



2020 Agricultural Water Management Plan

Prepared Pursuant to Water Code Section 10826

Lost Hills Water District (LHWD)
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Adopted on April 8, 2021

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Section I: Preparation and Adoption

This Agricultural Water Management Plan (AWMP) represents the 2020 Plan prepared by the Lost Hills Water District to comply with the requirements of the 2018 Water Conservation Legislation (AB 1668 and SB 606). The District has, however, been involved in other water management efforts, as itemized below.

A. Description of Previous Water Management Activities

Water management techniques have been utilized within the District since farming operations began in 1968. Water management practices were reviewed during preparation of the Salt Management Project report in 1983. In October of 1984, the District adopted its first written water conservation plan. In December 1992, the Board of Directors adopted a Water Management plan that conformed with the Agricultural Water Management Planning Act of 1986. In March of 1999, the Board adopted an Updated Water Management Plan for the District. On October 26, 2006 the District's Board adopted a Water Management Plan prepared in compliance with AB 3616 Agricultural Water Suppliers Efficient Water Practices Act of 1990, in accordance with the January 1, 1999 Memorandum of Understanding Regarding Efficient Water Management Practices by Agricultural Water Suppliers in California. The AWMC endorsed LHWD's October 2006 Water Management Plan on August 15, 2007.

In 2012, the District prepared and submitted the "2012 Agricultural Water Management Plan" in compliance with SB X7-7. The objectives of the AWMP were to evaluate the District's current water management practices and identify areas where significant improvements have been made, identify areas to improve the efficiency of water use within the District, and consider past and future water management strategies to increase the reliability of water deliveries to the District. The 2012 report concluded that the District had fully implemented all of the critical and the applicable conditional EWMPs.

In 2015, an update was made to the 2012 AWMP to incorporate the requirements from the Governor's April 1, 2015 Executive Order (B-29-15) to include in the AWMP a detailed drought management plan in addition to quantification of water supplies and demands for the 2013, 2014, and 2015 years to the extent data is available. The update also included information that identified areas to improve the efficiency of water use within the districts and to continue to evaluate the District's water management practices. The 2015 update also considered past and future water management strategies to increase the reliability of water deliveries to the Districts.

This 2020 AWMP is being written in response to the 2018 Water Conservation Legislation (AB 1668 and SB 606). Additionally, it will provide updated information regarding water management practices in the district.

The Westside Water Authority (WWA) was officially formed in April of 2020 to aide in the joint management of operations, contracts, administration, and water transactions for the Lost Hills Water District, Belridge Water Supply District, Dudley Ridge Water District, and

the Berrenda Mesa Water District. Although the WWA manages aspects of the districts, the 4 districts will submit their own AWMP's to capture the various intricacies of each district. In the future they may be combined to use AWMP as described in water code 10829.

B. Coordination Activities

1. Notification of AWMP Preparation

Table 1. summarizes the agencies and parties notified regarding the coordination, adoption, and submittal activities of the AWMP.

LHWD solicited public input by inviting oral and written comments prior to and during the LHWD Board of Directors public hearing on *April 8, 2021*. No comments were received during the public hearing.

2. Public Participation

The District provided notice of public meeting in the Bakersfield Californian on March 15 and 22, 2021 to review and adopt the AWMP (Appendix 1). This notice included the notification of preparation and the notification of the date of the public meeting to be held to review and adopt the AWMP.

The District has not received responses or comments from landowners/customers regarding the AWMP via email, phone calls, and meetings.

| Table 1. Summary of Coordination, Adoption, and Submittal Activities | | | | | | |
|---|------------------------------|------------------------------------|--|-----------------------------|-------------------------------------|--------------------------------------|
| Potential Interested Parties | Notified of Plan Preparation | Requested Copy of Draft (Optional) | Commented on Draft/Action Taken by Supplier (Optional) | Notified of Public Meetings | Attended Public Meetings (Optional) | Copy of Adopted Plan/ Amendment Sent |
| Local County(s) Kern County | | | | | | X |
| Groundwater Management Entity | | | | | | |
| Urban Water Supplier(s) Lost Hills UD | | | | | | |
| City or County Library | | | | | | X |
| Local Agency Formation Commission | | | | | | |
| DWR | X | | | | | X |
| Local Newspaper/ Equivalent Process Bakersfield Californian | | | | | | |
| Other Local Government Agency | | | | | | |
| Other Special Districts Berrenda Mesa Water District (BMWD) Belridge Water Storage District (BWSD) Dudley Ridge Water District (DRWD) Semitropic Water Storage District (SWSD) | X | | | | | X |
| Regional Agency Kern County Water Agency (KCWA) | X | | | | | X |
| Environmental Citizen Group | | | | | | |
| Land Use Agencies | | | | | | |
| Business Group | | | | | | |
| Social Citizen Group | | | | | | |
| Other State Government Agency | | | | | | |
| Federal Government Agency | | | | | | |
| Other (identify) District Landowners /Water Users Ag Water Management Council | | | | | | |
| Website | | | | | | May 1 st , 2021 |

C. AWMP Adoption, Submittal, and Availability

1. AWMP Adoption

The District is submitting the 2020 AWMP included in this document in accordance with AB 1668 and SB 606 requirements and which has been adopted by the Board of Directors on April 8, 2021. Resolution of Plan Adoption by the Board is included in Appendix 2.

2. AWMP Submittal

Copies of the finalized AWMP have been sent to the following agencies:

- DWR
- Kern County
- California State Library
- Lost Hills UD

3. AWMP Availability

The AWMP Update has been posted on the District's web site on May 01, 2021 and can be viewed in the following link: <http://www.lhwd.org>.

D. AWMP Implementation

Plan implementation began with Board adoption on April 8, 2021 and will continue until the next update. Further details on water use efficiency implementation schedule and documentation are described in Sections VII and VIII.

Section II: Description of the Agricultural Water Supply and Service Area

A. Physical Characteristics

1. Size of the service area

The LHWD was formed on February 8, 1963, pursuant to Division 13 of the California Water Code, for the purpose of providing irrigation water from the State Water Project (SWP) to land within the District. The California Water Code gives the District the authority to receive grant funds and construct infrastructure projects. On September 16, 1966, the California District Securities Commission approved the District contract, dated February 4, 1966, with the Kern County Water Agency (KCWA or Agency) and the District was authorized to execute the proposed water supply contract with the Agency. The contract between the District and the Agency was executed on November 10, 1966.

Under its enabling legislation, KCWA was granted the primary power to acquire and contract water supplies, control storm water, reclaim water, reclaim land, and protect

groundwater quality in Kern County. The Agency is an umbrella organization that is a State Water Contractor and obtains water from the SWP for delivery to its 13 member agencies of which LHWD is one of them. After contract execution with the Agency, the District commenced water deliveries in 1968.

District staff includes the Manager, one Operations Supervisor, six operations and maintenance personnel, and two full-time accounting/finance personnel, as well as occasional part-time help. During the off-season, the operations and maintenance personnel perform maintenance activities and some construction of new or upgraded facilities.

A five-member Board of Directors, elected at large for four-year terms, governs the District. All of the Board members must be landowners in the District or be designated as a representative of a landowner. Administration of the District is the responsibility of the General Manager, who reports directly to the Board. The Operations Supervisor, along with the District Manager, is in charge of operation and maintenance. The District has two offices; the administration office is located in Bakersfield and the O&M office is located at the southern end of the District in Lost Hills.

The location of the District is included as

Appendix 3 and the current map of the District is included as Appendix 4. Of the 78,056 acres in the District, 70,453 acres are farmable, although not all this acreage is currently being farmed. Service Area 9 contains oil production fields and is not farmable. Service Area 8 contains lands that have been annexed into the District but are not farmed because no delivery system is available. A portion of Service Area 6 (6E) has been excluded from the District water service area. The net cropped area is currently 28,481 acres all irrigated. The overall District history and size is summarized in Table 2.

| Table 2. Water Supplier History and Size | |
|---|---------------------------------|
| District | LHWD |
| Date of Formation | 8-Feb-63 |
| Source of Water | Applicable sources |
| Local Surface Water | |
| Local Groundwater | Limited |
| Wholesaler | Kern County Water Agency (KCWA) |
| USBR | |
| SWP | Via California Aqueduct |
| Service Area Gross Acreage | 78,056 acres |
| Service Area Acreage | 61,520 acres |
| Non-Service Area Acreage | 16,516 acres |

Contract acres are those acres that have a water supply contract with the District. The remaining farmable land within a service area may be farmed, but the land does not have a water supply contract and the water user must bring water in from outside sources or transfer water from other land. The District primarily supplies agricultural water to growers within its boundaries with a small amount of industrial water delivered annually to agricultural processing facilities and oil production customers. The District supplies no municipal water. The industrial water supplied makes up about one percent of the District's normal annual water deliveries. Most of the water delivered by the District is State Water Project (SWP) water and is delivered to the District through the California Aqueduct.

| Table 3. Water Supplier History and Size | |
|---|---------------------------------|
| Date of Formation | February 8, 1963 |
| Source of Water | Applicable sources |
| Local Surface Water | |
| Local Groundwater | Limited |
| Wholesaler | Kern County Water Agency (KCWA) |
| USBR | |
| SWP | Via California Aqueduct |
| Service Area Gross Acreage | 78,056 acres |
| Service Area Acreage | 61,520 acres |

| Table 4. Expected Changes to Service Area | | |
|--|------------------------------|-------------------------------------|
| Change to Service Area | Estimate of Magnitude | Effect on the Water Supplier |
| Reduced Service Area Size | 0 | None |
| Increased Service Area Size | 0 | None |
| New Governmental Entity | 0 | None |
| Other | 0 | None |

2. Location of the service area and water management facilities

A location map of the District and its proximity to neighboring districts is included as

Appendix 3. The District boundaries begin in the south at the town of Lost Hills, California and extend north and west to the Kings-Kern County line. The District lies in the northwest portion of Kern County, just west of the Kern National Wildlife Refuge. The Aqueduct and Interstate 5 bisect the District diagonally. Highway 46 is located at the south end of the District. Adjacent districts include Dudley Ridge Water District to the north, Berrenda

Mesa Water District to the west, Belridge Water Storage District to the south and Semitropic Water Storage District to the east.

The District delivers SWP water through four turnout locations within Reach 9 and four turnout locations within Reach 10A of the Aqueduct. The District currently owns and operates over 23 miles of concrete and geo-membrane lined canals, 42 miles of pipeline and 27 miles of unlined canals. The District has installed interceptor drains adjacent to a significant portion of the unlined canals, and has taken a majority of the unlined canals out of service. The District has four regulating and spill reservoirs as a part of the distribution system. There are currently 159 active metered turnouts within the District. The District distribution system is shown on Appendix 4. An inventory of the District distribution system facilities currently in use is shown in Table 4 and Table 5.

Table 5. Water Distribution System Inventory (includes 5.1, 5.2, 5.3)

| 5.1. Supply Canals and Laterals | | | | | | | |
|--|----------------|-------------|------|--------------------|----------------|-------------|------|
| Description | Construction | Length (mi) | Note | Description | Construction | Length (mi) | Note |
| Main Canal 1 | Concrete Lined | 6 | | Lateral 4-1 | Pipe | 3.2 | |
| Main Canal 1 | Pipe | 1.2 | | Lateral 4-2 | Pipe | 2.9 | |
| Lateral 1-1 | Pipe | 1.4 | | Lateral 4-3 | Pipe | 2.5 | |
| Lateral 1-2 | Pipe | 2.3 | | Lateral 5-1 | Pipe | 2.6 | |
| Lateral 1-3 | Pipe | 3.1 | | Lateral 5-2 | Pipe | 1.8 | |
| Lateral 1-4 | Pipe | 3.1 | | Connector 5 to 6-1 | Pipe | 1.9 | |
| Lateral 1-5 | Pipe | 1.6 | | Lateral 5-3 | Pipe | 1.4 | |
| Lateral 1-5 | Concrete Lined | 1.5 | | Lateral 5-4 | Pipe | 1.4 | |
| Lateral 1-6 | Pipe | 2.6 | | Canal 6N | Earthen Canal | 4 | ab |
| Lateral 1-7 | Pipe | 1 | | Canal 6E (por) | Earthen Canal | 3.3 | ab |
| Canal 2 S | Concrete Lined | 1.3 | | Canal 6E (por) | Earthen Canal | 5 | ab |
| 2-3 Intertie | Earthen Canal | 1.2 | a | Canal 6E | Earthen Canal | 0.5 | ab |
| Canal 3N | Concrete Lined | 0.5 | | Lateral 6-1 | Earthen Canal | 0.7 | b |
| Canal 3S | Concrete Lined | 0.8 | | Lateral 6-5E | Earthen Canal | 3 | ab |
| Canal 4N | EPDM Lined | 0.7 | | Lateral 6-6 | Earthen Canal | 1.5 | ab |
| Canal 4S | EPDM Lined | 2.2 | | Lateral 6-7 | Earthen Canal | 1.5 | ab |
| Canal 5N | Pipe | 0.2 | | Canal 7N (por) | EPDM Lined | 1 | |
| Canal 5N | Concrete Lined | 1.1 | | Canal 7N (por) | HDPE Lined | 2.5 | |
| Canal 5S | Pipe | 1.2 | | Canal 7N (por) | Earthen Canal | 0.7 | a |
| Canal 5S | Concrete Lined | 0.5 | | Canal 7S | Earthen Canal | 1.8 | a |
| Lateral 2-1 | Concrete Lined | 2 | | Canal 7S | HDPE Lined | 1.3 | |
| Lateral 2-1 | Earthen Canal | 2 | a | District Totals | Lined Canals | 22.7 | |
| Lateral 2-2 | Concrete Lined | 1.3 | | | Unlined Canals | 27.4 | |
| Lateral 2-2 | Earthen Canal | 2.2 | a | Notes | Pipeline | 41.9 | |
| Lateral 3-1 | Pipe | 3.4 | | a | Not in Use | 26.7 | |

| | | | | | |
|-------------|------|-----|---|-------------------|------|
| Lateral 3-2 | Pipe | 3.1 | b | Interceptor Lines | 19.5 |
|-------------|------|-----|---|-------------------|------|

| 5.2. Supply Points - California Aqueduct Turnouts | | | | |
|---|-----------------|----------|----------------|-------------------|
| Description | Pump or Gravity | Capacity | Meter Type | Aqueduct Milepost |
| Turnout 1 | Pump | 225 | Venturi | 189.69 |
| Turnout 2 | Gravity | 115 | Venturi | 191.18 |
| Turnout 3 | Gravity | 60 | Venturi | 194.22 |
| Turnout 4 | Gravity | 100 | Venturi | 196.75 |
| Turnout 5 | Both | 400 | Parshall Flume | 202.05 |
| Turnout 6 | Pump | 0.5 | Not in Use | 204.69 |
| Turnout 7A | Pump | 75 | Parshall Flume | 201.24 |
| Turnout 7B | Pump | 1.8 | Magnetic | 201.24 |
| Turnout 8 | Pump | 0.3 | Propeller | 205.26 |

| 5.3. Miscellaneous Distribution System Components | | | | | | |
|---|------------------|---------------|-----------------|------|------------|-----------------------|
| Service Area | Water Meters per | Pump Stations | | | Reservoirs | Radio Telemetry Units |
| | | Name | Number of Pumps | HP | | |
| 1 | 68 | P.S. 1 | 7 | 4800 | 11 & 12 | 8 |
| 1R | 13 | P.S. 2 | 5 | 950 | 13 | 2 |
| 2 | 15 | --- | --- | --- | 21 | 1 |
| 3 | 11 | --- | --- | --- | --- | 1 |
| 4 | 21 | --- | --- | --- | --- | 2 |
| 5 | 10 | P.S. 5 | 3 | 250 | --- | 3 |
| 6 | 5 | --- | --- | --- | --- | 2 |
| 7 | 16 | P.S. 7 | 3 | 150 | --- | 2 |

| Table 6. Water Conveyance and Delivery System | |
|---|-----------------------------|
| System Used | Number of Miles |
| Unlined Canal | 27.4 (not currently in use) |
| Lined Canal | 22.7 |
| Pipelines | 41.9 |
| Drains | 0 |

The District's distribution system can be classified as a fixed duration-restricted arranged system with deliveries arranged in advance and a normal duration in 24-hour time intervals.

Much of the District's delivery system is automated. Lift pump operation and canal and reservoir water levels can be monitored and controlled remotely through the District's Supervisory Control and Data Acquisition (SCADA) system. Check structures, water levels, and flow rates can be adjusted from nearly anywhere there is an internet connection. This aids in operation of the system and virtually eliminates operational spills.

The District does not own or operate any surface water drainage facilities (on-farm tailwater return systems are owned and operated by the landowners). The District also does not own any on-farm subsurface drainage systems. The District does own a subsurface drain water evaporation pond system, which was acquired from the landowners who built the system. This system includes the evaporation ponds and associated land, and the discharge sumps, pumps and piping (see Section IV.A.4 for a detailed discussion of the subsurface drain water evaporation pond system).

Growers within LHWD have utilized all three of the major irrigation system types: furrow, sprinkler and micro irrigation. Furrow irrigation cannot be used in all parts of the District because of the topography. Historically, furrow irrigation made up the majority of the irrigation systems and the remainder of the systems were sprinkler systems. As drip irrigation technology became available, drip irrigation systems were installed on some of the permanent crop acreage. In the 1980's, many of the permanent crops were converted from furrow or sprinkler systems to micro irrigation systems, either drip or fan-jet irrigation. All of the recent permanent crop plantings have been installed with micro irrigation systems. Currently, pressurized micro irrigation systems (drip and fan-jet systems) account for 100% of the irrigated permanent crop acreage. The permanent crop acreage irrigated with micro irrigation has increased from 8,643 acres (21%) in 1990 to 28,481 acres (100%) in 2020.

For more than 20 years the District has supported and utilized the mobile lab program to measure single event irrigation system distribution uniformities for District Water Users. Each year the mobile lab evaluates several irrigation systems and provides a report to Water Users identifying their distribution uniformity along with recommendations for improvement if needed. The average distribution uniformity from the 2006 - 2020 evaluations ranged between 87% and 97%. This compares to the average distribution uniformity of 82% in 2000 and 75% in 1990. The improved results are directly related to Water User investments in irrigation system improvements and continual management of those systems.

In addition, District Water Users continually monitor soil moisture profiles and utilize CIMIS data to assist in irrigation scheduling. Water Users base irrigation decisions on sophisticated soil moisture reports that evaluate current soil moisture at 1 foot intervals and project crop use based on local CIMIS information.

| Table 7. Water Supplier Reservoirs | |
|---|-------|
| Number | 4 |
| Total Capacity | 95 AF |

| Table 8. Tailwater/Spill Recovery System | |
|---|---------------|
| System | Yes/No |
| District Operated Spill Recovery | Yes |
| Grower Operated Tailwater Recovery | No |

3. Terrain and soils

The United States Department of Agriculture, Natural Resource Conservation Service (NRCS) (formerly the Soil Conservation Service), issued a soil survey of the northwestern portion of Kern County in the fall of 1988. This detailed soil survey included the Lost Hills Water District area. A general soils map of the District taken from the NRCS soil survey is included as Appendix 5. There are numerous soil types within the District with the predominant soil types being the Twisselman and Nahrub clay units, the Panoche and Yribarren clay loam units, the Milham and Twisselman sandy loam units and Kimberlina fine sandy loam. The majority of these soils were formed in alluvium derived predominantly from granitic and/or sedimentary rock.

Table 10) gives the general characteristics of the major soil types within the District and accompanies Appendix 5.

The ground surface within the District slopes generally to the east and northeast and ranges in elevation from about 550 feet in the southwestern portion to 215 feet in the northeast corner of the District. The Aqueduct is approximately at elevation 310 feet and Interstate 5 (I-5) varies from approximately 225 to 240 feet in elevation. Steep slopes are encountered until just east of the Aqueduct and then the slopes start tapering off until east of I-5 where the ground surface is nearly flat.

The Kern River Channel is the only major stream in the District and this channel generally only carries sporadic flood flows. During major storms, minor streams in the hills to the west may produce runoff that will occasionally enter the District.

Land use within the LHWD consists primarily of agricultural lands. Approximately 31,915 acres are in agricultural production with the most common crops being pistachios, pomegranates, and almonds. Other crops include grapes, figs, and other row crops. Some livestock grazing also occurs on previously farmed land (fallow). Table 9 below shows the water year land use in the District. As a result of SWP supply limitations, landowners are not able to irrigate the remaining contract acres in the District. Note, there is not enough historical information to get land use for 2016-2019.

| Table 9. LHWD Water Year Land Use | | | | | |
|--|---------------|---------------|----------|----------|------------|
| Planted Crops | Year | | | | |
| | 1990 | 2000 | 2009 | 2015 | 2020 |
| Cotton | 16,569 | 21460 | 0 | 0 | 0 |
| Alfalfa | | | | | 240 |
| Grains | | | | | 80 |
| Other Row Crops | 9907 | 12580 | 640 | 0 | 0 |
| Row Crop Total | 16,569 | 21,460 | 0 | 0 | 320 |
| Percentage | 64% | 63% | 2% | | 1% |
| | | | | | |
| Almonds | 2579 | 1800 | 7175 | 7095 | 5035 |
| Carrots | 0 | 0 | 0 | 0 | 0 |
| Citrus | 0 | 0 | 0 | 0 | 0 |
| Figs | 510 | 520 | 520 | 520 | 540 |
| Grapes | 2510 | 2560 | 720 | 560 | 320 |
| Pistachios | 7385 | 12645 | 13685 | 13765 | 16380 |
| Pomegranates | 79 | 2375 | 8760 | 5960 | 5886 |

| | | | | | |
|-----------------------------|--------------|--------------|--------------|--------------|--------------|
| Permanent Crop Total | 13063 | 19900 | 30860 | 27900 | 28161 |
| Percentage | | | | | 99% |

Table 10. Landscape Characteristics

| Topography Characteristic | | | % of the District | | | | Effect on Water Operations and Drainage |
|---------------------------|---|---|-------------------------|--|--|---|---|
| Rolling Land | | | (20% of irrigated land) | | | | Land is adaptable to sprinkler and micro irrigation systems. There are no effects on water operations and drainage because of the existence of pressurized irrigation systems |
| Flat Land | | | (80% of irrigated land) | | | | Land is adaptable to flood and other types of irrigation systems |
| Soil Unit | Soil Name / Characteristic / Classification | Description | Percent of District | Depth (in) | Clay (%) | Permeability (in/hr) | Effect on Water Operations and Drainage |
| 115 | Bitewater sandy loam, 9 to 15 percent slopes | Deep, well drained soil is on foothills. Formed in residuum derived dominantly from sandstone. | 0.00 | 0-23 23-40 60-70 | 5-10 5-10 — | 1.98 - 5.95 1.98 - 5.95 1.98 - 5.95 | No irrigation operations impact |
| 124 | Butterflyflow clay, partially drained | Deep, somewhat poorly drained soil is in basins. Formed in alluvium derived dominantly from granitic rock. Slope is 0-2 percent. | 0.29 | 0-9 28-55 55-64 | 48-55 8-15 35-50 | 0.06 - 0.2 1.98 - 5.95 0.06 - 0.2 | No irrigation operations impact |
| 125 | Cajon heavy sand, 0 to 2 percent slopes | Deep, somewhat excessively drained soil is on alluvial fans. Formed in alluvium derived dominantly from granitic rock. | 0.05 | 0-9 9-44 44-60 | 5-18 3-8 5-10 | 5.95 - 19.98 5.95 - 19.98 5.95 - 19.98 | No irrigation operations impact |
| 129 | Cardo-Twisselman saline alkali association, 2 to 15 percent slopes | Cardo (80% of area), clay loam, saline alkali. Moderately deep and well drained soil is on hill tops. Formed in residuum derived dominantly from shale. Twisselman (40% of area), clay, saline alkali. Deep and well drained soils is on side slopes and drainageways. Formed in alluvium derived dominantly from sedimentary rock. | 0.01 | 0-2 2-15 15-30 0-9 9-40 30-60 | 27-32 40-60 30-40 40-60 35-60 — | 0 - 0.06 0 - 0.06 0 - 0.06 0 - 0.06 0 - 0.06 0 - 0.2 | No irrigation operations impact |
| 144 | Delgado sandy loam, 5 to 30 percent slopes | Shallow, somewhat excessively drained soil is on hills. Formed in residuum derived dominantly from sedimentary rock. | 0.06 | 0-2 2-10 10-14 | 5-20 8-20 — | 1.98 - 5.95 1.98 - 5.95 0.2 - 1.98 | No irrigation operations impact |
| 150 | Panchoe loam, 0 to 2 percent slopes | Component is on alluvial fans. Parent material consists of alluvium derived from sedimentary rock. Natural drainage class is well drained. | 0.16 | 0-7 7-60 | 18-27 18-35 | 0.57 - 1.98 0.57 - 1.98 | No irrigation operations impact |
| 156 | Garces silt loam | Deep, well drained, saline-alkali soil is on basin rims. Formed in alluvium derived dominantly from granitic rock. | 1.19 | 0-2 2-9 9-23 23-37 37-60 | 10-18 27-35 20-35 20-27 10-27 | 0.2 - 0.57 0 - 0.06 0 - 0.06 0 0.2 - 0.57 | No irrigation operations impact |
| 157 | Garces silt loam, moderately wet | Deep, well drained, saline-alkali soil is on basin rims. Formed in alluvium derived dominantly from granitic rock. | 0.40 | 0-2 2-9 9-23 23-37 37-60 | 10-18 27-35 20-35 20-27 10-27 | 0.2 - 0.57 0 - 0.06 0 - 0.06 0 0.2 - 0.57 | No irrigation operations impact |
| 164 | Houser fine sandy loam, partially drained | Deep, somewhat poorly drained, saline-alkali soil is on basin rims. Formed in alluvium derived dominantly from granitic rock. Slope is 0-1 percent. | 1.77 | 0-4 4-60 | 5-20 40-60 | 1.98 - 5.95 0.06 - 0.2 | No irrigation operations impact |
| 168B | Twisselman silty clay. Slopes are 0 to 1 percent | Component is on alluvial fans. Parent material consists of alluvium derived from sedimentary rock. Natural drainage class is well drained. | 0.27 | 0-9 9-60 | 40-60 35-60 | 0.06 - 0.2 0.06 - 0.2 | No irrigation operations impact |
| 168B | Twisselman silty clay, saline-alkali | Component is on alluvial fans. Parent material consists of alluvium derived from sedimentary rock. Natural drainage class is well drained. | 0.80 | 0-9 9-60 | 40-60 35-60 | 0.06 - 0.2 0.06 - 0.2 | No irrigation operations impact |
| 174 | Kimberline fine sandy loam, 0 to 2 percent slopes | Deep, well-drained soil on alluvial fans & plains. Formed in alluvium derived dominantly from granitic & sedimentary rock. | 7.44 | 0-9 9-45 45-71 | 6-18 10-18 10-25 | 1.98 - 5.95 1.98 - 5.95 0.57 - 1.98 | No irrigation operations impact |
| 175 | Kimberline sandy loam, 2 to 5 percent slopes | Deep, well-drained soil on alluvial fans & plains. Formed in alluvium derived dominantly from granitic & sedimentary rock. | 1.46 | 0-9 9-45 45-71 | 6-18 10-18 10-25 | 1.98 - 5.95 1.98 - 5.95 0.57 - 1.98 | No irrigation operations impact |
| 176 | Kimberline sandy loam, 5 to 9 percent slopes | Deep, well-drained soil on alluvial fans & plains. Formed in alluvium derived dominantly from granitic & sedimentary rock. | 0.12 | 0-9 9-45 45-71 | 6-18 10-18 10-25 | 1.98 - 5.95 1.98 - 5.95 0.57 - 1.98 | No irrigation operations impact |
| 183 | Lethert silt loam | Deep, moderately well drained, saline-alkali soil on basin rims. Formed in alluvium derived dominantly from granitic & sedimentary rock. | 0.07 | 0-3 3-53 53-60 | 20-27 35-55 10-30 | 0.2 - 0.57 0 - 0.06 0.06 - 0.2 | No irrigation operations impact |
| 189 | Lokem clay, saline-alkali, partially drained | Deep, somewhat poorly drained soil is on basins. Formed in alluvium derived from mixed rock sources, mainly granitic rock. Slope is 0-2 percent. | 0.16 | 0-7 7-21 21-48 48-66 | 48-55 40-60 40-60 10-28 | 0.06 - 0.2 0.06 - 0.2 0.57 - 1.98 0.57 - 1.98 | No irrigation operations impact |
| 196 | Mihum sandy loam, 0 to 2 percent slopes | Deep, well-drained soil on alluvial fans, plains, & low terraces. Formed in alluvium derived dominantly from granitic & sedimentary rock. | 7.95 | 0-10 10-49 49-60 | 5-20 20-35 5-25 | 1.98 - 5.95 0.2 - 0.57 0.57 - 1.98 | No irrigation operations impact |
| 197 | Mihum sandy loam, 2 to 5 percent slopes | Deep, well-drained soil on alluvial fans, plains, & low terraces. Formed in alluvium derived dominantly from granitic & sedimentary rock. | 0.01 | 0-10 10-49 49-60 | 5-20 20-35 5-25 | 1.98 - 5.95 0.2 - 0.57 0.57 - 1.98 | No irrigation operations impact |
| 207 | Nahruh clay, drained | Deep, somewhat poorly drained soil is in basins. Derived dominantly from granitic and sedimentary rock. | 3.54 | 0-18 18-52 52-61 | 40-60 35-50 15-30 | 0 - 0.06 0 - 0.06 0.57 - 1.98 | No irrigation operations impact |
| 208 | Nahruh clay, partially drained | Deep, somewhat poorly drained soil is in basins. Derived dominantly from granitic and sedimentary rock. | 9.90 | 0-18 18-52 52-61 | 40-60 35-50 15-30 | 0 - 0.06 0 - 0.06 0.57 - 1.98 | No irrigation operations impact |
| 209 | Nahruh, drained Lethert complex | Located in basins, 75% Nahruh clay & 25% Lethert silt loam, intermingled | 1.42 | 0-18 18-52 52-61 | 40-60 35-50 15-30 | 0 - 0.06 0 - 0.06 0.57 - 1.98 | No irrigation operations impact |
| 210 | Nahruh, partially drained Lethert complex | Located in basins, 75% Nahruh clay & 25% Lethert silt loam, intermingled | 3.21 | 0-18 18-52 52-61 | 40-60 35-50 15-30 | 0 - 0.06 0 - 0.06 0.57 - 1.98 | No irrigation operations impact |
| 211 | Panchoe clay loam, 0 to 2 percent slopes | Deep, well-drained soil on alluvial fans & plains. Formed in alluvium derived dominantly from granitic or sedimentary rock. | 13.64 | 0-18 18-60 | 27-35 18-35 | 0.57 - 1.98 0.57 - 1.98 | No irrigation operations impact |
| 212 | Panchoe clay loam, 2 to 5 percent slopes | Deep, well-drained soil on alluvial fans & plains. Formed in alluvium derived dominantly from granitic or sedimentary rock. | 4.51 | 0-16 16-60 | 27-35 18-35 | 0.57 - 1.98 0.57 - 1.98 | No irrigation operations impact |
| 213 | Panchoe clay loam, 5 to 9 percent slopes | Deep, well-drained soil on alluvial fans & plains. Formed in alluvium derived dominantly from granitic or sedimentary rock. | 0.10 | 0-16 16-60 | 27-35 18-35 | 0.57 - 1.98 0.57 - 1.98 | No irrigation operations impact |
| 214 | Panchoe clay loam, saline-alkali, 0 to 2 percent slopes | Deep, well-drained soil on alluvial fans & plains. Formed in alluvium derived dominantly from granitic or sedimentary rock. | 0.19 | 0-16 16-60 | 27-35 18-35 | 0.57 - 1.98 0.57 - 1.98 | No irrigation operations impact |
| 215 | Panchoe clay loam, saline-alkali, moderately wet, 0 to 2 percent slopes | Deep, well-drained soil on alluvial fans & plains. Formed in alluvium derived dominantly from granitic or sedimentary rock. | 0.77 | 0-16 16-60 | 27-35 18-35 | 0.57 - 1.98 0.57 - 1.98 | No irrigation operations impact |
| 233 | Twisselman sandy loam, saline-alkali, 0 to 2 percent slopes | Deep, well-drained soil on alluvial fans & basin rims. Formed in alluvium derived dominantly from sedimentary rock. Drainage has been altered due to extensive irrigation. | 5.14 | 0-8 8-60 | 5-20 35-60 | 1.98 - 5.95 0 - 0.06 | No irrigation operations impact |
| 234 | Twisselman sandy loam, saline-alkali, moderately wet, 0 to 2 percent slopes | Deep, well-drained soil on alluvial fans & basin rims. Formed in alluvium derived dominantly from sedimentary rock. Drainage has been altered due to extensive irrigation. | 3.42 | 0-8 8-60 | 5-20 35-60 | 1.98 - 5.95 0 - 0.06 | No irrigation operations impact |
| 235 | Twisselman clay, 0 to 2 percent slopes | Deep, well-drained soil on alluvial fans. Formed in alluvium derived dominantly from sedimentary rock. | 12.88 | 0-14 14-60 | 40-60 35-60 | 0.06 - 0.2 0.06 - 0.2 | No irrigation operations impact |
| 236 | Twisselman clay, 2 to 5 percent slopes | Deep, well-drained soil on alluvial fans. Formed in alluvium derived dominantly from sedimentary rock. | 1.06 | 0-14 14-60 | 40-60 35-60 | 0.06 - 0.2 0.06 - 0.2 | No irrigation operations impact |
| 237 | Twisselman clay, saline-alkali, 0 to 2 percent slopes | Deep, well-drained soil on basin rims. Formed in alluvium derived dominantly from sedimentary rock. Drainage has been altered due to extensive irrigation. | 1.88 | 0-9 9-60 | 40-60 35-60 | 0 - 0.06 0 - 0.06 | No irrigation operations impact |
| 238 | Twisselman clay, saline-alkali, moderately wet, 0 to 2 percent slopes | Deep, well-drained soil on basin rims. Formed in alluvium derived dominantly from sedimentary rock. Drainage has been altered due to extensive irrigation. | 9.65 | 0-14 14-60 | 40-60 35-60 | 0 - 0.06 0 - 0.06 | No irrigation operations impact |
| 239 | Typic Oxisol/Kimberline association, 0 to 5 percent slopes | Deep and well drained. Formed in alluvium derived dominantly from sedimentary rock. | 2.94 | 0-9 9-45 45-71 | 6-18 10-18 10-25 | 1.98 - 5.95 1.98 - 5.95 0.57 - 1.98 | No irrigation operations impact |
| 251 | Yitbarren loam, 0 to 2 percent slopes | Deep, well drained soil on alluvial fans & plains. Formed in alluvium derived dominantly by sedimentary rock. | 0.65 | 0-7 7-19 19-22 22-40 | 20-27 35-55 15-35 15-30 | 0.57 - 1.98 0 - 0.06 0 - 0.06 0.2 - 0.57 | No irrigation operations impact |
| 253 | Yitbarren clay loam, 2 to 5 percent slopes | Deep, well-drained soil on alluvial fans & plains. Formed in alluvium derived dominantly by sedimentary rock. | 2.90 | 0-7 7-19 19-22 22-40 | 20-27 35-55 15-35 15-30 | 0.57 - 1.98 0 - 0.06 0 - 0.06 0.2 - 0.57 | No irrigation operations impact |

4. Climate

The climate of the District is typical of the southern San Joaquin Valley with temperatures in the summer often exceeding one hundred degrees Fahrenheit and low temperatures in the winter occasionally falling below freezing. Summers are generally hot and dry and winters are semi-arid with fog being a common occurrence during the winter. The rain season typically occurs from November to April, and ranges from 2.9 to 9.3 inches per year, with an average of 5.1 inches per year, where about nine-tenths of the rainfall occurs from November through April. The rainfall is sufficient for grazing purposes, but not sufficient for intensive agricultural purposes. Historical average climatology is presented in Tables 11 and 12.

The growing season runs from May through October, although various crops are grown year-round. Reference evapotranspiration ranges from 52.4 to 62.8 inches per year with an average of 58.3 inches per year. The length of the growing season (frost-free period) is about nine months, or around 250 days per year that are available for growing most agricultural crops. The crops must be sustained by irrigation during the hot, dry summers.

| Table 11. Summary Climate Characteristics | |
|---|-----------------------------------|
| | #054 Blackwells Corner, 2006-2020 |
| Climate Characteristic | Value |
| Average Annual Evapotranspiration (inches) | 5.5 |
| Average Annual Precipitation (inches) | 0.4 |
| Annual Minimum Precipitation (inches)* (2016) | (0) 0 |
| Annual Maximum Precipitation (inches)* (2018) | (1.98) 1.8 |
| Average Annual Minimum Temperature (°F) | 49.1 |
| Average Annual Maximum Temperature (°F) | 76.7 |
| Average Minimum Temperature (°F) (January) | 34.4 |
| Average Maximum Temperature (°F) (July) | 97.2 |
| Average Minimum Temperature Range (°F) (November-April) | 39.3 |
| Average Maximum Temperature Range (°F) (May-October) | 89.3 |
| Note: | |
| * Annual minimum and maximum precipitation correspond to the total minimum and maximum value recorded in the corresponding years. | |

| Table 12. Detailed Climate Characteristics | | | | |
|--|-------------------------------|---|---------------------------------|---------------------------------|
| CIMIS Station #054 - Blackwells Corner, 2006-2020 | | | | |
| Month/Time | Average Precipitation, Inches | Average Reference Evapotranspiration (ET _o), Inches | Average Minimum Temperature, °F | Average Maximum Temperature, °F |
| January | 1.09 | 1.71 | 34.39 | 56.25 |
| February | 0.71 | 2.52 | 35.87 | 61.86 |
| March | 0.99 | 4.28 | 42.41 | 67.85 |
| April | 0.51 | 6.11 | 46.55 | 74.72 |
| May | 0.44 | 8.20 | 52.86 | 82.56 |
| June | 0.01 | 9.19 | 60.46 | 91.67 |
| July | 0.02 | 9.90 | 66.15 | 97.21 |
| August | 0.02 | 8.78 | 64.58 | 95.83 |
| September | 0.08 | 6.49 | 59.45 | 90.03 |
| October | 0.14 | 4.32 | 50.19 | 78.69 |
| November | 0.44 | 2.42 | 41.17 | 66.79 |
| December | 0.67 | 1.60 | 35.30 | 57.01 |
| Wet Season* (Nov-Apr) | 0.74 | 3.13 | 39.33 | 64.17 |
| Dry Season* (May-Oct) | 0.71 | 46.89 | 58.95 | 89.33 |
| Extreme Conditions (if applicable) [e.g., 100-year event] | NA | NA | NA | NA |
| Other | NA | NA | NA | NA |
| Notes: | | | | |
| Wet season is defined for November through April. Dry season is defined for May through October. | | | | |
| NA = Not applicable | | | | |

B. Operational characteristics

1. Operating rules and regulations

The District Board of Directors has adopted policies for allocation and delivery of water for agricultural use to lands within the District. A copy of the Water Supply Contract, the Water Supply Contract Standard Provisions, and the Rules and Regulations for Distribution and Use of Water is included in Appendix 7, Appendix 8, and Appendix 9. These policies specify how water is allocated to lands eligible to receive water. The District allows its landowners to buy and sell water among themselves. Landowners that lease their land can assign their water allocation to their lessee, who becomes the water user within the District.

LHWD is a member of the KCWA, a State Water Contractor, and as such the District can only be as flexible with deliveries as the State Department of Water Resources (DWR) allows. Generally, the DWR requires 24-hour advance notice for start up, shut off and flowrate changes at each District turnout. These changes generally occur at 6:00 a.m. and 6:00 p.m. on a daily basis as needed. In an emergency, changes can be made with DWR with little or no warning. In recent years, DWR has been flexible in generally allowing changes with less warning and has allowed limited changes during the day; this aids in District operation and helps growers to irrigate more efficiently. LHWD is also a member

of the Westside District Water Authority (WDWA), which manages SGMA compliance; many of the LHWD landowners are members of the Westside Water Quality Coalition (WWQC), which manages compliance with the Irrigated Lands Regulatory Program (ILRP).

Irrigation deliveries within the District can be classified as a fixed duration-restricted arranged schedule (Table 13). Most of the constraints placed on the District by DWR are passed on to the water user. There are no restrictions on how often a grower can request water, but the quantity of water taken during a season is restricted to the grower's water allocation (Table 14). The only restriction on maximum flowrate is the limitation of the delivery structures (Table 14). Water orders must be placed with the District office 24 hours in advance of the desired irrigation start time (Table 15). Generally, irrigation flowrate changes, including start up and shut off, are accomplished at approximately 6:00 a.m. and 6:00 p.m. to correspond to the turnout changes. The District does have some capacity to allow growers to adjust their flowrate or shut off at odd times occasionally and makes provisions to reduce flows during the 12:00 p.m. to 6:00 p.m. peak energy usage period, but there is not sufficient storage capacity in the District distribution system to allow unlimited rate changes.

| Table 13. Supplier Delivery System | | |
|---|---------------|----------------------------|
| Type | Check if Used | Percent of System Supplied |
| On Demand | | |
| Modified Demand | | |
| Rotation | | |
| Other (fixed duration-restricted arranged schedule) | x | 100 |

| Table 14. Water Allocation Policy | | | | | |
|---|-----------------------|--------|----------------------|-------------|---------------------------------|
| Basis of Water Allocation | (Check if applicable) | | | Allocation | |
| | Flow | Volume | Seasonal Allocations | Normal Year | Percent of Water Deliveries (%) |
| Area within the service area | | | | | |
| Amount of land owned | | | | | |
| Riparian rights | | | | | |
| Other (Water supply contract amount*) | | x | | 2020 | 20% SWP Table A |
| Note: *Some turnouts can be prorated on some days based upon delivery capacity of facilities serving them. Available delivery capacities of distribution facilities are shared in proportion to water supply contract amounts held by turnout operators. | | | | | |

| Table 15. Actual Lead Times | |
|------------------------------------|----------------------|
| Operations | Hours/Days |
| Water orders | 24 hours |
| Water shut-off/changes | 6 a.m. and/or 6 p.m. |
| | |

2. Water delivery measurements or calculations

All of the field turnouts within the District are equipped with flowmeters that indicate the instantaneous flowrate and accumulate the quantity delivered in acre-feet. The meters are read on a daily basis on the turnouts that are operating and all meters are read once a month (Table 16). The District staff is capable of repairing these meters when required.

The DWR maintains measuring devices that measure the amount of water delivered through each of the District's turnouts from the Aqueduct. Measurements are taken continuously by the State (Table 17). At the end of each month, the District totalizes the field turnout deliveries served from each Aqueduct turnout and correlates this with the water orders and the Aqueduct turnout deliveries measured by DWR.

A majority of the pressurized irrigation systems that serve the permanent crops are equipped with in-field meters that are maintained by the farming operation. These meters are used for on-farm water management.

The District maintains software that allows the District to track daily water deliveries for each turnout being used and maintains records of daily water orders for each turnout. The software also summarizes a grower's water use to date and remaining allocation. The District maintains records on the drainage activities on a monthly basis.

DWR maintains records of daily diversions to the District and records of all diversions, water quality, and storage operations related to the SWP. Operational reports are distributed weekly and monthly to the District and published annually in DWR Bulletin 132.

| Table 16. Water Delivery Measurements | | | |
|---|-----------------------------------|-----------------------------------|---------------------------------|
| Measurement Device | Frequency of Calibration (Months) | Frequency of Maintenance (Months) | Estimated Level of Accuracy (%) |
| Orifices (meter gates) | | | |
| Propeller Meters | As needed | As needed | <4% |
| Weirs | | | |
| Flumes | | | |
| Venturi Meters (i.e, DWR) | As needed | As needed | <2% |
| Pump, Run Time | | | |
| Pump, KWH | | | |
| Other (e.g., some land owner operators) | As needed | As needed | <4% |

3. Water rate schedules and billing

The KCWA has a contractual obligation with DWR for SWP water. The District in turn has a contractual agreement with KCWA to pay its proportionate share of capital and operations costs for SWP water.

The District has nine service areas that have different charges associated with them. The District collects its annual water charges through the implementation of the landowner water supply contracts. The water charges are computed by summing five different types of charges that can vary with each service area, all of which are collected on a per acre-foot basis:

The Agency Charge is collected to pay the District's annual obligation of KCWA costs associated with water from the SWP. This cost is the same for all service areas.

The District Capital Charge is collected to satisfy payments of principal and interest, which is due that year on account of then outstanding bonds or repayment contracts, or both, of the District along with any required bond reserve fund. This cost varies from one service area to another.

The Delivery Charge is collected to pay for District costs incurred during the year for operations, maintenance, replacements and energy in delivering water to each service area. This cost does vary in each service area.

The Administrative Charge is collected to meet the costs of the District not included in the Agency Charge, District Capital Charge, Delivery Charge and the ID#9 Charge, and generally includes salaries and other administrative costs as well as potential development and maintenance of reasonable reserves. This charge is the same for all service areas.

The ID#9 Charge is collected to meet the annual fixed costs for the care, operation, management and improvement of the drainage facilities within ID#9, including the payment of salaries and other expenses and for drainage debt repayment obligations.

There are two zones of benefit in ID#9 that correspond to whether the lands are tile drained or not; the tile drained lands pay a higher ID#9 charge than the untitled lands.

A summary of the water delivery charges for contract water for year 2020 is presented in Table 17. The total contract costs/acre-foot totals are based on a full water allocation but are helpful to show trends in the water costs. The actual water cost each year can be significantly higher if the water supply was significantly reduced as a result of shortages.

The District also imposes a Drainage Charge that is levied on a per acre-foot basis for drainwater discharged to the evaporation ponds. The Drainage Charge is only paid by those landowners with on-farm drainage systems that discharge to the evaporation pond system.

In synthesis, the District bills Water Users based on Contract amounts (volume) using uniform rates (Table 18 and Table 19). Bills are sent to the users on a semiannual basis (i.e., 50% by Dec 15 prior year and June 15).

Table 17. Water Charges for Year 2020

| Service Areas | | | | | | | | | |
|-------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|
| Charge | SA 1 | SA 1R | SA 2 | SA 2A | SA 3 | SA 3A | SA 4 | SA 5 | SA 5A |
| Agency Charge | 119.15 | 119.15 | 119.15 | 119.15 | 119.15 | 119.15 | 119.15 | 119.15 | 119.15 |
| District Capital Charge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delivery Charge | 42.77 | 80.61 | 11.24 | 30.79 | 6.21 | 25.76 | 6.24 | 13.16 | 13.16 |
| Administrative Charge | 8.75 | 8.75 | 8.75 | 8.75 | 8.75 | 8.75 | 8.75 | 8.75 | 8.75 |
| ID#9 Charge | 0 | 0 | 0 | 0 | 0 | 0 | 0.34 | 0 | 0.34 |
| Total | 170.67 | 208.51 | 139.14 | 158.69 | 134.11 | 153.66 | 134.48 | 141.06 | 141.4 |
| Service Areas (cont'd) | | | | | | | | | |
| Charge | SA 6 | SA 6A | SA 7 No | SA 7 Nn | SA 7 So | SA 7 Ss | SA 8 | SA 9 | N/A |
| Agency Charge | 119.15 | 119.15 | 119.15 | 119.15 | 119.15 | 119.15 | 119.15 | 119.15 | 0 |
| District Capital Charge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delivery Charge | 4.86 | 4.86 | 15.07 | 40.07 | 15.07 | 32.21 | 4.74 | 15.07 | 0 |
| Administrative Charge | 8.75 | 8.75 | 8.75 | 8.75 | 8.75 | 8.75 | 8.75 | 8.75 | 0 |
| ID#9 Charge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 132.76 | 132.76 | 142.97 | 167.97 | 142.97 | 160.11 | 132.64 | 142.97 | 0 |

| Table 18. Water Rate Basis | | | |
|--------------------------------------|---------------|---------------------------------|---------------------------|
| Water Charge Basis | Check if Used | Percent of Water Deliveries (%) | Description |
| Volume of Water Delivered | x | 100 | Charges are per acre foot |
| Rate and Duration of Water Delivered | | | |
| Acre | | | |
| Crop | | | |
| Land Assessment | | | |
| Other | | | |

| Table 19. Rate Structure | | |
|--------------------------|---------------|---------------|
| Type of Billing | Check if Used | Description |
| Declining | | |
| Uniform | x | Per acre foot |
| Increasing Block Rate | | |
| Other | | |

| Table 20. Frequency of Billing | |
|--|---------------|
| Frequency | Check if Used |
| Weekly | |
| Biweekly | |
| Monthly | |
| Bimonthly | |
| Semiannually (50% by prior December 15 and 50% by June 15) | x |
| Annually | |

4. Drought Management Plan and Water Shortage Allocation Policy

As described in Section IV the District relies on water transfers, supplemental water purchases, and groundwater banking programs as its primary mechanism for enduring periods of drought. Unlike farmers in other areas who can fallow lands during periods of drought, farmers in the District have permanent plantings (trees and vines) that require a minimum water supply to keep alive. In water short years these farmers use deficit irrigation (the application of water below full crop-water requirements) to reduce irrigation water use. This can result in reduced crop yields and, if taken to the extreme, no crop yield and long-term damage.

Determining Drought Severity

The District's primary water source is imported surface water supplies from the SWP. In the fall of each year, DWR operations staff review current Project storage and projected

deliveries through the end of the year, and develop allocation projections for the following year based on a range of forecasted hydrology. DWR declares the initial allocation forecast for the following year at the end of November; this allocation is adjusted up or down as hydrology dictates.

District management maintains a close relationship with Kern County Water Agency and DWR operations staff and uses these allocation projections to determine water supply availability and level of drought severity. These projections are conveyed to District landowners for use in planning their farming operations and projecting supplemental water needs.

Water Shortage Allocation

The District's water allocation policy is described under Article IV Allocation of Water Item 4.02 of the District's Rules and Regulations for Distribution and Use of Water (Appendix 9). When there is shortage of water, water is allocated pro rata among water users (or buyers) on the basis of each user's annual entitlement.

Alternative Water Supplies

As discussed in Section IV, the District relies on banking, transfers, and exchanges to supplement its annual water supply. At all but the higher SWP water allocations, the District is proactive in seeking and securing supplemental water supplies. Since 2009, the District has collaborated in securing additional water with four other agricultural water districts that also rely heavily on the SWP for their water supplies. The other districts are Belridge Water Storage District, Berrenda Mesa Water District, Dudley Ridge Water District, and Wheeler Ridge–Maricopa Water Storage District. Due to their common location on the Westside of the southern San Joaquin Valley, the five districts are informally referred to as the Westside Districts or Westside 5.

Coordination and Collaboration

In addition to the Westside 5, the District coordinates with neighboring local districts where there are common landholders to utilize limited supplies in the most beneficial manner.

Revenues and Expenditures

The majority of the District's expenses are DWR charges that are due regardless of the amount of water delivered. As the SWP allocation gets reduced, the actual cost of the water to the water users increases proportionately.

In addition, at lower SWP allocations, the market for supplemental water becomes more active, which results in higher unit costs to the water users.

| Table 21. Decreased Water Supplies Allocations | |
|--|---------------|
| Allocation Method | Check if used |
| By crop | |
| First come first served | |
| Area in district | |
| Other (% of contract x Available Supplies) | x |
| No specific policy | |

| Table 22. Enforcement Methods of Allocation Policies | |
|---|---------------|
| Enforcement Method | Check if used |
| Fines | |
| Water Shut-off | |
| Other (pro rata on the basis of each user's annual entitlement) | x |
| No specific policy | |

Section III: Description of Quantity of Water Uses

Water year 2020 is chosen as the representative year for this plan (Table 23). For planning purposes, data starts in January 2020 and ends December 2020 (to include a full year of historic data). This “water year” will be the basis to reference the water supplies and water uses that define the water budget in the sections that follow.

| Table 23. Representative Year | |
|------------------------------------|---------------|
| | Description |
| Representative year(s) based upon | 2020 |
| First month of representative year | January 2020 |
| Last month of representative year | December 2020 |

A. Agriculture Water Use

Table 24 illustrates the annual agricultural water use in the District. The District relies only on surface water sources.

| Table 24. Annual Agricultural Water Use (AF) | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|
| Source | 2016 | 2017 | 2018 | 2019 | 2020 |
| Agricultural Water Supplier Delivered | | | | | |
| Surface Water | 82,958 | 89,235 | 85,445 | 89,333 | 83,781 |
| Groundwater | N/A | N/A | N/A | N/A | 8,415 |
| Subtotal | 82,958 | 89,235 | 85,445 | 89,333 | 92,196 |

The overall crop requirement also takes into consideration the leaching requirements and the effective precipitation. The following assumptions were used in the estimates for table 25.

- Crop evapotranspiration (ETc) was derived from the Irrigation Training and Research Centers (ITRC) ETc Table for Irrigation District Water Balances, Zone 16 for Typical Year.
- Leaching requirement was developed from Journal of Irrigation and Drainage Division data to maintain 100% yield potential.
- Effective Precipitation was calculated using a 50% effectiveness coefficient for the months of December and January, and a 100% effectiveness coefficient for the remaining months.

Table 25 illustrates the estimated crop water needs in the District for the years 2016-2020.

| Table 25.1 2020 Agricultural Crop Water Needs Etc (in) | | | | | | |
|---|---------------------|---------------------------|--------------------------------------|---|---------------------------------------|---------------------------------------|
| Crop | Area (acres) | ET Crop (ac-ft/ac) | Leaching Reqmnt LR (ac-ft/ac) | Effective Precip'n Pe (ac-ft/ac) | Total Crop Water Needs (AF/Ac) | Total Crop Water Needs (ac-ft) |
| Alfalfa | 240 | 5.21 | 0.21 | 0.42 | 4.99 | 1,198 |
| Almonds | 5,035 | 3.72 | 0.26 | 0.42 | 3.56 | 17,912 |
| Figs | 540 | 3.42 | 0.21 | 0.42 | 3.21 | 1,732 |
| Grains | 80 | 1.41 | 0.13 | 0.42 | 1.12 | 89 |
| Grapes | 320 | 2.00 | 0.08 | 0.42 | 1.66 | 531 |
| Pistachios | 16,380 | 3.44 | 0.21 | 0.42 | 3.22 | 52,801 |
| Pomegranates | 5,886 | 2.86 | 0.17 | 0.42 | 2.61 | 15,355 |
| Totals | 28,481 | 95,762.98 | 5,899.22 | 12,044.61 | | 89,618 |

Table 25.2 2019 Agricultural Crop Water Needs Etc (in)

| Crop | Area (acres) | ET Crop (ac-ft/ac) | Leaching Reqmnt LR (ac-ft/ac) | Effective Precip'n Pe (ac-ft/ac) | Total Crop Water Needs (AF/Ac) | Total Crop Water Needs (ac-ft) |
|---------------|---------------|--------------------|-------------------------------|----------------------------------|--------------------------------|--------------------------------|
| Alfalfa | 240 | 4.82 | 0.19 | 0.50 | 4.51 | 1,083 |
| Almonds | 5,035 | 3.51 | 0.25 | 0.50 | 3.26 | 16,399 |
| Figs | 540 | 3.22 | 0.19 | 0.50 | 2.92 | 1,576 |
| Grains | 2,111 | 1.19 | 0.11 | 0.50 | 0.81 | 1,708 |
| Grapes | 320 | 1.81 | 0.07 | 0.50 | 1.38 | 443 |
| Pistachios | 16,380 | 3.23 | 0.19 | 0.50 | 2.93 | 47,952 |
| Pomegranates | 5,886 | 2.70 | 0.16 | 0.50 | 2.37 | 13,925 |
| Totals | 30,512 | 92,454.07 | 5,777.26 | 15,143.11 | | 83,088 |

Table 25.3 2018 Agricultural Crop Water Needs Etc (in)

| Crop | Area (acres) | ET Crop (ac-ft/ac) | Leaching Reqmnt LR (ac-ft/ac) | Effective Precip'n Pe (ac-ft/ac) | Total Crop Water Needs (AF/Ac) | Total Crop Water Needs (ac-ft) |
|---------------|---------------|--------------------|-------------------------------|----------------------------------|--------------------------------|--------------------------------|
| Alfalfa | 240 | 5.18 | 0.21 | 0.33 | 5.06 | 1,215 |
| Almonds | 5,035 | 3.77 | 0.26 | 0.33 | 3.71 | 18,666 |
| Figs | 540 | 3.46 | 0.21 | 0.33 | 3.34 | 1,805 |
| Grains | 2,111 | 1.34 | 0.13 | 0.33 | 1.14 | 2,416 |
| Grapes | 320 | 2.00 | 0.08 | 0.33 | 1.76 | 562 |
| Pistachios | 16,380 | 3.44 | 0.21 | 0.33 | 3.32 | 54,377 |
| Pomegranates | 5,886 | 2.90 | 0.17 | 0.33 | 2.74 | 16,156 |
| Totals | 30,512 | 98,975.90 | 6,189.93 | 9,968.27 | 21.08 | 95,198 |

Table 25.4 2017 Agricultural Crop Water Needs Etc (in)

| Crop | Area (acres) | ET Crop (ac-ft/ac) | Leaching Reqmnt LR (ac-ft/ac) | Effective Precip'n Pe (ac-ft/ac) | Total Crop Water Needs (AF/Ac) | Total Crop Water Needs (ac-ft) |
|---------------|---------------|--------------------|-------------------------------|----------------------------------|--------------------------------|--------------------------------|
| Alfalfa | 240 | 5.26 | 0.21 | 0.35 | 5.12 | 1,230 |
| Almonds | 4,850 | 3.86 | 0.27 | 0.35 | 3.77 | 18,306 |
| Figs | 520 | 3.54 | 0.21 | 0.35 | 3.40 | 1,770 |
| Grapes | 560 | 2.04 | 0.08 | 0.35 | 1.77 | 994 |
| Pistachios | 17,505 | 3.58 | 0.21 | 0.35 | 3.44 | 60,280 |
| Pomegranates | 5,960 | 2.96 | 0.18 | 0.35 | 2.79 | 16,637 |
| Totals | 29,635 | 103,287.79 | 6,336.11 | 10,407.81 | | 99,216 |

Table 25.5 2016 Agricultural Crop Water Needs Etc (in)

| Crop | Area (acres) | ET Crop (ac-ft/ac) | Leaching Reqmnt LR (ac-ft/ac) | Effective Precip'n Pe (ac-ft/ac) | Total Crop Water Needs (AF/Ac) | Total Crop Water Needs (ac-ft) |
|---------------|---------------|--------------------|-------------------------------|----------------------------------|--------------------------------|--------------------------------|
| Alfalfa | 240 | 5.50 | 0.25 | 0.30 | 5.44 | 1,306 |
| Almonds | 5,035 | 4.00 | 0.30 | 0.30 | 4.00 | 20,163 |
| Figs | 520 | 3.67 | 0.17 | 0.30 | 3.53 | 1,837 |
| Grapes | 560 | 2.12 | 0.17 | 0.30 | 1.99 | 1,113 |
| Pistachios | 13,765 | 3.70 | 0.34 | 0.30 | 3.74 | 51,443 |
| Pomegranates | 5,960 | 3.07 | 0.14 | 0.30 | 2.91 | 17,359 |
| Totals | 26,080 | 93,812.86 | 7,286.81 | 7,878.77 | | 93,221 |

| Table 26. Irrigated Acres | | | | | |
|---------------------------|--------|--------|--------|--------|--------|
| Represented Year/District | 2020 | 2019 | 2018 | 2017 | 2016 |
| Total Irrigated Acres | 28,481 | 30,512 | 30,512 | 29,635 | 26,080 |

| Table 27. Multiple Crop Information | | | | | |
|-------------------------------------|--------|--------|--------|--------|--------|
| Cropping System | 2020 | 2019 | 2018 | 2017 | 2016 |
| Single-Cropped Acres | 28,481 | 30,512 | 30,512 | 29,635 | 26,080 |
| Inter-cropping | 0 | 0 | 0 | 0 | 0 |
| Double Cropping | 0 | 0 | 0 | 0 | 0 |

B. Environmental Water Use

A small amount of water is occasionally delivered to maintain mitigation ponds associated with the District's evaporation ponds for agricultural subsurface drainage water. The amount is insignificant to the District's overall supplies. Continued water management activities should eliminate the need for these deliveries in the future.

| Table 28. Environmental Water Uses (AF) | | | | | |
|---|------|------|------|------|------|
| Environmental Resources | 2016 | 2017 | 2018 | 2019 | 2020 |
| From Supplier | | | | | |
| Vernal pools | 0 | 0 | 0 | 0 | 0 |
| Streams | 0 | 0 | 0 | 0 | 0 |
| Lakes or reservoirs | 0 | 0 | 0 | 0 | 0 |
| Riparian Vegetation | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 0 | 0 | 0 | 0 |
| Subtotal | 0 | 0 | 0 | 0 | 0 |
| All Sources | | | | | |
| Vernal pools | 0 | 0 | 0 | 0 | 0 |
| Streams | 0 | 0 | 0 | 0 | 0 |
| Lakes or reservoirs | 0 | 0 | 0 | 0 | 0 |
| Riparian Vegetation | 0 | 0 | 0 | 0 | 0 |
| Other (Mitigation Ponds) | 0 | 0 | 0 | 0 | 0 |
| Subtotal | 0 | 0 | 0 | 0 | 0 |
| Overall Totals (From Supplier and From All Sources) | | | | | |
| Vernal pools | 0 | 0 | 0 | 0 | 0 |
| Streams | 0 | 0 | 0 | 0 | 0 |
| Lakes or reservoirs | 0 | 0 | 0 | 0 | 0 |
| Wetlands Subtotal | 0 | 0 | 0 | 0 | 0 |
| Riparian Vegetation | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 |

C. Recreational Water Use

No recreational resources are supported by the District's water supplies (Table 29).

| Table 29. Recreational Water Uses (AF) | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|
| Recreational Facility | 2016 | 2017 | 2018 | 2019 | 2020 |
| None | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 0 | 0 | 0 |

D. Municipal and Industrial Use

A small portion of the District's water supply is delivered to oil production customers and agricultural processors (Table 30) and is termed "industrial water".

| Table 30. Municipal/Industrial Water Uses (AF) | | | | | |
|---|-------------|-------------|-------------|-------------|------------------|
| Municipal/ Industrial Entity | 2016 | 2017 | 2018 | 2019 | 2020 LHWD |
| Municipal Entity | | | | | 0 |
| None | 42 | 46 | 40 | 47 | 30 |
| Subtotal | | | | | |
| Industrial Entity | | | | | |
| Oil Producers | 1202 | 934 | 959 | 875 | 828 |
| Ag Processing | 142 | 451 | 353 | 349 | 404 |
| Subtotal | 1344 | 1385 | 1312 | 1224 | 1256 |
| Total | 1386 | 1431 | 1352 | 1271 | 1286 |

E. Groundwater Recharge Use

No groundwater recharge resources within the District are supported by the District's water supplies. However, the District participates in the Pioneer and the Berrenda Mesa banking projects. In addition, one landowner participates in the Kern Water Bank Authority (all outside of the District on the Kern River alluvial fan).

| Table 31. Groundwater Recharge Water Uses (AF) | | | | | | |
|--|--------------------|----------|----------|----------|----------|----------|
| Groundwater Basin | Method of Recharge | 2016 | 2017 | 2018 | 2019 | 2020 |
| None | Recharge basins | 0 | 0 | 0 | 0 | 0 |
| Voluntary/Opportunistic | | | | | | |
| Other (non-District projects) | Recharge basins | 0 | 0 | 0 | 0 | 0 |
| Pioneer | Recharge basins | 0 | 0 | 0 | 0 | 0 |
| Berrenda Mesa | Recharge basins | 0 | 0 | 0 | 0 | 0 |
| Total | | 0 | 0 | 0 | 0 | 0 |
| Notes: | | | | | | |
| Amounts shown correlate to 2020 recovery. Recharge occurs opportunistically. A 10% factor is applied to recharge account for banking losses. | | | | | | |

F. Transfer and Exchange Use

The District relies on transfers and exchanges to supplement its annual water supply. In recent years, common landowner transfers into the District account for most of the activity in this section.

G. Other Water Use

There are no other water uses in the District (Table 32).

| Table 32. Other Water Uses (AF) | | | | | |
|---------------------------------|----------|----------|----------|----------|----------|
| Water Use | 2016 | 2017 | 2018 | 2019 | 2020 |
| None | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 0 | 0 | 0 |

Section IV: Description of Quantity and Quality of the Water Resources of the Agricultural Water Supplier

A. Water Supply Quantity

1. Surface Water Supply

Most of the water supply utilized within the District is surface water from the State Water Project (SWP) and is delivered to the District through the California Aqueduct (Aqueduct) by virtue of a contract signed with the KCWA. The KCWA in turn has a contract with DWR. In most years, the District purchases supplemental water supplies from KCWA and from other sources to partially offset SWP shortages (Table 34).

The District's annual entitlement of SWP water is 119,110 acre-feet (af). Historically in many years, Article 21 water and Turnback water has been available for purchase that can be used to supplement the District's contract supply. But those supplies have diminished in recent years. In many years, the District is water short and needs to purchase supplemental water from others besides KCWA. Also, the landowners will periodically transfer water into the District to help meet their crop water requirements.

The District's contracted water allotment is subject to deficiencies. Historically these shortages were due to drought conditions but in recent years significant deficiencies are the result of numerous restrictions in the delta by fishery agencies (Table 33). In fact, water supply deficiency is one of the major concerns of the District. Without a firm water supply, it is difficult, if not impossible, for growers to effectively plan for the coming growing season. Often the anticipated water supply changes from month to month and is not finalized until late spring or early summer, by which time it may be too late for a grower to obtain financing or obtain economical supplemental water for crops.

| Table 33. Surface Water Supplies (AF) | | | | | | |
|--|-----------------------|---------------|---------------|---------------|---------------|---------------|
| Source | Diversion Restriction | 2016 | 2017 | 2018 | 2019 | 2020 |
| Pre-1914 water rights | NA | 0 | 0 | 0 | 0 | 0 |
| CVP class I water contract | NA | 0 | 0 | 0 | 0 | 0 |
| SWP water contract | ESA & Delta BiOps | 71,466 | 101,244 | 41,689 | 89,333 | 23,822 |
| Other Surface Water* | ESA & Delta BiOps | -12,815 | 27,080 | 27,550 | 2,729 | 15,743 |
| Banked water recovery | NA | 13,763 | -63,546** | 6333 | -19,704** | 10,547 |
| Upslope drain water | NA | 0 | 0 | 0 | 0 | 0 |
| Carryover | | 10,544 | 24,457 | 10,351 | 17,077 | 33,669 |
| Other | | 0 | 0 | 0 | 0 | 0 |
| Total | | 82,958 | 89,235 | 85,923 | 89,435 | 83,781 |
| Notes: | | | | | | |
| ESA = Endangered Species Act | | | | | | |
| NA = Not Applicable | | | | | | |
| BiOps = Smelt and Salmon Biological Opinions | | | | | | |
| *Other Surface Water = Surface imports – Next Year Carryover | | | | | | |
| ** Negative number indicates Recharged Water | | | | | | |

| Table 34. Restrictions on Water Sources | | | |
|--|-------------------------------------|--------------------------------------|--|
| Source | Restrictions* | Name of Agency Imposing Restrictions | Operational Constraints |
| SWP | ESA & Water Quality | USF&WS, NMFS & SWRCB | Restricted Delta Pumping |
| SWP | Facility Operations and Maintenance | NA | Restricted SWP Deliveries and increased cost |
| | | | |
| Notes: | | | |
| SWP = State Water Project | | | |
| *ESA = Endangered Species Act protection measures | | | |
| *USF&WS = US Fish and Wildlife Service | | | |
| *NMFS = National Marine Fisheries Service | | | |
| *SWRCB = State Water Resources Control Board | | | |
| *Water Quality restrictions relate to maintenance of Delta salinity standards. | | | |

2. Groundwater Supply

A few private groundwater wells have historically supplied limited amounts of water for blending with SWP water, usually during shortage years. Limited records are available of the historical quantity of water pumped, as these were private wells. LHWD contacted the landowners for pumper groundwater quantities shown in table 38. The District does participate in the Berrenda Mesa and Pioneer groundwater banking projects to supplement dry-year water supplies.

The District drilled a test well in late 1992 in Service Area 6 in an attempt to find some good quality groundwater that could be used to supplement the surface water supply

during shortage years and help stabilize the water supply. This well was drilled to a depth of 900 feet, and when the water was tested in 1992, the water quality analysis showed total dissolved solids of 372 mg/l and an electrical conductivity of 0.62 µmhos/cm, which is generally acceptable for irrigation.

The District periodically monitors the water level in the test well that was drilled in 1992. The most recent information obtained by the District shows the standing water level at approximately 185 feet. Farming operations in the area of this well have ceased and the well has not been utilized for a number of years.

The District periodically operates a well to supply water to its evaporation basin mitigation site. The water quality is not suitable for agricultural use.

3. Sustainable Groundwater Management Act (SGMA)

Lost Hills Water District is located within the Kern Subbasin (Table 35). Lost Hills' SGMA compliance is handled through the Westside District Water Authority (WDWA), which is a member of the Kern Groundwater Authority (KGA), a Groundwater Sustainability Agency in the Kern Subbasin. An initial plan was submitted in early 2020, and the WDWA has been employing the management actions since then. The Management Area Plan (MAP) outlined three management actions to be completed over the course of SGMA implementation. All the management actions identified in the WDWA chapter GSP continue to progress. The three current management actions as stated in the WDWA chapter GSP are:

- Collection and analysis of representative hydrogeologic data to remedy a documented lack of groundwater data in the Westside.
- Water resource coordination – due to poor groundwater quality, Westside landowners rely primarily on surface water. As such to further reduce groundwater use and increase drought resiliency, WDWA Districts and their landowners will continue to work cooperatively in pursuing supplemental surface water opportunities, including trades and purchases both between themselves and with parties outside of the WDWA.
- Conjunctive reuse of brackish water as a new source of water supply is in the feasibility study and economic assessment phase. Sources of brackish water under study for treatment and beneficial reuse include groundwater with TDS above 2,000 mg/L and oilfield produced water.

For more information on Lost Hills Water District's compliance with SGMA, please see the Kern Groundwater Authority Groundwater Sustainability Plan, and reference the WDWA Management Area Plan.

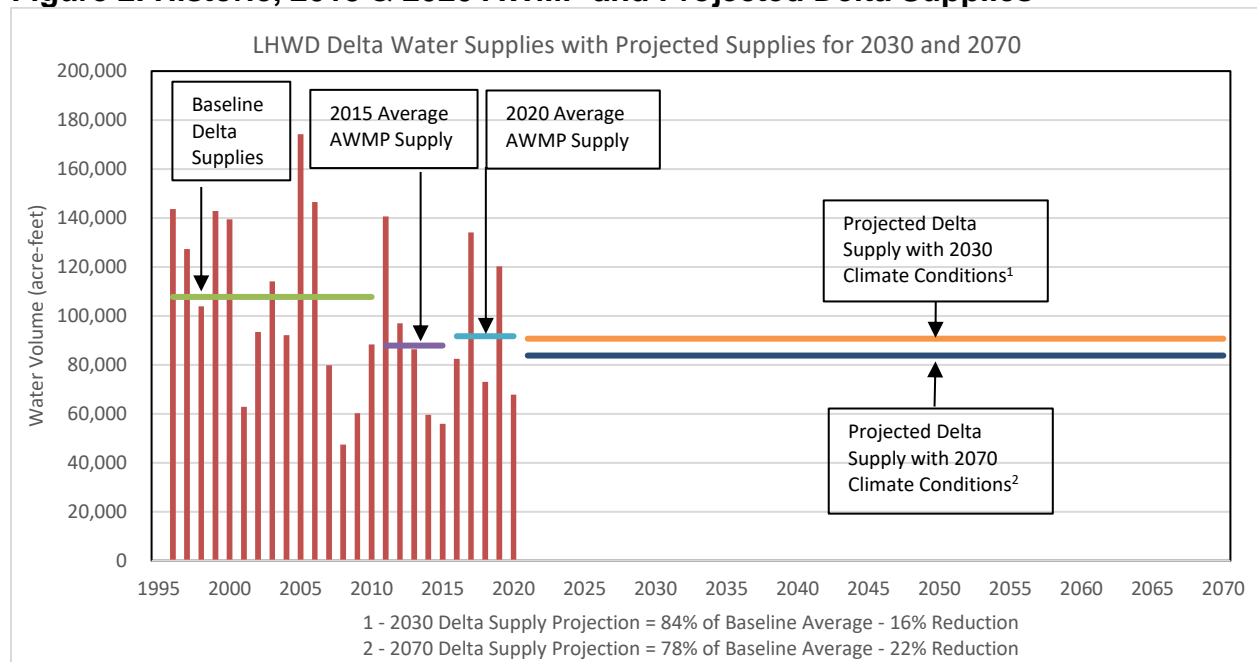
| Table 35. Groundwater Basins | | | |
|---|----------------|----------------------|--------------------|
| Basin Name | Size (Sq. Mi.) | Usable Capacity (AF) | Safe Yield (AF/Yr) |
| LHWD portion of Kern sub-basin of Tulare Lake basin (Water Banking Projects) | 116 | Unknown | Unknown |
| | | | |
| Note: Area of main Tulare Lake Hydrologic Region: 5,149,000 acres = 8,045 sq. mi. Area of Kern County sub-basin: 1,950,000 acres = 3,047 sq. mi. (37.9% of Tulare Lake Hydrologic Region) Area of LHWD: 74,357 acres = 116 sq. mi. (3.8% of Kern County Sub-basin) | | | |

4. Delta Plan Consistency

To provide “the expected outcome for measurable reduction in Delta reliance”, baseline historic Delta supplies delivered to DRWD were compared to supplies delivered over the past decade. Additionally, Delta supply reduction projections were made for comparison and future planning. For the purposes of comparison, the historic baseline period selected begins in 1996 and ends in 2010 because it is consistent with the typical historic water budget reporting period included in the recently completed Groundwater Sustainability Plans. This period provides a reasonable time frame for assessing average current conditions and to demonstrate consistency with reduced Delta reliance after enactment of the Delta Reform Act (2009). The table below shows projected water supplies from the Delta. The California Water Commission CALSIM 2030 and 2070 climate change scenarios were used to project future water supplies under 2030 and 2070 climate change scenarios. The table and figure below demonstrate reduced Delta reliance. Over the 2015 AWMP period, a 18% reduction in Delta water supplies was observed when compared to the baseline condition discussed above. Over the past decade (combined 2015 and 2020 AWMP period), a 15% reduction was observed. Due to increasing environmental commitments and restrictions on Delta Flows, landowners in the District will continue to experience reductions in Delta supply, likely exceeding the 2030 and 2070 projections.

| Table 36. Comparison of Historic Average Annual Delta Supplies vs. Projected Average Annual Delta Supplies | | | | | |
|--|-------------------------------------|--------------------------------|--------------------------------|--|--|
| Value | Baseline Delta Supplies (1995-2010) | 2015 Conditions Delta Supplies | 2020 Conditions Delta Supplies | 2030 Climate Conditions Delta Supplies | 2070 Climate Conditions Delta Supplies |
| Average Annual Supplies | 108,000 | 88,000 | 92,000 | 91,000 | 84,000 |
| Percent of Baseline Supply | n/a | 82% | 85% | 84% | 78% |
| Percent Reduction in Supplies | | 18% | 15% | 16% | 22% |

Figure 2. Historic, 2015 & 2020 AWMP and Projected Delta Supplies



| Table 37. Groundwater Management Plan | |
|---------------------------------------|------|
| Written By | LHWD |
| Year | 2020 |
| Is Appendix Attached? | Yes |

| Table 38. Groundwater Supplies (AF) | | | | | | |
|-------------------------------------|-----------------------|------|------|------|------|-------------|
| Groundwater Basin | Diversion Restriction | 2016 | 2017 | 2018 | 2019 | 2020 |
| Water Supplier Direct Pumping | None | N/A | N/A | N/A | N/A | NA |
| Private Pumping | None | N/A | N/A | N/A | N/A | 8415 |
| Transfers / Exchanges | None | N/A | N/A | N/A | N/A | NA |
| TOTAL | | | | | | 8415 |

5. Other Water Supplies

The District has no other water supplies.

6. Drainage from the Water Supplier's Service Area

A significant portion of land within the District is affected by saline shallow groundwater. Shallow groundwater in the area is high in salts and some other naturally occurring elements, including Boron and Selenium. Approximately 6,800 acres within the District are currently tile drained and produce subsurface drainwater that is routed to evaporation ponds. The tiled land is primarily located in Service Area 4, although some tiled land is located in the northern area of Service Area 5. The evaporation ponds were installed by landowners and later acquired by the District. Portions of Service Areas 2, 3, 6 and the remainder of 5 are also subject to some perched water conditions but do not currently have any drainage facilities.

When the District acquired the evaporation pond system from the landowners in 1993, the system was composed of 6 ponds totaling 660 acres. Through drainage reduction efforts, the District has been able to reduce drainage inflows and also reduce the size of the evaporation pond system. Significant cropping pattern changes, installation of micro-irrigation systems, and canal lining in the drainage area also helped to reduce the amount of drainwater collected. The District's evaporation pond system is now comprised of four interconnected evaporation ponds. During 2012 only one pond totaling 12 acres was utilized. The amount of drainwater discharged to the evaporation pond system has been reduced from a high of 3,831 AF in 1989 to less than 100 AF in 2012. The District conducts a monitoring and wildlife hazing program at the pond system in compliance with the Waste Discharge Requirement issued by the Regional Water Quality Control Board (RWQCB).

The evaporation pond system is shown in Appendix 6. Table 39 lists evaporation surface areas for the evaporation pond system as acquired by the District in 1993:

| Table 39. Evaporation Pond Acres | | | | | | | |
|----------------------------------|--------|--------|---------|---------|---------|--------|-------|
| | Pond 1 | Pond 2 | Pond 3A | Pond 3B | Pond 3C | Pond 4 | Total |
| Area (ac) | 200 | 114 | 112 | 65 | 12 | 31 | 534 |

In 1995, Pond 3C and Pond 4 (an emergency overflow cell which was used for a few years while Pond 2 was being constructed) were closed in accordance with the District's Closure Plan. Ponds 3C and 4 have been eliminated from future regular service by removing all of the levees that are not adjacent to other active ponds. Closure activities were initiated on Ponds 3A and 3B in 1996 but not completed. In 2002, one levee of Pond 3A that had previously been removed was rebuilt so that Pond 3A could be used to store drain water as an alternative for Pond 1 and/or Pond 2. Pond 3B was re-configured into a smaller (12 acre) pond to allow the District greater flexibility in managing the depth of the ponded drainwater. In 2012, closure activities were initiated in Pond 1 which contains 200 acres.

There are three sump discharges into the pond system where the drainage volume is metered. The historical volume entering the various ponds is shown below for each calendar year (Table 40).

| Table 40. Historical Drainage Volumes (AF) (1988-2020) | | | | | |
|---|--------|--------|---------|---------|-------|
| Calendar Year | Pond 1 | Pond 2 | Pond 3A | Pond 3B | Total |
| 1988 | 1676 | 0 | 321 | 455 | 2452 |
| 1989 | 2662 | 0 | 490 | 679 | 3831 |
| 1990 | 1995 | 0 | 446 | 647 | 3088 |
| 1991 | 810 | 0 | 334 | 690 | 1834 |
| 1992 | 979 | 0 | 12 | 734 | 1725 |
| 1993 | 1010 | 810 | 0 | 34 | 1854 |
| 1994 | 1092 | 647 | 0 | 0 | 1739 |
| 1995 | 791 | 758 | 0 | 0 | 1549 |
| 1996 | 1057 | 443 | 0 | 0 | 1500 |
| 1997 | 1086 | 545 | 0 | 0 | 1631 |
| 1998 | 864 | 446 | 0 | 0 | 1310 |
| 1999 | 1150 | 321 | 0 | 0 | 1471 |
| 2000 | 1064 | 405 | 0 | 0 | 1469 |
| 2001 | 480 | 161 | 0 | 0 | 641 |
| 2002 | 494 | 0 | 12 | 0 | 506 |
| 2003 | 10 | 0 | 675 | 0 | 685 |
| 2004 | 0 | 0 | 330 | 0 | 330 |
| 2005 | 0 | 0 | 101 | 0 | 101 |
| 2006 | 0 | 0 | 0 | 105 | 105 |
| 2007 | 0 | 0 | 0 | 72 | 72 |
| 2008 | 0 | 7 | 0 | 68 | 75 |
| 2009 | 4 | 5 | 0 | 11 | 20 |
| 2010 | 0 | 0 | 10 | 39 | 49 |
| 2011 | 0 | 0 | 0 | 94 | 94 |
| 2012 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 |
| 2014 | 0 | 0 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 | 0 | 0 |
| 2017 | 0 | 0 | 0 | 0 | 0 |
| 2018 | 0 | 0 | 0 | 0 | 0 |
| 2019 | 0 | 0 | 0 | 0 | 0 |
| 2020 | 0 | 0 | 0 | 0 | 0 |

As part of the annual evaporation pond monitoring program, the District monitors a series of observation wells around the perimeter of the ponds as shown in Appendix 6.

With cooperation from water users implementing drainage reduction measures and changes in cropping patterns, there has been no drainwater discharged into the pond system in recent years (Table 41). As mentioned earlier, the District reconfigured Pond 3B into a smaller cell to minimize the ponded area and maximize the pond water depth in the future.

| Table 41. Drainage Discharge (AF) | | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|-------------------------------------|
| Surface/ Subsurface Drainage Path | 2020 | 2019 | 2018 | 2017 | 2016 | Inside/ Outside Service Area |
| Subsurface drainage into evaporation pond | 0 | 0 | 0 | 0 | 0 | Inside |

B. Water Supply Quality

1. Surface Water Supply

There have been no water quality problems that limit the use of the SWP water within the District. The District does not monitor the surface water quality since all of the water delivered by the District is from the SWP and other agencies are already analyzing this water. The DWR has an on-going monitoring program where the quality of the SWP water is monitored on a monthly basis. The water is sampled at several locations along the Aqueduct and analyzed for electrical conductivity, standard minerals, selected trace elements and chemical residue. Table 42 presents historical water quality data for the months of January and June for the years 2010 through 2020. The water quality data shown in Table 42 was collected by DWR at Check 21 in the Aqueduct near Kettleman City, just upstream of the District.

The SWP water quality is generally very good for irrigation purposes, although even good quality water contains some salt. The evapotranspiration (ET) process returns water to the atmosphere but leaves the salts behind in the soil. To avoid damaging buildup of salt in the crop root zone, water in excess of the crops' ET is required. The amount of excess water needed, known as the leaching requirement, varies with the crop, soil, climate and quality of the applied water and is used as an indicator of the minimum amount of water needed to flush salts from the root zone.

Table 42. Surface Water Supply Quality

| Selected Laboratory Results | | | | | | | | | | | | | | | | | |
|---|-------|--|-----------|-----------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|--|
| Station Name/NR | | CALIFORNIA AQU NR KETTLEMAN CK-21 (KA017226) | | | | | | | | | | | | | | | |
| | | Sample Date | | | | | | | | | | | | | | | |
| Parameter | Units | 1/12/2010 | 6/15/2010 | 1/18/2011 | 6/14/2011 | 1/17/2012 | 6/19/2012 | 1/15/2013 | 6/18/2013 | 1/14/2014 | 6/17/2014 | 1/20/2015 | 6/16/2015 | 1/14/2020 | 6/16/2020 | | |
| Alkalinity as CaCO ₃ | mg/L | 78 | 76 | 47 | 40 | 77 | 73 | 72 | 72 | 89 | 93 | 95 | 92 | 71 | 76 | | |
| Aluminum | mg/L | N/A | N/A | N/A | 1,173,0.175* | 0.077 | 0.092 | 0.124 | 0.048 | r | r | 0.015 | r | 0.0441 | 0.063 | | |
| Dissolved Ammonia | mg/L | 0.04 | 0.01 | 0.05 | <0.01 | 0.02 | 0.01 | 0.05 | r | 0.002 | 0.02 | 0.08 | 0.04 | <0.05 | <0.05 | | |
| Dissolved Arsenic | mg/L | 0.002 | 0.002 | 0.001 | 0.001 | 0.002 | 0.002 | 0.001 | 0.002 | 0.001 | 0.003 | 0.004 | 0.002 | <0.001 | 0.002 | | |
| Arsenic | mg/L | N/A | N/A | N/A | 0.001 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.003 | 0.004 | 0.003 | 0.0023 | 0.002 | | |
| Barium | mg/L | N/A | N/A | N/A | N/A | <0.05 | 0.039 | 0.033 | 0.033 | 0.031 | 0.026 | 0.045 | 0.039 | 0.037 | 0.032 | | |
| Dissolved Beryllium | mg/L | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | r | r | r | r | r | r | <0.001 | <0.001 | | |
| Beryllium | mg/L | N/A | N/A | N/A | <0.001 | <0.001 | <0.001 | r | r | r | r | r | r | <0.001 | <0.001 | | |
| Dissolved Boron | mg/L | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.1 | 0.151 | | |
| Dissolved Bromide | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.18 | 0.193 | | |
| Dissolved Cadmium | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <0.001 | <0.001 | | |
| Cadmium | mg/L | N/A | N/A | N/A | <0.001 | <0.001 | <0.001 | r | r | r | r | r | r | <0.001 | <0.001 | | |
| Dissolved Calcium | mg/L | 22 | 21 | 15 | 12 | 22 | 20 | 22 | 22 | 25 | 25 | 26 | 25 | 18 | 19 | | |
| Dissolved Chloride | mg/L | 75 | 70 | 28 | 24 | 109 | 62 | 74 | 76 | 107 | 110 | 116 | 109 | 59.5 | 68 | | |
| Dissolved Chromium | mg/L | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | r | r | r | r | r | r | <0.001 | <0.001 | | |
| Chromium | mg/L | N/A | N/A | N/A | 0.001 | 0.003 | 0.001 | r | r | r | r | r | r | <0.001 | <0.001 | | |
| Conductance (EC) µS/cm | µS/cm | 496 | 449 | 259 | 223 | 630 | 426 | 474 | 469 | 624 | 648 | 671 | 645 | 415 | 450 | | |
| Dissolved Copper | mg/L | 0.002 | 0.002 | 0.008 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | <0.001 | 0.001 | | |
| Copper | mg/L | N/A | N/A | N/A | 0.002 | 0.002 | 0.001 | 0.002 | 0.002 | 0.001 | 0.002 | 0.002 | 0.002 | 0.003 | <0.001 | | |
| Dissolved Hardness as CaCO ₃ | mg/L | 112 | 105 | 68 | 53 | 114 | 98 | 113 | 111 | 132 | 135 | 137 | 136 | 93 | 95 | | |
| Dissolved Iron | mg/L | <0.005 | <0.005 | 0.017 | 0.016 | 0.019 | <0.005 | 0.034 | r | 0.005 | r | r | r | <0.005 | 0.0132 | | |
| Iron | mg/L | N/A | N/A | N/A | 1,389,0.395* | 0.131 | 0.12 | 0.14 | 0.08 | 0.017 | 0.017 | 0.017 | 0.023 | 0.099 | 0.076 | | |
| Kjeldahl Nitrogen as N | mg/L | 0.4 | 0.4 | 0.6 | 0.4 | 0.4 | 0.3 | 0.5 | 0.5 | 0.4 | 0.5 | 0.5 | 0.5 | 0.4 | 0.3 | | |
| Dissolved Lead | mg/L | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | r | r | r | r | r | r | <0.001 | <0.001 | | |
| Lead | mg/L | N/A | N/A | N/A | <0.001 | <0.001 | <0.001 | r | r | r | r | r | r | <0.001 | <0.001 | | |
| Dissolved Lithium | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | | |
| Dissolved Magnesium | mg/L | 14 | 13 | 8 | 6 | 15 | 12 | 14 | 14 | 17 | 18 | 18 | 18 | 11 | 11.6 | | |
| Dissolved Manganese | mg/L | <0.005 | <0.005 | 0.006 | <0.005 | <0.005 | <0.005 | r | 0.005 | r | 0.005 | 0.01 | r | <0.005 | <0.005 | | |
| Manganese | mg/L | N/A | N/A | N/A | 0.049,0.05** | 0.014 | 0.021 | 0.007 | 0.015 | 0.008 | 0.015 | 0.023 | 0.017 | 0.013 | 0.018 | | |
| Dissolved Mercury | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <0.0002 | <0.0002 | | |
| Dissolved Molybdenum | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | | |
| Dissolved Nickel | mg/L | 0.001 | 0.001 | 0.002 | <0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | <0.001 | 0.002 | | |
| Nickel | mg/L | N/A | N/A | N/A | 0.002 | 0.001 | 0.001 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | | |
| Dissolved Nitrate | mg/L | 3.7 | 2.5 | 2.9 | 2.4 | 3.8 | 1.8 | 4.6 | 1.6 | 2.4 | 0.4 | 0.2 | 2 | 4.6 | 0.7 | | |
| Dissolved Nitrate + Nitrite as N | mg/L | 0.69 | 0.54 | 0.65 | 0.41 | 0.87 | 0.4 | 1 | 0.32 | 0.57 | 0.09 | r | 0.49 | 1.06 | 0.156 | | |
| Dissolved Ortho-phosphate as P | mg/L | 0.05 | 0.08 | 0.08 | 0.05 | 0.06 | 0.06 | 0.07 | 0.05 | 0.05 | 0.05 | 0.08 | 0.08 | 0.085 | 0.054 | | |
| Dissolved Organic Carbon | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.5 | 3.3 | | |
| Total Organic Carbon | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.7 | 3.2 | | |
| Phosphorus | mg/L | 0.09 | 0.1 | 0.12 | 0.11 | 0.08 | 0.08 | 0.09 | 0.08 | 0.07 | 0.08 | 0.09 | 0.1 | 0.08 | 0.07 | | |
| Dissolved Selenium | mg/L | 0.001 | 0.001 | 0.001 | <0.001 | <0.001 | 0.001 | r | r | 0.001 | 0.001 | 0.001 | 0.001 | <0.001 | 0.001 | | |
| Selenium | mg/L | N/A | N/A | N/A | <0.001 | <0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 | <0.001 | 0.001 | | |
| Silver | mg/L | N/A | N/A | N/A | <0.001 | <0.001 | <0.001 | r | r | r | r | r | r | <0.001 | <0.001 | | |
| Dissolved Sodium | mg/L | 52 | 50 | 24 | 21 | 68 | 46 | 56 | 54 | 76 | 80 | 79 | 71 | 45 | 48 | | |
| Total Dissolved Solids | mg/L | 275 | 274 | 151 | 124 | 347 | 236 | 270 | 261 | 345 | 367 | 370 | 357 | 230 | 249 | | |
| Total Suspended Solids | mg/L | 2 | 11 | 7 | 20 | 2 | 11 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 2.3 | | |
| Volatile Suspended Solids | mg/L | 1 | <1 | 1 | 2 | <1 | 3 | r | 1 | 1 | r | r | r | <1 | <1 | | |
| Dissolved Strontium | mg/L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | | |
| Dissolved Sulfate | mg/L | 42 | 43 | 26 | 25 | 45 | 35 | 44 | 40 | 52 | 52 | 47 | 52 | 31 | 36 | | |
| Dissolved Zinc | mg/L | <0.005 | <0.005 | 0.005 | <0.005 | <0.005 | <0.005 | r | r | r | r | r | r | <0.005 | <0.005 | | |
| Zinc | mg/L | N/A | N/A | N/A | <0.005 | <0.005 | <0.005 | 0.005 | r | r | r | r | 0.007 | <0.005 | <0.005 | | |
| pH | | 8 | 8.2 | 7.6 | 7.7 | 7.8 | 8.1 | 7.6 | 7.8 | 8.6 | 8.7 | 8 | 8.2 | 7.7 | 8.7 | | |

http://www.water.ca.gov/waterdata/library/waterquality/station_county/select_station.cfm?URLStation=KA017226&source=map
 mg/L = milligrams per liter
 µS/cm = microSiemens per centimeter

2. Groundwater Supply

There are three groundwater zones within the District: "perched" or shallow, "unconfined" and "confined". Shallow groundwater is found above a clay layer called the "A" clay, which is about 40 feet below the ground surface. This shallow groundwater is generally of such poor quality that it is unacceptable for irrigation use. Observation wells located within the shallow groundwater area have shown TDS (total dissolved solids) levels ranging from 5,000 to near 100,000 parts per million (ppm). In recent years, shallow observation wells have been dry, with very few exceptions.

The unconfined aquifer lies on top of a thick, nearly impervious clay layer called the Corcoran Clay. The Corcoran Clay lies 600 to 700 feet below the ground surface. The water quality of the unconfined aquifer as measured by KCWA generally ranges from 500 to over 5,000 ppm TDS within the eastern part of the District. KCWA's mapping of the

unconfined aquifer terminates near the Aqueduct so very little information is available for the area west of the Aqueduct. The maps prepared by KCWA utilize chemical analyses of well water samples collected over several years.

The confined aquifer is found below the Corcoran Clay. This water is generally of better quality than the unconfined aquifer water and is the best chance to obtain useable groundwater within the District. The water quality of the confined aquifer as measured by KCWA generally ranges from 500 to 3,000 ppm TDS within the eastern part of the District. The northeast corner of the District appears to contain the best quality groundwater, and is where the majority of groundwater in 2020 was pumped.

3. Other Water Supplies

Water transferred into the District and/or returned from banking projects has Aqueduct quality (because it is exchanged and conveyed in the Aqueduct).

4. Drainage from the Water Supplier's Service Area

As explained in Section IV.A.4, the amount of subsurface drainage water is very limited and its chemical characteristics present limitations for its reuse in irrigation. All the drainage water is managed as wastewater which is contained and eliminated in evaporation ponds within the District's Service Area.

| Table 43. Drainage Reuse Effects | | | | | | |
|----------------------------------|------------------|----------------------------|-------------------|------------------------|------------------|-------|
| Analyte | Detected (Check) | Drainage Reuse Limitations | | | | |
| | | Increased Leaching | Blending Supplies | Restricted Area of Use | Restricted Crops | Other |
| TDS | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Se | ✓ | | | ✓ | | |
| B | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Mo | | | | | | |
| As | | | | | | |
| Na | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Cl | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Pesticide | | | | | | |
| Herbicide | | | | | | |
| Fertilizer(NO ₃) | | | | | | |
| Other | | | | | | |

C. Water Quality Monitoring Practices

1. Source Water

Regarding surface water supply, DWR maintains an automated sampling station at Check 21 (just upstream from the District turnouts) that records electrical conductivity, water temperature, and turbidity on a daily basis. In addition, grab samples are taken on monthly intervals. Groundwater is not used in the District. Drainage water is discharged directly into the evaporation ponds in which water is evaporated. Table 44 describes the monitoring practices and Table 45 summarizes sampled constituents and analysis standards.

| Table 44. Water Quality Monitoring Practices | | | |
|--|--|--|--------------------------|
| Water Source | Monitoring Location | Measurement/ Monitoring Method or Practice | Frequency |
| Surface water | DWR California Aqueduct (Kettleman City) Check 21 Station KA017226 | See DWR standards | DWR standards |
| Groundwater | Various | As required by ILRP/SGMA | As required by ILRP/SGMA |
| Subsurface drainage water | Pond influent sumps and pond itself | Grab sampling of drainwater at influent sumps and evaporation pond | Quarterly |

Table 45. Water Quality Monitoring Programs for Surface/Sub-Surface Drainage

| Constituent | Units | Standard |
|---|-------|--|
| Total Alkalinity as CaCO ₃ | mg/L | Std Method 2320 B |
| Total Aluminum | mg/L | EPA 200.8 (T) |
| Dissolved Ammonia as N | mg/L | EPA 350.1 |
| Dissolved Arsenic | mg/L | EPA 200.8 (D) |
| Total Arsenic | mg/L | EPA 200.8 (T) |
| Total Barium | mg/L | EPA 200.8 (T) |
| Dissolved Beryllium | mg/L | EPA 200.8 (D) |
| Total Beryllium | mg/L | EPA 200.8 (T) |
| Dissolved Boron | mg/L | EPA 200.7 (D) |
| Total Cadmium | mg/L | EPA 200.8 (T) |
| Dissolved Calcium | mg/L | EPA 200.7 (D) |
| Dissolved Chloride | mg/L | EPA 300.0 28d Hold |
| Dissolved Chromium | mg/L | EPA 200.8 (D) |
| Total Chromium | mg/L | EPA 200.8 (T) |
| Conductance (EC) | µS/cm | Std Method 2510-B |
| Dissolved Copper | mg/L | EPA 200.8 (D) |
| Total Copper | mg/L | EPA 200.8 (T) |
| Dissolved Hardness as CaCO ₃ | mg/L | Std Method 2340 B |
| Dissolved Iron | mg/L | EPA 200.8 (D) |
| Total Iron | mg/L | EPA 200.8 (T) |
| Total Kjeldahl Nitrogen as N | mg/L | EPA 351.2 |
| Dissolved Lead | mg/L | EPA 200.8 (D) |
| Total Lead | mg/L | EPA 200.8 (T) |
| Dissolved Lithium | mg/L | EPA 200.8 (D) |
| Dissolved Magnesium | mg/L | EPA 200.7 (D) |
| Dissolved Manganese | mg/L | EPA 200.8 (D) |
| Total Manganese | mg/L | EPA 200.8 (T) |
| Dissolved Mercury | mg/L | EPA 200.8 (Hg Dissolved) |
| Dissolved Molybdenum | mg/L | EPA 200.8 (D) |
| Dissolved Nickel | mg/L | EPA 200.8 (D) |
| Total Nickel | mg/L | EPA 200.8 (T) |
| Dissolved Nitrate | mg/L | EPA 300.0 28d Hold |
| Dissolved Nitrate + Nitrite as N | mg/L | Std Method 4500-NO ₃ -F (28Day) |
| Dissolved Ortho-phosphate as P | mg/L | EPA 365.1 (DWR Modified) |
| Total Phosphorus | mg/L | EPA 365.4 |
| Dissolved Selenium | mg/L | EPA 200.8 (D) |
| Total Selenium | mg/L | EPA 200.8 (T) |
| Total Silver | mg/L | EPA 200.8 (T) |
| Dissolved Sodium | mg/L | EPA 200.7 (D) |
| Total Dissolved Solids | mg/L | Std Method 2540 C |
| Total Suspended Solids | mg/L | EPA 160.2 |
| Volatile Suspended Solids | mg/L | EPA 160.4 |
| Dissolved Strontium | mg/L | EPA 200.8 (D) |
| Dissolved Sulfate | mg/L | EPA 300.0 28d Hold |
| Dissolved Zinc | mg/L | EPA 200.8 (D) |
| Total Zinc | mg/L | EPA 200.8 (T) |
| pH | pH | Std Method 2320 B |

Source of data:

http://www.water.ca.gov/waterdatalibrary/waterquality/station_county/select_station.cfm?URLStation=KA017226&source=map

Section V: Water Accounting and Water Supply Reliability

A. Quantifying the Water Supplier's Water Supplies

1. Agricultural Water Supplier Water Quantities

Table 46.1-46.5 illustrates the District's water. The District routinely transfers and/or exchanges water to and from various entities as part of its normal operations.

Table 46.1 Surface and Other Water Supplies for 2020

| Source | Supply | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|-----------------------|--------|------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|-------------|-------------|------------|------------|---------------|
| CVP Class 1 Contracts | 0 | | | | | | | | | | | | | 0 |
| Pre-1914 Rights | 0 | | | | | | | | | | | | | 0 |
| SWP water contract | 23,822 | | | | | | | | | | | | | 23,822 |
| Other Surface Water | 15743 | | | | | | | | | | | | | 15,743 |
| Banked water recovery | 10547 | | | | | | | | | | | | | 10,547 |
| Carryover | 33669 | | | | | | | | | | | | | 33,669 |
| Recycled Water | 0 | | | | | | | | | | | | | 0 |
| Other | 0 | | | | | | | | | | | | | 0 |
| Total Supply | | | | | | | | | | | | | | 83,781 |
| Monthly Deliveries | | 438 | 3172 | 3012 | 4036 | 9922 | 15208 | 17313 | 15369 | 8940 | 5474 | 760 | 137 | 83,781 |

Notes:

The District doesn't track monthly deliveries by individual water type. The Agency does.

Carryover balance is water from 2019

Table 46.2 Surface and Other Water Supplies for 2019

| Source | Supply | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|-----------------------|--------|------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|-------------|-------------|------------|------------|---------------|
| CVP Class 1 Contracts | 0 | | | | | | | | | | | | | 0 |
| Pre-1914 Rights | 0 | | | | | | | | | | | | | 0 |
| SWP water contract | 89,333 | | | | | | | | | | | | | 89,333 |
| Other Surface Water | 2,728 | | | | | | | | | | | | | 2,728 |
| Banked water recovery | 19,704 | | | | | | | | | | | | | 19,704 |
| Carryover | 17,078 | | | | | | | | | | | | | 17,078 |
| Recycled Water | 0 | | | | | | | | | | | | | 0 |
| Other | 0 | | | | | | | | | | | | | 0 |
| Total Supply | | | | | | | | | | | | | | 89,435 |
| Monthly Deliveries | | 624 | 2804 | 2395 | 6108 | 10213 | 15851 | 17997 | 16190 | 9473 | 6731 | 942 | 107 | 89,435 |

Table 46.3 Surface and Other Water Supplies for 2018

| Source | Supply | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|-----------------------|--------|-----|-------|-------|-------|--------|--------|--------|--------|-------|-------|-----|-----|--------|
| CVP Class 1 Contracts | 0 | | | | | | | | | | | | | 0 |
| Pre-1914 Rights | 0 | | | | | | | | | | | | | 0 |
| SWP water contract | 41,689 | | | | | | | | | | | | | 41,689 |
| Other Surface Water | 27550 | | | | | | | | | | | | | 27550 |
| Banked water recovery | 6333 | | | | | | | | | | | | | 6333 |
| Carryover | 10351 | | | | | | | | | | | | | 10351 |
| Recycled Water | 0 | | | | | | | | | | | | | 0 |
| Other | 0 | | | | | | | | | | | | | 0 |
| Total Supply | | | | | | | | | | | | | | 85,923 |
| Monthly Deliveries | | 695 | 3,783 | 3,986 | 5,502 | 10,010 | 15,123 | 16,786 | 14,875 | 9,486 | 4,641 | 703 | 333 | 85,923 |

Table 46.4 Surface and Other Water Supplies for 2017

| Source | Supply | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|-----------------------|---------|------|------|------|------|------|-------|-------|-------|-------|------|-----|-----|---------|
| CVP Class 1 Contracts | 0 | | | | | | | | | | | | | 0 |
| Pre-1914 Rights | 0 | | | | | | | | | | | | | 0 |
| SWP water contract | 101,244 | | | | | | | | | | | | | 101,244 |
| Other Surface Water | 27,467 | | | | | | | | | | | | | 27,080 |
| Banked water recovery | -63546 | | | | | | | | | | | | | -63546 |
| Carryover | 24457 | | | | | | | | | | | | | 24457 |
| Recycled Water | 0 | | | | | | | | | | | | | 0 |
| Other | 0 | | | | | | | | | | | | | 0 |
| Total Supply | 89622 | | | | | | | | | | | | | 89,235 |
| Monthly Deliveries | | 2396 | 3588 | 3967 | 5783 | 9636 | 15628 | 16457 | 14364 | 10062 | 5957 | 853 | 544 | 89,235 |

Table 46.5 Surface and Other Water Supplies for 2016

| Source | Supply | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|-----------------------|---------|-----|------|------|------|------|-------|-------|-------|------|------|-----|-----|---------|
| CVP Class 1 Contracts | 0 | | | | | | | | | | | | | 0 |
| Pre-1914 Rights | 0 | | | | | | | | | | | | | 0 |
| SWP water contract | 71,466 | | | | | | | | | | | | | 71,466 |
| Other Surface Water | -12,815 | | | | | | | | | | | | | -12,815 |
| Banked water recovery | 13,763 | | | | | | | | | | | | | 13,763 |
| Carryover | 10,544 | | | | | | | | | | | | | 10,544 |
| Recycled Water | 0 | | | | | | | | | | | | | 0 |
| Other | 0 | | | | | | | | | | | | | |
| Total Supply | | | | | | | | | | | | | | 82,958 |
| Monthly Deliveries | | 534 | 1658 | 4055 | 5685 | 8922 | 14509 | 16885 | 15632 | 9490 | 4759 | 724 | 105 | 82,958 |

Table 47 shows water pumped in the District. Groundwater in the District is typically brackish and unusable without being treated. The primary method of treatment for pumped groundwater in LHWD is to blend the groundwater with delivered SWP before use. The district only has groundwater pumped quantities for 2020, because it was historically so minimal (due to low water quality) that the data was not collected. With the onset of SGMA, pumped groundwater quantities will be collected annually.

Table 47. Groundwater Supplies Summary for 2020 (AF)

| Month | Pumped by the Water Supplier | | | Pumped within Service Area by Customers | | | TOTAL |
|--------------|------------------------------|---------|---------|---|---------|---------|-------|
| | Basin 1 | Basin 2 | Basin 3 | Basin 1 | Basin 2 | Basin 3 | |
| TOTAL | 0 | 0 | 0 | Unknown | Unknown | Unknown | 8160 |

2. Other Water Sources Quantities

Effective precipitation is accounted for as a water source within the cropped irrigated area Table 48.

| Table 48. Effective Precipitation Summary (AF) | | | | | | | | | | |
|--|-------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| Month | 2020 | | 2019 | | 2018 | | 2017 | | 2016 | |
| | Gross (in) | Effective (AF)* | Gross (in) | Effective (AF)* | Gross (in) | Effective (AF)* | Gross (in) | Effective (AF)* | Gross (in) | Effective (AF)* |
| January | 0.15 | 178 | 1.78 | 2263 | 1.83 | 2327 | 2.09 | 2581 | 2.27 | 2467 |
| February | 0 | 0 | 1 | 2543 | 0.19 | 483 | 1.6 | 3951 | 0.04 | 87 |
| March | 1.91 | 4591 | 1.45 | 3687 | 1.55 | 3941 | 0.53 | 1309 | 0.77 | 1673 |
| April | 2.43 | 5840 | 0.21 | 534 | 0.08 | 203 | 0 | 0 | 0.81 | 1760 |
| May | 0.01 | 24 | 0.71 | 1805 | 0.02 | 51 | 0 | 0 | 0.02 | 43 |
| June | 0 | 0 | 0 | 0 | 0.02 | 51 | 0 | 0 | 0 | 0 |
| July | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| August | 0.04 | 96 | 0 | 0 | 0 | 0 | 0 | 0 | 0.23 | 500 |
| September | 0 | 0 | 0 | 0 | 0 | 0 | 0.75 | 1852 | 0 | 0 |
| October | 0 | 0 | 0 | 0 | 0 | 0 | 0.14 | 346 | 0 | 0 |
| November | 0.38 | 913 | 1.03 | 2619 | 1 | 2543 | 0.06 | 148 | 0.04 | 87 |
| December | 0.34 | 403 | 1.33 | 1691 | 0.29 | 369 | 0.18 | 222 | 1.16 | 1261 |
| Total | 5.26 | 12046 | 8 | 15142 | 5 | 9967 | 5 | 10409 | 5 | 7878 |
| Note: *Assumes an effectiveness coefficient of 50% for the months of December and January and 100% for the remaining months. Volumes in AF result from multiplying the effective precipitation depth in a given year and the irrigated acreage. | | | | | | | | | | |

B. Quantification of Water Uses

Applied water Table 49 is approximately equivalent to agricultural water use Table 50.

| Table 49. Applied Water (AF) | | | | | |
|--------------------------------------|--------|--------|--------|--------|--------|
| | 2020 | 2019 | 2018 | 2017 | 2016 |
| Applied Water (from Table 46) | 92,196 | 89,435 | 85,923 | 89,235 | 82,958 |

The water use for each of the different concepts is described in Table 50. The different concepts are specified in the indicated tables.

| Table 50. Quantify Water Use (AF) | | | | | |
|---|----------------|---------------|----------------|----------------|----------------|
| Water Use | 2020 | 2019 | 2018 | 2017 | 2016 |
| Crop Water Use (from Table 25) | | | | | |
| 1. Crop Evapotranspiration* | 95763 | 92454 | 98976 | 103288 | 93813 |
| 2. Leaching* | 5899 | 5777 | 6190 | 6336 | 7287 |
| 3. Cultural practices | 0 | 0 | 0 | 0 | 0 |
| Conveyance & Storage System | | | | | |
| 4. Conveyance seepage | 0 | 0 | 0 | 0 | 0 |
| 5. Conveyance evaporation | 0 | 0 | 0 | 0 | 0 |
| 6. Conveyance operational spills | 0 | 0 | 0 | 0 | 0 |
| 7. Reservoir evaporation | 0 | 0 | 0 | 0 | 0 |
| 8. Reservoir seepage | 0 | 0 | 0 | 0 | 0 |
| Environmental Use (consumptive) | | | | | |
| 9. Environmental use – wetlands (from Table 27) | 0 | 0 | 0 | 0 | 0 |
| 10. Environmental use – Other (from Table 27) | 0 | 0 | 0 | 0 | 0 |
| 11. Riparian vegetation (from Table 27) | 0 | 0 | 0 | 0 | 0 |
| 12. Recreational use (from Table 29) | 0 | 0 | 0 | 0 | 0 |
| Municipal and Industrial | | | | | |
| 13. Municipal (from Table 30) | 30 | 47 | 40 | 46 | 42 |
| 14. Industrial (from Table 30) | 1344 | 1385 | 1312 | 1224 | 1256 |
| Outside the District | | | | | |
| 15. Transfers or Exchanges out of the service area (not included) | 0 | 0 | 0 | 0 | 0 |
| Conjunctive Use | | | | | |
| 16. In-District Groundwater recharge (from Table 31)* | 0 | 0 | 0 | 0 | 0 |
| Other (from Table 32) | 0 | 0 | 0 | 0 | 0 |
| Subtotal | 103,036 | 99,663 | 106,518 | 110,894 | 102,398 |
| Note: | | | | | |
| * Recharge outside District boundary is not accounted here. | | | | | |

There is no water leaving the District Table 51 and no irrecoverable water losses Table 52.

| Table 51. Quantify Water Leaving the District (AF) | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|
| | 2020 | 2019 | 2018 | 2017 | 2016 |
| 1. Surface drain water leaving the service area | 0 | 0 | 0 | 0 | 0 |
| 2. Subsurface drain water leaving the service area | 0 | 0 | 0 | 0 | 0 |
| Subtotal | 0 | 0 | 0 | 0 | 0 |

| Table 52. Irrecoverable Water Losses (Optional) (AF) | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|
| | 2020 | 2019 | 2018 | 2017 | 2016 |
| Flows to saline sink | 0 | 0 | 0 | 0 | 0 |
| Flows to perched water table | 0 | 0 | 0 | 0 | 0 |
| Subtotal | 0 | 0 | 0 | 0 | 0 |

C. Overall Water Budget

Table 53 and Table 54 summarize the water supplies and the water budget in the District.

| Table 53. Quantify Water Supplies (AF) | | | | | |
|--|----------------|----------------|---------------|----------------|---------------|
| Water Supplies | 2020 | 2019 | 2018 | 2017 | 2016 |
| 1. Surface Water (summary total from Table 46) | 83,781 | 89,435 | 85,923 | 89,235 | 82,958 |
| 2. Groundwater (summary total from Table 47) | 8,160 | 0 | 0 | 0 | 0 |
| 3. Annual Effective Precipitation (summary total from Table 48) | 12046 | 15142 | 9967 | 10409 | 7878 |
| 4. Water purchases | 0 | 0 | 0 | 0 | 0 |
| Subtotal | 106,007 | 106,596 | 97,908 | 101,661 | 92,852 |

| Table 54. Budget Summary (AF) | | | | | |
|---|---------|---------|---------|---------|---------|
| Water Accounting | 2020 | 2019 | 2018 | 2017 | 2016 |
| 1. Subtotal of Water Supplies (Table 53) | 106,007 | 106,596 | 97,908 | 101,661 | 92,852 |
| 2. Subtotal of Water Uses (Table 50) | 103,036 | 99,663 | 106,518 | 110,894 | 102,398 |
| 3. Drain Water Leaving Service Area (Table 51) | - | - | - | - | - |
| Excess Deep Percolation* | 2,971 | 6,933 | -8,610 | -9,233 | -9,546 |
| (Deficit Irrigation) | | | | | |
| Note: | | | | | |
| *Calculated from lines 2 and 3 subtracted from line 1 | | | | | |

The District as a whole appears to be very efficient with its water supply. Data from Table 54 for year 2020 suggests a Total Water Use Efficiency (TWUE) for the District of approximately 117% under the assumptions used in the calculations (see 25 for details). Excess deep percolation and TWUE values vary accordingly with the year type. Crop water use estimates may be too high, particularly for pomegranates. These results are due to uncertainties in the crop coefficients (might be high) values to estimate crop evapotranspiration and the salt tolerance threshold values to estimate the leaching requirements. These results suggest that growers are performing deficit irrigation in response to a limited, unreliable, and expensive water supply. These results also collaborate mobile lab results which indicate distribution uniformities (DU) for District Water Users ranged between 85% and 95% from 2016 to 2020.

In addition, it is probable that the growers are deficit irrigating in response to multiple years of insufficient water supplies.

D. Water Supply Reliability

The water supply reliability for the District is parallel to that of the SWP and is best described by DWR in the following excerpts from “The State Water Project Final Delivery Reliability Report 2011”, dated June 2012.

“The 2011 Report shows that the SWP continues to be subject to reductions in deliveries similar to those contained in the State Water Project Delivery Reliability Report 2009 (2009 Report), caused by the operational restrictions of biological opinions (BOs) issued in December 2008 and June 2009 by the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) to govern SWP and Central Valley Project operations. Federal court decisions have remanded the BOs to USFWS and NMFS for further review and analysis. We expect that the current BOs will be replaced sometime in the future. The operational rules defined in the 2008 and 2009 BOs, however, continue to be legally required and are the rules used for the analyses supporting the 2011 Report.”

Regulatory Restrictions on SWP Delta Exports

“Multiple needs converge in the Delta: the need to protect a fragile ecosystem, to support Delta recreation and farming, and to provide water for agricultural and urban needs throughout much of California. Various regulatory requirements are placed on the SWP’s Delta operations to protect special-status species such as delta smelt and spring- and winter-run Chinook salmon. As a result, as described below, restrictions on SWP operations imposed by State and federal agencies contribute substantially to the challenge of accurately determining the SWP’s water delivery reliability in any given year.”

Biological Opinions on Effects of Coordinated SWP and CVP Operations

“Several fish species listed under the federal Endangered Species Act (ESA) as endangered or threatened are found in the Delta. The continued viability of populations of these species in the Delta depends in part on Delta flow levels. For this reason, the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) have issued several BOs since the 1990s on the effects of coordinated SWP/CVP operations on several species.

These BOs affect the SWP’s water delivery reliability for two reasons. Most obviously, they include terms that specifically restrict SWP pumping levels in the Delta at certain times under certain conditions. In addition, the BOs’ requirements are based on physical and biological phenomena that occur daily while DWR’s water supply models are based on monthly data.

The first BOs on the effects of SWP (and CVP) operations were issued in February 1993 (NMFS BO on effects of project operations on winter-run Chinook salmon) and March 1995 (USFWS BO on project effects on delta smelt and splittail). Among other things, the BOs contained requirements for Delta inflow, Delta outflow, and reduced export pumping to meet specified incidental take limits. These fish protection requirements imposed substantial constraints on Delta water supply operations. Many were incorporated into the 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta (1995 WQCP), as described in the “Water Quality Objectives” section later in this chapter.

The terms of the USFWS and NMFS BOs have become increasingly restrictive in recent years. In December 2008, USFWS issued a new BO covering effects of the SWP and CVP on delta smelt, and in June 2009, NMFS issued a BO covering effects on winter-run and spring-run Chinook salmon, steelhead, green sturgeon, and killer whales. These BOs replaced BOs issued earlier by the federal agencies.

The USFWS BO includes additional requirements in all but 2 months of the year. The BO calls for “adaptively managed” (adjusted as necessary based on the results of monitoring) flow restrictions in the Delta intended to protect delta smelt at various life stages. USFWS determines the required target flow, with the reductions accomplished primarily by reducing SWP and CVP exports. Because this flow restriction is determined based on fish location and decisions by USFWS staff, predicting the flow restriction and corresponding effects on export pumping with any great certainty poses a challenge. The

USFWS BO also includes an additional salinity requirement in the Delta for September and October in wet and above-normal water years, calling for increased releases from SWP and CVP reservoirs to reduce salinity. Among other provisions included in the NMFS BO, limits on total Delta exports have been established for the months of April and May. These limits are mandated for all but extremely wet years.

The 2008 and 2009 BOs were issued shortly before and shortly after the Governor proclaimed a statewide water shortage state of emergency in February 2009, amid the threat of a third consecutive dry year. NMFS calculated that implementing its BO would reduce SWP and CVP Delta exports by a combined 5% to 7%, but DWR's initial estimates showed an impact on exports closer to 10% in average years, combined with the effects of pumping restrictions imposed by BOs to protect delta smelt and other species. The 2008 USFWS and 2009 NMFS BOs have been subject to considerable litigation. Recent decisions by U.S. District Judge Oliver Wanger changed specific operational rules for the fall/ winter of 2011–2012, and both the USFWS BO and NMFS BO have been remanded to the agencies for further review and analysis. However, the operational rules specified in the 2008 and 2009 BOs continue to be legally required and are the rules used in the analyses presented in Chapters 5, 6, and 7 of this report. Chapter 5 presents a comparison of monthly Delta exports as estimated for this 2011 Report with those estimated for the 2005 Report, illustrating how the 2008 and 2009 BOs have affected export levels from the Delta.

The California Department of Fish and Game (DFG) issued consistency determinations for both BOs under Section 2080.1 of the California Fish and Game Code. The consistency determinations stated that the USFWS BO and the NMFS BO would be consistent with the California Endangered Species Act (CESA). Thus, DFG allowed incidental take of species listed under both the federal ESA and CESA to occur during SWP and CVP operations without requiring DWR or the U.S. Bureau of Reclamation to obtain a separate State-issued permit.

Specific restrictions on Delta exports associated with the USFWS and NMFS BOs and their effects on SWP pumping levels are described further in Chapter 5, "SWP Delta Exports," of this report."

Water Quality Objectives

"Because the Delta is an estuary, salinity is a particular concern. In the 1995 WQCP, the State Water Board set water quality objectives to protect beneficial uses of water in the Delta and Suisun Bay. The objectives must be met by the SWP (and federal CVP), as specified in the water right permits issued to DWR and the U.S. Bureau of Reclamation. Those objectives—minimum Delta outflows, limits on SWP and CVP Delta exports, and maximum allowable salinity levels— are enforced through the provisions of the State Water Board's Water Right Decision 1641 (D-1641), issued in December 1999 and updated in March 2000.

DWR and Reclamation must monitor the effects of diversions and SWP and CVP operations to ensure compliance with existing water quality standards. Monitoring stations are shown in Figure 4-1.

Among the objectives established in the 1995 WQCP and D-1641 are the “X2” objectives. D-1641 mandates the X2 objectives so that the State Water Board can regulate the locations of the Delta estuary’s salinity gradient during the months of February–June. X2 is the position in the Delta where the electrical conductivity (EC) level, or salinity, of Delta water is 2 parts per thousand. The location of X2 is used as a surrogate measure of Delta ecosystem health. For the X2 objective to be achieved, the X2 position must remain downstream of Collinsville in the Delta (shown in Figure 4-1) for the entire 5- month period, and downstream of other specific locations in the Delta on a certain number of days each month from February through June. This means that Delta outflow must be at certain specified levels at certain times—which can limit the amount of water the SWP may pump at those times at its Harvey O. Banks Pumping Plant in the Delta. Because of the relationship between seawater intrusion and interior-Delta water quality, meeting the X2 objective also improves water quality at Delta drinking-water intakes; however, meeting the X2 objectives can require a relatively large volume of water for outflow during dry months that follow months with large storms.

The 1995 WQCP and D-1641 also established an export/inflow (E/I) ratio. The E/I ratio, presented in Table 3 of the 1995 WQCP (SWRCB 1995:18– 22), is designed to provide protection for the fish and wildlife beneficial uses in the Bay-Delta estuary (SWRCB 1995:15). The E/I ratio limits the fraction of Delta inflows that are exported. When other restrictions are not controlling, Delta exports are limited to 35% of total Delta inflow from February through June and 65% of inflow from July through January.”

Section VI: Climate Change

Within the five year horizon of this Plan, the District is much more concerned regarding the current reliability (or lack thereof) of the State Water Project than it is about climate change. However, the potential effects of climate change, which DWR projects to impact both the District’s local area and result in statewide changes that could affect the State Water Project and its water supplies in the longer term, are a substantial concern beyond the planning horizon of this Plan.

DWR estimates indicate that by 2050 the Sierra Nevada snowpack, which provides 65 percent of California’s water supply, will be significantly reduced. Much of the precipitation is expected to fall as rain instead of snow during winter and cannot be stored in our current water system for later use. The climate is also expected to become more variable and extreme, bringing more droughts and floods. Thus the District will need to be prepared to adapt to greater variability in weather patterns.

A. Potential Climate Change Effects

Within the next 20 years, DWR expects that water supplies, water demand, sea level, and the occurrence and increased severity of floods will be affected by climate change. Some of these potential changes are presented below.

The District will consider the following climate change effects, many of which are already documented in California, and reviewed in the latest State Water Project Reliability Report prepared by DWR.

1. Water Demand

Shorter winters, more hot days and nights, and a longer irrigation season will increase water demand in the District, and increase competition for water by others.

2. Water Supply and Quality

Reduced snowpack, shifting spring runoff to earlier in the year has the potential to impact water supply and quality.

3. Sea Level Rise

The Delta, which is in the hub of the SWP could be at greater risk to increased salinity should sea level rise occur. Sea level could continue to rise if warming of the oceans continues. This could affect Delta levee stability in low-lying areas.

4. Disaster

Disasters may become more frequent if climate change continues as some scientists believe.

B. Specific Points to Consider

As the District continues to address near-term periods of water deficiency from the State Water Project during the five years of this planning cycle, it will consider the following potential climate change impacts projected by DWR in its longer term plans and work with DWR and State Water Contractors in planning for:

1. Irrigation Demand

Irrigation demand may increase if temperatures rise and rainfall becomes more variable.

2. Permanent Crops

Permanent crops, which make up the majority in the District, may be adversely affected by climate change and may be more difficult to shift to alternative crops, causing reduced flexibility for adapting to changing climatic conditions.

3. Flooding Risk

Flooding risk may increase as a result of more severe rainfall patterns and warmer winter rains. This could affect water supply and conveyance of State and local water distribution facilities.

4. Snowpack

Snowpack may significantly diminish if the climate warms. Diminished snowfall in the mountains and earlier runoff may result in reduced SWP water supply and other sources derived from Sierra Nevada Snowpack.

5. The Sacramento-San Joaquin River Delta

The Sacramento-San Joaquin River Delta could be vulnerable to impacts of climate change, if it occurs. One impact could be sea level rise. Higher sea levels could make it more difficult to export water from the Delta with the existing infrastructure and may result in reduced water deliveries over time.

Section VII: Water Use Efficiency Information

A. EWMP Implementation and Reporting

1. Critical EWMPs

(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).)

All of the turnout deliveries within the District are fully metered with propeller flowmeters which register both instantaneous and totalized flows. Meters are repaired and/or replaced as necessary. The District staff is capable of repairing these meters when required.

The District maintains daily delivery records for each turnout being used and maintains records of daily water orders from the SWP. A grower's water use to date and remaining allocation is maintained by the District's comprehensive database system (Latis). The system helps manage water orders, water use, water supply, water contract information, and water delivery system information. The District maintains records on the drainage activities on a monthly basis.

LHWD is confident its existing water measurement devices meet the $\pm 12\%$ accuracy standard, and replacement meters meet the $\pm 5\%$ accuracy standard.

This EWMP is being implemented at a satisfactory level.

(2) Volume-Based Pricing (Adopt a pricing structure for water customers based at least in part on quantity delivered.)

The District revised its method of collecting annual water charges in 1999 with the implementation of the landowner water supply contracts. There are now five components that are used to compute the annual water charges in the District on a per acre-foot (volumetric) basis: the Agency Charge, District Capital Charge, Delivery Charge, Administrative Charge and the ID#9 Charge. In addition to the water charge, the District does levy a drainage charge on a per acre-foot basis for drainwater discharged to the evaporation pond system. In addition other water acquired by the District to meet Water User needs is charged on a per acre-foot basis (volumetric).

The District has implemented volume-based pricing and plans to continue that practice.

2. Conditional EWMPs

(1) Alternate Land Use (Facilitation of alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including problem drainage.)

The District established and maintained a demonstration trial to evaluate several species of salt tolerant trees and plants on a small trial under conditions found within the District to determine if drainwater reuse and selective cropping patterns can be incorporated into the District's drainwater management.

The project involved the irrigation of salt tolerant trees and plants with drainwater collected from the cropped area. The salinity of the drainwater was such that it precluded using the drainwater more than once. The two-acre drainwater reuse demonstration area was managed more like a commercial field rather than a research plot, with the idea being to obtain results that were practical to use in the field. Several new varieties of halophytes and trees were planted, in addition to some trees that District landowners planted in 1997, to see which plants and/or trees do best with the drainwater reuse.

The District has also reviewed a number of alternative approaches to manage drainage water that have been tested and studied in other areas of the Valley that fall under the classification of "Integrated on-Farm Drainage Management" (IFDM). These hold promise as an alternative management strategy to replace and/or reduce the size of evaporation ponds. However as noted earlier, extensive water management activities including canal lining, irrigation system improvements, and improved irrigation management have significantly reduced the quantity of drainwater managed by the District.

The District has also facilitated the long term transfer of contract water from lands considered less productive in the eastern area of the District to lands better suited for permanent crop planting. In addition landowners are able to annually transfer water within the District as long as the transfer doesn't create capacity issues.

This EWMP is being implemented at a satisfactory level.

(2) Recycled Water Use (Facilitation of use of available recycled water that otherwise would not be used beneficially, meets health and safety criteria, and does not harm crops or soils.)

There is no municipal water use and approximately one percent of the total water use within the District is industrial water use. In the future, there may be small amounts of water available from the Lost Hills Utility District in the southern end of the District, and oilfield water from the western boundary of the District. Currently, due to unsuitable water quality (high TDS) of these potential sources of re-use water, there is not an opportunity to reclaim any M&I wastewater within the District.

Adequate funds are not currently available, and are not expected to become available, for implementation of this EWMP during the term of the AWMP.

(3) On-Farm Irrigation Capital Improvements (Facilitate financing of capital improvements for on-farm irrigation systems)

The District is aware of the success of several programs that have been implemented by other agricultural water agencies where assistance is provided to growers to improve their on-farm irrigation systems. However as a result of high water costs and reduced SWP supplies, District landowners have already invested millions of dollars installing and managing state of the art micro-irrigation systems at the highest attainable efficiency on all the permanent crop acreage in the District which accounts for 99.8% of the irrigated land in the District.

This EWMP is being implemented at a satisfactory level.

(4) Incentive Pricing Structure (Implement an incentive pricing structure that promotes one or more of the following goals: A. “More efficient water use at the farm level such that it reduces waste”; B. “Conjunctive use of groundwater”; D. “Reduction in problem drainage”.)

Water marketing and transfers already occur routinely within the District and frequently outside the District within the KCWA in accordance with adopted policies. Water marketing, transfers and exchanges offer an opportunity to achieve both the reliability of the water supply and costs at levels economically viable for District water users. Through water transfers and/or exchanges, row crop farmers may release their water entitlement in dry years to permanent crop needs.

The District facilitates transfers and exchanges in accordance with District Rules and Regulations. The District relies on these transfers and exchanges with other water entities to provide the necessary flexibility to optimize beneficial use of the water supplies available to the District.

This EWMP has been implemented at a satisfactory level.

(5) Infrastructure Improvements (Expand line or pipe distribution systems, construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage)

District staff conducted a sizable seepage study in 1995 and 1996 to quantify the seepage losses of various canal reaches on all of the unlined canals in use at that time. As a result of the seepage study and analysis of the results, the District completed the concrete lining of approximately 4.6 miles of canal in Service Area 2 (funded by a SWRCB loan and completed in 1999), 1.4 miles of canal in Service Area 3, and 1.9 miles of canal in Service Area 5 (major funding for both provided by CALFED and completed in 2002). In addition, the District completed the HDPE lining of 1.3 miles of canal in Service Area 7 in 2004, and the EPDM lining of 2.9 miles of canal in Service Area 4 and 1.0 mile of canal in Service Area 7 (partially funded by a Water Use Efficiency Grant and completed in 2006).

The District lined 2.4 miles of unlined canal in Service Area 7N with geomembrane liner in 2008 to conserve 689 af/yr in seepage losses at a cost of \$800,000 (entirely paid by LHWD).

The District also lined Reservoir 2 with HDPE liner and improved structures to better manage its use as a regulation reservoir in 2011-2012 at a cost of \$190,000 entirely paid by LHWD.

There are no remaining improvements that can be made to LHWD facilities that are regularly used. This EWMP has been implemented at a satisfactory level. No further improvements are planned.

(6) Order/Delivery Flexibility (Increase flexibility in water ordering by, and delivered to, water customers within operational limits)

The District currently tries to be as flexible as possible with water deliveries, but as discussed in Section II.B.1, the major constraint on flexibility is that the District can only be as flexible as DWR and KCWA allows with the water supply. The District does have some capacity to allow growers to adjust their flow rate or shut off at odd times occasionally, but there is not sufficient storage capacity in the District distribution system to allow unlimited rate changes. The District works with all water users who request flexibility to satisfy their needs. The District has employed a night operator for many years to handle changes at night, and is planning on continuing this practice.

The District does utilize small regulation reservoirs as a part of the distribution system. Most of the reservoirs on the upper end of the laterals serve several laterals, which allow some regulation capability. The reservoirs add flexibility to the delivery system enabling the District to better meet grower needs. In 2001 the District completed the expansion of a reservoir in Service Area 1 that served several purposes: a) it allows the District to lift water from the Aqueduct at night when electrical rates are cheaper and then discharge from the reservoir during the day while the lift pumps are idle to avoid peak electrical rates, b) it added regulation capability, and c) it increased the flexibility of deliveries.

Nearly all of the existing reservoirs are lined with paving material on the sides and nearly impervious clay on the bottom. This lining prevents excessive seepage losses. Over time, however, the lining in some of the reservoirs will crack and develop holes that need to be repaired to prevent seepage losses. The District periodically repairs these reservoir linings as required.

Under the present system, water orders are phoned to the District O&M office where they are compiled daily for each lateral. Orders are then placed with the State for the next day's deliveries at each aqueduct turnout. Check structures and water levels in District canals and reservoirs can be adjusted directly from the O&M office through the District's SCADA system. Operators are in the field every day checking meters and ensuring smooth operation. Constant contact is maintained between the O&M office and the operators in the field. This system works efficiently.

One of the main concerns for the District and its growers is not knowing on a timely basis how much water will be received for that year. The initial water supply forecast received from DWR is often quite different from the final water supply allocation, which generally is not received until April. Modifications that the District can make in this regard are very limited.

An important water management tool that has been available to assist growers with increasing flexibility of deliveries and maximizing limited water supplies is the ability to carry water over from one year to the next. Previously, under certain conditions, the Department of Water Resources allowed entitlement water from one year to be carried over through March 31 of the following year. One of the provisions of the Monterey Amendment expanded the rules for carryover to allow storage by contractors from year to year when space is available. This could be helpful in shortage years when water could be carried over past March 31st.

This EWMP is being implemented at a satisfactory level.

(7) Supplier Spill and Tailwater Systems (Construct and operate supplier spill and tail-water systems)

The District's distribution system is automated which greatly reduces any operational spills. The District does have reservoirs at the end of some canals that will capture any water that does spill, and the reservoirs in Service Area 1 are capable of recirculating these captured spills. Additionally, while the reservoir at the end of the lined portion of canal 2-1 and canal 2-2 has some regulation capabilities, overflows could spill into the unused, unlined sections and not be recoverable. Losses in canals 2-1 and 2-2 are very low however, and do not justify investment in further improvements. The pipeline portion of the system does not require any spill reservoirs. There is currently not a need for additional spill capture reservoirs and because the volume of spill that does occur is small, it is not economically feasible to install any permanent type of recirculation.

The District also lined Reservoir 2 with geomembrane, and improved its inlet and outlet structures in 2011 and 2012 to give the District the operational flexibility to use it as a regulation reservoir. The cost of that project was \$190,000, and was paid entirely by the District.

This EWMP has been implemented at a satisfactory level and there are no plans for further improvements as they would be neither cost effective nor technically feasible.

(8) Conjunctive Use (Increase planned conjunctive use of surface water and groundwater with the supplier service area)

Conjunctive use, the process of jointly using surface water and groundwater to effectively manage both water supplies, is not feasible at this time within the District because there has historically been very little groundwater pumping (due to poor quality). A conjunctive use program normally includes a groundwater recharge program to replenish the

groundwater supply in wet years. As discussed in Section IV.A.2 and Section IV.B.2, groundwater recharge is not feasible within the District and hence, a typical conjunctive use program is not applicable. Opportunity for groundwater recharge within the District is negligible because of the soil structure and nearly impervious clay layers in most of the District. The District does bank some groundwater outside District boundaries and will recover this water in dry years to supplement the surface water supplies, but this is not considered a typical conjunctive use program.

This EWMP has been implemented where technically feasible which is by groundwater banking outside District boundaries. The District plans to continue these current practices.

(9) Automated Canal Controls (Automate canal control devices)

Automation of canal systems can reduce the flow variations experienced by growers and improve delivery flexibility. The result can be improved on-farm efficiencies, District and farm labor savings, and reduced operational spills. Much of the District's delivery system is currently automated. Lift pump operation and canal and reservoir water levels can be controlled and monitored through the District's SCADA system. Check structures and water levels can be adjusted from anyplace there is a WiFi connection. This aids in operation and virtually eliminates operational spills.

The District has completed the automation of Service Areas 1, 3, 4, 5 and 7; the remaining Service Areas (2 and 6) which are gravity fed require less automation, and losses are too low to justify additional cost to automate them. The District installed a SCADA program ("Lookout") at the O&M office, which assists system operations and provides better historical records. No other automation within the District is required at this time on existing facilities. Additional need for automation will be periodically reevaluated.

This EWMP has been implemented at a satisfactory level and the District has no further plans to automate canal controls beyond those already automated because they would not be locally cost effective.

(10) Customer Pump Test/Evaluation (Facilitate or promote customer pump testing and evaluation)

As noted earlier, there are very few agricultural water wells in the District. These wells are used on a limited basis and because of the poor water quality, only to blend with higher quality surface water from the CA Aqueduct. Customers do have many booster pumps on pressurized irrigation systems supplied with power by Pacific Gas and Electric (PG&E). PG&E provides subsidized pump tests to any customer requesting it through a program administered by Fresno State University (Center for Irrigation Technology).

The District will implement this EWMP by further publicizing PG&E's program by providing a link on the District's website to PG&E's website regarding the program.

(11) Water Conservation Coordinator (Designate a water conservation coordinator)

LHWD has designated the General Manager of the Westside Water Authority as water conservation coordinator for the purposes of the Memorandum of Understanding for Agricultural Water Suppliers.

Mark Gilkey
Westside Water Authority
Lost Hills Water District
1405 Commercial Way ste. 125
Bakersfield, CA 93309

mgilkey@westsidewa.org (email)

(661) 633-9022 (office)

(661) 633-9026 (fax)

LHWD considers that it has adequately implemented this EWMP and will continue it.

(12) Water Management Services to Customers (Provide for the availability of water management services to water users)

The District has utilized and contributed funding to the mobile lab program since 1989. The mobile lab conducts four to five irrigation evaluations per year, and the District intends to continue funding this program at the current level of \$5,000 per year for the foreseeable future.

Many of the water users in the District have attended workshops sponsored by the Natural Resources Conservation Service. The workshops cover such topics as irrigation scheduling, irrigation system improvements, irrigation system evaluations, improved technology, etc. The District each year notifies each landowner of the date and location of the workshop and encourages them to attend to learn more about efficient irrigation practices.

LHWD considers that it has adequately implemented this EWMP and plans to continue current practices mentioned above.

(13) Identify Institutional Changes (Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional change to allow more flexible water deliveries and storage)

The District has always tried to be responsive to its water users, encouraging their comments and suggestions. Suggestions from these individuals are discussed directly with the District Manager and openly with the Board of Directors. All District Board of Directors meetings are open to the public and are announced well in advance. Additionally, the District operators maintain close personal contact with water users. Over the years this personal contact has benefited both the District and its water users.

As previously noted, the District is nearly entirely dependent on the State Water Project (SWP) for its water supply. The SWP has historically been, and is expected to continue to be, subject to delivery deficiencies. Contractual obligations are 4.1 million acre-feet (MAF) per year while the average annual water supply is approximately 2.5 MAF. As environmental and urban water demands continue to increase, the reliability of the SWP decreases for all SWP contractors. Delivery deficiencies are related to both the reduced quantity of water available and the increased frequency that shortages are imposed. The District continues to look at ways to further stabilize, or firm up, the reliability of the water supply so that production agriculture can continue to flourish in the District.

One method of stabilizing the water supply that the District has initiated is groundwater banking. The District participates in the following groundwater banking/recovery programs:

- KCWA Pioneer Property
- Berrenda Mesa Spreading Grounds

Through 2020, the District and its water users had approximately 98,000 acre-feet (af) in storage in these projects. One District landowner also participates in groundwater banking activities through the Kern Water Bank.

Lost Hills Water District has initiated and will continue efforts to develop programs with other agencies that would alleviate the aforementioned problems regarding water supply stability.

LHWD considers that it has adequately implemented this EWMP, and plans to continue current practices to identify institutional changes.

(14) Supplier Pump Improved Efficiency (Evaluate and improve the efficiencies of the supplier's pumps)

The District does not have any regularly operating groundwater wells but does operate numerous lift pumps to serve a portion of the District acreage. The District retains the services of an electrical engineer (who also works with three neighboring districts) who works with the automation system and the pump stations. Electrical energy is obtained from Pacific Gas and Electric Co. (PG&E). The consulting electrical engineer periodically tests the efficiency of the lift pumps. The District has taken advantage of some of the efficiency programs offered by PG&E mentioned above (under EWMP 10) and SB5X (California Energy Commission, thru Cal Poly ITRC). Using SCADA, the District can constantly monitor acre-feet per kilowatt hour (af/kWh), which is related pump efficiency, pump amperage and discharge in combination to determine when maintenance is required. The District periodically pulls and repairs the pumps to maintain the highest pump efficiency possible to reduce energy consumption.

LHWD considers that it has adequately implemented this EWMP, and will continue practices mentioned above.

Table 55 summarizes the EWMPs implemented and planned, Table 56 summarizes the EWMPs efficiency improvements, and Table 57 summarizes the schedule to implement EWMPs.

Table 56 includes estimates of Water Use Efficiency (WUE) Improvements that occurred since adoption of the prior Water Management Plan (2005). In most cases data was not available to allow quantification.

The prior Plan's water balance calculations indicated very high overall District WUE had been attained by 2005, with little room for improvement. An exception was related to canal and reservoir lining projects implemented from 2005-2012. Reduced seepage losses resulting from those projects have been estimated as well as the increase in overall District WUE.

WUE improvements from EWMPs to continue and/or be implemented are also in Table 56. These also generally have no available data to allow for an estimate. Given the District's current WUE estimate of nearly 100%, little improvement is expected over the next 5-10 years. Rather, maintenance of high WUE is the expectation.

| Table 55. Report of EWMPs Implemented/Planned (Water Code §10608.48(d), §10608.48 (e), and §10826 (e)) | | |
|---|---|--|
| EWMP No.* | Description of EWMP Implemented | Description of EWMPs Planned |
| Critical EWMPs | | |
| 1 | Water Measurement | Continue current practices |
| 2 | Volume-Based Pricing | Continue current practices |
| Conditionally Required EWMPs (locally cost-effective and technically feasible EWMPs) | | |
| 1 | Alternate Land Use | Continue current practices |
| 2 | Recycled Water Use | Currently not feasible |
| 3 | On-Farm Irrigation Capital Improvements | Implemented by landowners |
| 4 | Incentive Pricing Structure | Continue current practices |
| 5 | Infrastructure Improvements | No further improvements planned |
| 6 | Order/Delivery Flexibility | Continue current practices |
| 7 | Supplier Spill and Tailwater Systems | No plans for further improvements |
| 8 | Conjunctive Use | Continue current practices |
| 9 | Automated Canal Controls | No further plans to automate |
| 10 | Customer Pump Test/Evaluation | Publicize PG&E's program on the District's website |
| 11 | Water Conservation Coordinator | Continue current practice |
| 12 | Water Management Services to Customers | Continue current practices |
| 13 | Identify Institutional Changes | Continue current practices |
| 14 | Supplier Pump Improved Efficiency | Continue current practices |
| Other Optional EWMPs (as applicable) | | |
| | | |
| | | |
| Notes: *EWMP numbers correspond to (Water Code §10608.48(c)) | | |

| Table 56. Report of EWMPs Efficiency Improvements (Water Code §10608.48(d), §10608.48 (e), and §10826 (e)) | | | |
|--|--|--|---|
| Corresponding EWMP No.(s)* | EWMP | Estimate of Water Use Efficiency Improvements That Occurred Since Last Report <i>(Quantitative or Descriptive)</i> | Estimated Water Use Efficiency Improvements 5 and 10 years in future <i>(Quantitative or Descriptive)</i> |
| Critical 1 | Water Measurement | No data available to estimate | 0% |
| Critical 2 | Volume-Based Pricing | No data available to estimate | 0% |
| Conditional 1 | Alternate Land Use | No data available to estimate | 0% |
| Conditional 2 | Recycled Water Use | No data available to estimate | 0% |
| Conditional 3 | On-Farm Irrigation Capital Improvements | No data available to estimate | 0% |
| Conditional 4 | Incentive Pricing Structure | No data available to estimate | No data available to estimate |
| Conditional 5 | Infrastructure Improvements | No data available to estimate | 0% |
| Conditional 6 | Order/Delivery Flexibility | No data available to estimate | 0% |
| Conditional 7 | Supplier Spill and Tailwater Systems | No data available to estimate | 0% |
| Conditional 8 | Conjunctive Use | No data available to estimate | 0% |
| Conditional 9 | Automated Canal Controls | No data available to estimate | 0% |
| Conditional 10 | Customer Pump Test/Eval. | Not applicable (new EWMP) | No data available to estimate |
| Conditional 11 | Water Conservation Coordinator | No data available to estimate | No data available to estimate |
| Conditional 12 | Water Management Services to Customers | No data available to estimate | No data available to estimate |
| Conditional 13 | Identify Institutional Changes | No data available to estimate | No data available to estimate |
| Conditional 14 | Supplier Pump Improved Efficiency | No data available to estimate | No data available to estimate |
| Notes: *EWMP numbers correspond to (Water Code §10608.48(c)). | | | |

| Table 57. Schedule to Implement EWMPs ((Water Code §10608.56 (d))) | | | | |
|---|-------------------------|--------------|------------------|-------------------------------|
| EWMP | Implementation Schedule | Finance Plan | Budget Allotment | 1999 AWMC MOU Demand Measures |
| Critical | | | | |
| 1. Water Measurement | NA | NA | (1) | C-1 |
| 2. Volume-Based Pricing | NA | NA | (1) | No equivalent |
| Conditional | | | | |
| 1. Alternate Land Use | NA | NA | | B-1 |
| 2. Recycled Water Use | NA | NA | | B-2 |
| 3. On-Farm Irrigation Capital Improvements | NA | NA | | B-3 |
| 4. Incentive Pricing Structure | NA | NA | (1) | C-2 |
| 5. Infrastructure Improvements | NA | NA | | B-5 |
| 6. Order/Delivery Flexibility | NA | NA | (1) | B-6 |
| 7. Supplier Spill and Tailwater Systems | NA | NA | | B-7 |
| 8. Conjunctive Use | NA | NA | (1) | B-8 |
| 9. Automated Canal Controls | NA | NA | | B-9 |
| 10. Customer Pump Test/Evaluation | NA | NA | | No equivalent |
| 11. Water Conservation Coordinator | NA | NA | (1) | A-2 |
| 12. Water Management Services to Customers | NA | NA | (1) | A-3 |
| 13. Identify Institutional Changes | NA | NA | (1) | A-5 |
| 14. Supplier Pump Improved Efficiency | NA | NA | (1) | A-6 |
| Other EWMPs: | | | | |
| 1999 AWMC MOU A-4: Improve communication and cooperation among water suppliers, users, and other agencies. | | | | |
| 1999 AWMC MOU B-4: Facilitate voluntary water transfers. | | | | |
| Grand Total all EWMPs | | | | |
| Note: There is no equivalent AWMC Critical EWMP #2 or Conditional EWMP #10 NA = Not Applicable (1) Budget allocation within District's operation budget | | | | |

B. Documentation for Non-Implemented EWMPs

The District has considered, but rejected one conditional EWMPs. The remainder have either been previously implemented, are continuing to be implemented, or will be implemented. Non-implemented EWMP justification/documentation was described previously and is summarized in Table 58.

| Table 58. Non-Implemented EWMP Documentation (Water Code §10608.48(d), §10608.48 (e), and §10826 (e)) | | | | |
|--|----------------------|-----------------------------------|--|---|
| Conditional EWMP # | Description | <i>(check one or both)</i> | | Justification/Documentation* |
| | | Technically Infeasible | Not Locally Cost- Effective | |
| 2 | Recycle Water Use | x | | Salinity of industrial and municipal LHUD wastewater exceeds safe re-use limit |
| Notes: *Justification/Documentation can include summary cost-benefit analysis or engineering determination with reference to the specific study/agency/engineer responsible for making that determination. | | | | |

Section VIII: Supporting Documentation

A. Agricultural Water Measurement Regulation Documentation (as applicable)

The District receives its water deliveries through eight DWR turnouts off of the California Aqueduct. These turnouts have state of the art meters which record instantaneous flow rates as well as total quantities delivered. The duration and flow rates for all deliveries are scheduled in advance so that DWR can coordinate water flows to the District.

In addition to the DWR metered turnouts, all in-District deliveries are metered daily during use at individual Water User turnouts. These Water User meters are located at turnouts throughout the District. These turnouts include propeller flow-meter facilities that were originally designed by District consulting engineers who also oversaw construction of the facilities. District Water Users also schedule their deliveries (duration and flow rates) in advance so the District can accurately schedule deliveries from DWR.

District System Operators measure deliveries to individual turnouts daily when they are operating. The System Operators know the requested flow rate at various turnouts as well as the normal flow rate. If there is any variance in these rates or if there is any problem with the meter the O&M Superintendent is immediately notified and repair work is scheduled. The District primarily uses McCrometer flow meters and District maintenance staff has received training at McCrometer's facility. Replacement meters are purchased from McCrometer and include a Certified Test Report (Appendix 11).

District staff compares DWR daily flow rates and deliveries with the sum of individual in-District flow rates and deliveries as another check of meter accuracy. This process enables District staff to document meter accuracy daily and to quickly identify variances and schedule repairs. In addition DWR total monthly deliveries are compared to the sum of individual in-District deliveries as another check of meter accuracy. During 2012 the sum of individual in-District meters was within about 1% of DWR meter readings.

Therefore, LHWD is confident its existing water measurement devices meet the $\pm 12\%$ accuracy standard, and replacement meters meet the $\pm 6\%$ accuracy standard.

1. Legal Certification and Apportionment Required for Water Measurement

Legal certification is not applicable.

2. Engineer Certification and Apportionment Required for Water Measurement

An engineer's certification is not provided because LHWD's water measurement practices as described above, demonstrate compliance with accuracy standards.

3. Description of Water Measurement Best Professional Practices

Best Professional Practices refer to:

- Collection of water measurement data: By staff members trained and supervised by the superintendent.
- Frequency of measurements: Daily while in use. All meters read monthly at a minimum.
- Method for determining irrigated acres: Provided by customers, checked by aerial photographs.
- Quality control and quality assurance procedures:
 - i Cross check daily flowrate versus customer order. Sum all turnout reading monthly. Investigate and attempt to correct identified differences.
 - i Sum all running meters daily and compare versus DWR meters by Service Area. Investigate and attempt to correct identified differences. Repair all meters found not functioning properly per manufacturer's recommendations.

All of the turnout deliveries within the District are fully metered with propeller flowmeters which register both instantaneous and totalized flows.

The District maintains daily delivery records for each turnout being used and maintains records of daily water orders from the SWP. A grower's water use to date and remaining allocation is maintained by the District's comprehensive database system (Latis). The system helps manage water orders, water use, water supply, water contract information, and water delivery system information.

4. Documentation of Water Measurement Conversion to Volume

All flowmeters used by LHWD register both instantaneous and totalized flows (volume accrued during a period of time).

5. Device Corrective Action Plan Required for Water Measurement

LHWD is confident its existing water measurement devices meet the $\pm 12\%$ accuracy standard, and replacement meters meet the $\pm 6\%$ accuracy standard. No corrective actions are planned.

B. Other Documents (as applicable)

Tables and appendices have been included as needed to support this AWMP document.

Appendices

**Appendix 1. Typical Notice of
Preparation sent to
Agencies listed in Table 1
and copy of Notice of Public
Meeting published in the
Bakersfield Californian on
*March 15 and 22, 2021***

LOST HILLS WATER DISTRICT

DIRECTORS

BERNARD PUGET, PRESIDENT
DON ELHOLM, VICE PRESIDENT
DOUG ANDERSON
MONTE MITCHELL
MIKE NORDSTROM

1405 Commercial Way Ste 125
Bakersfield, CA 93309

PHONE (661) 633-9022
FAX (661) 633-xxxx

GENERAL MANAGER

MARK A. GILKEY

ASST. to the GENERALMANAGER

MARY KING

REGULATORY MANAGER

KRIS LAWRENCE

LEGAL COUNSEL

JOSEPH D. HUGHES

March 10, 2021

NOTICE is hereby given that Lost Hills Water District's (the "District") proposed Agricultural Water Management Plan prepared pursuant to Water Code § 10820 et. seq. is available for public inspection. Any person who desires to review the plan may arrange to do so by telephoning the District at (661) 633-9022 and asking to speak to Kris Lawrence, *Regulatory Manager*.

In addition, the District will hold a remote access public hearing on the proposed plan as part of its regularly scheduled Board meeting on April 8, 2021 at 12:00 p.m. After the hearing, the District will adopt the plan as drafted or as modified.

Respectfully,

Kris Lawrence
Regulatory Manager

**NOTICE OF PREPARATION OF AND HEARING ON
LOST HILLS WATER DISTRICT
2020 AGRICULTURAL WATER MANAGEMENT PLAN**

NOTICE is hereby given that Lost Hills Water District's (the "District") proposed Agricultural Water Management Plan prepared pursuant to Water Code § 10820 et. seq. is available for public inspection. Any person who desires to review the plan may arrange to do so by telephoning the District at (661) 633-9022 and asking to speak to Kris Lawrence, *Regulatory Manager*.

In addition, the District will hold a remote access public hearing on the proposed plan as part of its regularly scheduled Board meeting on April 8, 2021 at 12:00 p.m. After the hearing, the District will adopt the plan as drafted or as modified.

Kris Lawrence, Regulatory Manager
Lost Hills Water District

Appendix 2. Resolution of Plan Adoption

LOST HILLS WATER DISTRICT

Resolution 940

**A RESOLUTION OF THE BOARD OF DIRECTORS OF
LOST HILLS WATER DISTRICT ADOPTING THE 2020 UPDATE TO THE
AGRICULTURAL WATER MANAGEMENT PLAN**

WHEREAS, pursuant to the Agricultural Water Management Planning Act and the Water Conservation Act of 2009, agricultural water suppliers, such as the Lost Hills Water District (District), were required to prepare and adopt an Agricultural Water Management Plan (Plan) by December 31, 2012; and

WHEREAS, the District prepared and adopted its original Plan on April 04, 2013; and

WHEREAS, agricultural water suppliers are required to update their respective Plans every five years;

WHEREAS, the District updated its original Plan and adopted the 2015 Plan Update on December 03, 2015; and

WHEREAS, the District must now update its 2015 Plan Update, adopt a 2020 Plan Update, and submit such updated plan to the California Department of Water Resources by May 1, 2021; and

WHEREAS, in preparing its 2020 Plan Update, the District scheduled and held a public hearing on April 8, 2021 to provide the public with an opportunity to offer comments to the District's Board of Directors (Board) on the proposed 2020 Plan Update; and

WHEREAS, the District provided notice of such public hearing as follows:

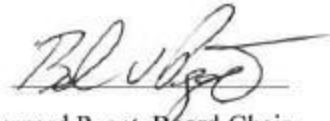
1. By publishing notice in the Bakersfield Californian on March 15, 2021 and March 22, 2021.
2. By posting a notice in a freely accessible location at the District's Bakersfield office located at 1405 Commercial Way Ste 125, Bakersfield, CA 93309 on March 10, 2021.
3. By mailing notice to local government agencies and other interested parties.

WHEREAS, the Board reviewed and considered all public comments received and incorporated such comments into the 2020 Plan Update as deemed appropriate by the Board; and

WHEREAS, the Board has reviewed the 2020 Plan Update and considers its adoption to be in the best interest of the District and its landowners.

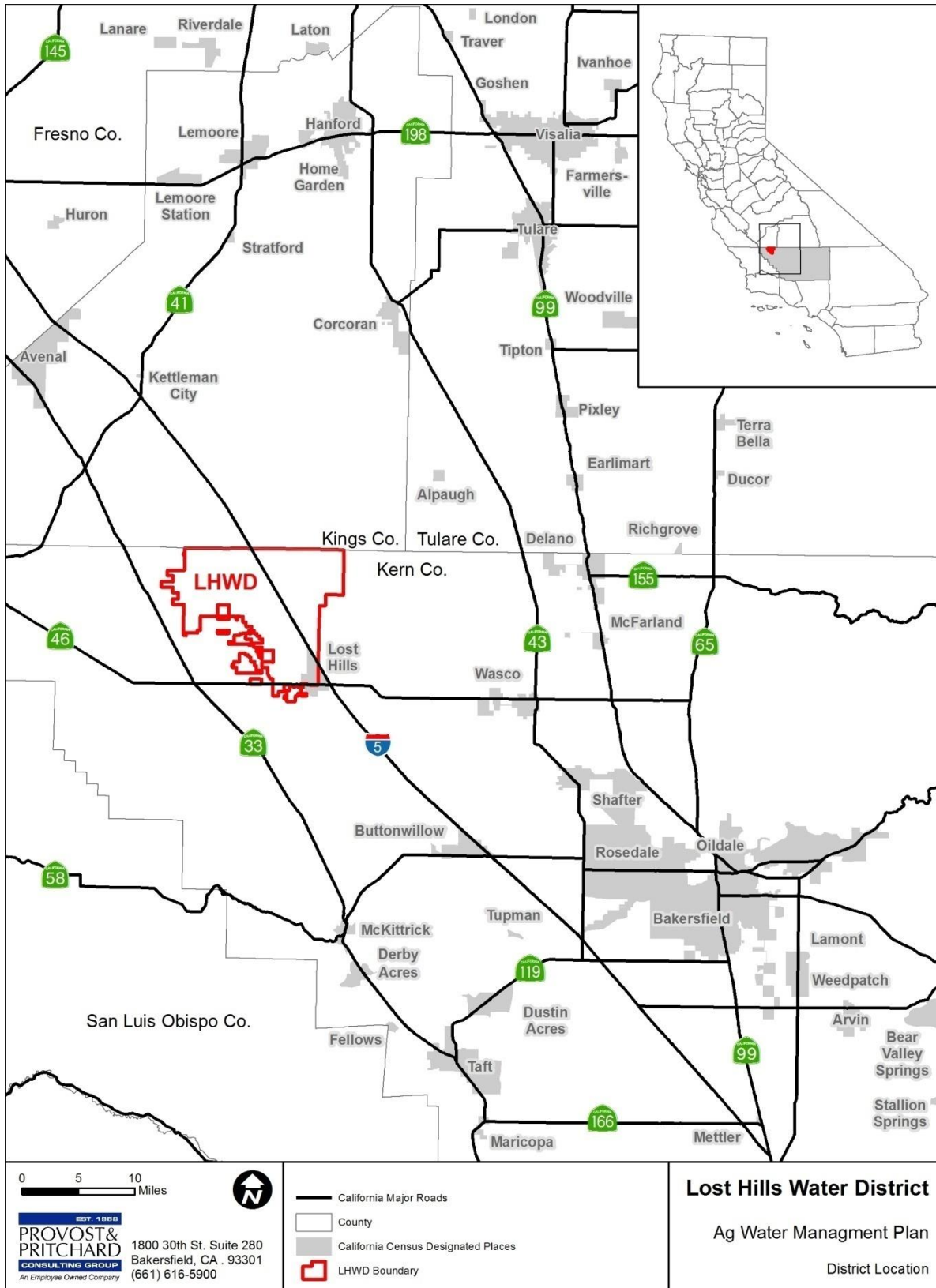
NOW, THEREFORE, BE IT RESOLVED by the Bord of Directors of the Lost Hills Water District as follows:

1. The Board of Directors of the Lost Hills Water District hereby adopt the 2020 Plan Update.
2. The General Manager, or designee, is hereby authorized and directed to prepare and submit the approved 2021 Update to the Agricultural Water Management Plan to the California Department of Water Resources.

A handwritten signature in black ink, appearing to read 'Bernard Puget', written over a horizontal line.

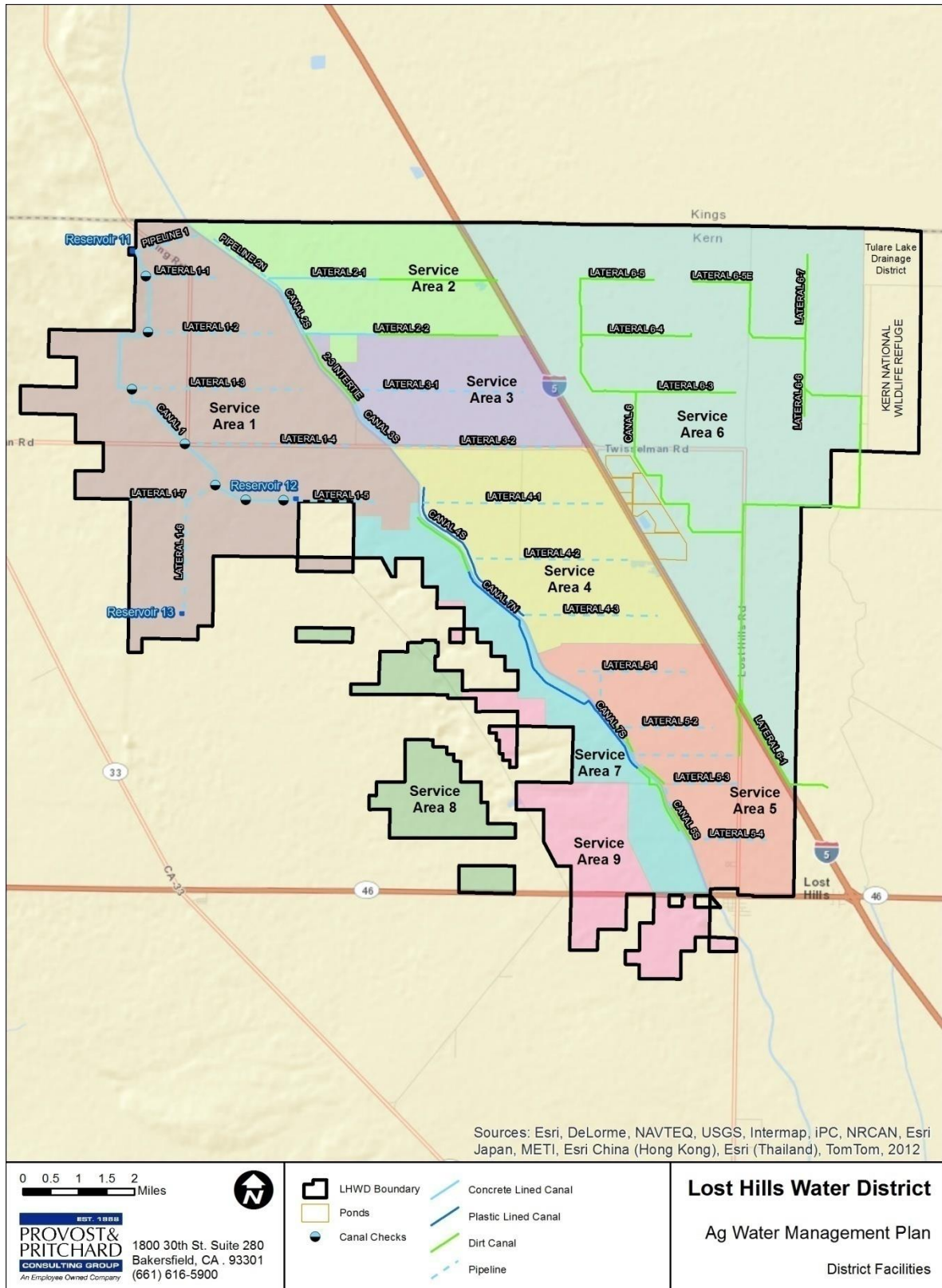
Bernard Puget, Board Chair

Appendix 3. Location Map



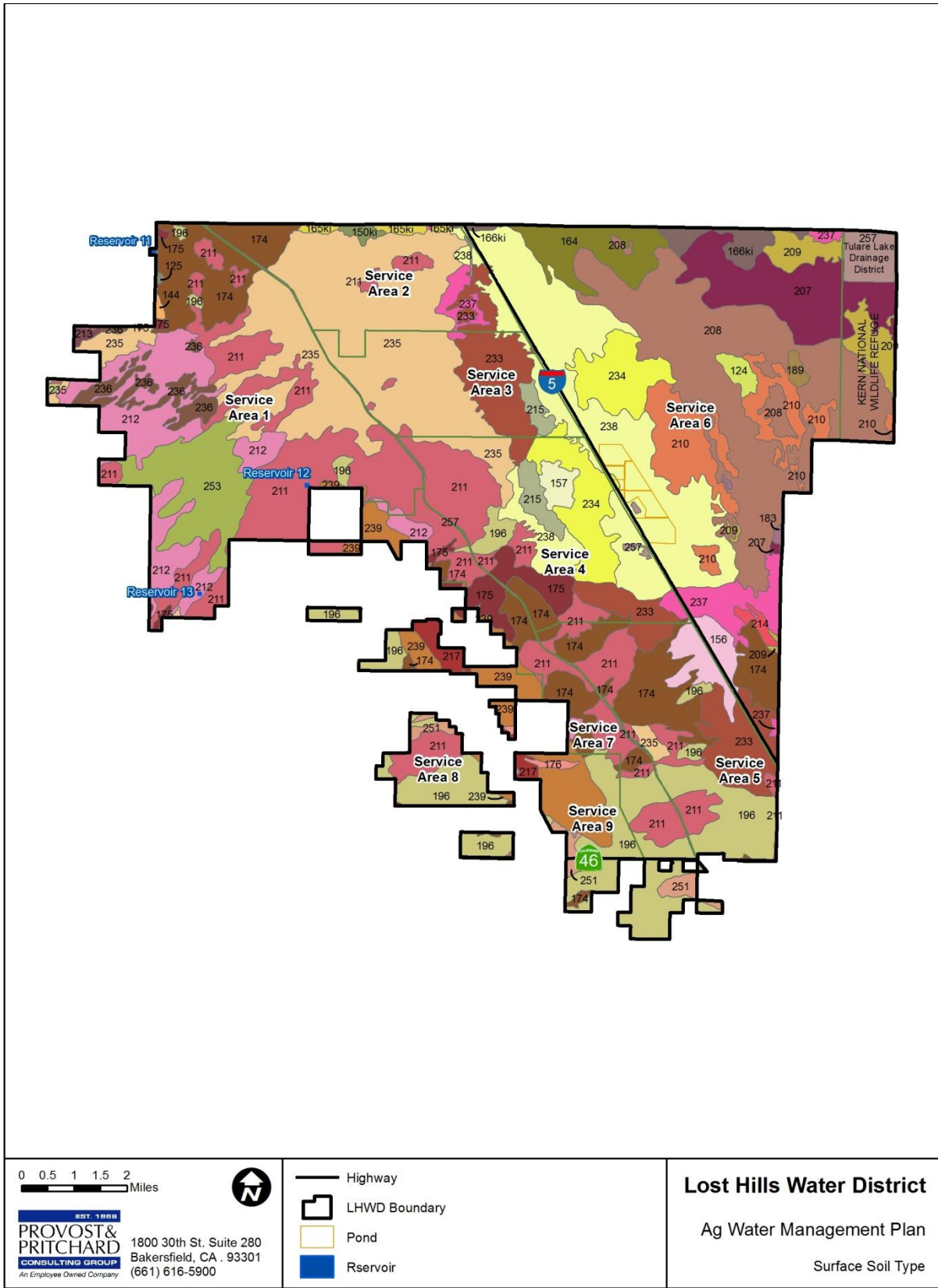
2/13/2013 : W:\Clients\Lost Hills WD - 1056\105612B1-Ag Water Management Plan\GIS\Map\LHWD_Regional_Location.mxd

Appendix 4. Irrigation Facilities Map

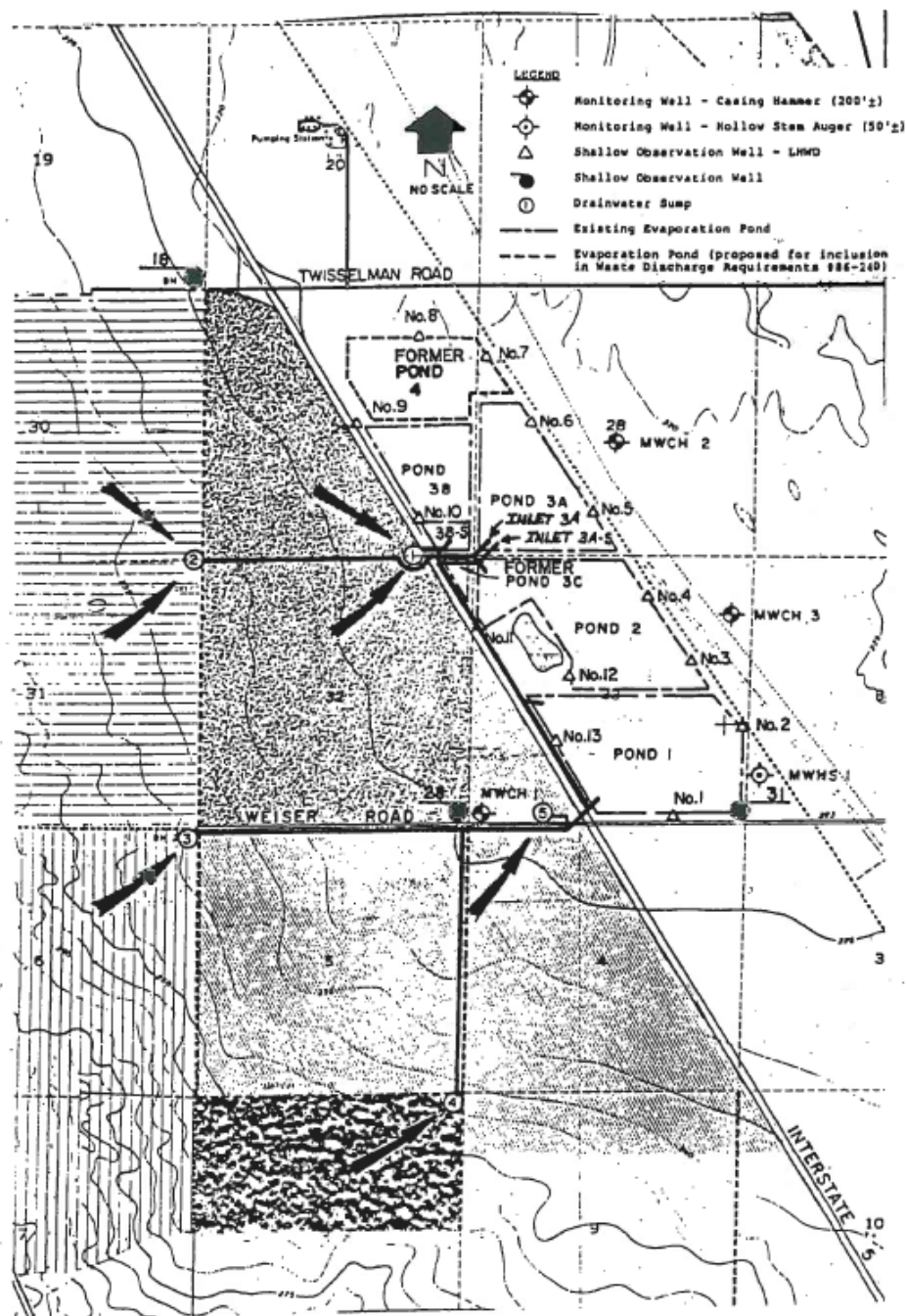


2/13/2013 : W:\Clients\Lost Hills WD - 1056\105612B1-Ag Water Management Plan\GISMap\LHWD_Facilities.mxd

Appendix 5. Soils Map



**Appendix 6. Lost Hills Evaporation Ponds
and Observation Wells**



OBSERVATION WELLS

LOST HILLS EVAPORATION BASINS

Appendix 7. Water Supply Contract

RECORDING REQUESTED BY:

Lost Hills Water District

RECORDED FOR THE BENEFIT OF:

Lost Hills Water District

WHEN RECORDED MAIL TO:

Lost Hills Water District
3008 Sillect Ave., Ste. 205
Bakersfield, CA 93308

LOST HILLS WATER DISTRICT

WATER SUPPLY CONTRACT

THIS WATER SUPPLY CONTRACT is executed in duplicate as of the Effective Date by and between LOST HILLS WATER DISTRICT, a California water district organized and existing under and by virtue of the provisions of Division 13 of the Water Code ("District"), and _____ ("Buyer");

W I T N E S S E T H:

WHEREAS, on November 10, 1966, the District and the Agency¹ entered into the District Contract whereby the Agency agreed to sell to the District a supply of Project Water; and

WHEREAS, Buyer is the owner of Buyer's Land (defined in section 11.02 hereof); and

WHEREAS, the District and the Buyer desire to enter into a water supply contract pursuant to Water Code section 35554;

NOW, THEREFORE, IT IS AGREED between the District and the Buyer that the Standard Provisions (defined in section 11.05 hereof) are hereby incorporated by reference as though set forth in full in this Water Supply Contract and articles XI and XII are added to the Water Supply Contract to read as follows:

ARTICLE XI.

¹ The word "Agency" and 32 additional words or phrases are defined in article II of the Standard Provisions. Those definitions, the definitions contained in article XI hereof, and the definitions contained in article II of the Rules shall govern the interpretation of the Water Supply Contract.

ADDITIONAL DEFINITIONS

11.00. Annual Entitlement.

“Annual Entitlement” means the annual amount of Entitlement Water set forth in the attached **Exhibit A**.

11.01. Buyer’s Address.

“Buyer’s Address” means:

11.02. Buyer’s Land.

“Buyer’s Land” means the parcel or parcels of real property in the District described in the attached **Exhibit A**.

11.03. Effective Date.

“Effective Date” means January 1, 1999 except as otherwise provided in section 12.03 hereof.

11.04. Standard Provisions.

“Standard Provisions” means the document recorded on November 2, 1998 as Document No. 0198151823 in the Official Records in the office of the Kern County Recorder.

ARTICLE XII.

SPECIAL PROVISIONS

12.00. Purchase and Sale of Annual Entitlement.

The District hereby sells to the Buyer as of the Effective Date and the Buyer hereby purchases from the District as of the Effective Date the Annual Entitlement to be delivered by the District to the Buyer for use on the Buyer’s Land under the terms of this Water Supply Contract.

12.01. Delivery Schedule.

The amounts, times and rates of delivery of Entitlement Water to the Buyer during any Year shall be in accordance with the water delivery schedule attached as **Exhibit B** unless the schedule is modified as provided in section 6.03 hereof.

12.02. Acknowledgment
Regarding Charges.

The Buyer hereby acknowledges that the charges established and to be established under section 8.00 hereof are charges for water within the meaning of section 6 (c) of article XIII D of the California Constitution and that the tolls and charges established after July 1, 1997 as a result of the application of section 8.00 hereof do not constitute a new, extended or increased fee or charge within the meaning of section 6 (a) or 6 (b) of article XIII D of the California Constitution.

12.03. Transition Provisions.

This Water Supply Contract establishes the rights and obligations of the District and the Buyer with respect to the matters covered by this Water Supply Contract commencing as of the Effective Date which is January 1, 1999 except as provided in this section 12.03. Notwithstanding the provisions of sections 5.01 and 5.02 hereof and article VIII hereof, the following provisions shall apply for the Year 1999:

(a) The Board shall establish the charges provided in section 8.00 hereof at its regular meeting in the month of October, 1998.

(b) The District shall give the Buyer written notice of the Buyer's annual payment obligation for the Year 1999 on or before November 10, 1998. All of the amount shown on such notice shall be due and payable November 10, 1998. Fifty percent of the amount shown on such notice shall become delinquent if not paid on or before December 15, 1998 and the remaining 50% shall become delinquent if not paid on or before April 15, 1999.

(c) IF THE AMOUNT DUE DECEMBER 15, 1998 BECOMES DELINQUENT, THE DISTRICT, AT ITS ELECTION, SHALL HAVE THE RIGHT TO TERMINATE THIS WATER SUPPLY CONTRACT.

(d) Sections 5.01, 5.02, 8.01 and 8.02 hereof shall not be applicable for the Year 1999.

Resolution 595, as amended, shall apply with respect to the matters covered thereby for all water delivered or scheduled for delivery in the Year 1998.

12.04. Limitation on Permanent
Transfer of Annual Entitlement.

The Annual Entitlement defined in section 11.00 hereof includes _____ acre feet that the Buyer contracted for in excess of 1.88 acre feet per acre. If the Buyer elects to permanently transfer any of its Annual Entitlement to any person, including the Buyer, for use outside the boundaries of the District, the Buyer shall first relinquish such

_____ acre feet of Annual Entitlement to the District at the cost paid to the District with no allowance for interest thereon.

IN WITNESS WHEREOF the District and the Buyer have executed this Water Supply Contract as of the Effective Date.

LOST HILLS WATER DISTRICT

By _____
Donald W. Elholm, President

By _____
_____, Secretary

“Buyer”

By _____
Phillip D. Nixon, Secretary

“District”

Appendix 8. Standard Provisions for Water Supply Contracts

James Maples, Assessor-Recorder
Kern County Official Records

PAID
Pages: 28
11/02/1998
8:00:00

DOCUMENT #: 0198151823



RECORDING REQUESTED BY:

Lost Hills Water District

RECORDED FOR THE BENEFIT OF:

Lost Hills Water District

WHEN RECORDED MAIL TO:

Kuhs, Parker & Stanton (WCK)
Post Office Box 2205
Bakersfield, CA 93303

Fees...
Taxes...
Other...
TOTAL
PAID...

Stat. Types: 1

LOST HILLS WATER DISTRICT

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FOR
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LOST HILLS WATER DISTRICT

STANDARD PROVISIONS FOR WATER SUPPLY CONTRACTS FOR SUPPLY OF STATE WATER PROJECT WATER

THIS DOCUMENT contains the standard provisions to be incorporated by reference in water supply contracts to be subsequently executed between LOST HILLS WATER DISTRICT, a California water district (the "District"), and Water Users [defined in section 2.27 hereof] in the District for the supply of State Water Project water;

W I T N E S S E T H:

WHEREAS, the District has a Contract Entitlement [defined in section 2.12 hereof] of 134,110 acre feet of Entitlement Water [defined in section 2.17 hereof] under the District Contract [identified in section 2.15 hereof]; and

WHEREAS, on November 17, 1987 the Board [defined in section 2.02 hereof] adopted Resolution 595 which established the policy of the District with respect to the allocation and delivery of Project Water [defined in section 2.20 hereof] for agricultural use within the District under the authority of Water Code sections 35421, 35423 and 35470; and

WHEREAS, Water Code section 35554 now authorizes the District to enter into long-term water service contracts with the holders of title to land for the apportionment of all or any part of the District's water supply; and

WHEREAS, the Board has adopted these standard provisions for the long-term water supply contracts and desires to record these standard provisions to reduce the quantity of documents that would otherwise need to be recorded with the County Recorder; and

NOW, THEREFORE, the Board hereby sets forth in the records of the County Recorder the following standard provisions for incorporation by reference in any subsequently executed or amended Water Supply Contract [defined in section 2.26 hereof]:

ARTICLE I.

INTERPRETATION OF AGREEMENT

1.00. Introduction.

Unless the context otherwise requires, the rules of interpretation set forth in this article I shall govern the interpretation of the Water Supply Contract and all documents executed pursuant thereto.

1.01. Captions.

The captions of articles and sections of the Water Supply Contract do not define the scope, meaning or intent of the Water Supply Contract or any documents executed pursuant thereto.

1.02. Exhibits.

All exhibits referred to in the Water Supply Contract are deemed to be incorporated by reference as though set forth therein.

1.03. Definitions.

Unless the context otherwise requires, the words and phrases defined in articles II and XI hereof shall govern the interpretation of the Water Supply Contract.

1.04. Amendments.

When any reference is made to any law, such reference shall apply to all amendments and additions thereto, heretofore or hereafter made.

1.05. Tenses.

The present tense includes the past and future tenses and the future tense includes the present.

1.06. Gender.

The masculine, feminine or neuter gender shall be deemed to include the other.

1.07. Singular; Plural.

The singular or plural numbers shall be deemed to include the other.

1.08. Civil Code Section 1654.

The normal rule of interpretation that any ambiguity is to be resolved against the drafting party shall not be employed in the interpretation of the Water Supply Contract or any amendment hereof or exhibit hereto and Civil Code section 1654 shall not be applied to resolve any ambiguity in the Water Supply Contract.

ARTICLE II.

DEFINITIONS

2.00. Agency.

"Agency" means the Kern County Water Agency.

2.01. Annual Entitlement.

"Annual Entitlement" means the amount of Entitlement Water set forth in section 11.00 of the Water Supply Contract.

2.02. Board.

"Board" means the Board of Directors of the District.

2.03. Buyer.

"Buyer" means a holder of title to land who is a party to a Water Supply Contract and any successor in interest of the Buyer in all or any part of the Buyer's Land.

2.04. Buyer's Address.

"Buyer's Address" means the address of the Buyer set forth in section 11.01 of the Water Supply Contract unless changed as provided in section 10.04 hereof.

2.05. Buyer's Administrative Charge.

"Buyer's Administrative Charge" means the charge computed in the manner provided in section 8.00(e) hereof.

2.06. Buyer's Agency Charge.

"Buyer's Agency Charge" means the charge computed in the manner provided in section 8.00(b) hereof.

2.07. Buyer's Delivery Charge.

"Buyer's Delivery Charge" means the charge computed in the manner provided in section 8.00(d) hereof.

2.08. Buyer's District Capital Charge.

"Buyer's District Capital Charge" means the charge computed in the manner provided in section 8.00(c) hereof.

2.09. Buyer's ID9 Charge.

"Buyer's ID9 Charge" means the charge computed in the manner provided in section 8.00(f) hereof.

2.10. Buyer's Land.

"Buyer's Land" means the real property described in section 11.02 of the Water Supply Contract.

2.11. Buyer's Turnout.

"Buyer's Turnout" means the District turnout designated in Exhibit A to the Water Supply Contract.

2.12. Contract Entitlement.

"Contract Entitlement" means the amount of Entitlement Water set forth in Table 1 of the District Contract.

2.13. District.

"District" means Lost Hills Water District, a California water district organized and existing under and by virtue of Division 13 (commencing with section 34000) of the Water Code.

2.14. District's Address.

"District's Address" means 3008 Sillect Avenue, Suite 205, Bakersfield, California 93308 unless changed as provided in section 10.04 hereof.

2.15. District Contract.

"District Contract" means the agreement between the Agency and the District dated November 10, 1966 as heretofore amended and as may be hereafter amended, supplemented or replaced.

2.16. Drainage Charge.

"Drainage Charge" means the charge computed in the manner provided in section 8.00(f)(3) hereof.

2.17. Entitlement Water.

"Entitlement Water" means water delivered by the Agency to the District as part of the District's Contract Entitlement and water delivered by the District to a Buyer as part of the Buyer's Annual Entitlement.

2.18. ID9.

"ID9" means Improvement District No. 9 of the District formed by the Board under Chapter 4.9 (commencing with section 36410) of Part 6 of Division 13 of the Water Code on November 15, 1984 by adoption of its Resolution 569.

2.19. Master Contract.

"Master Contract" means the agreement between the State and the Agency dated November 15, 1963 as heretofore amended and as may be hereafter amended, supplemented or replaced.

2.20. Project Water.

"Project Water" means all water made available to the District by the Agency under or because of the District Contract.

2.21. Rules.

"Rules" means the District's Rules and Regulations for Distribution and Use of Water adopted by the Board on October 22, 1998, and recorded on October 23, 1998 as Document No. 0198145349 in the Official Records in the office of the County Recorder of the County of Kern, State of California, as hereafter amended, supplemented or replaced.

2.22. Service Area.

"Service Area" means a geographical area of the District within which (a) the District is obligated to deliver Entitlement Water, (b) the Water Users are obligated to pay for the delivery of Entitlement Water, and (c) the Water Users are generally served through the same system of works.

2.23. State.

"State" means the State of California, acting by and through its Department of Water Resources.

2.24. Supplemental Water.

"Supplemental Water" means any water acquired by the District from the Agency, other than Project Water, and any other water acquired by the District from any source other than the Agency.

2.25. Water Shortage.

"Water Shortage" means a condition during a particular Year when the total amount of Entitlement Water to be made available by the Agency to the District during that Year under the District Contract is less than the District's Contract Entitlement for that Year.

2.26. Water Supply Contract.

"Water Supply Contract" means a separate written agreement between the District and the Buyer which incorporates these standard provisions.

2.27. Water User.

"Water User" means any holder of title to land in the District with whom the District has executed a Water Supply Contract and its successors and assigns.

2.28. Year.

"Year" means the twelve month period from January 1 through December 31.

2.29. Zone 1.

"Zone 1" means Zone 1 of ID9. The boundaries of Zone 1 may be changed from time-to-time in the manner provided in Chapter 2.2 (commencing with section 35520) of Part 5 of Division 13 of the Water Code.

2.30. Zone 1 Charge.

"Zone 1 Charge" means the charge computed in the manner provided in section 8.00(f)(2) hereof with respect to Zone 1.

2.31. Zone 2.

"Zone 2" means zone 2 of ID9. The boundaries of Zone 2 may be changed from time-to-time in the manner provided in Chapter 2.2 (commencing with section 35520) of Part 5 of Division 13 of the Water Code.

2.32. Zone 2 Charge.

"Zone 2 Charge" means the charge computed in the manner provided in section 8.00(f)(2) hereof with respect to Zone 2.

ARTICLE III.

RELATIONSHIP TO OTHER AGREEMENTS

3.00. Relationship to Master Contract and District Contract.

The Water Supply Contract is subject to the obligations and limitations imposed by the District Contract which, in turn, is subject to the obligations and limitations imposed by the Master Contract. The Water Supply Contract is intended to be in conformance and harmony with both the District Contract and the Master Contract. The District Contract and the Master Contract are hereby incorporated in these standard provisions by reference as though set forth in full herein. Nothing in the Water Supply Contract shall be deemed to require the District to perform any act in conflict with the District Contract or the Master Contract. The District shall at all times keep and maintain at its office, available for examination by the Buyer, copies of the District Contract and the Master Contract and all amendments thereto.

ARTICLE IV.

TERM

4.00. Term.

The Water Supply Contract shall become effective on the Effective Date stated in section 11.03 of the Water Supply Contract and shall remain in effect throughout the term provided in article 2 of the Master Contract; provided, however, that if the Master Contract or the District Contract is terminated or suspended in any manner and for any cause specified therein, then the Water Supply Contract similarly shall be terminated or suspended.

ARTICLE V.

ANNUAL ENTITLEMENT

5.00. Annual Entitlement.

The District shall sell and the Buyer shall purchase the Annual Entitlement set forth in section 11.00 of the Water Supply Contract under the terms of the Water Supply Contract.

5.01. Deliveries in Excess of Annual Entitlement.

The Buyer may at any time or times during the term of the Water Supply Contract, by timely written notice to the District, request that water be made available to it in any Year in an amount greater than the Buyer's Annual Entitlement for such Year. With the approval of the District and subject to the District's ability to obtain such additional water and the Buyer's payment therefor, the District shall deliver to the Buyer such additional water.

5.02. Request for Delivery of Less Than Annual Entitlement.

The Buyer may at any time or times during the term of the Water Supply Contract, by timely written notice to the District, request that Entitlement Water be made available to it in any Year in amounts less than the Buyer's Annual Entitlement. With the approval of the District and subject to the District's ability to dispose of such Entitlement Water elsewhere, the District shall reduce deliveries to the Buyer during such Year by the amounts requested and, in such event, the Buyer's obligation to make payments to the District during the next Year shall be reduced in the manner provided in section 8.02 hereof.

ARTICLE VI.

DELIVERY OF WATER

6.00. Delivery.

Water made available to the Buyer pursuant to the Water Supply Contract shall be delivered to and accepted by the Buyer at the Buyer's Turnout unless the place of delivery is changed in the manner provided in the Rules.

6.01. Operation of Delivery Structures.

No valve or other mechanism on the Buyer's Turnout shall at any time be operated by the Buyer so as to deliver or curtail delivery of water to the Buyer's Land or any portion thereof. Such valves and mechanisms shall be operated only by employees or agents of the District.

6.02. Measuring Devices.

Except as otherwise provided in the Water Supply Contract, the District shall be responsible for the measuring of all water delivered to the Buyer and shall keep or cause to be kept accurate records thereof. The District shall install, operate and maintain at the Buyer's Turnout such measuring devices and equipment as it shall determine. All such measuring devices and equipment shall be regularly examined, tested and serviced to insure accuracy. The Buyer or any other Water User may inspect such measuring devices and the measurements and records taken therefrom at any time during the regular business hours of the District.

6.03. Delivery Schedules.

The amounts, times and rates of delivery of Entitlement Water to the Buyer during any Year shall be in accordance with a water delivery schedule attached as Exhibit B to the Water Supply Contract unless the schedule is modified in the manner provided in the Rules.

6.04. Capacity in District Conveyance Facilities.

The District shall not be required to deliver to the Buyer in any one month of any Year a total amount of Entitlement Water greater than 18% of the Buyer's Annual Entitlement for that Year. The District will allocate capacity in District conveyance facilities among all affected Water Users in the manner provided in the Rules if the capacity of any District conveyance facility is insufficient to meet the needs of the affected Water Users.

6.05. Limitations.

Project Water delivered to the Buyer pursuant to the Water Supply Contract shall not be sold or otherwise disposed of by the Buyer for use other than on the Buyer's Land unless authorized in the Rules.

ARTICLE VII.

LIMITATIONS ON OBLIGATIONS OF DISTRICT

7.00. Failure of State or Agency to Perform.

The District shall not be liable for failure to perform any portion of the Water Supply Contract to the extent that such failure is caused by the failure of the State to perform any obligation imposed on the State by the Master Contract or by the failure of the Agency to perform any obligation imposed on the Agency by the District Contract; provided, however, that (a) the obligations of the Buyer shall be reduced to the extent that the District is prevented from so performing its obligations and (b) the District shall diligently and promptly pursue all feasible rights and remedies available to it to enforce the right of the District and the Buyer against the State or the Agency, or both, relative to such failure to perform.

7.01. Inadequate Supplies of
Entitlement Water.

(a) Introduction.

The District has contracted to deliver 95% of the District's Contract Entitlement to Water Users, the balance being reserved for operational losses. At times the Agency will be unable to deliver to the District the District's Contract Entitlement and the Water Users will receive less Entitlement Water than provided in the Water Supply Contracts. In a Water Shortage, Entitlement Water shall be apportioned among Water Users as provided in section 7.01(b) hereof.

(b) Apportionment of Entitlement
Water During Water Shortage.

If the Agency makes available to the District Entitlement Water in an amount less than the District's Contract Entitlement, the District shall reduce the delivery of Entitlement Water to the Buyer in an amount which bears the same relation to the total amount of such shortage as the Buyer's Annual Entitlement bears to the total

of the Annual Entitlements of all Water Users entitled to receive Entitlement Water in such Year.

(c) No District Liability.

If the Buyer does not receive its Annual Entitlement as a result of a Water Shortage, no liability shall occur against the District or its directors, officers, agents or employees for any damage, direct or indirect, arising therefrom.

7.02. Curtailment of Deliveries for Maintenance Purposes.

The State or the Agency may temporarily discontinue or reduce the delivery of Project Water for the purposes of maintaining, repairing, replacing, investigating or inspecting any of the facilities necessary for the furnishing and delivery of Project Water to the District, which temporary discontinuance or reduction may result in a similar discontinuance or reduction in deliveries to the Buyer. The District may similarly temporarily discontinue or reduce the delivery of Project Water to the Buyer for the purposes of maintaining, repairing, replacing, investigating or inspecting any of the District's facilities necessary for the delivery of Project Water to the Buyer. Insofar as it is feasible, the District will give the Buyer notice in advance of any such temporary discontinuance or reduction, except in the case of an emergency, in which case notice will be given within a reasonable time after such temporary discontinuance or reduction. In the event of such discontinuance or reduction, the District, upon resumption of service, shall deliver, as nearly as may be feasible, the amount of Project Water which would have been furnished to the Buyer in the absence of such discontinuance or reduction.

7.03. Non-Responsibility for Delivery and Distribution of Project Water.

Neither the District nor its directors, officers, agents, or employees shall be liable for the control, carriage, handling, use, disposal or distribution of Project Water delivered to the Buyer after the Project Water has passed through the Buyer's Turnout, nor for claims of damage of any nature whatsoever including, but not limited to, property damage, personal injury or death arising out of or connected with the control, carriage, handling, use, disposal or distribution of Project Water beyond the Buyer's Turnout and the Buyer shall indemnify and hold the District and its directors, officers, agents and employees harmless from any such damage or claim of damage.

7.04. Non-Responsibility for Quality of Water.

The District assumes no responsibility with respect to the quality of water to be delivered under the Water Supply Contract. **THE BUYER IS ADVISED THAT WATER, AS DELIVERED BY THE DISTRICT, WILL BE UNFIT FOR HUMAN CONSUMPTION.**

ARTICLE VIII.

PAYMENT FOR WATER

8.00. Buyer's Annual Payment Obligation.

(a) Introduction.

Annually, at its regular meeting in the month of June, the Board shall establish the charges provided for in this section 8. On or before each July 15 of the Year preceding the Year in which Project Water is to be delivered, the District shall give the Buyer written notice of the Buyer's annual payment obligation for the next Year. All of the amount shown on such notice shall be due and payable on such July 15. Fifty per cent of the amount shown on such notice shall become delinquent if not paid on or before the following December 15 and the remaining 50% shall become delinquent if not paid on or before the following April 15. The annual payment obligation for any Year shall be the total of (a) the Buyer's Agency Charge for such Year, (b) the Buyer's District Capital Charge for such Year, (c) the Buyer's Delivery Charge for such Year, (d) the Buyer's Administrative Charge for such Year, and (e) the Buyer's ID9 Charge for such Year, if any.

(b) Buyer's Agency Charge.

The Buyer's Agency Charge for the next Year shall be computed by the formula

$$BAC = \frac{DC}{\Sigma AE} \times AE$$

where

"BAC" is the Buyer's Agency Charge, expressed in dollars;

"DC" is that portion of the District's annual obligation to the Agency for such Year for the District's Contract Entitlement, expressed in dollars, provided, however, that (1) if the District at the time

of the regular June meeting of the Board has not received from the Agency a statement of such obligation, "DC" shall be the Board's estimate of such obligation, and (2) if "DC" for any Year is based upon the Board's estimate, "DC" for the next Year shall be adjusted to correct for the difference, if any between such estimate and such obligation;

"EAE" is the total of all Water Users' Annual Entitlements within the District for the next Year, expressed in acre feet; and

"AE" is the Buyer's Annual Entitlement for such Year, expressed in acre feet.

(c) Buyer's District Capital Charge.

The Board shall estimate the amount of money that will be required during the next Year to meet such part, as the Board shall determine to pay from water charges, of (1) payments of principal and interest which will become due during such Year on account of then outstanding bonds or repayment contracts, or both, of the District, and (2) the funds required to establish and maintain a bond reserve fund if such is permitted by law. Such amount shall be apportioned to the several Service Areas in the District as required by law or, if no law applies, in accordance with generally accepted methods of apportioning capital charges. The Buyer's District Capital Charge for the next Year for each Service Area in which any portion the Buyer's Land is located shall then be computed by the formula

$$BDCC = \frac{DCC}{\Sigma AE} \times BAE$$

where

"BDCC" is the Buyer's District Capital Charge, expressed in dollars;

"DCC" is the amount so estimated by the Board which has been apportioned to the Service Area for which the calculation is being made, less any amount determined by the Board to be available from other sources to finance part of the District Capital Charge, expressed in dollars;

"EAE" is the total of all Water Users' Annual Entitlements within the Service Area for the next Year, expressed in acre feet; and

"BAE" is Buyer's Annual Entitlement within the Service Area for the next Year, expressed in acre feet.

(d) Buyer's Delivery Charge.

The Board shall estimate the costs to be incurred during the next Year for operations, maintenance, replacements and energy in delivering Entitlement Water to each Service Area, adjusting each Year to reflect actual cost of operations, maintenance, replacements and energy during the previous Year. The Buyer's Delivery Charge for the next Year for each Service Area shall be computed by the formula

$$BDC = \frac{DDC}{EAE} \times BAE$$

where

"BDC" is the Buyer's Delivery Charge, expressed in dollars;

"DDC" is the amount so estimated by the Board, less any amount determined by the Board to be available from other sources to finance part of the Delivery Charge, expressed in dollars;

"EAE" is the total of all Water Users' Annual Entitlements within the Service Area for the next Year, expressed in acre feet; and

"BAE" is the Buyer's Annual Entitlement within the Service Area for the next Year, expressed in acre feet. If the Buyer's Land is within two or more Service Areas and the Buyer desires to reschedule all or any portion of its Annual Entitlement for a particular Year to Service Areas on a basis other than that set forth in Exhibit B, the District shall, at the time of such rescheduling, recompute the Buyer's Delivery Charge for each Service Area on the basis of the new schedule and the Buyer's annual payment obligation shall be adjusted accordingly; provided, however, if such rescheduling occurs after computation of the Buyer's annual payment obligation for a particular Year, then if such recomputations result in an extra charge to the Buyer, such extra charge shall be paid at the time of rescheduling or, if such computation results in a credit, such credit shall be applied as a credit

against the Buyer's annual payment obligation for the next Year.

(e) Buyer's Administrative Charge.

The Board shall estimate the amount of money that will be required from Water Users during the next Year to meet costs of the District not included in the computation of the Buyer's Agency Charge, the Buyer's District Capital Charge, the Buyer's Delivery Charge and the ID9 Charge, including but not limited to, the salaries of officers and nonoperating employees and the development and maintenance of such reasonable reserves as, from time-to-time, appear necessary and advisable, adjusting each Year to reflect actual cost experience of the past Year. The Buyer's Administrative Charge for the next Year shall be computed by the formula

$$BAC = \frac{DAC}{\Sigma AE} \times AE$$

where

"BAC" is the Buyer's Administrative Charge, expressed in dollars;

"DAC" is the amount so estimated by the Board, less any amount determined by the Board to be available from other sources to finance part of the Administrative Charge, expressed in dollars;

"ΣAE" is the total of all Water Users' Annual Entitlements for the next Year, expressed in acre feet; and

"AE" is the Buyer's Annual Entitlement for the next Year, expressed in acre feet.

(f) Buyer's ID9 Charge.

(1) Introduction.

Part of the Buyer's annual payment obligation is the Buyer's ID9 Charge if all or any part of the Buyer's Land is within Zone 1. The Buyer's ID9 Charge for Buyer's with Buyer's Land in Zone 1 but not in Zone 2 shall be the Zone 1 Charge. The Buyer's ID9 Charge for Buyer's with Buyer's Land in Zone 2 shall be the sum of the Zone 1 Charge, the Zone 2 Charge, and the Drainage Charge.

(2) Zone 1 and Zone 2 Charges.

The Board shall estimate the amount of money that will be required during the next Year to pay all fixed costs for the care, operation, management and improvement of the drainage facilities within ID9, including the payment of salaries of officers and employees and all other expenses, and for the payment of principal and interest on any debt obligations of the District adjusting each Year to reflect actual fixed costs of care, operation, management and improvement of such drainage facilities during the previous Year. The Buyer's Zone 1 Charge for the next Year shall be computed by the formula

$$BZC1 = \frac{0.75FC}{\Sigma AE1} \times BAE1$$

where

"BZC1" is the Buyer's Zone 1 Charge, expressed in dollars;

"FC" is the amount of the fixed costs so estimated by the Board, less any amount determined by the Board to be available from other sources to finance part of the Zone 1 Charge, expressed in dollars;

" $\Sigma AE1$ " is the total of all Water Users' Annual Entitlements within Zone 1 for the next Year, expressed in acre feet; and

"BAE1" is the Buyer's Annual Entitlement within Zone 1 for the next Year.

The Buyer's Zone 2 Charge for the next Year shall be computed by the formula--

$$BZC2 = \frac{0.25FC}{\Sigma AE2} \times BAE2$$

where

"BZC2" is the Buyer's Zone 2 Charge, expressed in dollars;

"FC" is the amount of the fixed costs so estimated by the Board, less any amount determined by the Board to be available from other sources to

finance part of the Zone 2 Charge, expressed in dollars;

"EAE2" is the total of all Water Users' Annual Entitlements within Zone 2 for the next Year, expressed in acre feet; and

"BAE2" is the Buyer's Annual Entitlement within Zone 2 for the next Year.

(3) Drainage Charge.

The Board shall estimate (a) the amount of money that will be required during the next Year to pay all variable costs for the care, operation, management and improvement of the drainage facilities within ID9, including the payment of salaries of officers and employees and all other expenses, adjusting each Year to reflect actual variable costs for the care, operation, management and improvement of such drainage facilities during the previous Year, and (b) the amount of drainage discharge into District drainage facilities during the next Year from all Water Users with lands in Zone 2. The Buyer's Drainage Charge for the next Year shall be computed by the formula

$$BDC = \frac{VC}{EDD} \times BDD$$

where

"BDC" is the Buyer's Drainage Charge, expressed in dollars;

"VC" is the amount of the variable costs so estimated by the Board, expressed in dollars;

"EDD" is the total amount of drainage discharge so estimated by the Board, expressed in acre feet; and

"BDD" is the amount of the Buyer's drainage discharge so estimated by the Board, expressed in acre feet.

8.01. Payments for Additional Deliveries of Water.

(a) Introduction.

If the Buyer makes a written request for the delivery of water in any Year in an amount greater than the Buyer's Annual Entitlement for such Year under section 5.01 hereof and the District is able to obtain such additional water to fill such request, the Buyer shall pay to the District in advance of the delivery of such water an amount established under section 8.01(b) hereof or section 8.01(c) hereof, whichever is applicable. If the additional water is both Entitlement Water available under section 5.02 hereof and other water, the cost for each acre foot of the additional water shall be the weighted average cost thereof using the applicable unit rates established under sections 8.01(b) and 8.01(c) hereof.

(b) Entitlement Water Available Under Section 5.02 Hereof.

If the source of the additional supply is Entitlement Water made available to the District under section 5.02 hereof, the Buyer shall pay, for each acre foot thereof, the lesser of (1) an amount determined by dividing (i) the total of (a) the portion of the Buyer's Agency Charge attributable to that portion of the Buyer's Annual Entitlement for such Year scheduled for delivery in the Service Area in which such water is to be delivered, (b) the Buyer's District Capital Charge for such Year for such Service Area, (c) the Buyer's Delivery Charge for such Year for such Service Area, (d) that portion of the Buyer's Administrative Charge which bears the same relationship to the whole thereof as the portion of the Buyer's Annual Entitlement for such Year scheduled for delivery in such Service Area bears to the Buyer's Annual Entitlement for such Year, and (e) the Buyer's ID9 charge for such Year for such Service Area by (ii) that portion of the Buyer's Annual Entitlement within such Service Area for such Year or (2) an amount equal to (i) the amount that the District could obtain from the Agency or any other person for the use of such Entitlement Water outside of the District and (ii) the unit Delivery Charge in such Service Area, determined without regard to the use of carryover funds.

(c) Other Water.

If the source of the additional supply is water other than Entitlement Water made available to the District under section 5.02 hereof, the Buyer shall pay, for each acre foot thereof, an amount equal to (1) the cost of such water delivered to the District and (2) the unit Delivery Charge in such Service Area, determined without regard to the use of carryover funds.

8.02. Reduction in Payment for
Reduced Deliveries of
Entitlement Water Under
Section 5.02 Hereof.

If, during any Year, the delivery of Entitlement Water to the Buyer is less than the Buyer's allocation of Entitlement Water for such Year at the request of the Buyer made in accordance with section 5.02 hereof, the Buyer's payment obligation for the next Year shall be reduced in an amount equal to (a) the amount received by the District in disposing of such Entitlement Water and (b) an amount equal to the direct costs which the District did not incur or will be refunded as a result of the reduced deliveries, less (c) all delivery charges incurred by the District in delivering the Entitlement Water to the ultimate user thereof.

8.03. Reduction in Payment for
Reduced Deliveries of
Entitlement Water Under
Section 7.01(b) Hereof.

If, pursuant to section 7.01(b) hereof, the Buyer is delivered less Entitlement Water than it is entitled to receive under the Water Supply Contract, the District may either refund to the Buyer an amount equal to the direct costs which the District did not incur as a result of the reduced delivery or apply such amount to reduce the Buyer's payment obligation for the next Year. If no refund is made to the Buyer, no change will be made in the method of computing the Buyer's payment obligation for the next Year since any reduction in the District's annual obligation to the Agency by reason of such reduction in delivery will be reflected automatically in the Buyer's payment obligation by reason of the adjustment made in the factor "DC" used in computing the Buyer's Agency Charge under section 8.00(b) hereof.

8.04. Reduction in Payment for
Other Reduced Deliveries
of Entitlement Water.

If, during any Year, the delivery of Entitlement Water to the Buyer is less than the Buyer's allocation of Entitlement Water for such Year for reasons other than those set forth in sections 8.02 and 8.03 hereof, the Buyer's payment obligation for the next Year shall be reduced in an amount equal to the direct costs which the District did not incur or will be refunded as a result of the reduced deliveries.

8.05. Adjustments of Payments for
Drainage Discharge.

(a) Additional Payments for
Excess Drainage Discharge.

If the amount of Buyer's drainage discharge during any Year exceeds the amount estimated by the Board under Section 8.00(f)(3) hereof, the Buyer shall pay the District, for each additional acre foot of such discharge, an amount determined by dividing the Buyer's Drainage Charge by the amount of the Buyer's drainage discharge estimated by the Board under section 8.00(f)(3) hereof. The District will invoice the Buyer from time-to-time for any excess drainage discharge and the Buyer shall pay the amount due within 30 days of the date of the invoice.

(b) Credits for Reduced Drainage Discharge.

If the amount of the Buyer's drainage discharge during the Year is less than the amount estimated by the Board under section 8.00(f)(3) hereof, the Buyer shall be entitled to a credit, for each acre foot of such reduced discharge, in an amount determined by dividing the Buyer's Drainage Charge by the amount of the Buyer's drainage discharge estimated by the Board under section 8.00(f)(3) hereof. The credit shall be determined by the Manager of the District as soon as feasible after the end of the Year for which it is to be determined and shall be applied, without interest, against the next payment thereafter becoming due to the District from the Buyer. The determination of the Manager shall be final and conclusive as to the District and the Buyer.

8.06. Default and Penalty for Late
Payment of Water Charges.

All water charges required to be paid by the Buyer to the District hereunder constitute water charges under Water Code section 35470. All water charges shall be due and payable as provided in section 8.00 hereof. If any water charge becomes delinquent, a penalty of 10% shall be added thereto and the delinquent charge shall bear interest at the rate of 1 1/2% per month. After any water charge becomes delinquent, the tax collector shall publish the notice required by Water Code section 36951 and proceed to sell the Buyer's Land pursuant to Chapter 4 (commencing with section 36950) of Part 7 of Division 13 of the Water Code. The District, in the event of any delinquency, may suspend delivery of Project Water during the period charges of delinquency; provided, however, that during any such period of suspension the Buyer shall remain obligated to make all payments required under the Water Supply Contract.

8.07. Default and Penalty for Late
Payment of ID9 Charge.

The ID9 Charge constitutes a service charge under Water Code section 35520.38. The ID9 Charge shall be due and payable as provided in section 8.00 hereof. If any portion of the ID9 Charge becomes delinquent, a penalty of 10% shall be added thereto and the delinquent charge shall bear interest at the rate of 1% per month. After any portion of the ID9 Charge becomes delinquent, the Board may, by resolution, direct the assessor to add to the assessment of the parcel of land to which it relates all delinquent charges, penalties and interest thereon as provided in Water Code section 35520.41. If all delinquent charges, penalties and interest are added to the assessment of the Buyer's Land, the tax collector shall publish the notice required by Water Code section 36951 and proceed to sell the Buyer's Land pursuant to Chapter 4 (commencing with section 36950) of Part 7 of Division 13 of the Water Code. The District, in the event of any delinquency, may suspend all drainage services during the period of delinquency; provided, however, that during any such period of suspension the Buyer shall remain obligated to make all payments required under the Water Supply Contract.

ARTICLE IX.

APPURTENANCY AND NON-ASSIGNABILITY

9.00. Appurtenancy.

The Water Supply Contract and the Buyer's right to receive Project Water thereunder are appurtenant to the Buyer's Land. Upon the transfer, whether by sale or by operation of law,

of all of a parcel of the Buyer's Land, the transferee of the parcel of Buyer's Land shall be substituted for the Buyer under the Water Supply Contract to the same extent and effect as though the transferee had executed the Water Supply Contract as the Buyer with respect to the parcel transferred; provided, however, that unless and until after a lapse of 90 days from the date of any such transfer, such transferee shall have executed a contract for a water supply for the parcel of the Buyer's Land that was transferred, identical in all provisions with the Water Supply Contract, the District may, pending execution of such a contract, suspend delivery of Project Water to the parcel of the Buyer's Land that was transferred, in which event, and notwithstanding such suspension, all charges and payments required under the Water Supply Contract shall continue to accrue, shall constitute a charge against the parcel of the Buyer's Land that was transferred, and shall be secured by the lien. Upon the transfer, whether by sale or by operation of law, of less than all of a parcel of the Buyer's Land on an areal basis, the Water Supply Contract shall be deemed divided and the transferee of a portion of a parcel of the Buyer's Land shall be entitled thereafter to receive that portion of Buyer's Annual Entitlement for such parcel which bears the same relation to the amount of the Buyer's total Annual Entitlement under the Water Supply Contract for the parcel as the acreage transferred bears to the total acreage of the parcel of the Buyer's Land; provided, however, that unless and until, after a lapse of 90 days from the date of any such transfer, such transferee shall have executed a contract for a water supply for the portion of a parcel of the Buyer's Land so transferred, identical in all provisions with the Water Supply Contract, except as to Annual Entitlement and land descriptions, the District, pending execution of such a Water Supply Contract, may suspend delivery of Project Water to the portion of the parcel of the Buyer's Land so transferred, in which event, and notwithstanding such suspension, a pro rata share of all charges and payments required under the Water Supply Contract shall continue to accrue, shall constitute a charge against the portion of a parcel of the Buyer's Land so transferred, and shall be secured by the lien. The Water Supply Contract to be executed by the transferee of less than all of a parcel of the Buyer's Land shall provide for an Annual Entitlement which bears the same relation to the Buyer's total Annual Entitlement under the Water Supply Contract for such parcel as the acreage transferred bears to the total acreage of the parcel of the Buyer's Land and the "Buyer's Land" under such Water Supply Contract shall be the land so transferred. Upon execution of such Water Supply Contract covering less than all of a parcel of the Buyer's Land by the transferee, the Water Supply Contract of the transferor shall be deemed amended to eliminate from the Buyer's Land the land described in the transferee's Water Supply Contract and to reduce the Buyer's Annual Entitlement by the amount of the Annual Entitlement provided in the transferee's Water Supply Contract. The District, in

evidence of such amendment, may execute and record in the Office of the County Recorder of Kern County, California, a declaration of such amendment.

9.01. Non-Assignability.

Except as provided in section 9.00 hereof or the Rules, the Buyer shall not, without the prior written consent of the District, assign any right or interest in or to the Water Supply Contract.

ARTICLE X.

GENERAL PROVISIONS

10.00. Remedies Not Exclusive.

The use by either party of any remedy specified in the Water Supply Contract for the enforcement of the Water Supply Contract is not exclusive and shall not deprive the party using such remedy of or limit the application of any other remedy provided by law, at equity, or otherwise.

10.01. Amendments.

The Water Supply Contract may be amended at any time by mutual agreement of the parties except insofar as any proposed amendment is in any way contrary to applicable law or inconsistent with the provisions of the District Contract or the Master Contract. The District shall make available to the Buyer at all times during normal business hours, at the District offices, for the Buyer's inspection, copies of all contracts now or hereafter executed by the District with other Water Users and of any amendments thereto.

10.02. Opinion and Determinations.

Where the terms of the Water Supply Contract provide for action to be based upon opinion, judgment, approval, review or determination of either party hereto, such terms are not intended to be and shall never be construed as permitting such opinion, judgment, approval, review or determination to be arbitrary, capricious or unreasonable.

10.03. Waiver of Rights.

Any waiver at any time by either party hereto of its rights with respect to a default or any other matter arising in connection with the Water Supply Contract shall not be deemed to be a waiver with respect to any other default or matter.

10.04. Notices.

Any notice to be given by the District to the Buyer shall be deemed given and delivered if delivered personally to the Buyer or if enclosed in an envelope addressed to the Buyer at the Buyer's Address and deposited in the United States mail. Any notice to be given by the Buyer to the District shall be deemed given and delivered if delivered personally to an officer of the District at the District's office or if enclosed in an envelope addressed to the District at the District's Address and deposited in the United States mail. Either party may at any time and from time-to-time, by proper notice to the other, change its address of receipt of notice.

10.05. Execution of Documents.

In addition to any documents expressly referred to in the Water Supply Contract to be executed by either or both parties, both parties shall execute any and all documents which might be required to carry out the provisions of the Water Supply Contract.

10.06. Application of Water Supply Contract.

The Water Supply Contract is made for the sole benefit of the District and the Buyer, and their respective successors and assigns, and no other person or persons shall have any right of action thereon or be entitled to any benefits that flow therefrom.

END OF DOCUMENT

wck/LRWD/stanprov.17

LOST HILLS WATER DISTRICT

SECRETARY'S CERTIFICATE

I, WILLIAM C. KUHS, Assistant Secretary of the Board of Directors of LOST HILLS WATER DISTRICT, hereby certify that:

(a) the foregoing is a full, true and correct copy of the Standard Provisions For Water Supply Contracts For Supply of State Water Project Water (the "Standard Provisions") duly adopted at a regular meeting of the Board duly and regularly held at the regular meeting place thereof on October 22, 1998;

(b) all directors had due notice of the meeting and a majority thereof were present;

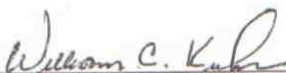
(c) I have compared the foregoing copy of the Standard Provisions with the original minutes of the meeting on file and of record in my office and the foregoing is a full, true and correct copy of the original thereof adopted at the meeting and entered in the minutes; and

(d) the Standard Provisions have not been amended, modified or rescinded since the date of their adoption, and are now in full force and effect.

WITNESS my hand and the seal of the LOST HILLS WATER DISTRICT this 30th day of October, 1998.



[SEAL]


William C. Kuhs, Assistant
Secretary Board of Directors

wck/lhwd/secycert.7

**Appendix 9. Rules and Regulations for
Distribution and Use of Water**

LOST HILLS WATER DISTRICT

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RULES AND REGULATIONS
FOR
DISTRIBUTION AND USE OF WATER

(Revised February 22, 2007)

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LOST HILLS WATER DISTRICT

**RULES AND REGULATIONS
FOR
DISTRIBUTION AND USE OF WATER**

(Wat. Code, § 35423)

The Board of Directors of Lost Hills Water District hereby publishes the rules and regulations for the distribution and use of water within the District.

ARTICLE I.

RULES OF INTERPRETATION

1.00. Introduction.

The rules of interpretation contained in article I hereof shall govern the interpretation of these rules unless the context otherwise requires.

1.01. Authority.

These Rules are established and published under the authority of Water Code sections 35423 and 35424.

1.02. Effective Date.

These Rules shall become effective upon publication under Water Code section 35424.

1.03. Purpose.

These Rules are intended to implement the California Water District Law (Division 13 (commencing with section 34000) of the Water Code) and the Water Supply Contracts with respect to the administration, operation and maintenance of the District Project. In the event of any conflict between these Rules and the Water Supply Contracts, the latter shall control.

1.04. Severability.

If any provision of these Rules, or the application thereof to any person or circumstance, is held invalid, no other provision shall be affected.

1.05. Captions.

The captions of articles and sections of these Rules shall not define the scope, meaning or intent of these Rules.

1.06. Definitions.

The definitions contained in article II hereof shall govern the interpretation of these Rules unless the context otherwise requires.

1.07. Amendments.

The reference to any law, agreement, or policy shall include all amendments and additions thereto, heretofore or hereafter made.

1.08. Tenses.

The present tense includes the past and future tenses; and the future tense includes the present.

1.09. Gender.

The masculine, feminine or neuter gender shall include the other.

1.10. Singular; Plural.

The singular or plural number shall include the other.

ARTICLE II.

DEFINITIONS

2.00. Agency.

"Agency" means the Kern County Water Agency.

2.01. Annual Entitlement.

"Annual Entitlement" means the amount of Entitlement Water set forth in section 11.00 of the Water Supply Contract

2.02. Board.

"Board" means the Board of Directors of the District.

2.03. Buyer.

"Buyer" means a holder of title to land who is a party to a Water Supply Contract and any successor in interest of the Buyer in any part of the Buyer's Land.

2.04. Buyer's Administrative Charge.

"Buyer's Administrative Charge" means the charge computed in the manner provided in section 8.00(e) of the Water Supply Contract.

2.05. Buyer's Agency Charge.

"Buyer's Agency Charge" means the charge computed in the manner provided in section 8.00(b) of the Water Supply Contract.

2.06. Buyer's Delivery Charge.

"Buyer's Delivery Charge" means the charge computed in the manner provided in section 8.00(d) of the Water Supply Contract.

2.07. Buyer's District Capital Charge.

"Buyer's District Capital Charge" means the charge computed in the manner provided in section 8.00(c) of the Water Supply Contract.

2.08. Buyer's ID9 Charge.

"Buyer's ID9 Charge" means the charge computed in the manner provided in section 8.00(f) of the Water Supply Contract.

2.09. Class 1 Land.

"Class 1 Land" means land within the District subject to a Water Supply Contract.

2.10. Class 2 Land.

"Class 2 Land" means land within the District not subject to a Water Supply Contract.

2.11. Connection Service Charge.

"Connection Service Charge" means the charge established from time-to-time by the Board for the construction, acquisition and installation of a turnout.

2.12. Contract Entitlement.

"Contract Entitlement" means the amount of Entitlement Water set forth in Table 1 of the District Contract.

2.13. District.

"District" means Lost Hills Water District, a California water district organized and existing under and by virtue of the provisions of Division 13 (commencing with section 34000) of the Water Code.

2.14. District Contract.

"District Contract" means the agreement between the Agency and the District dated November 10, 1966 as heretofore amended and as may be hereafter amended, supplemented or replaced.

2.15. District Project.

"District Project" means those certain facilities that have been constructed by and are presently being operated and maintained by the District and any future facilities that may hereafter be constructed, or otherwise acquired, and operated and maintained by the District.

2.16. Entitlement Water.

"Entitlement Water" means the water delivered by the Agency to the District as part of the District's Contract Entitlement and water delivered by the District to the Buyer as part of the Buyer's Annual Entitlement.

2.17. Manager.

"Manager" means the person appointed by the Board to manage the affairs of the District.

2.18. Interruptible Water.

"Interruptible Water" means Project Water available to the District under article 15(e) of the District Contract.

2.19. Master Contract.

"Master Contract" means the agreement between the State and the Agency dated November 15, 1963 as heretofore amended and as may be hereafter

amended, supplemented or replaced.

2.20. Permanent Transfer Policy.

"Permanent Transfer Policy" means the District's duly adopted policy for the permanent transfer of entitlement to Project Water as heretofore amended and as may be hereafter amended, supplemented or replaced.

2.21. Project Water.

"Project Water" means all water made available to the District by the Agency under or because of the District Contract.

2.22. Rules.

"Rules" means the District's Rules and Regulations for Distribution and Use of Water.

2.23. Service Area.

"Service Area" means the geographical area of the District within which (a) the District is obligated to deliver Entitlement Water, (b) the Water Users are obligated to pay for the delivery of Entitlement Water, and (c) the Water Users are generally served through the same system of works.

2.24. State.

"State" means the State of California, acting by and through its Department of Water Resources.

2.25. Supplemental Water.

"Supplemental Water" means any water acquired by the District from the Agency, other than Project Water, and any other water acquired by the District from any source other than the Agency.

2.26. Turnout.

"Turnout" means the delivery structure installed by the District in accordance with the Water Supply Contract.

2.27. Water Shortage.

"Water Shortage" means a condition during a particular Year when the total amount of Entitlement Water to be made available by the Agency to the District

during that Year under the District Contract is less than the District's Contract Entitlement for that Year.

2.28. Water Supply Contract.

"Water Supply Contract" means a contract between the District and a holder of title to land in the District for the purchase and delivery of Project Water.

2.29. Water User.

"Water User" means any holder of title to land in the District with whom the District has executed a Water Supply Contract.

2.30. Year.

"Year" means the twelve month period from January 1 through December 31.

2.31. Zone 1.

"Zone 1" means Zone 1 of ID9. The boundaries of Zone 1 may be changed from time-to-time in the manner provided in Chapter 2.2 (commencing with section 35520) of Part 5 of Division 13 of the Water Code.

2.32. Zone 2.

"Zone 2" means Zone 2 of ID9. The boundaries of Zone 2 may be changed from time-to-time in the manner provided in Chapter 2.2 (commencing with section 35520) of Part 5 of Division 13 of the Water Code.

ARTICLE III.

ADMINISTRATION OF DISTRICT

3.00. Board.

The Board shall govern the administration of the District.

3.01. Meetings of Board.

(a) Regular Meeting.

The regular meeting of the Board shall be held without notice at nine o'clock in the morning on the fourth Thursday of each month at the

District's Administration Office at 3008 Sillect Avenue, Suite 205, Bakersfield, CA 93308, or such other place as the Board may provide by resolution. If at any time any regular meeting falls on a holiday, such regular meeting shall be held on the next business day. If by reason of fire, flood, earthquake or other emergency, it shall become unsafe to meet at the place designated, the meeting may be held for the duration of the emergency at such place as is designated by the President of the Board.

(b) Adjourned and Special Meetings.

Adjourned meetings and special meetings may be held from time-to-time and at such places and in such manner as is authorized by law.

3.02. Officers.

The officers of the District shall be a President, a Secretary, a Treasurer, and such other officers as may be elected or appointed by the Board from time-to-time to perform such duties as may be designated by the Board. The duties of such officers shall include the following:

(a) President. The President shall:

(1) be the principal executive officer of the District and, unless otherwise determined by the Board, shall preside at all meetings of the Board;

(2) sign deeds, notes, bonds, contracts or other instruments authorized by the Board to be executed, except in cases in which the signing and execution thereof is expressly designated by the Board or by these Rules to some other officer or agent of the District or is required by law to be otherwise signed or executed; and

(3) perform in general all duties incident to the office of President and such other duties as may be prescribed by the Board.

(b) Secretary. The Secretary shall:

(1) keep the minutes of the meeting of the Board in one or more books provided for that purpose;

(2) see that all notices are duly given in accordance with these Rules or as required by law;

(3) be custodian of the District records and of the seal of the District and affix the seal of the District to documents, the execution of which on behalf of the District under its seal is duly authorized in accordance with the provisions of these Rules; and

(4) perform in general all duties incident to the office of Secretary and such other duties as may be assigned by the Board.

(c) Treasurer.

The Treasurer shall see that all funds and securities of the District are deposited with the District's depository and in general perform all the duties incident to the office of Treasurer and such other duties as from time-to-time may be assigned by the Board.

(d) Other Officers.

Any Vice President shall exercise the authority of the President in the absence or unavailability of the President. Any Assistant Secretary shall exercise the authority of the Secretary in the absence or unavailability of the Secretary. Any Assistant Treasurer shall exercise the authority of the Treasurer in the absence or unavailability of the Treasurer.

3.03. Manager.

The Manager shall be responsible for the administration, construction, operation and maintenance of the District Project and is responsible directly to the Board.

3.04. District Employees.

The Manager shall supervise the activities of all District employees in connection with the operation and maintenance of the District Project and all other activities of the District. District employees and other persons authorized by the Manager shall have access at all times to all lands being served by the District Project for the purpose of conducting District business which may include the following:

(a) The inspection of the lands upon which Project Water is

being applied for the purpose of determining compliance with the terms of the Water Supply Contracts or other agreements for the supply or delivery of water.

(b) The inspection, maintenance, repair or modification of facilities of the District Project.

(c) The determination of improper use or wasting of Project Water.

ARTICLE IV.

ALLOCATION OF WATER

4.00. Introduction.

The District's primary source of water is Project Water, that is, water made available to the District by the Agency under or because of the District Contract. Most of the District's Contract Entitlement has been allocated to Water Users under their Water Supply Contracts. A Water User may apply for more or less than its Annual Entitlement in the manner provided in section 4.01 hereof. The District will attempt to obtain all of the water needed by the Water Users and will allocate such water under section 4.02 hereof. Finally, it may be necessary for the District to allocate or reallocate water when the amount of water available to the District is inadequate to meet the needs of all Water Users and the District will do so under section 4.02(a) hereof.

4.01. Applications.

(a) Requests On or Before September 1.

A request by a Buyer that water be made available in any Year in an amount greater than its Annual Entitlement for that Year or in an amount less than its Annual Entitlement for that Year, made in accordance with the Water Supply Contract, shall be "timely made" if received by the District by four o'clock in the afternoon, local time, on September 1 of the Year preceding the Year during which the Buyer desires more or less than its Annual Entitlement. All timely made requests shall have the same priority in time and shall be deemed made at four o'clock in the afternoon, local time, on such September 1. A request shall constitute an offer by the Buyer to purchase the requested water from the District. The request shall be irrevocable until the District accepts the request and agrees to make such water available to the Buyer or until the next December 31, whichever first

occurs. The request, to the extent accepted by the District, shall constitute a contract on the part of the Buyer to purchase water from the District at the applicable rate established by the District in the manner provided in article V hereof or, if no such rate has been established, at the rate agreed to by the District and the Buyer. A request received by the District by 4:00 p.m., local time, on September 1 of the Year preceding the Year during which the Buyer desires more than its Annual Entitlement shall no longer be deemed "timely made" after the District accepts the request and agrees to make such water available to the Buyer or after the next December 31, whichever first occurs.

(b) Requests After September 1.

All requests for additional water received by the District after September 1 of a Year prior to the Year of delivery will be considered and acted upon by the District in a fair and equitable manner. Buyers who request additional water will be notified as to the availability of water, the estimated cost thereof, and such other information as may be material so that they may determine whether they wish to purchase additional water. When appropriate, pools will be established and water will be allocated among Buyers pro rata on the basis of each Buyer's Annual Entitlement.

4.02. Allocation of Water Supply to Class 1 Lands.

(a) Introduction.

If water is not available to the District in an amount sufficient to satisfy the requests of all Buyers for the delivery of water in amounts greater than their Annual Entitlements, the available water shall be allocated first among the Buyers whose requests therefor are timely made and next to Buyers whose requests are not timely received by the District. If the amount of water made available to the District is reduced after the District has made an original allocation thereof, the remaining available supply thereof shall be allocated or reallocated, as the case may be, pursuant to the allocation procedures contained in this section.

(b) Pooled Entitlement Water.

All Entitlement Water made available to the District as a result of requests timely made for reduced deliveries shall be pooled and shall be the first water used to fill the requirements of those Buyers requesting that water be made available to them in amounts greater than their allocation of Entitlement Water. If the requests for pooled

Entitlement Water exceed the amount of such water available to the District, the available water shall be allocated pro rata among Buyers on the basis of each Buyer's Annual Entitlement.

(c) Supplemental Water.

Water required by the District to satisfy the demands of Buyers desiring the delivery of water in amounts greater than the aggregate of their allocation of Entitlement Water and their allocation pooled Entitlement Water, shall be obtained by the District, to the extent possible, from the Agency or from any other outside source which may from time-to-time become available. If the requests for Supplemental Water exceed the amount of such water available to the District, the available water shall be allocated pro rata among the Buyers on the basis of each Buyer's Annual Entitlement.

4.03. Assignment of Entitlement Water.

A Buyer may assign the right to receive Entitlement Water under its Water Supply Contract to any person for use on Class 1 Land without the prior written consent of the District. A Buyer may not assign the right to receive Entitlement Water under its Water Supply Contract to any person for use on Class 2 Land without the prior written consent of the District. A Buyer may not assign the right to receive any other water allocated by the District.

ARTICLE V.

WATER CHARGES AND CREDITS

5.00. Adoption of District Budget.

The Board shall adopt at its regular meeting in June a District budget for the next Year.

5.01. Establishment of Buyer's Annual Payment Obligation.

The Board shall determine at its regular meeting in June each Buyer's Agency Charge, District Capital Charge, Delivery Charge, Administrative Charge, and ID9 Charge for the next Year in accordance with the Water Supply Contract.

5.02. Establishment of Other Water Charges.

(a) Initial Unit Rates.

The Board, to the extent possible, shall establish initial unit rates for additional Project Water and Supplemental Water at the time the District gives each Buyer notice of its annual payment obligation for the next Year. The unit rate for pooled Entitlement Water shall be the unit rate established in the manner provided in section 8.01(b) of the Water Supply Contract. The unit rate for (1) Project Water, other than Entitlement Water and pooled Entitlement Water, and (2) Supplemental Water within each Service Area shall be an amount equal to (1) the unit cost of such water delivered to the District and (2) the unit Delivery Charge for water delivered into the Service Area, determined without regard to the use of carryover funds.

(b) Final Unit Rates.

On or before April 15 following the District's notice to each Buyer of its annual payment obligation, the District shall reestablish the unit rate for additional Project Water and Supplemental Water based upon the latest available information as to the availability of such water. The revised unit rates for additional water shall be established in the manner provided in section 5.02(a) hereof.

5.03. Payment of Water Charges.

(a) Annual Entitlement.

The Buyer shall pay for its Annual Entitlement in the manner and at the times indicated in its Water Supply Contract.

(b) Other Water Charges.

At the time the District gives each Buyer notice of its annual payment obligation for the next Year, the District, to the extent possible, shall bill the Buyer separately for (1) pooled Entitlement Water, and (2) Supplemental Water ordered by the Buyer for the purchase of which the District must obligate itself in advance of delivery and for water which the District is not required to obligate itself in advance of delivery. If it is not possible for the District to bill the Buyer for water at the time the District gives notice to a Buyer of its annual payment obligation for the next Year, the District shall bill the Buyer for such water at the District's earliest opportunity. The amount billed for water for which the District is not required to obligate itself in advance of delivery (1) shall be deposited by the Buyer with the District

on or before the date specified by the District, (2) shall be held by the District as trustee for the benefit of the Buyer separate and apart from other funds of the District but may be commingled with other such deposits, (3) shall be transferred by the District to the District's Operations Fund, and (4) shall become the property of the District as needed to pay for water delivered to the Buyer. The Buyer shall not be entitled to any interest on or from the funds so deposited.

5.04. Credits.

(a) Non Use of Available Water.

A Buyer who requests and pays for water other than Entitlement Water in any Year and who thereafter fails to use, accept or otherwise dispose of all such water shall be entitled to a credit in an amount equal to the direct costs which the District does not incur or will be refunded as a result of the reduced delivery of such water requested and paid for but not used, accepted or otherwise disposed of, to be determined each Year within each Service Area. The "direct costs" which the District does not incur or will be refunded shall consist of (1) any credit due from the Agency or other water supplier resulting from the reduced deliveries and (2) the average cost of power used for pumping water into the Service Area. The credit shall be determined by the Manager as soon as feasible after the end of the Year for which it is to be determined and shall be applied, without interest, against the next payment thereafter becoming due to the District from a Buyer entitled thereto.

(b) Non Availability of Water.

A Buyer who requests and pays for water other than Entitlement Water in any Year and who thereafter is unable to receive the delivery of any portion thereof because of a reduction in the amount thereof and a reallocation thereof as provided in section 4.02(a) hereof shall be entitled to a credit in an amount equal to the difference between the Buyer's actual total payment for such water and what the Buyer's total payment for such water would have been if determined on the basis of the reduced supply of such water. Any credit shall be applied in the manner provided in section 5.04(a) hereof.

ARTICLE VI.

SCHEDULING OF WATER SERVICE

6.00. Five Year Schedules.

If a Buyer desires to modify a water delivery schedule, the Buyer shall file with the District on or before September 1 a preliminary schedule for each Turnout indicating the amount of Entitlement Water to be delivered each month for the succeeding five Years through such Turnout. Upon receipt of a preliminary schedule, the District shall review it and, after consultation with the Buyer, shall make such modifications as the District deems necessary to insure that the amounts, times and rates of delivery to the Buyer will be consistent with the District's receipt of Entitlement Water from the Agency and the State, considering the then current delivery schedules of all Water Users.

6.01. Monthly Delivery Schedule.

If a Buyer modifies a water delivery schedule under section 6.00 hereof, on or before December 30 of the Year prior to the Year of delivery, the District will furnish each Buyer a schedule of monthly deliveries for the next Year. This schedule will conform to the Buyer's requests for water deliveries as nearly as possible. In the event that the dates provided for in the District Contract are changed, the dates provided for

in this section shall be changed so that the time span between dates specified in this section and the corresponding dates in the District Contract will remain constant.

6.02. Daily Delivery Schedule.

Prior to 12:01 p.m. each Tuesday of each week, each Buyer shall file with the District a daily water use schedule for the next week for each Turnout of such Buyer. Buyers shall be informed by the District if any change is required in their requested schedules. Daily delivery schedules shall be made on the basis of continuous use of water during the 24-hour period commencing at 7:00 a.m. of one day and ending at 7:00 a.m. the following day, including Sundays and holidays, and no allowance shall be made in the service to any Buyer for failure to use the water. Daily delivery schedules may be revised by notification to and approval by the District 48 hours prior to the time such revision is to take effect.

ARTICLE VII.

DELIVERY OF WATER

7.00. Installation of Turnouts.

The District shall install and maintain all Turnouts specified in the Water Supply Contracts. The Board shall establish the Connection Service Charge concurrent with the Buyer's written request for the installation of a Turnout.

7.01. Place of Delivery.

All water shall be delivered to and accepted by each Buyer at the Buyer's Turnout unless otherwise agreed in writing by the District.

7.02. Delivery of Water.

Delivery of water to Buyers shall conform to the daily delivery schedules or approved revisions thereof. Water deliveries shall be made to Buyers on a continuous flow basis in 24-hour increments. Required adjustments in the delivery facilities of the District's project will be made each day beginning at seven o'clock in the morning and will be completed by nine o'clock in the morning or as soon thereafter as practicable. The Buyer's system must be designed to receive water from a Turnout on a continuous flow basis for 24-hour increments. If a Buyer fails to use the water during a period assigned on the schedule, or if the operation under the schedule is begun and then discontinued, the Buyer shall nevertheless be responsible for the water. However, upon notice of emergencies, the District will give such assistance to the Buyer as may be practicable under the circumstances to minimize any water losses.

7.03. Change of Place of Delivery and Use.

The District hereby consents to the change of place of delivery and use of Project Water from any Class 1 Land to any other Class 1 Land, provided that the Buyer first notifies the District in writing of the proposed change of place of delivery and use.

7.04. Delivery to Lands Subject to Outstanding Certificates of Sale.

To the extent that a Buyer is otherwise entitled to the delivery of Entitlement Water from the District, the District will not suspend the delivery of such Entitlement Water under the terms of the Water Supply Contract because the land subject to the Water Supply Contract is also subject to one or more certificates of

sale issued pursuant to Chapter 4 (commencing with section 36950) of Part 7 of Division 13 of the Water Code so long as such Buyer is not delinquent in the payment of its water charges for the Year in which the delivery of Entitlement Water is requested.

7.05. Limitations.

(a) Refusal to Deliver Water.

The District may refuse to deliver water to a Buyer if water is to be delivered through a private facility which the Manager has determined is not capable of conveying water without creating damage to the District Project, or any portion thereof.

(b) Waste of Water.

Water deliveries will be discontinued to any Buyer found to be wasting water either willfully, carelessly, or on account of defective or inadequate ditches or pipelines or inadequately prepared land or improper management and water deliveries will not be resumed until such conditions are corrected.

(c) Water Unfit for Domestic Use.

Water furnished by the District will be unfit for human consumption. A Buyer who desires to use such water for incidental domestic use must provide, operate, and maintain water treatment facilities satisfactory to all governmental authorities vested with jurisdiction over domestic water supplies.

(d) Non-Waiver of Lien.

The lien created by the Water Supply Contract on the lands of a Buyer shall not be waived or in any manner modified as a result of the Buyer's changing the place of delivery and use of any water and the District's consent thereto as provided for in section 7.03 hereof, or the disposition of water as provided in article VIII hereof.

7.06. Allocation of Capacity in District Conveyance Facilities.

If the capacity of any District conveyance facility is insufficient to meet the demands of the Water Users served by such facility, the capacity thereof shall be

allocated among such Water users pro rata on the basis of the annual entitlements appurtenant to lands served by such facility.

ARTICLE VIII.

DISPOSITION OF WATER

8.00. Entitlement Water and Pooled Entitlement Water.

If (1) a Buyer is unable to put all of its Entitlement Water to reasonable beneficial use and has either not filed or not timely filed a written request with the District as provided in the Water Supply Contract and section 4.01(a) hereof or (2) a Buyer has been allocated pooled Entitlement Water as provided in section 4.02(b) hereof but is unable to put all of such water to reasonable beneficial use, the Buyer may dispose of such water to any owner of Class 1 Land within the District for use on such Class 1 Land if the Buyer first notifies the District in writing of the disposition of such water. If a Buyer does not so dispose of such water, upon written request the District will attempt to dispose of such water; provided, however, that such water will be disposed of by the District only after there has been complete allocation of all pooled Entitlement Water and after allocation of any other water required to be paid for, whether or not taken. Any funds received by the District for the account of the Buyer shall be credited and applied as provided in section 5.04 hereof.

8.01. Supplemental Water.

If the Supplemental Water requirements of a Buyer are less than the amount of Supplemental Water allocated to the Buyer as provided in section 4.02(c) hereof, the District, upon written request from the Buyer, will attempt to dispose of the excess Supplemental Water for the account of the Buyer. Any funds received by the District for the account of the Buyer shall be credited and applied as provided in section 5.04 hereof. Except as herein provided or as provided in section 5.04(a) hereof, a Buyer who receives an allocation of Supplemental Water shall not sell or otherwise dispose of such Supplemental Water without the prior written consent of the District.

8.02. Permanent Transfer of Annual Entitlement.

If a Buyer elects to permanently transfer any of its Annual Entitlement to any person, including the Buyer, for use outside the boundaries of the District, any such transfer shall be subject to any limitations, conditions, or like provisions contained in the Water Supply Contract and the Permanent Transfer Policy.

ARTICLE IX.
UNDERGROUND STORAGE
AND
RECOVERY OF WATER

9.00. Additional Definitions.

The definitions contained in this section shall govern the interpretation of article IX hereof.

(a) 2800 Acres.

“2800 Acres” means about 2800 acres of land owned by the City of Bakersfield along the Kern River channel that is used or useful for the underground storage of water.

(b) 2800 Acre Participation Agreement.

“2800 Acre Participation Agreement” means the agreement designated AGREEMENT NO. 84-232 between the Agency and the City of Bakersfield dated October 17, 1984 for the spreading and recovery of water from the 2800 Acres.

(c) Agency Pool Water.

“Agency Pool Water” means water available to the District under Interlocutory Judgment filed November 15, 1989 in *Kern County Water Agency v. Berrenda Water Storage District*, Tulare County Superior Court Case 129839.

(d) Berrenda Mesa Project.

“Berrenda Mesa Project” means about 369 acres of land owned by Berrenda Mesa Water District along the Kern River channel that is used or useful for the underground storage of water.

(e) Berrenda Mesa Project Participation Agreement.

“Berrenda Mesa Project Participation Agreement” means the agreement among the Agency, Berrenda Mesa Water District, the District, and other public entities dated October 28, 1999 for the

construction, operation and maintenance of the Berrenda Mesa Project.

(f) Cross Valley Canal.

“Cross Valley Canal” or “CVC” means the concrete lined canal owned and operated by the Agency which extends from the California Aqueduct near Tupman easterly to the Arvin-Edison Water Storage District canal.

(g) Cross Valley Canal Participation Agreement.

“Cross Valley Canal Participation Agreement” means the agreement between the Agency, the District, and others dated December 22, 2006 regarding the construction and operation of the Cross Valley Canal.

(h) Kern Water Bank.

“Kern Water Bank” means about 20,000 acres of land owned by the Kern Water Bank Authority along the Kern River channel that is used or useful for the underground storage of water.

(i) Pioneer Project.

“Pioneer Project” means about 2,233 acres of land owned by the Agency along the Kern River channel that is used or useful for the underground storage of water and the Agency’s rights to spread water or recover water, or both, in (1) the 2800 Acres and (2) the Kern River channel easterly of the 2800 Acres.

(j) Pioneer Project Participation Agreement.

“Pioneer Project Participation Agreement” means the agreement among the Agency, the District, and other public entities having an effective date of January 1, 1997 for the construction, operation and maintenance of the Pioneer Project.

(k) State Pool Water.

“State Pool Water” means water available to the Agency under Article 56(d) of the Master Contract, some of which may be available to the District under Article 34 of the District Contract.

(l) Storage Project.

“Storage Project” means the Pioneer Project, the 2800 Acres, or the Berrenda Mesa Project, or any combination thereof.

9.01. Relationship of Rules to Agreements.

The Rules in this article are subject to the obligations and limitations imposed by the Pioneer Project Participation Agreement, if water is stored in and recovered from the Pioneer Project, the 2800 Acre Participation Agreement, if water is stored in and recovered from the 2800 Acres, or the Berrenda Mesa Project Participation Agreement, if water is stored in and recovered from the Berrenda Mesa Project, and the Cross Valley Canal Participation Agreement. A copy of the Pioneer Project Participation Agreement, a copy of the 2800 Acre Participation Agreement, a copy of the Berrenda Mesa Project Participation Agreement, and a copy of the Cross Valley Participation Agreement are on file at the District’s administrative office and available for review during normal business hours by any Water User who desires to spread and recover water under the Rules in this article. Any Water User who elects to store water in the Pioneer Project, the 2800 Acres, or the Berrenda Mesa Project, or any combination thereof, and use of the Cross Valley Canal under the Rules in this article (a) shall be conclusively presumed to have read and fully understood the terms of each of such agreements, and (b) agrees that nothing in these Rules shall be deemed to require the District to perform any obligation in conflict with such agreements.

9.02. Financing of Costs.

The Storage Project costs and the Cross Valley Canal costs are segregated into (a) capital costs, (b) fixed costs, and (c) variable costs. The District’s share of the annual capital costs and the annual fixed costs shall be distributed to all Water Users in the Buyer’s Administrative Charge. The District’s share of all variable costs for the storage of water shall be distributed to the Water Users who store water and shall be invoiced to such Water Users as provided in section 9.04(c) hereof. The District’s share of all variable costs for the recovery of water shall be distributed to the Water Users who recover water and invoiced to such Water Users as provided in section 9.06(c) hereof.

9.03. Sources of Water for Underground Storage.

The water made available to the District by the Agency under or because of the District Contract, i.e., Project Water, includes (a) Entitlement Water, (b) State Pool Water, (c) Interruptible Water, sometimes referred to as Article 21

water, and (d) Agency Pool Water. A Water User may store any Project Water in any Storage Project for subsequent use in the District. A Water User may store other water in any Storage Project if authorized by the Board.

9.04. Underground Storage of Water.

(a) Request to Store Water.

A Water User who desires to store water in a Storage Project or the Kern Water Bank shall file a written request with the District on a form provided by the District. The request may be hand-delivered or mailed to the District at its administrative office in Bakersfield, California, sent by facsimile to (661) 633-9026, or sent by e-mail to *admin@lhwd.org*. The request shall be signed by the Water User or its authorized agent. A Water User may revise its request at any time by delivering a revised request to the District on the same form marked "revised". The revised request shall not be effective until received by the District.

(b) Allocation of Storage Capacity.

If the District's allocated storage capacity in the Pioneer Project, the 2800 Acres, or the Berrenda Mesa Project or the facilities required to transport water to such Storage Project is not sufficient to meet the requests made under section 9.04(a) hereof, the available storage capacity shall be allocated among the Water Users who have filed such requests pro rata on the basis of Annual Entitlements.

(c) Payment of Transportation and Storage Costs.

The District shall invoice each Water User for the costs incurred by the District for transporting and storing any water requested by the Water User to be stored in a Storage Project. The Water User shall pay to the District its invoiced costs within 30 days of the date of the invoice. The Water User shall forfeit any claim to such stored water and title to such stored water shall pass to the District if the invoice is not timely paid.

9.05. Records.

The Agency maintains records for District water stored in the Pioneer Project, the 2800 Acres, and the Berrenda Mesa Project. The Kern Water Bank

Authority maintains records for District water stored in the Kern Water Bank. The District shall maintain records indicating for each Water User the amount and type of all water in storage in the Pioneer Project, the 2800 Acres, and the Berrenda Mesa Project and the amount and type of any Project Water stored in the Kern Water Bank.

9.06. Recovery of Stored Water.

(a) Request to Recover Water.

A Water User who desires to recover water from a Storage Project or the Kern Water Bank shall file a written request with the District on a form provided by the District. The request may be hand-delivered or mailed to the District at its administrative office in Bakersfield, California, sent by facsimile to (661) 633-9026, or sent by e-mail to admin@lhwd.org. The request shall be signed by the Water User or its authorized agent. A Water User may revise its request at any time by delivering a revised request to the District on the same form marked "revised". The revised request shall not be effective until received by the District.

(b) Allocation of Recovery Capacity.

If the District's allocated recovery capacity in the Pioneer Project, the 2800 Acres, or the Berrenda Mesa Project, or any combination thereof, or the facilities required to transport water from such Storage Project is not sufficient to meet the requests made under section 9.06(a) hereof, the available recovery capacity shall be allocated among the Water Users who have filed such requests pro rata on the basis of Annual Entitlements.

(c) Payment of Transportation and Recovery Costs.

The District shall invoice each Water User for the costs incurred by the District for transporting and recovering any water requested by the Water User to be recovered from a Storage Project. The Water User shall pay to the District its invoice costs within 30 days of the date of the invoice. The invoiced amount, or any part thereof, shall be deemed delinquent if not timely paid. Interest on the delinquent amount shall accrue at the rate of 10% per annum from the delinquent date until paid. The District, if it so elects, may terminate any water deliveries to the delinquent Water User until the delinquent amount and all accrued interest have been paid.

9.07. Appurtenancy.

All water stored by a Water User in a Storage Project is appurtenant to the Water User's land in the District.

9.08. Assignability.

A Water User may transfer to another Water User, in place, any water previously stored by the transferor Water User in a Storage Project. The transfer shall not be effective until the transferor and the transferee, individually or jointly, provide the District with written notice of the amount and type of water transferred from each Storage Project.

9.09. Transition Provision.

If a person has water in storage in a Storage Project prior to the effective date of the Rules in this article but is no longer a Water User, the water stored shall become appurtenant to the land of such person in the District if the person subsequently becomes a Water User or the person may transfer such water to a Water User under section 9.08 hereof.

ARTICLE X.

MISCELLANEOUS PROVISIONS

10.00. Operation and Maintenance of District Project.

The operation and maintenance of all of the District Project shall be within the exclusive control of the District. No person shall be allowed to make any opening in, cut, plow down or otherwise interfere with or weaken any bank of any facility of the District Project.

10.01. Prohibitions.

(a) Pumping Into Canals and Pipelines.

No private pumping into or from District canals or reservoirs shall be permitted. No private pumping into District pipelines shall be permitted, except those pipeline laterals in which a rejection structure has been installed and the water in the pipeline downstream of the structure is controlled by the Buyer.

(b) Structures.

No structures of any kind whatsoever, shall be placed in, on, or over any District canal or pipeline by anyone, except as such are approved, both as to location and character of construction, by the District.

(c) Nuisances.

No rubbish, swill, garbage, manure or refuse, or dead animal or animal matter from any barnyard, stable, dairy or hog pen shall be placed in or allowed to be emptied into any canal, reservoir, or pipeline of the District.

(d) Waste Waters.

No waste water shall be discharged into District canals or pipelines without the written consent of the District.

(e) Private Interference.

Attention is directed to Penal Code section 592 which provides as follows:

"(a) Every person who shall, without authority of the owner or the 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."

10.02. Availability of Public Records.

All public records on file with the District shall be made available for review and inspection of landowners within the District, or any other interested party, during the normal business hours of the District. Copies may be procured of all such public records which the District can reproduce at its office upon the payment of reasonable reproduction charges as shall be established by the Manager. Copies of those public documents which are not capable of being reproduced at the District's office may be procured by making appropriate arrangements with the Manager for the safe delivery thereof to a person determined by the Manager to be capable of safely reproducing such documents, and all costs of such reproduction shall be borne by the party requesting the copies.

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Appendix 10. Permanent Entitlement Transfer Policy

LOST HILLS WATER DISTRICT

**PERMANENT ENTITLEMENT TRANSFER POLICY
(As Amended July 16, 1998)**

The District's policy with respect to the permanent transfer of entitlement to State Water Project ("SWP") water is as follows:

1. The District's entitlement to SWP water ("entitlement") will be allocated among the tracts of land in Service Areas 1 through 9 to determine the amount of entitlement that may be permanently transferred by each holder of title thereto ("landowner") out of the District on the following basis:
 - (a) First, 1.88 acre feet per acre ("AF/Ac") will be allocated to landowners in Service Areas 1 through 9 with the exception of the following landowners: (1) the District; (2) landowners in Service Areas 6E, 8 and 9 who have previously declined to contract for entitlement, (3) landowners of lands which have been stripped of any right to entitlement as a result of the permanent transfer of entitlement for the Kern Water Bank transaction ("KWB Lands"), and (4) landowners of lands previously owned by the District which have been stripped of any right to entitlement.
 - (b) Second, any entitlement in excess of 1.88 AF/Ac will be allocated to the landowners described in paragraph 1(a) hereof who wish to contract for more than 1.88 AF/Ac pro rata on the basis of acreage.

A landowner who contracts for entitlement allocated under paragraph 1(b) hereof will not be allowed to permanently transfer any entitlement out of the District unless and until the entitlement allocated under paragraph 1(b) hereof is first offered to the District at the price the landowner paid the District with no allowance for interest thereon.
2. Permanent transfers of entitlement out of the District will be allowed in the following order:
 - (a) First, the District with respect to entitlement not under contract to any landowner.

- (b) Second, landowners in Zone of Benefit 2 of Improvement District 9 who do not contract for more than 1.88 AF/Ac.
 - (c) Third, landowners in Service Areas 1 through 7, other than landowners in Zone of Benefit 2 of Improvement District 9, who do not contract for more than 1.88 AF/Ac.
 - (d) Fourth, landowners in Service Areas 8 and 9.
 - (e) Fifth, each landowner who contracts for more than 1.88 AF/Ac for any tract of land owned by such landowner or any person closely affiliated with such landowner, as determined by the District.
- 3. Outstanding District debt will be allocated among the service areas in the District pro rata on the basis of the indebtedness originally incurred by the District for each service area. The outstanding debt within a service area will be allocated among the tracts of land in the service area pro rata on the basis of acreage.
 - 4. Any landowner who contracts for more than 1.88 AF/Ac will be required to pay the District at the time of entering into the contract an amount equal to the pro rata share of the outstanding District debt associated with such entitlement.
 - 5. An O&M charge, an ID9 charge, and an administration charge will be established by the District for each transfer.
 - 6. A landowner who wishes to permanently transfer his, her, or its entitlement to SWP water out of the District ("transferor") must pay the following charges to the District prior to the transfer:
 - (a) The transferor's share of the outstanding District debt.
 - (b) The O&M charge, the ID9 charge and the administration charge established by the District.
 - (c) Any charges imposed by the Kern County Water Agency (the "Agency") attributable to the transfer.
 - (d) Any charges imposed by the State of California, acting by and through its Department of

Water Resources (the "State"), attributable to the transfer.

- (e) All due but unpaid District assessments, water charges, or like charges and any penalties, interest and like charges associated therewith.
 - (f) Any other transactional costs that the District has or will incur in connection with the transfer.
7. A transferor may continue to farm the land from which the entitlement was transferred so long as such farming does not adversely affect other landowners in the District and the District so agrees. If the District delivers water to such lands and has not otherwise established charges for such delivery, the District will establish reasonable charges for such delivery and, in establishing such charges, will consider the payments previously made by the transferor to the District pursuant to paragraph 6 hereof.

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Appendix 11. Certified Test Report



CERTIFIED TEST REPORT

CUSTOMER: MCCALLS METER SALES SERVICE
MODEL NO: M0306
METER SERIAL NO: 11-04485

CONFIGURATION

METER INSIDE DIAMETER: 6.065
METER OUTSIDE DIAMETER: 6.625
TEST DATE: 6/16/2011
TEST FACILITY: Volumetric
IDEAL TEST CONSTANT: 6738

CALIBRATION DATA

| | Tested TC | GPM | Accuracy |
|---|-----------|------|----------|
| 1 | 6741 | 1257 | 100.0 |

CERTIFIED BY: Paul Hobbs DATE: 6/20/2011

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



McCROMETER

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11-04485

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