ORANGE COVE IRRIGATION DISTRICT
Water Management Plan
Including DWR Supplemental Information

August 9, 2018

Index

Section I: Description of the District

District Name: ***Orange Cove Irrigation District***

Contact Name: Fergus Morrissey

Title: Engineer-Manager

Telephone: 559-626-4461

E-mail: fmorrissey@orangecoveid.org

Web Address: *orangecoveid.org*

A. History

1. Date district formed: 1937 *Date of first Reclamation contract*: 1949

Original size (acres): 12,587 *Current year (last complete calendar year)*: 2015

2. Current size, population, and irrigated acres

2015	
Size (acres)	27,962
Population served (urban connections)	0
Customers (Landowners)	362
Irrigated acres	25,796

3. Water supplies received in current year

Water Source	***AF***
Federal urban water (Tbl 1)	
Federal agricultural water (Tbl 1)	3,152
State water (Tbl 1)	
Other Wholesaler (define) (Tbl 1)	
Local surface water (Tbl 1)	
Upslope drain water (Tbl 1)	
Private groundwater (Tbl 2)	
Banked water (Tbl 1)	
Transferred water (Tbl 1)	5,805
Recycled water (Tbl 3)	
Total	8,957

4. Annual entitlement under each right and/or contract

	AF	*Source*	*Contract #*	*Availability period(s)*
Reclamation Agriculture	39,200	USBR	175r-1672D	No restrictions

5. Anticipated land-use changes. For Ag contractors, also include changes in irrigated acres.

None

6. Cropping Patterns

List of current crops (crops with 5% or less of total acreage) can be combined in the 'Other' category.

Original Plan 2002		***Previous Plan 2009***		***Current Plan***	
Crop Name	***Acres***	***Crop Name***	***Acres***	***Crop Name***	***Acres***
Citrus	18,168	Citrus	21,051	Citrus	20,600
Fruits & Nuts	3,096	Fruits & Nuts	2,477	Fruits & Nuts	2,324
Grapes	1,872	Grapes	1,100	Grapes	959
		Olives	876	Olives	751
		Forage	940	Forage	589
		Fallow	884	Fallow	2,166
Other (<5%)		*Other (<5%)*	229	*Other (<5%)*	573
Total	23,894	*Total*	27,557	*Total*	27,962

(See Planner, Chapter 3, Addendum D for list of crop names)

7. Major irrigation methods (by acreage) (Agricultural only)

Original Plan 2002		***Previous Plan 2009***		***Current Plan***	
Irrigation Method	***Acres***	***Irrigation Method***	***Acres***	***Irrigation Method***	***Acres***
Furrow	6,338	Furrow	5,196	Furrow	3,196
Border	430	Border	502	Border	238
Low Volume Mister/Drip/Micro Jet	16,726	Low Volume Mister/Drip/Micro Jet	20,876	Low Volume Mister/Drip/Micro Jet	22,166
		Sprinkler	983	Sprinkler	2,362
Total	23,894	*Total*	27,557	*Total*	27,962

B. Location and Facilities

See Attachment A for a map containing the Orange Cove ID legal boundary and its 14 delivery turnouts off of the federally owned Friant-Kern Canal.

1. Incoming flow locations and measurement methods

Location Name	***Physical Location Friant Kern Canal Mile Post***	***Type of Measurement Device***	***Accuracy***
1 North	35.85	Venturi	+/- 1%
1A/1B/1AE	35.87	Venturi	+/- 1%
2	36.79	Venturi	+/- 1%
3	38.74	Venturi	+/- 1%
4	39.82	Venturi	+/- 1%
5	41.76	Venturi	+/- 1%
6	42.89	Venturi	+/- 1%
7	44.56 Right Bank	Venturi	+/- 1%
8	44.56 Left Bank	Venturi	+/- 1%
9	45.46	Venturi	+/- 1%

10	47.03	Venturi	+/- 1%
11	48.58	Venturi	+/- 1%
12	50.38	Venturi	+/- 1%
13	51.62	Venturi	+/- 1%
14	53.32	Venturi	+/- 1%

2. *Current year Agricultural Conveyance System*

Miles Unlined - Canal	***Miles Lined - Canal***	***Miles Piped***	***Miles - Other***
NA	NA	116	NA

3 *Current year Urban Distribution System*

Miles AC Pipe	***Miles Steel Pipe***	***Miles Cast Iron Pipe***	***Miles - Other***
NA	NA	NA	NA

4. *Storage facilities (tanks, reservoirs, regulating reservoirs)*

Name	*Type*	*Capacity (AF)*	*Distribution or Spill*
3A	Reservoir	10	Distribution
8	Reservoir	26	Distribution
11A	Reservoir	8	Distribution
13	Reservoir	15	Distribution

5. Description of the agricultural spill recovery system and outflow points.
The District is a completely piped / pressurized system and there is no operational spill or need for recovery system.
The District is primarily micro irrigation and what little amount is furrow irrigated, water is collected in tail water basins and reused on the same farm.

6. *Agricultural delivery system operation (check all that apply)*

Scheduled	*Rotation*	*Other (describe)*
X		

7. *Restrictions on water source(s)*

Source	***Restriction***	***Restriction Cause***	***Effect on Operations***
Friant-Kern Canal	Hydrology/Delta Operations/Environmental Redistribution	Water Made Available – BOR discretion	Discretion of Reclamation can be significant. 2014 and 2015 Discretion led to ZERO Allocation

8. *Proposed changes or additions to facilities and operations for the next 5 years*
None

C. Topography and Soils

1. *Topography of the district and its impact on water operations and management.*

The terrain is sloping to the west from the Sierra Nevada foothills. The average slope is 5 to 10 feet per mile. Most soils range in texture classification from a sandy loam with intake characteristics ranging from moderately low. There is little impact from the soils or topography on water management practices.

2. *District soil association map (Agricultural only)*
   See Attachment B, District Soils Map.
   This attachment is also available on the OCID website (orangecoveid.org).

3. *Agricultural limitations resulting from soil problems (Agricultural only)*

Soil Problem	*Estimated Acres*	*Effect on Water Operations and Management*
Salinity	0	none
High-water table	200	none
High or low infiltration rates	2,000	none
Other (define)		none

D. Climate

1. *General climate of the District service area and weather in 2015*

Climate (1961-1990)

Climate Factor	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Annual*
Avg. Precip. (in.)	2.68	2.2	2.4	0.83	0.43	0.08	0	0.04	0.2	0.67	1.38	1.42	12.33
Avg. High (F)	56	62	68	76	85	93	99	98	92	82	66	56	78
Avg. Low (F)	37	40	43	46	52	58	62	61	57	49	41	35	48

U.S. Climate Data.com - Climate data for Orange Cove, CA - 93646 for the period from 1961-1990

Weather in 2015

2015 Weather	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Min. Temp (F)	37	42	43	43	50	61	66	63	60	55	38	33	49
ETo (in.)	1.21	1.99	4.47	5.94	7.04	8.95	9.03	8.46	6.19	4.08	1.97	1.22	61

Weather station ID *CIMIS # 142 – Orange Cove* *Data period: Year* 2015 *to Year* 2016 *ET Station ID* *CIMIS # 142 – Orange Cove* *Average annual frost-free days:* 353

Frost Free Days - According to National Oceanic and Atmospheric Administration (NOAA), frost free days are days with temperatures greater than 28 degrees Fahrenheit.

2. *Impact of microclimates on water management within the service area*
   The impact of microclimates on water management generally results in a reduced need for application of crop protecting frost water. Warm inversion layers from foothill air drainage coupled with wind machine operation enhances the microclimate in the District

and is what allows for greater reliability of annual production relative to areas of the valley that experience harmfully low temperatures on a regular basis.

E. Natural and Cultural Resources

1. *Natural resource areas within the service area*

Name	*Estimated Acres*	*Description*
None	NA	NA

2. *Description of district management of these resources in the past or present*
   The service area of the District is generally void of natural resources that would require management to protect; its farmland.

3. *Recreational and/or cultural resources areas within the service area*

Name	*Estimated Acres*	*Description*
None		

F. Operating Rules and Regulations

1. *Operating rules and regulations*
   See Attachment B, District Rules and Regulations

2. *Water allocation policy*
   See Attachment B, **Page 3**
   Summary –

   4. *ENTITLEMENT TO WATER*

   a. When the demand for water is greater than the available supply, available water will be distributed equitably among those who have filed an application in accordance with Paragraph l and as required by California State Water Code Section 22250, which reads in part as follows:

   "All water distributed by districts for irrigation purposes shall be apportioned ratable to each landowner upon the basis or ratio which the last assessment against his land for district purposes bears to the whole sum assessed in the district."

   * *b. Any landowner may assign for use within the District their full allocation pursuant to Section 22250 provided the water is first Secured in accordance with Paragraph 1 and the Transfer Fee Rule.*

3. *Official and actual lead times necessary for water orders and shut-off (Agricultural only)*
   See Attachment B, **Page 4**
   Summary –

24 hours advance notice for turn on and shut off

4. *Policies regarding return flows (surface and subsurface drainage from farms) and outflow (Agricultural only)*
   See Attachment B, Page 5
   Summary –

   TAILWATER

   a. The District is required to regulate excessive tail-water. The District's Repayment Contract with the United States requires the District, as a provision of its conservation plan and as a condition of continued service, to ensure water is put to beneficial use. Hence, the District must regulate excessive tail-water to avoid determinations that it is wastefully or unreasonably using the federal resource (water supply). If the District is required to regulate tail-water because the grower does not do so, it needlessly expends District funds without providing specific benefit to the broad group of District landowners.

   b. If the District determines that a landowner has improperly used irrigation water delivered to them, or improperly prepared the ground to receive irrigation water, such that excess tail-water, in the District's opinion, is leaving the landowner's property, the District shall notify the landowner with the appropriate steps to take to ensure that excess tail water is eliminated. If the landowner does not take appropriate steps to remedy the situation, the District will reduce and/or discontinue water delivery until the problem is rectified. Alternatively, the District may, at the landowner's expense, take corrective action in order to ensure that excess tail-water does not leave the landowner's property. Landowners will be charged the full cost to the District of any services provided to restrict tail-water runoff, and payment of these charges will be required as a condition of continued service.

5. *Policies on water transfers by the district and its customers*
   See Attachment B, **Page 4**
   Summary –

   WATER TRANSFERS

   *a. Intra-district - between **same entity**:*
   A landowner having properties in two or more of the District's delivery systems (e.g. OCID System 7 and OCID System 11), may transfer water, without penalty or transfer fee, from one system to another system. The Energy Charge will apply only if water is delivered on a pump-pressurized delivery.

   *b. Intra-district - between **different entities**:*
   A landowner may transfer water to another landowner by filing a signed water transfer form with the District and paying fees in accordance with the Transfer Fee Rule. The transferor, prior to the transfer in accordance with Paragraph 1, must have purchased the transferred water. The District assumes no responsibility for collecting monies due to the transferor from the transferee. Both the transferor and the transferee must sign a water transfer form. The Energy Charge will apply to the transferee only if water is delivered on a pumped delivery.

Transfers out of District are not permitted under any circumstances. Transfers in from other supplies, are permitted and shall require payment of a $50 per acre-foot wheeling fee prior to delivery.

G. Water Measurement, Pricing, and Billing

1. Agricultural Customers

Refer to BMP A.1. Information on water measurement for agricultural contractors is completed under BMP A.1 on page 4-15.

2. Urban Customers -None

3. Agricultural Rates

a. Current year agricultural and /or urban water charges - including rate structures and billing frequency

See Attachment D for current year (2017) rates

b. Annual charges collected from District landowners (2015 Net Standby)

Fixed Charges			
Charges ($ by unit)	*Charge units $/acre, etc.*	*Units billed during year acres, etc.*	*Total $ collected ($ times units)*
$72.5	$72.50/acre	27,962	$2,027,245

Please refer to the guidebook for information when completing the table.

Volumetric charges			
Charges ($ by unit)	*Charge units $/AF, etc.*	*Units billed during year AF, etc.*	*Total $ collected ($ times units)*
$500	$500/af	1,529	$764,500
$800	$800/af	5,654	$4,523,200
$1,050	$1,050/af	280	$294,000
$1,400	$1,400/af	2,000	$2,800,000

Please refer to the guidebook for information when completing the table.

See Attachment C Page for District Sample Bills

c. Describe the contractor's record management system

The District keeps various records or documents for a minimum period of 4 years up to perpetually, depending on the life usefulness of the document. For example, accounts payable and receivable are kept for at least four years, whereas Contract and Legal documents are kept forever. Documents are kept in hard copy form in a fireproof safe as well as electronically on the Districts server.

H. Water Shortage Allocation Policies

1. *Current year water shortage policies or shortage response plan - specifying how reduced water supplies are allocated*

   When the demand for water is greater than the available supply, available water will be distributed equitably among those who have filed an application in accordance with Paragraph l and as required by California State Water Code Section 22250, which reads in part as follows:

   "All water distributed by districts for irrigation purposes shall be apportioned ratable to each landowner upon the basis or ratio which the last assessment against his land for district purposes bears to the whole sum assessed in the district."

2. *Current year policies that address wasteful use of water and enforcement methods*

   Water illegally used shall be billed at $500 per acre-foot, or 150% of the current water open-market rate, ***whichever is greater****. For example, if the water market rate (as determined by the Board of Directors) is $1,000 per acre-foot, illegally used water shall be purchased at $1,500 per acre-foot. If the District is unable to determine how much water was illegally used through the meter, the District will estimate the amount through water orders, previous years' water usage history, or field (i.e., consumptive use) estimates and charge the landowner accordingly.*

   Diverting water from the District in violation of these Rules and Regulations is a violation of law. Any landowner using District water prior to purchasing it from the District may be prosecuted for theft and will be liable for the administrative fees and water payments described above in Paragraph 1.e. In addition to administrative fees and penalties, the District will remove its delivery infrastructure (piping, valves, meter) from landowners illegally diverting District water. Landowners found to be illegally diverting water will be assessed a fine of $10,000. In addition to the $10,000 fine they will be billed for the District's time spent removing District delivery infrastructure.

I. Evaluation of Regulatory Agency Policies Inhibiting Water Management

The California legislature passed the Groundwater Sustainability Act in 2014. This legislation is a game changer for agriculture. The Friant Division was designed and predicated on sustainability. The District's surface and ground water use since 1949 has demonstrated sustainable use of groundwater. Notwithstanding this history of demonstrable sustainability, pressure may result on farming in the District such that water above and beyond what has historically been diverted, may be required to ensure sustainability under definitions of the state.

To this end, the District is developing policy to encourage maximizing available

surface water use. Generally, recently adopted District policy changes include noting to the landowners that fees on groundwater use may be coming in the near future (to minimize those fees, one needs to maximize available surface water diversion). In addition to the imposition of fees, the District is attempting policy development in order to incentivize surface water use, such as pricing comparable to or less than the cost to extract surface water and take or pay policy for water ordered each year.

Section II: Inventory of Water Resources

A. Surface Water Supply

1. *Surface water supplies in acre feet, imported and originating within the service area, by month (Table 1).*
   Water Inventory Tables, Table 1

2. *Amount of water delivered to the district by each of the district sources for the last 10 years*
   Water Inventory Tables, Table 8.

B. Groundwater Supply

1. *Groundwater extracted by the district and delivered, by month*
   None

2. *Groundwater basin(s) that underlies the service area*

Name	*Size (Square Miles)*	*Usable Capacity (AF)*	*Safe Yield (AF/Y)*
Easterly fringe of Kings Basin	14	Unknown	27,800

3. *Map of district-operated wells and managed groundwater recharge areas*
   None

4. *Description of conjunctive use of surface and groundwater*
   Surface water delivered in the District is a supplemental supply to private landowner use of privately owned wells. At full allocation, surface water provides roughly half of the crop consumptive use on a District-wide basis. Private groundwater is used in "conjunction" with surface water, however, there is no active recharge occurring in the District, aside from in-lieu recharge. Conjunctive use of water is storing wet year type water, over and above any irrigation requirement, in the underground. The District does not have the ability to delivery wet year water in this manner due to the nature of the soils and underlying aquifer.

5. *Groundwater Management Plan*
   Groundwater Monitoring and Drought Preparedness Program (AB 303 Adopted June 2006) See Attachment E or go to the District's website at www.orangecoveid.org

6. *Groundwater Banking Plan*
   None within District. Arrangements for banking are made with surrounding Friant Division Contractors.

C. Other Water Supplies

1. *"Other" water used as part of the water supply – Describe supply*
   No "other" water was delivered in 2015 within the District.

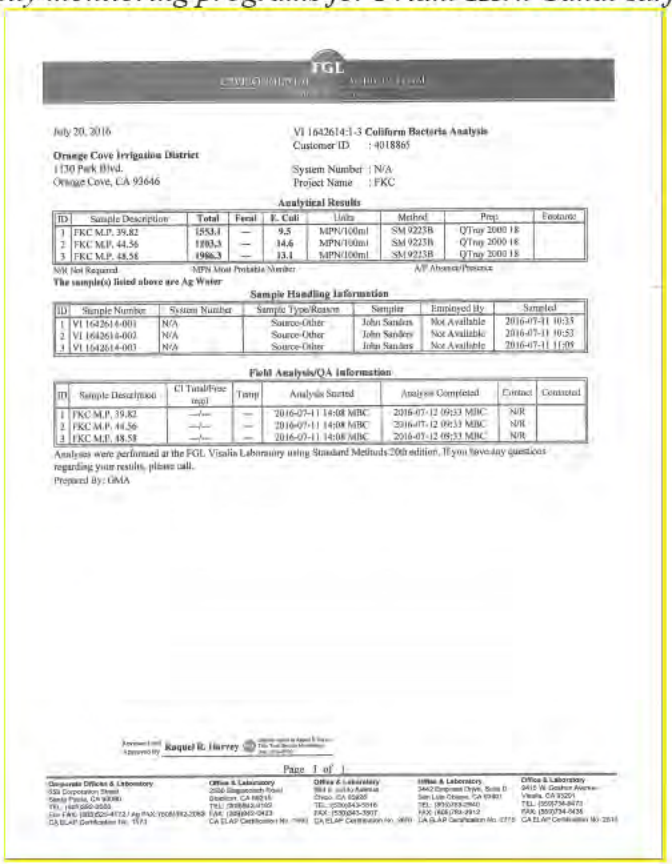
D. Source Water Quality Monitoring Practices

1. *Potable Water Quality (Urban only)*
   None, Potable water is not delivered by OCID

2. *Agricultural water quality concerns*: *Yes* _____ *No* X

3. *Description of the agricultural water quality testing program and the role of each participant, including the district, in the program.*
   Friant Water Authority conducts water quality analyses of the Friant-Kern Canal on annual bases and the findings are shared with OCID and its growers.

4. *Recent water quality monitoring programs for Friant-Kern Canal surface water*



FGL

July 20, 2016

VI 1642614:1-3 **Coliform Bacteria Analysis**
Customer ID : 4018865

Orange Cove Irrigation District
1130 Park Blvd.
Orange Cove, CA 93646

System Number : N/A
Project Name : FKC

Analytical Results

ID	Sample Description	Total	Fecal	E. Coli	Units	Method	Prep	Footnote
1	FKC M.P. 39.82	1553.1	—	9.5	MPN/100ml	SM 9223B	QTray 2000 18	
2	FKC M.P. 44.56	1893.3	—	14.6	MPN/100ml	SM 9223B	QTray 2000 18	
3	FKC M.P. 48.58	1986.3	—	13.1	MPN/100ml	SM 9223B	QTray 2000 18	

NR(Not Required MPN Most Probable Number A/P Absence/Presence
The sample(s) listed above are Ag Water

Sample Handling Information

ID	Sample Number	System Number	Sample Type/Reason	Sampler	Emmisyed By	Sampled
1	VI 1642614-001	N/A	Source-Other	John Sanders	Not Available	2016-07-11 10:35
2	VI 1642614-002	N/A	Source-Other	John Sanders	Not Available	2016-07-11 10:52
3	VI 1642614-003	N/A	Source-Other	John Sanders	Not Available	2016-07-11 11:09

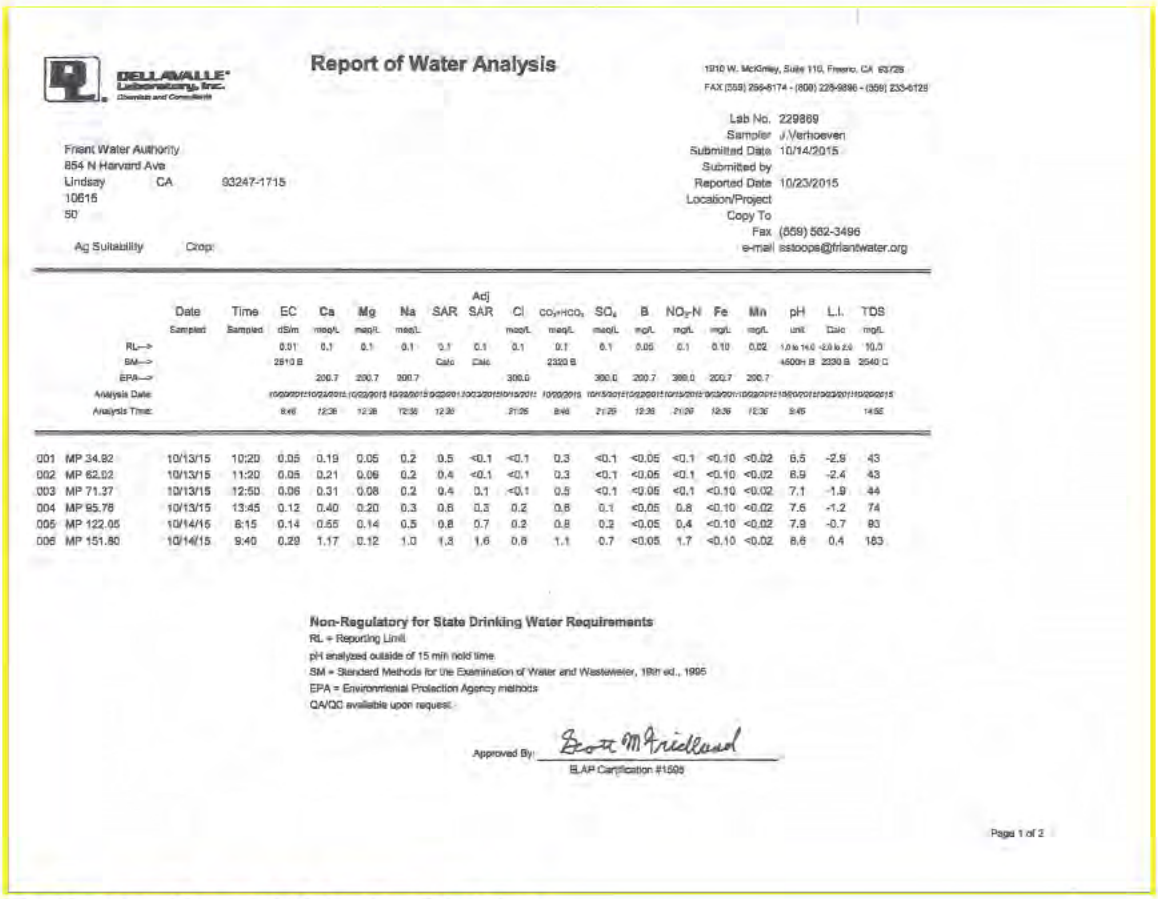
Field Analysis/QA Information

ID	Sample Description	Cl Total/Free mg/l	Temp	Analysis Started	Analysis Completed	Extract	Comment
1	FKC M.P. 39.82	—/—	—	2016-07-11 14:08 MBC	2016-07-12 09:33 MBC	NR	
2	FKC M.P. 44.56	—/—	—	2016-07-11 14:08 MBC	2016-07-12 09:33 MBC	NR	
3	FKC M.P. 48.58	—/—	—	2016-07-11 14:08 MBC	2016-07-12 09:33 MBC	NR	

Analyses were performed at the FGL Visalia Laboratory using Standard Methods 20th edition. If you have any questions regarding your results, please call.
Prepared By: GMA

Raquel R. Harvey

Page 1 of 1



DELLAVALLE Laboratory, Inc.
Chemists and Consultants

Report of Water Analysis

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 266-6174 - (800) 228-9896 - (559) 233-6128

Friant Water Authority
854 N Harvard Ave
Lindsay CA 93247-1715
10615
50

Ag Suitability Crop:

Lab No. 229869
Sampler J.Verhoeven
Submitted Date 10/14/2015
Submitted by
Reported Date 10/23/2015
Location/Project
Copy To
Fax (559) 562-3496
e-mail sstoops@friantwater.org

	Date Sampled	Time Sampled	EC dS/m	Ca meq/L	Mg meq/L	Na meq/L	SAR	Adj SAR	Cl meq/L	CO_3+HCO_3 meq/L	SO_4 meq/L	B mg/L	NO_3-N mg/L	Fe mg/L	Mn mg/L	pH unit	L.I. Calc	TDS mg/L
RL-->			0.01	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.10	0.02	1.0 to 14.0	-2.0 to 2.0	10.0
SM-->			2510 B				Calc	Calc		2320 B						4500H B	2330 B	2540 C
EPA-->				200.7	200.7	200.7			300.0		300.0	200.7	300.0	200.7	200.7			
Analysis Date:				10/20/2015	10/23/2015	10/23/2015	10/23/2015	10/23/2015	10/15/2015	10/20/2015	10/15/2015	10/23/2015	10/15/2015	10/23/2015	10/23/2015	10/20/2015	10/20/2015	10/20/2015
Analysis Time:			8:46	12:36	12:36	12:36	12:36		21:26	8:46	21:26	12:36	21:26	12:36	12:36	9:45		14:55
001 MP 34.82	10/13/15	10:20	0.05	0.19	0.05	0.2	0.5	<0.1	<0.1	0.3	<0.1	<0.05	<0.1	<0.10	<0.02	6.5	-2.9	43
002 MP 62.02	10/13/15	11:20	0.05	0.21	0.06	0.2	0.4	<0.1	<0.1	0.3	<0.1	<0.05	<0.1	<0.10	<0.02	6.9	-2.4	43
003 MP 71.37	10/13/15	12:50	0.06	0.31	0.08	0.2	0.4	0.1	<0.1	0.5	<0.1	<0.05	<0.1	<0.10	<0.02	7.1	-1.9	44
004 MP 95.78	10/13/15	13:45	0.12	0.40	0.20	0.3	0.6	0.3	0.2	0.8	0.1	<0.05	0.8	<0.10	<0.02	7.6	-1.2	74
005 MP 122.05	10/14/15	8:15	0.14	0.55	0.14	0.5	0.8	0.7	0.2	0.8	0.2	<0.05	0.4	<0.10	<0.02	7.9	-0.7	93
006 MP 151.80	10/14/15	9:40	0.29	1.17	0.12	1.0	1.3	1.6	0.6	1.1	0.7	<0.05	1.7	<0.10	<0.02	8.6	0.4	163

Non-Regulatory for State Drinking Water Requirements
RL = Reporting Limit
pH analyzed outside of 15 min hold time
SM = Standard Methods for the Examination of Water and Wastewater, 19th ed., 1995
EPA = Environmental Protection Agency methods
QA/QC available upon request

Approved By: Scott McFriedland
ELAP Certification #1508

Page 1 of 2

E. Water Uses within the District

1. *Agricultural*
   See Chapter 5, Water Inventory Tables, Table 5 - Crop Water Needs

2. *Types of irrigation systems used for each crop in current year*

Crop	Total Acres	Level Basin	Furrow	Sprinkler	Low Volume
	acres				
Citrus	21,005	43	2,231	1,575	17,156
Deciduous Fruits/Nuts	2,324		597	168	1,559
Grapes	959		50	250	659
Olives	751	1	152	175	423
Forage	589	194	166	194	35
Other/Fallow	2,334	10	200	100	2,024
TOTAL	27,962	248	3,396	2,462	21,856

3. Urban use by customer type in current year

None

4. Urban Wastewater Collection/Treatment Systems serving the service area

None

5. Groundwater recharge in current year (Table 6)

None

*6a. Transfers and exchanges **into** the service area in current year – (Table 1)*

From Whom	*To Whom*	*AF*	*Use*
Fresno ID	OCID	1,705	Ag
Arvin Edison WSD	OCID	1,860	Ag
Westlands Water District	OCID	1,819	Ag
Central California ID	OCID	2,133	Ag
Tri-Valley Water District	OCID	9	Ag
Kern Tulare ID	OCID	21	Ag
Kaweah Delta WCD	OCID	81	Ag
	Total	7,628	Ag

*6b. Transfers and exchanges **out** of the service area in current year – (Table 6)*

From Whom	*To Whom*	*AF*	*Use*
None			
	Total		

Not applicable

7. Wheeling, or other transactions in and out of the district boundaries – (Table 6)

From Whom	*To Whom*	*AF*	*Use*
None			
	Total		

Not applicable

8. Other uses of water

Other Uses	*AF*
None	

Not applicable

F. Outflow from the District (Agricultural only)

See Facilities Map, Attachment A, for the location of surface and subsurface outflow points, outflow measurement points, outflow water-quality testing locations

1. *Surface and subsurface drain/outflow*

Surface Outflow Point	*Location description*	*AF*	*Type of measurement*	*Accuracy (%)*	*% of total outflow*	*Acres drained*
None						

Not applicable

Subsurface Drain Outflow point	*Where the outflow goes (drain, river or other location)*	*Type Reuse (if known)*
None		

Not applicable

2. *Description of the Outflow (surface and subsurface) water quality testing program and the role of each participant in the program*
Not applicable

3. *Outflow (surface drainage & spill) Quality Testing Program*

Analyses Performed	*Frequency*	*Concentration Range*	*Average*	*Reuse limitation?*
None				

Not applicable

Outflow (subsurface drainage) Quality Testing Program

Analyses Performed	*Frequency*	*Concentration Range*	*Average*	*Reuse limitation?*
None				

Not applicable

4. Provide a brief discussion of the District's involvement in Central Valley Regional Water Quality Control Board programs or requirements for remediating or monitoring any contaminants that would significantly degrade water quality in the receiving surface waters.

The District landowners have the opportunity to be members of a local water quality coalition (Kings River Water Quality Coalition) whereby they are deemed compliant with Regional Water Quality Control Board regulations to be actively participants in efforts to monitor discharges of surface and groundwater into receiving waters. The District has no involvement within this group and does not enforce or police activities associated therewith.

G. Water Accounting (Inventory)

1. *Water Supplies Quantified*

a. *Surface water supplies, imported and originating within the service area, by month (Table 1)*
b. *Ground water extracted by the district, by month (Table 2)*
c. *Effective precipitation by crop (Table 5)*
d. *Estimated annual ground water extracted by non-district parties (Table 2)*
e. *Recycled urban wastewater, by month (Table 3)*
f. *Other supplies, by month (Table 1)*

2. *Water Used Quantified*

a. *Agricultural conveyance losses, including seepage, evaporation, and operational spills in canal systems (Table 4) or*

Urban leaks, breaks and flushing/fire uses in piped systems (Table 4)

b. *Consumptive use by riparian vegetation or environmental use (Table 6)*
c. *Applied irrigation water - crop ET, water used for leaching/cultural practices (e.g., frost protection, soil reclamation, etc.) (Table 5)*
d. *Urban water use (Table 6)*
e. *Ground water recharge (Table 6)*
f. *Water exchanges and transfers and out-of-district banking (Table 6)*
g. *Estimated deep percolation within the service area (Table 6)*
h. *Flows to perched water table or saline sink (Table 7)*
i. *Outflow water leaving the district (Table 6)*
j. *Other*

3. *Overall Water Inventory*
   a. *Table 6*

Section III: Best Management Practices (BMPs) for Agricultural Contractors

A. Critical Agricultural BMPs

1. *Measure the volume of water delivered by the district to each turnout with devices that are operated and maintained to a reasonable degree of accuracy, under most conditions, to +/- 6%*

   a. *Number of delivery points (turnouts and connections)* 1,141

   b. *Number of delivery points serving more than one farm* 0

   c. *Number of measured delivery points (meters and measurement devices)*

   1,141

   d. *Percentage of water delivered to the contractor that was measured at a delivery point*

   100

   e. *Total number of delivery points not billed by quantity* *0*

   f. *Delivery point measurement device table*

Measurement Type	*Number*	*Accuracy* (+/- %)*	*Reading Frequency (Days)*	*Calibration Frequency (Months)*	*Maintenance Frequency (Months)*
Propeller Meter	1,069	2%	30	As needed	As needed
Digital Meters	72	0.25%	30	As needed	As needed
Total	1,141				

**Documentation verifying the accuracy of measurement devices must be submitted with Plan and included in Attachment C.*

2. *Designate a water conservation coordinator to develop and implement the Plan and develop progress reports*

Name: Fergus Morrissey *Title:* Engineer-Manager

Address:1130 Park Blvd. Orange Cove, Ca 93646

Telephone: 559-626-4461 *E-mail:* fmorrissey@orangecoveid.org

Provide the job description and minimum qualifications

ORANGE COVE IRRIGATION DISTRICT
JOB DESCRIPTION – GENERAL MANAGER

PRIMARY FUNCTION:

Under the policy direction of and reporting to the Board of Directors, plans, organizes, directs and controls the District's activities in fulfilling the requirements for the administration, operation, maintenance and repair of the District's water distribution system and power plants. Under the policy direction of and reporting to the Board of Directors, plans, organizes, directs and controls the District's activities that primarily strive to protect the water supply, water rights, and FERC licenses of the District.

TYPICAL DUTIES:

a) **Establishes overall program priorities for District staff and consultants after receiving policy direction from the Board of Directors;**
b) **Serves as principal point of contact regarding issues or actions that could impact the water supply availability and cost to the District;**
c) **Ensures that annual budgets are prepared and presented for approval by the Board of Directors;**
d) **Ensures that the accounting and expenditures of District funds are performed in accordance with the direction of the Board of Directors and state and federal law;**
e) **Serves as Secretary to the Board of Directors;**
f) **Prepares and oversees the preparation of reports to the Board of Directors regarding all aspects of the District's programs;**
g) **Responsible for ensuring that the District's safety practices and programs are being coordinated, implemented and maintained;**
h) **Coordinates the activities of the departments within the District to insure a high level of overall program efficiency;**
i) **Effectively communicates and administers the personnel policies and other established policies of the Board of Directors;**
j) **Represents the District Board of Directors at meeting or before federal and state agencies, federal and state legislatures, and other organizations;**
k) **Administers the provisions of the Orange Cove Irrigation District;**
l) **Participates in monthly meetings of the Board of Directors, establishing agendas, and disseminating information;**
m) **Manages special projects of the District;**
n) **Performs other related assignments as required.**

Minimum Qualifications

Bachelor of Science in Engineering or other technical degree from an accredited University.
Master of Science in Engineering or other technical degree is preferable.
Minimum of 5 years experience in the water resources arena, California water resources is preferable.
Must excel and have demonstrated knowledge of or experience in:

- *Hydrology,*
- *Fluid Mechanics,*
- *Physics,*
- *Finance and Accounting,*
- *Computer Programming,*
- *Communication Skills (written and verbal),*
- *Interpersonal and relational skills,*
- *Business Administration,*
- *Analytical Skills and Problem Solving,*
- *Hydroelectric Power Plant Facility Design and Operation,*
- *Plumbing*

3. *Provide or support the availability of water management services to water users*
   The District provides information to growers on water management services upon request as well as general information available on its website, such as links to CIMIS Station data, weather resources, ITRC, and pump test programs.

   The growers in the Orange Cove Irrigation District are sophisticated. This is a natural outgrowth of those agricultural producers who invest in farming in an area with a microclimate suitable for protection against the vast majority of freezing weather events and with a reliable (historically) and affordable water supply.
   For example, many growers have installed weather stations (CIMIS like) on their property in addition to integrated moisture sensors at various depths of the root zone to determine water content relative to field capacity on a real time basis.

   a. On-Farm Evaluations

   1) On farm irrigation and drainage system evaluations using a mobile lab type assessment. *Orange Cove ID does not track growers' implementing mobile lab services. This is done at the discretion of the landowner. Some growers report their use of this service but many do not. To report incomplete information would give a false indication of actual activity. Because of this, the District does not track this information.*

	Total in district	*# surveyed last year*	*# surveyed in current year*	*# projected for next year*	*# projected 2nd yr in future*
Irrigated acres	25,628	Unknown	Unknown	Unknown	Unknown
Number of farms	362	Unknown	Unknown	Unknown	Unknown

2) Timely field and crop-specific water delivery information to the water user.

a. ***District Records***

The District's meters have both an instantaneous flow rate and a totalized flow. The irrigator sets the valve opening by looking at the rate (using the meter dial) for a duration over an acreage and thereby knows the amount of water (i.e. inches) applied to the field for that irrigation event. The totalizer is a backup check (in acre feet) and the same information (inches applied) is determinable over any period of time that the irrigator is interested in, daily, weekly, monthly, yearly, etc…..

b. Real-time and normal irrigation scheduling and crop ET information

The District does not provide this information to the growers, however CIMIS data is available, including Real Time information. "Irrigators" are interested in maintaining a healthy crop while avoiding over irrigating, which consumes valuable water and requires, for the majority of deliveries, use of electricity which also comes at a cost. Links to CIMIS stations are available on the District's website.

c. Surface, ground, and drainage water quantity and quality data provided to water users

The District has historically provided this information to growers upon request. Recently, this information has been added to the information available on the District's website. Go to *Orangecoveid.org* for a link to this information (tab on left *FKC – Water Analysis.*

d. Agricultural water management educational programs and materials for farmers, staff, and the public

Program	*Co-Funders (If Any)*	*Yearly Targets*
Various	Friant Water Authority (Friantwater.org)	NA

The Friant Water Authority offers links to educational and resource information on their website (friantwater.org) a link to which is on the District's website under *Related Links* in the menu bar.

The District provides information to growers on water management services upon request as well as general information available on its website, such as links to CIMIS Station data, weather resources, ITRC, and pump test programs.

4. Pricing structure - based at least in part on quantity delivered

The District has adopted a pricing structure that is based on the quantity of water delivered, and that structure is designed to encourage use of water supply made available.

Because irrigation demand "is what it is" when it comes to permanent crops, failing to irrigate is not an option if bankruptcy is to be avoided.

The District's Contract quantity with the United States is predicated on both the cropping pattern and the crop irrigation requirement as well as hydrologic variability

and reliability - **Contracted surface water is there to be used**. Available surface water not used must come from somewhere and the only other place besides effective precipitation from which it may be derived, is groundwater.

In other words, conserving available surface water puts an undue burden on the groundwater resource and therefore does not conserve that resource.

Because (and now under the law – Sustainable Groundwater Management Act) it is required that groundwater use must be consumed over time at a sustainable rate, one cannot shift use from Contract supply or be discouraged from using Contract supply when it is available, by punitive or tiered pricing. That pricing mechanism would be counterproductive to overall water management (surface + groundwater), as with permanent crops, the interplay between surface and groundwater is a zero-sum game.

5. Evaluate and improve efficiencies of district pumps

Describe the program to evaluate and improve the efficiencies of the contractor's pumps.

	Total in district	*# surveyed last year*	*# surveyed in current year*	*# projected for next year*
Wells	0			
Lift pumps	50	• Continuously Monitored		

The District continuously monitors the energy required per af per pump that is part of the District's delivery system. This is done through the use of metered energy consumed (as reported by the electric utility provider) per acre foot of water conveyed (as measured by the District's flow totalizing meters). Whenever there is a marked drop in energy efficiency of a particular pump/motor, the District pulls those pumps and motors for repair/rehabilitation by qualified professionals.

B. Exemptible BMPs for Agricultural Contractors

(See Planner, Chapter 2, Addendum B for examples of exemptible conditions)

1. Facilitate alternative land use

Drainage Characteristic	*Acreage*	*Potential Alternate Uses*
High water table (<5 feet)	0	NA
Poor drainage	0	NA
Groundwater Selenium concentration > 50 ppb	0	NA
Poor productivity	0	NA

Describe how the contractor encourages customers to participate in these programs.

2. Facilitate use of available recycled urban wastewater

Sources of Recycled Urban Waste Water	*AF/Y Available*	*AF/Y Currently Used in District*
City of Orange Cove	500	0

The District is on a path to use available recycled urban wastewater. District is in discussion with the City of Orange Cove to take delivery of their treated wastewater upon development of a treatment plant with suitable capabilities. The timing of implementing this is a function of the City's construction of an improved, tertiary treatment facility. The timing of construction of this facility is a function of available of grant funds that have yet to be secured by the City. The timing of these factors' emergence is outside of the control of the District. When or if the time comes, the District is very interested in assimilating this recycled waste product.

3. *Facilitate the financing of capital improvements for on-farm irrigation systems*

Program	*Description*
None	

The District does not engage with landowners on capital improvement projects on their lands.

4. *Incentive pricing*

Describe incentive rate structure or other programs and purpose.

In 2015 there was no incentive rate structure in place, as the cost of water (averaging over $886 per acre foot) is implicit incentive. The District encourages the use of all surface water available to it, as that action conserves the groundwater. Conservation of groundwater is a mandate of the Sustainable Groundwater Management Act (SGMA) in order to avoid undesirable affects such as subsidence and lowering of groundwater tables.

5. *a) Line or pipe ditches and canals*

Canal/Lateral (Reach)	*Type of Improvement*	*Number of Miles in Reach*	*Estimated Seepage (AF/Y)*	*Accomplished/ Planned Date*
District Wide	*Pipelines*	*(All 116 miles)*	*0*	*1948*

The District has no open channels or canals.

b) Construct/line regulatory reservoirs

Reservoir Name	*Location*	*Describe improved operational flexibility and AF savings*

The District has no regulatory reservoirs as there is no tail water developed within the District that is the responsibility of the District to manage. Managing tail water is a burden placed on the landowner. The following excerpt from the District's Rules and Regulations is provided for context.

If the District determines that a landowner has improperly used irrigation water delivered to them, or improperly prepared the ground to receive irrigation water, such that excess tail-water, in the District's opinion, is leaving the landowner's property, the District shall notify the landowner with the appropriate steps to take to ensure that excess tail water is eliminated. If the landowner does not take appropriate steps to remedy the situation, the District will reduce and/or discontinue water delivery until the problem is rectified. Alternatively, the District may, at the landowner's expense, take corrective action in order to ensure that excess tail-water does not leave the landowner's property. Landowners will be

charged the full cost to the District of any services provided to restrict tail-water runoff, and payment of these charges will be required as a condition of continued service.

6. *Increase flexibility in water ordering by, and delivery to, water users*

See Attachment F, contractor 'agricultural water order' form. In the early to mid 1990's, the District completely rehabilitate its delivery system (new pipeline (pvc), high efficiency pumps, Supervisor Control and Data Acquisition (automated and computer / telemetry controlled) distribution system. This rehabilitation provided for operation of the system "on-demand". The system is capable of operating without the intervention of "ditch tenders" or staff once it is set to automatic.
Water orders are still required in order to operation Friant Dam, the responsibility for which is retained by the owner, the Bureau of Reclamation.

7. *Construct and operate district spill and tail water recovery systems*

Distribution System Lateral	*Annual Spill (AF/Y)*	*Quantity Recovered and reused (AF/Y)*

As noted in 5 above, the landowner is required to control the production of tail water on each farm, or the District will do so at cost to the landowner. This has never been an issue in the District. Landowners collect their own tail water, if any is generated (due to the preponderance of micro-sprinkler irrigation methods there is little potential for it in the first place). Landowners that generate tail water, install recapture ponds on their property and have the ability to recirculate that water on their fields. This avoids the creation of nuisance tail water.

Drainage System Lateral	*Annual Drainage Outflow (AF/Y)*	*Quantity Recovered and reused (AF/Y)*

There are not drainage system components as part of the District's infrastructure.

Describe facilities that resulted in reduced spill and tail water

There are no facilities of this type within the District.

8. *Plan to measure outflow.*

There is no outflow from the District as a result of irrigation practices. At times of high runoff due to storm events, there is overland flow that passes through the District from east to west.

9. *Optimize conjunctive use of surface and groundwater*

Describe the potential for increasing conjunctive use of surface and groundwater.
Local geology is not conducive to conjunctive use so the best that can be done is in-lieu recharge and a modest amount of over irrigation. Over irrigation is generally not a feasible practice for citrus as they suffer from water logged soils and never enter a period of dormancy. Optimizing conjunctive use is minimizing the use of groundwater and maximizing the use of the Contract supply.

In order for the District to be sustainable under SGMA, its growers must develop the practice of utilizing the groundwater in accordance with what is naturally replenished, a quantity that is unique to each area.
Based on groundwater monitoring of approximately 35 wells within the OCID service area dating back to 1948, the groundwater resource underlying the District boundary has been in a state of dynamic equilibrium since the early 1950's.

10. Automate distribution and/or drainage system structures
Identify locations where automation would increase delivery flexibility and reduce spill and losses. Describe program to achieve these benefits and estimate the annual water savings.

The District's delivery system is a state of the art, fully SCADA enabled and computer/telemetry controlled automated on demand system. The system is closed so barring a breakage in the line, there are zero losses. Broken lines are repaired immediately upon identification.

11. Facilitate or promote water customer pump testing and evaluation

The District facilitates and promotes water customer pump testing or evaluation by including relevant links for its landowners on the District's website (www.orangecoveid.org) under the "Water Conservation" heading within the "Links" tab. Resources available here on this topic include; *On-Farm Irrigation System Evaluations, Irrigation Training & Research Center (ITRC)* and *PGE Pump Efficiency Testing*.

12. *Mapping*

The District does not have a program where GIS maps are being developed. This issue will be taken to the Board of Directors for approval in the near term.

GIS maps	*Estimated Cost*				
	Year 1	*Year 2*	*Year 3*	*Year 5*	*Year 6*
Layer 1 – Distribution system	$5,000	$5,000	$5,000	$5,000	$5,000
Layer 2 – Drainage system	NA	NA	NA	NA	NA
Suggested layers:					
Layer 3 – Groundwater information	$2,000	$2,000	$2,000	$2,000	$2,000
Layer 4 – Soils map	$2,000	$2,000	$2,000	$2,000	$2,000
Layer 5 – Natural & cultural resources	NA	NA	NA	NA	NA
Layer 6 – Problem areas	NA	NA	NA	NA	NA

C. Provide a 5-Year Budget for Implementing BMPs

1. Amount actually spent during current year.

Year 2015 or Year 1

BMP #		*BMP Name*	*Actual Expenditure (not including staff time)*	*Staff Hours*
A	*1*	*Measurement*	*$20,000*	*400*
	2	*Conservation staff*	*$3,000*	*40*
	3	*On-farm evaluation /water delivery info*	*$0*	*0*
		Irrigation Scheduling	*$0*	*0*

		Water quality	*$500*	*20*
		Agricultural Education Program	*$0*	*0*
	4	*Quantity pricing*	*$2,000*	*20*
	5	*Contractor's pumps*	*$30,000*	*100*
B	*1*	*Alternative land use*	$0	0
	2	*Urban recycled water use*	$1,000	10
	3	*Financing of on-farm improvements*	$0	0
	4	*Incentive pricing*	$2,000	20
	5	*Line or pipe canals/install reservoirs*	$0	0
	6	*Increase delivery flexibility*	$5,000	75
	7	*District spill/tail water recovery systems*	$0	0
	8	*Measure outflow*	*$0*	*0*
	9	*Optimize conjunctive use*	$0	0
	10	*Automate canal structures*	$0	0
	11	*Customer pump testing*	$0	0
	12	*Mapping*	$9,000	*150*
		Total	*$72,500*	*835*

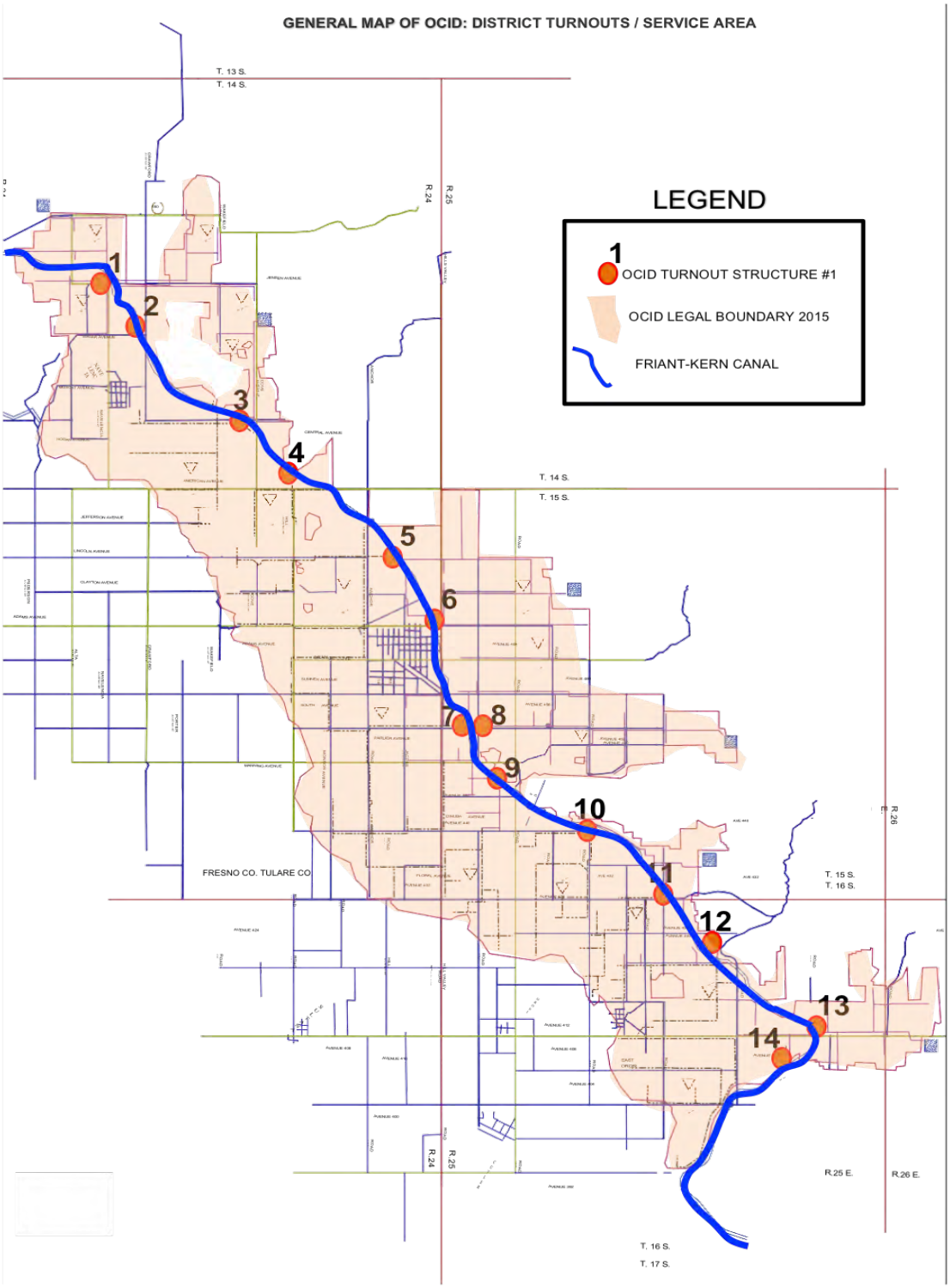
2. Projected budget summary for the next year.

Years 2, 3, 4 and 5 (annual estimate)

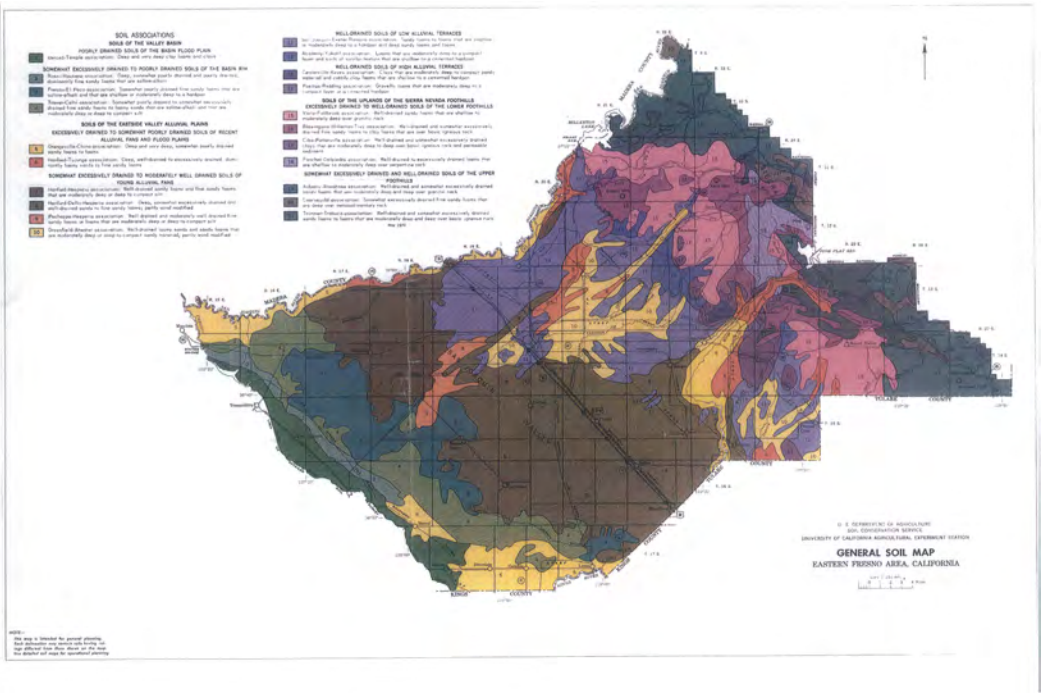
BMP #		*BMP Name*	*Budgeted Expenditure (not including staff time)*	*Staff Hours*
A	*1*	*Measurement*	*$20,000*	*400*
	2	*Conservation staff*	*$3,000*	*40*
	3	*On-farm evaluation /water delivery info*	*$0*	*0*
		Irrigation Scheduling	*$0*	*0*
		Water quality	*$500*	*20*
		Agricultural Education Program	*$0*	*0*
	4	*Quantity pricing*	*$2,000*	*20*
	5	*Contractor's pumps*	*$30,000*	*100*
B	*1*	*Alternative land use*	$0	0
	2	*Urban recycled water use*	$1,000	10
	3	*Financing of on-farm improvements*	$0	0
	4	*Incentive pricing*	$2,000	20
	5	*Line or pipe canals/install reservoirs*	$0	0
	6	*Increase delivery flexibility*	$5,000	75
	7	*District spill/tail water recovery systems*	$0	0
	8	*Measure outflow*	*$0*	0
	9	*Optimize conjunctive use*	$0	0
	10	*Automate canal structures*	$0	0
	11	*Customer pump testing*	$0	0
	12	*Mapping*	$9,000	*1500*
		Total	*$72,500*	*835*

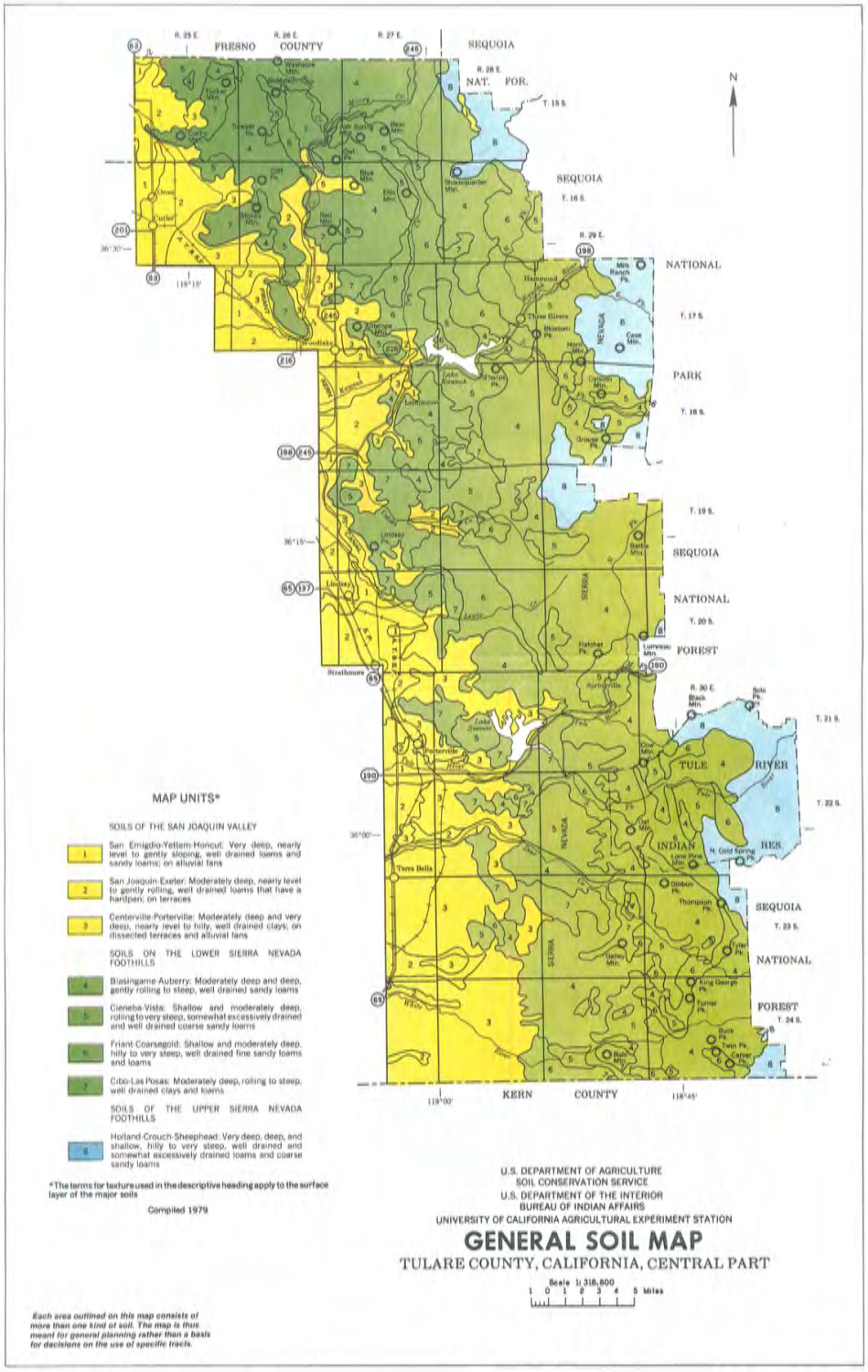
ATTACHMENT A

OCID Boundary and Points of Conveyance Takeoff from Federal Conveyance (FKC)


GENERAL MAP OF OCID: DISTRICT TURNOUTS / SERVICE AREA
LEGEND
1
OCID TURNOUT STRUCTURE #1
OCID LEGAL BOUNDARY 2015
FRIANT-KERN CANAL
T. 13 S.
T. 14 S.
T. 15 S.
T. 16 S.
T. 17 S.
R. 24
R. 25
R. 26
R.25 E.
R.26 E.
FRESNO CO. TULARE CO.
1
2
3
4
5
6
7
8
9
10
11
12
13
14

ATTACHMENT B
DISTRICT MAP AND SOILS





Link to the previous two maps are on District website at Orangecoveid.org

ATTACHMENT B

DISTRICT RULES AND REGULATIONS (2015)

RULES AND REGULATIONS FOR WATER DELIVERIES 2015 CONTRACT-YEAR

1. APPLICATION FOR WATER

a. Water applications will be accepted at the District office until 4:00 P.M., February 28, 2015, and must include the quantity in acre-feet of District water the landowner wishes to reserve for the upcoming Contract-Year (March 1, 2015 – February 29, 2016). **Please Note: Having a credit balance on an individual water account does not relieve the need to submit a water application; it only changes the payment due. CONTRACT WATER MAY NOT BE CARRIED OVER IN INDIVIDUAL'S ACCOUNT(S) FROM ONE YEAR TO THE NEXT – AN APPLICATION IS REQUIRED EVERY YEAR TO SECURE CONTRACT WATER MADE AVAILABLE TO THE ORANGE COVE IRRIGATION DISTRICT BY THE BUREAU OF RECLAMATION UNDER THE DISTRICT'S REPAYMENT CONTRACT.**

The minimum payment due at this time (when added to your credit balance) must cover one-half the cost of the water reserved. The second installment will be due June 20, 2015. Applications received and/or postmarked on or before February 28th will be accepted. Applications received or postmarked after February 28th will be subject to availability and a $20.00 per acre-foot administrative charge. No water will be delivered before it is purchased.

b. Water will not be delivered to any customer until all outstanding customer charges, including but not limited to Standby Charges, have been paid District-wide.

c. **Unpaid or delinquent water charges and unauthorized operation or tampering with water delivery meters will trigger the District to lock subject water delivery meters.** Unpaid water or Standby charges will become a lien against the landowner's property. Interest charges will accrue on all delinquent accounts at the legal rate permitted by law. A $200 administrative fee will be assessed to the applicant to UNLOCK any delivery that has been locked due to delinquency, unauthorized operation or meter tampering. Cutting chains or locks will result in an additional $200 administrative fee ($400 total).

All water illegally used shall be billed at $500 per acre-foot, or 150% of the current water market rate, whichever is greater. For example, if water supply conditions result in a water market rate of $1,000 per acre foot, illegally used water shall be purchased at $1,500 per acre foot. If the District is unable to determine how much water was illegally used through the meter, the District will estimate the amount through water orders, previous years' water usage history, or field (i.e., consumptive use) estimates and charge the landowner accordingly.

d. Water applications filed with the District by persons other than the property owner (lessees, renters, etc.) shall be countersigned by the property owner authorizing the applicant to use water and assuming responsibility for any unpaid water bills.

e. To ensure maximum supply is available to you under this dry year hydrology the District is requiring reserving at least 0.12 acre feet per acre. Note the typical full reservation requirement of 1.4 acre feet per acre is not required this year.

If available, additional water may be purchased during the water-year; a $20 per acre-foot administrative charge will be imposed on customer orders whose initial application reserved less than 0.12 acre-feet per acre while those applications reserving at least 0.12 acre-feet per acre will not be subject to this charge.

The process by which additional water is made available to an applicant depends on the applicant's initial order – here's how it works. If the initial Bureau Class 1 allocation provides insufficient supply for the District to satisfy all orders made of at least 0.12 acre-feet per acre, additional water that becomes available during the year will first be allocated to fulfill orders of 0.12 acre-feet per acre. Put another way, orders less than 0.12 acre-feet per acre will not be eligible to receive additional water as it becomes available from an increase in the Bureau's water supply declaration **until** all orders made of at least 0.12 acre-feet per acre have been satisfied. Thereafter, any additional water will be allocated to those ordering more than 0.12 acre-feet per acre. Only upon fulfillment of all those orders (0.12 acre feet or more per acre) will customers who ordered less than 0.12 acre feet per acre be eligible to receive additional water. Finally, any additional supply available after the foregoing orders have been fulfilled will be made available to applicants whose order is received after February 28th.

Note that as additional water becomes available it first satisfies orders of at least 0.12 acre feet per acre. Also, note that additional water does not become available to customers whose applications are received after February 28th until all on time orders have been fulfilled.

f. Taking water from the District in violation of these Rules and Regulations is a violation of law. Any landowner using District water prior to purchasing it from the District may be prosecuted for theft, and will be liable for the administrative fees and water payments described in Paragraph 1.c. above.

2. CONTRACT-YEAR

The Contract-Year coincides with the United States Bureau of Reclamation's (Bureau) Contract-Year (March 1st to the last day of February of the following year) to ensure that the District does not allocate more water than is "Made Available" by the Bureau (water must first be declared available by the Bureau before it can be delivered to the District). Water delivery may be made any time during the Contract-Year provided water is "Made Available", deliverable (i.e., maintenance activities by the District and or the Friant Water Authority do not preclude its delivery) and the applicable provisions of Paragraph 1 have been satisfied. Water rates are established annually by the Board of Directors and will apply on a Contract-Year basis **unless otherwise modified by the Board of Directors**.

3. USE OF WATER

a. Water delivered by the District must be for an agricultural beneficial use within the District's boundary. Caution: Water used for spraying purposes may ONLY be taken from a District delivery or other District facility provided a County-approved connection is made and maintained at all times between the District facility and the spray equipment. Similarly, any permanent or temporary installed fertigation facility on a landowner's irrigation system must contain backflow prevention features to preclude the release of fertilizer, pesticide or any foreign substance from being introduced back into the Districts delivery system.

b. Water usage statements will not be sent to the water user on a monthly basis (unless requested) but **may** be sent when less than 25% of a water user's purchased supply remains. When the water user's purchased supply is depleted, water delivery will be discontinued. Water delivery may be resumed if the water user acquires additional water by transfer(s) or additional purchases (if additional water is available). It is the water user's responsibility to track their water usage, to not overuse their allotment and to make necessary arrangements with the District for additional water.

c. The ultimate disposition of water ordered, but not used or transferred by September 30th, is subject to the discretion of the District. Alternative disposition of this water may include, but is not limited to, making it available to other District landowners, outside exchange or transfer, or banking in accordance with Bureau Policies. The determination of an alternate disposition of unused water will be based on the projected end of Contract-Year District use, an individual customer's water usage history (i.e. landowners who order water that they never use may be made available to those needing water) and a scheduled Friant-Kern Canal dewatering. Water deposits may be returned after September 1st unless alternative arrangements have been made with the District.

d. Water rates are established on the basis of covering District annual Operation and Maintenance costs. To better insure those charges satisfy that financial obligation, **Contract supply shall be the first water used by landowners in the District.**

e. The Board of Directors may elect to carry unused Contract Supply (carryover) from one Contract-Year to the next in accordance with Bureau of Reclamation Policy. Unused water shall not be carried over into the next Contract-Year on an individual landowner basis; however, unused landowner water deposits may be carried over into the next Contract-Year, unless Dry hydrologic conditions are in effect.

1. Dry Year Amendments

i. *Critically Dry Years*: In years with less than or equal to a 50% Class 1 Friant Division allocation, **unused landowner water deposit funds will not be creditable from one Contract Year to the next and unused water deposits will not be returned to during the Contract Year.** Landowners' with positive Contract Supply account balances will not carry those financial or water balances into the next Contract Year and as such should make arrangements to transfer any residual available Contract Supply to another District landowner prior to the start of the ensuing Contract Year.

ii. *Spot Market Water*: In years with less than or equal to a 50% Class 1 Friant Division allocation, if growers acquire and pay for water from outside sources "Spot Market Water" for their exclusive use within the District (they may also transfer such water to another District landowner), **those supplies shall be used only after their Contract Supply is used or transferred**.

Unused Spot Market Water volumes may be carried over by landowners from one Contract Year to the next. Landowners wishing to do so will be responsible for paying the annually established Bureau of Reclamation carryover fees and landowners understand that they assume the risk of losing such supply to spills which may occur depending on hydrology or Bureau of Reclamation operational requirements.

4. ENTITLEMENT TO WATER

a. When the demand for water is greater than the available supply, available water will be distributed equitably among those who have filed an application in accordance with Paragraph l and as required by California State Water Code Section 22250, which reads in part as follows:

"All water distributed by districts for irrigation purposes shall be apportioned ratable to each landowner upon the basis or ratio which the last assessment against his land for district purposes bears to the whole sum assessed in the district."

b. Any landowner may assign for use within the District their full allocation pursuant to Section 22250 provided the water is first purchased in accordance with Paragraph 1.

5. WATER TRANSFERS

a. Intra-district between **same entity**: A landowner having properties in two or more of the District's delivery systems (e.g. OCID System 7 and OCID System 11), may transfer water, without penalty, from one system to another system. The final charge for water will be based on water charges for the system in which it is used.

b. Intra-district between **different entities**: A landowner may transfer water to another landowner by **filing a signed water transfer form** with the District. The transferred water must have been purchased by the transferor prior to the transfer in accordance with Paragraph 1. The final charge for water will be based on water charges for the system **in which it is used**. The difference in cost, if any, must be paid to the District at the time of transfer. The District assumes no responsibility for collecting monies due to the transferor from the transferee. Both the transferor and the transferee must sign a water transfer form.

6. WATER DELIVERY PROCEDURES

a. Orders for turn-on and turn-off must be scheduled with the District at least 24 hours before the service is to be provided. Landowners diverting water without notifying the District of their intent to do so, may be subject to an administrative charge of $20 per acre foot based on unordered diversions since the previous meter reading. Customers should also notify the District as soon as possible when making unscheduled changes.

The District's policy is to deliver water in quantities and flow rates that are economically feasible and within the operating limits of the delivery systems and flow meters. Extenuating circumstances, where it may not be economical to provide water to a particular delivery point will be considered by the District on a case-by-case basis. No orders will be fulfilled that create the potential to harm the District's facilities.

b. Water for the following day is ordered from the Friant Water Authority at 8:30 A.M. Monday through Friday. **Orders must be received at the District Office before 8:00 A.M to receive next day delivery**. Sunday and Monday orders must be received before noon the preceding Friday. Water orders may be made as follows:

DISTRICT OFFICE – The office is open for water orders between 7:00 A.M. to 4:00 P.M. Monday through Friday. You may also place a water order by calling the District Office at (559) 626-4461. During non-business hours, water orders may be placed with the District's answering service. Alternatively, water orders may be placed by emailing the request to ops@orangecoveid.org. District receipt of email orders will be confirmed through an email reply from District staff.

HOLIDAY SCHEDULE – The District office will be closed in observance of the following holidays: afternoon of New Years Eve, New Years Day, President's Day, afternoon of Good Friday, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day and the day after, afternoon of Christmas Eve, and Christmas Day. Water orders for holidays and the day following a holiday shall be made by 8:00 A.M. on the business day prior to the holiday.

c**. The timing requirements shall be relaxed for the delivery of water for frost protection.** Frost water must be ordered by 1:00 P.M. to receive water for that night and the following day. For pumped systems, a notice as early as possible is desirable in case the system has to be filled. Order your water by System(s) and delivery(ies) and provide the desired flow and duration as you would for the regular irrigation season. When ordering, provide the District with your name and a telephone number where you can be reached, if possible, during the period when you intend to be taking water. Failure to take delivery of water that is ordered for frost protection can severely damage the District's pumps. Landowners that have placed frost water orders and later decide not to take delivery must make every effort to contact District Operation's staff to avoid being liable for damage to District infrastructure.

d. Landowners will be permitted to operate their delivery provided it is operated in accordance with District procedures. Water must be used at a rate that will accurately register on the delivery meter. Landowners shall immediately inform the District office of any maintenance required on their meter due to normal wear, vandalism, accident, or other cause. Landowners shall be responsible for all water delivered or spilled through their point of delivery.

e. A change of water from one delivery point to another on the same system will be permitted without a 24-hour notice provided that you notify the District in advance of the change to be made.

f. No person, other than a District employee unless otherwise designated, shall operate any of the District's facilities. Tampering with or changing the adjustment of any pump or valves, other than the delivery assigned for your use, is prohibited. Any interference with facilities under the jurisdiction of the District is a criminal offense and will be prosecuted accordingly.

7. DISTRICT LIABILITY

a. The District is not responsible for the quality of water delivered as that ability is outside of the District's jurisdiction and control. The Friant Water Authority is responsible for the operation and maintenance of the Friant-Kern Canal and from time to time they perform treatment (i.e. application of copper sulfate or other chemicals) and or maintenance (i.e. mechanical removal of invasive weeds within the system) that may result in water of variable quality. The District communicates with the Friant Water Authority routinely and there is a concerted effort to maximize and stabilize the quality of water delivered. **Water delivered by the District is untreated.** Use of District water is inconsistent with human consumption and a violation of state law under AB 1194. Water supplied by the District is not intended to be and should not be used for residential uses or human consumption, including but not limited to; drinking, bathing or showering, hand washing, oral hygiene, or cooking, preparing food or washing dishes.

b. Water shortages may occur during any year, which may affect the amount of water furnished to the District by the United States pursuant to the District's Repayment Contract. In no event shall any liability accrue against the District or any of its officers, directors, agents or employees for any damages, direct or indirect, arising from a water shortage due to errors in operation, drought or unavoidable causes.

8. TAIL-WATER

a. The District is required to regulate excessive tail-water. The District's Repayment Contract with the United States requires the District, as a provision of its conservation plan and as a condition of continued service, to ensure water is put to beneficial use. Hence, the District must regulate excessive tail-water to avoid determinations that it is wastefully or unreasonably using the federal resource (water supply). If the District is required to regulate tail-water because the grower does not do so, it needlessly expends District funds without providing specific benefit to the broad group of District landowners.

b. If the District determines that a landowner has improperly used irrigation water delivered to them, or improperly prepared the ground to receive irrigation water, such that excess tail-water, in the District's opinion, is leaving the landowner's property, the District shall notify the landowner with the appropriate steps to take to ensure that excess tail water is eliminated. If the landowner does not take appropriate steps to remedy the situation, the District will reduce and/or discontinue water delivery until the problem is rectified. Alternatively, the District may, at the landowner's expense, take corrective action in order to ensure that excess tail-water does not leave the landowner's property. Landowners will be charged the full cost to the District of any services provided to restrict tail-water runoff, and payment of these charges will be required as a condition of continued service.

ATTACHMENT C
MEASUREMENT DEVICE DOCUMENTATION

FlowCom™ Register

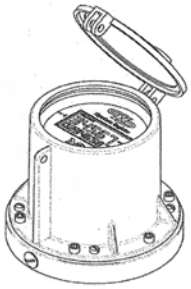
DIGITAL DATA & COMMUNICATIONS

CONFIGURATION SHEET

MODEL FC100/FC101

FLOWCOM REGISTER

FC100
Mc Propeller



FC101
Water Specialties Propeller

DESCRIPTION

The FlowCom Register displays a flowmeter's flowrate and volumetric total. The FlowCom can be fitted to any new or existing McCrometer propeller flowmeter.

FEATURES & SPECIFICATIONS

- Retrofits to any existing McCrometer Propeller Flowmeter
- Four output options: 4-20mA Loop, Open Collector, Optically Isolated, and Contact Closure.
- Unique Units of Measurement for Rate, Total, 4-20mA and Pulse Outputs
- Factory sealed Remote and Meter-Mounted Models

Environmental	
Operating Temp:	-4°F to 158°F (-20°C to 70°C)
Storage Temperature:	-40°F to 158°F (-40°C to 70°C)
Housing Rating:	NEMA 4X
Input Signal	
Input Compatibility:	McCrometer Flowmeters
Remote Distance:	100 feet max.
Rate Functions	
Display:	5-digit
Rate Units:	22 different units
Totalizer Functions	
Display:	8-digit
Totalizer Units:	20 different units
Accuracy:	0.25%
Non-Volatile Storage:	Updated hourly
Programming	
Program Access:	Magnetic wand
Access Lockout:	4-digit code
Test Modes:	4 mA and 20 mA test modes
Totalizer Reset:	Programming
Total Reset Disable:	Programming (permanent)
Calibration Adjustment:	+ or - .01% to 10%

4-20mA Analog	
Power Requirements:	12 to 40 VDC
Transmissions:	5,000 feet max.
4mA/20mA Trim:	.01 mA to .50 mA
Engineering/Time Units:	22 different units
Pulse Outputs	
Engineering Units:	20 different units
Optically Iso. Pulse Width:	80 ms
Open Collector Pulse Width:	adjustable
Collector to emitter voltage:	50v @ 250 mA max.
Pulse Width:	80 ms
Max Pulses Per Minute:	30
Signal Distance:	500 feet max.
Contact Closure Output	
Contact Rating:	30v @ 1 Amp max.
Pulse Width:	80 ms
Max Counts Per Minute:	30
Signal Distance:	500 feet
Power Requirement	
Battery Type:	Lithium 3.6 V
Battery Life:	6 - 10 years
Optional 4-20mA:	Loop powered

McCROMETER
www.mccrometer.com

3255 WEST STETSON AVENUE • HEMET, CALIFORNIA 92545 USA
TEL: 951-652-6811 • 800-220-2279 • FAX: 951-652-3078 Printed In The U.S.A Lit. # 24510-49 Rev. 1.1/09-07

30119-20 Rev. 4.8/07-09

WATER SPECIALTIES™
PROPELLER METER

4"-20"
VERTICAL UPFLOW METERS
MODELS
VF27, VF28, VF29, VF30

OPERATION AND MAINTENANCE MANUAL
PARTS LIST

FEATURING:
*STANDARD TOTALIZER ASSEMBLY
*MODEL CN06-2 INDICATOR-TOTALIZER
*CERAMIC BEARING CARTRIDGE PROPELLER
*ONE PIECE SEPARATOR/SPINDLE AND THREADED REVERSE THRUST BEARING CARTRIDGE

McCROMETER
3255 WEST STETSON AVENUE
HEMET, CALIFORNIA 92545 U.S.A.

PHONE: 951-652-6811
FAX: 951-652-3078
VISIT OUR WEBSITE: www.mccrometer.com

ATTACHMENT D
DISTRICT SAMPLE BILLS

Orange Cove Irrigation District
1130 Park Blvd
Orange Cove, CA 93646-0308
(559) 626-4461

Estimated Usage
No

WATER USAGE STATEMENT
3/1/2017 8/23/2017

Cust No. 2

Don't forget to order water 24 hrs in advanced. If you have an emergency please call 626-1509. If sending water orders via email, send to: waterorders@orangecoveid.org

Summary

Total AF Supply	Total AF Used	Total AF Remaining	Total $ Remaining
60.000	21.661	38.339	$2,135.49

Cust	Seq	AF	WaterDesc	Rate	AF Remaining	Water Cost	Usage Cost
2	1	30.000	USBR Tier 1	$65.00	8.339	$1,950.00	$1,407.97
2	2	30.000	USBR Tier 2	$25.00	30.000	$750.00	$0.00
						Pumping Charge	$476.54
						Total Usage Cost	$1,884.51
			Misc Credit	$0.00		Account Deposit	$4,020.00
			Estimated Carry Over $ Credit 10.0%	$150.00		Remaining Balance After Usage	$2,135.49
			Total Estimated Carry Over Credit/Refundable	$150.00		Remaining Estimated Pumping Cost	$843.46
			Carry Over Amount May Change Depending On Actual Pumping Cost. Unused/Remaining Pumping Cost Will Add to Carry Over Credit/Refund Amount.			Remaining Water Balance	$1,292.04

ID 9 #30 "PLRP" HP-22 F-225 Outlet Acres: 30

Start Date	Time On	Reading	End Date	Time Off	Reading	GPM	Acre ft	Pumping Rate	Amount
4/28/2017		752.923	5/31/2017		761.251		8.328	22.00	$183.22
5/31/2017		761.251	6/30/2017		766.106		4.855	22.00	$106.81
6/30/2017		766.106	7/31/2017		774.584		8.478	22.00	$186.52
AF Per Acre	0.722		Summary for ID 9 #30 "PLRP" HP-22 F-225				21.661		$476.54
						Total Water Used	21.661	Pumping Cost	$476.54

Wednesday, August 23, 2017 Cust No: Page 1

ATTACHMENT E

GROUNDWATER MANAGEMENT PLAN

This document is from 2006 and is a very large file. If you do not already have in your records, request an electronic version from OCID. Alternatively, a link to the document is provided on the District website at *orangecoveid.org*

ATTACHMENT F
District Agricultural Water Order Form

Orange Cove Irrigation District *2017* - **WATER ORDER SHEET** ***Fax: 626-4463***

E-mail : waterorders@orangecoveid.org

Name	System	Outlet	Date	Time	Flow	On/Off	Duration	Remarks	*DATE* ENTERED	*TIME* ENTERED

APPENDIX A

SB7x-7 Supplemental Information
(Attachments A-E)

For

Agricultural Water Management Plan Submittal to DWR
Pertaining to USBR CVPIA Compliance Entities

by

Orange Cove Irrigation District

Attachment A

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

The Orange Cove Irrigation District (District) measures water delivered to each and every "farm-gate" in its system. The District's delivery infrastructure consists of closed pressurized polyvinylchloride (PVC) pipe systems connected to the federally, constructed and owned Central Valley Project (CVP) surface water conveyance system; the Friant-Kern Canal.

District farm gate delivery quantification and subsequent District customer billing is accomplished through Water Specialties ® propeller meters with either mechanical or digital registers, ranging in size from 2-inch to 6-inch diameter. The meter size depends on the acreage served by the farm-gate; otherwise all delivery installations are identically configured. The vast majority of deliveries in the Orange Cove Irrigation District are through 4-inch diameter meters, which can provide surface water demands on parcels up to 60 acres. All meters register instantaneous flow in gallons per minute and accumulating total in acre-feet. District meters are read monthly.

The Description / Specification sheet of a typical District Water Specialties meters is attached below.

WATER SPECIALTIES™
PROPELLER METER

MODEL VF29

VERTICAL UPFLOW TEE TUBE METER
SEALED METER MECHANISM - MAGNETIC DRIVE
SEALED TOTALIZER
SIZES 4" thru 20"

TOTALIZER

DESCRIPTION

MODEL VF29 VERTICAL UPFLOW TEE TUBE METERS are designed to meet AWWA specifications. The flanged end tee design permits use in a wide range of applications with up to 150 psi working pressure. The base and side outlets are 150 lb. AWWA class "D" flat face steel flanges. Fabricated steel meter tubes have straightening vanes and are protected internally and externally with 12-15 mils of NSF approved, fusion epoxy resin.

INSTALLATION is made to any vertical discharge line with the proper size flange connection or to vertical discharge concrete turnouts with the proper anchor bolts. The meter must be installed upright for a full flow of liquid through the pipe to assure proper accuracy. Fully opened gate valves, fittings or other obstructions that tend to set up flow disturbances should be a minimum of five pipe diameters upstream and two pipe diameters downstream from the meter.

PROPELLER is magnetically coupled with the drive mechanism through the sealed separator assembly. This completely eliminates water entering the meter assembly, as well as the need for any packing gland. The propeller is a conical shaped three bladed propeller, injection molded of thermoplastic material resistant to normal water corrosion and deformity due to high flow velocities.

BEARING in propeller is a water lubricated ceramic sleeve and spindle bearing system with a ceramic/stainless steel spindle. Dual ceramic thrust bearings, standard on all meters, handle flows in both forward and reverse directions. The bearing design promotes extended periods of maintenance free propeller operation. Bearings within the sealed meter mechanism are shielded precision stainless steel bearings and are factory lubricated for the life of the meter.

TOTALIZER is o-ring sealed and magnetically coupled with the driving mechanism, and features a six digit totalizer with a full 3" diameter, 100 division, center sweep dial that permits extremely accurate readings for timing purposes in determining flow rates. The totalizer dial can be furnished in gallons, cubic feet, acre feet or any standard liquid measuring units. The bonnet, with padlock hasp, can be positioned in four different directions for the easiest possible reading when the meters are mounted in unusual positions.

CHANGE GEARS may be easily exchanged in the field when changing the dial, or when recalibrating for different pipe sizes. It is not necessary to remove pressure from the line for these changes.

O-RING SEALS are used at the meter head and all points where seals are required, making the meter mechanism completely immune to any of the corrosive effects of atmospheric moisture or the liquids measured by the meter assembly.

SPECIFICATIONS

ACCURACY Plus or minus 2% of actual flow within the range specified for each meter size.

PRESSURE RANGE Up to 150 PSI maximum working pressure.

TEMPERATURE RANGE 140° F Maximum. Consult factory for special construction for higher temperatures.

MINIMUM FLOWS As shown for each meter size and construction are required for accurate registration. See flow chart. NOTE: Minimum flow will be higher when auxiliary equipment is added.

MAXIMUM FLOWS As shown for each meter size and construction are rated for continuous operation. See flow chart.

INTERMITTENT FLOWS as shown for each meter size are rated for 10% to 15% of the total time the meter is operating. Consult factory for High Velocity construction when intermittent flows are higher than shown on flow chart and/or when longer operating periods are required.

MATERIALS used in construction are chosen to minimize the corrosive effects of the liquids measured by the meter assembly.

MAGNETS - permanent ceramic type
INTERIOR BEARINGS - shielded stainless steel
PROPELLER BEARING - ceramic sleeve type
PROPELLER SPINDLE - ceramic coated stainless steel
PROPELLER - injection molded thermoplastic
DROP-PIPE - stainless steel
SEPARATOR - stainless steel
SHAFTS AND BOLTS - stainless steel
METER HEAD - cast iron, NSF approved, fusion epoxy coated.
METER TUBE - fabricated steel with 12-15 mils of NSF approved, fusion epoxy resin.

OPTIONAL EQUIPMENT A meter mounted Fwd. & Rev. Totalizer, Totalizer Extensions and a wide range of controls and instruments for indicating, totalizing and recording flow data for each meter. Special constructions and materials are available upon request.

ORDERING INFO Must be specified by the customer and includes:

- Minimum & maximum flow ranges
- Temperature of meter environment
- Totalizer dial units
- Type of materials and construction
- Optional equipment desired

FlowCom™ Register

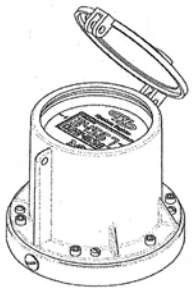
DIGITAL DATA & COMMUNICATIONS

CONFIGURATION SHEET

MODEL FC100/FC101

FLOWCOM REGISTER

FC100
Mc Propeller



FC101
Water Specialties Propeller

DESCRIPTION

The FlowCom Register displays a flowmeter's flowrate and volumetric total. The FlowCom can be fitted to any new or existing McCrometer propeller flowmeter.

FEATURES & SPECIFICATIONS

- Retrofits to any existing McCrometer Propeller Flowmeter
- Four output options: 4-20mA Loop, Open Collector, Optically Isolated, and Contact Closure.
- Unique Units of Measurement for Rate, Total, 4-20mA and Pulse Outputs
- Factory sealed Remote and Meter-Mounted Models

Environmental	
Operating Temp:	-4°F to 158°F (-20°C to 70°C)
Storage Temperature:	-40°F to 158°F (-40°C to 70°C)
Housing Rating:	NEMA 4X
Input Signal	
Input Compatibility:	McCrometer Flowmeters
Remote Distance:	100 feet max.
Rate Functions	
Display:	5-digit
Rate Units:	22 different units
Totalizer Functions	
Display:	8-digit
Totalizer Units:	20 different units
Accuracy:	0.25%
Non-Volatile Storage:	Updated hourly
Programming	
Program Access:	Magnetic wand
Access Lockout:	4-digit code
Test Modes:	4 mA and 20 mA test modes
Totalizer Reset:	Programming
Total Reset Disable:	Programming (permanent)
Calibration Adjustment:	+ or - .01% to 10%

4-20mA Analog	
Power Requirements:	12 to 40 VDC
Transmissions:	5,000 feet max.
4mA/20mA Trim:	.01 mA to .50 mA
Engineering/Time Units:	22 different units
Pulse Outputs	
Engineering Units:	20 different units
Optically Iso. Pulse Width:	80 ms
Open Collector Pulse Width:	adjustable
Collector to emitter voltage:	50v @ 250 mA max.
Pulse Width:	80 ms
Max Pulses Per Minute:	30
Signal Distance:	500 feet max.
Contact Closure Output	
Contact Rating:	30v @ 1 Amp max.
Pulse Width:	80 ms
Max Counts Per Minute:	30
Signal Distance:	500 feet
Power Requirement	
Battery Type:	Lithium 3.6 V
Battery Life:	6 - 10 years
Optional 4-20mA:	Loop powered

McCROMETER
www.mccrometer.com

3255 WEST STETSON AVENUE • HEMET, CALIFORNIA 92545 USA
TEL: 951-652-6811 • 800-220-2279 • FAX: 951-652-3078 Printed In The U.S.A Lit. # 24510-49 Rev. 1.1/09-07

Year of Data	Calendar Year 2015

Table 1

Surface Water Supply

Calendar Year 2015 Month	**Federal Ag Water** (acre-feet)	**Federal non-Ag Water.** (acre-feet)	**State Water** (acre-feet)	**Transfers into District** (acre-feet)	**Upslope Drain Water** (acre-feet)	**Total** (acre-feet)
Method						
January	213	0	0	0	0	213
February	108	0	0	0	0	108
March	138	0	0	0	0	138
April	260	0	0	0	0	260
May	0	0	0	513	0	513
June	0	0	0	991	0	991
July	1294	0	0	356	0	1,650
August	1139	0	0	713	0	1,852
September	0	0	0	1981	0	1,981
October	0	0	0	1080	0	1,080
November	0	0	0	0	0	0
December	0	0	0	171	0	171
TOTAL	3,152	0	0	5,805	0	8,957

Table 2

Ground Water Supply

Calendar Year 2015 Month	**Warren Act (Intra-District Groundwater introduced into FKC and delivered as Surface Water)** (acre-feet)
January	0
February	0
March	10
April	66
May	69
June	157
July	68
August	36
September	35
October	30
November	33
December	2
TOTAL	506

Method Definitions:

M1	Measured summation from calibrated measuring devices, accurate to within +/- 6 percent.
M2	Measured summation from calibrated measuring devices.
M3	Measured summation from measuring devices.
C1	Calculated (more than summation) using information from calibrated devices (such as the difference between measurements upstream and down stream of diversion).
C2	Calculated using information from measuring devices.
C3	Calculated using estimates from pump run-times and pump efficiency.
E1	Estimated using measured information from similar conditions.
E2	Estimated using historical information.
E3	Estimated using observation.
O1	Other (attach a note with descriptions of other methods used).

Table 3

Total Water Supply

Calendar Year 2015 Month	Surface Water Total (acre-feet)	Intra-District Groundwater (acre-feet)	Recycled M&I Wastewater (acre-feet)	Total District Water Supply (acre-feet)
Method				
January	213	0	0	213
February	108	0	0	108
March	138	10	0	148
April	260	66	0	326
May	513	69	0	582
June	991	157	0	1,148
July	1,650	68	0	1,718
August	1,852	36	0	1,888
September	1,981	35	0	2,016
October	1,080	30	0	1,110
November	0	33	0	33
December	171	2	0	173
TOTAL	8,957	506	0	9,463

Calendar Year 2015 Precipitation Worksheet

	inches precip	ft precip	acres	AF/Year
Jan	0.11	0.01		
Feb	2.13	0.18		
Mar	0.00	0.00		
Apr	0.64	0.05		
May	0.15	0.01		
Jun	0.00	0.00	27,962	
Jul	0.05	0.00		
Aug	0.00	0.00		
Sept	0.01	0.00		
Oct	0.45	0.04		
Nov	2.47	0.21		
Dec	2.91	0.24		
TOTAL	**8.92**	**0.74**		20,785

Calendar Year 2015 Evaporation Worksheet

	inches evap	ft evap	acres	AF/YEAR
Jan	0.00	0.00	27,962	0
Feb	0.00	0.00	0	0
Mar	0.00	0.00	0	0
Apr	0.00	0.00	0	0
May	0.00	0.00	0	0
Jun	0.00	0.00	0	0
Jul	0.00	0.00	0	0
Aug	0.00	0.00	0	0
Sept	0.00	0.00	0	0
Oct	0.00	0.00	0	0
Nov	0.00	0.00	0	0
Dec	0.00	0.00	0	0
TOTAL	**0**	**0.00**	0	0

Table 4

Agricultural Distribution System

Calendar Year 2015 Canal, Pipeline, Lateral, Reservoir	Length (feet)	Width (feet)	Surface Area (square feet)	Precipitation (acre-feet)	Evaporation (acre-feet)	Spillage (acre-feet)	Seepage (acre-feet)	Total (acre-feet)
Pipe Lines	612,480	0	0	0.0	0.0	0	0	0
Reservoir 3A	315	295	92,925	1.6	9.0	0	0	(7)
Reservoir 8	475	265	125,875	2.1	13.0	0	0	(11)
Reservoir 11A	265	135	35,775	0.6	4.0	0	0	(3)
Reservoir 13	325	325	105,625	1.8	11.0	0	0	(9)
TOTAL			360,200	6.1	37.0	0	0	(31)

Table 5

Crop Water Needs

Calendar Year 2015 Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Leaching Requirement (AF/Ac)	Cultural Practices (AF/Ac)	Effective Precipitation (AF/Ac)	Appl. Crop Water Use (acre-feet)
Oranges / Tang.	20,074	2.80	0	0.0	0.56	44,966
Plums/Prunes	1,063	3.20	0	0.0	0.56	2,806
Grapes, table	909	3.20	0	0.0	0.56	2,400
Lemons / Limes	908	2.80	0	0.0	0.56	2,034
Olives	751	2.80	0	0.0	0.56	1,682
Irrigated pasture	401	4.10	0	0.0	0.56	1,420
Almonds	346	3.55	0	0.0	0.56	1,035
Pomegranates	259	3.50	0	0.0	0.56	761
Other hay	121	4.04	0	0.0	0.56	421
Pecans/Nectarines	116	3.55	0	0.0	0.56	347
Kiwis	91	4.50	0	0.0	0.56	359
Cherries	87	3.40	0	0.0	0.56	247
miscellaneous crops	502	3.00	0	0.0	0.56	1,225
Fallow	2,334				0.56	
	27,962				15,658.7	59,702

Total Irrig. Acres 25,628 (If this number is larger than your known total, it may be due to double cropping)

Table 6

Calendar Y District Water Inventory

Water Supply	Table 3		9,463
Riparian ET	(Distribution and Drain)	minus	0
Groundwater recharge	(intentional - ponds, injection)	minus	0
Seepage	Table 4	minus	0
Evaporation - Precipitation	Table 4	minus	31
Spillage	Table 4	minus	0
Transfers out of District		minus	0
Water Available for sale to customers			9,432
Actual Agricultural Water Sales	Calendar Year 2015	From District Sales Records	9,463
Private Groundwater	Table 2	plus	0
Crop Water Needs	Table 5	minus	59,702
Drainwater outflow	(tail and tile, not recycled)	minus	0
Percolation from Agricultural Land	(calculated)		(50,239)
Unaccounted for Water	(calculated)		(31)

Table 7

Influence on Groundwater and Saline Sink

Calendar Year 2015

Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence on Groundwater Storage	(506)
Estimated actual change in ground water storage, including natural recharge)	0
Irrigated Acres (from Table 5)	25,628
Irrigated acres over a perched water table	0
Irrigated acres draining to a saline sink	0
Portion of percolation from agri seeping to a perched water table	0
Portion of percolation from agri seeping to a saline sink	0
Portion of On-Farm Drain water flowing to a perched water table/saline sink	0
Portion of Dist. Sys. seep/leaks/spills to perched water table/saline sink	0
Total (AF) flowing to a perched water table and saline sink	0

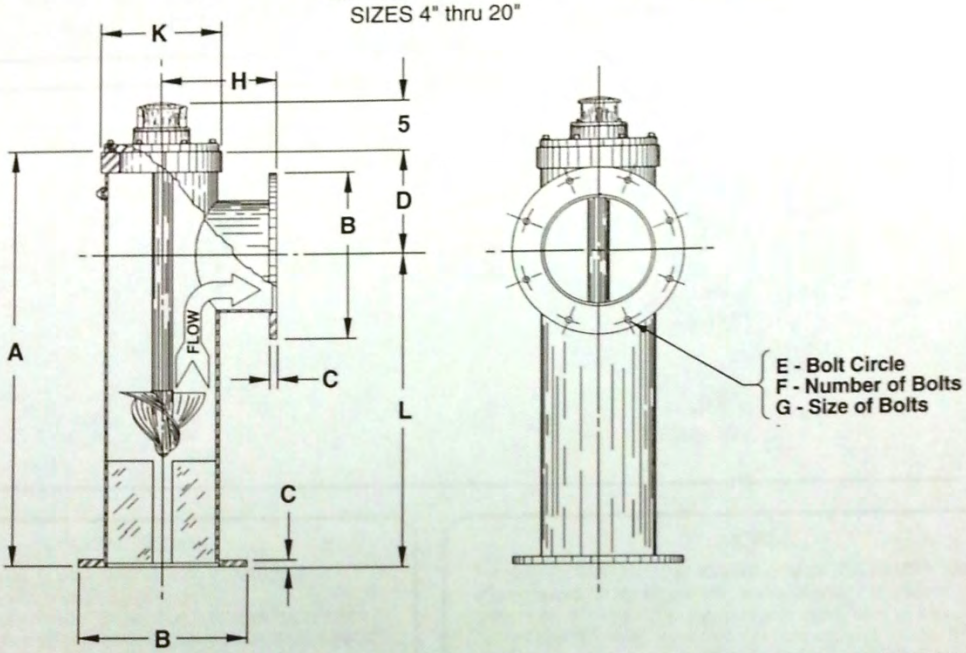
Table 8

Annual Water Quantities Delivered Under Each Right or Contract

Year	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water (acre-feet)	Transfers into District (acre-feet)	Upslope Drain Water (acre-feet)	Total (acre-feet)
2006	36,407	0	0	0	0	0	36,407
2007	26,672	0	0	0	0	0	26,672
2008	37,701	0	0	0	0	0	37,701
2009	42,236	34	0	0	1,500	0	43,770
2010	21,549	25	0	0	3,946	0	25,520
2011	30,018	23	0	0	0	0	30,041
2012	18,359	62	0	0	10,076	0	28,497
2013	21,419	78	0	0	3,100	0	24,597
2014	5,167	0	0	3,706	4,482	0	13,355
2015	3,152	0	0	506	5,805	0	9,463
Total	242,680	222	0	4,212	28,909	0	276,023
Average	24,268	22	0	421	2,891	0	27,602

MODEL VF29

VERTICAL UPFLOW TEE TUBE METER
SEALED METER MECHANISM - MAGNETIC DRIVE
SEALED TOTALIZER
SIZES 4" thru 20"



METER & PIPE SIZE	FLOW RANGES, GPM MIN.	MAX.	INT.	STANDARD DIAL FACE (GPM/GAL)	DIMENSIONS A	B	C	D	E	F	G	H	K	L	EST SHIPPING WEIGHT POUNDS
4	55	500	700	500/100	18	9	5/8	4 1/2	7 1/2	8	5/8	5	6	13 1/2	180
6	130	1200	1500	1200/1000	40	11	11/16	10	9 1/2	8	3/4	9	11	30	190
8	170	1500	2000	1500/1000	40	13 1/2	11/16	10	11 3/4	8	3/4	10	11	30	240
10	200	2000	3000	2000/1000	40	16	11/16	10	14 1/4	12	7/8	11	11	30	330
12	220	3000	3500	3000/1000	40	19	13/16	10	17	12	7/8	12	11	30	440
14	320	4000	4500	4000/1000	40	21	15/16	10	18 3/4	12	1	14	11	36	520
16	420	5000	6000	5000/1000	54	23 1/2	1	11 1/2	21 1/4	16	1	15	11	42 1/2	620
18	720	6000	7500	6000/1000	60	25	1 1/16	12	22 3/4	16	1 1/8	18	11	48	720
20	870	8000	9000	8000/10000	66	27 1/2	1 1/8	14	25	20	1 1/8	20	11	52	820

McCROMETER
Visit our Website: www.mccrometer.com
3255 WEST STETSON AVENUE • HEMET, CALIFORNIA 92545 USA
TEL: 951-652-6811 • FAX: 951-652-3078

The following image is a photograph of one of the District's meters as it is installed in the field and a close-up view of the indicators.

Meter Close-up – Rate and Totalizer

Typical Farm Gate Installation

Attachment B

Engineer Certification and Apportionment Required for Water Measurement - Technically Infeasible

Since the District measures water at each farm-gate and not at an upstream point on a lateral, there is no apportionment of flow not provided for by a discreet indicator and this certification is moot.

Attachment C

Description of Water Measurement Best Professional Practices

The aforementioned technical specifications attached hereto on the Water Specialties flow meter is representative of all meters used throughout the District to quantify volumetric deliveries and substantiate customer billing. Each month, unlocked meters are read and recorded by the District's field staff. Meters are locked for various reasons, including but not limited to:

- Customer generally does not order water (for whatever reason), or
- Customer is ineligible to receive water due to delinquent payments to the District.

Professional Practices

- *Water Measurement Data Collection and Frequency*

  Meter totalizers are read and recorded on all unlocked District delivery meters on a monthly basis (unless District water is unavailable such as during the dewatering of the Friant-Kern Canal in which case there is no possibility for water to be delivered to any individual customer).

- *Method for Determining Irrigated Acreage*

  Just prior to the beginning of each CVP contractor "Contract Year" which coincides with March 1 through the last day of the following February, the District provides each landowner in its service area with a crop survey form which they must complete in accordance with the USBR Water Conservation Plan. This information is tabulated on a District wide basis and reported to the USBR in order to determine the irrigation requirement for the District. The calculation includes crop type and acreage per crop type along with corresponding crop coefficients to determine the consumptive side of the water balance. That water requirement is balanced by the supply side, which includes; the readily quantifiable effective precipitation (using local CIMIS Station information) and CVP contracted surface deliveries. From these parameters the less readily quantifiable groundwater use is determined to balance supply and irrigation demand.

The District's CVP supply is supplemental to groundwater and effective precipitation. At a 100% Bureau of Reclamation declaration the District may allocate 1.4 feet per acre to all landowners in the District. If initial orders do not reserve the total supply declaration, growers may receive additional supply above and beyond the 1.4 feet per acre-foot quantity and many in the District rely on this as they have limited groundwater access. Because of the supplemental nature of the supply and the fact that applying water to crops has a cost, farmers have a strong disincentive to over irrigate.

- *Quality Control and Quality Assurance Procedures*
    - Gross Comparison by Delivery System

      The District delivers water from the Friant-Kern Canal, a federal CVP facility, through 15 discreet turnouts off the Canal, which are connected to individual pressurized pipeline systems. These systems convey water to up to 1,200 farm-gates within the District's legal boundary.

      Surface water diverted from the Friant-Kern Canal at each of these 15 turnouts flows through United States Bureau of Reclamation owned meters (FKC meters) before entering the District's system. FKC meters are routinely maintained and calibrated by the non-federal operating entity, which in this case is the ***Friant Water Authority***. The Friant Water Authority is the entity responsible for operation and maintenance of the Friant-Kern Canal under a cooperative agreement with the United States Bureau of Reclamation and they read each of the FKC meters on a daily basis.

      The following image is a capture of the FKC meter recorder output.

FKC Meter Recorder Output

Each month, a gross numerical comparison (by individual delivery system) is performed by District staff to ensure that the quantity of water metered through the FKC meters matches the cumulative total of corresponding farm-gate meters in the District. Performing this calculation assists in identifying potential meter problems.

In addition to this method of meter validation, each landowner is required (under penalty assessed for noncompliance) to place a water order every time they irrigate. A discrepancy between the cumulative monthly order and the end of the month meter reading provides an indication that the meter may not be working properly. This validation is done every month and motivates District staff inspection of individual meters.

Monthly totals indicated by the FKC meters are the basis of monthly payments to the United States. The FKC meters installed at the District turnouts are predominantly venturi (differential pressure) type meters, which according to the Bureau of Reclamation measure to within an accuracy range of +/- 1%.

While the FKC meters are the basis of payments to the United States for quantifying the diversion of the District's Contract supply, each of the District's farm-gate meter readings are the basis for customer billing; regardless of FKC meter indication. In other words, the District pays for water used based on the FKC meters, whose accuracy is validated by the United States.

Variation among FKC and District meters is therefore self correcting through the District's staffs efforts, as it is essential that the District's meters reflect actual farm-gate diversions (which is presumed to be reflected by FKC meters) particularly in a closed / pipeline system case where conveyance losses are, for all intents and purposes, zero.

It has long been the District's observation that on a long term cumulative basis there is close agreement between the FKC meters and the District's meters by system and overall to within 1%. While this indicator reflects the overall accuracy of the water supply consumed by the District and not each individual farm-gate's accuracy, it does suggest that the District's quantification of deliveries is very good. Below is Calendar year comparison of the respective quantifications from 2010 forward.

Contract Year	FWA vs. District Meters % Variance
2010	-2.11%
2011	+2.72%
2012	+0.44%
2013	+0.92%
2014	-1.3%
2015	-1.14%
2016	+5.37%
Average	**+0.87%**

Comparison of FWA and District meter totals by Contract Year

- Direct Observation

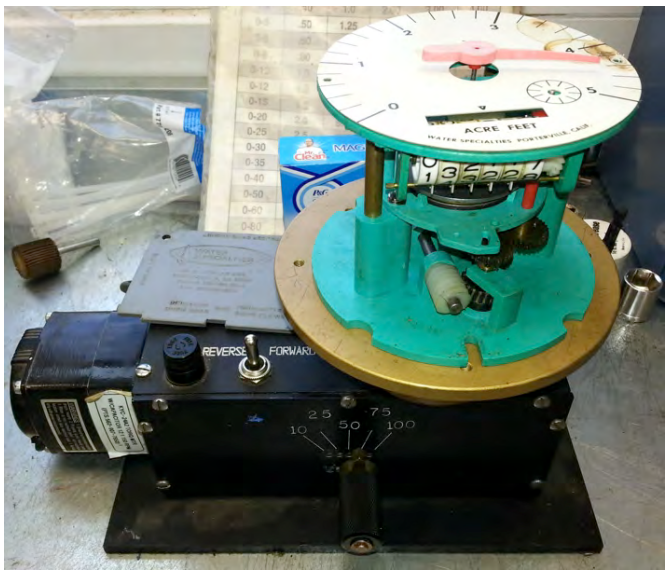
  Whenever the District staff reads an active meter the instantaneous flow is compared to the water order (daily customer orders are required by all users of District water and are ordered on an instantaneous flow basis in gallons per minute) for a specified duration (i.e. 48 hours). If there is an apparent difference between the instantaneous flow observed by staff and the ordered flow rate, this informs that the meter's instantaneous mechanism is not working properly. In addition to instantaneous anomalies, the monthly-totalized volume is compared to the monthly volume that would be achieved by the time factored water rate orders. If there is a discrepancy in this respect, this informs that the totalizer portion of the mechanism is malfunctioning.

  Whatever the case, observation is an important tool to identify meter issues/inaccuracies and the District's staff acts immediately to rectify an observable meter malfunction, as failure to do so has economic consequences back to the District.

- Meter Repair / Calibration Protocols

  If observation suggests a discrepancy or if a meter is observed not to be working properly (making a noise, needle bouncing, water in the meter, etc…), or if a landowner informs the District that a meter is not working properly, the District staff pulls the meter for internal inspection and repair as necessary. The District spends approximately $10,000 annually on meter repair parts / new meters.

  A meter that is suspected of not working properly based on the aforementioned observable indicators is connected to a mechanical bench-testing device in order to test its instantaneous and totalizing meter functions (see photograph below of mechanical bench test device).



Mechanical Meter Bench Test

If there is a variance observed, repair parts are installed and adjustments are made until retest confirms accuracy to within +/- 2%.

- Meter Accuracy Validation Facility and Protocols

  The District constructed an active real time flow-through meter test facility (Facility) to validate accurate farm gate meter performance. The Facility utilizes a factory calibrated magnetic flow meter (validation meter) upstream of a randomly pulled propeller meter to be tested (test meter) to ensure that the instantaneous and totalized tested meter mechanisms are performing within the manufacturer's stated accuracy range, namely +/- 2%. The pictures below show some aspects of the constructed test facility.

Test Meter in the Foreground and Validating Meter in the Background

Image of District Meter Test Facility

The image to the left depicts the District's Meter Test / Accuracy Validation Facility. The meter stand mimicking field-installed meters is visible in the upper right hand portion of the image left of the stairway. The Facility pumps water (at a controllable rate) through the Test and the Validating meters for direct comparison, before discharging the flow in a recirculating manner so that meters can be tested without the delivery of water to District outlets. If the test meter does not operate within the manufacturers specified range, District staff repairs or replaces it.

The District is replacing each mechanical register with digital registers, which have no wear parts and perform with greater accuracy. The District has budgeted register replacement at 50 units per year.

A log will be kept of each meter tested. It was anticipated that 25 meters would be tested annually, depending on observed accuracy of meters tested.

During 2014 and 2015 water years, the District received a zero allocation of water supply. As such, no testing was performed during those years and so at this time there is nothing to report

relating to Test Meter observed accuracy. The next report will include information on the use and results associated with the Facility.

The flow through test facility design included input from meter technical sales representatives / vendors of the meters used by the District, as well as the District's Engineer-Manager who has an engineering degree and a Masters Degree in Hydrologic Science from UC Davis.

Based on information gathered from this Facility, the District will further improve upon its high standard of individual farm-gate accuracy, which is certainly a primary goal of the District as fairness dictates customers pay in direct proportion to the resource actually consumed.

Attachment D

Documentation of Water Measurement Conversion to Volume

The conversion to volume is achieved by the meters' totalizers, which indicate in acre-feet. All meters utilized by the District have this capability so there is nothing to be discussed relative to this Attachment.

Attachment E

Device Corrective Action Plan Required for Water Measurement

As stated, the District has several existing tools to ensure accurate metering of water to its customers. These methods and the nature of the District's sophisticated delivery system strongly indicate that water is metered most accurately. Notwithstanding agreement between gross diversion quantification indicated by FKC and cumulative District meter readings, the District will endeavor to improve individual farm-gate measurement accuracy with the addition of the aforementioned flow-through meter test facility. This test facility was constructed in-house by District staff; the same staff that purchases, installs, reads, maintains, repairs and replaces all the District's meters. Similarly, the District budgets for replacement of 50 of its mechanical registers with digital registers each year and this program will continue until all registers are of the digital type.