AGRICULTURAL WATER MANAGEMENT PLAN

2020 Update

FOR THE

LAGUNA IRRIGATION DISTRICT

Adopted March 7, 2023

Completed in Accordance with the

WATER CONSERVATION ACT OF 2009
(SBx7-7)

DATE SIGNED: 3-7-2023

Prepared by:

EST. 1968
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List of Acronyms

2020 Guidebook	*A Guidebook to Assist Agricultural Water Suppliers to Prepare a 2020 AWMP*
AB	Assembly Bill
AF	acre-feet
AW	applied water
AWMP or Plan	Agricultural Water Management Plan
CCR	California Code of Regulations
CCUF	crop consumptive use fraction
CDFA	California Department of Food and Agriculture
cfs	cubic feet per second
CIMIS	California Irrigation Management Information System
CVRWQCB	Central Valley Regional Water Quality Control Board
DAC	Disadvantaged Community
DWR	Department of Water Resources
EC	Electrical Conductivity
ET	Evapotranspiration
ET_o	Reference evapotranspiration
ETAW	evapotranspiration of applied water
EWMP	Efficient Water Management Practice
FT	Foot
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
ILRP	Irrigated Lands Regulatory Program
Inflows	Water Supplies
KBWA	Kings Basin Water Authority
KRCD	Kings River Conservation District
KRWA	Kings River Water Association
LID or District	Laguna Irrigation District
NFKGSA or GSA	North Fork Kings Groundwater Sustainability Agency
NRCS	Natural Resources Conservation District
Outflows	Water Demands
PG&E	Pacific Gas & Electric
Regulation	Final SBx7-7 Agricultural Water Measurement Regulation
Rule and Regs	*Rules and Regulations Governing the Distribution of Water in the Laguna Irrigation District*
SB	Senate Bill
SBx7-7	Water Conservation Act of 2009
SCADA	Supervisory Control and Data Acquisition
SGMA	Sustainable Groundwater Management Act
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
USBR	United States Bureau of Reclamation
USGS	United States Geological Survey
WMO	Water Management Objectives

AGRICULTURALWATER MANAGEMENT PLAN

Section I. Plan Preparation and Adoption

This Laguna Irrigation District (LID or District) Agricultural Water Management Plan (AWMP) is an update of the District's 2015 AWMP and has been prepared in accordance with the requirements of the Water Conservation Act of 2009 (SBx7-7) and conforms to the framework presented in *A Guidebook to Assist Agricultural Water Suppliers to Prepare a 2020 Agricultural Water Management Plan* (2020 Guidebook) that was issued by the California Department of Water Resources (DWR) in 2021. LID does not have a U.S. Bureau of Reclamation (USBR) water supply; therefore, it is exempt from developing and submitting a Water Conservation Plan per USBR's requirements.

The District is located in the San Joaquin Valley in southern Fresno and northern Kings counties, west of the Sierra Nevada mountains and northwest of and adjacent to the Kings River.

The requirements introduced by SBx7-7 are intended to encourage agricultural water suppliers to assess current efficient water management practices (EWMP), to evaluate additional practices that may conserve water, and to require accurate measurement of water delivered to customers. The AWMP process also presents an opportunity for water suppliers to demonstrate existing accomplishments in water use efficiency as well as anticipated water use efficiency measures.

A. Description of Previous Water Management Activities

LID and its agricultural water users have implemented many of the EWMPs described in the District's previous AWMPs. In addition, numerous water conservation measures beyond those identified in the historic AWMPs have been implemented. Prior water management efforts include:

- In 1992, the District adopted an AB 1658 Groundwater Management Plan
- In 1993, the District prepared an AB 255 Groundwater Management Plan
- In 2005, the District participated in the preparation of an SB 1938 Groundwater Management Plan, which was adopted.
- In 2012, the District prepared and submitted the "2012 Agricultural Water Management Plan" in compliance with SB X7-7. The 2012 report concluded that the District had fully implemented all of the critical and applicable conditional EWMPs.
- In 2015, the District prepared an update to the 2012 Agricultural Water Management Plan to include in the AWMP a drought management plan in addition to quantification of water supplies and demands for certain years and identify areas to improve the efficiency of water use within the District.

The purposes for preparing the 2020 update to the District's 2015 Agricultural Water Management Plan are to:

1. Incorporate new requirements for AWMPs pursuant to AB 1668, including the addition of an

annual water budget, identification of water management objectives based on the water budget, quantification of water use efficiency, and detailed drought management plan.

2. Continue to evaluate the District's water management practices.
3. Identify areas to improve the efficiency of water use within the District.
4. Consider past and future water management strategies to increase the reliability of water deliveries to the District.

A central consideration in the District's determination of how best to implement a program of EWMPs is the District's goal of providing flexible, reliable service to its agricultural water users. In the past decade, some land has transitioned from forage crops to permanent crops such as trees and vines. The permanent crops are typically irrigated with efficient water use systems such as low-volume drip and micro-sprinkler systems rather than surface irrigation systems used on forage crops. The District remains aware of the irrigation practices of their customers to best support their services, including making relevant funding, education, and technical resources available on the District website.

The District is committed to maintaining a balance between surface water and groundwater as sources of supply and has pursued pricing policies and operational practices that support conjunctive management. The District has and continues to support groundwater sustainability through providing affordable surface water. This District priority results in surface water as the primary water source and groundwater as a secondary supply.

The effort required to sustain groundwater levels and retain the ability to tap this resource during periods of prolonged drought has served the District well, is discussed later in this AWMP, and supports the sustainability goal of the North Fork Kings GSA GSP and the greater Kings Basin, as well as serving as adaptive management to the effects of climate change.

For the reasons described above, when evaluating EWMPs, LID assesses the value of EWMPs as part of a comprehensive package of practices that assists the District in providing a high level of customer service and supporting conjunctive management.

B. Coordination Activities

Notification of AWMP Preparation

SBx7-7 requires that each city or county within which the supplier provides water supplies be notified that the AWMP is being prepared but does not specifically identify how much advance time is required for notification of cities and counties of the AWMP preparation. SBx7-7 also does not require notification to any other agency(s) and does not require that comments from any city, county, or other agency must be solicited and considered. The District, however, did notify local agencies and the public that the AWMP was being updated as shown below:

County of Kings
Date of Notification of Plan Preparation: March 26, 2021

County of Fresno
Date of Notification of Plan Preparation: March 26, 2021

Appendix A includes documentation of the letters that were issued to the County of Kings and the County of Fresno notifying them of Plan preparation.

Public Participation

Notification of a Public Meeting was published in the Hanford Sentinel on February 14, 2023 and February 21, 2023, noticing that the "DRAFT" updated AWMP was available at the District Office for public review starting on February 14, 2023, with a Hearing to be held on March 7, 2023, at 9:30 am at the same location. Notification of the Public Meeting is included in Appendix B.

Public participation activities associated with preparation of the updated AWMP are presented in Table 1.

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

Potential Interested Parties	Notified of AWMP Preparation	Notified of Public Meetings	Sent Copy of Adopted AWMP
Department of Water Resources			X
County of Fresno	X		X
County of Kings	X		X
Local Newspaper (Hanford Sentinel)		X	
California State Library			X
North Fork Kings GSA			X
Laguna ID Website	X	X	X

C. AWMP Adoption and Submittal

The purposes of this updated AWMP are to assess Laguna ID's current water management operations, provide background with respect to actions taken since the 2015 AWMP, respond to the provisions of SBx7-7, and to discuss future actions that may be taken within the next planning horizon. The AWMP adoption and submittal process follows that outlined in the 2020 Guidebook.

AWMP Adoption

This 2020 AWMP update was adopted by the District Board of Directors on March 7, 2023 following a Public Hearing. Appendix C includes a Resolution of AWMP Adoption.

AWMP Submittal

The District followed the steps that are described in the 2020 Guidebook for submittal of the AWMP and the process that was followed is outlined in Table 1. The AWMP was submitted electronically to DWR no later than 30 days after adoption.

AWMP Availability

In preparing this AWMP, LID solicited public input by holding a public hearing and inviting oral and written comments prior to adoption of the AWMP at a Board of Director's meeting on March 7, 2023. The public hearing was advertised in the Hanford Sentinel newspaper on February 14, 2023 and February 21, 2023. A copy of the newspaper notice is found in Appendix B. Table 1 shows the state and local interested parties who were notified about preparation of the updated AWMP and were provided copies of the adopted AWMP. Written comments that were received on the AWMP during the public review are found in Appendix D. The AWMP will be posted on the District website following adoption.

D. AWMP Implementation

LID continues to implement EWMPs based upon the implementation plan presented in its original AWMP and refined in later AWMP updates. LID has fully implemented the volumetric pricing EWMP as well as the water measurement EWMP mandated by SBx7-7 as described later in this document.

Section II. Description of the Laguna Irrigation District and Service Area

A. Physical Characteristics

Laguna Irrigation District (LID or District) was formed in 1920 and is governed by the Water Code of the State of California. The District was formed under Irrigation District Law to deliver water to farmers and landowners within the District. The development of irrigated agriculture around the LID area began with the development of facilities by the Fresno Canal and Irrigation Company whose successor, the Fresno Canal and Land Corporation, sold the system to LID in 1921. The District service area includes a substantial portion of the historic Laguna de Tache Land Grant.

The District is a member of the Kings River Water Association (KRWA), Kings Basin Water Authority (KBWA), and North Fork Kings Groundwater Sustainability Agency (NFKGSA). The District is a multiple-county district, meaning that its boundaries include territory in both Fresno and Kings Counties. A five-member Board of Directors governs the District. Board Members are elected by division and serve four-year staggered terms with two terms that expire in even years divisible by four, and the other three terms expire in the next even year. Directors must be registered voters and landowners within the District and residents of the respective division that they represent. Two divisions are in Fresno County, one division is in Kings County and two divisions include land in both Fresno and Kings Counties.

The District delivers agricultural surface water through approximately fifty miles of open canal and a similar mileage of pipeline. Surface water is provided to an area of southern Fresno County and northern Kings County southwest of Kingsburg and south, southeast, and southwest of Riverdale. The District's southerly boundary is generally along the South Fork of the Kings River or the Kings County line. The District has multiple points of diversion from the Kings River that supply the District conveyance system - Grant Canal, A Ditch, Island Canal, and Summit Lake Ditch.

The District has water rights to a portion of the annual runoff of the Kings River and storage rights in Pine Flat Reservoir as one of the 28 member units of the KRWA. The District's entire surface water supply comes from the Kings River. The District does not operate any groundwater wells, but its landowners use their own groundwater wells to supply water for their crop needs when surface water supplies are not available. In areas where surface water cannot be delivered, the landowners rely on groundwater. The District delivers and beneficially uses all surface water that it is entitled to. Depending on the surface water supply conditions each year, water supplies may be carried over in storage for use in a subsequent year.

LID's surface water supply is from the Kings River, with contracted storage of 44,000 AF at Pine Flat Reservoir and allocated storage of 8,481 AF in upstream reservoirs in the Kings River watershed for a total available storage of 52,481 AF. The available water supply each year is dependent upon winter rain and snowfall in the Kings River Watershed in the Sierra Nevada Mountains. Due to the limited ability to store water, the Kings River water users depend upon storage in the Kings River Watershed in

the form of snow to capture surface water that then melts in the spring and summer months when water requirements increase. The District's water rights are held in trust through KRWA.

The District is a conjunctive use district, meaning that both surface water and groundwater are used within the District. Historically, in flood years when surface water is abundant, the District takes advantage of that available water and recharges as much as possible in groundwater storage for withdrawal by landowners in subsequent dry years. The District owns and operates seven regulation/recharge reservoirs where water can be captured and banked as groundwater or temporarily held and reused as surface water. The District has also recently acquired the land for one more site for a future recharge basin.

Due to the unpredictable nature of the District's surface water supply, *conjunctive use* is a very important part of District operations. The District does not operate any groundwater wells, but the District delivers and recharges available surface water and its landowners use their own groundwater wells to supply water for their crop needs when surface water supplies are not available.

The plan document will demonstrate that the District is unique in the Lower Kings River Sub-Basin because its groundwater supply is fairly stable. Due to the proximity to the Kings River and permeable soils within the District, it is possible to replenish subsurface storage in wet years after drought cycles.

1. Size of the Irrigation Service Area

The District encompasses approximately 53,301 acres of mainly agricultural land producing field and row crops along with a variety of permanent crops, with approximately 35,044 acres in Fresno County and 18,257 acres in Kings County. In 2020, LID annexed about 16,666 acres to the northeast of the historical District boundary and north of the Community of Laton that was not in the service area of any water provider. This area is often referred to locally as the "Little Texas" area. This annexation increased the size of the District from about 36,635 acres to its current 53,301 acres

Approximately 30,134 acres can receive surface water for agricultural production. The balance of the land is either undeveloped, operated as livestock facilities, rights-of-way, utilities, owned by public agencies, or in areas where surface water deliveries from the District are, for various reasons, not feasible (or outside of the place of use for Kings River water). LID is situated in the south-central portion of Fresno County and northwestern portion of Kings County. The LID service area abuts several other public agencies: Riverdale ID to the northwest, the Liberty WD and Consolidated ID to the north, the Clark's Fork Reclamation District and the Lemoore Canal Company to the south in Kings County, and the Kings County WD in Kings County to the southeast. The District is a member of the North Fork Kings Groundwater Sustainability Agency (NFKGSA). Figure 1 shows the service area of the District as well as the cities that are located within and near the District.

The District does not conduct any crop surveys, but cropping information is available for select years through the Department of Water Resources and recently through the North Fork Kings GSA. Cropping patterns in the District are a mix of annual row crops and permanent crops, with the original District acreage being a nearly equal mix of annual row crops and permanent crops,

whereas the land that was annexed into the District in 2020 is predominantly permanent crops. The acreage of permanent crops in the entire District is now approximately 60% of the irrigated acreage. The total cropped area of the District in 2021 was 42,924 acres, with the breakdown of crops shown in Table 2.

Table 2 - Estimated Agricultural Land Use in 2021

Estimated 2021 Crop Acreage				
Crop Type	Original District	Annexed Area	Total Acres	Percent
Alfalfa and Alfalfa Mixtures	3,309	393	3,702	9%
Almonds	6,553	3,601	10,154	24%
Corn, Sorghum and Sudan	897	372	1,269	3%
Cotton	311		311	1%
Grapes	738	1,167	1,905	4%
Miscellaneous Deciduous	266	781	1,047	2%
Miscellaneous Grain and Hay	3,537	316	3,853	9%
Miscellaneous Grasses	188	59	246	1%
Miscellaneous Truck Crops	156	218	374	1%
Mixed Pasture	472	23	495	1%
Peaches/Nectarines	57	1,870	1,927	4%
Pistachios	3,373	132	3,505	8%
Plums, Prunes and Apricots	159	2,356	2,515	6%
Unclassified Fallow	2,211	1,287	3,498	8%
Walnuts	2,659	1,521	4,180	10%
Wheat	3,183	330	3,513	8%
Young Perennials	180	170	350	1%
Other	26	55	81	0%
Total	28,276	14,649	42,924	

Source: North Fork Kings GSA LandIQ land use data

The land use data identified by LandIQ is considered the most representative and recently available land use data for consideration. The land use data omits urban areas, rural residential areas, roads, canals, dairies, and government owned natural habitat from the irrigated acreage totals.

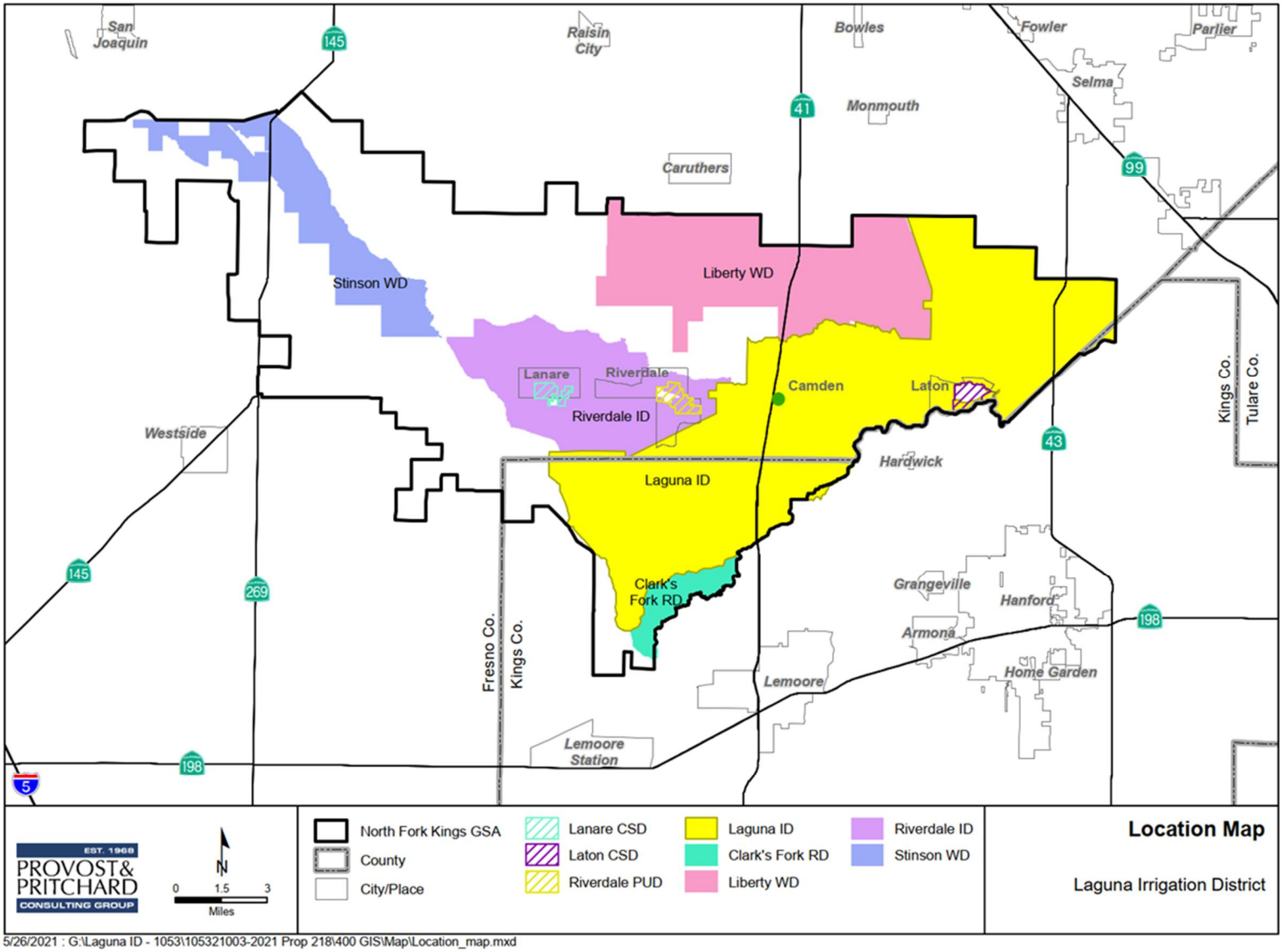


Figure 1. Location Map

Prior to the construction of Pine Flat Dam in the 1950's, the District water supply was dependent upon what water was actually in the Lower Kings River and a schedule of allocation developed in 1949. This resulted in a very unreliable source of surface water, with extremes of abundant water, often when not needed, to little or no water at other times. Upon completion of the Pine Flat Dam in 1954, water supplies became somewhat more manageable because of storage provided in Pine Flat Reservoir, but supplies are still quite variable and not reliable. The surface water supply is unpredictable due to variations in precipitation and runoff, and the current limited surface water storage.

Table 3 summarizes the water supply sources and District acreage.

Table 3 - Water Supplier History and Size

Water Supplier History and Size	
Date of Formation	1920
Source of Water	
Local Surface Water (Kings River)	Yes
Local Groundwater	Yes - by landowner
USBR Central Valley Project	No
State Water Project	No
Gross Acreage - at Time of Formation	35,197
Gross Acreage – in 2021	53,301
Estimated Current Irrigated Acreage (2021)[1]	42,924
District Supplied Surface Water Acreage (2020)	30,134
[1]Based off 2021 LandIQ land use data from NFKGSA, considered to be the most recent and most comprehensive available irrigated land use data for the area. The 42,924 estimated irrigated acreage in 2021 does not include urban areas, rural residential areas, roads, canals, dairies, and government owned natural habitat in the irrigated acreage totals.	

2. Location of the Irrigation Service Area and Water Management Facilities

As shown on Figure 1, LID is situated in the south-central portion of Fresno County and northwestern portion of Kings County. The LID service area abuts several other public agencies: Riverdale ID to the northwest, the Liberty WD and Consolidated ID to the north, the Clark's Fork Reclamation District and the Lemoore Canal Company to the south in Kings County, and the Kings County WD in Kings County to the southeast.

The District has a vast water conveyance and delivery system for its many customers that is based on maximizing use of available surface water through direct diversion for irrigation and recharge potential of the lands including lined and unlined canals, pipelines, diversion structures, terminal basins, and recharge basins. The District has a very extensive distribution system consisting of about 50 miles of open canals and 47 miles of water distribution pipeline used to deliver water supply to District customers. Much of the pipeline is monolithic cast-in-place concrete pipe that is nearing the end of its useful life. The canal distribution system is equipped with various trash screens, stilling wells, pumps, electric motors, and SCADA equipment (sensors, radio transmitters and receivers, antennae).

The 50 miles of canal range in capacity from 500 cubic feet per second (cfs) in the Grant Canal down to 20 cfs in the Little B canal. The network of pipelines ranges in size from 18-inch diameter to 42-inch diameter. The pipelines are being upgraded over time at District expense from concrete monolithic to plastic pipe to increase efficiency and reduce leakage. Historically, the pipelines were installed in areas where an existing open canal had excessive seepage loss due to the soil types present. All landowner diversions are currently made from District owned facilities and all water deliveries are made at the District (farm-gate) turnout that is equipped with a flowmeter. There are no private laterals in use at this time.

Due to the placement of the delivery system, approximately 86 percent of the original District can be supplied with surface water. The land that was annexed in 2020 is outside the Kings River service area and does not receive an allocation of surface water. The conveyance and delivery system is outlined in Table 4 and shown in Figure 2. No changes to the length of the distribution system have been made since the 2015 AWMP Update.

Table 4 - Water Conveyance and Delivery System

System Used	Number of Miles
Unlined Canals	49
Lined Canals	1
Pipelines	47
Drains	0

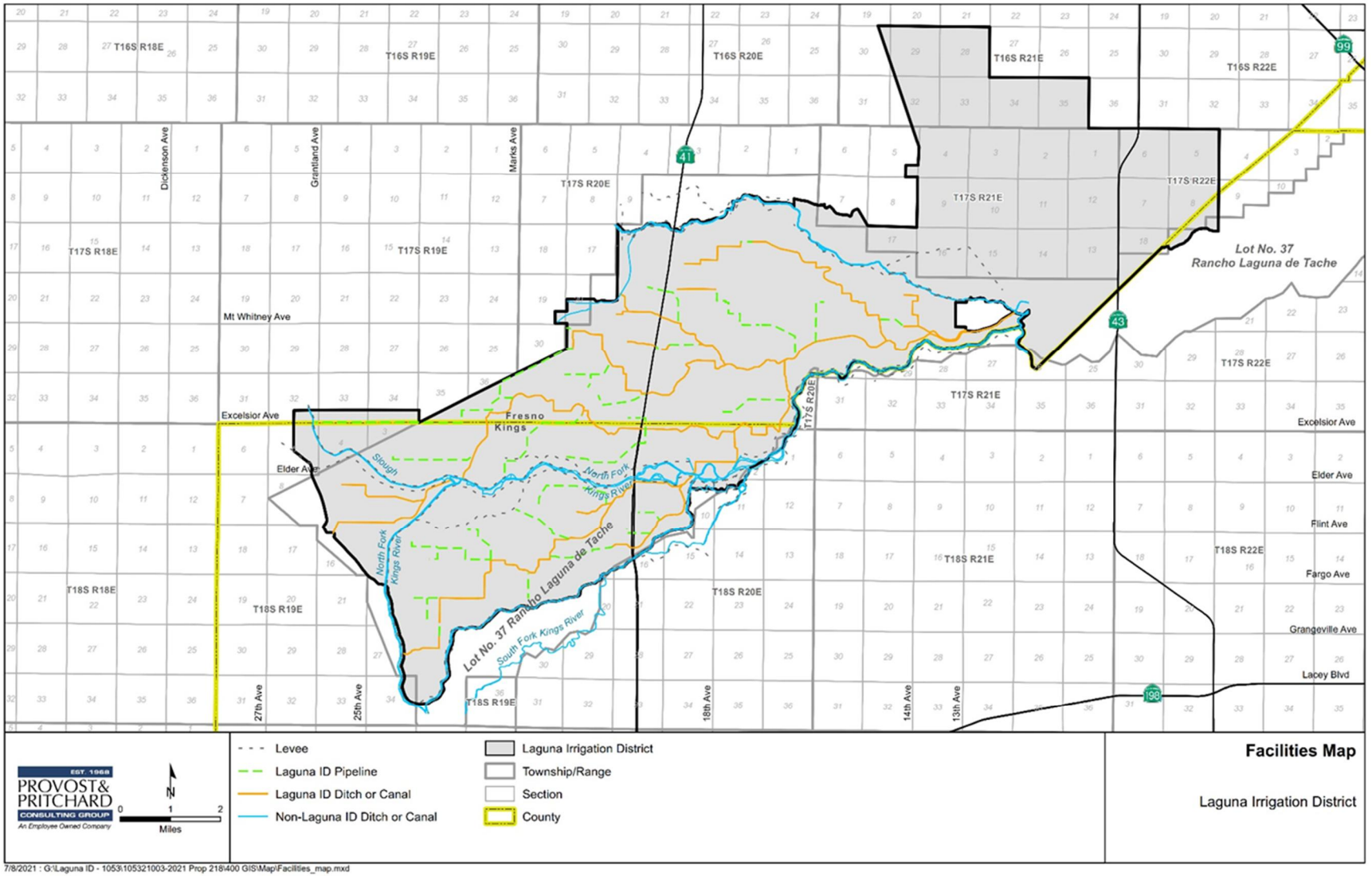


Figure 2. Distribution System Facility Map

Local soils and near surface conditions influence how water applied at the land surface, either from rainfall or irrigation, moves through the soil and percolates downward into the groundwater basin; how canals flow and stream flow contribute to the groundwater budget; and also may influence the location and design of recharge projects and delivery canals. Deeper geologic features control the fate and transport of water once it is in the subsurface, groundwater storage capacity, recharge-discharge relationships, flow between areas, and well designs and pumping rates.

The District has historically addressed its groundwater supply by implementing a strong conjunctive use program of using all available surface water supplies for irrigation and recharge purposes, thereby reducing the amount of groundwater that must be pumped by landowners. The District's groundwater recharge basins are listed in Table 5 and shown in Figure 3. In addition to the increased use of dedicated groundwater recharge facilities, the District distribution system serves as a major source of groundwater recharge. LID is committed to continuing to implement innovative and cost-effective solutions addressing groundwater sustainability.

Through the full utilization of all available surface water, in conjunction with the available groundwater supplies, the District can achieve a sustainable water supply. Being a conjunctive use district, the continued management of its surface water supplies in conjunction with groundwater is a critical tool in fully managing the water supply.

Table 5 - Water Supplier Recharge Basins

Laguna Irrigation District Recharge Basins
Zonneveld Pond
Dias Pond
Higdon Pond
Everett Pond / Casa Loma
Coelho Pond
Vaz Pond
Basin 11

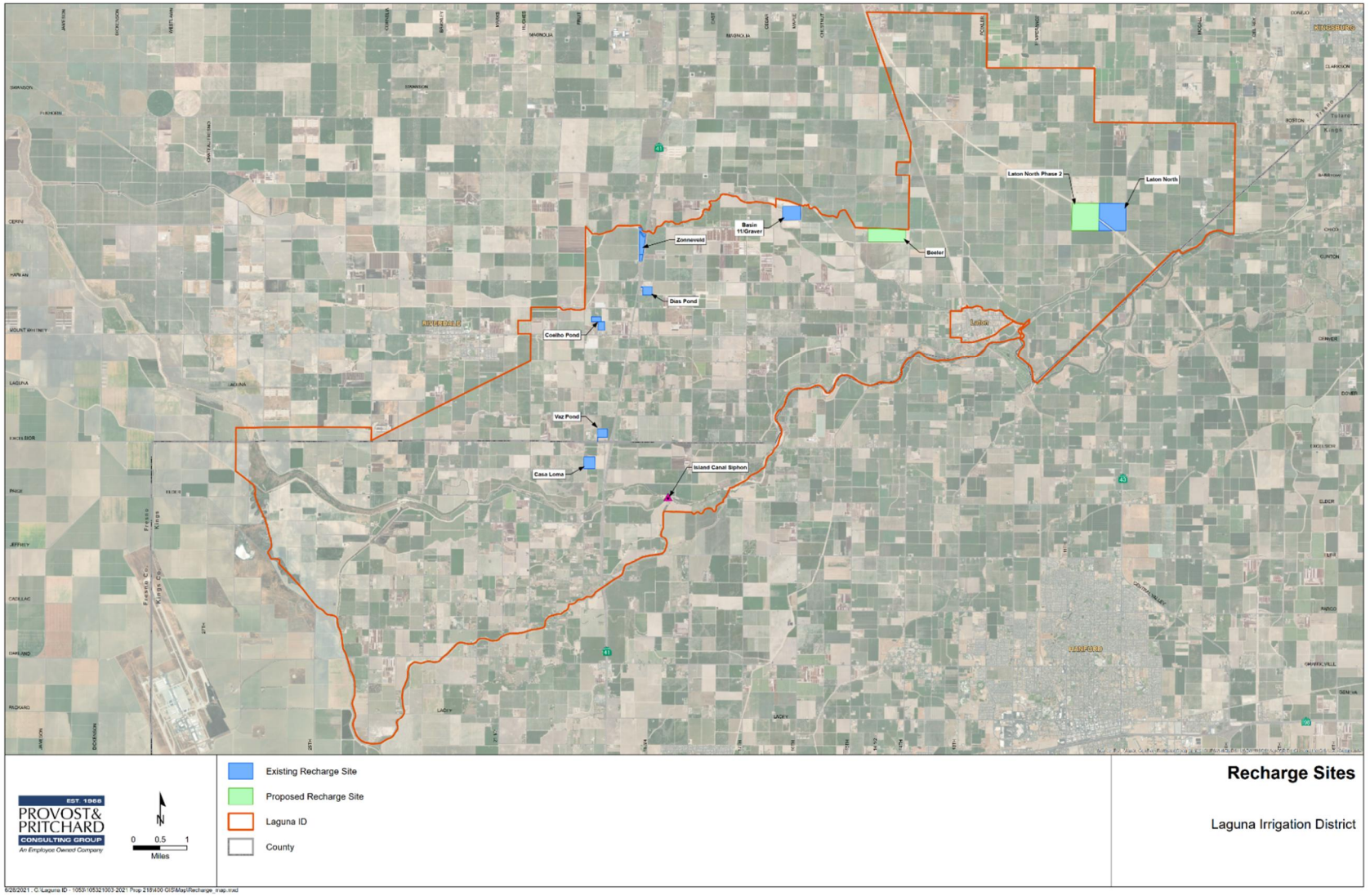


Figure 3. District Recharge Facilities and Proposed Projects

The need for on-farm surface drainage within the District is minimal, as the majority of the land within the irrigation service area is well drained. Much of the land that is irrigated with surface irrigation techniques have been leveled to allow agricultural water users to retain all irrigation water applied on-farm within the parcels' boundaries.

In gravity water delivery systems like the District's, flow fluctuations towards the ends of canals are common due to various factors including farm delivery mismatches, evaporation losses, water being turned on and off, and flow restrictions. To address operational fluctuations in the distribution system, the District utilizes the recharge basins located throughout the District so any fluctuations are captured and not spilled. Currently, LID has no District-operated recovery system, and tailwater returns to the District conveyance system are minimal. Some growers, especially at dairies, re-circulate their water on site.

Terrain and Soils

The terrain of the District is relatively flat and is composed primarily of alluvial fans sloping from east to west. Ground surface elevations are slightly higher along the east side of the District and gradually decline to the west, ranging from 220 to 205 feet above mean sea level.

Land within LID consists mainly of sediments that have formed the broad alluvial plains of the Kings River. The groundwater aquifer system consists of unconsolidated continental deposits that are divided into formations that include older alluvium, marsh deposits, younger alluvium, and flood-basin deposits. The older alluvium is an important aquifer that readily yields water to wells. It consists of lenses of clay, silt, sand, gravel, cobbles, and boulders and is generally fine grained near the deepest part of the valley. Marsh deposits are mixed in with the older alluvium. The younger alluvium is a sedimentary deposit found beneath the river channels and is highly permeable. There are no known major faults or fault zones that have been mapped or identified that would inhibit groundwater flow within District boundary.

Within LID, the hydraulic conductivity of soils based on soil texture ranges from relatively rapid for coarse-grained soils to relatively slow for fine-grained soils as shown in Figure 4.

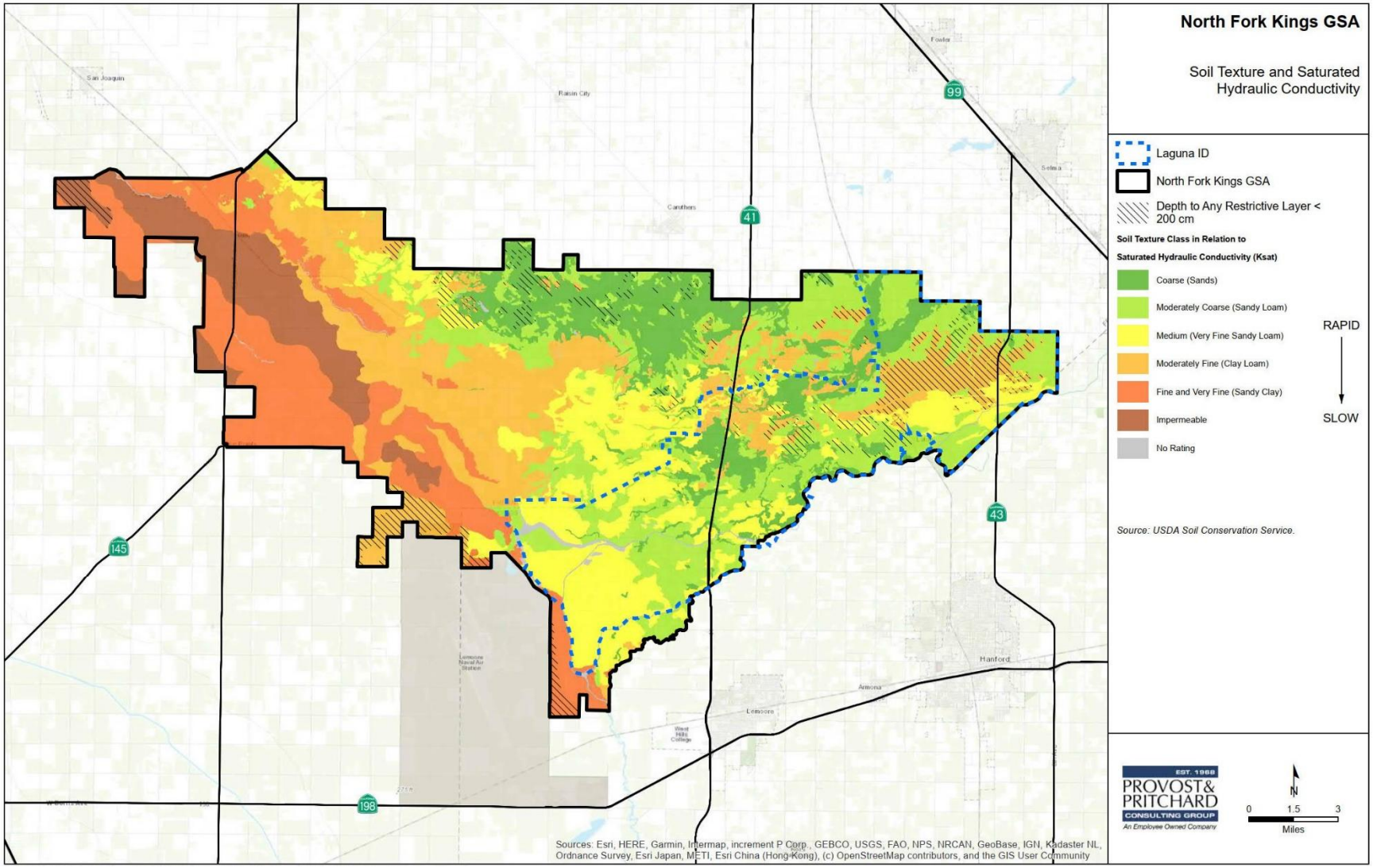


Figure 4. Soil Texture

Climate

The climate in the region is typical of the San Joaquin Valley and is considered semi-arid, with mild winters and hot summers. Typical annual rainfall is 7-10 inches per year, with most of the rainfall occurring from December to March with little to no precipitation occurring during the summer months of June through August. The pattern for crop water use (evapotranspiration or ET) and evaporation are just the reverse, therefore, precipitation in the region does not provide significant water for crops at the required time or in the amounts needed to meet crop water demands. Average daily temperatures vary from average lows of about 34°F in December to average highs of 97°F in July. Summer temperatures often exceed 100° F and winter temperatures commonly fall below 32°F but are rarely lower than 25°F. Shown below in Table 6 and Table 7 is average climatic data for Lemoore Naval Air Station, located just south and west of the District.

Table 6 - Summary of Climate Characteristics – Lemoore NAS

Climate Characteristic	Annual Value
Average Precipitation	7.9 inches
Minimum Temperature (Avg.)	34.2°F
Maximum Temperature (Avg.)	96.8°F

Table 7 - Detailed Climate Characteristics – Lemoore NAS

Month	Average High Temperature, °F	Average Low Temperature, °F	Average Precipitation (inches)[2]
January	55.0	35.6	1.66
February	62.1	38.6	1.34
March	68.7	41.7	1.52
April	75.6	44.7	0.61
May	84.6	51.1	0.30
June	91.7	56.4	0.04
July	96.8	60.5	0
August	95.4	59.0	0.02
September	90.4	55.1	0.18
October	80.3	47.3	0.49
November	65.8	38.5	0.58
December	54.9	34.2	1.17

Temperature distribution is uniform throughout the area. There are no known microclimates located within the District, primarily due to the flat topography of the area.

B. Operational Characteristics

1. Operating rules and regulations

The current *Rules and Regulations Governing the Distribution of Water in the Laguna Irrigation District* (Rules and Regulations) were updated in April 2005 and are presented in Appendix E. The Rules and Regulations guide the operation and delivery of irrigation water and cover the procedures followed by the District to distribute irrigation water in an orderly, efficient,and equitable manner.

2. Water Delivery Measurements or Calculations

The District has, since 1989, allocated and measured all on-farm deliveries of surface water. The allocation is the best estimate of water supply made prior to the actual start of deliveries. As previously indicated, the available surface water supply can vary significantly from year to year. Each year the District's available water supply is spread evenly on a per-acre basis over the acreage that is eligible to receive such water, with a per acre allocation made to the landowners that is approved each year by the Board of Directors.

Water deliveries to the landowners have been measured with Water Specialties brand propeller type open flow meters since 1989. These meters measure an instantaneous flow rate in cubic feet per second and accumulate the total amount of water delivered in acre feet. The meters' cumulative and instantaneous flows are recorded daily by the field staff and the data is entered into the District's computer system where daily available balances are calculated for each landowner. Errors in readings are immediately addressed by verifying data. If there is an issue with a meter, it is repaired on site and tested or replaced. Any lapses in data are extrapolated from prior and current instantaneous flow rate measurements and time duration between readings. Water use is measured with propeller meter measuring devices and is debited against the landowner's water allocation. Water deliveries are cut off to a water user when they have used their water allocation. Table 8 indicates the type of water delivery measurements used by the District.

Table 8 – Water Delivery Measurements

Water Delivery Measurements				
Measurement Device	Percent of Measurement	Frequency of Measurement (Days)	Frequency of Maintenance (Months)	Estimated Level of Accuracy (%)
Headgate w/stilling well	0%	n/a		
Propeller Meters	100%	Daily	Annually/as needed	±2%
Weirs	0%	n/a		
Flumes	0%	n/a		
Vertical Meters	0%	n/a		
Pump, Run Time	0%	n/a		
Pump, KWH	0%	n/a		

Water Rate Schedules and Billing

The LID Board annually establishes a land based assessment rate and water delivery charge based on budget requirements and board policy. The District landowners approved a Proposition 218 election in 2021 that established the current rate structure. The District's billing structure is described below and presented in Table 9. Figure 5 is a map of the current water service classification.

Land Based Assessment & Groundwater Charge: The District recovers its operating expenses primarily through acreage-based assessments on lands within the District. Thus, the majority of the District's annual income is essentially fixed regardless of the amount of water that is delivered. The District's land-based assessment is the only fixed income collected by the District, and thus its economic stability and existence is dependent upon the assessment revenue. There are three primary land assessment rates, which are based on the type of water classification service available:

- Irrigated - Rate 1 - the Irrigated rate assessment is for lands that are able to receive surface water supplies from the District and also receive the benefit from groundwater recharge that the District's surface water supply provides, similar to lands in the Rate 2 category;
- Recharge/Pumped - Rate 2 - the Recharge/Pumped rate assessment is for lands that are not able to receive surface supplies and only irrigate using private groundwater wells, but receive a benefit from being in the District because of the groundwater recharge that occurs through seepage from the delivery of surface water and dedicated recharge facilities. Also included in Rate 2 are the non-irrigated or undeveloped lands (normally Rate 3) that are selling or trading their allocated groundwater pumping rights or credits as established by the local Groundwater Sustainable Agency (GSA) under the Sustainable Groundwater Management Act (SGMA));
- Pasture - Rate 3 - the Pasture rate assessment is for non-irrigated or undeveloped lands that may be able to move to another rate category in the future and thus benefits by being in the District. The non-irrigated or undeveloped lands that have sold or traded their allocated groundwater pumping rights or credits established by the local GSA shall not be classified as Pasture.

There are also lands that have been deemed Exempt from assessments (typically public agencies or utilities and the community of Laton).

The Irrigated rate assessment accounts for approximately 60% of the District assessed area. The Irrigated rate assessment is higher than the Recharge/Pumped rate because the service provided to the Irrigated rate users (i.e. surface water delivery) is more valuable than the service to the Recharge/Pumped rate users (groundwater recharge). With the available surface water, to apply a given annual volume of irrigation water, an Irrigated rate user would not have to operate their private well as often as a Recharge/Pumped rate user needing the same annual amount of water. The 2020 annexation to the District of 16,666 acres of the area often called "Little Texas" does not have the ability to receive surface water, so the entire area is assessed at the Recharge/Pumped rate, unless a property was determined to be pasture or exempt. The Proposition 218 election approved by the landowners in 2021 established higher assessment rates, which had not previously been increased since 2004, to cover increasingly higher District fixed operating and maintenance costs and replenish

savings. The approved rates authorized maximum rate increases during each of the next five years along with an escalator increase implemented over the subsequent five years to allow the District to raise rates as needed in order to pay for actual increases in fixed costs and immediate repair or replacement of capital facilities projects without having to incur the expense of repeating the Proposition 218 process. Each year the Board of Directors determines the assessment rate for that year up to the maximum that was approved by the landowners through the Prop 218 process. The maximum annual per acre assessment that the Board would be authorized to assess in 2021 and in 2026 is shown in Table 9.

Volumetric Charge: For those landowners that can receive surface water that are on the "Irrigated" assessment rate discussed above, there is a volumetric water charge called a water delivery charge. The water delivery charge is established by the District each year to cover projected expenditures that exceed the revenue collected through the acreage-based assessments. A Proposition 218 election was held in 2014 that authorized the implementation of a water delivery charge. The water delivery charge is established each year by the District, not to exceed $5.00 per acre-foot. The water delivery charge is in addition to the land-based assessment. The District bills landowners directly for both the land-based assessments and the water delivery charge.

If landowners choose not to use their surface water allotment, their allocation may be transferred and sold to other landowners within the District. Since the annual water allocation varies, the District recommends that the sales price of transferred water also vary on a per acre foot basis in accordance with the allocation. The rate suggested by the District is determined by dividing the current annual assessment by the allocation in acre feet. The suggested water transfer rate is meant to cover the land-based assessments but not be a money maker for the transferor.

The actual cost of delivered water varies each year with the allocation. For example, the Rate 1 (Irrigated) 2021 annual assessment was fixed at $24.50 per acre. If 2 AF per acre was allocated that year, the total water price would have been $17.25 per acre foot ($24.50 ÷ 2 = $12.25/AF + $5.00/AF water delivery charge). If only 0.5 AF per acre were allocated to the landowner, the water price would have been $54.00/AF ($24.50 ÷ 0.5 = $49.00/AF + $5.00/AF water delivery charge).

Table 9 - Billing Categories, Rates, and Acreage

Laguna Irrigation District Billing Categories, Rates, and Acreage			
Land Based Assessment Billing Category	2021 Rate ($/acre)	2026 Rate ($/acre)	Acreage
Irrigated			
Surface Water Deliveries	$24.50	$50.00	30,134
Recharge/Pumped			
Well Only (no surface water)	$12.25	$25.00	19,409
Pasture			
Undeveloped / non-irrigated	$2.45	$5.00	610
Exempt			
Agencies/Utilities	N/A	N/A	N/A
Total Assessed			50,153

Water Delivery Charge	2021 Rate ($/AF)	2021 Rate ($/AF)
Volumetric Charge	up to $5.00	up to $5.00

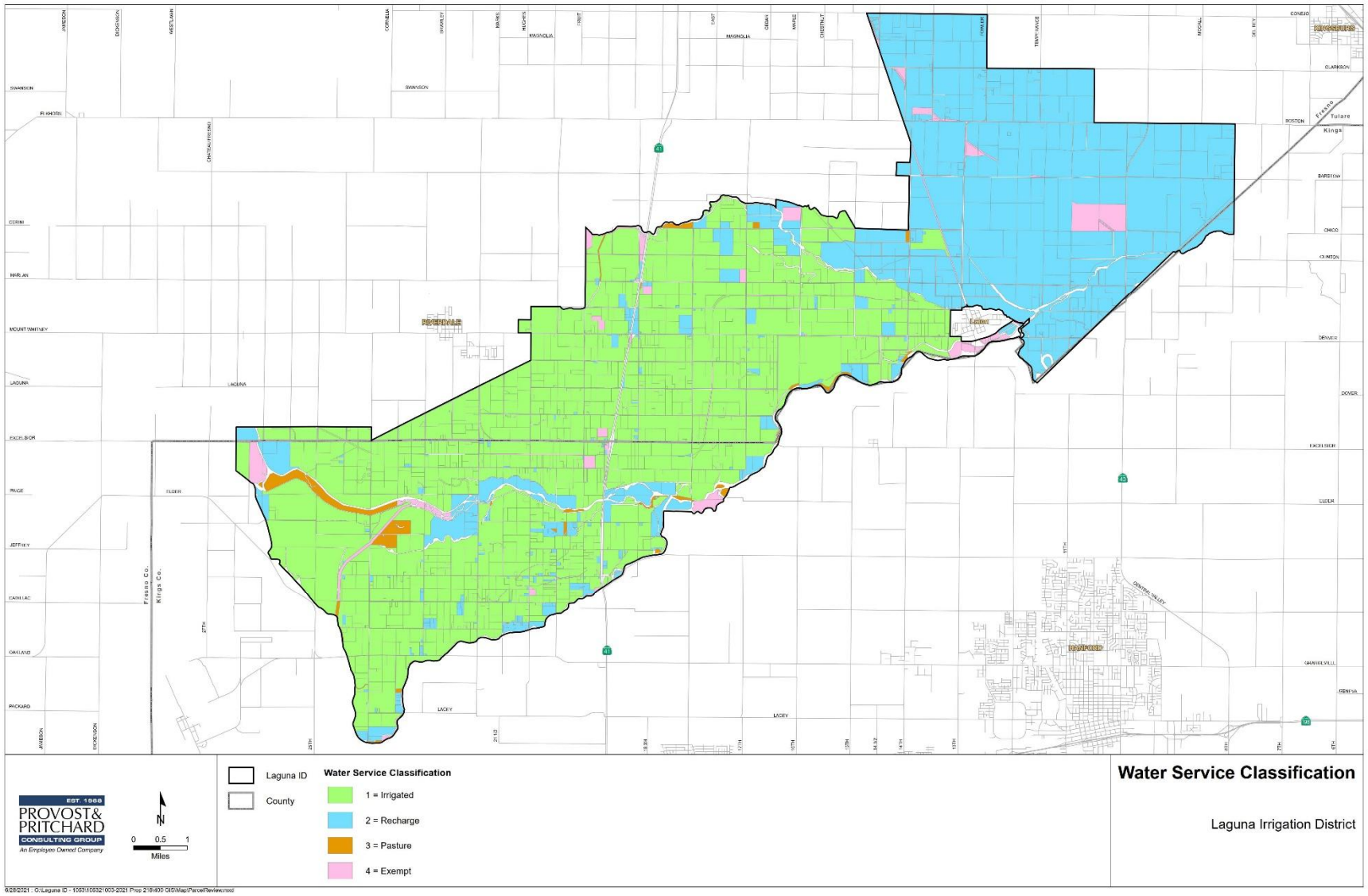


Figure 5. 2020 Water Service Classification

Duration of Water Deliveries

The duration of water deliveries varies each water year and is dependent upon the amount of available surface water that year. In a typical year, water deliveries begin in June and run through August, approximately 90 days. During that time, the entire distribution system is used to allow for flexibility of deliveries. The District does not confine deliveries to certain reaches of the canals or pipelines. By doing so, water operations are more flexible so that water from a premature shutoff can be directed to another grower on the same canal or pipeline. This method, in most cases, eliminates drastic changes in the system operation and efficient deliveries. In years with reduced supplies of surface water, the water deliveries may only last 2-3 weeks.

Laguna Irrigation District encourages water efficiency by allowing those growers who use less than their annual allocation of surface water to transfer their unneeded surface water to other growers within the District. The transferred water is then accounted to the end user.

Water Shortage Allocation Policies

Laguna Irrigation District, regardless of water supply, allocates all water on a per acre basis to its landowners based on the acreage eligible to receive surface water. In a water shortage during drought years, all landowner allocations are reduced equally. The ability to equitably ration and distribute water supplies is feasible due to the District's ability to measure water at the field turnouts. Furthermore, if a water user is wasting water or using water in a manner deemed inefficient, the District may stop water deliveries until such time as the landowner follows all District policies. This is accomplished by closing and locking the turnout headgate to stop water flow to eliminate the landowner from receiving surface water. See Rules and Regulations, item 13 in Appendix E.

Water Supply Shortage

Table 1 of the LID Drought Management Plan (Appendix F) provides historic context on the frequency of severe droughts (less than 50% of average runoff) occurring on the Kings River since the construction of Pine Flat Dam, which happens approximately one year in every five years. Table 1 of the Drought Plan (Appendix F) lists the historic drought years, the water year runoff on the Kings River, the LID entitlement earned and total headgate diversions by LID. In drought periods, surface water is reserved in upstream storage for use during critical periods, which generally correspond to the hottest temperature period having the highest water demands for crop production (i.e., July is the highest priority month). Rationed water supplies are coordinated and scheduled to maximize efficiency of water deliveries and minimize delivery losses.

Operational Adjustments

Typical delivery periods are shorter and water system flow rates are lower in drought periods resulting in a reduction of required staff to monitor and record water deliveries. Furthermore, water system fluctuations are minimized with the coordinated delivery schedule and compressed delivery times, but higher water demands are generally during the daytime hours, mid-week (Monday through Friday). A potential option during drought periods is to redistribute surface water deliveries based on

groundwater conditions. If this potential option is to be pursued, there would need to be equitable compensation for those areas not receiving surface water.

C. Drought Management Plan

LID has developed a Drought Management Plan which is included as Appendix F. The Drought Management Plan defines a variety of innovative strategies to cope with drought. Most of these strategies have already been used in recent prolonged droughts and have proven effective in conserving water and sustaining crops.

Section III. Description of Quantity of the Water Uses of the Agricultural Water Supplier

The District has water rights to a portion of the annual runoff of the Kings River and storage rights in Pine Flat Reservoir as one of the 28 KRWA member units. The District's entire surface water supply comes from the Kings River. The Kings River water is diverted to storage in Pine Flat and released downstream to the District's canal system under water right licenses issued by the State Water Resources Control Board (SWRCB). The District does not operate any groundwater wells, but its landowners use their own groundwater wells to supply water for their crop needs when surface water supplies are not available. In areas where surface water cannot be delivered, the landowners rely on groundwater. The District delivers and beneficially uses all surface water that it is entitled to. Depending on the surface water supply conditions each year, water supplies may be carried over in storage for use in a subsequent year. LID does not use or plan to use any water originating from the Sacramento-San Joaquin Delta.

A. Agricultural Water Use

Cropping patterns in the District are a mix of annual row crops and permanent crops, with the original District acreage being a nearly equal mix of annual row crops and permanent crops, whereas the land that was annexed into the District in 2020 is predominantly permanent crops. Improvements in irrigation water delivery systems and changing economic conditions have brought many changes to the crop mix within the District in the past decade. The acreage of permanent crops in the entire District is now approximately 60% of the irrigated acreage.

As the cropping pattern changes, low-volume irrigation systems such as drip and micro-sprinkler have replaced flood irrigation in some areas, resulting in improvements in on-farm irrigation water use efficiency but impacting the benefits achieved from flood irrigation in wet years. Despite these changes, the total water requirement for the LID irrigation service area has remained relatively constant over the years as the total annual crop water requirement does not appreciably change with a corresponding change in irrigation system. Table 10 summarizes the estimated agricultural water use within the District's service area in 2020.

Table 10 – Estimated Agricultural Crop Water Demand Data for 2020

Estimated 2020 Crop Water Demand			
Crop Type	Approximate Acres	Estimated Unit ET (AF/Acre)	Estimated Crop Water Demand (AF)
Grain and Grain Hay	6,331	1.67	10,557
Corn and Grain Sorghum	2,739	2.40	6,580
Cotton	451	3.17	1,430
Misc. field crops	17	2.29	39
Alfalfa Hay and Clover	3,885	4.11	15,982
Pasture and Misc. Grasses	686	4.16	2,852
Misc truck crops	436	1.99	866
Almonds	9,447	3.59	33,888
Pistachio	3,016	3.59	10,819
Misc. Deciduous	9,828	3.81	37,411
Grape Vines with 80% canopy	2,128	2.63	5,603
Citrus (no ground cover)	48	3.46	166
Young Perennial	679	1.79	1,218
Idle/Fallow	3,265	--	--
Total	42,956		127,410

Land Use Source: DWR/LandIQ Land Use Data. 2020 land use prorated between available years of data.
The land use data identified by LandIQ is considered the most representative and recently available land use data for consideration. The land use data omits urban areas, rural residential areas, roads, canals, dairies, and government owned natural habitat from the irrigated acreage totals.
Unit ET values from North Fork Kings GSA GSP and is total estimated water use regardless of whether applied surface water, groundwater or precipitation is water source.

The District's estimated irrigation source by acreage within LID is presented in Table 11 below. A quantification of the water supply and irrigation efficiency is presented in Section V.

Table 11 - Estimated Irrigation Source by Acreage within Laguna Irrigation District

Estimated 2020 Irrigation Source by Acreage within Laguna Irrigation District	
Water Supply Source	Approximate Percent of District Acreage Total
Surface and Groundwater Irrigated Area (Conjunctive Use)	58%
Groundwater Only Irrigated Area	36%
Non-Irrigated	6%

The District's farm turnout deliveries from 2015 to 2020 is summarized in Table 12.

Table 12 – Aggregated Farm Gate Deliveries within Laguna Irrigation District

Year	Total Number of Turnouts	Measured Turnouts	Irrigated Acres	Total Service Area Acres	Monthly Deliveries						
					Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	Total (AF)
2020	432	432	30,101	35,197	0	0	3,324	16,910	0	0	20,234
2019	430	430	29,618	35,197	0	4,081	11,870	24,805	6,460	0	47,216
2018	427	427	29,618	35,197	0	0	11,271	11,229	0	0	22,500
2017	427	427	29,210	35,197	3,586	10,876	16,371	19,264	7,754	0	57,851
2016	427	427	29,210	35,197	0	0	0	3,064	0	0	3,064
2015	427	427	29,210	35,197	0	0	0	2,601	0	0	2,601
Average	428	428	29,495	35,197	598	2,493	7,139	12,979	2,369	0	25,578

B. Environmental Water Use

LID does not own or operate facilities associated with environmental water use. The District is a party to an effort to maintain the Kings River Fishery through the KRWA. Known as the Kings River Fisheries Management Program, the Program is a cooperative effort between KRWA, the Kings River Conservation District (KRCD), and the California Department of Fish and Wildlife. The District has agreed, along with other Kings River water rights holders, to divert some water from storage to maintain minimum flows within the river channel for a portion of its length. The Fisheries Management Program has been in place since 1999.

C. Recreational Water Use

LID does not own or operate any facilities which serve a recreational water use. The Pine Flat Reservoir, which stores LID and other KRWA member unit's water supply, and the associated Pine Flat Dam, which discharges water into the Kings River, is owned and operated by the US Army Corps of Engineers. The Reservoir is a popular recreational facility with no consumptive uses attributable to recreation that apply to the AWMP water balance.

D. Municipal and Industrial Water Use

No municipal and industrial resources are supported by the District's water supplies. The unincorporated communities of Laton and Camden, while largely excluded from the LID system, are wholly contained within District boundaries and rely on groundwater. The community of Laton has potable water provided by the Laton Community Services District and Camden is provided by private systems, both areas utilizing groundwater as their sole water supply.

E. Groundwater Recharge Use

Groundwater recharge in the District is an important component of conjunctive use and occurs several ways:

- intentional recharge activities through dedicated recharge basins
- seepage from canals
- deep percolation of surface water applied to agricultural lands, and
- deep percolation of precipitation.

Historically, in flood years when surface water is abundant, the District takes advantage of that available water and recharges as much as possible in groundwater storage for withdrawal by landowners in subsequent dry years. Even though the District does not own or operate any groundwater wells, LID monitors groundwater levels in landowner wells at 81 different locations within the District. Surface water is used conjunctively with groundwater in an effort to stabilize the groundwater supply by maximizing the surface water supply when it is available. Figure 6 depicts the average depth to groundwater trends as of Fall 2021, based on some representative water level measurements made by District staff of wells within the District. As can be seen in Figure 6, groundwater levels have generally declined, indicating an overall slight state of groundwater overdraft, although groundwater levels have some recovery following above average

water years that helps to somewhat level off the groundwater decline. Flood event years occur about every four years on average. SGMA requires that average groundwater levels be stabilized by 2040.

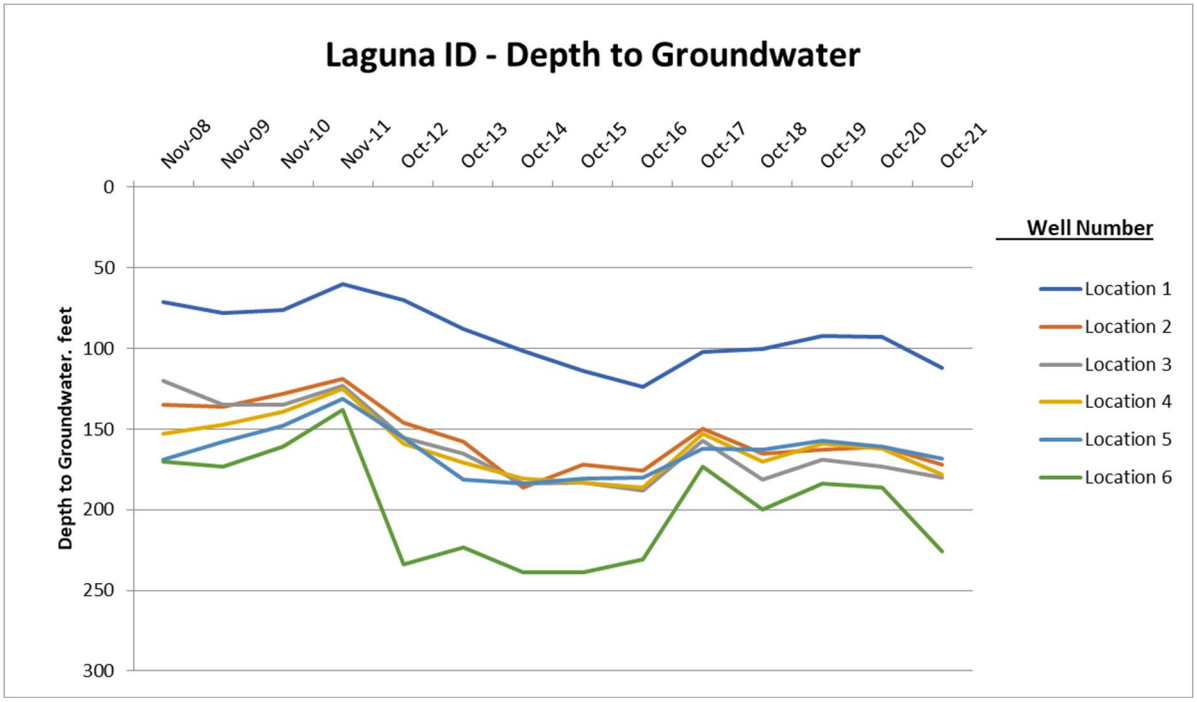


Figure 6. Groundwater Level Trends

Note: Location 6 is toward the west end of the District, near the Lemoore Naval Air Station (LNAS). LNAS has limited available surface water and the need to grow crops for dust and weed control, which continually pulls from the local groundwater supply as LNAS is on the lower end of Laguna's groundwater gradient. Due to this, the water levels only recover at this location on flood event years and there are wide swings in the depth to groundwater at this location.

The District currently owns and operates seven (7) recharge/regulation reservoir sites inside the District and operates its distribution system to recharge the groundwater aquifer. The basins currently cover approximately 170 acres, with six basins in Fresno County and one in Kings County. A 150-acre recharge site, known as Laton North, has been acquired by the District and is being developed for additional recharge. A significant amount of groundwater recharge occurs each year when water is delivered through the unlined canal distribution system, but the amount of this recharge is not directly quantifiable and is estimated by accounting for the difference between the headgate diversions and on-farm water deliveries. The location of the existing recharge basins are shown in Figure 3 and approximate size and recharge quantities in recent years are included in Table 13. Proposed potential recharge projects are also shown in Figure 3. Delivery to the dedicated basins for recharge primarily occurs in years when floodwater is available, with the largest deliveries for recharge made in 2011, 2017, and 2019 as shown in Table 13.

Table 13 – Laguna ID Groundwater Recharge

Groundwater Recharge (AF)															
Location/ Recharge Basin	Method of Recharge	Approximate size (acres)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Zonneveld Pond	Basin Seepage	25	105	135	316	120	157	0	0	0	0	949	0	720	24
Dias Pond	Basin Seepage	19	44	68	113	731	56	0	0	0	0	655	0	360	0
Higdon Pond	Basin Seepage	13	132	158	339	996	191	0	0	0	0	982	0	698	246
Everett Pond / Casa Loma	Basin Seepage	30	96	124	332	471	84	0	0	0	0	756	0	567	190
Coelho Pond	Basin Seepage	10	0	0	0	126	0	0	0	0	0	155	0	97	0
Vaz Pond	Basin Seepage	20	106	163	417	434	121	0	0	0	0	752	0	504	0
Basin 11	Basin Seepage	53	0	0	0	0	0	0	0	0	0	3371	0	2010	0
Dedicated Recharge Basins		170	483	648	1,517	2,878	609	0	0	0	0	7,620	0	4,956	460
Various Laguna ID Canals	Canal Seepage		8,323	10,651	23,469	45,353	10,604	4,079	0	3,602	9,089	41,442	13,602	21,027	8,898
Total Recharge			8,806	11,299	24,986	48,231	11,213	4,079	0	3,602	9,089	49,062	13,602	25,983	9,358

In addition to recharge activities conducted by the District, LID has a policy that allows landowners to deliver available surface to privately owned water banking facilities to recharge the groundwater. In essence a landowner can "bank" surface water underground and then extract a portion of it at a later date. The main components of the private water banking program are shown below:

- Landowners will have the opportunity to bank surface water in recharge ponds
- Water flowing into recharge ponds will be measured with weirs to quantify water added to the bank
- Landowners will be able to extract no more than 70% of the water banked as groundwater pumped from designated wells, thereby leaving 30% in the ground that would be available to other landowners
- Landowners will be required to meter the designated extraction wells with a district-approved totalizing flow meter equipped with remote telemetry that is compatible with the District's water banking database. Benefits of remote telemetry for groundwater wells include:
    - Continuous real-time monitoring of GW pumped for Water Banking Program
    - Better data for GW pumping of additional wells in LID
    - Alleviates need for district staff to directly read meters, reduced vehicle wear and tear, allows staff to perform other duties
    - Automated data entry from water meters to district databases

F. Transfer and Exchange Use

The District does not have a need for transfers and exchanges of groundwater or surface water.

G. Other Water Use

All water uses of any significance have been described previously in this section. Negligible volumes of surface water are used within the District for livestock watering, mixing with agricultural chemicals before spraying, and dust abatement.

H. Projected Water Use

Urban encroachment is not a significant issue in the LID service area. Currently the urban, residential, and industrial developed areas are solely reliant on groundwater, whereas the agricultural lands are based on a conjunctive use system with LID supplied surface water and groundwater extracted by the landowners from the Kings groundwater basin.

Future changes in agricultural water use will be driven by changes in cropping, irrigation practices, climate change, and fluctuations in the hydrology of the Kings River watershed. Although the irrigated service area within LID is expected to remain relatively stable given the fact that the groundwater in the LID service area is relatively stable, future impacts could occur in achieving groundwater sustainability. In addition, changes in the availability of surface water will continue to influence the annual allocation of water.

Given the unknown nature of the impacts of climate change and groundwater sustainability, as well as possible regulatory impacts on water supply, the District is committed to continuing to support efficient infrastructure and the existing adaptive management via conjunctive use.

Section IV. Description of Quantity and Quality of the Water Resources of the Agriculture Water Supplier

A. Water Supply Quantity

The District delivers Kings River water to those areas eligible to receive surface water, and all landowners, even those that receive surface water, pump groundwater from the Kings Groundwater Basin because of the limited and variable Kings River supply available to the District. This conjunctive use and prioritization are informed by available surface water supplies and sustainable groundwater management and adaptive drought management policies. Domestic and municipal water users throughout the District rely on groundwater as their sole water supply.

Water Supply Quantity – Irrigation Water

Kings River water is divided among the member units of the KRWA based on an allocation schedule that has been in use since 1949. The District's allocated share of storage at Pine Flat Reservoir and upstream reservoirs in the Kings River Watershed is approximately 52,481 acre-feet (AF). Surface water is stored in Pine Flat and diverted from the Kings River from facilities above Reynolds Weir, Island Weir, and Crescent Weir. The diverted water is used for irrigation on approximately 30,134 acres of cropland in the District that are on the Irrigated Rate. In most years the District does not have enough surface water to meet all crop demands, and growers must supplement the available surface water with privately pumped groundwater. During water shortages, all landowner allocations are reduced equally. The majority of the water has traditionally been stored within the snowpack, with spring and summer snow melt flowing into Pine flat Reservoir. If global climate change predictions indicating less precipitation as snow and more as rainfall are correct, then increased reservoir storage will be essential in the future to capture water for beneficial use.

In the last two decades, irrigator reliance on District surface water has somewhat changed as some field crop land was converted to permanent crops such as orchards and vineyards and irrigation systems were changed. Because low-volume irrigation requires more frequent irrigations and water free from debris, some agricultural water users began converting to groundwater to supply their pressurized irrigation systems when desired rather than continuing to receive surface water on a rotation basis and having to install filtration required for operation of low-volume systems. In an effort to mitigate this shift in groundwater use, the District has provided surface water use incentives, such as low pricing, using full canal capacity, diverting water for intentional recharge purposes earlier in the wet season, and using canals for recharge opportunities.

The District's annual surface water diversions of Kings River water (measured at the headgate of the canals) for the past 40 years is depicted in Figure 7 and Table 14. As shown, water deliveries in the District are highly variable depending on the annual runoff of the Kings River. The four-year period of water years 2011-12 to 2014-15 were cumulatively the driest 4-year period on record at only 36% of the average annual runoff, resulting in minimal Kings River water deliveries.

Also shown in Table 14 is the annual entitlement received by the District from the Kings River schedule. Entitlement water, which is the amount of water LID is entitled to based on the annual river runoff and the 1949 schedule less required deductions, can be delivered in the year generated or stored in Pine Flat Reservoir for use in subsequent years subject to the reservoir flood control criteria. In years shown where the headgate diversions exceeded the entitlement for that year, water would have been released from storage.

Figure 7 includes a visual depiction of the significance of surface water deliveries in above average water years like 2011, 2017 and 2019, as compared to the average diversions and diversions during the recent drought period.

Figure 7. LID Kings River Headgate Diversions 1982 to 2021

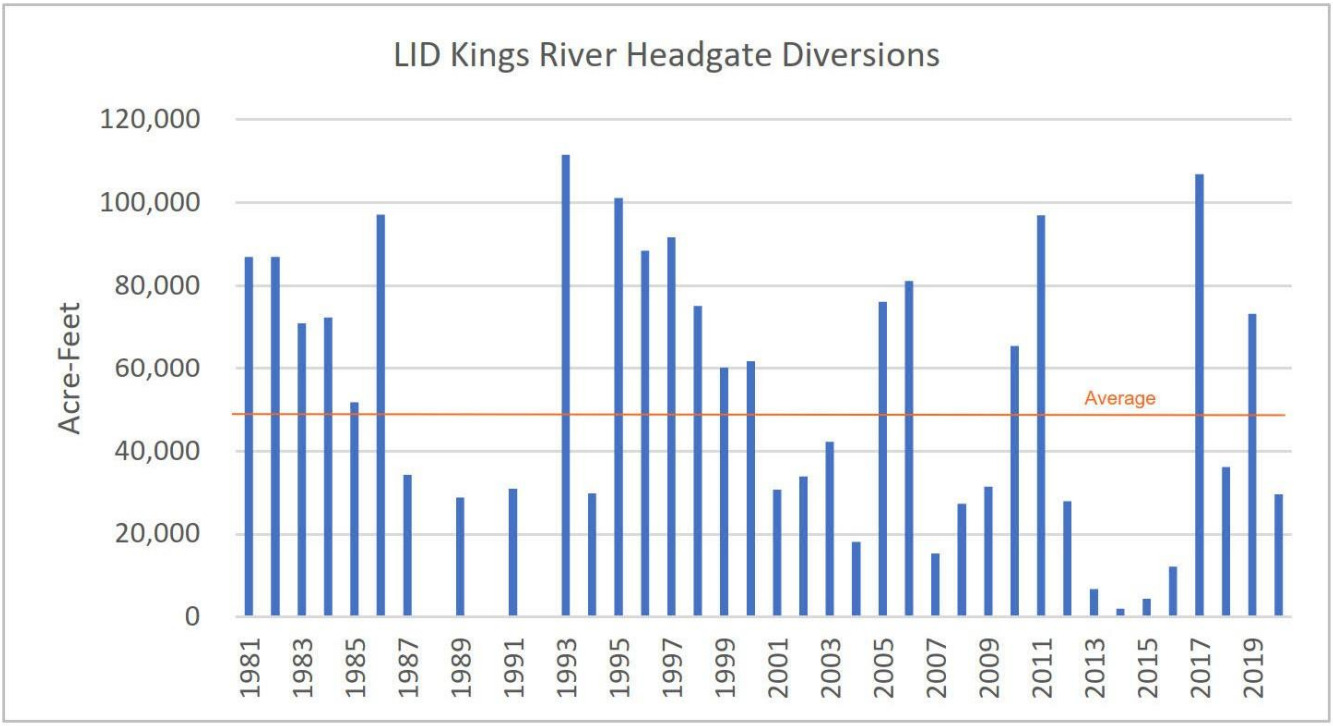


Table 14 - LID Kings River Entitlement and Diversions 1981 to 2020

LID Kings River Entitlement and Diversions 1981 to 2020		
Water Year	Entitlement	Headgate Diversions
1981	35,634	23,969
1982	139,242	86,911
1983	196,495	70,947
1984	69,696	72,343
1985	41,786	51,723
1986	153,356	97,124
1987	15,965	34,207
1988	14,706	0
1989	20,749	28,788
1990	7,859	0
1991	32,216	30,878
1992	14,920	0
1993	114,642	111,502
1994	21,549	29,754
1995	155,366	101,064
1996	81,817	88,446
1997	122,664	91,680
1998	133,553	75,124
1999	39,630	59,994
2000	57,045	61,822
2001	35,205	30,672
2002	35,398	33,868
2003	46,856	42,222
2004	26,105	18,102
2005	114,712	76,070
2006	140,202	81,189
2007	9,725	15,285
2008	39,543	27,310
2009	44,198	31,351
2010	85,473	65,517
2011	167,023	96,959
2012	22,669	27,856
2013	12,236	6,807
2014	6,661	2,029
2015	6,682	4,413
2016	39,347	12,153
2017	196,942	106,913
2018	38,678	36,102
2019	127,697	73,199
2020	27,527	29,592
Average	67,294	48,347

The District's annual surface water diversions of Kings River water has averaged approximately 39,580 AF for water years 2008-2020 as shown in Table 15. Water deliveries in the District are highly variable depending on the annual runoff of the Kings River. Over the thirteen-year period from 2008 to 2020, which was a drier than normal period, the average annual on-farm surface water deliveries were approximately 22,700 AF, and varied from a low of 0 AF in 2014, to a high of over 57,800 AF in 2017.

During wet years and when these supplies are available, LID captures Kings River floodwaters to use for direct deliveries and for delivery to dedicated recharge basins. Substantial quantities can be used for recharge in the District's canals and recharge basins. Opportunities for direct irrigation use can be limited depending on the year since floodwater is often available outside of peak irrigation months and for short periods of time, but they are used for direct irrigation whenever feasible.

Table 15 - LID Surface Water Supplies 2008 to 2020

Water Year Surface Water Supplies (AF)														
Kings River	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	***Average***
Kings River Water Year Type	Dry	Normal	Normal	Wet	Dry	Dry	Dry	Dry	Dry	Wet	Normal	Wet	Dry	
Schedule	45,352	49,246	89,911	169,547	26,311	16,332	11,554	11,121	43,759	200,027	42,538	131,659	31,658	*66,847*
Entitlement	39,543	44,198	85,473	167,023	22,669	12,236	6,661	6,682	39,347	196,942	38,678	127,697	27,527	*62,667*
Demand Met	27,630	31,357	66,255	153,961	27,926	6,815	2,029	4,409	12,560	188,542	36,518	107,400	29,627	*53,464*
LID Headgate Diversions	27,310	31,351	65,722	94,036	25,161	6,807	0	6,203	12,153	106,913	36,102	73,199	29,592	*39,581*
LID On Farm Delivery	18,504	20,052	40,736	45,805	13,948	2,728	0	2,601	3,064	57,851	22,500	47,216	20,234	*22,711*
Dedicated Recharge Deliveries	483	648	1,517	2,878	609	0	0	0	0	7,620	0	4,956	460	*1,475*
Seepage Canals (recharge)	8,323	10,651	23,469	45,353	10,604	4,079	0	3,602	9,089	41,442	13,602	21,027	8,898	*15,395*

Schedule = Amount scheduled to LID by the 1949 Amended Schedule using calculated Pre-Project Piedra as the natural flow of the river (includes share of J&T)

Entitlement = Scheduled amount minus Centerville Bottoms deductions

Demand Met = Ordered Diversions + Mill & Hughes Creek + flood release

Headgate Diversions = Diversions at head of canal at all locations

The estimated volume of groundwater pumped within LID is shown in Table 16. Privately-owned landowner wells that are pumped within the District irrigation service area are not metered, however, an estimate of private groundwater extraction for the past five years was included as a parameter in the District water budget (Section V).

Table 16 - Groundwater Supplies 2016-2020

Groundwater Supplies within Laguna Irrigation District					
	2016	**2017**	**2018**	**2019**	**2020**
LID Direct Pumping	0	0	0	0	0
Private Pumping within the District (Estimation)	132,400	44,700	126,100	75,600	119,400
Total	132,400	44,700	126,100	75,600	119,400

Sustainable Groundwater Management Act

Groundwater pumping by landowners can vary substantially in LID based on hydrologic conditions. Following the 2012-2015 drought and the significant groundwater pumping that occurred throughout the State, a revitalized interest, funding, and focus on sustainable groundwater management occurred with the adoption of the Sustainable Groundwater Management Act (SGMA) in 2015. The SGMA is a comprehensive three bill package that includes Assembly Bill (AB) 1739 (Dickinson), Senate Bill (SB) 1168 (Pavely), and SB 1319 (Pavely). SGMA set the framework for statewide sustainable groundwater management by local agencies and requires, among other items, the formation of Groundwater Sustainability Agencies (GSA) and the preparation of Groundwater Sustainability Plans (GSP) with a focus on long-term groundwater sustainability in the subbasin.

LID has been actively engaged in sustainable groundwater management within their irrigation service area for more than 20 years. LID will continue to represent the best interests of its growers through a multitude of local groundwater organizations, and the District is optimistic that through State law and the continued cooperation of local water purveyors that LID will bring careful, deliberate, and coordinated action for achieving groundwater sustainability moving forward. Groundwater recharge has increased in recent years within LID, and will continue to increase as the District works toward compliance with SGMA. At this time the landowners have no restriction from the District on the amount of groundwater they can pump, other than their ability to pay for their own facilities and energy costs, although that will continue to be reevaluated as efforts to achieve groundwater sustainability continue.

Information on LID's role in the SGMA process is outlined in Table 17 below.

Table 17 - Groundwater Sustainability Agency and Plan

Sustainable Groundwater Management Planning within the District	
Groundwater Subbasin	Kings Basin - Lower Kings SubBasin
GSA	North Fork Kings GSA
GSP	North Fork Kings GSA GSP
GSA Website	www.northforkkings.org
Prepared By	Provost & Pritchard Consulting Group
Year	2020, revised 2022

Influences on Historic Water Supplies

As previously noted, the District operates a gravity water delivery system to serve eligible land, with water deliveries at grower turnouts measured with flowmeters since 1989. Over time the District has adapted a more efficient and flexible distribution system to accommodate landowner's demands for water, thus reducing landowner's reliance on groundwater pumping from privately owned wells. Additional basins have been constructed for groundwater recharge and to help with operational fluctuations. However, the biggest influence on historic water supplies has been the widely fluctuating water supply from the Kings River. The hydrology of the Kings River is beyond the control of the District, and the District must adapt every year to the available water supply.

In most years, especially average and below normal years, the District coordinates with the other lower river units to deliver water down the lower Kings River system at the same time to maximize water deliveries and minimize river seepage losses. The "coordinated water run" can be several months long or only a couple of weeks long, depending on the river runoff and water supply available to the lower river units. The District provides early communication and periodic updates to water users on the projected water supply and allocation, when the coordinated run will start, and the projected duration of the coordinated run.

Potential Projected Influences on Water Supplies

Potential predicted impacts to water supplies are detailed in Section VI. Analysis of Effect of Climate Change. The most notable anticipated impacts include (1) shifts in volume, timing, and intensity of surface water flows due to changes in snowpack and (2) a predicted increase in ET demands by crops, resulting in increased water demand.

B. Water Supply Quality

LID's groundwater and surface water quality is generally good to excellent. Surface water diverted from the Kings River originates from snowmelt in the high Sierra and is of excellent quality for irrigation. LID and its growers support the water quality monitoring activities required by the Central Valley Regional Water Quality Control Board (CVRWQCB) Irrigated Land Regulatory Program (ILRP) through participation in the Kings River Water Quality Coalition.

Surface Water Quality

The Kings River watershed is located within the western slopes of the central Sierra Nevada Mountains including portions of the Sequoia and Kings Canyon National Park. The snowpack and rainfall within the Kings River watershed produce extremely high-quality water with very low amounts of dissolved salts. The quality of the river water is generally consistent from year to year. As runoff from agricultural and developed land is introduced into the lower part of the river, the overall water quality degrades some, but the overall quality remains very good. This has allowed consistently high agricultural yields to occur in areas with heavier soils, which are not freely drained, without causing a serious drainage problem. The surface water also provides an excellent source of water for recharging the area's groundwater supply.

The Kings River Conservation District (KRCD) through its management of the Irrigated Lands Regulatory Program (ILRP) for the Kings River Water Quality Coalition (KRWQC) serving the Kings River Service Area (Kings Basin and Tulare Lake Basin), has monitored surface water quality within the basin on a monthly basis since the program's inception in 2006. The constituents monitored are specified by the Central Valley Regional Water Quality Control Board (Regional Board). Project specific Quality Assurance and Quality Control (QA/QC) is outlined in the Quality Assurance Project Plan (QAPP) prepared by the KRWQC. This document outlines detection limits (detection and reporting limits), methods used to detect the constituent in question, and the laboratory procedures used to process the submitted samples. The QAPP also outlines sample collection and handling procedures and required actions should problems arise.

Sampling of surface water is not limited to chemical constituents; basic physical parameters (conductivity, pH, temperature, dissolved oxygen) are measured and bacterial and water column toxicity samples are collected as well. Bacteria samples are analyzed for E. coli and fecal coliform, water column toxicity is a combination of tests of indicator species (algae, minnow, crustacean) to evaluate toxicity within the food chain. The number of monitored constituents and frequency of sampling has changed as the ILRP has evolved, but several monitoring sites have remained relatively constant throughout the program. The program is expected to continue to operate similar to its current form.

Two sampling sites on the Kings River are routinely measured as part of the ILRP and are included within this report: Manning Ave, and Lemoore Weir. Each site has unique characteristics and represents the best water quality data points on the Kings River. This gives the KRCD two distinct sampling locations from which to collect water quality data.

The Manning Ave sampling site is located behind Reedley Community College and has the largest

available dataset for quality analysis. This site is downstream of most, if not all, of the foothill watersheds that discharge into the Kings River. The operational characteristics of the Kings River means that the water quality during the winter months is more reflective of these foothill watersheds than of the Kings River itself, as most of the flows for the Kings River are being accumulated behind Pine Flat Dam, and only fishery maintenance flows are being released from the reservoir. This sampling site represents water quality of the Upper River.

Lemoore Weir is a major diversion point on the lower Kings River (the portion of the river downstream of People's Weir at Kingsburg). Lemoore Canal and Irrigation Company frequently orders water during the late winter/early spring to assist growers in pre-plant irrigation needs, as well as the summer "coordinated run," where lower river water rights holders agree to take their irrigation deliveries during the same period, thus sharing the channel losses in the Lower Kings. This sampling site represents water quality of the Lower River and is generally more representative of water diverted in the District.

Water quality monitoring was initially conducted monthly during irrigation deliveries (with additional samples collected during or shortly after storm events) when flowing water was present within the system. In 2010, the program was modified to include year-round testing each month of all flowing water, conditions permitting. Manning Ave is the only site with samples collected year-round. Table 18 below indicates typical water quality constituents sampled along with average and minimum and maximum values at the Manning Avenue sampling site from 2006 through 2020, and Table 19 below indicates typical water quality sampling at the Lemoore Weir sampling site during the same period.

Table 18 - Surface water sampling at Manning Avenue 2006-2020

Manning Avenue					
Constituent	**Field/Lab**	**Units**	**Average**	**Min**	**Max**
EC	Field	umhos/cm	65.1	11.0	192.7
pH	Field	pH	7.1	5.2	8.7
Dissolved Oxygen	Field	mg/L	9.8	5.5	16.0
Temperature	Field	Celsius	16.2	4.7	27.7
TDS	Lab	mg/L	44.7	11.0	151.0
Arsenic	Lab	ug/L	0.8	ND	1.8
Boron	Lab	ug/L	13.4	ND	20.0
Molybdenum	Lab	ug/L	2.4	ND	5.2
Nitrate-N	Lab	mg/L	0.5	ND	2.3
Selenium	Lab	ug/L	2.4	ND	3.8

Table 19 - Surface water sampling at Lemoore Weir 2006-2020

Lemoore Weir					
Constituent	**Field/Lab**	**Units**	**Average**	**Min**	**Max**
EC	Field	umhos/cm	41.1	19.0	107.8
pH	Field	pH	7.2	5.9	8.7
Dissolved Oxygen	Field	mg/L	9.5	4.4	15.3
Temperature	Field	Celsius	17.5	9.6	26.9
TDS	Lab	mg/L	33.2	10.0	110.0
Arsenic	Lab	ug/L	0.6	ND	1.0
Boron	Lab	ug/L	12.3	ND	19.0
Molybdenum	Lab	ug/L	1.8	0.6	4.0
Nitrate-N	Lab	mg/L	0.5	ND	1.3
Selenium	Lab	ug/L	1.1	ND	1.3

Pesticides and herbicides are also periodically tested at the Manning Avenue and Lemoore Weir sites. The pesticides and herbicides that are tested has changed over time as some chemicals have been eliminated from consideration by previous testing. The pesticides and herbicides that are currently tested is shown in Table 20. For the most part, none of these chemicals have been detected in reportable/actionable quantities.

Table 20 - Pesticides and Herbicides Included in Surface Water Testing

Pesticides/Herbicides Included in Surface Water Testing			
Constituent	Units	Constituent	Units
2,4-D acids & salts	ug/L	FENPROPATHRIN	ng/L
BIFENTHRIN	mg/L	FLUMIOXAZIN	ug/L
CARBARYL	ug/L	GLYPHOSATE	ug/L
CHLOROPICRIN	ug/L	IMIDACLOPRID	ug/L
CHLOROTHALONIL	ug/L	LAMBDA-CYHALOTHRIN	ng/L
CHLORPYRIFOS	mg/L	MALATHION	mg/L
CLOTHIANIDIN	ug/L	METHOMYL	ug/L
COPPER	ug/L	ORYZALIN	ug/L
CYFLUTHRIN	ng/L	OXYFLUORFEN	ug/L
CYPERMETHRIN	ng/L	PARAQUAT DICHLORIDE	ug/L
DIAZINON	ug/L	PENDIMETHALIN	ug/L
Dichlorvos (DDVP)	ug/L	PERMETHRIN	ng/L
DIMETHOATE	ug/L	PYRACLOSTROBIN	ug/L
DIURON	ug/L	PYRIDABEN	ug/L
ESFENVALERATE	mg/L	SIMAZINE	ug/L

Groundwater Quality

Groundwater in the District is of good quality for irrigation use. Source water from the Sierra Nevada mountains is very clean and has low total dissolved solids (TDS) concentrations. The clean surface water percolates to the groundwater through canal seepage, deep percolation of irrigation water, and direct recharge in recharge basins. These actions generally help to improve groundwater quality.

When groundwater is used for domestic purposes some water quality enhancement measures have been required in some areas to include construction of treatment facilities and drilling deeper wells. Groundwater monitoring under the ILRP requires domestic wells to be sampled for Nitrate-Nitrogen on an annual basis in areas where concentrations exceed acceptable limits. Nitrate contamination results from agricultural fertilizer, domestic sewage, livestock wastes, or natural sources. Problems for agricultural pumpers have occurred in some isolated locations due to nitrate levels. Some wells require chlorination due to bacteriological concerns as well. DBCP is no longer used for nematode control, so concentration levels are expected to decrease over time (AID, 2010). Nitrate-Nitrogen is generally not problematic for agriculture but needs to be considered when applying fertilizer to agricultural fields.

Proper planning and well design can help urban water agencies avoid the areas with poor water quality. LID is not an urban water agency and urban water users in the vicinity of the District, including residents in Laton, and unincorporated areas, are supplied by urban water agencies or domestic wells. Many LID growers have small wells for domestic use. These wells fall under the jurisdiction of county governments. However, LID plays an indirect role in enhancing domestic water use through importing surface water that maintains groundwater levels and improves water quality through mixing the high-quality surface water with the groundwater.

C. Water Quality Monitoring Practices

Water quality is monitored in compliance with several water quality monitoring programs, including the Irrigated Lands Regulatory Program, and the North Fork Kings GSA GSP's representative water quality monitoring. Table 21 provides general information on monitoring of source water quality in the District.

Table 21 - Water Quality Monitoring Practices

Water Quality Monitoring Within Laguna Irrigation District				
Water Source	**Monitoring Location**	**Monitoring Practice**	**Frequency of Analysis**	**Monitoring Agency**
Surface water	Various locations on the Kings River	Agricultural Suitability & Pesticides	Periodically and in compliance with Irrigated Lands Regulatory Program	Kings River Water Quality Coalition
Groundwater	Groundwater wells	Agricultural Suitability and domestic constituents of concern	Annually and in compliance with the Kings Basin and North Fork Kings GSA GSP implementation protocols.	North Fork Kings GSA

Section V. Water Accounting and Water Supply Reliability

A. Quantifying the Water Supplier's Water Supplies

This section presents an annual water budget for Laguna Irrigation District for Water Years 2016 to 2020. The water budget presents water supplies (inflows) and water demands (outflows). Below is a description of the water budget variables and methodology for determining values, followed by water budget summary tables. The purpose of this section is to bring together water supply and use information for an overall picture of agricultural water use within the LID service area. The data presented below is largely based on water budgets in the North Fork Kings GSA Groundwater Sustainability Plan (NFKGSA GSP, 2020) and the 2019 and 2020 Kings Basin Annual SGMA Reports (Provost & Pritchard, 2020 and 2021).

Water Budget Inflows

Following is a summary of the variables in the water budget that are considered inflows or water supplies for LID.

- Effective Precipitation. Effective precipitation is the amount of rainfall beneficially used by crops, either directly as evapotranspiration (ET) or through storage in the root zone for crop use in subsequent periods. Effective precipitation was based on an empirical formula developed by DWR (1989). Annual precipitation contours were generated from several regional local weather stations, and the monthly distribution throughout the region was assumed to be similar to the long-term monthly distribution at the Fresno Airport Weather Bureau station.
- Surface Water Diversions. All surface water diversions are from the Kings River and are based on headgate diversion data from the Kings River Water Association and LID internal records. All on-farm water deliveries are measured with flow meters.
- Water Supplier Groundwater Pumping. LID does not have any District owned or operated groundwater wells.
- Private Groundwater Pumping. Private groundwater pumping is not metered but was estimated based as the difference between crop water demands and total water supplies minus system losses and included an estimate of overall irrigation efficiency.
- Other – Riparian Diversions. The Kings River traverses a portion of LID where landowners adjacent to the River have the right to divert and use riparian water. These diversions are not measured but were estimated based on the cropped acreages adjacent to the River that potentially could be served by a riparian pump and the months when Kings River flowed in that stretch of the river, similar to the analysis in the NFKGSA GSP.

LID does not currently use recycled water and has no future plans to develop a recycled water supply.

LID's water system is based largely on conjunctive use of surface water and groundwater. When available, surface water is used as much as feasible for crop water demands and groundwater

recharge. Groundwater is used by landowners to meet remaining demands not met by surface water.

Water Budget Outflows

Following is a summary of the variables in the water budget that are considered outflows (demands and losses) for LID.

- Crop Water Demands. Crop water demands for agricultural areas were calculated based on land use maps and estimated evapotranspiration rates for different crop types. Evapotranspiration was based on DWR values published in DWR Bulletin 160 (DWR, 2019) for 1998-2011, with reference ETo adjusted for 2016-2020 based on local California Irrigation Management Information System (CIMIS) station data, similar to the analysis in the NFKGSA GSP and annual reports.
- Semi-agricultural Water Demands. Semi-agricultural water demands, primarily dairy water demands, were estimated based on the facility size and were estimated to be 2,600 AF/year.
- Surface Outflows. There are no known surface outflows from the District. The District has recharge basins strategically placed in the distribution system that are used in conjunction with operational criteria to essentially eliminate surface spills.
- Deep Percolation of Irrigation Water. Deep percolation of irrigation water was calculated by assuming that the amount of water applied above and beyond the evapotranspiration rate (due to irrigation inefficiencies or over-irrigation) infiltrates past the root zone and into the groundwater system. As a result, the quantity of deep percolation of irrigation water is computed as a function of irrigation efficiency. The LID-wide irrigation efficiency was estimated to be 80% based on the mix of annual and permanent crops. As a result, deep percolation of irrigation water is estimated at 100% – 80% = 20% of the applied water.
- Groundwater Recharge. LID has numerous intentional recharge basins where water is delivered for percolation. Flow meters are used to measure water deliveries into the recharge ponds.
- Canal Evaporation. Detailed studies to document canal evaporation and canal bank evapotranspiration (collectively called evaporation losses) have not been conducted, but are estimated to be 0.5% of canal system flows.
- Canal Seepage. Canal seepage is the difference between the headgate diversions measured by KRWA and the on-farm deliveries measured by LID, less deliveries to recharge basins and estimated evaporation.

All deep percolation from canal seepage, intentional recharge, and irrigation goes to a usable aquifer for groundwater recharge and is recoverable by landowner pumping. No percolated water goes to a saline sink or perched aquifer.

Annual Water Budget Tables

Following are tables showing the Inflows and Outflows to the LID water budget for water years 2016 to 2020.

Table 22 - Water Budget Inflows

Inflow Component	AWMP Location	How Quantified?	Uncertainty	Water Year 15/16	Water Year 16/17	Water Year 17/18	Water Year 18/19	Water Year 19/20
Units	**Section**		**Percent**	**AF/yr**	**AF/yr**	**AF/yr**	**AF/yr**	**AF/yr**
Effective precipitation	V.A	Calculated	15%	16,886	24,366	5,301	19,411	12,457
Kings Headgate Diversions	V.A	Measured	5%	12,153	106,913	36,102	73,199	29,592
Water supplier groundwater	V.A	Measured	0%	0	0	0	0	0
Private groundwater pumping	V.A	Calculated	25%	132,400	44,700	126,100	75,600	119,400
Other – Riparian Diversions	V.A	Estimated	35%	4,770	17,160	11,990	17,160	7,590
Total				**166,209**	**193,139**	**179,493**	**185,370**	**169,039**

Table 23 - Water Budget Outflows

Outflow Component	AWMP Location	How Quantified?	Uncertainty	Water Year 15/16	Water Year 16/17	Water Year 17/18	Water Year 18/19	Water Year 19/20
Units	**Section**		**Percent**	**AF/yr**	**AF/yr**	**AF/yr**	**AF/yr**	**AF/yr**
Crop Water Demands	V.B	Calculated	15%	126,314	116,726	127,742	126,548	127,410
Semi-Agriculture Water Demands	V.B	Estimated	25%	2,600	2,600	2,600	2,600	2,600
Surface Outflows	V.B	Measured	5%	0	0	0	0	0
Deep Percolation of Irrigation Water	V.B	Calculated	25%	27,890	23,620	31,150	27,310	29,260
Dedicated GW Recharge	V.B	Estimated	30%	0	7,620	0	4,956	460
Canal Loss Seepage/Evap	V.B	Estimated	35%	9,089	41,442	13,602	21,027	8,898
Total				**165,893**	**192,008**	**175,094**	**182,441**	**168,628**

B. Water Management Objectives

Water Management Objectives (WMO) are the District's objectives based on the water budget to improve water system efficiency, improve water system management, and reduce water loss. Some actionable steps to achieve these WMOs are presented in Section VII. Water Use Efficiency Information. It is important to note that LID's water system is based largely on conjunctive use of surface water and groundwater, using available surface water as much as possible for crop water demands and groundwater recharge to reduce the amount of groundwater that must be pumped by landowners, which helps reduce over pumping of groundwater and helps to stabilize groundwater levels. Details on the identification, prioritization, and actionable efforts are presented below.

1. Identification of the WMOs

The following WMOs have been identified by the District.

- WMO-1. Encourage Surface Water Use in Place of Groundwater Use

  As presented in the Water Budget, the District's sustainability is greatly supported by the use of surface water in place of groundwater, whenever possible. To achieve this, the District intends to continue to supply affordable surface water options so landowners can minimize the amount of water that must be extracted from groundwater wells to meet crop water demands. More information on this is available in Table 25. Report of EWMPs, under the Incentive Pricing (10608.48.c(4)) EWMP and Conjunctive Use (10608.48.c(8)) EWMP.

- WMO-2. Support Intentional Groundwater Recharge

  Intentional recharge activities can serve as a mitigation for groundwater extractions in the District by private pumpers and municipalities. The District values increased intentional recharge activities and has worked to increase groundwater recharge during the last decade. These actions will be continued as a priority action to support the goal of groundwater sustainability. The District currently has seven recharge facilities with more to come in the future (Table 5) and the Districts unlined canals (Table 4) offer additional recharge opportunities. The District is interested in pursuing development of additional recharge facilities, especially those that serve to directly benefit both agricultural users of groundwater and Disadvantaged Communities within or near the District.

  All recharged water within LID is recoverable, and no recharged waters enter a saline sink or perched aquifer. The Water Budget includes an intentional recharge category, which quantitatively analyzes the impact such activities can have on the District's sustainability.

- WMO-3. Assist Adaptive Management in Response to Impacts from Climate Change

  Predicted impacts from Climate Change on the District are included in Section VI Analysis of Effect of Climate Change. One of the more significant anticipated impacts includes the anticipated increase in variability of surface water timing, volume, and intensity. To adapt to this potential change, the District has recently expanded intentional recharge activities to capture available surface water even outside the irrigation season. In addition to increased flexibility in deliveries for intentional recharge, water ordering flexibility has been increased for

the District's customers. More information on this is available in Table 25. Report of EWMPs, under the Water Ordering Flexibility (10608.48.c(6)) EWMP.

- WMO-4. Economic Incentives to Influence Water Management

  To support sustainable water management among the District's customers, the District has historically and intends to continue offering affordable surface water to support the use of Kings River water rather than contribute to a decline in groundwater storage. The District is also investigating opportunities to import other sources of surface water whenever available. More information on this is available in Table 25. Report of EWMPs, under the Incentive Pricing (10608.48.c(4)) EWMP.

- WMO-5. Support Sustainable Groundwater Storage

  Following the 2012-2016 critical drought and with the onset of the Sustainable Groundwater Management Act (SGMA) and implementation of the NFKGSA GSP, there are ignited interest and requirements to assist groundwater sustainability through managing groundwater levels and storage in the Kings Basin. The Water Budget details the District's contribution to sustainability through a system balanced by the surface water-heavy conjunctive use system, intentional recharge activities, and minimization of operational spills. The District intends to emphasize recharge opportunities and increased stormwater capture when prioritizing future projects.

- WMO-6. Reduce Operational Spills

  The District has constructed and operates recharge basins throughout the system that serve as regulation reservoirs to capture operational fluctuations and avoid spills. The lack of operational spills that leave the District is presented in the Water Budget. To support WMO-7, the District can continue maintenance of these recharge basins and efficient operation of the water use throughout the District. More information on this is available in Table 25. Report of EWMPs, under the Spill and Tail-Water Recovery (10608.48.c(7)) EWMP.

- WMO-7. Improve Operational Efficiency

  The District's Supervisory Control and Data Acquisition (SCADA) system and distribution infrastructure require periodic updates to maximize operational efficiency in the District's delivery and measurement systems. The District landowners recently approved a rate increase through the process of a Proposition 218 election to secure funding to implement system efficiency improvements, such as pipeline replacement. More information on this is available in Table 25. Report of EWMPs, under the Canal Lining/Piping (10608.48.c(5)) EWMP and Automation (10608.48.c(9)) EWMP.

- WMO-8. Agricultural Land Stewardship

  As defined by the 2005 California Water Plan, "Agricultural land stewardship" means farm and ranch landowners — the stewards of the state's agricultural land — producing public environmental benefits in conjunction with the food and fiber they have historically provided while keeping land in private ownership. To assist private landowners in supporting the ecosystem services of their land, the District has provided a list of funding opportunities and educational resources on the District Website. More information on this is available in Table 25. Report of EWMPs, under Technical Assistance (10608.48.c(12)) EWMP.

2. Prioritization of the WMOs

The WMOs listed above are presented in order of priority. The prioritization criteria included the following considerations.

Does the WMO support…

1. the District's immediate needs?
2. the District's projected needs?
3. cost effective methods for implementation?
4. the sustainability goal of the NFKGSA GSP?
5. the needs of beneficial users of groundwater and surface water within the District?
6. adaptations to predicted impacts from climate change?

3. Actions to be implemented to reduce water loss

The descriptions of WMO-2, WMO-3, and WMO-6 detail how execution of these specific WMOs can reduce water loss in the District. The actual loss of water is very minor since system losses contribute to groundwater recharge. The primary ability to reduce water loss is through the use of recharge facilities to capture all available surface water.

4. Actions to be implemented to meet other WMOs

Many of the WMOs are interrelated, supporting one another to maximize District flexibility, efficiency, and sustainability. Specific examples of the relationship between multiple WMOs are detailed below.

- By supporting affordable surface water (WMO-1 and WMO-4) and increasing the periods in which intentional recharge activities can take place (WMO-3), groundwater storage and groundwater levels conditions are improved (WMO-5).
- The District provides affordable surface water to influence water management (WMO-4) to prioritize surface water use in replacement of groundwater use (WMO-1).
- With private landowners gaining access to technical, educational, and financial resources to support the ecosystem services within their property (WMO-8), the indirect benefit of improved sustainable actions is likely (WMO-5).

C. Efficiency of Agricultural Water Use

The District is required to report the efficiency of agricultural water use based on one of four methods presented in "A Guidebook to Assist Agricultural Water Suppliers to Prepare a 2020 Agricultural Water Management Plan" (DWR, 2020). The efficiency of agricultural water use in LID was estimated using the Crop Consumptive Use Fraction method which utilizes the following formula:

Crop Consumptive Use Fraction (CCUF) = ETAW / AW

where:

ETAW = Evapotranspiration of Applied Water = Crop evapotranspiration – effective precipitation

AW = Applied Water = Surface water diversions + groundwater pumping – recharge basin deliveries – system losses (evaporation and seepage)

This method quantifies the efficiency of applied irrigation water consumed directly for the purpose of crop growth. It evaluates the relationship between the consumptive use of a crop and the quantity of water used for irrigation within the boundary.

Table 24 shows the data used to estimate a CCUF for two different year types – water year 2019 when significant surface water was available, and water year 2020 when a reduced supply of surface water was available.

Table 24 - Crop Consumptive Use Fraction

Description	Variable	WY 2018/19	WY 2019/20
Evapotranspiration of Applied Water (ETAW)	Crop Consumptive Use	126,548	127,410
	Effective Precipitation	(19,411)	(12,457)
	Total	107,137	114,953
Applied Water (AW)	Surface Water HG Div	73,199	29,592
	Riparian Water	13,724	6,679
	Groundwater Pumping	75,600	119,400
	Intentional Recharge	(4,956)	(460)
	Canal Evaporation	(366)	(148)
	Canal Seepage	(20,661)	(8,750)
	Total	136,540	146,313
Crop Consumptive Use Fraction	ETAW/AW	0.78	0.79

Section VI. Analysis of Effect of Climate Change

A. Effects of Climate Change on Water Supply

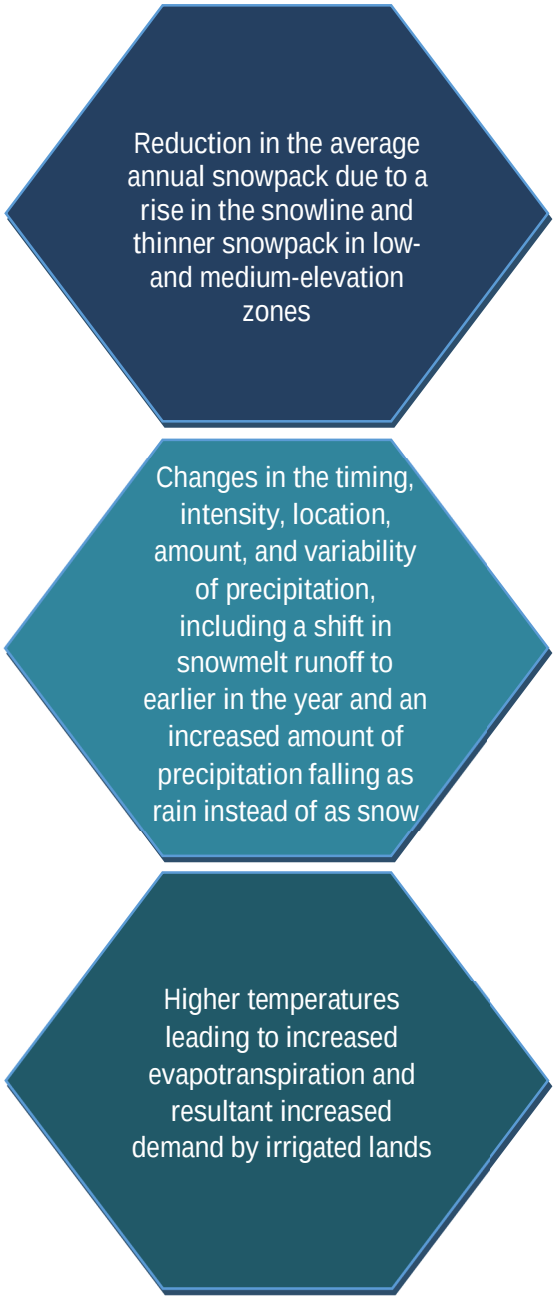
The future availability of the LID water supply will be driven by changes in hydrology and particularly by the volume, nature, and timing of precipitation in the Kings River watershed. In addition to direct impacts on surface water supplies, climate change may indirectly affect groundwater resources. This section describes analyses of how climate change may affect the hydrology of the Kings River watershed and the water supply of the District.

Some of the main potential impacts related to climate change within California's Central Valley include the effects in the neighboring graphic.

One of the more significant projected impacts on water resources as related to Climate Change in the Central Valley is the anticipated change in timing, intensity, location, and volume of surface waters as influenced by snowpack both being melted earlier in the year and precipitation falling as rain rather than snow.

When considering projected water supply and demands as well as adaptive management, the District considers a forward-thinking approach to support projects and management actions that benefit the District's water reliability through drought-response recharge projects and floodwater capture opportunities.

Figure 8 is from the SWRCB and depicts their simulation analysis of projected snowpack (snow water equivalent) in the Northern Sierra Nevada because of climate change. If this model simulation is correct, snowpack will significantly decrease in the future.



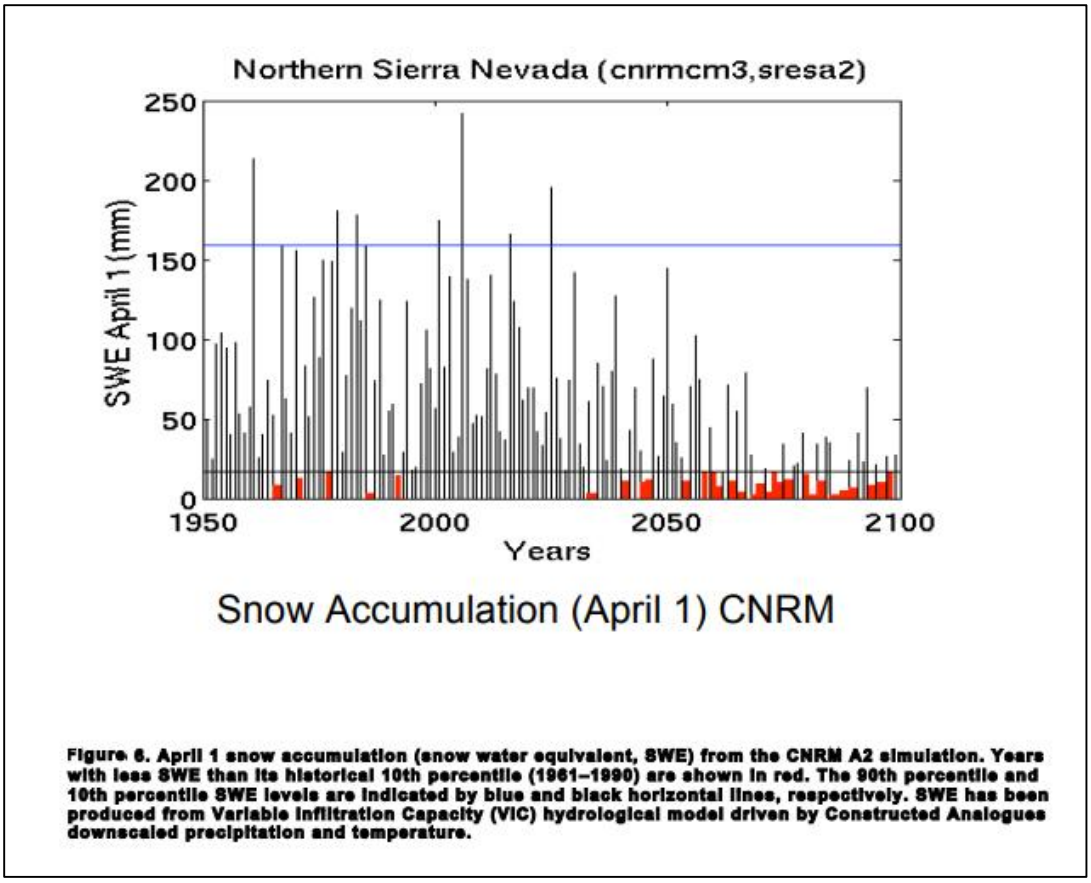


Figure 8. Projected Sierra Nevada Snowpack[1]

B. Projected Water Budget Considerations of Climate Change

In the NFKGSA GSP, the effects of climate change on projected water supplies, evapotranspiration, and precipitation were considered for the LID region. Climate change impacts analyzed for the NFKGSA GSP were based on the *Guidelines for Climate Change Data Use During Groundwater Sustainability Plan Development* (DWR, 2018)[2]. Three DWR datasets were used to assess projected conditions in the Kings Subbasin and KREGSA: (1) projected Kings River inflows to Pine Flat Reservoir, (2) projected precipitation, and (3) projected evaporation.

Projected Kings River Runoff

Predicted future Kings River inflows to Pine Flat Reservoir suggest that climate change will have no significant impact on Kings River water supplies. The estimated Kings River inflows for both 2030 and 2070 DWR climate change data are shown in Figure 9 below. The projections suggest a slight increase in total Kings River inflows; however, the most notable shift is in the timing of the inflows, with less runoff occurring in late spring/early summer and increased runoff in late winter/early spring months.

[1] Cayan, D. et al. 2008. California State Water Resources Control Board. *Climate Change Scenarios and Sea Level Rise Estimates for California.* Page 11. Climate Change Scenarios and Sea Level Rise Estimates for California - 2008 Climate Change Scenarios Assessment

[2] DWR. 2018. *Guidelines for Climate Change Data Use During Groundwater Sustainability Plan Development* https://data.cnra.ca.gov/dataset/sgma-climate-change-resources

This shift in timing is likely attributed to the predicted warmer temperatures in the future resulting in more precipitation in the upstream Sierra Nevada occurring as rainfall and less snowfall. In addition, this same warmer trend correlates with snowpack melting earlier in the year than it has historically. LID and other Kings River water contractors believe that this shift can be accommodated through reservoir reoperation, conjunctive use, and the development of new recharge and banking projects.

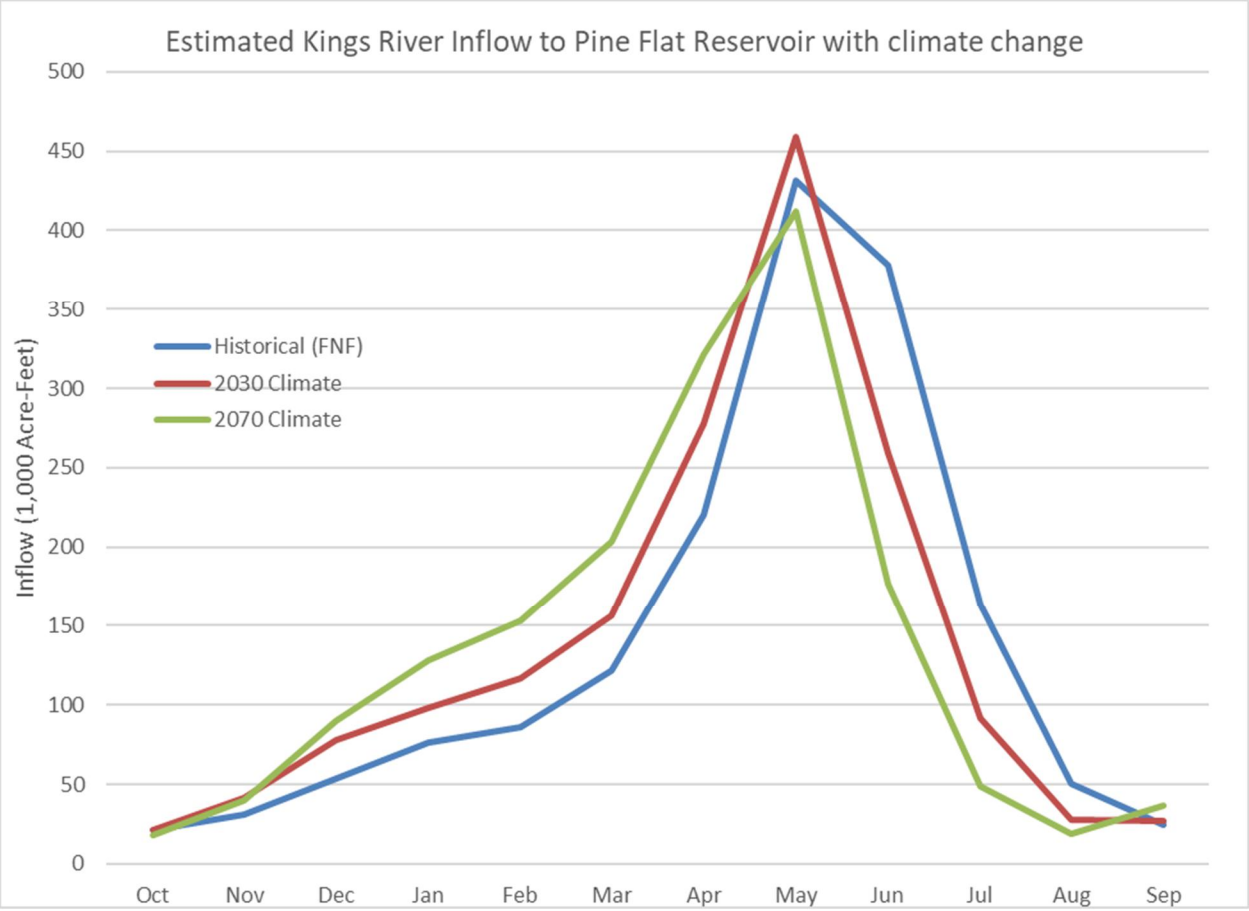


Figure 9. Estimated Kings River Inflow to Pine Flat Reservoir with Climate Change

Projected Precipitation Change

The NFKGSA analysis of climate change impacts to precipitation concluded that there would generally be a minimal change in precipitation within the NFKGSA. The overall precipitation was projected to increase by 3% for 2030 conditions and to decrease by 1% for 2070 conditions. Moreover, the average monthly adjustment factors understate the effect on precipitation, as many of the months with projected decreases in precipitation (e.g., May, June and October) are low precipitation months while months with indicated increased precipitation tend to be wetter (e.g., January and February). Adjusting for monthly average precipitation, the total volume of precipitation for the North Fork Kings GSA is estimated to increase by 5% for early future and 2% for late future conditions. Given the generally low amount of precipitation in the Kings Subbasin and the slight increase projected with climate change, a conservative assumption has been made that projected rainfall, and amounts available for water

supply such as effective precipitation and recharge from precipitation, will remain the same for early future and late future projection as estimated for the historical period Figure 10 depicts the projected precipitation adjustment factors with climate change in the NFKGSA area. These changes and the change in annual distribution are expected to have a negligible impact.

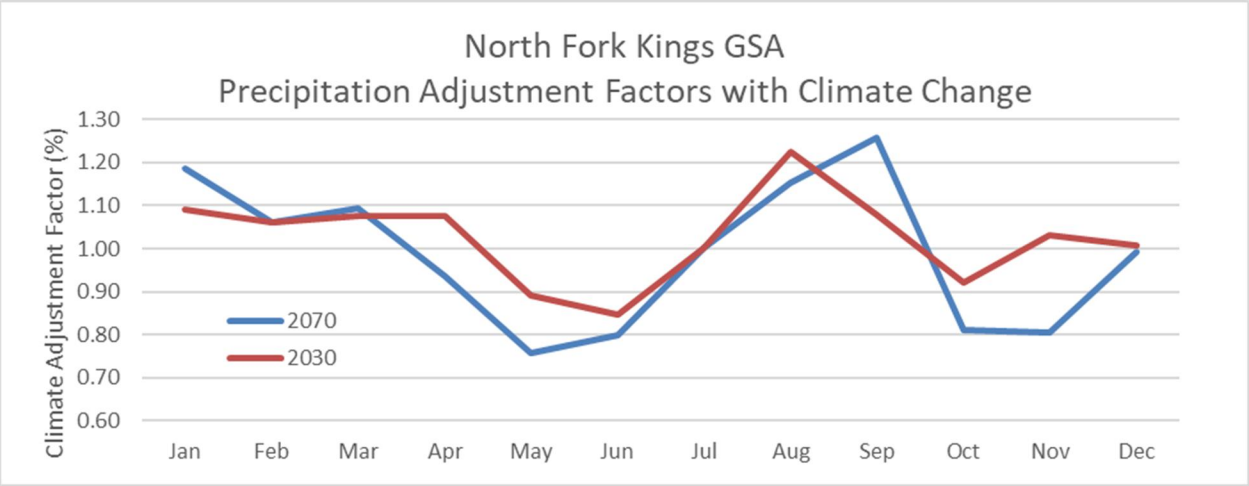


Figure 10. Estimated Precipitation Impacts in NFKGSA with Climate Change

Projected Evapotranspiration

The projections for evapotranspiration impacts from climate change predicted higher evapotranspiration rates for 2030 (3%) and 2070 (8%). The projections include some variation month to month with higher rate in low evapotranspiration months (November, December, and January) when irrigation is minimal and relatively small increases during the irrigation season (April through September). Figure 11 depicts the projected monthly adjustment factors for 2030 and 2070. This change would increase water demands for the District and will be monitored over time.

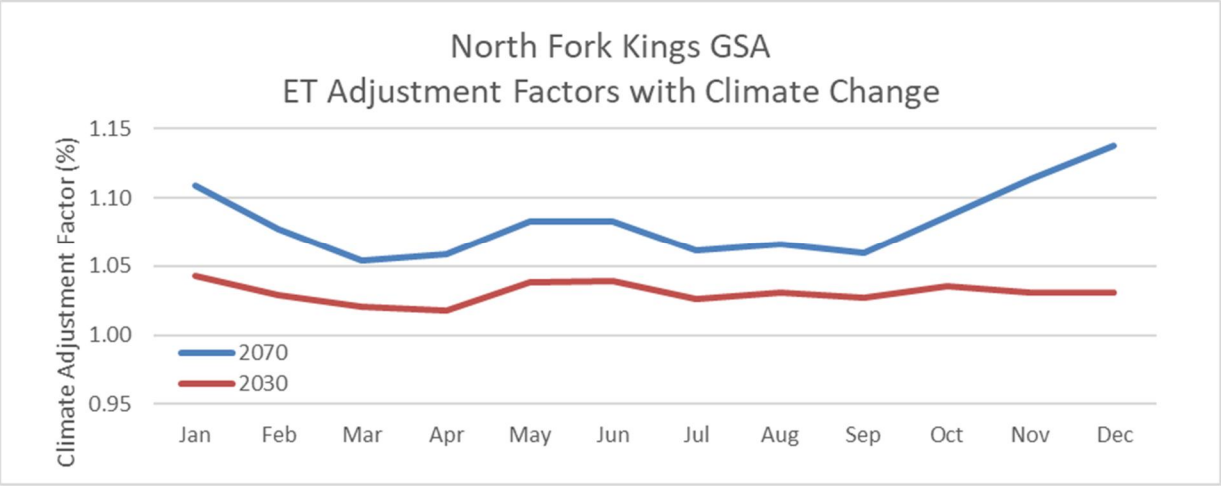


Figure 11. DWR Evaptranspiration Adjustment Factors with Climate Change in NFKGSA

C. LID Response to Effects of Climate Change

While changes in watershed hydrology and in temperature-driven crop water demand may result from future climate change, there is little consensus about the rate at which climate change will occur or the magnitude of the impacts. Given the general agreement that climate change is taking place and the general uncertainty regarding the rate of change, the District is committed to monitoring key indicators of climate change that affect the hydrology of the Kings River watershed and growing conditions in the District's irrigation service area and to adapting its water management practices responding to changes as they become evident. One practical adaptation for consideration by landowners who grow annual crops would be to plant the crops earlier in the year if temperatures rise, as well as harvesting the crops earlier. This should result in no net increase in water demands.

In addition to adaptive management, implementation of the water conservation initiatives now underway at LID is intended to help the District and its agricultural water users prepare for the potential impacts of climate change by improving operational control within the District. Improving operational control will enable the District to exercise adaptive management measures should they become necessary.

Most of the water users within the Tulare Lake Basin receive surface water deliveries from snowmelt in the Sierra Nevada Mountains designed around a system which is dependent on occasional above normal snow pack. In normal years and depending on previous years' storage carry-over, local reservoirs within the region are able to store all snow melt during periods of low/no demand. Flood releases occur on the Kings River on average once every 4 years as a result of above average snow melt. During these flood events, flood water typically exits the region because of the lack of banking and groundwater recharge facilities to store the water.

Laguna Irrigation District in an effort to prepare for such events where flood events occur has a series

of regulation reservoirs which can be used to temporarily store water for near term use and to recharge the groundwater though percolation. Additional facilities that will greatly increase the District's annual groundwater recharge capacity in flood years are planned.

Section VII. Water Use Efficiency Information

A. EWMP Implementation and Reporting

Table 25 summarizes the status of implementation of Efficient Water Management Practices (EWMPs) at AID. As the table indicates, all of the EWMPs are required by SBx7-7 and listed in the DWR publication *A Guidebook to Assist Agricultural Water Suppliers to Prepare a 2020 Agricultural Water Management Plan*.

Table 25 - Report of EWMPs

Water Code Reference	EWMP	Current Status	Description of Implemented and Planned EWMPs
10608.48.b(1)	Water Measurement. 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.	Currently Implemented Changes since 2015 AWMP: None. Since the last AWMP, the District upgraded several grower turnouts and has maintained and calibrated the turnout flow meters that have been installed at each turnout in use since 1989. The primary benefit of measurement in a conjunctive use district that does not have adequate surface supplies most years is the equitable distribution of water.	LID currently measures, monitors, and controls flows throughout its water delivery system and measures deliveries at each farm gate in order to equitably distribute the available water supply and bill agricultural water users accurately under the District's volumetric water pricing structure. The District has, since 1989, primarily used Water Specialties propeller type meters. These devices are made to deliver readings to an accuracy of 98% by volume. These meters are used for all of the farm delivery measurements within the District. The District is committed to complying with the requirements of SBx7-7 by verifying the accuracy of seasonal measurement of irrigation water deliveries using the methodology described in Section VIII of this AWMP.
10608.48.b(2)	Volumetric Pricing. Adopt a pricing structure for water customers based at least in part on quantity delivered.	Currently Implemented Changes since 2015 AWMP: Since the last AWMP, the District has implemented a water toll charge based on the volume of water delivered.	LID has adopted a pricing structure based at least in part on volume used. Growers are charged a land-based assessment and volumetric charge for water used. The water delivery charge is established each year by the District, not to exceed $5.00 per acre-foot. The volumetric cost of water is kept low to encourage landowners to use surface water The first year of implementation was the 2015-16 water year.

Water Code Reference	EWMP	Current Status	Description of Implemented and Planned EWMPs
10608.48.c(1)	Facilitate Alternate Land Use. Facilitate alternative land use for lands with exceptionally high-water duties or whose irrigation contributes to significant problems, including drainage.	Not Applicable Changes since 2015 AWMP: None	There are no lands with exceptionally high shallow water tables or whose irrigation contributes to on farm or recognized downstream drainage issues. The District does not have authority to impose land use restrictions on customers. LID does recognize the importance of informing landowners of groundwater conditions and to be aware of conservation measures which may beneficially impact their area.
10608.48.c(2)	Facilitate Use of Recycled Water. 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.	Not Applicable Changes since 2015 AWMP: None	There are no sources of water available for recycling within LID service area. Water recycling opportunities are currently not applicable for the District.
10608.48.c(3)	Financing On-Farm Systems. Facilitate financing of capital improvements for on-farm irrigation systems.	Currently Implemented Changes since 2015 AWMP: None.	Currently, the District does not have the funding necessary to facilitate on-farm improvements, but supports and encourages interested water users to apply for agricultural financing programs offered by others such as the Natural Resources Conservation Service (NRCS). District Staff does help facilitate and offers technical help with drip and micro sprinkler irrigation as well as assistance in design of surface water delivery facilities for such projects upon request.

Water Code Reference	EWMP	Current Status	Description of Implemented and Planned EWMPs
10608.48.c(4)	Incentive Pricing. 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.	Currently Implemented Changes since 2015 AWMP: Since the last AWMP, the District instituted a water delivery charge in the 2015-16 water year that supplements the land-based assessment.	The District's intention is to keep the pricing structure reasonably priced to encourage landowners to use surface water when available. In 2020, the volumetric water price was only $5.00/AF. This supports the District's conjunctive program; see EWMP on Conjunctive Use (10608.48.c(8)) below. The current pricing structure of the District allocates available water on a per acre basis. Therefore, the price of the water increases in dry years because the landowners receive less water per acre. The price effectively decreases in wet years as there is more water available. In these years, surface water use is encouraged to aid with recharge for future dry years.
10608.48.c(5)	Infrastructure Improvements. Expand line or pipe distribution system and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance and reduce seepage.	Currently Implemented Changes since 2015 AWMP: The District replaced 1 mile of cracked monolithic concrete pipe, constructed 53 acres of new recharge basins and improved 20 acres of existing basins since the last AWMP to increase the distribution system flexibility and capacity, decrease maintenance, or reduce unintentional seepage.	LID has a program to replace existing cracked or broken concrete monolithic pipelines with plastic pipe. The current pipeline system replaced high seepage canals in the 1960's through the 1980's. The balance of the LID canals are of relatively good soil type, and due to the District's conjunctive use nature, it would not be beneficial to line additional canals or convert them to pipeline. Cracked monolithic concrete pipeline is replaced and new recharge basins are constructed as funding allows. Improvements are made to existing recharge basins as fill dirt is required for other projects (thereby deepening the existing basins). The District recently received approval from landowners through a Proposition 218 process to support funding for infrastructure improvements.

Water Code Reference	EWMP	Current Status	Description of Implemented and Planned EWMPs
10608.48.c(6)	Water Ordering/Delivery Flexibility. Increase flexibility in water ordering by, and delivery to, water customers within operational limits.	Currently Implemented Changes since 2015 AWMP: None.	LID's delivery system works as a complete unit. Customers order water a minimum of 24 hours before their desired delivery start. Customers give 24 hours prior to their shutoff in order to deliver that water to another customer. In effect, one customer finishes irrigating and another is able to take that water and begin his irrigation. This minimizes the fluctuation of water and reduces the possibility of water loss. Any errors in shut off times by a customer can be compensated for with early start by another customer or temporary diversion to a District regulation reservoir, thereby improving on-farm water management flexibility.
10608.48.c(7)	Supplier Spill and Tail-water Recovery. Construct and operate supplier operational outflows and tailwater recovery systems.	Currently Implemented Changes since 2015 AWMP: Improvements were made to several District recharge basins, which serve as regulation reservoirs to capture excess water to eliminate spillage.	Recharge basins, which also serve as regulation reservoirs, are strategically located within the distribution system so the District can redirect and measure any operational spill water. The short term stored water can then be returned to the system if needed or allowed to infiltrate for recharge.

Water Code Reference	EWMP	Current Status	Description of Implemented and Planned EWMPs
10608.48.c(8)	Conjunctive Use. Increase planned conjunctive use of surface water and groundwater within the supplier service area.	Currently Implemented Changes since 2015 AWMP: Construction of 150 acres of recharge basins, and improvements to 20 acres of existing recharge basins, allowing the District to capture more surface water.	The District has effectively practiced conjunctive use for many years by delivering or recharging as much surface water as possible so groundwater is available for landowners to pump. The proximity to the Kings River and the soil types in the area are one facet of conjunctive use in the District. The District does not have enough Kings River entitlement to provide a full surface water supply in average or less than average water years (see Section V. Water Accounting and Supply Reliability). As a result, it is in the District's best interest to efficiently manage the available water supply for direct delivery and groundwater recharge so landowners have a sustainable groundwater supply to rely on to supplement the available surface water (conjunctive use program). In order to take full advantage of abundant water years, the District plans to construct additional recharge facilities as property availability and funding allows.
10608.48.c(9)	Automation. Automate canal control structures.	Currently Implemented Changes since 2015 AWMP: None.	The District has an automated gate at the Reynolds Weir to maintain pool water level elevation for uniform diversions into the Grant and "A" Canals.

Water Code Reference	EWMP	Current Status	Description of Implemented and Planned EWMPs
10608.48.c(10)	Customer Pump Testing. Facilitate or promote customer pump testing and evaluation.	Currently Implemented Changes since 2015 AWMP: None	The District previously referred water users to the KRCD pump test assistance program, however, the KRCD program is no longer available. The District does help facilitate pump testing and other pumping efficiency studies and improvements by referring landowners to Pacific Gas and Electric's (PG&E) Advanced Pumping Efficiency Program[3]. The program includes subsidizing pump tests and cash-back incentives for pump overhaul.
10608.48.c(11)	Water Conservation Coordinator. Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.	Currently Implemented Changes since 2015 AWMP: None	A District employee, Scott Sills, serves as the designated Water Conservation Coordinator for the District and is responsible for overseeing and coordinating implementation of the EWMPs identified.
10608.48.c(12)	Technical Assistance. Provide for the availability of water management services to water users.	Currently Implemented Changes since 2015 AWMP: None	LID facilitates dissemination of information from KRCD that informs growers about available water management services. Growers can schedule an appointment for a member of the KRCD staff to visit the location to review current irrigation practices. The District also facilitates distribution of financial and technical resources to support water and soil management efficiencies for interested growers.

[3]PG&E Advanced Pumping Efficiency Program Agriculture Money-Back Solutions (pge.com)

Water Code Reference	EWMP	Current Status	Description of Implemented and Planned EWMPs
10608.48.c(13)	Evaluate Policies. 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.	Currently Implemented Changes since 2015 AWMP: None. The District has stayed engaged in helping to shape the policies and procedures of the Kings River Water Association (KRWA).	The institution whose policies most directly affect LID is KRWA. If a problem is found, the District works with the KRWA Watermaster to find a solution within the governing policies of KRWA. If this is not possible, as a voting member of KRWA, the problem is brought before the Executive Committee of the Association for discussion and ruling. An example of the cooperative nature of the Association would be in the water run itself. The District is able to run water whenever the District needs to run. However, with the help of KRWA, each member unit is able to coordinate its water run with other KRWA members in order to reduce seepage losses in the Kings River channel. The LID Board of Directors has the legal authority to set and implement policies that affect the distribution of water within the District. The Rules and Regulations for the District were updated in 2005 and are periodically reviewed and revised as needed.
10608.48.c(14)	Water Supplier Pump Efficiency. Evaluate and improve the efficiencies of the supplier's pumps.	Currently Implemented Changes since 2015 AWMP: None	The District does not own or operate any groundwater wells or lift pumps.

Evaluation of Water Use Efficiency Improvements

The EWMPs presented in Table 26 can help to improve water use efficiency. Quantifying the improvements in water use efficiency is difficult or in some cases impossible, due to the complexity of the LID conveyance system, varying water supply on an annual basis, limited implementation periods, and lack of certain data needed for evaluations. However, a qualitative assessment using existing data in consideration of completed and proposed projects and/or policies is a more feasible approach in quantifying the magnitude of efficiency improvements.

Table 26 discusses the qualitative improvements in water use efficiency for each EWMP. Table 26 shows relative "improvements" in water use efficiency that have occurred since LID's 2015 AWMP and those that are anticipated to occur in the next 5-year reporting period. The improvements are qualitatively denoted as potentially: No Changes, Minor, Moderate, or Significant. Some EWMPs have already made contributions to water use efficiency, but no changes or further improvements have occurred recently or are anticipated in the future. Potential projects and improvements below are all contingent on available funding.

Table 26 - Report of EWMPs Efficiency Improvements

EWMP No.	EWMP Description	Estimate of Water Use Efficiency Improvements Since Last Report (2015)	Estimated Water Use Efficiency Improvements 5 to 10 Years in the Future
10608.48.b(1)	Water Measurement. 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.	Minor Flowmeters are installed on each grower turnout and are used to measure all farm water deliveries. Since the last AWMP, the District upgraded several grower turnouts and has maintained and calibrated the turnout flow meters. The primary benefit of measurement in a conjunctive use district that does not have adequate surface supplies most years is the equitable distribution of water.	Minor Existing flowmeters used to measure farm water deliveries will be maintained on the normal maintenance schedule and replaced as needed to maintain meter accuracy, and improvements will be made at individual turnouts as conditions warrant.
10608.48.b(2)	Volumetric Pricing. Adopt a pricing structure for water customers based at least in part on quantity delivered.	Moderate Since the last AWMP, the District has implemented a water toll charge based on the volume of water delivered.	Minor LID already has adopted a pricing structure based at least in part on volume used; growers are charged for water volumetrically. The water delivery charge is established each year by the Board of Directors. The rate structure is meant to encourage landowners to use all available surface water.
10608.48.c(1)	Facilitate Alternate Land Use. Facilitate alternative land use for lands with exceptionally high-water duties or whose irrigation contributes to significant problems, including drainage.	No changes since the 2015 LID AWMP. There is no need to facilitate alternative land use within LID. In addition, the District does not have authority to impose land restrictions on landowners in the District.	No projected changes in 5 to 10 years, no action required.

EWMP No.	EWMP Description	Estimate of Water Use Efficiency Improvements Since Last Report (2015)	Estimated Water Use Efficiency Improvements 5 to 10 Years in the Future
10608.48.c(2)	Facilitate Use of Recycled Water. 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.	No changes since the 2015 LID AWMP. There are no sources of water available for recycling within the LID service area.	No projected changes in 5 to 10 years, no action required. Water recycling opportunities are currently not applicable for the District.
10608.48.c(3)	Financing On-farm Systems. Facilitate financing of capital improvements for on-farm irrigation systems.	Minor The District does not have the funding necessary to facilitate on-farm improvements, but supports NRCS and grower financing of such improvements. District Staff does help facilitate and offers technical help with drip and micro sprinkler irrigation as well as assistance in design of surface water delivery facilities for such projects upon request.	Minor The District intends to continue to lend support as needed and identify and distribute information about various funding and technical resources available to support improved water management for their customers.

EWMP No.	EWMP Description	Estimate of Water Use Efficiency Improvements Since Last Report (2015)	Estimated Water Use Efficiency Improvements 5 to 10 Years in the Future
10608.48.c(4)	Incentive Pricing. Implement an incentive pricing structure the 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.	Minor The District instituted a water delivery charge in the 2015-16 water year that supplements the land-based assessment. The current pricing structure of the District allocates available water on a per acre basis. Therefore, the price of the water increases in dry years because the landowners receive less water per acre. The price effectively decreases in wet years as there is more water available. In these years, surface water use is encouraged to aid with recharge for future dry years as the District is a conjunctive use entity.	Minor Continue with current program, charging water deliveries on a volumetric basis. The District's intention is to keep water reasonably priced to encourage landowners to use surface water when available. In above average water years the water toll rate may be reduced to encourage the use of surface water to conserve groundwater resources.
10608.48.c(5)	Canal Lining / Piping. Expand line or pipe distribution system and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.	Minor The District replaced 1 mile of cracked monolithic concrete pipe, constructed 53 acres of new recharge basins and improved 20 acres of existing basins since the last AWMP to increase the distribution system flexibility and capacity, decrease maintenance, or reduce unintentional seepage. The portions of the unlined canal system are used for groundwater recharge which is needed in a conjunctive use district.	Minor Continue replacement of existing cracked or broken concrete monolithic pipelines with plastic pipe as funding allows.

EWMP No.	EWMP Description	Estimate of Water Use Efficiency Improvements Since Last Report (2015)	Estimated Water Use Efficiency Improvements 5 to 10 Years in the Future
10608.48.c(6)	Water Ordering Flexibility. Increase flexibility in water ordering by, and delivery to, water customers within operational limits.	Minor LID's delivery system works as a complete unit. Customers order water a minimum of 24 hours before their desired delivery start. Customers give 24 hours prior to their shutoff in order to deliver that water to another customer. In effect, one customer finishes irrigating and another is able to take that water and begin his irrigation. This minimizes the fluctuation of water and reduces the possibility of water loss. Any errors in shut off times by a customer can be compensated for with early start by another customer or temporary diversion to a District regulation reservoir, thereby improving on-farm water management flexibility.	Minor The current operational scheme is anticipated to continue, allowing as much flexibility as possible.
10608.48.c(7)	Spill and Tail-water Recovery. Construct and operate supplier operational outflows and tailwater recovery systems.	Minor To prevent operational spills, LID uses regulation ponds to divert excess water to eliminate spillage. The short term stored water can then be returned to the system or used for recharge.	Minor Continue existing practices utilizing existing regulation ponds to capture and beneficially use water that otherwise would have spilled. The District continually evaluates opportunities to increase water delivery flexibility and may construct additional regulation/recharge basins as funding allows.

EWMP No.	EWMP Description	Estimate of Water Use Efficiency Improvements Since Last Report (2015)	Estimated Water Use Efficiency Improvements 5 to 10 Years in the Future
10608.48.c(8)	Conjunctive Use. Increase planned conjunctive use of surface water and groundwater within the supplier service area.	Significant The District constructed 53 acres of recharge basins, and improvements to 20 acres of existing recharge basins, allowing the District to capture more surface water. LID is a conjunctive use district with the District delivering and recharging surface water and the landowners pumping groundwater as needed to supplement the surface water. LID currently operates seven recharge facilities along with 49 miles of open canal. Conjunctive use is critical as the District's surface water supply is generally not sufficient to meet the water needs of its landowners.	Significant (if funding is available) The District has effectively practiced conjunctive use for many years by delivering or recharging as much surface water as possible so groundwater is available for landowners to pump. In order to take full advantage of abundant water years, the District plans to construct additional recharge facilities as property availability and funding allows.
10608.48.c(9)	Automation. Automate canal control structures.	Moderate The District has an automated gate at the Reynolds Weir to maintain pool water level elevation for uniform diversions into the Grant and "A" Canals.	Minor The main conveyance systems in the District have been automated, although some improvements to the Island Canal headworks automation are required. No additional automation is planned.
10608.48.c(10)	Customer Pump Testing. Facilitate or promote customer pump testing and evaluation.	No changes since the 2015 LID AWMP. Historically, KRCD provided a pump test assistance program that is no longer available; however, the District does direct landowners to a PG&E technical and financial assistance program for pump testing and other pumping efficiency studies and improvements.	No projected changes in 5 to 10 years. The District will continue to direct landowners to available pump testing and other pump efficiency improvement programs from PG&E or other agencies as available.

EWMP No.	EWMP Description	Estimate of Water Use Efficiency Improvements Since Last Report (2015)	Estimated Water Use Efficiency Improvements 5 to 10 Years in the Future
10608.48.c(11)	Water Conservation Coordinator. Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.	No changes since the 2015 LID AWMP. A District staff member, Scott Sills, serves as the designated Water Conservation Coordinator for the District and is responsible for overseeing water conservation measures and programs.	No projected changes in 5 to 10 years. Continue existing program, there are no anticipated changes for Water Conservation Coordinator in the next 5 to 10 years.
10608.48.c(12)	Technical Assistance. Provide for the availability of water management services to water users.	Minor LID facilitates dissemination of information from KRCD to assist growers with implementing efficient and cost-effective measures to improve water management.	No projected changes in 5 to 10 years. The existing methods of disseminating water management services information are anticipated to continue unless a need for improvement is identified.
10608.48.c(13)	Evaluate Policies. 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.	Minor The District cooperatively works with KRWA and other member units to resolve issues and manage water deliveries as efficiently as possible.	Minor The District will stay engaged in helping to shape KRWA policies and procedures, and continue existing cooperative efforts.
10608.48.c(14)	Water Supplier Pump Efficiency. Evaluate and improve the efficiencies of the supplier's pumps.	No changes since the 2015 LID AWMP. The District does not own or operate any groundwater wells or lift pumps.	No projected changes in 5 to 10 years. The District does not anticipate drilling any groundwater wells or installing any lift pumps.

B. Documentation for Non-Implemented EWMPs

LID has identified two non-implemented EWMPs, including the lack of recycled water use (10608.48.c(2)) and facilitation of alternative land uses (10608.48.c(1)). These measures are considered not locally cost-effective and the District's position is described in Table 27.

Table 27 - Non-Implemented EWMP Documentation

EWMP No.	EWMP Description	(check one or both)		Justification/ Documentation
		Technically Infeasible	Not Locally Cost-Effective	
10608.48.c(1)	Facilitate Alternative Land Use. Facilitate alternative land use for lands with exceptionally high-water duties or whose irrigation contributes to significant problems, including drainage.		√	The irrigated lands within Laguna Irrigation District currently demonstrate no drainage concerns or significant soil quality or water quality issues that would support conversion of the land to an alternative use. In addition, LID does not have the authority to impose land use restrictions on landowners within the District. LID continues to recognize the importance of informing landowners of groundwater conditions and to be aware of conservation measures which may beneficially impact their area. The potential economic loss of the conversion of land that is currently well suited for agriculture and absent of significant problems renders this EWMP economically infeasible.
10608.48.c(2)	Facilitate Use of Recycled Water. 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.	√	√	There are no sources of water available for recycling within the LID service area; therefore this EWMP is both technically infeasible and not economically feasible.

Section VIII. Agricultural Water Measurement Regulation Documentation

A. Introduction

LID has implemented uniform standards and procedures for measuring and recording agricultural water deliveries in order to: (1) improve water management by equitably distributing water to each agricultural water user; (2) provide cost-effective service to all agricultural water users; (3) improve operational records for analysis and panning purposes, and (4) comply with recent regulatory requirements.

LID currently measures all agricultural water deliveries using Water Specialties propeller flow meters with an accuracy of 2%± by volume. The propeller flow meters comply with State Regulations that require a specified level of delivery point measurement accuracy that were incorporated into California Code of Regulations (CCR) Title 23 Division 2 Chapter 5.1 Article 2 Section 597 (23 CCR §597) in July 2012 as an outgrowth of Senate Bill X7-7 (SBx7-7), the Water Conservation Act of 2009.

Briefly summarized, SBx7-7 (23 CCR §597) requires that agricultural water suppliers providing water to 25,000 irrigated acres or more measure the volume of water delivered to customers with sufficient accuracy to comply with AB 1404 and bill water customers based at least in part on the quantity of water delivered (volumetric pricing). AB 1404 (2007) amended the California Water Code to add §531.10 regarding water measurement and water delivery reporting as follows:

- Any agricultural water supplier, either public or privately owned, supplying 2,000 AF or more of surface water annually for agricultural purposes, or serving 2,000 or more acres of agricultural land, must comply with reporting requirements.
- An agricultural water supplier shall submit an annual report to DWR that summarizes aggregated farm-gate delivery data, on a monthly or bi-monthly basis, using best professional practices.
- §531.10(a) states that a water supplier is to use best professional practices in reporting annual aggregated farm-gate delivery data, while §531.10(b) states that "*nothing in this article shall be construed to require the implementation of water measurement programs or practices that are not locally cost effective*".

The final SBx7-7 Agricultural Water Measurement regulation (Regulation) that was prepared by DWR and adopted in July 2012 requires that the volume of water delivered by an agricultural water supplier be measured at the delivery point where the agricultural water supplier transfers control of delivered water to a customer or group of customers and be of sufficient accuracy to meet the requirements of AB 1404. In most cases, the transfer of control occurs at the farm-gate, but the Regulation does allow for measurement upstream in a lateral under certain conditions. If a water supplier elects to measure upstream on a lateral, the water supplier shall document in their water management plan the criteria used to apportion the volume of water delivered to individual downstream customers, and document that the method is sufficient to establish a pricing structure based at least in part on the volume

delivered. Regardless of where the measurement is made, the following numeric accuracy standards apply to the volume of delivered water:

- Existing measurement devices shall be certified to be accurate within ±12% by volume.
- New or replacement measurement devices shall be certified to be accurate within ±5% by volume in the laboratory if using a laboratory certified device (such as an ultrasonic meter) or ±10% by volume in the field if using a device that is non-laboratory certified (such as meter gates or constant head orifice turnouts).

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, such as flow rate and elapsed time. If existing measurement devices do not meet the accuracy requirements, water suppliers should include in the AWMP a plan to take corrective action to comply with the SBx7-7 requirements.

This section describes LID's water measurement practices in compliance with the water measurement provisions of SBx7-7, including a schedule, budget and financing plan.

B. Existing Facilities and Measurement Practices

(California Water Code §10826(a)(6))

All irrigation surface water deliveries made through District owned or controlled farm-gate turnouts are measured by District staff and recorded once a day. Water measurement to the landowners is accomplished with the use of Water Specialties brand propeller type open flow meters. These meters read in cubic feet per second in instantaneous measurement and in acre feet, cumulative total. The meters' cumulative and instantaneous flows are recorded daily by the field staff and the data is entered into the District's computer system where daily available balances are calculated by landowner. Errors in readings are immediately addressed by verifying data in the field. If there is an issue with a meter, it is repaired on site and tested or replaced. Any lapses in data are extrapolated from prior and current instantaneous flow rates.

All water use is recorded by using a 24-hour timing cycle. Landowners are required to give a minimum of 24-hour notice for turning water on or off. Notwithstanding low volume irrigation facilities, all water deliveries are to be scheduled for a minimum period of 24 hours. Low volume irrigation can be used for less than 24 hours with flexible time schedules coordinated between Landowner and the Ditchtender. If a landowner turns off without a 24-hour notice to Ditchtender, said Landowner will be charged for 24-hours of delivery unless the water can shifted early to another landowner.

C. Legal Certification and Apportionment Required for Water Measurement – Lack of Legal Access to Farm-gate

The District has legal access to measure water at every delivery point, defined by LID as the location where the District transfers control of the delivered water to the irrigator or a group of irrigators. The District measures water delivered through all farm turnouts on property owned by the District in canal right-of-way or over which the District holds an easement. There are no privately-owned lateral

pipelines within the District that serve multiple users, so there is no need to access private property for water delivery measurement.

D. Engineer Certification and Apportionment Required for Water Measurement – Technically Infeasible

All farm turnouts are measured, there are no District owned or controlled turnout locations that are technically infeasible to measure.

E. Description of Water Measurement Best Professional Practices

(California Code of Regulation §597.4(e)(2))

LID measures the water delivered to each farmer turnout from their distribution system. The District's distribution system consists of 50 miles of open canals and 47 miles of pipelines. The water deliveries are measured by means of an open flow propeller flow meter. There are 242 District owned meters and 432 active delivery turnouts located within the District. Because of the rotation delivery schedule utilized by the District, after one landowner finishes his irrigation the meter can be moved to another landowner turnout that is the same size. This practice allows the District to inspect the meter prior to each irrigation delivery. At the end of the irrigation season, all meters are removed and stored in the District yard for maintenance and repair if needed.

The District conducts a review and maintenance program for the meters on an annual basis, checks them daily during the water season and maintains them as needed. Meters have a defined calibration schedule, subject to use, that includes removal of the meter and transporting to a testing laboratory. A complete check and evaluation of the meter will be done. This includes a calibration test and replacement of bearings, propeller, register, etc., as required. Sample certified test reports of flowmeters is included in Appendix G.

The extensive best professional practices employed by the District are costly and time consuming. The continuation of these practices provides the necessary checks and balances required to deliver and verify the irrigation flows delivered to each parcel. The continued implementation of these practices is recommended with modification or replacement of turnout structures or flowmeters as conditions warrant. Additional best management practices are not currently anticipated. These practices will be revisited, and additional practices recommended as appropriate.

Description of District Operations

The District is a public agency which supplies irrigation service to agricultural customers for crop production within its service area. The District's entitlement of Kings River water is the source of irrigation water, which varies from year to year depending on the amount of Kings River runoff and daily entitlement earned from the monthly entitlement schedule used by the KRWA. This variability in runoff drives many of LID's irrigation policies and practices.

The annual amount of water allocation is assigned to each individual parcel prior to the start of irrigation water run each year. The Board of Directors determine the amount of water allocated to land based on water supply projections and the scheduled length of the coordinated run. The Rules and

Regulations contained in Appendix E are the guidelines for the operation and delivery of irrigation water and cover the procedures followed to distribute irrigation water in an orderly, efficient, and equitable manner. The annual landowner allocation is made on a per acre basis once the District's available surface water is estimated for that year. Water use is measured with propeller meter measuring devices and is debited against the landowner's water allocation. Water deliveries are cut off to a water user when they have used their water allocation.

The duration of water deliveries is dependent upon the water year. In a typical year, water deliveries begin in June and run through August, approximately 90 days. During that time, the entire distribution system is used to allow for flexibility of deliveries. The District does not confine deliveries to certain reaches of the canals or pipelines. By doing so, water operations are more flexible so that water from a premature shutoff can be directed to another grower on the same canal or pipeline. This method, in most cases, eliminates drastic changes in the system operation and efficient deliveries. In below average or drought years, the District may only run a portion of the distribution system at one time to reduce seepage losses, but deliveries are scheduled to ensure that all landowners have access to surface water. In the case of excessively drought periods, no water deliveries are made if the District does not have enough water to give each landowner at least one irrigation. The ability to equitably ration water supplies is feasible due to the District's ability to measure water at the turnouts.

Laguna Irrigation District encourages water efficiency by allowing those growers who use less than their annual allocation of surface water to transfer their unneeded surface water to other growers within the District, in accordance with the Rules and Regulations. The transferred water is then accounted to the end user.

Collection of Water Measurement Data

As previously mentioned, all irrigation surface water deliveries made through District owned or controlled farm-gate turnouts are measured by District staff using propeller type open flow meters and the measurements are recorded once a day. The meters' cumulative and instantaneous flows are recorded daily by the field staff and the data is entered into the District's computer system where daily available balances are calculated by landowner. Errors in readings are immediately addressed by verifying data in the field. If there is an issue with a meter, it is repaired on site and tested or replaced. Any lapses in data are extrapolated from prior and current instantaneous flow rates to obtain a cumulative delivery total for that period.

Frequency of Measurements

All irrigation surface water deliveries at operating farm turnouts are measured with cumulative flow meters and recorded once a day.

Method for Determining Irrigated Acres

The District does not conduct any crop surveys, but cropping information is available for select years through the Department of Water Resources (DWR) and through the NFKGSA. The information provided by DWR and by the NFKGSA is collected and analyzed by a third-party consultant, LandIQ, that identifies the crop grown on each field as well as the acreage of each crop through satellite

imagery and ground surveys. The District can utilize this information to identify the irrigated acreage of each field, which then can be aggregated by turnout and/or landowner. In addition, County Agricultural Commissioner data, pesticide use reports, and Irrigated Lands Regulatory Program data are other sources of irrigated acreage information available to the District.

Meter Maintenance Program

Existing flow meters used to measure farm water deliveries are maintained on a normal maintenance schedule by District personnel and replaced as needed to maintain accuracy, with selected meters sent to the factory for certified testing. The District has instituted the following meter maintenance program:

1) Only LID personnel trained to do so shall inspect and repair meters.
2) All open flow meters are to be inspected annually, prior to their use in the water run.
3) Any meters in need of maintenance are to be repaired as necessary.
4) Ten percent of the meters will be fully inspected each year.
    - Disassemble drive mechanism. Clean components and replace worn parts as necessary. Replace lubricant.
    - Inspect meter head for proper gear fit and operation. Repair and replace as necessary.
    - Reassemble meter, calibrate and test.
5) During season of operation, all anomalies are to be immediately investigated. Meters found to have a problem will be repaired or replaced.
6) Problem meters are to be identified with a "Red Tag" and not put back into service until repairs and testing are complete.
7) As necessary, meters may be sent to the manufacturer's (Water Specialties) test and repair facilities in Porterville, CA for additional repair and testing.

F. Quality Control and Quality Assurance Procedures

For quality control purposes, when the field measurement data is entered into the computer each day, normal range parameters for water measurements are pre-programed and the District is alerted to the possibility of an error when readings are out of the normal range. This allows the District to verify and confirm the input data and if an errors in readings is detected then the issue is addressed by the ditchtender in the field. If there is an issue with a meter, it is repaired on site and tested or replaced. Any lapses in data are extrapolated from prior and current instantaneous flow rates to obtain a cumulative delivery total for that period.

G. Documentation of Water Measurement Conversion to Volume

*(California Code of Regulation **§597.4(b)(2)(e)**)*

SBx7-7 requires an annual volumetric accuracy of within 12 percent on existing devices. The District uses propeller flow meter measurement devices for measuring water deliveries to each farmer turnout. The propeller meters are factory built and installed according to the manufacturer's requirements. The propeller meters have a register that indicates the instantaneous flow rate in cfs and a totalizer that integrates the flow rate over time and records the cumulative quantity of water

delivered in acre-feet. The manufacturer's testing has shown the meters to be more than 95 percent accurate. The published literature has placed the accuracy of propeller flowmeters to be ±2% by volume.

H. Device Corrective Action Plan Required For Water Measurement

(California Code of Regulations ***§597.349(e)(4)****)*

The District is currently able to bill for all water deliveries on a volumetric basis, and will continue to do so in the future. At this time the District has not identified any turnout locations that require corrective action, although the District will continually evaluate if improvements on water measurement can be made.

Corrective Action Schedule

As previously discussed, the District currently measures water deliveries at each farm turnout each year and has not identified any required corrective actions. LID will monitor the measurement program activity on an on-going basis to determine if any adjustments are needed to ensure a technically sound, locally cost-effective method of water measurement at the farm-gate level.

Finance Plan

The District's on-going water measurement program operations and maintenance costs are funded through the District's existing assessments and volumetric water toll rates as part of the District's on-going operating costs.

Budget

Compliance with the water measurement program is included as part of the O&M budget adopted by the District each year. The actual amount of money expended each year on water delivery measurement depends on the length of the water run and available funding, but the District has budgeted $20,000/year for calibration, repair and replacement of measurement devices.

Section IX. References

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Appendix A – Notice of Preparation

LAGUNA IRRIGATION DISTRICT

5065 19 ½ AVENUE
RIVERDALE, CA
93656

March 26, 2021

Bernard Jimenez
Fresno County Public Works and Planning
Development Services Division
2220 Tulare Street, Sixth Floor
Fresno, CA 93721

RE: Laguna Irrigation District's Intent to Update an Ag Water Management Plan

Dear Bernard,

As you may know, Laguna Irrigation District (District), as an Agricultural Water Supplier in California, is required to update its 2015 Ag Water Management Plan (AWMP) as set forth in SB X7-7, the Water Conservation Act of 2009. The District is currently updating that existing plan.

As part of the update of the AWMP and pursuant to Water Code §10821(a), the District is required to notify each city or county in which it supplies water for agricultural use that it will be preparing an updated plan. As our District supplies water in your county and we are preparing such a plan, you are hereby notified.

Please feel free to contact our office if you have any questions.

Sincerely,

Scott Sills
General Manager
Laguna Irrigation District

TELEPHONE 559-923-6800 FACSIMILE 559-867-3062

LAGUNA IRRIGATION DISTRICT

5065 19 ½ AVENUE
RIVERDALE, CA
93656

March 26, 2021

Chuck Kinney, Deputy Director - Planning
Kings County Community Development Agency
Kings County Government Center
1400 W. Lacey Blvd., Engineering Building #6
Hanford, CA 93230

RE: Laguna Irrigation District's Intent to Update an Ag Water Management Plan

Dear Chuck,

As you may know, Laguna Irrigation District (District), as an Agricultural Water Supplier in California, is required to update its 2015 Ag Water Management Plan (AWMP) as set forth in SB X7-7, the Water Conservation Act of 2009. The District is currently updating that existing plan.

As part of the update of the AWMP and pursuant to Water Code §10821(a), the District is required to notify each city or county in which it supplies water for agricultural use that it will be preparing an updated plan. As our District supplies water in your county and we are preparing such a plan, you are hereby notified.

Please feel free to contact our office if you have any questions.

Sincerely,

Scott Sills
General Manager
Laguna Irrigation District

TELEPHONE 559-923-6800 FACSIMILE 559-867-3062

Appendix B – Public Meeting Notification

LAGUNA IRRIGATION DISTRICT

PUBLIC NOTICE

Intent to update the District's 2015 Agricultural Water Management Plan (AWMP) and adopt a 2020 AWMP

A Draft 2020 Agricultural Water Management Plan can be reviewed at the Laguna Irrigation District Office, located at 5065 19 ½ Avenue, Riverdale, CA 93656

Office Hours: Monday thru Friday 7:00am – 3:30pm
(Closed for lunch from 12:00 – 12:30pm)

A public hearing will be held at 9:30 on March 7, 2023, at 5065 19 ½ Avenue, Riverdale, CA to review the Draft 2020 Agricultural Management Plan. Subsequent to the public hearing, the Laguna Irrigation District Board of Directors at a public meeting will adopt the plan as presented, amend the plan, or not take action on the plan.

Published: Hanford Sentinel – February 14, 2023, February 21, 2023

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LAGUNA IRRIGATION DISTRICT-LEGALS
TERRI GILL
5065 19 1/2 AVENUE
RIVERDALE CA 93656
USA

ORDER NUMBER 159522

Publication- The Hanford Sentinel

State of California

County of Kings

I am a citizen of the United States and a resident of the county foresaid; I am over the age of eighteen years, and not a part to or interested in the above entitled matter, I am the principal clerk of The Hanford Sentinel, a newspaper of general circulation, printed and published daily in the city of Hanford, County of Kings, and which newspaper has been adjudged a newspaper of general circulation by the superior court of the County of Kings, State of California, under the date of October 23, 1951, case number 11623.

That I know from my own personal knowledge the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspapers and not in any supplement thereof on the following dates, to wit:

Section: Legals
Category: 201 Public Notices
PUBLISHED ON: 02/14/2023 02/21/2023

TOTAL AD COST:	235.14
FILED ON:	02/21/2023

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Kings County, California

This Day 21 of February, 2023

Signature _____

40a-3D
Adoption of 2020 AWMP
Public Hearing Notice

Ad text : AD# 159522

LAGUNA IRRIGATION DISTRICT

PUBLIC NOTICE

Intent to update the Districts 2015 Agricultural Water Management Plan (AWMP) and adopt a 2020 AWMP

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Published: Hanford Sentinel February 14, 2023, February 21, 2023

Posted at LID Office February 14, 2023

Posted on LID Website February 14, 2023

Appendix C – Resolution Adopting AWMP

Resolution 23-01

A RESOLUTION BY THE BOARD OF DIRECTORS OF LAGUNA IRRIGATION DISTRICT

AUTHORIZING THE ADOPTION OF THE LAGUNA IRRIGATION DISTRICT'S UPDATED 2020 AGRICULTURAL WATER MANAGEMENT PLAN DEVELOPED UNDER THE AUTHORITY OF SB X7-7

WHEREAS, Laguna Irrigation District is located in portions of Fresno and Kings Counties; and

WHEREAS, Laguna Irrigation District did notice the counties within Laguna Irrigation District's boundaries of its intent to review, hold a public hearing and adopt Laguna Irrigation District's Updated 2020 Agricultural Water Management Plan; and

WHEREAS, Laguna Irrigation District did notice pursuant to Government Code 6066 its intent for the public to review the Laguna Irrigation District Agricultural Water Management Plan, hold a public hearing to consider all comments and adopt the Laguna Irrigation District Agricultural Water Management Plan; and

WHEREAS, the Laguna Irrigation District Updated Agricultural Water Management Plan includes changes that are being contemplated in the near future, including for example:
Implementation of water banking facilities, strategies for mitigating climate change and drought, and continued water measurement at the turnout and volumetric pricing.

NOW, THEREFORE, BE IT RESOLVED, at a Regular Board Meeting held on March 7, 2023, Laguna Irrigation District did consider all comments and adopted the Laguna Irrigation District Updated Agricultural Water Management Plan developed under applicable law and Executive Orders. By taking this action, it is Laguna Irrigation District's intent to demonstrate its long-term commitment to water management and conservation.

NOW, THEREFORE, BE IT FURTHER RESOLVED, that Laguna Irrigation District did adopt the Laguna Irrigation District Agricultural Water Management Plan on March 7, 2023, as submitted, by the following vote:

AYES: 4 - Zonneveld, Thomas, Oliveira, Hoggard

NAYS: ~~0~~

ABSTAIN: ~~0~~

ABSENT: 1 - Miller

SEAL

Frank Zonneveld, President

Tony Thomas, Secretary

Appendix D – Written Public Comments

No written comments were received on the Draft 2020 Laguna Irrigation District 2020 Agricultural Management Plan Update and no verbal comments were received during the Public Hearing.

Appendix E – Rules & Regulations

RULES AND REGULATIONS

Governing the Distribution of Water in the Laguna Irrigation District

Rules and regulations governing the distribution of water in the Laguna Irrigation District were adopted May 2, 1928 and amended September 4, 1984 and April 14, 2005, by the Board of Directors under authority of the provisions of Section 22257 of the *California Water Code,* which reads, in part, as follows:

> "Each District shall establish equitable rules for the distribution and use of water, which shall be printed in convenient form for distribution in the District."

DEFINITIONS

1. The following definitions apply to these Rules and Regulations:

"Board" or "Board of Directors" shall mean Board of Directors of Laguna Irrigation District.
"District" shall mean the Laguna Irrigation District.
"Landowner" shall mean one who owns land within the District.
"Rules and Regulations" or "Rules" shall mean these Rules and Regulations.
"Water User" shall mean one who owns and/or leases land within the District and who places water orders with the District.
"Year" shall mean the calendar year, that is January 1 through December 31.

SUPERVISION

2. All matters relating to the distribution and use of water shall be under the general charge of the General Manager of the District acting under the authority conveyed by and with the approval and supervision of the Board of Directors.

EMPLOYEES

3. The General Manager shall, subject to the approval of the Board of Directors, employ such employees as may be necessary for the proper operation and maintenance of the system and for the equitable and economical distribution of the water. He shall assign the employees to and prescribe their several duties, supervise and direct all of their activities as they relate to the maintenance and operation of the system. He shall prescribe the form and extent of field records to be kept and shall cause such field reports to be made by these employees as he may deem expedient.

DISTRICT RIGHT OF WAYS - GENERAL

4. The diversion works, canals, and conduits, headgates and other structures owned by the Laguna Irrigation District were acquired by virtue of prescriptive use, grants, and various forms of conveyance agreements. All are dedicated to public use and are under the exclusive control of the elected Board of Directors acting through the General Manager of the District and its employees.

WATER DISTRIBUTION

5. In general, water shall be distributed among the landowners eligible to be allocated water according to equitable schedules prepared under the direction of the General Manager, provided however that when the supply of water and the demand for its use are so related and other contributing factors make it feasible, service may be given on request.

The Board may prescribe applications and other forms for Water Users to order water and for administration of same.

If a Water User fails, neglects, or refuses to use water when scheduled, it shall not be a valid basis for claiming the right to use water until rescheduled and confirmed by the General Manager. In the event a headgate is opened without being ordered or rescheduled, the District reserves the right to close and lock the headgate until the problem is corrected.

APPORTIONMENT OF WATER / NO GUARANTEE OF QUALITY OR QUANTITY

6. Surface water available to the District will be apportioned among the Districts Water Users whose lands are classified as Irrigated Rate (as defined in Rule 27) and who are not delinquent in payment of assessments on a pro-rata equal amount per acre in so far as practical.

The District does not guarantee service and will not be liable for defective quality of water, shortage of water, either temporary or permanent, or for failure to deliver water or delay in doing so.

The District's water supply is in a raw, untreated condition, and as a result, is considered to be unfit for human consumption without treatment. The District does not warrant the quality of water delivered and is under no obligation to construct or furnish water treatment facilities or maintain or better the quality of water.

MAINTENANCE AND REPAIRS OF CANALS AND DITCHES

7. There are two classes of ditches and canals in the District:

Class (A) Those owned, operated and maintained by the District as a whole.

Class (B) The distribution ditches, owned, operated and maintained by individuals or groups of landowners, which are also known as "private ditches."

The management, operation and maintenance of all of the canals and ditches in Class (A) shall be exclusively a function of the District organization and no Water User shall be allowed to make any changes whatever in the distribution of the water in these canals and ditches except when specifically instructed or requested to do so by the General Manager, or other authorized agent of the District, or in case of an emergency in which latter case he shall expeditiously report his action to the local ditchtender or to the District's office.

No person shall be allowed to make any opening in, cut, plow down or otherwise interfere with or weaken any bank of any Class (A) ditch except by specific written authority of the General Manager and in such case only for the period, to the extent and for the purpose which shall be specifically provided in such written authority.

The District shall construct, operate and maintain the gates and outlets for serving water from Class (A) to Class (B) ditches, and have full and complete jurisdiction thereof. The District may construct and maintain at the head of Class (B) ditches, such measuring devices, gauges, etc. as the General Manager may deem expedient to facilitate equitable distribution or records of flow in such ditches.

The District may temporarily discontinue water service or reduce the amount of water to be furnished for investigation, inspection, maintenance, repair or replacement of any of the District's facilities. The District will give the Water User notice in advance of such temporary discontinuance or reduction, except in case of an emergency, in which event no notice need be given. No liability shall accrue against the District or any of its officers, directors or employees for damage, direct or indirect, because of the failure to provide water as a result of system malfunctions, interruptions in service necessary to properly operate and maintain the water distribution system or other similar causes which are beyond the District's reasonable control.

CLASS (A) DITCHES AND CANALS

8. The District does not encourage the use of its ditches and canals for private conveyance of water. However, on a case by case basis with the written approval of the General Manager, the private use of a specific ditch or canal may be allowed. When permission is granted by the General Manager, the user of the ditch or canal shall be responsible for any and all maintenance costs related to the private use of same and any liabilities or damages arising from use of same. The Water User using the District's ditch or canal shall assume the defense of, indemnity and hold harmless the District and its officers, directors, agents and employees from any loss, damage, liability, claims or courses of action arising out of or incidental to Water User's use of such ditch or canal. The user shall not prevent or hinder in any way, maintenance or any other operations deemed necessary by the District. Failure to comply with these rules will be cause for immediate termination of the permit.

CLASS (B) DITCHES

9. The management and maintenance of the ditches and pipelines in Class (B) shall be taken care of by the individuals and groups of individuals who use them and ditchtenders shall be instructed not to turn water into these ditches until they are cleaned and otherwise prepared to convey the water with reasonable efficiency. Any disputes concerning use of such Class B ditches and pipelines and conveyance of water in same beyond the head of such ditch or pipeline shall be a matter between the affected Landowners and Water Users, provided, however, a District Ditchtender may provide for each Landowner receiving his prorate share of District supplies consistent with these Rules and Regulations

The authorized agents of the District shall, at all times, have access to such private ditches and the lands irrigated from them for the purpose of making any investigations relating to any matters affecting the use of flow of water through the ditches, pipelines or on the lands.

DAMAGE LIABILITY – CLASS (A) CANALS AND DITCHES

10. Water Users or Landowners who, by opening, closing or otherwise interfering with regulating gates or devices, cause any fluctuations in the flow of the ditches or canals in Class (A) or therefore cause any breaks in such ditches or canals, or any damage of any kind whatsoever, shall be responsible to the District for the whole of the expense and damage caused thereby, except where regulation is made on instructions or requests of the District agents.

DAMAGE AND LIABILITY ON CLASS (B) DITCHES AND LATERALS

11. The District will not be liable for any damage resulting from the use of water in the ditches and laterals of Class (B).

LIABILITY OF PERSONS TAKING WATER WITHOUT AUTHORITY; INTERFERING WITH REGULATION OF WATER

12. Section 592 of the Penal Code of California is 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, is guilty of a misdemeanor."

(b) If the total retail value of all the water taken is more than four hundred dollars ($400), or if 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 the county jail for not more than one year, or in the state prison.

Under such statute and other statutes (for example Penal Code section 607), persons interfering with the regulation of water in the canals and ditches are subject to prosecution.

If any person takes water at any other time than that provided in the schedule, or without permission of the ditchtender, he shall not only be subject to such criminal prosecution, but may forfeit his right to water for the balance of the Year.

WASTE OF WATER. INADEQUATE DITCHES

13. Landowners or Water Users who waste water, either willfully, carelessly or on account of defective or inadequate ditches and structures, or on account of inadequate preparation of the land for irrigation, may be refused further service until the conditions are remedied.

LIABILITY

14. The District will not be responsible for the control, carriage, handling, use, disposal or distribution of water delivered to Water User outside the facilities then being operated and maintained by the District. Water User does hereby indemnify and shall assume the defense of and hold harmless the District and its 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 the District's property, or 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 District facilities.

WATER TRANSFERS

15. Water Users may be permitted to transfer water from one parcel to another, provided that both parcels are operated by the same Water User and both parcels are entitled to receive water service and any such transfer will not exceed the safe operating capacity of any canal, ditch or conduit as determined by the ditchtender.

In addition, Water Users may transfer water to other Water Users for use on the transferee's lands, provided such lands are eligible to receive Water Service from the District. Prior to any such transfer becoming effective, the transferor and transferee shall execute a transfer form provided by the District consistent with then existing policies and applicable fee structures. As a convenience to District Water Users, the District shall maintain and post a list of Water Users wishing to transfer all or a portion of their allocated supply, provided arrangements for any such transfers shall be made among individual Water Users.

PIPELINES

16 a. The District does not encourage the use of its pipelines for private conveyance of water. However, on a case-by-case basis with the written approval of the General Manager, the private use of a specific District pipeline may be allowed. When permission is granted by the General Manager, there is no implied warranty that the pipeline will not leak. Should any leaks or pipe failures occur when the District pipeline is being used by a private water user, then that user shall be financially responsible for all repair costs and related property and/or crop damage. An example of the misuse of the District pipeline is closing of a gate too fast, or of the sudden discharge of a full head of water into the pipeline, either of which could cause a surge of water sufficient to break the pipe. The Water User using the District's pipeline shall indemnify and shall assume the defense of, indemnity and hold harmless the District and its officers, directors, agents and employees from any loss, damage, liability,

claims or causes of action arising out of or incidental to Water Users use of such pipeline.

b. No dirt is to be removed from a District pipeline right of way without prior permission of the District. Any plans to relevel a field which contains a District pipeline shall be reviewed by the General Manager. If needed, the District will uncover the District's pipeline at spots solely for the purpose of determining the amount of dirt on top of the pipe. The use of any heavy equipment will be limited to crossing the District's pipeline at locations as directed by the General Manager. All pipeline breaks at other locations caused by landowner operations shall be repaired at the cost of the landowner.

c. If any deep tillage is proposed, or the use of any heavy equipment is to be used which may cause damage to a District pipeline, the General Manager shall be notified in advance in order to determine what must be done to protect that pipeline. Failure to comply with this provision shall result in any pipeline repair cost to be paid for by the landowner.

REQUESTS FOR WATER SERVICE

17. Landowners within the District who are not presently receiving water from the District's distribution system, but desire to do so, shall be required to provide the necessary facilities to transport the water from the District's system to their lands. Requests for new water service must be submitted to the Board which may prescribe additional conditions concerning such proposed new service.

Said Landowner shall pay all costs incurred by the District to install facilities necessary for delivery to Landowner, including, but not limited to water meters.

RIGHTS OF WAY

18. Rights of way and easements for canals, ditches and pipelines owned by the District include the land actually occupied by the canal, ditch, or pipeline and such land on both sides thereof, as is reasonably necessary for the maintenance and operation of such canals, ditches or pipelines. Widths of easements vary with the size of the canal or pipeline and other factors. Maps and other records of the District generally show the location of such easements and right-of-ways.

ENCROACHMENTS

19. No trees, vines, shrubs, corrals, fences, buildings, bridges, or any other type of encroachment shall be planted or placed in, on, over or across any District canal, ditch, conduit or the right of way therefore except pursuant to a written encroachment permit

issued by the District. Any such encroachment of an unusual or extraordinary nature shall be approved by the Board of Directors. Any unauthorized encroachment may be removed by the District at the expense of the encroacher and the encroacher shall be liable for any damages or liability arising from such encroachment. In that regard, the following set backs shall be presumed for any facilities constructed, reconstructed or planted after April 14, 2005:

Fences at least 10 feet from the toe of canal bank
Buildings and trees at least 20 feet from the toe of canal bank

ACCESS TO LANDS

20. The authorized agents and employees of the District shall have reasonable access at all times to all lands irrigated from the District's distribution system for the purpose of maintaining, operating, or inspecting the canals, ditches, and conduits and the flow of water therein and for the purpose of ascertaining the acreage of crops on lands irrigated or to be irrigated. If the District holds a right of way or easement across private land for the operation and maintenance of a canal or other facilities, the law provides that the District shall have certain secondary rights, such as the right to enter upon the property on which the right of way or easement is located to make repairs and do such things reasonably necessary for the full exercise of the easement rights.

WELL MEASUREMENTS

21. If requested, landowners shall be expected to allow District employees to enter upon their property and measure the depth of water in their private wells for the purpose of determining the conditions of the groundwater within the District.

UNAUTHORIZED INSTALLATION

22. No delivery gate, pipe, siphon or any other structure or device shall be installed or placed in any canal, ditch or conduit owned by the District without express written permission and must be in strict compliance with plans and specifications approved by the General Manager or his designated representative. *Any such structure or device installed on* a District canal, ditch or conduit without approval may be removed by the District at the expense of the owner.

BRIDGES AND CANAL CROSSINGS

23. Bridges and Canal Crossings shall not be installed without express written permission of the General Manager. All such private crossing when approved shall be at the sole expense of the Landowner. Bridge structures shall be engineered by a licensed civil engineer and must meet all requirements of the applicable county

building code. In addition to District approval, a county building permit will be obtained for all bridge structures to be installed on District rights of way.

PERSONAL LIABILITY

24. Any person entering upon District property or District right of way, does so at his own risk and assumes all risks associated therewith and by such action accepts the responsibility for any damage to District or private property resulting therefrom.

TRASH AND DEBRIS

25. No tires, trash, debris, litter, garbage, prunings, brush, grass, dairy waste, dead animals, herbicides, pesticides, or any other material which is offensive to the senses or injurious to health, or which pollutes or degrades the quality of water or which obstructs the flow of water, shall be placed, emptied, discharged, thrown, or be allowed to slide, flow, wash or be blown into any canal, ditch or conduit belonging to the District. The District reserves the right to take appropriate legal action and seek restitution in incidents of this nature.

DISCHARGES INTO CANALS

26. No person, firm, company, corporation or agency shall be permitted to pump, siphon, or drain surplus irrigation water (tail-water), storm water, waste water, or any other water, including but not limited to well water, into any District canal, ditch, or conduit, without the express written consent *of* the Board of Directors. The General Manager may require the installation of line gates or back flow devices for specific turnouts where there is the risk of such other waters entering the District's facilities. A short term authorization for conveyance of well water may be issued by the General Manager. Any such written authorization shall include the manner, method, limitations, and terms and provisions for the District's control and regulation of the conveyance of well water.

ASSESSMENTS

27. The District's principle source of revenues to carry out its responsibilities and operations is through assessments levied pursuant to the Water Code. Lands within the District are classified into four classifications, which are as follows:

a. Irrigated Rate—that being lands eligible to receive irrigation water from District facilities.

b. Pump Rate—that being lands eligible to receive irrigation water pumped from the Kings River or interconnected channels, OR lands

irrigated exclusively from groundwater, which are enhanced by the District importing principally Kings River water.

c. Pasture Rate—lands which are not developed to irrigated agriculture or other uses which consume surface water or groundwater.

d. Exempt—typically lands held by governmental entities which do no use water, except for incidental domestic needs.

Lands served by River diversions or River pumps shall not be eligible to receive surface water supplies from the District.

In years where a flood release occurs, the Board may adopt other policies to move effectively allocated water.

Historically, the Pump Rate has been 50% of the Irrigated Rate and the Pasture Rate 10% of the Irrigated Rate to reflect an approximate apportionment of the benefits the different classes of lands receive from the District. The District reserves the right to modify these classifications and percentages in the future as the Board of Directors determines appropriate.

The typical process regarding levy and collection of assessments, as prescribed by the Water Code, is that in September the Board meets as a Board of Equalization to determine if the classification of any lands should be changed and to finalize the rate of the assessment. It is incumbent on each landowner to check with the District and determine whether his lands have been properly classified. Assessments may be paid in installments, with the first installment delinquent on December 20th and the second installment delinquent on June 20th. Lands for which the assessment is delinquent are ineligible to receive water service form the District. In addition, as prescribed by the Water Code, penalties and interest are assessed for delinquent assessments and failure to pay assessments will result in liens being filed against the delinquent land and eventual loss of the land if not paid.

The District reserves the right to implement other means to collect revenues to pay for District operations, including implementing a water toll and other charges for services rendered.

REPAIR COSTS DUE TO VIOLATION OF RULES

28. The District will submit a bill for repairs to District facilities caused by a Water User for any violation of these Rules and Regulations or otherwise damaging the District's facilities. Water User shall pay for any such repairs within 30 days of invoice.

ENFORCEMENT OF RULES

29. Refusal to comply with the requirements hereof, or transgression of any of the foregoing Rules and Regulations, or any interference with District employees carrying out their duties, shall be sufficient cause for shutting off the water, and water will not again be furnished until full compliance has been made with all requirements herein set forth.

APPEALS

30. In cases where Landowners or Water Users have disputes or disagreements with employees of the District, in relation to the delivery of water or maintenance of ditches, they may appeal to the General Manager who shall diligently investigate and reach a conclusion in the matter.

If a controversy still exists they may appeal to the Board of Directors. Decisions of the Board of Directors shall be final.

GENERAL PROVISIONS

31. Any waiver by the District of any breach of these Rules and Regulations shall not be deemed a waiver of any subsequent breach or default. Where appropriate, words in the singular include the plural and words in the masculine shall include feminine or an entity. These rules are supplementary to provisions of the California Water Code with respect to Irrigation Districts.

The Board of Directors may promulgate from time to time, policies and procedures to carry out and administer these Rules and Regulations or to otherwise govern the affairs of the District, which are incorporated by this reference and are on file for inspection at the District office.

CERTIFICATION

I hereby certify that the foregoing Rules and Regulations were revised by the Board of Directors of the LAGUNA IRRIGATION DISTRICT at its meeting of April 14, 2005.

Secretary
LAGUNA IRRIGATION DISTRICT

[SEAL]

END OF DOCUMENT

Appendix F – Drought Management Plan

Laguna Irrigation District
Drought Management Plan

This Drought Management Plan (drought plan) for Laguna Irrigation District (District or LID) was developed as a supplemental resource to the District's 2020 Agricultural Water Management Plan and defines a variety of innovative strategies to cope with drought. Most of these strategies have already been used during previous droughts and have proven effective in conserving water and sustaining crops.

Topics discussed in this drought plan include drought planning, indicators of drought, drought vulnerability, opportunities for preparing and responding to drought, water shortage policies, operational adjustments, enforcement and appeals, monitoring, and communication with District growers.

As a conjunctive use district with a highly variable surface water supply, the District and its water users are constantly juggling supply and demand and landowners must pump groundwater to make up for the deficit between demand and available surface water supplies. In accordance with the Rules and Regulations, the District allocates all available water supply each year among water users whose lands are classified as Irrigation Rate (and are not delinquent on any payments) on a pro-rata equal amount per acre in so far as practical. In most years, there is usually more demand for surface water than there is supply, so proper water management is critical. Water users in the District must have a private deep groundwater well in order to supplement surface water available from the District. For decades, the District has taken a multi-year approach to drought management by developing and operating numerous recharge basins that capture water in average and wet years. Then, during below average years, growers utilize their private wells to meet demands. The District captures as much floodwater as possible during wet years for direct delivery to growers and for delivery to recharge basins.

In most years, especially average and below normal years, the District coordinates with the other lower river units to deliver water down the lower Kings River system at the same time to maximize water deliveries and minimize river seepage losses. The "coordinated water run" can be several months long or only a couple of weeks long, depending on the river runoff and water supply available to the lower river units. The District provides early communication and periodic updates to water users on the projected water supply and allocation, when the coordinated run will start, and the projected duration of the coordinated run.

Laguna Irrigation District encourages water efficiency by allowing those growers who use less than their annual allocation of surface water to transfer their unneeded surface water to

other growers within our District. The transferred water is then accounted to the end user.

In the case where a water user is wasting water or using water in a manner deemed inefficient, the District may stop water deliveries until such time as the landowner follows all policies of Laguna I.D. This is accomplished by closing and locking the headgate to stop water flow. See Rule #13, Rules and Regulations in Appendix F of the AWMP.

In below normal and drought years, the District will minimize expenditures as much as possible to reduce operating costs. The District historically has collected the majority of revenue through acreage based assessments and collects additional revenue through volumetric water charges based on the quantity of water delivered, measured in acre-feet. The volumetric water rate is established by the District each year to cover projected expenditures that exceed the revenue collected through the acreage based assessments.

Drought Resilience Planning

To prepare for adaptive and proactive drought management, LID evaluates a variety of data sources to review historic trends and project potential water supply conditions. The District's approach to studying drought vulnerability and opportunities and constraints is detailed below.

Data & Indicators

Requirements: Data, indicators, and information needed to determine the water supply availability and levels of drought severity.

To plan and forecast water supplies and schedule for water deliveries of surface water, the following resources are utilized:

1. Bulletin 120, DWR: River runoff forecast;
2. Watershed snow sensors: real time reporting of depth of snowpack;
3. Onsite measurement of snowpack (February 1 and April 1): measure the density of the water content;
4. Historical data evaluated for similar type water years;
5. KRWA reports on water availability and expected deliveries; and
6. Annual District Supply Analysis. The District annually estimates the amount of water available to operate the distribution system and equitably distribute the available water supply. The entitlement is based on the amount of water in storage and the projected runoff and amount of entitlement earned in accordance with the schedule. Once the estimated quantity of water supply is determined, the District evaluates historical use patterns and distribution system losses and recharge, and then integrates these into operational guidelines. The District is then able to operate its

system based on current use patterns and water delivery requirements to equitably distribute water evenly to all eligible landowners. During drought periods, the District can operate at a minimum, pre-determined water supply and adjusts the length of the water run.

Drought Vulnerability

Requirements: Analyses and identification of potential vulnerability to drought.

The data and methods identified in Data & Indicators section above are used to assess annual and trending drought conditions to inform real-time management decisions. In addition, the District participated in the development of the North Fork Kings Groundwater Sustainability Agency's (NFKGSA) Groundwater Sustainability Plan (GSP), submitted in January 2020. During this development, the vulnerability and impacts of drought conditions on the District and region were evaluated in terms of thresholds, projected water supply, and other quantitatively measured impacts. The GSP also recognized projects and management actions to adapt to impacts to water supply during drought periods, such as groundwater recharge and continued conjunctive use. Analyses of projected water supply are informed by historic climactic conditions in the Kings River watershed. Table 1 below indicates historic drought years (less than 50% of average runoff) on the Kings River since the construction of Pine Flat Dam, and the LID entitlement earned and deliveries that year. Beside entitlement, carryover storage from previous years can impact water deliveries.

Table 1 – Historic Drought Years

Water Year		Kings River Runoff WY Percent	Entitlement AF	Headgate Diversions AF
2011	2012	49.0%	22,669	27,856
1958	1959	47.9%	14,641	28,945
1986	1987	46.2%	15,965	34,207
1959	1960	42.4%	12,539	15,289
1991	1992	41.9%	14,920	0
2012	2013	41.1%	12,236	6,807
2006	2007	40.3%	9,725	15,285
1989	1990	40.7%	7,859	0
1960	1961	33.8%	10,180	11,304
1975	1976	32.1%	8,347	18,890
2013	2014	31.9%	6,661	2,029
1976	1977	23.5%	5,927	0
2020	2021	23.4%	6,475	7,630
2014	2015	21.4%	6,682	4,413

Opportunities and Constraints

Requirement: A description of the opportunities and constraints for improving drought resilience planning, including all of the following:

A. *The availability of new technology or information.*
B. *The ability of opportunities and constraints for the agricultural water supplier to obtain or use additional water supplies during drought conditions.*
C. *A description of other actions planned for implementation to improve drought resilience planning.*

The biggest opportunity for LID to improve drought resilience is the construction of new groundwater recharge basins to capture and recharge excess water on the Kings River when it is available. The District is in the process of constructing one new 150-acre recharge basin and has plans for additional recharge facilities in the future.

Maximizing the utilization of surface water and groundwater recharge is the primary strategy for drought protection since this helps to preserve groundwater that can be pumped to meet dry year supplies.

No dependable new water supplies or new technology are identified for use in the drought management planning for LID.

Drought Response Planning

In response to potential drought vulnerability, the District continues to practice water shortage policies and has strategies for enforcement and appeals. This section further details drought vulnerability, the potential impacts, and the District's outreach with its growers.

Water Shortage Policies Implementation

Requirements: Policies and a process for declaring a water shortage and for implementing water shortage allocations and related response actions.

The District informs it's water users about a water shortage when water supplies are projected to be substantially below normal based on water supply projections by KRWA. The anticipated allocation and predicted length of water runs are communicated to district growers through email lists, board meetings, and the District website.

In the case where a water user is wasting water or using water in a manner deemed inefficient, the District may stop water deliveries until such time as the landowner follows all policies of Laguna I.D. This is accomplished by closing and locking the headgate to stop water flow. See Rule #13, Rules and Regulations in Appendix F of the AWMP. The ability to equitably ration water supplies is feasible due to the District's ability to measure water at each turnout. Furthermore, if landowners are caught taking more water than they are entitled, such turnouts are eliminated from receiving surface water for the remainder of the year and

possibly charged for the taking of additional water with a penalty at the discretion of the District.

Water Supply Shortage

Table 1 provides historic context on the frequency of severe droughts (less than 50% runoff) occurring approximately one year in every five years, although 5 of the driest years on record have occurred in the past 10 years. Table 1 lists the severe drought years, percent water year runoff, LID entitlement and LID headgate diversions. In water short years, the "coordinated run" generally coincides with the hottest time of year when crop water demands are highest. Rationed water supplies are coordinated and scheduled to maximize efficiency of water deliveries and minimize delivery losses, allowing surface water to help landowners meet demands in water short years by supplementing groundwater supplies. In severe drought periods, surface water may be reserved in upstream storage for use during the following year.

Operational Adjustments

Typical water system delivery run times are less in drought periods resulting in a reduction of required staff to monitor and record water deliveries. Furthermore, water system fluctuations are minimized with the coordinated delivery schedule and compressed delivery times, but water demands are generally higher during the daytime hours, mid-week (Monday through Friday).

Enforcement and Appeals

Requirements: Methods and procedures for the enforcement or appeal of, or exemption from, triggered shortage response actions.

The District's water shortage response is informed by the winter's snowpack and resultant supplies at Pine Flat Dam. During drought conditions, a supply shortage influences the available surface water available for the District's grower customers. The enforcement and appeal of water shortage responses are discussed during monthly LID board meetings.

In addition to real-time responses during drought periods, the District takes a proactive approach at groundwater recharge via intentional recharge facilities and canals during the water years in which additional supplies are available.

Monitoring and Evaluation

Requirements: Methods and procedures for monitoring and evaluating the effectiveness of the drought plan.

The District will evaluate the effectiveness of the Drought Plan during 5-year increments, consistent with AWMP updates and assistance with the NFKGSA GSP development. A minimum of 5 years of data is useful for estimating trends, as isolated annual data has a tendency to fluctuate without the necessary context of climactic and policy trends. The District will continue tracking supplies, surface water deliveries, climate data, snowpack, and

groundwater levels to be consistent with existing District operations and in cooperation with the NFKGSA GSP's implementation.

Communication Protocols

Requirements: Communication protocols and procedures to inform and coordinate customers, the public, interested parties, and local, regional, and state government.

The District periodically informs landowners with helpful information on surface water supplies, anticipated length of irrigation runs, changes in policy, and other relevant information to LID's customers. In addition, the District includes information on protocols and procedures on the LID website. Changes in protocols and procedures are further documented in the 5-year updates of the AWMP. In this process, both Fresno and Kings counties, as well as the Department of Water Resources are notified and provided copies.

Financial Impacts

Requirements: A description of the potential impacts on the revenues, financial condition, and planned expenditures of the agricultural water supplier during drought conditions that reduce water allocations and proposed measures to overcome those impacts, including reserve-level policies.

The District revenue is primarily generated by land based assessments that are independent of water supply, and supplemental volumetric water delivery revenue from surface water supplies from the Kings River. Considering this, the District has a supportive system in place to adapt to drought conditions. The greatest current need of LID is the operational and maintenance improvements of existing infrastructure and construction of recharge facilities as supported by landowners in the recently approved Proposition 218 process that increased land-based assessments.

Appendix G – Certified Meter Test Results

GR 4.64

CERTIFIED TEST REPORT

CUSTOMER: CALWEST RAIN

MODEL NO: LP32D-12

METER SERIAL NO: 20151522

CONFIGURATION

METER INSIDE DIAMETER: 12.374

DIAL: AFT X 0.01 5000 GPM

INDEX: 0.9098

TEST FACILITY: Volumetric

CALIBRATION DATA

	FLOW RATE GPM	% ACCURACY
1	5040.00	99.89
2	2565.00	99.65
3	801.03	99.40

TEST DATE: 7/6/2015

PRINT DATE: 2/28/2017

This calibration was performed on a primary or secondary test facility, traceable to the National Institute of Standards and Technology, USA. The estimated flow measurement uncertainty of the calibration facilities are:
Primary +/- 0.15% Secondary +/- 0.5%

McCROMETER
3255 WEST STETSON AVENUE
HEMET, CA 92545 USA
PHONE (951) 652-6811 / FAX (951) 652-3078
WEB SITE: http://www.mccrometer.com E-MAIL: customerservice@mccrometer.com

20151522
20151522

Printed by Kimberly Morton
2/28/2017 1:26:45 PM
Version 1.0 (3/9/2007)

CERTIFIED TEST REPORT

CUSTOMER: LAGUNA IRRIGATION DISTRICT

MODEL NO: OF12D-48

METER SERIAL NO: 20160526

CONFIGURATION

METER INSIDE DIAMETER: 48

DIAL: AFT X 0.1 80 CFS

INDEX: 15.0430

TEST FACILITY: Volumetric

CALIBRATION DATA

	FLOW RATE GPM	% ACCURACY
1	26983.50	101.24
2	15095.67	98.23
3	6522.80	98.75

TEST DATE: 3/31/2016

CERTIFIED BY: Paul Hobbs **PRINT DATE:** 3/31/2016

This calibration was performed on a primary or secondary test facility, traceable to the National Institute of Standards and Technology, USA. The estimated flow measurement uncertainty of the calibration facilities are:
Primary +/- 0.15% Secondary +/- 0.5%

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3255 WEST STETSON AVENUE
HEMET, CA 92545 USA
PHONE (951) 652-6811 / FAX (951) 652-3078
WEB SITE: http://www.mccrometer.com E-MAIL: customerservice@mccrometer.com

20160526
20160526

Printed by Ramiro D. Hernandez
3/31/2016 6:43:15 PM
Version 1.0 (3/9/2007)

WATER SPECIALTIES PROPELLER METER

CERTIFIED TEST REPORT

CUSTOMER: LAGUNA IRRIGATION DISTRICT

MODEL NO: OF12D-48

METER SERIAL NO: 20160527

CONFIGURATION

METER INSIDE DIAMETER: 48

DIAL: AFT X 0.1 80 CFS

INDEX: 14.6200

TEST FACILITY: Volumetric

CALIBRATION DATA

	FLOW RATE GPM	% ACCURACY
1	33853.50	100.95
2	17416.67	99.19
3	6882.00	98.59

TEST DATE: 3/31/2016

CERTIFIED BY: Paul Hobbs **PRINT DATE:** 3/31/2016

This calibration was performed on a primary or secondary test facility, traceable to the National Institute of Standards and Technology, USA. The estimated flow measurement uncertainty of the calibration facilities are:
Primary +/- 0.15% Secondary +/- 0.5%

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20160527

Printed by Ramiro D. Hernandez
3/31/2016 8:26:02 AM
Version 1.0 (3/9/2007)

WATER SPECIALTIES PROPELLER METER

CERTIFIED TEST REPORT

CUSTOMER: LAGUNA IRRIGATION DISTRICT

MODEL NO: OF12D-36

METER SERIAL NO: 20160528

CONFIGURATION

METER INSIDE DIAMETER: 36

DIAL: AFT X 0.1 50 CFS

INDEX: 8.0372

TEST FACILITY: Volumetric

CALIBRATION DATA

	FLOW RATE GPM	% ACCURACY
1	17425.00	101.35
2	10508.67	101.53
3	6052.20	98.98

TEST DATE: 3/31/2016

CERTIFIED BY: Paul Hobbs **PRINT DATE:** 3/31/2016

This calibration was performed on a primary or secondary test facility, traceable to the National Institute of Standards and Technology, USA. The estimated flow measurement uncertainty of the calibration facilities are:
Primary +/- 0.15% Secondary +/- 0.5%

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20160528
20160528

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3/31/2016 11:16:43 AM
Version 1.0 (3/9/2007)

CERTIFIED TEST REPORT

CUSTOMER: LAGUNA IRRIGATION DISTRICT

MODEL NO: OF12D-16

METER SERIAL NO: 20190909

CONFIGURATION

METER INSIDE DIAMETER: 16

DIAL: AFT X 0.01 10 CFS

INDEX: 1.5044

TEST DATE: 6/12/2019

TEST FACILITY: Volumetric

CALIBRATION DATA

	FLOW RATE GPM	% ACCURACY
1	4832.00	100.30
2	2476.00	100.23
3	926.40	98.96

CERTIFIED BY: Robert Galusha **ID#:** 176785 **PRINT DATE:** 6/12/2019

This calibration was performed on a primary or secondary test facility, traceable to the National Institute of Standards and Technology, USA. The estimated flow measurement uncertainty of the calibration facilities are:
Primary +/- 0.15% Secondary +/- 0.5%

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20190909

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6/12/2019 8:19:13 AM
Version 1.0 (3/9/2007)

CERTIFIED TEST REPORT

CUSTOMER: LAGUNA IRRIGATION DISTRICT

MODEL NO: OF12D-16

METER SERIAL NO: 20200925

CONFIGURATION

METER INSIDE DIAMETER: 16

DIAL: AFT X 0.01 10 CFS

INDEX: 1.5080

TEST DATE: 6/29/2020

TEST FACILITY: Volumetric

CALIBRATION DATA

	FLOW RATE GPM	% ACCURACY
1	4873.50	100.35
2	2648.67	101.41
3	550.20	98.70

CERTIFIED BY: Robert Galusha **ID#:** 176785 **PRINT DATE:** 6/30/2020

This calibration was performed on a primary or secondary test facility, traceable to the National Institute of Standards and Technology, USA. The estimated flow measurement uncertainty of the calibration facilities are:
Primary +/- 0.15% Secondary +/- 0.5%

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3255 WEST STETSON AVENUE
HEMET, CA 92545 USA
PHONE (951) 652-6811 / FAX (951) 652-3078
WEB SITE: http://www.mccrometer.com E-MAIL: customerservice@mccrometer.com

20200925

Printed by
6/30/2020 8:19:58 AM
Version 1.0 (3/9/2007)

CERTIFIED TEST REPORT

CUSTOMER: LAGUNA IRRIGATION DISTRICT

MODEL NO: OF12D-16

METER SERIAL NO: 20200924

CONFIGURATION

METER INSIDE DIAMETER: 16

DIAL: AFT X 0.01 10 CFS

INDEX: 1.5044

TEST DATE: 6/29/2020

TEST FACILITY: Volumetric

CALIBRATION DATA

	FLOW RATE GPM	% ACCURACY
1	10398.50	100.66
2	5263.00	101.71
3	757.40	100.23

CERTIFIED BY: Robert Galusha **ID#:** 176785 **PRINT DATE:** 6/29/2020

This calibration was performed on a primary or secondary test facility, traceable to the National Institute of Standards and Technology, USA. The estimated flow measurement uncertainty of the calibration facilities are:
Primary +/- 0.15% Secondary +/- 0.5%

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3255 WEST STETSON AVENUE
HEMET, CA 92545 USA
PHONE (951) 652-6811 / FAX (951) 652-3078
WEB SITE: http://www.mccrometer.com E-MAIL: customerservice@mccrometer.com

20200924

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6/29/2020 12:37:37 PM
Version 1.0 (3/9/2007)

Appendix H – Guidelines Checklist

Laguna Irrigation District - 2020 Agricultural Water Management Plan - Water Code Checklist			
AWMP Location	Guidebook Location	Description	Water Code Section (or as Identified)
Section 1	1.4	AWMP Required?	10820, 10608.12
Section 2.A.	1.4	At least 25,000 irrigated acres	10853
Not Applicable	1.4	10,000 to 25,000 acres and funding provided	10853
Section 1	1.4	April 1, 2021 update	10820 (a)
Section 1	1.4 A.2	Added to the Water Code: AWMP submitted to DWR no later than 30 days after adoption; AWMP submitted electronically	New to the Water Code: 10820(a)(2)(B)
Section 1	1.4 B	5-year cycle update	10820 (a)
Not Applicable	1.4 B	New agricultural water supplier after December 31, 2012 - AWMP prepared and adopted within 1 year	10820 (b)
Section 1	1.6, 5	USBR water management/conservation plan:	10828(a)
Not Applicable	1.6, 5.1	Adopted and submitted to USBR within the previous four years, AND	10828(a)(1)
Not Applicable	1.6, 5.1	The USBR has accepted the water management/conservation plan as adequate	10828(a)(2)
Section 1.A, Section 4.A, Section 4.C	1.4 B	UWMP or participation in area wide, regional, watershed, or basin wide water management planning: does the plan meet requirements of SB X7-7 2.8	10829
Section 1.A	3.1 A	Description of previous water management activities	10826(d)
Section 1.B, Appendix A	3.1 B.1	Was each city or county within which supplier provides water supplies notified that the agricultural water supplier will be preparing or amending a plan?	10821(a)
Section 1.B , Appendix D	3.2 B.2	Was the proposed plan available for public inspection prior to plan adoption?	10841
Section 1.B, Appendix C	3.1 B.2	Publicly-owned supplier: Prior to the hearing, was the notice of the time and place of hearing published within the jurisdiction of the publicly owned agricultural water supplier in accordance with Government Code 6066?	10841
Section 1.B	3.1 B.2	14 days notification for public hearing	GC 6066
Section 1.B, Appendix C	3.1 B.2	Two publications in newspaper within those 14 days	GC 6066
Section 1.B.	3.1 B.2	At least 5 days between publications? (not including publication date)	GC 6066
Not Applicable	3.1 B.2	Privately-owned supplier: was equivalent notice within its service area and reasonably equivalent opportunity that would otherwise be afforded through a public hearing process provided?	10841
Section 1.C.	3.1 C.1	After hearing/equivalent notice, was the plan adopted as prepared or as modified during or after the hearing?	10841
Section 1.B. Table 1	3.1 C.2	Was a copy of the AWMP, amendments, or changes, submitted to the entities below, no later than 30 days after the adoption?	10843(a)
Section 1.B. Table 1	3.1 C.2	The department.	10843(b)(1)
Section 1.B. Table 1	3.1 C.2	Any city, county, or city and county within which the agricultural water supplier provides water supplies.	10843(b)(2)

Laguna Irrigation District - 2020 Agricultural Water Management Plan - Water Code Checklist			
AWMP Location	Guidebook Location	Description	Water Code Section (or as Identified)
Section 1.B. Table 1	3.1 C.2	Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.	10843(b)(3)
Section 1.C.	3.1 C.3	Adopted AWMP availability	10844
Section 1.C.	3.1 C.3	Was the AWMP available for public review on the agricultural water supplier's Internet Web site within 30 days of adoption?	10844(a)
Not Applicable	3.1 C.3	If no Internet Web site, was an electronic copy of the AWMP submitted to DWR within 30 days of adoption?	10844(b)
Section 1.D.	3.1 D.1	Implement the AWMP in accordance with the schedule set forth in its plan, as determined by the governing body of the agricultural water supplier.	10842
Section 2.A	3.3	Description of the agricultural water supplier and service area including:	10826(a)
Section 2.A	3.3 A.1	Size of the service area.	10826(a)(1)
Section 1, Section 2.A	3.3 A.2	Location of the service area and its water management facilities.	10826(a)(2)
Section 2.A	3.3 A.3	Terrain and soils.	10826(a)(3)
Section 2.A	3.3 A.4	Climate.	10826(a)(4)
Section 2.B	3.3 B.1	Operating rules and regulations.	10826(a)(5)
Section 2.B	3.3 B.2	Water delivery measurements or calculations.	10826(a)(6)
Section 2.B	3.3 B.3	Water rate schedules and billing.	10826(a)(7)
Section 2.B	3.3 B.4	Water shortage allocation policies and detailed drought plan	10826(a)(8) 10826.2
Section 3	3.4	Water uses within the service area, including all of the following:	10826(b)(5)
3.B	3.4 A	Agricultural.	10826(b)(5)(A)
3.B	3.4 B	Environmental.	10826(b)(5)(B)
3.B	3.4 C	Recreational.	10826(b)(5)(C)
3.B	3.4 D	Municipal and industrial.	10826(b)(5)(D)
3.B	3.4 E	Groundwater recharge, including estimated flows from deep percolation from irrigation and seepage	10826(b)(5)(E)
Section 4	3.5 A	Description of the quantity of agricultural water supplier's supplies as:	10826(b)
Section 4.A	3.5 A.1	Surface water supply.	10826(b)(1)
Section 4.A	3.5 A.2	Groundwater supply.	10826(b)(2)
Section 5.A	3.5 A.3	Other water supplies, including recycled water	10826(b)(3)
Section 5.A, Section 2.A	3.5 A.4	Drainage from the water supplier's service area.	10826(b)(6)
Section 4.B	2.5 B	Description of the quality of agricultural waters suppliers supplies as:	10826(b)
Section 4.B	3.5 B.1	Surface water supply.	10826(b)(1)
Section 4.B	3.5 B.2	Groundwater supply.	10826(b)(2)
Section 3.G	3.5 B.3	Other water supplies.	10826(b)(3)
Section 4.C	3.5 C	Source water quality monitoring practices.	10826(b)(4)
Section 5.A	3.6	Added to the Water Code: Annual water budget based on the quantification of all inflow and outflow components for the service area.	Added to Water Code: 10826(c)
Section 5.B	3.7 C	Added to the Water Code: Identify water management objectives based on water budget to improve water system efficiency	Added to Water Code: 10826(f)
Section 5.A	3.8 D	Added to the Water Code: Quantify the efficiency of agricultural water use	Added to Water Code: 10826(h)

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AWMP Location	Guidebook Location	Description	Water Code Section (or as Identified)
Section 6.A - Section 6.C	3.9	Analysis of climate change effect on future water supplies analysis	10826(d)
Section 7	4	Water use efficiency information required pursuant to § 10608.48.	10826(e)
Section 7.A	4.1	Implement efficient water management practices (EWMPs)	10608.48(a)
Section 7.A	4.1 A	Implement Critical EWMP: Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of § 531.10 and to implement paragraph (2).	10608.48(b)
Section 7.A	4.1 A	Implement Critical EWMP: Adopt a pricing structure for water customers based at least in part on quantity delivered.	10608.48(b)
Section 7.A	4.1 B	Implement additional locally cost-effective and technically feasible EWMPs	10608.48(c)
Section 7.B	4.1 C	If applicable, document (in the report) the determination that EWMPs are not locally cost- effective or technically feasible	10608.48(d)
Section 7.A	4.1 C	Include a report on which EWMPs have been implemented and planned to be implemented	10608.48(d)
Section 7.A	4.2 C	Include (in the report) an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future.	10608.48(d)
Not Applicable - Section 1	5	USBR water management/conservation plan may meet requirements for EWMPs	10608.48(f)
Not Applicable - Section 8.C	6 A	Lack of legal access certification (if water measuring not at farm gate or delivery point)	CCR §597.3(b)(2)(A)
Not Applicable - Section 8.D	6 B	Lack of technical feasibility (if water measuring not at farm gate or delivery point)	CCR §597.3(b)(1)(B), §597.3(b)(2)(B)
Not Applicable	6 A, 6 B	Delivery apportioning methodology (if water measuring not at farm gate or delivery point)	CCR §597.3.b(2)(C),
Section 8.E	6 C	Description of water measurement BPP	CCR §597.4(e)(2)
Section 8.G	6 D	Conversion to measurement to volume	CCR §597.4(e)(3)
Section 8.H	6 E	Existing water measurement device corrective action plan? (if applicable, including schedule, budget and finance plan)	CCR §597.4(e)(4))