by the Board that such additions are: (1) in the best interest of the District, and (2) are not detrimental to other District Water Users. Any such additions shall be pursuant to an application filed with the Board of Directors by the owner or owners of said lands and each such application will be considered on a case-by-case basis. Such applications will not be approved unless it is determined that the proposed change does not unduly reduce the effective return flow to the ground water basin and unless it is demonstrated that the final amount of water will be sufficient for the type of crop involved. In the event of the approval of such an application *where exclusion of lands from the SWSA is involved, the original acreage of the excluded lands shall be the acreage used in determining the allocation of water pursuant to Rule 8 of these Rules and Regulations.*

- c. **Exclusion of Lands From the Surface Water Service Area:** Lands may be excluded from the Surface Water Service Area pursuant to an application filed with the Board therefor only if: (1) the Board of Directors determines that such exclusion will not be detrimental to the best interests of the District, and (2) the obligations of the contract for water service, if any, binding said lands are assumed by other lands within the District which are added to the Surface Water Service Area as provided in Section 3(b) above. Assumption of said obligations must be under terms and conditions, which will result in no financial loss to the District.
- d. **Concurrent Additions/Exclusions:** To facilitate the addition of lands to the SWSA and exclusion of lands therefrom, the District will receive and maintain applications for the addition of lands to or exclusion of lands from the SWSA. Applications for exclusion of land from the SWSA will only be processed to the extent that there are applications for an equal area of land to be added to the SWSA, and applications for addition of land to the SWSA will only be processed to the extent that there are applications for an equal area of land to be excluded from the SWSA. Requests to add land to the SWSA will only be considered involving a minimum of 40 acres and all requests to exclude land from the SWSA will be considered.

Contracts for the addition of lands to the SWSA or exclusion of land therefrom will be processed for execution with an effective date of January 1 of the year following the Board's approval of the application. Applications for addition or exclusion to the SWSA which meet all the applicable criteria herein provided will be given priority in the order in which they are received, and said priority for unfulfilled applications shall carry over from year to year. Provided, however, the Board may consider applications for lands of similar acreage independent of said priority when landowner(s) wish to transfer contract(s) from one property to another, and have agreed to all the District's terms and conditions of addition/exclusion as prescribed by the Board and including Sections 3(b) and (c) above.

The addition of land to the SWSA will be subject to the criteria set forth in Rule 3(b) and the exclusion of land will be subject to the criteria set forth in Rule 3(c). The District's costs of evaluating and preparing documents for said additions and exclusions shall be paid by the applicants.

To prevent adverse water supply impacts on other Water Users, the area of excluded land and related Contract Amount of Water (CAW) must be equal to the area of added contract land and related CAW. Provided however, that minor differences between the areas of land excluded and added will be permitted if the owner of land added agrees to accept use of the area of excluded land as the basis for allocation of water in years of water shortage as set forth in Rule 3(a).

To prevent adverse financial impacts on other Water Users, a new "NAL" category of service (Non-Sprinkler Added Land) shall be established. The bond debt obligation and the OM&R obligation from all lands excluded from the SWSA pursuant to this Rule 3(d) will be melded into this category. This category shall have separate components for bond debt and OM&R obligations in general conformance to Exhibit A of the Contracts. The bond debt obligation and the OM&R obligation of the lands added to the SWSA pursuant to this Rule 3(d) shall be equal to the melded obligation of the excluded lands, and rates applicable to the added lands shall be determined in general conformance to Exhibit A of the Contracts. From time to time, as lands are excluded under this Rule 3(d), the obligations and acreage of the "NAL" category of service will increase, and the unit rates applicable to this category of service may increase or decrease accordingly.

The Board will evaluate each request to confirm such requested addition or exclusion or concurrent addition/exclusion to the SWSA will not adversely affect, *or unequally benefit*, the District or its landowners, and may from time to time adopt further policies to implement Rules 3.b., 3.c. and 3.d.

- e. **Unscheduled Water Service:** Unscheduled water is water made available to a contract Water User in any year in excess of the Contract Amount of Water, delivered through Water User's turnout, as provided in Section 2(f) of the Contract. Such water may be made available at the request of Water User and is delivered on an interruptible and non-dependable basis. Such service will be made available if the Board determines that it is in the best interest of the District and will only be made if it does not interfere with the obligations of the District under its Water Service Contracts.
- f. **Temporary or In-Lieu Water Service:** Temporary or In-Lieu Water Service means the delivery of water on an interruptible and non-dependable basis for agricultural use to lands outside the Surface Water Service Area or a Farming Unit Operation, under conditions established by the Board. Such Temporary or In-Lieu service will be made available if the Board determines that it is in the best interest of the District, will be for a limited period of time and will only be made if it does not interfere with the obligations of the District under its Water Service Contracts.
- g. **Industrial Water Service:** Industrial Water Service means the delivery of water on an interruptible and non-dependable basis for industrial use, including construction work, and shall be made under conditions established by the Board. Industrial water service may be made pursuant to provisions for temporary water deliveries or pursuant to long-term contracts for Industrial Water Service. Such industrial water is not a potable water supply and shall not be used for domestic purposes or for human consumption unless specifically authorized by all agencies responsible for administering the Safe Drinking Water Act(s). It will be made available upon such terms as the Board determines is in the best interest of the District, will be for a limited period of time and will only be made if it does not interfere with the obligations of the District under its Water Service Contracts.

Subject to the foregoing, the District may also enter into long-term contracts to provide Industrial Water Service and/or to reserve system capacity which contracts shall be substantially uniform, which contractors are hereinafter referred to as "Industrial Water Users." Water Service pursuant to said contracts shall be subject to water being made available from the District pool established pursuant to Section 9 hereof. Upon finding that sufficient capacity exists within the District distribution system, the District may by contract reserve a portion of such capacity for the conveyance of water for industrial use, whether from supplies available to the District or supplies made available to the Industrial Water User.

Water Service Contracts may be amended to provide for delivery of water for Municipal and Industrial Use as further described in Rule 21 hereto.

- h. Supplemental Water:** Supplemental water means the water supplies acquired in addition to the water supply available under the Agency contract and includes district wells, Banking programs and water purchases. Supplemental water will be allocated pursuant to these Rules and Regulations up to the Contract Amount of Water in Water Users Water Service Contract. The quantities of Supplemental Water allocated to Water User shall only be available after Water User has submitted a signed order in a form provided by the District for such purposes in which the Water User agrees to the terms and conditions of delivery and payment for Supplemental Water.

4. **DELIVERY, USE AND MEASUREMENT OF WATER**

- a. Annual Water Deliveries:** Unless formally advised by Water User to the contrary, it will be assumed that Water User will desire delivery of his full contract amount of water each year. The District will make every effort to provide said contract amount of water on a demand basis as requested by Water User but does not assume any obligation if it is unable to do so. It should be recognized that the District's delivery capability is limited in the month or months of maximum demand by the capacity of the District's distribution facilities and such limitations must be considered in meeting Water User's request.

If Water User wishes to dispose of a portion of his contract amount of water, the District will attempt to do so in accordance with Article 5(k) of the Water Service Contract. If the allocation of the Contract Amount of Water in any year includes Supplemental Water and the District has not yet acquired or produced the Supplemental Water, it shall be the first water returned to the District for disposal. To the extent Supplemental Water has not already been acquired or produced the Water User shall receive full credit for the cost of the Supplemental Water so returned. To the extent the Supplemental Water has already been acquired or produced said Supplemental Water shall be pooled in accordance with paragraph 9 hereof. If Water User wishes more than his contract amount of water, the District will attempt to meet Water User's request to the extent water can be made available.

The District will notify Water User as to the availability of water and the ability of the District to meet Water User's request from time to time, as information is available to the District to do so.

- b. Daily Water Orders:** Orders to turn on or to turn off water, or orders to increase or decrease the rate of water delivery, shall be made at the District office through telephone communication, facsimile transmission, e-mail or personal communication from Water User or his designee as provided in these Rules and Regulations. Water orders shall be placed before 8:00 AM for water service for the following day, and water orders placed after 8:00 AM will be for water service the second succeeding day. In the event of an emergency, or when a change is in the delivery point within the service area of the same lateral, or when it may otherwise be practical to do so, changes in deliveries may be approved on lesser notice but the District assumes no obligation to do so. Although the District will make every reasonable effort to comply with the requested water orders, there may be times when, because of system capacity limitations, or limitations in the amount of water available from the Agency, such compliance may not be possible, and the

District assumes no obligation therefor. Orders shall normally be made based on continuous use of water during the 24-hour period commencing between 7:00 AM and 9:00 AM. **Provided however**, that the Board may establish special conditions for short-run deliveries and/or for deliveries at lower flow rates than for normal irrigation practices.

- c. **Authorization of Agent:** In the case of leased land, or for any other reason, Water User shall provide District written notice as to its primary contact, billing address and additional contact information, if applicable, of who is authorized to place water orders; said notice shall be construed to be the consent of the Water User to all charges and the collection thereof, in any manner authorized under the Water Service Contract and by Sections 47181 to 47185 inclusive of the California Water Code. Said notice may authorize agent to receive copies of District billings and water data arising from the affected Water Service Contract. This authorization shall remain in effect until the date of termination stated thereon, or until superseded, or until revoked in writing by Water User.
- d. **Interruptions in Service:** Attention is directed to Section 3(h) of the Water Service Contracts which provides as follows: "District may temporarily discontinue or reduce the amount of water to be furnished to Water User as herein provided, for the purpose of investigation, inspection, maintenance, repair or replacement, as may be reasonably necessary, of any of the Project facilities for the furnishing of water to Water User, or of the facilities of the State Water Project, but so far as feasible, District will give Water User due notice in advance of such temporary discontinuance or reduction, except in case of emergency, in which case no notice need be given. In no event shall any liability accrue against District or any of its directors, officers, agents or employees, for any damage, direct or indirect, arising from such temporary discontinuance or reduction of water deliveries." In case of emergency shut-off by the District, an effort will be made to notify Water User as soon as possible.
- e. **Emergency Turnoffs by Water User:** Water User may in an emergency, including but not limited to Acts of God, turn off the supply of water at Water User's turnout. If Water User effects such emergency turnoff, he must notify the District office immediately by telephone or in person. Water User and anyone affecting such an emergency turnoff does thereby agree to assume the defense of and hold harmless the District and its directors, officers, agents and employees from any and all loss, damage, liability, claims or causes of action of every nature whatsoever, for damage to or destruction of property including District's property, or for injury to or death of persons, in any manner, arising out of or incidental to such emergency turnoff.
- f. **Use of Other Water Supplies:** Water User may use water furnished by District concurrently with water from other sources, provided that Water User can demonstrate to the satisfaction of the Engineer-Manager or his designee that project water is not being used on land other than that for which it is intended, as set forth in the Water Service Contracts and provided in these Rules and Regulations.
- g. **Waste of Water:** Water delivery may be discontinued by the District for any Water User found to be wasting water either willfully, carelessly, or on account of, but not limited to, defective or inadequate ditches, pipelines, inadequate tailwater facilities, inadequately prepared land or improper management; said water delivery will not be resumed until such conditions are corrected.

- h. Farm Turnouts:** Except as hereinafter provided for temporary deliveries of water and as provided in Sections 3(c) and 3(d) of the Water Service Contracts, all deliveries will be made only through District owned and operated turnouts.
- i. Connections:** All connections to District's system shall be made in a manner so as to prevent damage from occurring to District's system resulting from operation of Water User's system and so as to prevent water from Water User's system from entering District's system. Plans for the connection of Water User's system to District's system shall be submitted to the Engineer-Manager or his designee for approval, and no such connection will be permitted until such approval has been given.
- j. Combined Turnouts:** In accordance with District's design criteria, water service will be provided to parcels less than twenty acres in size within the Surface Water Service Area only in conjunction with service to an adjacent larger parcel or several adjacent smaller parcels where the total combined area is twenty acres or more. Such service will be made through a single turnout designated a "Combined Turnout." Water will be furnished through such a Combined Turnout to a group of Water Users only upon condition that said group of Water Users first files with District an agreement in a form approved by the District, executed by each and every Water User in said group, and providing, among other things, the following:

 - (1) Acceptance of delivery of water through the combined turnout.
 - (2) Granting of an easement to the other Water Users as necessary to convey water from the combined turnout to their respective lands.
 - (3) Authorization for one individual to represent said group in all matters relating to delivery of water by District through said combined turnout.

In the event a parcel served by a single turnout is conveyed to two or more different parties, and each of the parcels is larger than 20 acres, the new owner(s) of the parcel(s) upon which the turnout is not located shall pay for the cost of constructing a new turnout, and any pipeline necessary to serve such turnout, and shall provide to the District a permanent easement in a form acceptable to the District to accommodate such new turnout and pipeline, unless the Board of Directors approves some other arrangement to serve said parcel.

- k. Temporary Water Service Deliveries:** As a condition of temporary water service, the owner of lands to be served shall have executed an agreement establishing a covenant running with the land, in a form provided by the District, wherein the landowner expressly acknowledges that the affected lands have no right to firm water service from the District. Delivery of temporary water service to lands for which such an agreement has been properly executed and recorded will be made in such a manner as may be approved by the Engineer-Manager or his designee.
- l. Industrial Water Service Deliveries:** For Industrial Water Users with long-term contracts, the District will attempt to provide the full contract amount of water each year from water supplies excess to the needs of the Surface Water Service Area from the District pool established pursuant to Section 9 hereof. To the extent such excess water supplies are not available the District shall be under no obligation to supply water for Industrial Water Service users. However, at such times water is not available from the pool, the District will make District system capacity reserved under the terms of the long-term Industrial Water Service Contract to wheel water

supplied to Industrial Water Users from other sources and conveyed to District turnouts from the California Aqueduct. The District will also make its unused California Aqueduct capacity available for conveyance of water supplied by the District or by Industrial Water User under the terms of the long-term Industrial Water Service Contract to the extent such capacity is not being used for other District water deliveries.

However, at times when unused California Aqueduct capacity is not available from the District, the Industrial Water User shall be responsible for the delivery of water from the California Aqueduct into District facilities.

In the event an Industrial Water User wants to receive more or less than the quantity of water specified by the contract, it shall notify the District in writing of the difference by January 1, of the year of delivery.

If Industrial Water User orders less than the Contract Amount of Water, the District will reserve a correspondingly lower quantity of excess pool water for Industrial Water User for that year. If Industrial Water User orders more than the Contract Amount of Water the District will attempt to meet Industrial Water User's additional request to the extent water can be made available.

The District will notify Industrial Water User as to the availability of water and the ability of the District to meet Industrial Water User's request from time to time as information is available to the District. From January 1 through May 31 of the year of delivery Water Users request for water will be provided from the monthly pools to the extent of availability. If the District is unable to provide for the balance of Industrial Water Users annual request on or before May 31 of the year of delivery Industrial Water Users may secure water from alternate sources for the balance of the year and will not be required to purchase water from subsequent pools.

Absent a long-term contract, delivery of Industrial water will be made in such a manner as may be approved by the Engineer-Manager or his designee.

m. Farming Unit Operation:

(1) General. Water User may assign all or part of his water entitlement through designated turnouts to a Farming Unit Operation. A Farming Unit Operation is a grouping of two or more parcels of land which is under the ownership or control (by lease or otherwise) of a single Water User which includes Contract Land and may include Non-contract Land. Such assignment authorizes the Farming Unit Operator or his designee to file water schedules and order water, and authorizes District to deliver said water through, and assign water charges to, any of the several turnouts, which have been designated by all Water Users similarly assigning water to said Farming Unit Operation. Such assignment shall be made on a Farming Unit Operation Agreement provided by the District.

(2) Non-Contract Lands. If a Farming Unit Operation includes Non-contract Lands, the owner of the Non-contract Lands shall have executed an agreement establishing a covenant running with the land, in a form provided by the District, wherein the landowner expressly acknowledges that the Non-contract Lands have no right to firm water service from the District. The Farming Unit Operation Agreement shall reference the lower priority for purchase of Unscheduled Water for Non-contract Lands as set forth at 4.n.(2) of the Rules and Regulations, and acknowledge that allocation of water and/or system capacity will be based only on the area

of Contract Land. Water delivered to Non-contract Land prior to the completion or modification of Farming Unit Operation Agreements shall be made pursuant to conditions for Temporary Water Service.

(3) Term. The assignment shall remain in effect from year to year until superseded or revoked in writing by Contributing Water User, Farming Unit Operator, or the District. Revocations and modifications made after July 1 (or other date established by the Board) in any given year shall not take effect until the following calendar year.

n. Priority of Requests: In the event the District is not able to meet all requests for water, and without detracting from the provisions of Section 3(b) of the Water Service Contracts, priority of requests shall be considered on the following basis:

- (1) Contract Water Service for the Contract Amount of Water in the Agricultural Water Service Contract of Water User, for use upon contract lands and lands within the Water User's Farming Unit Operation, shall receive the first priority.
- (2) Unscheduled water for the amount of unscheduled water requested by a Water User with the priority of such requests in the order as follows:
 - (a) Unscheduled water for that portion of the requested Contract Amount of Water not allocated to Water User because of shortage of water supply provided the total water supply allocated under each of the Water Service Contracts will be in accordance with the provisions of Section 3.(1) of said Water Service Contracts.
 - (b) Additional Unscheduled Water for use in a Farming Unit Operation up to an aggregate quantity of water, including both the Contract Amount of Water and Unscheduled Water, equal to 4.0 acre-feet per acre on the contract lands within the Farming Unit Operation. Any additional water shall be prioritized as Temporary Water.
- (3) Industrial Water Service under long-term contracts for the Contract Amount of Water requested in the annual delivery schedule submitted by an Industrial Water User.
- (4) Temporary water service for the amount of water requested by temporary Water Users, including temporary industrial water service.
- (5) Temporary water service for areas annexed after October 9, 1975 (other than where the annexation was coupled with a detachment of an equal number of acres) for the amount of water requested by the landowner in said area.

The above priorities are applicable to the allocation of available water at any point in time when the demand exceeds the available water supply. The water supply once allocated in accordance with the above priorities shall remain so allocated notwithstanding any subsequent increase in demand of a higher priority.

o. Supplemental Water: Supplemental Water allocated to Water Users as part of the Contract Amount of Water may be delivered by Water User through Water Users' turnout(s) pursuant to water orders submitted by Water User. Provided, however, that the Board may establish special

conditions, which limit the quantities of Supplemental Water available to Water User on a monthly or seasonal basis including, but not limited to, limitation of groundwater withdrawals from District banking projects or District wells for District Water Users as a whole.

- p. **Intra District Water Transfers:** In Any Year, Water User may transfer all or portions of his water supplies to a designated Water User (and designated turnouts) by completing information required on a District approved transfer form. Supplies developed through the User Input Program may not be transferred. Such transfer authorizes the District to deliver said water through, and assign appropriate Water Use charges to, any of the turnouts, which have been designated. If Water User transfers supplies to Non-contract Lands, the owner of the Noncontract Lands shall have executed an agreement establishing a covenant running with the land, in a form provided by the District, wherein the landowner expressly acknowledges that the Non-contract Lands have no right to firm water service from the District, and that the landowner of the Non-contract Lands shall pay all appropriate Water Use charges associated with the transfer. Intra District Water Transfers provides an alternate option to Water Users to dispose of excess supplies other than those provided in Rule 9: "DISPOSAL OF WATER", and Section 5(k) of the Contract.
- q. **Intra Kern Water Transfers:** In any year when the District has made an additional Supplemental Water supply available to Water Users and that supply is undersubscribed (total demands are less than the supply available) and the District otherwise elects not to obtain such unsubscribed supply, Water User may transfer all or portions of that Supplemental Water supply to other districts in Kern County subject to appropriate approvals. Such a request authorizes the District to deliver said Water, and furthermore authorizes the District to assign any appropriate charges pertaining to the transfer to the Water User.

5. PAYMENTS FOR WATER

- a. **Contract Water Service:** Under conditions of Contract Water Service, Water User shall pay the Water Availability Charge and Water Use Charge as provided in the Water Service Contract. On or before December 1 of each year, District will notify Water User in writing of the estimated total amount of these charges for the following year, and said total amount shall be paid by Water User in eight equal installments, said installments to become due and payable on the tenth day of the months of February through September. **Provided however**, the Board of Directors may elect to delay and/or consolidate the payment schedule if information for computing rates is not timely available. On or before July 1 of each year or as soon thereafter as practical, District will mail to Water User a final accounting of water charges for the previous year. District will include with said final accounting either (1) a statement of credit owing to Water User for overpayment, or (2) a statement of Water User's additional payment obligation, which shall be due and payable on August 1. Any credit owing to the Water User for overpayment shall first be applied to cure any delinquency outstanding and then may be deducted from the Water User's next installment of Water User's payment obligation to the District. In the event such credit exceeds the amount of the next installment, then upon written request of Water User, the excess amount may be remitted to Water User. In the event of a change of ownership, the Board of Directors, upon written request by the then current and previous Water User, may authorize that the amount of such credit, refund, or additional payment due, as applicable, be remitted to or paid by the immediately previous Water User; otherwise, the credit, refund or any additional payment due shall apply to or be paid by the current Water User. If the final accounting adjustment reveals that an additional payment is due, and the previous Water User fails to timely pay such additional payment due, that obligation shall be assessed against the then current Water User.

- b. Unscheduled Water Service:** Payments for unscheduled water service shall be made at the rate or rates established therefor by the Board. If the request for unscheduled water service has been made before the Statement of Estimated Annual charges has been completed, the charges for said service will be included in said Statement of Estimated Charges for the year. If the request is made subsequent thereto, payments shall be made monthly. Advance payment or establishment of credit may be required.
- c. Temporary or In-Lieu Water Service:** Under conditions of temporary or in-lieu water service, payment shall be made each month at the rate or rates and under conditions established by the Board of Directors for such temporary or in-lieu water service. Advance payment or the establishment of credit by the Water User may be required.
- d. Industrial Water Service:** (i) Payment for temporary Industrial Water Service shall be made at the rate or rates and under conditions established by the Board of Directors for such service. Advance payment or the establishment of credit may be required. (ii) In such cases where Industrial Water Service is provided under a water service contract entered pursuant to Section 3(g) hereof in which capacity is made available, then the contract for Industrial Water Service shall provide, in addition to other customary terms, that the Water User annually pay a wheeling fee based on the Contract Amount of Water as provided in the Water Service Contract. In years and at times in which Industrial Water is furnished by the District, Industrial Water User shall also pay the Fixed Obligation (F.O.) component of the Water Availability Charge (WAC) and the Water Use Charge (WUC) for water ordered and delivered as provided in the Industrial Water Service contract. Payment for water furnished in excess of the Contract Amount of Water shall be at rates for Temporary Industrial Water Service.

In those years and at times in which Industrial Water is not furnished by District the Industrial Water User shall pay only the wheeling fee for water service. The contract may provide that should the F.O. and WUC exceed an indexed water cost that the Industrial Water User may secure its own water supply and the District deliver same upon paying the wheeling fee. Such wheeling fee shall, commencing in 2000, be the higher of \$100 per acre-foot of Contract Amount of Water each year of the long-term obligation to make capacity available, or \$50 per day of water delivery, adjusted annually by the Consumer Price Index, All Urban Consumers, All Items Index, Western Cities with populations of less than 1,500,000, for December of the calendar year immediately preceding utilizing the index for December 2000 as a base to determine adjustments.

On or before December 1 of each year, District will notify Industrial Water User under long-term water contract in writing of the estimated total amount of these charges for the following year and said total amount shall be paid by Industrial Water Users in four equal quarterly installments. Each installment is to become due and payable on the last day of the first month of each quarter. **Provided however** that in the event the District is unable to provide water for Industrial Water User or other credits are due to the Industrial Water User the second and subsequent quarterly installment payment for the Water Availability and Water Use Charges will be recomputed by the District and Industrial Water User will be notified of the change. On or before July 1 of each year following the first year of Industrial Water Service, District will mail to Water User a final accounting of water charges for the previous year. District will include with said final accounting either (1) a statement of credit owing to Industrial Water User for overpayment, or (2) a statement of Water User's additional payment obligation, which shall

be due and payable on August 1. Any credit owing to the Industrial Water User for overpayment may be deducted from the Industrial Water User's next installment of Water User's payment obligation to the District. In the event such credit exceeds the amount of the next installment, then, upon written request of Industrial Water User, it may authorize that the remaining amount of such credit be remitted to the Water User.

- e. **Supplemental Water:** Payments for Supplemental Water shall be made at the rate or rates established therefore by the Board. Payment for Supplemental Water, either allocated as part of the Contract Amount of Water or in addition thereto, for Water User and ordered by Water User shall be spread over the remaining regular monthly payments set forth in the Water Service Contract. Payment for Supplemental Water shall be subject to and a part of a final accounting of costs in the same manner as set forth in paragraph 5(a) of these Rules and Regulations. Water User shall be entitled to any credit due for overpayment and shall be responsible for any additional payment obligation as a result of underpayment identified in said final accounting adjustment.

f. **Delinquency in Payments:** Pursuant to Section 5(g) or 5(f), as applicable, of the Water Service Contract the total amount of water charges of Water User is divided into eight equal installments, which are due and payable on the tenth day of each of the months of February through September. If there is a delinquency in payments for water service for any turnout, the District shall impose penalties for such delinquency as follows:

- (1) If the payment for any turnout which Water User is required to make to District is not received by the District by 5:00 PM 30 days after the date it becomes due and payable, said payment is delinquent within the meaning of Section 5(j) or 5(i), as applicable, of the Water Service Contract, and delivery of water to said Water User will be discontinued. No further water deliveries will be made to said Water User until all delinquencies, plus penalties and interest if applicable, are paid, except as provided at subparagraph (3) hereof.
- (2) Any payment remaining unpaid for a period of 30 days after the date it becomes due and payable (the 10th of the month) is delinquent as provided in Section 5(j) or 5(i), as applicable, of said Contract, and a penalty of 10% of the payment will be charged plus interest at 12% per year until all payments are brought up-to-date. On the 10th of the month the District will deposit the remaining allocation of water from delinquent accounts in the current monthly pool and apply the credits therefrom to the Water Users account. Said credits will be applied before the assessment of penalty or interest on the delinquent account. In the event Water Users subsequently cures the delinquency, District will give Water User first priority upon any water in the pool remaining unsold, or water from other sources, which may be available to the District, up to that quantity of water originally placed in the pool from the delinquent account. Should a Water User be delinquent on October 10, the District will commence proceedings to collect the charges as provided in Sections 47181 to 47185, inclusive, of the Water Code. Provided, however, the District may commence such proceedings at an earlier date if the Board determines it is in the best interest of the District to do so. This may lead to a sale of the property affected by the Water Service Contract, or any other remedies available to the District, and to continued refusal of water service, all as provided in the Water User's Water Service Contract and these Rules and Regulations. Nothing herein contained shall be construed to limit in any manner of enforcing any remedy, either at law or in

equity, for any breach by Water User in failing to timely pay any assessments, tolls or charges.

- (3) If the District is in possession of a Certificate of Sale (executed by the County Treasurer pursuant to Water Code §46761) for delinquent charges for Contract Water Service, and Water User demonstrates that he has no available means to satisfy the charges which are covered by the Certificate of Sale, water service may be provided to Water User so long as the Water User is otherwise entitled to Contract Water Service, and the Water User (and his tenant in the event Water User leases his land) enter into a form of agreement approved by the Board. Said agreement shall include the following provisions: (a) The Water User acknowledges the existence and priority of the Certificate of Sale; (b) The term of the agreement shall only be for one year and there shall be no automatic right of renewal; and (c) The Water User (and/or the tenant if the tenant as Operating Agent is paying water bills) must pay in advance contract water charges as determined by the District during the term of the agreement. Said agreement may also, at the discretion of the Board, provide for repayment of prior delinquent charges, which are the subject of the Certificate of Sale. Service to such lands subject to a Certificate of Sale shall only be provided in accordance with terms and conditions of such agreement.

6. PAYMENT OF SPECIAL SERVICE CHARGES

Special Service Charges, as provided by law and as set forth in the Water Service Contracts will be collected periodically as provided by law. Such charges may include the Administrative and General Service Charges, Project Service Charge and Deferred Service Charge, all as set forth in the contracts, and such other tolls and charges as may be provided for under Water Storage District Law.

7. PROCEDURE FOR FIXING TOLLS AND CHARGES NOT ESTABLISHED BY CONTRACT

In accordance with Section 43003 of the Water Code, the following procedures are established for fixing Tolls and Charges authorized by Sections 43006 and 47180 other than those established by the Water Service Contract. Before fixing any such Toll and Charges, the Board shall pass a resolution declaring its intent to do so and in the resolution fix a time not less than two weeks from the date of the resolution as the time when the Board will meet to consider the matter of fixing such Tolls and Charges. A copy of the Resolution of Intention shall be published in a newspaper of general circulation in Kern County once a week for at least two weeks before the time appointed by the Board for the open meeting. At the time appointed for the open meeting, the Board shall consider the matter of fixing the Tolls and Charges, hear any objections thereto and may adjourn the matter from time to time.

8. WATER SHORTAGES

Pursuant to powers granted by Section 43003 et seq., of the California Water Code, the Board has established the following policy to provide for the sharing of the burden of any shortages in the quantity of water available for distribution to Water Users and the cost thereof during any year.

- a. **Allocation of Water:** The water supplies available to the District will be allocated to the District's Agricultural Contract Water Users as follows:

- i. If the District's available water supply in any year is less than the total of Contract Amount of Water for all Water Users, but more than two acre-feet per acre when averaged for all lands in the Surface Water Service Area, the available supply will be apportioned to all Water Users in the proportion that each Water User's Contract Amount of Water for that year bears to the total of Contract Amount of Water for all Water Users.
 - ii. If the District's available supply in any year, averaged for all lands in the Surface Water Service Area, is less than two acre-feet per acre, the available supply will be apportioned among all Surface Water Service Area lands on an equal acre-feet per acre basis provided that Water User shall not be apportioned more water under this paragraph (ii) than Water User would receive under paragraph (i) above. Notwithstanding the above, in the event of a severe long-term water shortage, the Board reserves the right to make such other allocations as it deems appropriate, taking into consideration the type of crop, critical water needs, and the economic effect of losses which may occur as a result of such allocations and may provide for adjustments of charges as a result of such allocations.
- b. **Supplemental Water:** The District during years of short supply may obtain water supplies in addition to that available under the Agency Contract, including District wells, Banking Programs and water purchases. Such water supplies shall be allocated first to provide the full Contract Amount of Water provided for in the contracts for Agricultural Water Service under terms as the Board then determines appropriate and the costs thereof borne by the beneficiaries of such supplies, Provided, however, in any year the Board may determine and limit the amount of water made available for Supplemental Water from District wells and banking programs. The method of allocation of Supplemental Water shall be as set forth in the contracts for Agricultural Water Service and recited in paragraph 8(a) above.
- c. **Industrial Water:** Apportionment of water under an Industrial Water Service Contract shall be governed by the terms of that Contract.
- d. **Conveyance of Groundwater (or User Input Program):** In any year the District declares a water shortage exists, District facilities may be used to convey ground water for use upon land within the District for agricultural purposes so long as the lands to be served are within the common ownership or Farming Operation of the land from which the water is pumped, provided the affected parties enter into an Agreement in a form provided by the District which shall include but not be limited to the following provisions:
 - i. Nothing therein contained shall be interpreted as a waiver, relinquishment, and/or abandonment of the District's title to water stored in the underground as a result of the District's project.
 - ii. The District shall not involve itself with any disputes regarding the right of a landowner/Water User or others, nor any disputes regarding continuation of such service, nor any dispute regarding payment for such a ground water conveyed, and any landowner/Water User desiring to utilize the District's facilities for such purposes shall hold the District harmless from any such claims.

- iii. Wheeling from one system to another generally is only possible if the water being delivered to the District system is of sufficient quality to discharge into the California Aqueduct as determined by the State. Only to the extent the District is taking delivery of surface water, may ground water be delivered to the District and "banked" for later uses with the District at times when the District would be taking delivery of surface water. Such restriction must be applied on a system by system basis unless water quality of the ground water is sufficient to discharge it into the California Aqueduct.
- iv. The wheeling charge shall be sufficient to recover all costs to the District associated with the Storage, conveyance and delivery of ground water. The wheeling charge shall be estimated based on available information on costs and estimated quantities of ground water production. The estimated wheeling charge shall be paid by Water User within 30 days of notice. When the final costs are determined by the District, any overpayment will be credited to the Water User, and any additional charge will be paid by Water User within 30 days of notice. The cost of power and energy for pumping shall not be included in the wheeling charge and shall be charged separately based on the unit rate for transferring water between pump zones.
- v. Water User shall indemnify and hold the District harmless from any damages resulting from loss of pumped ground water due to causes beyond the control of the District.
- vi. The cost of providing connections to District systems, including any protective devices required by District as a condition of such connection, shall be paid from funds deposited by Water User for this purpose in advance of construction.

9. DISPOSAL OF WATER

As provided in Section 5(k) of the Contract, the District will make reasonable efforts to dispose of any water made available to but not required by Water User, and to the extent of Water User's obligation, any net revenue from such disposal shall be credited to Water User. In disposing of any such water, District will make reasonable effort to obtain the maximum amount of credit for Water User. If in the event such water is made available to the District by Water Users in accordance with Section 5(k) of the contract, over a period of time covering two or more calendar months, then such water will be accumulated into monthly pools which may be established by the District, and all the water from the first such pool will be sold and credits applied to its contributors before any sales are made from the second pool, and all water from the second pool will be sold before any sales are made from the third pool, etc., thus following a "first-in-first-out" policy in increments of monthly pools. **Provided however,** if any water in the second or subsequent monthly pools is sold at rates higher than any individual rate for water sold from the first pool, then the pool sales shall be adjusted so that the highest rates for water sold are credited to the first pool and successively lower rates are applied to the second and subsequent pools.

10. CONTROL, USE AND RECAPTURE OF WATER

- a. District will not be responsible for the control, carriage, handling, use, disposal or distribution of water delivered to Water User hereunder outside the facilities then being operated and maintained by District. Water User shall indemnify and shall assume the defense of and hold harmless the District and its directors, officers, agents and employees for any and all loss, damage, liability, claims or causes of action of every nature whatsoever for damage to or

destruction of property, including the District's property, for injury to or death of persons, in any manner arising out of or incidental to the control, carriage, handling, use, disposal or distribution of water outside such facilities.

- b. Pursuant to the provisions of Section 3 of the Contract dealing with conditions of delivery, place of use of project water, and Water User's liability and indemnification, water delivery may be discontinued by the District for any Water User who permits water delivered by District to escape beyond the boundary of the lands described in said contract whether willfully, carelessly, or on account of defective or inadequate ditches or pipelines, or inadequate tailwater facilities, or inadequately prepared land or improper management, and said water delivery will not be resumed until such conditions are corrected. For the purposes of administration of this section, for lands included in a Farming Unit Operation as described in Section 4(m) of these Rules and Regulations, the contract lands shall be deemed to include all lands within said Farming Unit Operation; provided, however, that nothing herein contained shall limit or detract from the obligations assumed by Water User.
- c. Without obligating District to assume any responsibility therefor, District shall have the right to the use of all waste, seepage, and return flow resulting from water supplied by the District, including but not limited to Project Water, which escapes or is discharged beyond Water User's recovery facilities, if any, and nothing herein contained shall be construed as an abandonment or relinquishment of District of the right to recapture and the use of any such water; **Provided however**, that nothing herein contained shall limit or detract from the obligations assumed by Water User.

11. CARRYOVER

Carryover is the ability to use undelivered State Water Project entitlement in the year following its allocation as part of the Contract Amount of Water. Water Users are permitted to carry over undelivered State Water Project Entitlement allocated to them as part of their Contract Amount of Water and not pooled as of December 31 of the year of allocation. Water from the District's supplemental water programs and previous year carryover supplies may be carried over by Water Users. Water derived from the User Input Program may not be carried over by Water Users. In administering this rule, the first water delivered during the year will be counted as SWP entitlement up to the quantity of entitlement allocated to Water User. Other water supplies including supplemental water and pool purchases will be the last water supplies delivered to Water Users. Payment for Carryover shall be at rates or rates established by the Board, to recover the costs associated with delivery of carryover water. Carryover water is subject to loss without notice, and the District shall not be responsible for losses or damages from the loss of Carryover water.

12. SECOND PRIORITY USE OF KERN WATER BANK

It is the policy of the District to manage the Kern Water Bank (KWB) for the benefit of all Water Users on a first priority basis. To the extent the District is not using KWB recharge or recovery capacity for said benefit, the District's rights and access to the KWB may be used by Water Users, on a second priority basis, to recharge and recover supplies for use upon land within the District for agricultural purposes, provided that Water User(s) enter into an agreement in a form provided by the District which shall include but not be limited to the following provisions:

- a. Water User priority to use of the KWB is secondary to the District. Use of the KWB by Water User may be superseded by the District at anytime.

- b. Water User may request to recharge and recover supplies, at District's discretion, within the KWB for in-District use only. District's consideration of requests shall take into account what is feasible and practical. Such requests shall be in writing in a form acceptable to the District. Recovery of supplies in excess of Water User's Second Priority Bank Account balance are not allowed.

Water User shall submit request for recharge/recovery to District, which has the discretion to refuse such request provided such request shall not be unreasonably refused. In certain circumstances, the District may deny requests due to reasons beyond the District's control, including but not limited to reasons of maintenance of the KWB, or due to scale, e.g. the Water User order is too small for recharge/recovery, or there is not enough time to perform the request. In some cases, it may possible or desirable to accomplish said request by exchange rather than direct recharge or recovery.

- c. Water User may recharge specific water types as established by the Board. User Input supplies may not be banked. The Board shall from time to time establish which water types and quantities are eligible for second priority recharge to mitigate local groundwater impacts or for other purposes. It is the District's intent to manage second priority use to avoid increasing local groundwater overdraft consistent with the District Project purposes and the Sustainable Groundwater Management Act.
- d. District shall record all second priority use by Water User, maintain an accounting thereof, make adjustments thereto for losses due to conveyance, recharge, recovery, mitigation, overdraft correction, and such other losses as may occur, and provide an accounting to Water User from time to time. Such accounting shall identify the quantity of water available to Water User for second priority recovery (the Second Priority Bank Account).
- e. Water User may transfer all or part of its Second Priority Bank Account to other Water Users; provided such transfer shall not be made until Water User provides written notice thereof to the District on a form provided therefor, and further provided the District shall not involve itself with any disputes regarding the right of a landowner/Water User or others, nor any disputes regarding continuation of such service, nor any dispute regarding payment of accounts conveyed, and any landowner/Water User desiring to utilize the District's facilities for such purposes shall defend, indemnify and hold the District harmless from any such claim. Transferred Accounts must still be delivered in-District.
- f. Water User payment for second priority use of the Kern Water Bank shall include any and all conveyance, mitigation, delivery, recharge and/or recovery costs, plus any additional fees as established by the Board. Payment of all fees and charges due under the agreement, including delinquencies under the agreement, would be on the same terms and conditions, as the Water User Water Service Contract. The Board may establish a procedure for forfeiture of the Second Priority Bank Account to cure delinquency in payments not timely made and due under the agreement.
- g. Water User is subject to all the same restrictions and obligations to which the District is subject in the KWB Joint Powers Agreement, KWB Memorandum Of Understanding, and the policies of the Kern Water Bank Authority, including but not limited to water banking losses.
- h. Water User Second Priority Bank Accounts may be limited as established by the Board. Such Accounts are subject to partial or complete loss in favor of the District due to Kern Water Bank Authority policy, or because of the District's loss of recharge capability due to Water User(s) second priority recharge. Water User loss of Second Priority Bank Accounts to the District may receive some compensation at rates established by the Board, which rates may be less than Water User's costs. The District shall

periodically notify Water Users of the quantities of water stored in the KWB so Water Users can periodically assess their risk of loss of said Accounts.

- i. Second priority use of recharge and recovery capacity of the Kern Water Bank by Water Users shall be allocated in proportion to Water Users' Contract Amounts of Water.
- j. The initial term of the agreement shall be until December 31, 2020, with 5-year renewals thereafter. The District reserves the right to modify the agreement during the renewal period. If a Water User finds the modified contract unacceptable, the Water User has a five-year period to either recover their Second Priority Bank Account or transfer said Account to another Water User. Until such time as that Account has been recovered or transferred, the Water User would be subject to the terms of the current agreement. If the Account has not been transferred or recovered, the Account will forfeit to the District.

13. **PRESERVATION OF PUMPING RIGHTS**

In order that no Water User be prejudiced by utilizing Project Water in lieu of exercising whatever rights he may have to pump ground water and in recognition of the anticipated benefit to the District's underground water supply arising from the implementation of the District's project, the Board of Directors has adopted the following policies:

- a. All Water User's contracts with the District for water service shall include a Section 3(m), which is quoted following:

*"In the interest of preserving to Water User his rights to pump ground water for use on his lands which will be served with water under this contract, it is agreed that, during all the years that District delivers water to Water User, to the extent that Water User shall reduce his pumping of ground water and shall make use of water so delivered to him by District, Water User's said use of water so delivered to him by the District shall be deemed the same as if he had pumped from the underground a quantity of water equal to the quantity of water so delivered to him by District. Water User also agrees to recognize and be bound by the pumping rights similarly preserved to other Water Users in the District pursuant to water service contracts heretofore and hereafter executed. It is further agreed that, in the event District were to carry out a program for spreading of water and percolation thereof to underground storage, District shall have the right to use of the underground storage for spreading and recovery of water in connection with supplying water service to Water User and to all other Water Users, and it is further agreed that, to the extent that District may pump water from underground supplies for furnishing to Water Users, District shall be deemed to be exercising said Water User's rights to pump water from underground water supplies; **Provided however**, that nothing herein contained shall prevent or hinder Water User from exercising his rights to pump ground water."*

- b. During the lifetime of District's adopted project, District will maintain records of ground water level and quality, and, in accordance with Water Storage District Law, if future conditions should indicate the need therefor, will levy a service charge on lands irrigated from ground water and/or seek to have an Assessment Commission appointed to readjust the Original Project Assessment to reflect project benefits to lands within District irrigated from ground water; and such action will be taken in a timely manner in order to maintain financial equity between the Water Users and ground water users in District.

In effecting this policy it is declared that without obligating District to assume any responsibility therefor and without limiting or detracting from the obligations assumed by Water Users in this regard, District shall have the right to the use of all waste, seepage and return flow resulting from Project Water which escapes, percolates or is discharged beyond Water User's recovery facilities, if any, and nothing herein contained shall be construed as an abandonment or relinquishment by District of the right to the recapture, use and benefit of all such water, and any use made of any resultant benefit to ground water conditions arising from project water is made with the consent of the District, which consent is revocable at any time, and such use is not to be considered a use adverse to District's rights nor shall any such use under any circumstances create an estoppel in asserting such rights at any time.

Further in effecting this policy, it is declared that, during all the years that District delivers water to a Water User, to the extent that such Water User shall have reduced his pumping of ground water and shall make use of water so delivered to him by District, any use made of the resultant benefit to ground water conditions is made with the consent of said Water User, which consent is revocable at any time, and such use is not to be considered a use adverse to his right to the continued exercise of his rights to pump and utilize ground water nor shall any use under any circumstances create an estoppel in asserting any such right at any time.

14. PROTECTION OF DISTRICT FACILITIES

Without limiting rights otherwise reserved and except for drains and waterways built by the District expressly for the conveyance of drainage water, no persons will be allowed to drain irrigation water upon District-owned property, and any person doing so will be subject to fine and damages, will be in violation of these Rules and Regulations and water service may be terminated.

It is the duty of Water User to furnish reasonable protection for the individual Farm Turnout to prevent damage to said turnout. In the event that damage occurs to Farm Turnout as a result of failure by Water User to provide such protection, the repair of such damage will be made by the District, the expense of such repair will be charged to Water User and no water will be furnished through the affected turnout until such repairs are made and the charges therefor paid to the District.

15. SUBSIDENCE

It is known that portions of the District to be served with project water consist of soil which, with continued application of water, may consolidate to a considerable degree. It is also reasonable to assume that this phenomenon may result in damage to District's facilities. This factor is recognized in the District's Project Report, which contains estimates of an amount of money necessary to pay the added cost of construction required to minimize danger and an estimate of the cost of increased maintenance on facilities in said subsidence areas. Such factors were again considered during final design of project facilities and in connection with the District's right of way program. It is also recognized that the use of water in such areas for normal agricultural purposes may nevertheless result in unforeseen damage to District's facilities arising from this natural phenomenon. It has been suggested that paragraph 3(e) of the Water Service Contract and various portions of these Rules, particularly Rule 13, can be interpreted as rendering a Water User liable for any and all damage occurring to District's facilities by reason of the ordinary use of his lands for agricultural purposes. It is to be noted that nothing contemplated in the Water Service Contracts or these Rules and Regulations is intended to make any Water User strictly liable for damage to District's facilities attributable to subsidence; that the philosophy of the Project Report is such that the Water Users will pay the estimated cost of minimizing such damage and the

increased maintenance attributable thereto as a District expense, and that the consideration paid, or to be paid, to Water Users for the acquisition of District's rights-of-way has not included an element of damage for assumption of any liability arising from such risk.

In this regard, and notwithstanding anything contained in the Water Service Contract and/or these Rules and Regulations, District will repair, at District's own expense, damage to District facilities due to subsidence occasioned by the normal, ordinary and reasonable use of land of Water User related to application of Contract Water, provided that Water User's uses incorporate every reasonable precaution to prevent, eliminate or minimize such damage; **Provided however**, nothing herein contained shall modify in any manner the provisions of Paragraph 3(h) of the Water Service Contract or in any manner render District liable for any damage to a Water User occasioned by disruption of Water Service.

16. ENCROACHMENT ON DISTRICT PROPERTY

Without limiting rights otherwise reserved, consent for encroachment will be required from the District before any drains, fences, pipelines or other encroachments from private sources will be permitted to be used upon the District's property. Consent forms will be furnished by the District to the applicant and must first be approved by the Engineer-Manager or his designee before any construction begins. Where District rights in any property are an easement, no encroachments will be permitted which will in any manner interfere with the rights under said easement, and the District's consent must first be obtained before any pipelines or other encroachments are constructed in any easement area. The work shall be constructed to specifications approved by the District at the sole expense of the permittee and maintained to the satisfaction of the District. If such consent is granted, then the permittee shall be solely responsible for and shall indemnify and shall assume the defense of and hold harmless the District and its directors, officers, agents and employees from any and all loss, damage, liability, claims or cause of action of every nature whatsoever, for damage to or destruction of property, including the District's property, or for injury to or death of persons, in any manner, arising out of permittee's exercise of the rights and privileges given in the granting of such consent. Issuance of consent does in no way grant a permanent right, and if the District determines at a future date that said works do in fact interfere with its operations, said works shall be removed and the District's property restored to its original state at the sole expense of the permittee. Granting of such consent does in no way and in no extent surrender or subordinate the District's control or supervision over the encroachment. Any person or his authorized agent who uses the property of District for the movement of equipment shall be responsible to District for any damage to District property. No livestock will be allowed to enter upon or graze on District's fee property without the specific written approval of the District. Any persons using a District rights-of-way for any purpose assumes all risks associated therewith and assumes the responsibility for any damage to District property resulting therefrom and also for any damage to private property caused by such damage to District property.

17. MODIFICATION OF THE PROJECT FACILITIES

No changes shall be made in the constructed project facilities except by District personnel or its contractors and in accordance with the District's specifications. If a modification is made at the request of a Water User, and for his benefit, the cost thereof shall be paid in advance by the Water User requesting said modification. The advance payment shall be determined by the Engineer-Manager based upon an estimate of the costs including but not limited to reasonable charges for engineering performed by the District and overhead, and after completion of the work a final accounting shall be submitted to the Water User. Within thirty (30) days after submission of said final accounting, the Water User will pay the difference between the actual cost and the estimate thereof, or the District will make a refund if the

actual cost is less than the advance payment. Any additions to project facilities so constructed shall become the property of the District.

18. SALE OR TRANSFER OF TITLE TO LANDS

- a. Without limiting the provisions of Paragraph 10 of the Water Service Contracts, when land affected by a Water Service Contract is sold or title otherwise transferred to another party, District will be under no obligation to deliver water to such lands until the Water Service Contract is assumed by the new landowner. Such assumption shall be on forms provided by the District, executed and completed timely in a manner satisfactory to the District. In the event of a transfer of ownership as to a portion of the lands described in an Exhibit "A" to a Water Service Contract and in the absence of written instructions from the affected landowner, the Assumption Agreement will be prepared so as to allocate the rights and obligations under said Water Service Contract on an acreage basis.
- b. Notwithstanding any transfer or change of ownership, the District shall be entitled to administer a Water Service Contract in reliance upon and in accordance with matters in the files at the District office including but not limited to matters regarding title to land, address of Water User, authorizations, appointments, designations, credits and refunds and the like, until or unless District has received actual notice in writing that any or all of such matters are changed, modified or revoked.

19. MISCELLANEOUS PROVISIONS REGARDING ASSIGNMENTS AND TRANSFERS

- a. The execution by the District of any assignment and/or the giving of its consent to transfer of the rights of a Water User under a Water Service Contract or to a disposal of water by the District pursuant to Rule 10 hereof, shall be without any warranty of title on the part of the District and shall not be interpreted as any representation, express or implied, by or on behalf of District, that such assignment, transfer or disposal is free and clear of outstanding encumbrances.
- b. Without attempting to establish or in any manner affect the rights of any person arising from a deed of trust, any person or entity having any interest in a deed of trust on property subject to a Water Service Contract, may file with the District a written request for notice of failure to make the payments required by such Water Service Contract or a request for notice of any specific act that the District may be requested to undertake or to consent to under the Water Service Contract or these Rules and Regulations that such person alleges will detrimentally affect its interest, including but not limited to (1) a request for exclusion from the Surface Water Service Area; (2) a request for written permission to utilize water on lands other than those described in Exhibit "A" to a Water Service Contract for a period in excess of a year; or (3) a request for assignment of rights under Water Service Contract for a period in excess of a year. Upon receipt of such notice, District shall give such person written notice of default or of any request that it take such action as is set forth in the request for notice, at least fifteen (15) days prior to foreclosure proceedings or prior to such other specified act by the District, unless such person has given written consent to the requested action. In addition to setting forth the matters as to which notice by the District is requested, the request for such notice shall set forth a legal description of the land affected; the name of the current owner of the fee; the name and address where the requested notice is to be sent and a copy of the deed of trust showing the recording information. Any notice from the District shall be effective when deposited in the mail, postage prepaid, directed to the address shown in the notice. **Provided however**, District may disregard

any request for notice which has not been re-filed within fifteen (15) days of a written demand therefor by the District mailed in the same manner and with the same effect as herein above provided for the notice by the District; **Provided further, however**, nothing herein provided shall render District liable to any person under any circumstances.

20. REAPPORTIONMENT OF ASSESSMENTS

The provisions hereof are supplementary to the provisions of Article 8 (commencing with Section 46325) of Chapter 2 or Part 9 of the Water Code.

When any tract of land upon which an assessment has been levied, has been subdivided into smaller parcels of land, the Board may, in the absence of any application being filed therefor, prior to a call on said assessment or prior to closing of the County Assessment Rolls if the alternative procedure for collecting District assessments is utilized, order that such assessments be reapportioned in the same manner as utilized in establishing the assessments on the entire tract being reapportioned without notice and hearing unless a person interested shall have filed with the Board a request for notice of hearing of reapportionment of assessments to be made pursuant to Section 46325.

Applications for reapportionment of assessments on tracts of land in the District shall be in such form as is approved by the Board; landowners' signatures shall be acknowledged in the same form as a conveyance of real property and the application shall be accompanied by certified copies of recorded deeds showing the current ownership of the entire tract to be reapportioned. If the application be signed by less than all the landowners within the subdivided tract, a hearing will be held and notice of hearing shall be by mail directed to landowners affected at the address shown on District records and only to such other persons as are interested who have filed with the Board a request for notice of reapportionment, mailed at least ten (10) days prior to the day of hearing. District may require a report as to status of title of said reapportionment tract and may require a payment of such fees and costs by the applicant as the Board may establish.

21. MUNICIPAL AND INDUSTRIAL WATER

- a. These Rules and Regulations are applicable to water served for agricultural, industrial, and municipal and industrial uses. Water will be furnished for industrial use, or municipal and industrial use, only with the written permission of the District and subject to specific terms and conditions to be imposed for the particular service involved or pursuant to contracts for Industrial Water Service. Water is in a raw, untreated condition and is considered to be unfit for human consumption without treatment. Insofar as is practicable the basic rules and regulations governing the delivery of agricultural water shall apply to delivery of water for industrial use and municipal and industrial use.
- b. **Conditions Under Which Water May be used for Municipal and Industrial Use:** Paragraph 3(a) of the District's Water Service Contracts with individual landowners provides in part "Water furnished under this Contract shall be used by Water User for Agricultural Use only, Provided, However, that, with the written permission of District, Water User may use said water for Municipal and Industrial Use (M&I) subject to terms and Conditions imposed by District." The terms and conditions that the District will consent to such a conversion, which would be implemented through a Contract Amendment including the affected landowner and water purveyor as parties, ("Implementation Contract"), would incorporate the following principles into such contact amendment:

- (1) Water Treatment Entity. There must be a responsible water purveyor that would be fully responsible for treatment of wholesale supplies provided by the District and distribution of those supplies. The purveyor would have to have demonstrated the technical and financial ability to perform those functions. The purveyor would most likely be another district, a County service area, or a regulated public utility.
- (2) Return Flows to Groundwater. The M&I development must be designed and implemented in such a manner so as to not unduly reduce effective return flows to the groundwater basin, as compared to continued use for irrigation under then current conditions.
- (3) M&I Development / Ag Land Use Conflicts. The M&I development must be designed and implemented in such a manner so as to not adversely impact adjacent agricultural operations, as provided for on a case by case basis.
- (4) Safe Drinking Water Act. It must be confirmed that as a result of the conversion and the activities of the water purveyor, the District will not become subject to additional regulatory constraints, such as the Safe Drinking Water Act, which would adversely affect other landowners and the District's costs.
- (5) Isolation of Delivery Systems. The delivery system from the California Aqueduct to the water purveyor would be isolated from District facilities, unless other arrangements are made.
- (6) Additional Institutional Costs. Any added costs, such as any additional charges from Department of water Resources and/or the Kern County Water Agency (KCWA), or any increase in KCWA zones of benefit assessments, will have to be paid by the converting landowner and/or water purveyor.
- (7) Additional O&M Costs. Arrangements must be made to avoid any facility conflicts, such that the M&I development does not make it more difficult or expensive for the District to access, maintain and repair and replace its facilities.
- (8) Other Cost Impacts. To the extent the Implementation Contract may adversely affect costs or unit water rates to other Water Users, such adverse impact must be mitigated to the extent deemed appropriate by the Board.
- (9) Security for Water Charges. The District's security for payment of contract water charges and any non-contract assessments and charges must be maintained, particularly upon subdivision of lands. Among other things, if the water purveyor defaults in payment of charges or assessment (for instance if the development is a failure), that notwithstanding the land may have been subdivided, that the District's security is not compromised as compared to what would be the case if the land was still in agriculture. This may take the form of an equivalent recorded contract and/or lien by the water purveyor (if it is a public agency) with similar lien rights and providing for the district being a third party beneficiary, or a security enhancement arrangement, such as a letter of credit.

(10) No Increase in Demands. The Implementation Contract will include provisions, as necessary on a case by case basis, to ensure that, as a result of the conversion to M&I use, demands for water in the District and areas immediately adjoining the District, whether from surface water or groundwater, do not increase as a result of the conversion.

(11) No Domestic Priority for Water Allocations. The Implementation Contract will include language that, notwithstanding Water Code Section 106 and any other provisions of law, the Water User and water purveyor, and their successors and customers, waive and will not assert any priority to water provided for M&I use, including domestic use, and that the allocation of water supplies under the Contract Amendment in any given year will not exceed that which would have been allocated if the water was used exclusively for Agricultural Uses.

(12) Notice to Water Purveyor Customers. A mechanism will be included in the Implementation Contract to ensure that future customers of the water purveyor are provided notice of those provisions of the Implementation Contract that the District deems appropriate on a case-by-case basis.

22. SECTION 592 OF THE PENAL CODE OF THE STATE OF CALIFORNIA

Attention is directed to the provisions of Section 592 of California Penal Code as follows:

" (a) Every person who shall, without authority of the owner or managing agent, and with intent to defraud, take water from any canal, ditch, flume or reservoir used for the purpose of holding or conveying water for manufacturing, agricultural, mining, irrigating or generation of power, or domestic uses, or who shall without like authority raise, lower or otherwise disturb any gate or other apparatus thereof, used for the control of measurement of water, or who shall empty or place or cause to be emptied or placed, into any such canal, ditch, flume or reservoir, any rubbish, filth or obstruction to the free flow of the water, is guilty of a misdemeanor.

(b) If the total retail value of all the water taken is more than nine hundred fifty dollars (\$950), or of the defendant has previously been convicted of an offense under this section, or any former section that would be an offense under this section, or of an offense under the laws of another state, or of the United States that would have been an offense under this section if committed in this state, then the violation is punishable by imprisonment in a county jail for not more than one year, or in the state prison."

23. AUTHORITY OF CONTRACTS

This District entered into a contract with the Kern County Water Agency and contracts between the District and Water Users for water service. In case of an inconsistency between these Rules and Regulations and the Water Users Contract, the Agency Contract, the Master Contract, Industrial Water Service Contract and any amendments thereto, the Contracts shall govern.

24. ENFORCEMENT OF RULES AND REGULATIONS

The Engineer-Manager of the District is authorized to do all acts necessary and proper to enforce these Rules and Regulations. Failure of a Water User to comply with any of the Rules and Regulations shall be sufficient cause for the termination of water service, and water service will not again be furnished to such Water User until full compliance has been made with all the requirements as herein set forth; Provided however, that Water User shall in no way be relieved of any responsibility for payment of any

charges or obligations by reason of such termination of water service. When it is practicable to do so, advance notice of any such termination of water service will be furnished to Water User. In no event shall any liability accrue against District or any of its directors, officers, agents or employees, for damage, direct or indirect, arising from such terminations of water service. Non-enforcement of any provision of these Rules and Regulations does not constitute a waiver of the District's right of enforcement at any time.

25. APPEAL OF DECISION OF ENGINEER-MANAGER

In the event a Water User disagrees with a decision made by the Engineer-Manager in carrying out the enforcement of these Rules and Regulations, he shall have the right of appeal to the Board of Directors. Appeals shall be submitted in writing no less than five (5) days prior to a regular meeting of the Board in order to be considered at that meeting, shall specifically set forth the decision being appealed and shall give the reasons for said appeal. Decisions of the Board of Directors shall be final and conclusive.

26. CHANGES IN RULES AND REGULATIONS

The Rules and Regulations shall become effective immediately and may be added to, amended or repealed at any time by resolution of the Board of Directors of the District.

27. SEVERABILITY OF PROVISIONS

If any provision of these Rules, or the application thereof to any person or circumstance, is held invalid, the remainder of these Rules, and the application of its provisions to other persons or circumstances, shall not be affected thereby.