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Byron Bethany Irrigation District Agricultural Water Management Plan

Prepared for

Byron Bethany Irrigation District

September 2017

Prepared by:

ch2m

Completed in Accordance with
Executive Order B-29-15 and the Water Conservation Act of 2009 (SBx7-7)

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Acronyms and Abbreviations

AF	acre foot (acre feet)
AWMP	Agricultural Water Management Plan
BBID or District	Byron Bethany Irrigation District
CalEPA	California Environmental Protection Agency
CCWD	Contra Costa Water District
CDEC	California Data Exchange Center
CIMIS	California Irrigation Management Information System
CIP	capital improvements plan
CVP	Central Valley Project
CWC	California Water Code
DMC	Delta-Mendota Canal
DWR	California Department of Water Resources
EO	Executive Order
ET	evapotranspiration
EWMP	efficient water management practices
GSA	Groundwater Sustainability Agency
mg/L	milligrams per liter
M&I	municipal and industrial
MHCSD	Mountain House Community Services District
NCDC	National Climatic Data Center
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTU	nephelometric turbidity units
OEHHA	Office of Environmental Health Hazard Assessment
PL	public law
PVWD	Plain View Water District
Reclamation	Bureau of Reclamation
RWSA	raw water service area
SBx7-7	Water Conservation Act of 2009
SCADA	supervisory control and data acquisition
SLDMWA	San Luis and Delta Mendota Water Authority
SWRCB	State Water Resources Control Board
TAF	thousand acre feet

UWMP	Urban Water Management Plan
WBM	water balance model

SECTION 1

Introduction

Byron Bethany Irrigation District (BBID or District) produced this Agricultural Water Management Plan (AWMP) in compliance with Executive Order (EO) B-29-15. EO B-29-15 requires all agricultural water suppliers that supply water to 10,000 to 25,000 agricultural acres to develop an AWMP. The AWMP must include a drought management plan, a quantification of water supply, and a quantification of demand over the years 2013, 2014, and 2015. The District's AWMP has been prepared in accordance with EO B-29-15 and the Water Conservation Act of 2009 (SBx7-7), and follows the structure specified in the California Department of Water Resources' (DWR's) *A Guidebook to Assist Agricultural Water Suppliers to Prepare a 2015 Agricultural Water Management Plant* (2015 Guidebook) (DWR, 2015a). The District is generally located at the junction of Alameda, Contra Costa and San Joaquin counties, and contains portions of those counties. The District is about 25 miles west of Stockton, California, and is shown in Figure 1-1.

1.1 Description of Previous Water Management Activities

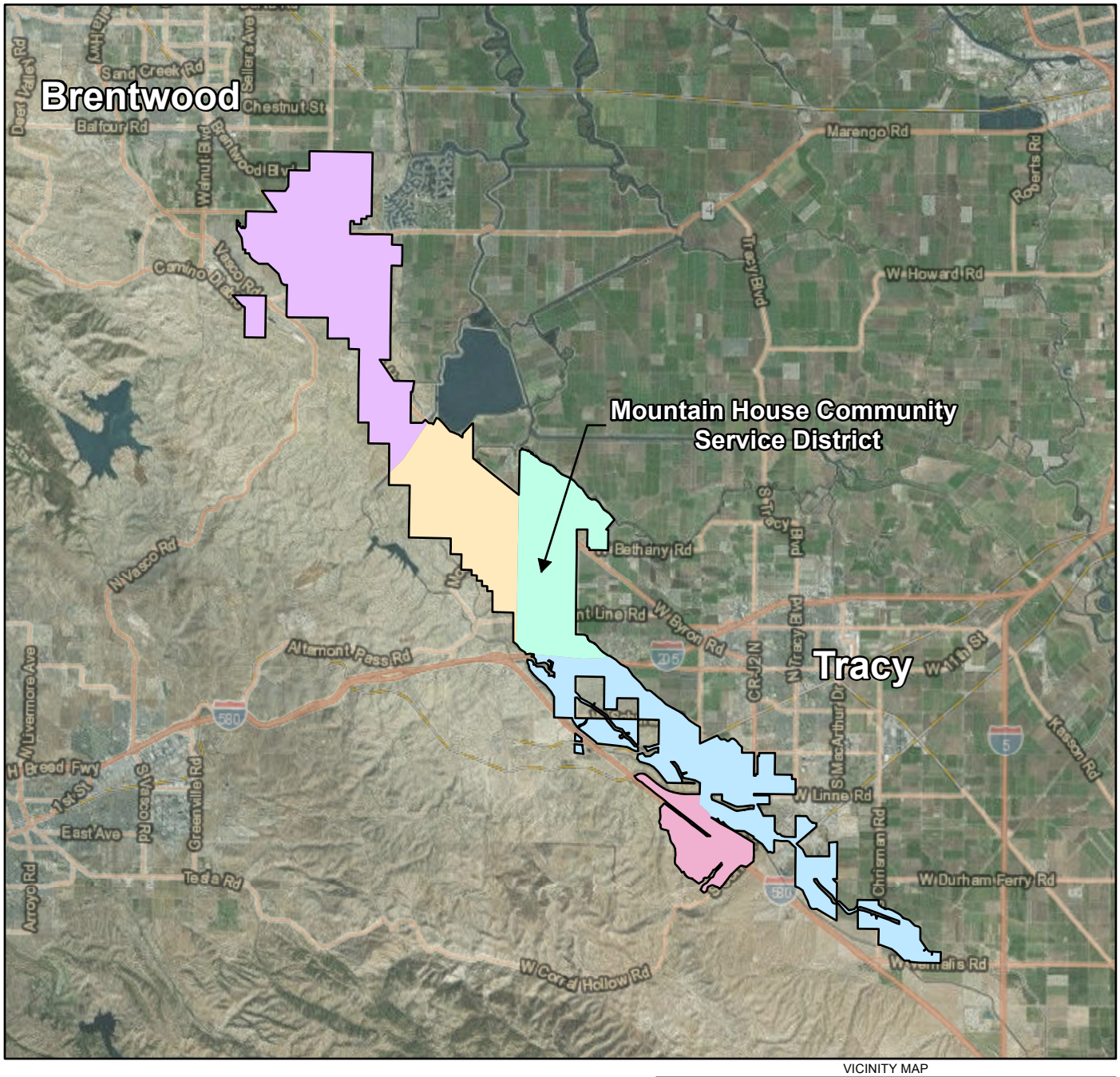
BBID has historically realized an essential need for water management and planning for the future. The 1964 report titled *Byron Bethany Irrigation District Feasibility Report in Support of P.L. 984 Loan Application for Proposed Improvements to Irrigation System* (Clair A. Hill and Associates, 1964) includes history and geography, general geology, water quality, groundwater and drainage problems, existing system evaluations, lands and water requirements for the District. The report details a general plan for improvements and includes designs and estimates.

BBID continually tracks water usage and routinely updates projections for water demand within the District service area. In the mid-1990s, the District participated in the East County Water Supply Management Study (East County Water Management Association, 1996) and developed projections of agricultural and municipal/industrial demands within its service area for the planning periods of 2000, 2010, 2020, 2030, and 2040. In 1999, the District revisited these projections in support of the annexation of the Tracy Hills Development into the District. In 2002, in support the State of California application for certification proceedings for the East Altamont Energy Center, the District updated their water supply and demand evaluation, and presented evaluation results in testimony before the California Energy Commission. In 2010, the District updated its supply and demand analysis to support its water supply and exchange agreement with the City of Tracy and the Bureau of Reclamation (Reclamation) to support water supply for Tracy Hills.

1.2 Coordination Activities

1.2.1 Notification of Agricultural Water Management Plan Preparation

Per California Water Code (CWC) §10821, BBID plans to notify Alameda, Contra Costa, and San Joaquin counties, the City of Tracy, and the Mountain House Community Services District (MHCSD) by October 3, 2017 that the AWMP was developed in draft form (see supporting AWMP checklist in Appendix A). Prior to adoption, the AWMP will be made available on BBID's website for public review and comment from September 18, 2017 to October 17, 2017. Prior to the public hearing, two public notices advertising the hearing will be published in the *Brentwood Press*. The notices will be published once a week for two successive weeks, with at least five days between the respective publication dates (see Appendix B). On October 17, 2017, the public hearing will be conducted to receive comments and discussion, pursuant to CWC §10820.b and §10841.



LEGEND

- RWSA 2
- RWSA 1
- CVP Service Area
- Byron Division
- Bethany Division

VICINITY MAP

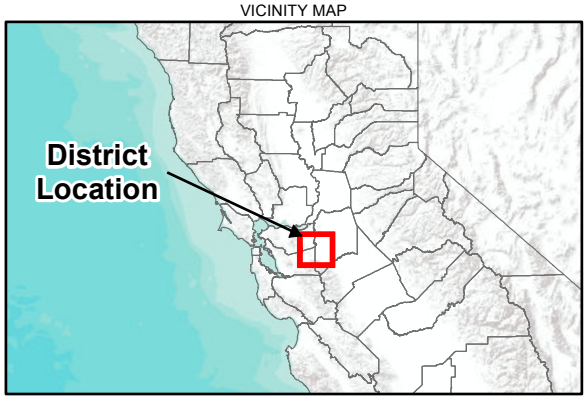


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Figure 1-1
District Location Map
Agricultural Water Management Plan
Byron Bethany Irrigation District

1.2.2 Public Participation

On October 17, 2017, the public hearing will be conducted to receive comments and discussion, pursuant to CWC §10820.b and §10841. BBID will incorporate public comments into the AWMP prior to adoption.

1.3 Agricultural Water Management Plan Adoption and Submittal

1.3.1 Agricultural Water Management Plan Adoption

BBID plans to adopt, via signed resolution, the updated AWMP as prepared or as modified during the October 17, 2017 hearing; Appendix C will contain the resolution.

1.3.2 Agricultural Water Management Plan Submittal

BBID will submit electronic copies of the AWMP and any changes to DWR, the California State Library, to Alameda, Contra Costa, and San Joaquin counties, to the City of Tracy, MHCSD, and the Alameda, Contra Costa, and San Joaquin local agency formation commissions.

1.3.3 Agricultural Water Management Plan Availability

Per CWC §10821, BBID will notify Alameda, Contra Costa, and San Joaquin counties, the City of Tracy, and the MHCSD by October 3, 2017 that the AWMP was developed. Prior to adoption, the AWMP will be made available on BBID's website for public inspection and comment from September 18, 2017 to October 17, 2017. A public hearing will be conducted to received comments and discussion on October 17, 2017, pursuant to CWC §10820.b and §10841. BBID incorporated public comments prior to adoption. BBID will make the adopted AWMP available on its website at http://bbid.org/.

1.4 Agricultural Water Management Plan Implementation Schedule

As discussed in Section 7, BBID has implemented all of the critical efficient water management practices (EWMPs), and has been implementing the majority of conditional EWMPs in recent decades. BBID plans to continue to implement feasible EWMPs over the next twenty years. The District, which provides water to 10,000 to 25,000 irrigated acres, is not required by law to implement EWMPs, because funding was not provided to the District (California Code of Regulations §597.1.e).

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SECTION 2

Description of the Agricultural Water Supplier and Service Area

2.1 Physical Characteristics

2.1.1 Location and Size of BBID's Service Area

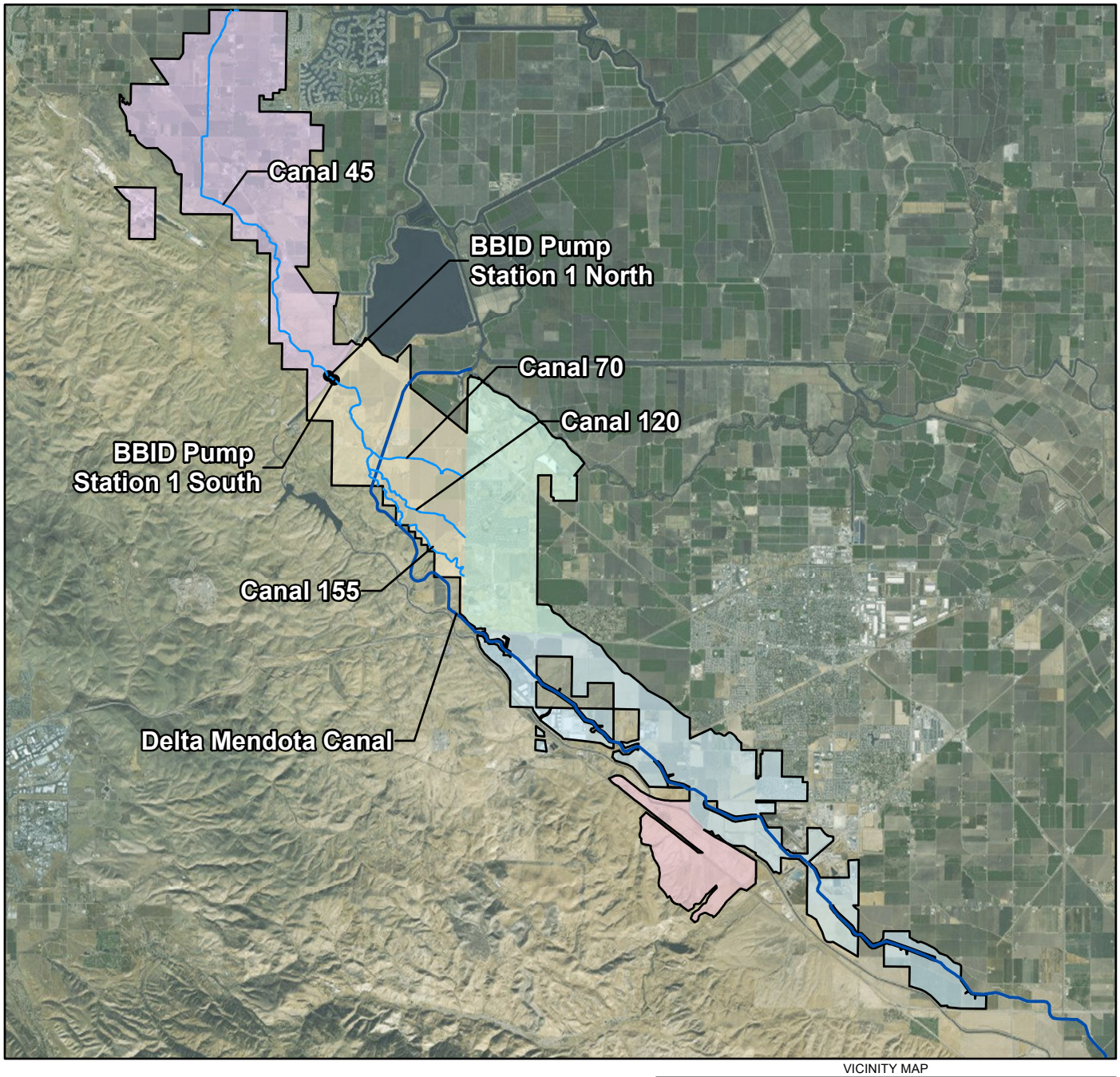
BBID is a multi-county special district formed under the provisions of CWC §20500 et seq. It is a public agency governed by an elected board of directors, and was established for the purpose of providing water to the lands within Alameda County, Contra Costa County and San Joaquin County. BBID is located at the junction of Alameda, Contra Costa and San Joaquin counties. The District holds a pre-1914 appropriative right to divert water for irrigation and domestic uses from the Harvey O. Banks Pumping Plant Intake Channel. In 2004, Plain View Water District (PVWD) consolidated into the District. The District was assigned PVWD's Central Valley Project (CVP) water service contract from Reclamation via the Delta-Mendota Canal (DMC). Based on these water rights and sources, the District has the following primary service areas:

- Byron Division
- Bethany Division
- Raw Water Service Area (RWSA) 1
- RWSA 2
- CVP Service Area

The Byron and Bethany divisions and RWSAs 1 and 2 are served by the pre-1914 water rights. The CVP Service Area is served by the CVP water services contract. Figure 1-1 shows these primary service areas.

The Byron and Bethany divisions and RWSA 1 encompass approximately 23,700 acres, of which 10,500 are irrigable acres. RWSA 2 was established for future development of the Tracy Hills community of the City of Tracy; demand will not be included in the analysis within this initial AWMP until municipal development occurs. The CVP Service Area includes approximately 6,300 acres, with 3,450 irrigated acres.

The Byron and Bethany divisions and RWSA 1 water supply distribution system includes pump stations on the intake channel at the Harvey O. Banks Pumping Plant, which are facilities of the California State Water Project; the State Water Project is owned and operated by DWR. These pump stations divert the District's pre-1914 water supply into canals that convey supply north to the Byron Division and south to the Bethany Division and RWSA 1. Figure 2-1 shows the location of the major pump stations and distribution canals.



LEGEND

- BBID Pump Stations
- BBID Canals
- RWSA 2
- RWSA 1
- CVP Service Area
- Byron Division
- Bethany Division
- Delta-Mendota Canal

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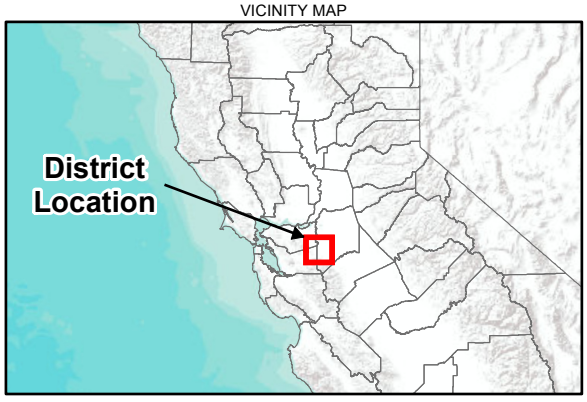
VICINITY MAP



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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2-1
Byron Bethany Irrigation District Infrastructure
Agricultural Water Management Plan
Byron Bethany Irrigation District

Table 2-1 summarizes the Byron and Bethany divisions' infrastructure.

BBID has an evolving Capital Improvements Plan (CIP) in place. The CIP gives the District the ability to systematically improve and maintain facilities in an efficient manner, while ensuring that the system operates effectively, efficiently, and reliably into the future.

Table 2-1. Byron and Bethany Division and RWSA 1 Conveyance and Delivery System
BBID Agricultural Water Management Plan

Element	Quantity and Unit
Intake Pump Stations	2 each
Canals	12 miles
Pipelines	30 miles
Subsurface Drains	7 miles
Pump Stations	16 each
Metered customer turnouts	315 each

In the CVP Service Area, the water supply turnouts are located directly on the DMC. The CVP Service Area conveyance is entirely piped, with a total length of 9.2 miles. Figure 2-1 shows the location of the CVP Service Area and the DMC.

2.1.2 Terrain and Soils

The terrain of the District is relatively flat, and is mainly comprised of alluvial fan and valley floor landscapes, with smaller areas of basin rim and stream terrace landscapes. Small areas of the western edge of the District consist of rolling hills, with slopes up to 40%, although these areas are not irrigated.

The District is made up primarily of clay and clay loam-textured soils, with small areas of loam and sandy loam soils near the Clifton Court Forebay. The soils are generally well and moderately well drained (with a small area of poorly drained soils north of the Clifton Court Forebay), and do not have restrictive layers in the subsoil. The fine textures of these soils are well suited to irrigation and have a slow infiltration rate when wet. Much of the land in the District is prime farmland if irrigated, and has a slight erosion hazard. Detailed soil map unit information is displayed on in Table 2-2, below.

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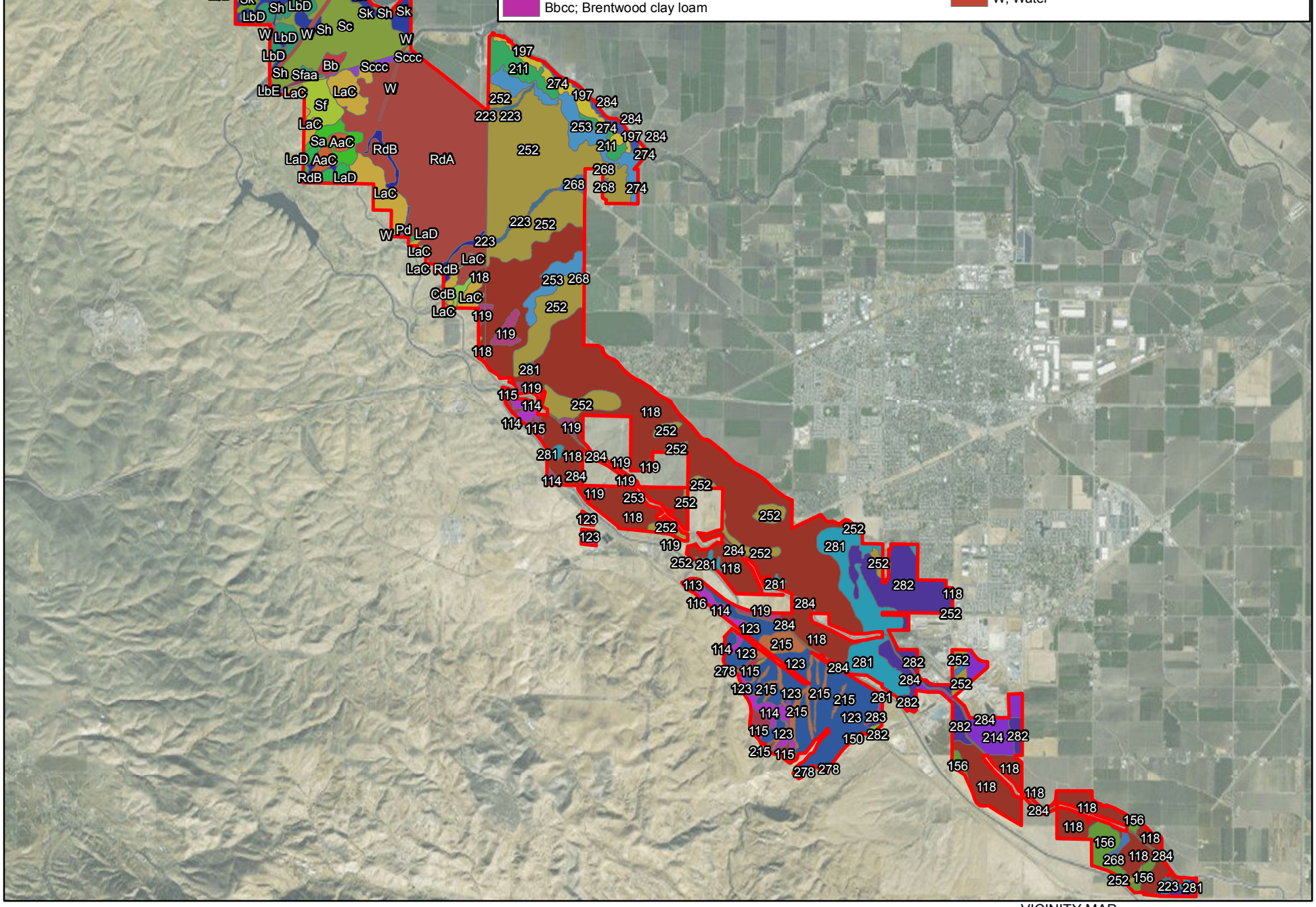
Byron Bethany Irrigation District

Soil Map Unit

- 113; Calla clay loam, 2 to 8 percent slopes
- 114; Calla-Carbona complex, 8 to 30 percent slopes
- 115; Calla-Carbona complex, 30 to 50 percent slopes
- 116; Calla-Pleito complex, 8 to 30 percent slopes
- 118; Capay clay, 0 to 2 percent slopes
- 119; Capay clay, 2 to 5 percent slopes
- 123; Carbona clay loam, 2 to 8 percent slopes
- 150; Dumps
- 156; El Solyo clay loam, 0 to 2 percent slopes
- 197; Merritt silty clay loam, partially drained, 0 to 2 percent slopes
- 211; Pescadero clay loam, partially drained, 0 to 2 percent slopes
- 214; Pits, gravel
- 215; Pleito clay loam, 2 to 8 percent slopes
- 223; Reiff loam, 0 to 2 percent slopes
- 252; Stomar clay loam, 0 to 2 percent slopes
- 253; Stomar clay loam, wet, 0 to 2 percent slopes
- 268; Vernalis clay loam, 0 to 2 percent slopes
- 274; Willows clay, partially drained, 0 to 2 percent slopes
- 278; Xerofluvents-Xerorthents complex, 1 to 8 percent slopes, occasionally flooded
- 281; Zacharias clay loam, 0 to 2 percent slopes
- 282; Zacharias gravelly clay loam, 0 to 2 percent slopes
- 283; Zacharias gravelly clay loam, 2 to 8 percent slopes
- 284; Water
- AaC; Altamont clay, 3 to 15 percent slopes
- AbD; Altamont clay, 9 to 15 percent slopes
- AbE; Altamont clay, 15 to 30 percent slopes
- AcF; Altamont-Fontana complex, 30 to 50 percent slopes
- Bb; Brentwood clay loam
- Bbcc; Brentwood clay loam
- Bc; Brentwood clay loam, wet
- BdE; Briones loamy sand, 5 to 30 percent slopes
- CaA; Capay clay, 0 to 2 percent slopes
- CbA; Capay clay, wet, 0 to 2 percent slopes
- Cc; Clear Lake clay
- CdB; Clear Lake clay, drained, 3 to 7 percent slopes
- LaC; Linne clay loam, 3 to 15 percent slopes
- LaCaa; Linne clay loam, 3 to 15 percent slopes
- LaD; Linne clay loam, 15 to 30 percent slopes
- LbD; Linne clay loam, 5 to 15 percent slopes
- LbDcc; Linne clay loam, 5 to 15 percent slopes
- LbE; Linne clay loam, 15 to 30 percent slopes
- LbEcc; Linne clay loam, 15 to 30 percent slopes
- Mb; Marcuse clay
- Mc; Marcuse clay, strongly alkali
- Pd; Pescadero clay
- RbA; Rincon clay loam, 0 to 2 percent slopes
- RbC; Rincon clay loam, 2 to 9 percent slopes
- RdA; Rincon clay loam, 0 to 3 percent slopes
- RdB; Rincon clay loam, 3 to 7 percent slopes
- Sa; Sacramento clay
- Sa; San Ysidro loam
- Sb; Sacramento clay, alkali
- Sc; San Ysidro loam
- Sccc; San Ysidro loam
- Sf; Solano fine sandy loam
- Sfaa; Solano fine sandy loam
- Sh; Solano loam
- Sk; Solano loam, strongly alkali
- Sm; Sorrento silty clay loam
- W; Water



VICINITY MAP

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2-2
Soil Map Units
Byron Bethany Irrigation District, California

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Table 2-2. Soil Map Units within the BBID Boundary
BBID Agricultural Water Management Plan

Soil Map Unit*	Estimated Acres	Percent of District
Capay clay	8,450	29.7
Stomar clay loam	3,321	11.7
Rincon clay loam	2,679	9.4
Brentwood clay loam	2,299	8.1
Zacharias clay loam	1,696	6.0
Linne clay loam	1,401	4.9
San Ysidro loam	1,358	4.8
Solano loam	1,353	4.7
Marcuse clay	1,269	4.5
Carbona clay loam	1,261	4.4
Calla-Carbona complex	478	1.7
Sorrento silty clay loam	383	1.3
Pits, gravel	315	1.1
Pleito clay	296	1.0

*Soil map units of the same soil series, but with different slope classes, have been combined within this table for brevity. See Figure 2-2 for complete map unit names (that include slope classes). Map units with slopes greater than 2% are generally not used for irrigated agriculture within the District.

Data from the Natural Resources Conservation Service (NRCS) Soil Surveys of Alameda, San Joaquin, and Contra Costa Counties. Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

2.1.3 Climate

BBID's climate is characterized by hot, dry summers and cool, moist winters. The majority of the precipitation falls during the winter wet season (approximately November to March), with the majority of the evapotranspiration demand occurring during the summer dry season. The BBID service area climate is relatively uniform throughout, and microclimates, if present, do not influence operations. Average climate data for the period from 1955 to 2016 (for precipitation and temperature) and from 1991 to 2016 (for crop evapotranspiration [Eto]) are displayed in Table 2-3. This long duration of record illustrates long-term climate conditions. The potential effects of climate change are discussed in Section 6.

Table 2-3. BBID Summary Climate Characteristics
BBID Agricultural Water Management Plan

Climate Characteristic	**Average Value***
Average Annual Precipitation	12.04 inches
Annual Minimum Precipitation	0.03 inches (July)
Annual Maximum Precipitation	2.54 inches (January)
Average Annual Minimum Temperature	38.3°F (January)
Average Annual Maximum Temperature	92.6°F (July)
Average Annual Reference Evapotranspiration (ET_o)	60.06 inches
Average Minimum Monthly Reference Evapotranspiration (ET_o)	1.32 inches (January)
Average Maximum Monthly Reference Evapotranspiration (ET_o)	9.02 inches (July)

*Data sources:

- Precipitation and temperature data from the National Climatic Data Center (NCDC) Tracy Pumping Plant station available at: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca9001
- ETo values are from the California Irrigation Management Information System (CIMIS) Station 167 – Tracy available at: http://www.cimis.water.ca.gov/UserControls/Reports/MonthlyEtoReportViewer.aspx

Detailed monthly climate information is displayed in Table 2-4.

Table 2-4. BBID Detailed Climate Characteristics
BBID Agricultural Water Management Plan

Month/Time	Average Precipitation (inches)	Average Reference (Et_o, inches)	Average Minimum Temperature (degrees Fahrenheit [°F])	Average Maximum Temperature (°F)
January	2.54	1.32	38.3	54.8
February	2.13	2.21	41.9	61.2
March	1.57	3.89	44.7	66.4
April	0.83	5.52	47.8	72.2
May	0.40	7.77	53.4	79.7
June	0.13	8.94	57.8	87.2
July	0.03	9.02	60.5	92.6
August	0.06	7.97	60.4	91.9
September	0.23	6.00	58.3	87.7
October	0.65	3.94	52.3	78.3
November	1.56	2.04	44.2	64.7
December	1.91	1.44	38.6	55.2
Wet Season Monthly Average*	1.60			
Dry Season Monthly Average*	0.17			

Notes:
*Wet season is defined as November through March.

2.2 Operational Characteristics

2.2.1 Operating Rules and Regulations

BBID operating rules and regulations are outlined in the *Rules and Regulations of the Byron Bethany Irrigation District – Governing the Distribution of Water* (Appendix D), and are discussed in the following sections.

2.2.1.1 Water Use and Availability

The beginning of the irrigation season is established by the Manager each year and is approved by the Board of Directors. The water year ends on October 31st. Water is made available for use in the laterals of the District during the irrigation season, provided sufficient irrigators make application to make the use of the laterals economically feasible. Water must be used continuously by irrigators throughout the period of the run. If water is wasted, inefficiently used, or improperly used, the Manager may refuse further delivery of water until the cause of waste or inefficient or improper use is removed.

2.2.1.2 Lead Time for Water Orders and Water Shut-Off

In the Byron and Bethany divisions, consumers are required to give the Water Conservation/Schedule Coordinator at least 48 hours lead time for deliveries, delivery changes, and shut-off of deliveries, depending on the individual lateral. In the CVP Service Area, 24 to 48 hours' notice is required for on-demand water delivery and shut-off. Flexible shut-off times are encouraged to the extent they can be accommodated by DMC operators.

2.2.1.3 Policies for Return Flows and/or Drainage Leaving the Service Area

Byron and Bethany Divisions

Per the BBID Rules and Regulations (Appendix D), all water introduced into the District by District works is considered District water, and is subject to rediversion and use by the District. All such water, whether waste and/or seepage water, intercepted and used by consumers will be charged for at the rate established by the District. All return flows, from water served by District shall become the property of District when such flows enter a District lateral or surface drainage system, leave the boundaries of a landowner's property, or percolate into the District's sub-surface drainage system or other District facility. All such water, whether return flow, tail water, waste and/or seepage water is subject to rediversion and use by District.

All consumers who drain their surface run-off (i.e., tailwater) into District facilities are required to install sumps according to District's sump standards and requirements. No water, including tailwater, can be placed into the District's irrigation or drainage system without the approval of the Manager. Adequate safeguards are established to prevent entry of trash, silt, herbicides, pesticides, fertilizers, etc., into the District's system. For example, the District requires the use of polyacrylamide to stabilize soil against erosion for furrow irrigation. Any concern or control which may result from quality of tailwater, including injury to third parties, is the responsibility of the discharger (i.e., consumer). The District may require reasonable periodic testing of tailwater discharged into District's system at the expense of the discharger.

These standards and requirements were established for the protection of District facilities; should the water user's system be inadequate for this purpose, the Manager requires the water user to correct the condition before their water enters the District's facilities.

CVP Service Area

If applicable, control and disposition of tailwater drainage flow is the landowner's responsibility. There is no recirculation of water within the CVP Service Area. Drainage in the CVP Service Area is minimal.

2.2.1.4 Restrictions on Deliveries

When the demand for water deliveries exceeds the capability of the District's system or the supply of water available, the Manager prorates water according to the limits of the system. The general cropping preference is set by the Manager with the approval of the Board of Directors in the manner most likely to minimize overall detriment that may result from the District's inability to serve water in the order requested.

2.2.2 Water Delivery Measurements

Per the rules and regulations of BBID (Appendix D), the unit of measurement the District uses when delivering water is cubic foot per second (cfs). The unit for charging customers is volumetric in acre-feet (AF). Water is delivered to consumers only through measuring devices approved and installed by the District. The price charged for water is set by the Board of Directors before the beginning of each irrigation season and may be modified if necessary.

BBID is committed to the accurate measurement of all customer deliveries as a basis for sound water management and appropriate billing to its customers. BBID purchases, installs, and maintains meters for each of the 315 customer turnouts, which serve 110 agricultural customers and 12 municipal and industrial (M&I) customers. Typically, BBID uses McCrometer strap-on electronic meters and in-line propeller meters, and inspects the meters annually. On a regular rotating basis, BBID sends meters to the McCrometer factory for calibration. The most prominent meter model employed by BBID is the McCrometer Strap-On Electronic Low Pressure Meter. Factory specifications for this meter model are in Appendix E with the most recent certification for factory inspection and calibration as performed by the factory.

2.2.3 Water Rate Schedules and Billing

Water rates and terms are established annually by the Board of Directors prior to the start of the irrigation season. Appendix F contains the 2017 Water Rate Charge Resolution. Payment for water delivered is due and payable 30 days after completion of irrigation.

The rates and terms of payment for water for special acreage, low-volume usage, municipal, commercial, or industrial purposes are determined by the Board of Directors from time to time in instances where use is permitted via Board order or contract.

2.2.4 Drought Management Plans and Water Shortage Allocation Policies

2.2.4.1 Background

Key guiding principles of this Drought Management Plan are the overall mission of BBID, and consider the nature of its water supplies.

BBID is committed to providing reliable water supply and water-related services in an environmentally sound and cost-effective manner. The District shall endeavor to undertake the following:

- Protect, preserve, and enhance District's historically acquired pre-1914 appropriative water rights together with managing the District's groundwater resources basin-wide, in cooperation with other water agencies.
- Provide District consumers and landowners with an efficient raw water distribution system.
- Encourage conservation and prudent management of water resources.
- Provide a safe working environment for all District employees and associated personnel.
- Foster a positive working relationship with all agricultural, municipal and industrial consumers, landowners, and other agencies.

BBID's pre-1914 water supply as diverted from the intake channel of the Banks Pumping Plant is a highly reliable water supply to the Byron Division, Bethany Division, RWSA 1 and ultimately RWSA 2. This supply is also operated per the 2003 *Agreement Between the Department of Water Resources of the State of California and the Byron-Bethany Irrigation District regarding the Diversion of Water from the Delta* (Agreement) (DWR and BBID, 2003), which limits rate of the diversion to 300 cfs and annual diversion to 50,000 AF, annually. Historically, there has never been a shortage in this supply until a curtailment notice was issued by the State Water Resources Control Board (SWRCB) in 2015 during California's five-year drought. The supply for BBID's CVP Service Area is primarily CVP contract water, which is subject to allocations by Reclamation. These allocations depend on hydrologic conditions and reservoir storage in the CVP system. CVP deliveries are also affected by operations at the CVP Jones Pumping Plant, which is governed by fish protection regulations. The District as a whole has limited groundwater resources available for any of its customers. This Drought Management Plan is in response to the extreme conditions of 2015; the District will continue to develop and refine this plan.

2.2.4.2 Drought Response and Water Shortage Policy

BBID is proactive in communicating with its customers regarding water supply. Under extreme hydrologic conditions and regulatory considerations, BBID Board can consider declaring a water shortage emergency per CWC §350. In April 2015, the Board adopted a resolution declaring a water shortage emergency and directed staff to address the water shortage.

The 2015 water shortage provided a template for future drought response. The following actions were taken in 2015, and would be expected to be taken under similar future extreme dry conditions:

- Initiate actions to confirm whether curtailments issued by the SWRCB are appropriate and legal.
- In the Byron and Bethany divisions, work cooperatively with landowners with groundwater wells to pump into service canals and laterals.
- Actively pursue short-term water transfers to keep high-value crops alive.
- In the CVP Service Area, use more groundwater to keep orchards alive.
- Work cooperatively with the MHCSD (in the RWSA 1) to convey non-BBID sources of water that the MHCSD is able to secure through short-term water transfer.
- Work collaboratively with San Luis and Delta Mendota Water Authority (SLDMWA) and other CVP contractors on the DMC pump back project to deliver water stored in San Luis Reservoir to users upstream of reservoir on the DMC.
- Per BBID allocation policy, the District could initiate water rationing (per BBID's *Rules and Regulations*, Appendix D) as follows: When the demand for water deliveries exceeds the capability of the District's system or the supply of water available, the Manager will prorate water according to the limits of the system. The general cropping preference will be set by the Manager with approval of the Board of Directors in the manner most likely to minimize overall detriment that may result from the District's inability to serve water in the areas requested.
- No out-of-District water would be provided; no construction water would be provided; run-off from agricultural fields would be disallowed and monitored.
- Hold additional public outreach meetings for growers and the general public, hold educational meetings to help growers work with reduced supplies, and develop informational newsletters or website content regarding drought conditions and the District's response. Inform the public about the severity of conditions and promote water conservation.

2.2.4.3 Long-Term Drought Planning Actions

BBID is a recognized steward of its water resources, working with growers, M&I customers, and regional partners to foster the beneficial use of water in a responsible manner. The conservation of water is key to long-term water supply reliability. On the demand side, BBID has supported growers' conversion to drip irrigation, and minimization of field runoff. On the BBID supply system side, BBID has implemented or planned for canal lining projects, canal to pipeline conversion projects, control structure automation projects, and a systemwide supervisory control and data acquisition (SCADA) system (as discussed later in Section 7). These improvements minimize spills, provide better service to users, and reduce the amount of water diverted. Together, these improvements enhance water supply reliability in all years, but are especially important during droughts.

In recognition of future drought potential, and BBID's commitment to providing a reliable water supply to its constituents, BBID is planning for and has developed numerous projects in the region to diversify its water supply portfolio during droughts. These projects include the following:

- Executing a construction and operating agreement for and intertie between Byron Division Canal 45 and the Contra Costa Water District (CCWD) Old River Pipeline to facilitate water transfers with CCWD and/or storage of BBID water in the Los Vaqueros Reservoir for later use in northern portions of the Byron Division.
- Participating with CCWD in the Los Vaqueros Reservoir Expansion Project to increase storage in the reservoir by 275 thousand acre-feet (TAF). The additional storage would increase water supply reliability, develop supplies for environmental water management and improve water quality. As a potential regional partner in the project, BBID could reserve 30 TAF in storage, and use 20 TAF in critical dry years, of which 10 TAF would be dedicated to RWSA 1 (MHCSD).
- Continuing to engage with regional water agencies for water transfer and regional water supply agreements.
- Continuing to study opportunities for regional or in-District groundwater use during times of surface water shortage, and actively participating in the recently formed groundwater sustainability agency (GSA). This includes further study of a conceptual plan to develop groundwater and surface water storage in abandoned gravel pits in the Byron Division area.
- Continuing to participate as a regional partner in the City of Tracy's ongoing recycled water conceptual studies to make beneficial use of the City's wastewater treatment plant effluent.
- Continuing refinement of this Drought Management Plan.

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Description of Quantity of Water Uses of the Agricultural Water Supplier

EO B-29-15 requires quantification of water supplies and demands for 2013, 2014, and 2015. The same time period was used to report the quantity of water uses in this section. The years 2013 to 2015 are all classified as critical water year types, according to the San Joaquin Valley Water Year Type Index.

3.1 Agricultural Water Use

3.1.1 Byron and Bethany Divisions

Within the Byron and Bethany divisions, there are approximately 6,600 active irrigated acres and 10,500 potential irrigable acres. Historically, BBID has relied on surface water to meet agricultural demands. Table 3-1 shows surface water deliveries from 2013 to 2015. At the peak of the 2012 to 2016 California drought in 2015, BBID's surface water supply was curtailed by the SWRCB, as reflected in the surface water deliveries. To meet customer demand, BBID used groundwater pumping and water transfers.

Table 3-1. Byron and Bethany Division Agricultural Water Use, 2013 to 2015
BBID Agricultural Water Management Plan

Source	2013 Use (AF)	2014 Use (AF)	2015 Use (AF)
Surface Water (Pre-1914 Rights)	21,001	20,700	15,911
Groundwater	0	0	510
Totals	**21,001**	**20,700**	**16,421**

Table 3-2 shows the agricultural crop water demand data for 2013 to 2015. Typically, BBID delivers water to agricultural customers from March to November. In 2013 and 2015, water was delivered from February to November. In 2014, water was delivered year-round to meet water demands.

Table 3-2. Byron and Bethany Divisions Agricultural Crop Water Demand Data for 2013 to 2015
BBID Agricultural Water Management Plan

Crop Type	2013		2014		2015	
	Area (acres)	ET (AF)	Area (acres)	ET (AF)	Area (acres)	ET (AF)
Alfalfa	1,308	4,890	1,516	5,613	1,325	4,963
Field Crops	1,958	6,207	1,499	4,704	1,133	3,630
Grain	322	1,031	252	806	87	284
Orchards	554	3,702	1,040	3,795	1,056	791
Pasture	571	864	333	4,295	359	4,295
Truck Crops	1,135	3,716	994	3,607	955	1,559
Vineyards	755	1,559	735	1,501	746	1,544
Totals	**6,603**	**21,970**	**6,369**	**24,321**	**5,662**	**17,065**

Irrigation methods used in the District are shown in Table 3-3 below. Drip and micro-spray methods are used to irrigate approximately 50% of the District.

Table 3-3. Irrigation Methods in BBID
BBID Agricultural Water Management Plan

Irrigation Method	Average Acreage Irrigated	Percent Acreage Irrigated
Drip and micro-spray	3,100	50
Flood	2,460	39
Sprinkler	678	11

3.1.2 Central Valley Project Service Area

The CVP Service Area includes approximately 3,450 irrigated acres and 5,550 standby acres. The irrigated area fluctuates with the variable CVP Service Area water supply.

Table 3-4 shows the CVP Service Area agricultural crop water use data for 2013, 2014, and 2015.

Table 3-4. CVP Service Area Agricultural Crop Water Demand Data for 2013 to 2015
BBID Agricultural Water Management Plan

Crop Type	2013		2014		2015	
	Area (acres)	ET (AF)	Area (acres)	ET (AF)	Area (acres)	ET (AF)
Alfalfa	-	-	-	-	-	-
Grain	89	284	89	284	89	291
Orchards	1,419	5,099	1,419	5,048	1,187	4,263
Pasture	184	442	184	437	24	57
Truck Crops	226	855	226	845	293	1,106
Vineyards	-	-	-	-	-	-
Totals	**2,054**	**6,986**	**1,917**	**6,615**	**1,592**	**5,718**

3.2 Environmental Water Use

BBID does not provide water for environmental uses.

3.3 Recreational Water Use

BBID does not provide water for recreational uses.

3.4 Municipal and Industrial Use

The Byron-Bethany Divisions currently serves three M&I customers: G3 Enterprises, Mariposa Energy LLC, and MHCSD. Table 3-6 lists the deliveries made to M&I customers in the Byron Division as well as RWSA 1, which supplies MHCSD. Though not reflected in Table 3-6 as a current water use, it is important to note that BBID is committed to deliver a portion of its pre-1914 water supply to the Tracy Hills development (RWSA 2) in the City of Tracy once developed. BBID has water supply and exchange agreements in place with the City and Reclamation, as well as infrastructure to convey this supply.

As depicted in Table 3-5, BBID typically supplies over 3,000 AF of raw water annually for M&I purposes, which makes BBID an urban water supplier. As such, BBID is required to adopt an Urban Water Management Plan (UWMP). BBID has chosen to adopt by resolution the UWMP of its M&I customers (i.e., MHCSD and City of Tracy). The BBID resolution is provided as Appendix G.

Table 3-5. Byron Division and RWSA 1 Municipal and Industrial Water Uses, 2013 to 2015
BBID Agricultural Water Management Plan

M&I Entity	2013 M&I Water Use (AF)	2014 M&I Water Use (AF)	2015 M&I Water Use (AF)
G3 Enterprises	131	432	468
Mariposa Energy, LLC	62	110	44
MHCSD (RWSA 1)	3,669	2,783	2,367
Construction Water	6	5	58
Total	**3,868**	**3,330**	**2,937**

BBID's CVP Service Area serves five M&I customers: Patterson Pass Business Park, Baselite Concrete, GWF Energy, and Musco Family Olive. In addition, the CVP Service Area sold 38 AF of water for construction in the area. Table 3-6 lists the deliveries made to M&I customers in the CVP Service Area.

Table 3-6. CVP Service Area Municipal and Industrial (M&I) Water Uses, 2013 to 2015
BBID Agricultural Water Management Plan

M&I Entity	2013 (AF)	2014 M&I (AF)	2015 M&I (AF)
Patterson Pass Business Park	210	454	320
Baselite Concrete	31	11	12
GWF Energy	34	25	35
Musco Family Olive	531	458	392
Construction Water			38
Total	**806**	**948**	**797**

3.5 Groundwater Recharge Use

There is no water used directly for groundwater recharge in BBID.

3.6 Transfer and Exchange Use

The District has historically participated in water transfers and/or exchanges with willing buyers/sellers, typically with entities in the vicinity. In BBID, no transfers or exchanges outside of the District occurred from 2013 to 2015.

Table 3-7 shows the transfers out of the CVP Service Area from 2013 to 2015. The transfers also include water from the storage in San Luis Reservoir.

Table 3-7. CVP Service Area Transfer Use
BBID Agricultural Water Management Plan

	2013 (AF)	2014 (AF)	2015 (AF)
Transfers	476	1,922	0

SECTION 4

Quantity and Quality of Water Resources

4.1 Water Supply Quantity

4.1.1 Surface Water Supply

BBID's water right on Italian Slough is based on a Notice of Appropriation for water by the Byron-Bethany Irrigation Company recorded on May 27, 1914 in the amount of 40,000 miner's inches (Hill, 1964). In 2003, BBID and DWR executed their Agreement. According to the Agreement, BBID may divert up to 50,000 AF for beneficial use within the Byron and Bethany divisions, RWSA 1, and RWSA 2 at a maximum rate of 300 cfs. Total diversions from the intake channel at the Harvey O. Banks Pumping Plant may not exceed 50,000 AF (DWR, 2003).

The Byron and Bethany divisions and the RWSA 1 portion of the District's water supply is based on pre-1914 water rights that were established by the Byron-Bethany Irrigation Company. In 1921, the District acquired the Company's irrigation facilities and water rights. The District asserts claims under this pre-1914 water right for reasonable and beneficial use of 60,000 AF. In exchange for operational certainty, the District has agreed to limit their annual diversion from the Delta to 50,000 AF through their Agreement with DWR.

The remaining District water supply is CVP water for use in the CVP Service Area (formerly known as the PVWD). The PVWD was formed in 1951 to contract a Class 1 surface water supply from the CVP. When BBID merged with PVWD in 2004, BBID obtained the CVP Class 1 Contracts. From 2012 to 2016, the CVP Class 1 Contract allocations ranged from 40% in the 2012-13 water year to 0% in the 2014-15 and 2015-16 water years. Through Warren Act contracts 15-WC-20-4382 and 15-WC-20-4657, which BBID holds with Reclamation, BBID also has non-CVP Project water in CVP facilities, including the DMC and San Luis Reservoir. The CVP Service Area uses San Luis Reservoir as a water storage banking facility. This water supply is shown in the water supplies listed in Table 4-1; this table also lists surface water supplies for the Byron and Bethany divisions, and the CVP Service Area.

Table 4-1. BBID Surface Water Supplies
BBID Agricultural Water Management Plan

Source	2013 Supply (AF)	2014 Supply (AF)	2015 Supply (AF)
Total Surface Water, CVP Service Area	1,118	928	247
Pre-1914 Rights, Byron and Bethany Divisions, and RWSA 1 and RWSA 2	29,241	30,325	18,625

4.1.2 Groundwater Supply

For the first time in its operational history, BBID's surface water supply was curtailed in 2015. To augment the shortage in surface water supplies throughout the growing season, groundwater was pumped from growers' wells into the canals to deliver water to customers downstream. The quantity of the water pumped depended on the hydrological conditions and the crop water demand.

Table 4-2 summarizes the groundwater pumped in 2015. Throughout the District, private pumping occurs, and the District does not keep records of the quantity of privately pumped water. The Byron and Bethany division landowners have predominantly relied on surface water allocation, and groundwater

use has been minimal. The CVP Service Area is served by groundwater under the Warren Act contract 13-WC-20-4382.

Table 4-2. Groundwater Supply Delivered in BBID, 2013 to 2015
BBID Agricultural Water Management Plan

Year	Byron and Bethany Divisions (AF)	CVP Service Area (AF)
2013	0	1,064
2014	0	1,534
2015	510	731

In March 2017, BBID became a GSA for a portion of the Tracy Subbasin. As a GSA, BBID will work cooperatively with surrounding agencies, cities, and counties to manage groundwater resources in a responsible, sustainable manner.

4.1.3 Other Water Supplies: Transfers

During the 2015 water curtailment, the District had to vigorously seek out other water sources to be able to provide its growers enough water to survive the drought. The following is a summary of the District's failed efforts in 2015 to obtain additional water supply:

- In May 2015, BBID and DWR unsuccessfully conducted negotiations intended to provide BBID additional water to BBID in 2015.
- In June 2015, BBID and the Zone 7 Water Agency attempted to enter into two separate water transfers to provide additional water to BBID in 2015, but DWR was uncooperative with both efforts.
- Also in or about June 2015, BBID attempted to purchase Yuba River water, but the sale required approval by the State Water Contractors, and they rejected the sale.
- BBID attempted to create a 25% voluntary reduction program whereby BBID would reduce diversions prior to curtailments early in the 2015 irrigation season in exchange for assurance of no curtailments late in the season, but the SWRCB rejected the proposal.
- BBID attempted to appropriate wastewater discharge from both the Mountain House Community Services District and the Sacramento Regional County Sanitation District, but the SWRCB rejected these efforts.

After the rejection of above supply proposals, two additional water supplies were identified and approved. The Carmichael Water District agreed to supply approximately 3 TAF to the District. The Contra Costa Water District agreed to transfer 500 AF to the District. Table 4-3 shows the actual transfers made into the Byron and Bethany divisions in 2015.

Table 4-3. Water Supply from Transfers into the Byron and Bethany Divisions, 2015
BBID Agricultural Water Management Plan

Transfer Entity	Amount (AF)
Carmichael Water District	1,724
Contra Costa Water District	500

Table 4-4 shows the water supply from transfers into the CVP Service Area from 2013 to 2015.

Table 4-4. Water Supply from Transfers into the CVP Service Area, 2013 to 2015
BBID Agricultural Water Management Plan

	2013 (AF)	2014 (AF)	2015 (AF)
Transfers	989	2,305	430

4.1.4 Drainage from the Water Supplier's Service Area

The BBID district does not monitor the amount of water draining out from District boundaries. BBID does not currently deliberately recycle drainwater back into the supply delivery system, though some quantities of surface water drainage from fields served by Canal 155 drain into Canal 120 in the Bethany Division. This use of drainwater is considered negligible for the water balance analysis.

In the CVP Service Area, drainage is negligible because of the prevalence of drip and micro-spray irrigation in the area.

4.2 Water Supply Quality

BBID is primarily a surface water user, diverting its pre-1914 high quality water from the intake channel of the State Water Project Banks Pumping Plant to supply its users. The following sections discuss the water supply used by BBID, and give information about its quality and monitoring programs implemented at BBID.

4.2.1 Surface Water Supply

BBID diverts surface water directly from the intake channel of the California Aqueduct. This high-quality water source is monitored by DWR at the Banks Pumping Plant; extensive water quality information is available at DWR's California Data Exchange Center (CDEC) website (DWR, 2017; sites HRO and HBP). Table 4-4 displays recent water quality information from DWR at the Banks Pumping Plant. Water quality constituents that impact agricultural and urban uses are low to negligible from this water source, and there are no constraints to its use.

Table 4-4. BBID Pre-1914 Source Water Supply Quality

Parameter	Units	2016 Average (min, max)
pH	-	7.86 (7.52, 8.17)
EC	uS/cm	458 (295, 655)
Dissolved Br	mg/L	0.253 (0.060, 0.0563)
Dissolved Cl	mg/L	73.89 (29.33, 151.00)
Dissolved NO3	mg/L	1.99 (0.00, 6.89)
Dissolved SO4	mg/L	26.84 (11.11, 56.95)
		2014-2015 Average (min, max; 2016 not available)
Turbidity	NTU	7.25 (3.53, 16.39)

Surface water is diverted from the DMC for use in the CVP Service Area. This water source is monitored by DWR at the Jones Pumping Plant (site TRP), and by Reclamation at the DMC headworks (site DMC); water quality information is available at the CDEC website (DWR, 2017). Table 4-5 displays available water quality information for 2016 from DWR and Reclamation at these sites.

Table 4-5. BBID CVP Source Water Supply Quality

Parameter	Units	2016 Average (min, max)
EC*	uS/cm	433 (259, 681)
Dissolved Br	mg/L	0.261 (0.060, 0.813)
Dissolved Cl	mg/L	76.48 (23.43, 161.65)
Dissolved NO3	mg/L	2.67 (0.02, 16.67)
Dissolved SO4	mg/L	36.05 (9.01, 128.98)

*EC from site DMC; rest of the parameters from site TRP.

4.2.2 Groundwater Supply

BBID's primary sources of water are surface water based on highly reliable pre-1914 water rights and contracted CVP water through Reclamation. In general, sources of groundwater within the boundaries of BBID have historically been of poor quality and/or quantity. In the midst of California's historic drought of 2012 to 2016, BBID landowners used relatively small amounts of groundwater in 2015 to keep high value crops alive in response to curtailment orders issued by the SWRCB.

4.2.3 Other Water Supplies

BBID transferred water in from cooperating water agencies to address water supply curtailments during the 2015 irrigation season. From a physical standpoint, the transferred water is the same source (i.e., Delta water was diverted from the intake channel for Banks Pumping Plant) as BBID's pre-1914 water supply; no special water quality sampling was necessary.

4.2.4 Drainage from the Water Supplier's Service Area

In the Byron and Bethany divisions, BBID collects drainwater in a drainage conveyance system; however, under current and recent conditions, no drainwater is recycled to meet BBID water demands. In the CVP Service Area, about 60% of surface drainage is recirculated by water users' privately installed return flow systems.

4.3 Water Quality Monitoring Practices

4.3.1 Source Water

Surface water quality is monitored in conjunction with an aquatic pesticide monitoring program. BBID maintains coverage for its applications of acrolein and endothall herbicides under the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Aquatic Pesticides. Under the BBID monitoring program, source water quality is determined before applying weed control herbicides into the supply canals to ensure quality as the water flows into the BBID system.

Post herbicide application, water from the supply canals is sampled to ensure complete dispersion of the herbicide. BBID-measured source water quality results, taken during aquatic herbicide monitoring, are displayed in Table 4-5.

Table 4-5. BBID Monitored Average Water Quality

Parameter	Units	2016 Average (min, max)*
pH	-	8.03 (7.36, 9.06)
Conductivity	uS/cm	349 (243, 681)
DO	mg/L	7.50 (5.87, 10.18)

*BBID aquatic pesticide monitoring season ran from April to September in 2016.

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SECTION 5

Water Accounting and Water Supply Reliability

5.1 Water Supplies

5.1.1 Agricultural Water Supplier Water Quantities

5.1.1.1 Byron and Bethany Divisions

BBID's Byron and Bethany divisions agricultural water deliveries typically occur from March to November. During 2013 and 2015, deliveries occurred from February to November. In 2014, deliveries occurred year-round. Tables 5-1 to 5-3 summarize the annual diversions from 2013 to 2015. The water years 2013 to 2015 are all classified as critical years according to the CDEC (source: http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST).

Table 5-1. 2013 Byron and Bethany Divisions Surface Water Supply Quantities
BBID Agricultural Water Management Plan

Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Pre-1914 Rights	104	583	3,160	2,895	4,492	4,686	4,286	4,295	2,659	1,574	389	117	
Transfers & Exchanges	-	-	-	-	-	-	-	-	-	-	-	-	
Total	**104**	**583**	**3,160**	**2,895**	**4,492**	**4,686**	**4,286**	**4,295**	**2,659**	**1,574**	**389**	**117**	**29,241**

Table 5-2. 2014 Byron and Bethany Divisions Surface Water Supply Quantities
BBID Agricultural Water Management Plan

Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Pre-1914 Rights	2,301	921	2,005	2,848	4,298	4,842	4,017	2,871	2,792	2,657	612	160	
Transfers & Exchanges	0	0	0	0	0	0	0	0	0	0	0	0	
Total	**2,301**	**921**	**2,005**	**2,848**	**4,298**	**4,842**	**4,017**	**2,871**	**2,792**	**2,657**	**612**	**160**	**30,325**

Table 5-3. 2015 Byron and Bethany Divisions Surface Water Supply Quantities
BBID Agricultural Water Management Plan

Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Pre-1914 Rights	202	559	2,588	3,413	3,860	3,903	1,625	0	1,455	1,261	162	127	
Transfers & Exchanges	0	0	0	0	0	497	544	727	455	0	0	0	
Total	**202**	**559**	**2,588**	**3,413**	**3,860**	**4,401**	**1,898**	**727**	**1,743**	**1,261**	**162**	**127**	**20,942**

5.1.1.2 CVP Service Area

BBID's CVP Service Area agricultural water deliveries typically occur from March to November. Each water year runs from March to February. For the purposes of this AWMP, these water years have been adjusted to calendar years (i.e., January to December). Table 5-4 summarizes the annual diversions from 2013 to 2015. The water years 2013 to 2015 are all classified as critical years.

Table 5-4. CVP Service Area Surface Water Supply Quantities, 2013 to 2015
BBID Agricultural Water Management Plan

Source	2013 Supply (AF)	2014 Supply (AF)	2015 Supply (AF)
Total Surface Water, CVP Service Area	1,355	928	247
Transfers	989	2,305	430
Total	**2,344**	**3,233**	**677**

5.1.2 Other Water Sources Quantities

5.1.2.1 Byron and Bethany Divisions

In 2015, the drought and water supply curtailment necessitated the use of limited groundwater resources to satisfy irrigation needs. Throughout BBID, groundwater was pumped and distributed to meet a portion of agricultural demand. Table 5-5 summarizes the groundwater supplied for the year 2015 and an estimate of private pumping for each year to meet crop water demands. This use of groundwater is not planned to be sustained in coming years.

Table 5-5. Byron and Bethany Divisions Groundwater Supply Quantities, 2013 to 2015
BBID Agricultural Water Management Plan

Source	2013	2014	2015
BBID Distributed Groundwater	0	0	510
Byron and Bethany Divisions Private Pumping Estimate	0	0	0
Total	**0**	**0**	**510**

The effective precipitation for the Byron and Bethany Divisions is shown in Table 5-6.

Table 5-6. Byron and Bethany Divisions Effective Precipitation, 2013 to 2015
BBID Agricultural Water Management Plan

Month	2013 (AF)	2014 (AF)	2015 (AF)	Average (AF)
January	571	225	242	346
February	598	1,213	545	785
March	226	330	127	228
April	307	395	233	311
May	35	97	159	97
June	37	45	53	45
July	0	0	0	0
August	2	10	16	9
September	94	79	32	68
October	66	152	67	95
November	635	775	738	716
December	1,342	2,517	795	1,551
Total	**3,912**	**5,838**	**3,008**	

Source: NCDC "Tracy Pumping Plant" station precipitation data (http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca9001)

5.1.2.2 CVP Service Area

In 2015, the drought and water supply curtailment necessitated the use of limited groundwater resources to satisfy irrigation needs. Throughout BBID, groundwater was pumped and distributed to meet a portion of agricultural demand. Table 5-7 summarizes the CVP Service Area groundwater distributed in 2015 and an estimate of private pumping for each year to meet crop water demands. The CVP Service Area landowners have deep wells on their property that they operate as required to meet crop demands, depending on the CVP surface supply allocation.

Table 5-7. CVP Service Area Groundwater Supply Quantities, 2013 to 2015
BBID Agricultural Water Management Plan

Source	2013	2014	2015
13-WC-20-4382	1,064	1,534	731
CVP Service Area Private Pumping Estimate	3,100	1,000	1,000
Total	**3,164**	**2,534**	**1,731**

The effective precipitation for the CVP Service Area is shown in Table 5-8.

Table 5-8. CVP Service Area Effective Precipitation, 2013 to 2015
BBID Agricultural Water Management Plan

Month	2013 (AF)	2014 (AF)	2015 (AF)	Average (AF)
January	233	40	3	97
February	35	444	210	230
March	37	128	33	67
April	69	128	69	90
May	8	0	73	27
June	11	6	20	13
July	0	0	0	0
August	0	0	8	3
September	27	30	0	20
October	0	56	28	28
November	177	165	259	204
December	86	1,026	257	459
Total	684	2,023	959	

Source: NCDC "Tracy Pumping Plant" station precipitation data (http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca9001)

5.2 Quantification of Water Uses

5.2.1 Byron and Bethany Divisions and RWSA 1

Table 5-9 quantifies the amount of water used for each water use, including agricultural water, M&I water, and construction water. BBID does not allocate water for groundwater recharge; however, the current cropping practices allow for a significant amount of groundwater recharge, as shown in Table 5-3.

Table 5-9. Byron and Bethany Divisions and RWSA 1 Quantify Water Use, 2013 to 2015
BBID Agricultural Water Management Plan

Water Use	2013 (AF)	2014 (AF)	2015 (AF)
Crop Water Use			
Crop Evapotranspiration	21,970	24,321	17,065
Conveyance and Storage System			
Conveyance seepage	896	896	896
Conveyance evaporation	109	109	109
Environmental Use	0	0	0
Municipal and Industrial	3,868	3,330	2,937
Transfers or Exchanges out of the service area	0	0	0
Subtotal	**26,842**	**28,656**	**21,007**

5.2.2 CVP Service Area

Table 5-10 quantifies the amount of water used for each water use, including agricultural water, M&I water, and construction water.

Table 5-10. CVP Service Area Quantify Water Use, 2013 to 2015
BBID Agricultural Water Management Plan

Water Use	2013 (AF)	2014 (AF)	2015 (AF)
Crop Water Use			
Crop Evapotranspiration	6,680	6,615	5,718
Conveyance & Storage System			
Environmental Use	0	0	0
Municipal and Industrial	998	947	858
Transfers or Exchanges out of the service area	476	1,922	0
Subtotal	**8,460**	**9,484**	**6,576**

5.3 Overall Water Balance

5.3.1 Byron and Bethany Divisions

Table 5-11 summarizes the Byron and Bethany divisions' water supplied for 2013 to 2015. The water supplies include the District's pre-1914 water supply, groundwater distributed by BBID, an estimate of privately pumped groundwater, annual effective precipitation, and water purchased from other districts. Figure 5-1 shows a conceptual water balance model schematic.

Table 5-11. Byron and Bethany Divisions Quantification of Water Supplies
BBID Agricultural Water Management Plan

Water Supplies	2013 (AF)	2014 (AF)	2015 (AF)
Surface Water (Pre-1914 Supply)	29,241	30,325	18,718
Groundwater	0	0	510
Annual Effective Precipitation	3,912	5,838	3,008
Water purchases	0	0	2,224
Subtotal	**33,153**	**36,164**	**24,460**

Table 5-12 shows the Byron and Bethany divisions water balance summary for 2013 to 2015. The closure term represents deep percolation to groundwater, conveyance losses, errors in measurement and recordings, unaccounted drain water, and any errors in assumptions used in the water use calculations (effective precipitation and ET).

Table 5-12. Byron and Bethany Divisions Water Balance Summary
BBID Agricultural Water Management Plan

Water Accounting	2013 (AF)	2014 (AF)	2015 (AF)
Subtotal of Water Supplies	33,153	36,164	24,367
Subtotal of Water Uses	26,842	28,656	21,007
Closure Term	6,311	7,507	3,360

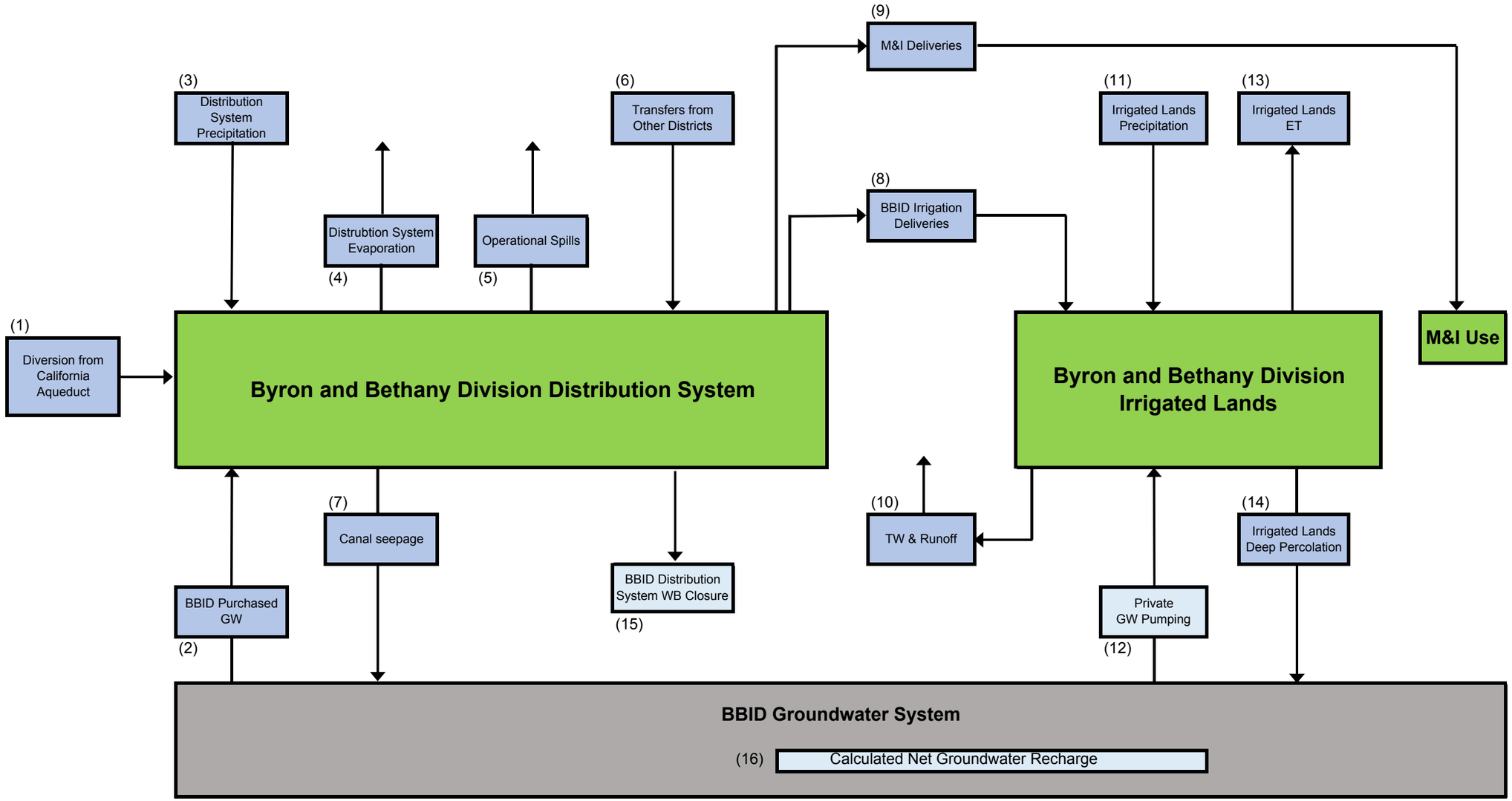

FIGURE 5-1
Byron and Bethany Divisions Water Balance Model Schematic
Agricultural Water Management Plan
Byron Bethany Irrigation District

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5.3.2 CVP Service Area

Table 5-13 summarizes the CVP Service Area's water supplied for 2013 to 2015. The water supplies include the District's CVP contract water supply, groundwater distributed by BBID, an estimate of privately pumped groundwater, annual effective precipitation, and water purchased from other districts.

Table 5-13. CVP Service Area Quantification of Water Supplies
BBID Agricultural Water Management Plan

Water Supplies	2013 (AF)	2014 (AF)	2015 (AF)
Surface Water (CVP Supply)	2,344	4,756	3,704
Groundwater[a]	4,604	2,580	1,731
Annual Effective Precipitation	684	2,023	959
Transfers	989	2,305	430
Subtotal	**8,081**	**11,664**	**6,824**

Table 5-14 shows the CVP Service Area water balance summary for 2013 to 2015. The closure term represents deep percolation to groundwater, conveyance losses, errors in measurement and recordings, unaccounted drain water, and any errors in assumptions used in the water use calculations (effective precipitation and ET).

Table 5-14. CVP Service Area Water Balance Summary
BBID Agricultural Water Management Plan

Water Accounting	2013 (AF)	2014 (AF)	2015 (AF)
Subtotal of Water Supplies	8,181	11,664	6,824
Subtotal of Water Uses	8,154	9,484	6,576
Closure Term	24	2,180	248

5.4 Water Supply Reliability

Water supply reliability can be a function of source, hydrologic conditions, regulatory constraints, and conveyance infrastructure. These factors are considered for the two primary sources of water for BBID: pre-1914 water rights and CVP supply. This section also address measures to address reliability.

As discussed previously, the Byron and Bethany Divisions and RWSA 1 are nearly completely served by its pre-1914 water supply. The District asserts claims under this pre-1914 water right for reasonable and beneficial use of 60,000 AF. In exchange for operational certainty, the District has agreed to limit their annual diversion from the Delta to 50,000 AF through agreement with DWR. Prior to 2015, this supply was considered 100% reliable; there were no curtailments of this supply in the history of BBID. This is due to the seniority of the water rights, the geographic location of the BBID place of diversion at the extreme downstream end of the San Joaquin River basin, and the physical location on the State Water Project intake channel to the Banks Pumping Plant downstream of fish protection facilities. For the first time in its history, a curtailment notice was issued by the SWRCB for BBID diversion of water in 2015.

Ultimately, the SWRCB issued an Administrative Civil Liability (ACL) Complaint against BBID alleging BBID engaged in unauthorized diversions of water, and therefore, committed a trespass under Water Code section 1052 BBID vigorously defended against this ACL Complaint, and on the third day of the hearing before the SWRCB, BBID moved to dismiss the ACL Complaint on the grounds that the prosecution team failed to meet its burden of proof. The SWRCB sustained BBID's motion, and the ACL was dismissed.

Furthermore, a month before the SWRCB issued the ACL Complaint, BBID filed a civil action against the SWRCB alleging that the 2015 curtailment notice violated, among other things, BBID's due process rights. This action was originally filed in Contra Costa County Superior Court, but was subsequently consolidated in Santa Clara County Superior Court with similar actions filed by other districts. Those cases are currently pending before that Court.

Given the recent regulatory events pertaining to BBID's pre-1914 supply, a detailed reliability analysis is not available, though this pre-1914 water supply remains a highly reliable source of water for BBID.

BBID's CVP Service Area relies on a water service contract for CVP water as provided by Reclamation via the DMC, which is subject to annual allocations (i.e., a percentage of the contract). The CVP allocation is a function of current hydrologic conditions (e.g., snowpack, stream flows, reservoir storage) and regulatory constraints for Delta water quality and protection of endangered fish species. The long-term reliability of CVP water has declined significantly in recent decades due to changing regulatory and environmental operational constraints. Given current operational parameters (i.e., since court decisions and biological opinions published from 2007 to 2009) and the recent hydrologic record, the CVP supply south-of-Delta agricultural allocations have averaged 35%, and has ranged from 0% in dry years to 100% in wet years for agricultural service contracts (source: Reclamation, https://www.usbr.gov/mp/cvo/).

BBID used several measures to get through the 2015 water year to address supply reliability to minimize economic losses due to crop losses. BBID worked with the SLDMWA for an emergency pump back project on the DMC, which used banked water in San Luis Reservoir for several water agencies, including BBID. Additionally, BBID worked collaboratively with landowners to pump groundwater into the BBID conveyance system, CVP water users pumped private groundwater wells, and BBID transferred water in from willing sellers to address water shortages. These examples of drought mitigation measures were employed in 2015 and are available options for use during curtailments of pre-1914 water supply or reductions in the CVP allocations in the future.

Regarding physical infrastructure, BBID has implemented a significant CIP in the last decade and has upgraded numerous facilities to address new M&I customers to ensure that water is reliably conveyed to these customers. Due to pumping plant upgrades, replacement of aging pipelines and control structures, and installation of a modern SCADA system, the risk of infrastructure failure impacting water supply reliability is relatively small. To address the risk of pump failures, each pump station has redundant pumps, and diesel-fueled emergency power sources. BBID also has resources to install temporary pipelines and/or pumps to address system failures to deliver water to customers.

Looking toward the future, BBID has partnered with the Contra Costa Water District on the Los Vaqueros Reservoir Expansion Project. This project will give BBID the ability to obtain additional water supply during critically dry years, during fall supply in dry months, and to have reserved storage in Los Vaqueros Reservoir. Over the past decade, BBID has taken steps to facilitate future water use from Los Vaqueros Reservoir via infrastructure projects and improvements. The District looks forward to having an even more reliable water supply and the opportunity for water storage due to the Los Vaqueros Reservoir Expansion Project.

SECTION 6

Climate Change

Changes in climate will continue to have an impact on water supply and demand throughout California. Although BBID is well positioned from an infrastructure and source water supply standpoint, local water availability could change as supply decreases in volume and/or timing and demand increases in the Central Valley and beyond. This section discusses potential effects of climate change on BBID's water supply, including volume and quality; and demand from its users.

The local climate snapshot tool and local annual averages charts available at Cal-Adapt were used to gain insight into potential future changes to the BBID area due to climate change (Cal-Adapt, 2017a; Cal-Adapt, 2017b). As is forecasted for most California, the area in the vicinity of BBID is expected to see an increase in maximum and minimum temperature, wildfire risk, and precipitation.

6.1 Effects of Climate Change on Water Supply

Several impacts to the BBID water supply may result from climate change, including changes in volume and timing of surface water production, and changing quality of water.

Spring snowmelt is a main source of high-quality water in the Delta. Snowmelt in the Sierra Nevada has declined in the last century, with more precipitation falling as rain instead of snow, and flowing directly into watersheds instead of being stored as snowpack, and slowly released as snowmelt (California Environmental Protection Agency [CalEPA] – Office of Environmental Health Hazard Assessment [OEHHA], 2013). This reduction in snowpack leads to a reduction in water released as snowmelt throughout the summer irrigation season. BBID does not have surface water storage to partially address the changing timing of precipitation to ensure adequate water supply during the peak time of use.

Water slowly released during the summer thaw season currently provides a constant source of high-quality water entering the surface water system. With less precipitation falling as snow, this source of high-quality water decreases, and surface water quality is likely to degrade. Climate changes have also yielded more severe weather events that can result in flooding and degradation of future water supply as fast-moving floodwaters erode and carry sediment downstream.

Sea-level rise is also a consideration for the long-term future water quality for BBID. Sea-level rise could lead to flooding of low-lying areas due to stress on Delta levees, and degradation of water quality due to seawater intrusion. Seawater intrusion could also impact surface water supplies by requiring releases of freshwater from reservoirs to repel the poorer quality saltwater moving eastward in the Delta (DWR, 2015b).

6.2 Effects of Climate Change on Water Demand

Demand for water will change as temperature and weather patterns change, and crop types could be shifted as a result. The following sections consider potential changes due to weather and temperature fluctuation, and subsequent cropping changes.

6.2.1 Changes as a Result of Weather and Temperature Fluctuation

The majority of a crop's evapotranspiration (ET) occurs during the warm summer months, when irrigation demand is high. An increase in temperatures during the summer will lead to an increase in plant ET, requiring more water needed to satisfy its needs.

In addition, if the quality of water decreases due to a decrease in snow melt or saltwater intrusion, additional irrigation water may be needed as a leaching fraction to carry salts outside of the root zone.

6.2.2 Changes as a Result of Crop Changes

Changing climate conditions may result in agricultural users changing crop types to more suitable varieties or to different crops entirely. Crop types may shift to those requiring a longer growing season, or farmers currently only growing one crop on their field may double-crop the fields to take advantage of the longer growing season. These scenarios coupled with more frequent and intense heat waves and intense but unpredictable rainfall events yield a need for increased irrigation demand.

In addition, the current warming trend has brought with it increasing winter temperatures, which result in a decrease in winter chill. Winter chill is important in fruit-growing regions, as many fruit trees require a certain number of hours below a temperature threshold to produce flowers and fruit (CalEPA – OEHHA, 2013). BBID currently provides water to growers of several types of fruit and nut trees (Table 3-2 and 3-4); the decrease in winter chill may result in replanting with low-chill fruit tree varieties, or removal of these crop types entirely.

6.3 Potential Actions and Responses to Changes

BBID has been proactive in determining potential solutions to changes in its surface water supply due to climate change. Monitoring of changes within the District and developing adaptations to these changes has been made a priority. Reductions in the supply conveyance system's inefficiencies and redundancies is underway as part of its ongoing CIP as the District looks to the future of water delivery. To reduce canal seepage canal lining projects and canal-to-pipeline conversions are a critical portion of the annual CIP to further stretch limited water supplies. Additionally, ongoing SCADA system upgrades are also a portion of the CIP to optimize the water supply conveyance system, which minimizes waste and reduces diversion while maintaining agricultural productivity. The District will continue to support grower initiatives to improve irrigation methods and on-farm technologies that will be a part of adoptive measures for climate change.

Water Use Efficiency Information

7.1 Efficient Water Management Practice Implementation and Reporting

According to the 2015 Guidebook, if certain EWMPs are not locally cost-effective or technically feasible, implementation is not required. The District, which provides water to 10,000 to 25,000 irrigated acres, is not required to implement EWMPs because funding was not provided to the District (California Code of Regulations §597.1.e). Critical and conditional EWMPs are presented below.

7.2 Critical Efficient Water Management Practices

7.2.1 Critical Efficient Water Management Practice 1, Water Measurement

Status: Implemented

Since 1965, the District has measured deliveries at each farm turnout with flowmeters, with an accuracy of ±2%. The turnout flowmeters are inspected on an annual basis. The flowmeters are also factory tested on a rotational schedule. At the intake channel diversions, BBID measures flow with Water Specialty brand propeller type meters for all pump discharge except the pump to RWSA 1, which is measured by a Magmeter flowmeter. The ±2% accuracy is certified on an annual basis for these devices. BBID maintains a database of customer turnout delivery data and aggregates by service area. BBID complies with the terms of its 2003 Agreement with DWR regarding the diversion of water from the Delta by providing daily records of diversions from the intake channel to DWR.

7.2.2 Critical Efficient Water Management Practice 2, Volumetric Pricing

Status: Implemented

Since 1965, the District has used volumetric pricing for agricultural water use. For all parcels greater than 2 acres, the District charges on a per AF basis. For parcels of 2 acres or less, there is an interruptible annual flat rate water service charge and there is no volumetric pricing. Parcels of 2 acres or less constitute less than 2% of all parcels served.

7.3 Conditional Efficient Water Management Practices

7.3.1 Conditional Efficient Water Management Practice 1, Facilitate Alternative Land Use

Status: Ongoing

According to CWC §10608.48 (c)(1), this EWMP is the facilitation of alternative land use for lands with exceptionally high water duties or whose irrigation contributes to drainage and other signification problems. As discussed Section 2.1.2, the majority of the District is prime farmland and is used for an agricultural purpose though some farmland has been developed for municipal uses (MHCSD) due to external drivers in the last 20 years. BBID addressed this change of land use within its Bethany Division and provides raw water to RWSA 1 (MHCSD; see Appendix G for the resolution regarding MHCSD and City of Tracy UWMP).

7.3.2 Conditional Efficient Water Management Practice 2, Facilitate Recycled Water Use

Status: Conceptual planning ongoing

In 2001, the District conducted a system-wide recycled water feasibility study to analyze the integration of recycled water supplies into BBID water resources. In 2009, a recycled water pipeline feasibility study was conducted to provide supply to the Mariposa Energy Project, though it was deemed economically infeasible. Through these efforts, the District has sought out the possibility of using recycled water and most internal opportunities were deemed to be economically infeasible. However, the District continues to pursue recycled water use with regional partners and will continue to do so. Currently, the District is engaged in preliminary studies with the City of Tracy and the West Side Irrigation District to potentially receive recycled water from the City of Tracy to diversify its water supply portfolio.

7.3.3 Conditional Efficient Water Management Practice 3, Facilitate On-Farm Irrigation System Capital Improvements

Status: Not implemented

BBID's priority is to provide water to its customers at the lowest cost. The District does not have the resources to finance on-farm irrigation system capital improvements though landowners continue to make on-farm irrigation efficiency improvements to increase yields.

7.3.4 Conditional Efficient Water Management Practice 4, Incentive Pricing Structure

Status: Implemented

The District uses volumetric pricing for water deliveries. No tiered pricing is planned due to the fact that current growers' have near maximum efficiencies and tiered pricing is not expected to yield greater water efficiency. Growers in the District are very efficient with their water: over 90% of the row crops are irrigated with drip irrigation. The majority of all farms in the District are on drip or micro-spray irrigation.

7.3.5 Conditional Efficient Water Management Practice 5, Infrastructure Improvements

Status: Implemented/Ongoing

According to CWC §10608.48 (c)(1), this EWMP includes expanding lined or pipe distribution systems, decreasing maintenance, and reducing seepage. The District's CIP includes several projects that will decrease maintenance and reduce seepage. The District is continually maintaining existing canal lining and installing new lining. Table 7-1 shows some of the completed, in progress, and future projects that will decrease maintenance and reduce seepage.

Table 7-1. BBID Seepage Reduction Projects
BBID Agricultural Water Management Plan

Project	Status
Canal 45 South Lining	Completed
Canal 120 Lined Portion	Completed
Canal 155 Lined Portion	Completed
Canal 45 North Lined Portion	Completed
Gate 14 Pipeline Replacement with Fused HDPE Pipe	Completed
Green Line Phases I-IV Pipeline Replacement and Canal Conversion to Pipe	Completed
H-Line Pipeline Replacement with Fused HDPE Pipe	Completed
Taylor Lane Culvert Replacement Project	Completed
Canal 45 North Canal Conversion to Pipe	In progress: design complete
R-Line Pipeline Replacement	In progress: design complete
Green A-Line and Green B-Line Pipe Replacement	In progress: design complete
Kellogg Creek-Canal 45 Radial Gate Replacement and Canal Lining	In progress: construction
12 Canal Lining and Lining Rehabilitation Projects	Future planned
13 Pipeline Replacement Projects	Future planned

7.3.6 Conditional Efficient Water Management Practice 6, Increase Order Flexibility

Status: Implemented/Ongoing

The District is using its CIP to increase order flexibility and decrease lead time for water orders. The District has SCADA system monitoring and control south of the Intake Channel (Bethany Division), using a mobile SCADA platform (tablet) that allows canal operators more flexibility with water orders from any location in the division by making real-time changes to canal flows. The District is currently developing a SCADA telemetry plan that will allow them to expand their SCADA capabilities in the Byron Division.

Another example of increased order flexibility (and efficiency) is the replacement of Pumping Station 5 in the Byron Division. The original pumping station required manual changes to flow and used an inefficient recirculation system to achieve lower flow rates. The new automated level control strategy allows water to be taken downstream without any input from canal operators or recirculation. The District has plans to replace Pumping Station 4 with the same level control strategy to further execute this EWMP.

7.3.7 Conditional Efficient Water Management Practice 7, Operational Outflow and Tailwater Recovery Systems

Status: Implemented

The District has approximately 7 miles of subsurface drain (Table 2-1). As discussed in this AWMP, growers in the District have high efficiencies and runoff is minimal. The District's operational outflows are kept to a minimum in the Byron and Bethany divisions. In the CVP Service Area, runoff is practically zero. The District does recapture drainage from lands served by Canal 155 and distributes drainage in Canal 120. The District continues to seek any opportunity to minimize operational spills and efficiently manage water deliveries throughout the District.

7.3.8 Conditional Efficient Water Management Practice 8, Conjunctive Use

Status: Conceptual planning ongoing

Opportunities for groundwater use and development are limited in the District. Historically, BBID has fully relied on surface water supplies. During the five-year drought in California, BBID investigated opportunities for collaboration with abandoned gravel pits for groundwater recharge and surface water storage. This opportunity is in the conceptual phase and analysis will be needed to determine economic and technical feasibility. The District also became the GSA for a portion of the Tracy Subbasin. As a GSA, BBID will work cooperatively with surrounding agencies, cities, and counties to manage groundwater resources in a responsible, sustainable manner. BBID will also continue to look for opportunities for future conjunctive use.

7.3.9 Conditional Efficient Water Management Practice 9, Automate Canal Control Structures

Status: Implemented/Ongoing

The District is working toward SCADA system automation for the Byron Division. BBID has SCADA control and monitoring at Pumping Plant 1 North and at all major facilities in the Bethany Division, including RWSA 1. A SCADA telemetry plan is being developed for the Byron Division to enable more automation of canal control structures and pump stations. Also, as part of this effort, Pumping Station 5 was automated, a radial gate on Canal 45 will be automated by 2017, and most future projects will be automated with the intent of future SCADA system control. Considering BBID's long-term plan for system-wide SCADA automation, the CIP includes eight canal automation projects.

7.3.10 Conditional Efficient Water Management Practice 10, Facilitate Customer Pump Testing

Status: Not Implemented

Because BBID has historically relied on surface water in nearly all years with very limited groundwater for water supply, providing groundwater pump testing for its customers has not been necessary. Customers rely on their power supplier (Pacific Gas & Electric) for pump testing service.

7.3.11 Conditional Efficient Water Management Practice 11, Water Conservation Coordinator

Status: Implemented

The District has designated Kelley Geyer as the Water Conservation/Schedule Coordinator; contact information is shown below.

Kelley Geyer
Byron Bethany Irrigation District
7995 Bruns Road
Byron, CA 94514-1625
Office: 209-835-0375 x10

7.3.12 Conditional Efficient Water Management Practice 12, Water Management Services

Status: Implemented/Ongoing

BBID coordinates irrigation delivery scheduling with all growers and encourages efficient use of water. Additionally, BBID provides intake channel flow data and water quality data to growers upon request. ET rates are available to growers from the California Irrigation Management Information System (CIMIS) for both ends of the District (Station 47 Brentwood and Station 167 Tracy). ET data can be used by growers for irrigation scheduling and maximization of irrigation efficiency.

7.3.13 Conditional Efficient Water Management Practice 13, Supplier Policies

Status: Ongoing

The District believes that there are three basic components to a water delivery service: equity, reliability, and flexibility. When considering modifications to District policies and facilities, BBID is aware of the significance of optimizing these components. The District believes it is also important to recognize the evolving demands of the water users, based on improved water management practices, and to incorporate the means to meet the demands by updating and enhancing District policies as necessary.

7.3.14 Conditional Efficient Water Management Practice 14, Supplier Pump Efficiencies

Status: Ongoing

Since 1964, BBID has been testing pumps of its water supply conveyance system for efficiency and maintaining the pumps to increase the efficiency. As part of the CIP, BBID has replaced or has plans to replace all of the major pumping stations in the District within the next 10 years. Pumping Stations 1S, 3 and 5 have been replaced. Pumping Stations 1N, 2, 4 and Smith are planned for replacement.

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SECTION 8

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Appendix A
Agricultural Water Management Plan Checklist

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AWMP* Location	Guidebook Location	Description	Water Code Section (or other, as identified)
	1.4	AWMP Required?	10820, 10608.12 Executive Order B-29-15
Section 1	1.4	At least 25,000 irrigated acres *At least 10,000 irrigated acres*	10853 *Executive Order B-29-15*
N/A	1.4	10,000 to 25,000 acres and funding provided	10853
N/A	1.4	5-year cycle update	10820 (a)
N/A	1.4	New agricultural water supplier after December 31, 2012 - AWMP prepared and adopted within 1 year	10820 (b)
N/A	1.5, 5	USBR water management/conservation plan:	10828(a)
	1.5, 5.1	Adopted and submitted to USBR within the previous four years, AND	10828(a)(1)
	1.5, 5.1	The USBR has accepted the water management/conservation plan as adequate	10828(a)(2)
3.4	1.4	UWMP or participation in area wide, regional, watershed, or basin wide water management planning: does the plan meet requirements of SB X7-7 2.8	10829
1.1	3.1 A	Description of previous water management activities	10826(d)
1.2.1	3.1 B.1	Was each city or county within which supplier provides water supplies notified that the agricultural water supplier will be preparing or amending a plan?	10821(a)
1.2.2	3.2 B.2	Was the proposed plan available for public inspection prior to plan adoption?	10841
1.2.2	3.1 B.2	Publically-owned supplier: Prior to the hearing, was the notice of the time and place of hearing published within the jurisdiction of the publicly owned agricultural water supplier in accordance with Government Code 6066?	10841
1.2.2	3.1 B.2	14 days notification for public hearing	GC 6066
1.2.2	3.1 B.2	Two publications in newspaper within those 14 days	GC 6066
1.2.2	3.1 B.2	At least 5 days between publications? (not including publication date)	GC 6066
N/A	3.1 B.2	Privately-owned supplier: was equivalent notice within its service area and reasonably equivalent opportunity that would otherwise be afforded through a public hearing process provided?	10841

AWMP* Location	Guidebook Location	Description	Water Code Section (or other, as identified)
1.3.1	3.1 C.1	After hearing/equivalent notice, was the plan adopted as prepared or as modified during or after the hearing?	10841
1.3.2	3.1 C.2	Was a copy of the AWMP, amendments, or changes, submitted to the entities below, no later than 30 days after the adoption?	10843(a)
1.3.2	3.1 C.2	The department.	10843(b)(1)
1.3.2	3.1 C.2	Any city, county, or city and county within which the agricultural water supplier provides water supplies.	10843(b)(2)
1.3.2	3.1 C.2	Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.	10843(b)(3)
1.3.2	3.1 C.2	Any urban water supplier within which jurisdiction the agricultural water supplier provides water supplies.	10843(b)(4)
1.3.2	3.1 C.2	Any city or county library within which jurisdiction the agricultural water supplier provides water supplies.	10843(b)(5)
1.3.2	3.1 C.2	The California State Library.	10843(b)(6)
1.3.2	3.1 C.2	Any local agency formation commission serving a county within which the agricultural water supplier provides water supplies.	10843(b)(7)
1.3.3	3.1 C.3	Adopted AWMP availability	10844
1.3.3	3.1 C.3	Was the AWMP available for public review on the agricultural water supplier's Internet Web site within 30 days of adoption?	10844(a)
1.3.3	3.1 C.3	If no Internet Web site, was an electronic copy of the AWMP submitted to DWR within 30 days of adoption?	10844(b)
Sections 2-7	3.1 D.1	Implement the AWMP in accordance with the schedule set forth in its plan, as determined by the governing body of the agricultural water supplier.	10842
2.1	3.2	Description of the agricultural water supplier and service area including:	10826(a)
2.1.1	3.2 A.1	Size of the service area.	10826(a)(1)
2.1.1	3.2 A.2	Location of the service area and its water management facilities.	10826(a)(2)
2.1.2	3.2 A.3	Terrain and soils.	10826(a)(3)
2.1.3	3.2 A.4	Climate.	10826(a)(4)
2.2.1	3.2 B.1	Operating rules and regulations.	10826(a)(5)
2.2.2	3.2 B.2	Water delivery measurements or calculations.	10826(a)(6)
2.2.3	3.2 B.3	Water rate schedules and billing.	10826(a)(7)
2.2.4	3.2 B.4	Water shortage allocation policies.	10826(a)(8)

AWMP* Location	Guidebook Location	Description	Water Code Section (or other, as identified)
		Drought Management Plan	*Executive Order B-29-15*
Section 3	3.3	Water uses within the service area, including all of the following:	10826(b)(5)
3.1	3.3 A	Agricultural.	10826(b)(5)(A)
3.2	3.3 B	Environmental.	10826(b)(5)(B)
3.3	3.3 C	Recreational.	10826(b)(5)(C)
3.4	3.3 D	Municipal and industrial.	10826(b)(5)(D)
3.5	3.3 E	Groundwater recharge.	10826(b)(5)(E)
3.6	3.3 F	Transfers and exchanges.	10826(b)(5)(F)
3.7	3.3 G	Other water uses.	10826(b)(5)(G)
4.1	3.4 A	Description of the quantity of agricultural water supplier's supplies as:	10826(b)
4.1.1	3.4 A.1	Surface water supply.	10826(b)(1)
4.1.2.	3.4 A.2	Groundwater supply.	10826(b)(2)
4.1.3	3.4 A.3	Other water supplies.	10826(b)(3)
4.1.4	3.4 A.4	Drainage from the water supplier’s service area.	10826(b)(6)
4.2	3.4 B	Description of the quality of agricultural waters suppliers supplies as:	10826(b)
4.2.1	3.4 B.1	Surface water supply.	10826(b)(1)
4.2.2	3.4 B.2	Groundwater supply.	10826(b)(2)
4.2.3	3.4 B.3	Other water supplies.	10826(b)(3)
4.3	3.4 C	Source water quality monitoring practices.	10826(b)(4)
4.2.4	3.4 B.4	Drainage from the water supplier’s service area.	10826(b)(6)
Section 5	3.5	Description of water accounting, including all of the following:	10826(b)(7)
5.1	3.5 A	Quantifying the water supplier’s water supplies.	10826(b)(7)(A)
5.2	3.5 B	Tabulating water uses.	10826(b)(7)(B)
5.3	3.5 C	Overall water budget.	10826(b)(7)(C)
5.4	3.5 D	Description of water supply reliability.	10826(b)(8)
Section 6	3.6	Analysis of climate change effect on future water supplies analysis	10826(c)
Section 7	3.7	Water use efficiency information required pursuant to Section 10608.48.	10826(e)
7.1	3.7 A	Implement efficient water management practices (EWMPs)	10608.48(a)

AWMP* Location	Guidebook Location	Description	Water Code Section (or other, as identified)
7.1	3.7 A.1	Implement Critical EWMP: Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).	10608.48(b)
7.1	3.7 A.1	Implement Critical EWMP: Adopt a pricing structure for water customers based at least in part on quantity delivered.	10608.48(b)
7.1	3.7 A.2	Implement additional locally cost-effective and technically feasible EWMPs	10608.48(c)
7.1	3.7 B	If applicable, document (in the report) the determination that EWMPs are not locally cost-effective or technically feasible	10608.48(d)
7.1	3.7 A	Include a report on which EWMPs have been implemented and planned to be implemented	10608.48(d)
7.1	3.7 A	Include (in the report) an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future.	10608.48(d)
N/A	5	USBR water management/conservation plan may meet requirements for EWMPs	10608.48(f)
N/A	6 A	Lack of legal access certification (if water measuring not at farm gate or delivery point)	CCR §597.3(b)(2)(A)
N/A	6 B	Lack of technical feasibility (if water measuring not at farm gate or delivery point)	CCR §597.3(b)(1)(B), §597.3(b)(2)(B)
N/A	6 A, 6 B	Delivery apportioning methodology (if water measuring not at farm gate or delivery point)	CCR §597.3.b(2)(C),
N/A	6 C	Description of water measurement BPP	CCR §597.4(e)(2)
N/A	6 D	Conversion to measurement to volume	CCR §597.4(e)(3)
N/A	6 E	Existing water measurement device corrective action plan? (if applicable, including schedule, budget and finance plan)	CCR §597.4(e)(4))

Appendix B
Coordination Activities: Public Notification of Agricultural Water Management Plan Preparation

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Appendix C
Agricultural Water Management Plan Adoption and Submittal

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Appendix D
Rules and Regulations
of the Byron Bethany Irrigation District

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RULES AND REGULATIONS

Of the

BYRON BETHANY IRRIGATION DISTRICT

Governing the Distribution

Of Water

Updated: 2012

BYRON BETHANY IRRIGATION DISTRICT

OFFICERS

Russell Kagehiro……..……..……..……..President
Tim Maggiore……..……..……..Vice-President
Rick Gilmore……..……..General Manager
Kelley Geyer……Director, Administration
Somach Simmons and Dunn……..…Legal Counsel
Robert W. Johnson, An Accountancy Corporation ……..……..……..…….Auditor
CH_2M ……..……..Engineers

BOARD OF DIRECTORS

Larry Enos Jr.……..……..…Director, Division I
Mark Maggiore…..……...Director, Division II
Tim Maggiore……..……Director, Division III
Felix Musco..……..……...Director, Division IV
Russell Kagehiro …...……Director, Division V
Charles Tuso.……..……...Director, Division VI
Jeff Brown……. …...……Director, Division VII

District Headquarters

7995 Bruns Road
Byron, California 94514-1625

Office (209) 835-0375
Facsimile (209) 835-2869

The Board of Directors holds their Regular Board Meeting on the third Tuesday of each Month at the District Headquarters on 7995 Bruns Road Byron, California 94514-1625.

BYRON BETHANY IRRIGATION DISTRICT

MISSION STATEMENT

Providing for the beneficial use of water and water-related services for consumers and landowners

Byron Bethany Irrigation District is committed to providing reliable water and water-related services in an environmentally sound and cost-effective manner.

The District shall endeavor to:

- Protect, preserve, and enhance District's historically acquired pre-1914 appropriative water rights together with managing the District's groundwater resources basin wide, in co-operation with other water agencies.
- Provide District consumers and landowners with an efficient raw water distribution system.
- Encourage conservation and prudent management of the water resources.
- Provide a safe working environment for all District employees and associated personnel.
- Foster a positive working relationship with all: agricultural, municipal and industrial consumers, landowners, and other agencies.

RULES AND REGULATIONS
OF BYRON BETHANY IRRIGATION DISTRICT
Governing the Distribution and Use of Water

****

The Byron Bethany Irrigation District is a State agency governed by a board of directors elected by the people. It operates under the authority conferred by the Water Code of the state of California. It makes no profit and is operated for the sole benefit of the lands and people within its boundaries. The benefits they can derive from it will be enhanced by the extent to which the people within the district cooperate to make it a success.

These rules and regulations are adopted under the authority conferred by the Water Code to affect an orderly and equitable procedure of operations.

DEFINITIONS

As used in these rules and regulations the words hereinafter set forth shall be interpreted as follows:

1. "District" means the Byron Bethany Irrigation District functioning as an Irrigation District under the California Water Code.

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

3. "Manager" means the General manager appointed by the Board.

4. "Works" of the District includes conduits, ditches, pipelines, flumes, drains, measuring and control devices therein and their appurtenances.

5. "Conduit" includes conduits, laterals, ditches, pipelines, flumes, drains, measuring and control devices therein and their appurtenances.

6. "Private Conduit" means any conduit that is not owned or controlled by the District.

7. "District Conduit" means a conduit owned by the District in place and installed according to District records.

8. "Consumer" includes water user or users of other services of District and includes but is not limited to, any services of District and includes but is not limited to, any person, firm, association, partnership, business, trust, corporation company, joint venture and public agency.

9. "Irrigation water" means untreated water used for agriculture, gardens, lawns and trees that is not provided for agriculture, gardens, lawns and trees that is not provided for Municipal or Industrial uses.

10. "Municipal and Industrial Water" means water provided by the District for Municipal and Industrial uses.

I. GENERAL RULES

1.1 Purpose

The District was organized for the purpose of supplying irrigation service for farm crops. The water quality and District facilities are not suitable for domestic use, raising of fish or use for industrial or commercial use; however, the District may provide water services for municipal, industrial and domestic uses. Any service for purposes other than irrigation will only be provided on a special order of the Board entered in its minutes.

1.2 Management

The operation and maintenance of the conduits and works of the District shall be under the exclusive control of the Manager. No one not authorized by the Manager shall interfere with the operation of any part of the water transmission, conveyance and distribution system.

The Manager shall employ such water service workers and other assistants as may be required and authorized by the Board for the operation and maintenance of the system and at rates of compensation fixed by the Board.

Employees shall distribute the water fairly and impartially to all persons entitled to water service, and shall apply the Rules and Regulations without favor. It is the specific duty of each employee to maintain cordial relations with all landowners and consumers in the District. Every consumer is entitled to courteous service.

Complaints by consumers shall first be referred to the field personnel. If such complaints are not satisfactorily settled they should be taken up with the Manager. Final appeal may be made to the Board. Every employee is charged with the duty and responsibility of cooperating with the consumers and the Board in a sincere effort to cooperating with the consumers and the Board in a sincere effort to render as satisfactory service as can reasonably be attained. Every consumer has a right to such service, and every employee of the District is enjoined to maintain and execute this policy.

1.3 Control of Works

In order that proper control may be exercised over the water service and that it be as uniform as possible over the entire district, the system is divided into two division, known as the Byron Division and the Bethany Division, each division to be operated under the direction of a Watermaster, who will report the Manager.

No gate, takeout siphon or other structure or device shall be installed or placed in any works of the District except with the written consent of the Manager and in the manner directed by the Manager; nor shall any person interfere with any works of the District without permission of the Manager or his assistants.

Only employees of the District will be allowed to open and close diverting gates, except in cases of emergency where prompt action is necessary to avoid damage.

1.4 Private Conduits

No private stopgates, standpipes, turnout pipes or valves, lift or sprinkler pumps or privately-owned facilities or conduits of any type shall be connected to or placed in or on District facilities, conduits, or drains conveying District water unless and until all of the following have occurred:

a) A written application setting forth the type and specifications of the installation has been filed with the Manager; and,

b) The application and specifications are approved in writing by the Manager or the Board prior to the start of construction; and,

c) If any of the work is to be performed by the District, or under a District contract, the full estimated cost to the District is paid to the District by the applicant in advance; however, the applicant shall be responsible for the actual costs of construction, regardless of the amount of the estimate. Upon completion, the applicant shall pay the difference between the estimated amount and the actual cost if the estimate is exceeded. If the actual cost is not paid to District within thirty (30) days of billing, applicant agrees that District may impose the lien procedures set forth in Water Code 25806 et seq. If the actual cost is less that the estimate, the applicant will receive a refund from the District for the overpayment.

d) In order that all involved be protected, in the discretion of the Manager, a written contract may be requested specifying the conditions of performing the work and the conditions applicable to the use of the facilities.

e) If the work can affect the flow of water in the works of the District, the work must not be performed without first receiving the prior written approval of the Manager.

f) Under no circumstances, even where the private conduit has been constructed by the District, shall the District be responsible for the repair and maintenance of the private conduit. Additionally, unless otherwise specified in writing, any private conduit, including those constructed or repaired by the District, is not under the ownership and control of the District, and the conduit owner is solely responsible for such facilities.

1.5 Use of District Conduits

The District intends that its conduits be used solely for the purpose of conveying water for use on land and for conveying agricultural drainage water away from the land. Their use for recreational purposes, play or other purposes, is prohibited.

Landowners and consumers are urged to prevent use of District conduits and their banks for swimming or play.

1.6 **Ownership of Water**

All water introduced into the district is property of the District and is subject to diversion, control and use by the District. No landowner or consumer acquires any proprietary right in the water by reason of such use, nor does such landowner or consu8mer acquires any proprietary right in the water by reason of such use, nor does such landowner or consumer acquire any right to resell the water purchased or used, or the right to use it on premises or for a purpose other than for which it was applied and as to recapture, reuse and resell all water that passes from the premises described in the application as the place of use, and asserts its right to all waters introduced into the District.

If a consumer uses water on land outside the District that was applied for use within the District, whether by routing through a conduit, first flowing it across the land within the District, by recapturing it from drains, or otherwise, the District may refuse service to the charges for use of the water on the outside land, as fixed by the Board, are paid and the consumer or landowner makes such physical changes in his fields or irrigation system as the Board deems necessary to assure the District that no future use of District water on the outside can occur.

All persons intercepting, using or impounding District water will be charged for such water at the rates established by the District, irrespective of whether water at the rates established by the District, irrespective of whether water is diverted from a conduit or taken from or impounded in a natural channel or drain, or whether it is waste, spill, seepage, runoff or other water. In order that rates may be kept as low as possible, consumers should notify the District of any waste or unauthorized use of water.

1.7 Measurement of Water

The unit of measurement used by the District in delivering water will in all cases, be a cubic foot per second ("cfs"). The unit for charging will be the acre foot (" AF"), which is the quantity of water that is necessary to cover one acre of ground one foot deep.

Water will be delivered to consumers only through measuring devices approved and installed by the District. The price charged for water shall be set by the Board before the beginning of each irrigation season and may be modified if necessary.

1.8 Unauthorized Taking of Water

Persons interfering with the regulation of water in District conduits are subject to prosecution. If any person takes water without permission of the Watermaster or authorized District employees, they may be subject to criminal prosecution.

1.9 Recapture of Water

All water introduced into the District by District works is District water and is subject to rediversion and use by the District. All such water, whether waste and/or seepage water, intercepted and used by consumers will be charged for at the rate established by the District. All return flows, from water served by District shall become the property of District when such flows enter a District lateral or surface drainage system, leave the boundaries of a landowner's property, or percolate into the District's sub-surface drainage system or other District facility. All such water, whether return flow, tail water, waste and/or seepage water is subject to rediversion and use by District.

1.10 Access to Land

The agents of the District shall have free access at all times to the property being supplied with water from the District's system for the purpose of examining the lands irrigated, the flow of water thereon, the water facilities and any private canal, ditches, sumps, or drains.

1.11 Rights of Way

No building or structure shall be constructed over/under District rights of way (prescriptive or deeded [unless provided otherwise in the deed]), and no trees, vines, or bushes shall

be planted upon District rights of way without first receiving written approval from the Manager. No fences other than necessary cross fences shall be constructed on Districts rights of way. Cross fences on District Rights of way shall be constructed in the manner directed by the Manager with gates to permit passage along canal banks by ditch tenders and District equipment and to permit maintenance work to be done, and in a manner, that will not interfere with the flow of water.

Any obstruction on District rights of way interfering with District operation and maintenance may be removed by the District without notice and the cost of removal charged to the landowner, and if not paid within thirty (30) days of billing, the lien provisions of Water Code 25806 shall apply.

1.12 Canal Bank Roads

Use of District canal bank roads is at the sole risk of the user. Use of such roads by vehicles not owned by the district is prohibited.

1.13 Non-Liability

Neither the District, its officers or employees will be liable for any damage of any kind or nature resulting directly or indirectly from any conduit not owned by the District or the water flowing therein, or by reason of lack of capacity therein or for negligent, wastefully or other use of handling of water by the users thereof.

All water furnished by the District flows through many miles of open conduits and is therefore subject to pollution, shortages, fluctuation in flow and interruption in service. Ditch tenders are forbidden to make any agreements binding the District to serve an uninterrupted constant supply of water. All water furnished by the District will be on the basis of irrigation deliveries and every user putting the water to other uses does so at his own risk and by doing so assumes that may occur as a result of the water quality, shortages, excess flow, fluctuation in flow, and interruption in service.

Neither the District, its officers or employees, will be liable for defective quality of water, shortage or excess of water either temporary or permanent, or for failure to deliver such water.

Pumping by users of District water is done at the user's risk and the District, its officers and employees, assume no liability for damages to pumping equipment or any other damages that may occur.

Nothing contained in these rules shall be construed as an assumption of liability on the part of the District, its directors, officers or employees for any damages occasioned through the improper construction, maintenance, or use of conduits, or waste of water, or by permitting the flow of water, or turning water in any conduit, or to any land.

District sells water as a commodity only and not as a guaranteed service and will not be liable for defective quality of water, shortage of water, either temporary or permanent, or for failure to deliver water or delay in doing so.

District assumes no liability for damages to persons or property occasioned through defective works.

Each consumer shall be liable to the District and to third parties for all damages caused by his or her neglect or malicious, careless or willful acts.

1.14 **Nuisances**

No tree or vine prunings, brush, weeds, grass, rubbish, swill, garbage, manure or refuse, or dead animal matter from any barnyard stable, dairy or hog pen, or other material or substance that will become offensive to the senses or injurious to health or injuriously affect the quality of water, or obstruct the flow of water, or result in the scattering of seeds or noxious weeds, plants or grasses, shall be placed or dumped in any District conduit or be place or left so as to roll, slide flow or be washed or blown into any such conduit. Any violation of this rule will subject the offender to prosecution and all costs of the District in removing such nuisance shall be charged to the perpetrator. All employees of the District shall promptly report any violation of this rule, and the consumers of the District are especially urged to cooperate in its enforcement.

1.15 Enforcement of Rules

Failure or refusal of any landowner or water user to comply with these Rules and Regulations, or any interference by any landowner or water user, or their agents, servants of employees, with the rights, duties or obligations of the District, or its employees, shall entitle the owner or user until the landowner or water user shall furnish satisfactory proof to the Board of their intention to comply these Rules and Regulations and shall likewise remove any default existing at the time service of water is discontinued. If it shall be necessary for District to commence legal action to enforce the Rules and Regulations, the District shall be entitled to recover the reasonable value of staff time spent in enforcing the Rules and Regulations and the reasonable value of attorney services incurred, as well as out-of-pocket costs incurred by the District.

1.16 Disputes

Whenever there is a dispute between a District employee and a consumer, the matter shall first be referred to the Watermaster. If the decision of the Watermaster is not acceptable to either party, the dispute may be taken to the Manager. If the Manager is unable solve the dispute to the mutual satisfaction of the parties, either party may present the matter in writing to the Board of a hearing and discussion. The decision of the Board shall be final and binding.

1.17 Prohibited Acts of Consumers

It is unlawful to do any of the following without authority of the Board:

1. Take water from a District conduit without express authorization of the District;
2. Disturb any work of the District
3. Cause to be emptied or placed into any District conduit or other facility any rubbish, debris, or any other material or obstruction to the free flow of water.
4. Willfully and maliciously cut, break, injure, or destroy any bridge, dam, District conduit, work of the District, or any signs owned by the District.

II. IRRIGATION WATER SERVICES

2.1 Water Use and Availability

The beginning of the irrigation season shall be established by the Manager each year and approved by the Board of Directors and shall end on October 31st. Water will be available for use in the laterals of the District, during the irrigation season, provided sufficient irrigators make application to make the use of said lateral economically feasible.

Water must be used continuously by the irrigator throughout the period of the run. If water is wasted or inefficiently or improperly used, the Manager may refuse further delivery of water until the cause of waste or inefficient or improper use is removed.

Consumers are required to give the Watermaster at least three to eight hours notice, depending on the individual lateral, of the changing or turning on or off of water.

Consumers must provide sufficient and competent help on a twenty-four-hour day basis, if necessary as determined by the Manager, to reduce surface runoff to a minimum and prevent excessive water applications.

The District will not be liable for any damage resulting, directly or indirectly, from the operation of a private ditch or pipeline or water flowing therein whether transporting irrigation or drainage water. The District's responsibility and/or liability ceases at each District service point to a landowner on a lateral or sub-lateral. Disposition of any waters once having left the District's service points shall be the responsibility of the consumer.

2.2 Application of Water

No applications for water will be accepted or acted upon until all previously incurred obligations to District by landowner or tenant, including but not limited to, water charges, standby charges, tax assessments, or other charges incurred for services performed have been fully paid.

Applications will not be accepted from tenants unless written authorization from the landowner is filed with the District. Unless otherwise stated in landowners written authorization, said authorization for tenant's request water service shall be deemed to remain in effect for subsequent irrigation seasons until revoked in writing to District by the landowner.

Applications for water must be signed on forms available for this purpose at the District's office in Byron. Requests for water service will be accepted by telephone twenty-four hours a day after the initial application is signed each season.

2.3 Charges for Water and Payment

Water rates and the terms thereof will be established annually by the Board of Directors prior to commencement of the Irrigation Season. Payment for water delivered shall be due and payable thirty (30) days after completion of the irrigation.

The rates and terms of payment for water for special acreage and low-volume usage and for municipal, commercial and industrial purposes shall be determined by the Board from time to time in instances where such use is permitted by Board order or contract.

2.4 Unpaid Tolls and Refusal of Service

All charges for service remaining unpaid at the time of the delivery of the assessment book to the collector of the District, may be added to and become a part of the annual

assessment levied by the District as provided for by Sections 25806 and 25807 or may be secured by the recording of a Certificate in the office of the County Recorder in accordance with California Water Code Section 25806.

District reserves the right to refuse or discontinue service to any consumer who is in default in the payment of water charges and to any land on which water charges are delinquent unless and until such defaulted payments shall have been paid in full.

Any landowner whose land is being rented by a tenant shall be responsible for all water charges or installments not paid by tenant at the time the same become due regardless of the person or persons requesting and making application for the water. All unpaid by tenant, or landlord, at the time specified by law for the delivery of the Assessment Book to the Collector of the District, in November of each year, may be added to and become a part of the annual assessment levied by the District as provided for by Sections 25806 and 25087 of the Water Code. Nothing herein contained shall deprive the District of any other rights it may have to enforce payment of charges.

If less than the full amount of unpaid water charges is paid by a consumer irrigating several parcels of land, the District reserves the right to determine to which of the parcels payment shall be applied. This rule shall be effective notwithstanding the fact that the applicant may not be the same person who owned or farmed the land when the delinquent water charges were incurred.

2.5 Point of Delivery

Water will be delivered to landowners at a convenient point on the existing District's conduit, the exact point to be determined by the Manager. The District is not obligated to construct any extensions to its existing conduits. The landowner desiring service must at their expense construct an adequate take out box in the District's existing conduit and a conduit to transport the water from that point to their land.

2.6 Waste of Water

Irrigators will be required at all times to keep their ditches and facilities for conveying and distributing in good condition so that water can be used without undue loss or waste of time, and without damage to other lands. Lands must be prepared so that water can be distributed without waste and landowners shall construct adequate drainage facilities so that adjacent land will not be damaged. The Manager or Watermaster may refuse to deliver water to a consumer whose ditches and structures are not in a proper state of repair or whose land is not prepared to convey or use water in an economic and non-wasteful manner.

No consumer shall be entitled to a greater amount of water than the consumer can beneficially use without waste and with due regards to the needs of other consumers.

2.7 Water Rationing

When the demand for water deliveries exceeds the capability of the District's system, or the supply of water available, the Manager will prorate water according to the limits of the system. The general cropping preference will be set by the manager with approval of the Board of Directors in the manner most likely to minimize the overall detriment which might result from the district's inability to serve water in the other requested.

During periods of critical supply, the District may not be able to provide water delivery on time. If the consumer has not received water within five (5) days from date requested and feels permanent damage may result to the crop from such delay in delivery of water, the consumer shall file a written factual statement with the Manager. The Manager will immediately review this statement with a committee of two Directors and determine (in their complete discretion) if crop priorities should and could be modified. It is understood that the capacity of the District's system can be over reached by demands or outages occurring which could result in a delay up to or exceeding five (5) days.

2.8 Sump Requirements (Drainage)

All consumers who will drain their surface run-off (tailwater) into District facilities will be required to install sumps according to District's "Sump Standards and Requirements."

Both the standards and the requirements have been established for the protection of District facilities, and should the water user's system not be adequate for this purpose, the Manager will require the water user to correct the condition before his water enters the District's facilities.

2.9 Surface Drainage Discharge and Tile Drain Interconnections

No water, including tailwater, will be placed into the District's irrigation or drainage system without the approval of the Manager. Adequate safeguards must be established to prevent entry of trash, silt, herbicides, pesticides, fertilizers, etc., into the District's system.

Any concern or control which may result from quality of tailwater, including injury to third parties, shall be the responsibility of the discharger (consumer). The District may require reasonable periodic testing of tailwater discharged into District's system at expense of discharger.

The landowners benefiting by the extension or enlargement of any drainage conduit shall assume the cost for any improvements needed to the District's existing subsurface drainage system.

Any construction or modification to the subsurface drainage system must be done in accordance with District specifications at the sole expense of the party desiring the work to be accomplished and must have the approval of the Board.

2.10 Damage to Rights-of-Way, Conduits, Laterals, Drains or Ditch Banks

Any person whose equipment, livestock, poultry or waterfowl damages or injures any works, facilities or other property of the District or who shall damage,, injure or destroy by burning or otherwise any such works, or who shall dump any rubbish therein or thereon, or erect signs, fences or structures on District rights-of-way, shall pay to the District upon demand, all expenses incurred in repairing the damage, or removing the rubbish, signs, fences or structures, including reasonable value of staff time and attorneys' fees expended in enforcing this provision.

2.11 Division of Property

Where a division of property is made within the District creating smaller parcels requiring separate irrigation or drainage service by the District, the landowner dividing the property shall provide the necessary rights of way to such smaller parcels as required for service

by District and the cost of any additional facilities required to provide such service shall be borne by either the landowner creating such lot splits of the landowners of the lots created. District shall not be responsible for service of water to any lot or parcel separated from the District water facility as to which such rights of way and additional distribution facilities have not been provided, as may be required by District.

2.12 Water Service Outside the Irrigation Season

The District may serve water outside the irrigation season, when and where possible, subject to the following conditions:

- ★ A finding by the Manager that such service would not interfere with the District's maintenance program and that the District has sufficient personnel available to administer the water delivery.
- ★ The charge per acre foot shall be determined by the Board of Directors.
- ★ All applicable District Rules and Regulations shall govern the Distribution of water either during or outside the irrigation season.

III. MUNICIPAL AND INDUSTRIAL WATER SERVICES

3.1 Definition of Municipal and Industrial Water

Any water sold or delivered by the District for other than irrigation purposes shall be known as municipal and industrial water ("M&I water"). M&I water shall only be made available in accordance with an agreement between the District and the consumer requesting such service.

3.2 Water Charges and Payment

Water charges will be billed in accordance with the District water rate schedule for M&I water. If payment is not made within thirty (30) days after date of billing, service of the water may be discontinued until the water user has paid for all water delivered and interest at the rate of one and one-half percent (1-1/2%) per month will be charged until paid and a lien may be adopted and recorded pursuant to Water Code 25806 *et seq*.

3.3 Permit Required

All new municipal and industrial water systems for the delivery of potable water must be installed in accordance with the provisions of Sections 4011 through 4035 of the California Health & Safety Code prior to making application for water service. All facilities necessary for such uses of water must be constructed at the sole cost of the consumer requesting such service. A permit must be obtained from the Department of Public Health on all potable water systems which are connected to District conduit and supply water for municipal and industrial purposes.

3.4 Meters

The District will determine, in its sole discretion, the appropriate measurement system for M&I water. The District is authorized to require the installation of and payment of, meters when in the District's sole judgement such installation is the most appropriate for the type of use, is necessary to conserve water, or when a user willfully or negligently wastes water.

3.5 Emergency Shutoff of Water

In case of necessity, water may be shut off from the District's system, but such interruptions in service shall be for the shortest possible time. Except in the case of emergencies, the users will be notified in advance by public notice of such action. Users shall, in event of failure of services, be responsible for damages to all household appliances.

3.6 Application for water

Applications for municipal and industrial service may be made on forms furnished by the District and accompanied by advance payment.

3.7 Connection Fees

New service may be subject to connection fees to reimburse the District for cost of special distribution facilities. Fees will be in accordance with a fee schedule adopted by the Board.

3.8 Installation of Facilities

All conduits and water treatment facilities for M&I water, including subdivision continues and facilities, which are to become a part of the District's system, must be installed in accordance with plans approved by the District or its engineers, at no cost to the District and in accordance with District specifications.

3.9 Method of Conveyance and Use of Water

Consumers of M&I water will be required to transport, convey, distribute and use water in a reasonable may at all times and not to waste water under any circumstances. The Manager or Watermaster may refuse to deliver water to consumers of M&I water who do not put water to a beneficial use who otherwise waste the water.

3.10 Pro-ration of Water in Case of Shortages

When the demand for water deliveries exceeds the capabilities of the District's system, or the District's water supply, the District and the Manager may pro-rate water according to the limits of the system.

3.11 Damage to District Facilities

Any person causing damage to District's rights-of-way, conduits, or other facilities, shall pay to the District upon demand all expenses incurred in repairing the damage, including reasonable value of staff time and attorneys' fees expended in enforcing this provision.

Appendix E
Water Meter Device Information

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CERTIFIED TEST REPORT

CUSTOMER: TECHNOFLO SYSTEMS

MODEL NO: LP32D-12

METER SERIAL NO: 20170805

CONFIGURATION

METER INSIDE DIAMETER: 11.734

DIAL: AFT X 0.01 6 CFS

INDEX: 0.8307

TEST FACILITY: Volumetric

As Calibrated

CALIBRATION DATA

	FLOW RATE GPM	% ACCURACY
1	2681.36	101.78
2	1566.51	101.82
3	313.31	98.43

TEST DATE: 5/9/2017

PRINT DATE: 5/9/2017

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

McCROMETER
3255 WEST STETSON AVENUE
HEMET, CA 92545 USA
PHONE (951) 652-6811 / FAX (951) 652-3078
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WATER SPECIALTIES™ PROPELLER METER

13.27 Chahal

6"-20" STRAP-ON ELECTRONIC LOW PRESSURE METERS

MODEL

LP04D, LP12D, LP32D

OPERATION AND MAINTENANCE MANUAL PARTS LIST

FEATURING:

*CERAMIC BEARING CARTRIDGE

*STAINLESS STEEL SADDLE & U-STRAP

*MODEL FC101 FLOWCOM REGISTER INDICATOR-TOTALIZER

*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
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WARRANTY

This Warranty shall apply to and be limited to the original purchaser consumer of any McCrometer product. Meters or instruments defective because of faulty material or workmanship will be repaired or replaced, at the option of McCrometer, free of charge, FOB the factory in Hemet, California, within a period of one (1) year from the date of delivery.

Repairs or modifications by others than McCrometer or their authorized representatives shall render this Warranty null and void in the event that factory examination reveals that such repair or modification was detrimental to the meter or instrument. Any deviations from the factory calibration require notification in writing to McCrometer of such recalibrations or this Warranty shall be voided.

In case of a claim under this Warranty, the claimant is instructed to contact McCrometer, 3255 W. Stetson Ave., Hemet, California 92545, and to provide an identification or description of the meter or instrument, the date of delivery, and the nature of the problem.

The Warranty provided above is the only Warranty made by McCrometer with respect to its products or any parts thereof and is made expressly in lieu of any other warranties, by course of dealing, usages of trade or otherwise, expressed or implied, including but not limited to any implied warranties of fitness for any particular purpose or of merchantability under the uniform commercial code. It is agreed this Warranty is in lieu of and buyer hereby waives all other warranties, guarantees or liabilities arising by law or otherwise. Seller shall not incur any other obligations or liabilities or be liable to buyer, or any customer of buyer for any anticipated or lost profits, incidental or consequential damages, or any other losses or expenses incurred by reason of the purchase, installation, repair, use or misuse by buyer or third parties of its products (including any parts repaired or replaced); and seller does not authorize any person to assume for seller any other liability in connection with the products or parts thereof. This Warranty cannot be extended, altered or varied except by a written instrument signed by seller and buyer.

This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

McCrometer reserves the right to make improvements and repairs on product components which are beyond the Warranty period at the manufacturer's option and expense, without obligation to renew the expired Warranty on the components or on the entire unit. Due to the rapid advancement of meter design technology, McCrometer reserves the right to make improvements in design and material without prior notice to the trade.

All sales and all agreements in relation to sales shall be deemed made at the manufacturer's place of business in Hemet, California and any dispute arising from any sale or agreement shall be interpreted under the laws of the State of California.

ELECTRONIC LOW PRESSURE METER INDEX

ELECTRONIC LOW PRESSURE METER INSTALLATION

I. UNCRATING. When uncrating the meter, any damage due to rough or improper handling should be reported to the transportation firm and McCrometer. If for any reason it is determined that the unit or parts of the unit should be returned to the factory, please contact McCrometer for clearance prior to shipment. Each unit must be properly crated to prevent any further damage. The factory assumes no responsibility for equipment damage in return shipment due to improper packaging. The shipping crate contains the following items:

Low Pressure Meter Assembly with FC101.....1
Mounting Equipment as required.....
Operation and Maintenance Manual.....1
Tool T-2402X-1.....1

II. INSTALLATION of McCrometer Low Pressure Electronic Meters varies depending upon the type and model of meter selected for each application. The meter must have a full flow of liquid for proper accuracy. Fully opened gate valves, fittings or other obstructions that tend to set up flow disturbances should be a minimum of ten pipe diameters upstream and two pipe diameters downstream from the meter. Installations with less than ten pipe diameters of straight pipe require straightening vanes. Meters with straightening vanes require at least five pipe diameters upstream and one pipe diameter downstream from the meter. The meter installations fall into three basic categories:

1. **FLANGED TUBE METERS** can be installed exactly as you would install any short length of flanged pipe. Flanged ends are standard pattern and drilling for any meter size.

2. **PLAIN END TUBE METERS** can be installed similar to replacing a short length of plain end pipe in the line by either welding, or by using one of a variety of pipe couplings available. **Note:** Meter saddle assembly (#23) should be removed before welding. (See step IV.)

3. **STRAP-ON SADDLE METERS** can be installed on an existing pipeline by cutting a hole of proper size in the existing pipeline. The installation steps outlined below should be followed carefully to achieve proper mounting of the meter:

A. ALIGN the cutout template in the desired position for the meter on the pipe. Make certain that the center line of the pipe and the center line marked on the template are parallel with each other.

B. MARK the pipe using a center punch as indicated on the cutout template. These marks will help to properly align the saddle over the cutout opening.

C. **SCRIBE** the pipe along the line specified for your meter size cutout.

D. **CUT OUT** the section of pipe within the scribed line and remove all burrs, slag, and rough edges from the inside and outside of the cutout section.

E. **STRAIGHTENING VANES** are recommend when there are less than ten pipe diameters of straight pipe (no fittings or obstructions) directly upstream from the meter location. Straightening vanes are available from the factory. (See Straightening Vane Installation Instructions if required for your meter.)

F. **METER ASSEMBLY** should be placed on the pipe with the "D" shaped ring gasket in position on the bottom of the saddle. The saddle must be positioned so that the D-ring maintains contact with the surface of the pipe completely around the cutout opening. Align the centerline of the saddle with centerline of the pipe and locate the saddle so that it is exactly between, and aligned with, the center punch marks on the pipe. Each edge of the meter saddle should be approximately 1/8" from the center punch mark on the pipe. U-Strap nuts should be tightened evenly. **WARNING:** Customers are warned that the U-Strap nuts are to be tightened evenly to approximately 30 foot pound torque. This is sufficient to seal the saddle to the pipeline. Additional tightening may be required to seal the saddle on rough or irregular pipe.

ELECTRONIC LOW PRESSURE METER INSTRUCTION AND MAINTENANCE MANUAL

III. **MCCROMETER** products have been carefully designed to be as maintenance free as possible. Periodic preventive maintenance, however, is highly recommended and should be practiced according to schedule to assure continuous accuracy and trouble-free performance of your propeller meters. The maintenance and inspection procedure can also be used as a guide to locating a problem in the unit that may be the cause of abnormal meter operation.

Routine preventative maintenance should be performed on all meters, which includes cleaning and an inspection of the propeller and its bearing. The interval between inspections depends on the water quality and the usage of the meter. The initial inspection should be performed after one to two years of service to determine the period between future inspections. After five to ten years, the complete meter should be inspected to ensure years of dependable service.

IV. **METER SADDLE ASSEMBLY (#23)** should be removed from the service line by removing the U-strap nuts (#27) and lifting up the rear (downstream) portion of the meter saddle (#23), carefully pulling the assembly back (downstream) and up at the same time to allow the propeller (#2) to clear the cutout opening in the pipeline so the meter can be lifted free. Inspect the meter saddle D-ring (#22) for any sign of damage and replace, if necessary. Replace the meter assembly (#23) with a dummy cover saddle if the service line is to remain in operation.

V. **WORKING AREA** chosen for disassembly and reassembly of the meter components should be clean to reduce the chance of dust or dirt particles being introduced into the propeller area.

VI. **DISASSEMBLY AND INSPECTION OF METER** includes cleaning the propeller assembly (#1), ceramic sleeve bearing (#8), separator assembly (#12) and drive magnet (#9).

1. **PROPELLER REMOVAL** can be accomplished by first removing the thrust bearing cartridge assembly (#5). Loosen the set screw (#3) in the side of the nose of the propeller. Remove the thrust bearing cartridge (#5) by turning it counterclockwise while holding the propeller in place.

2. **REVERSE THRUST BEARING CARTRIDGE (#6)** must now be removed. Turn the propeller (#2) so that the Allen wrench clearance hole is lined up with the set screw in the side of the reverse thrust bearing cartridge (#6). The location of the set screw is marked by a small hole drilled in the face of the reverse thrust bearing cartridge. With a 5/64 inch Allen wrench, loosen the set screw (#7) in the reverse thrust bearing cartridge (#6) two to three turns, which will allow the cartridge to be unscrewed without damaging the spindle thread. **Note:** If the bearing area appears to be clogged with dirt or sediment, making it difficult to locate the set screw (#7) or to allow the Allen wrench to fit into the set screw socket, then the bearing area should be flushed out with water. Insert Tool T-2402X-1 into the propeller through the threaded nose. The tabs in the tool should engage in the screwdriver slot in the end of the reverse thrust bearing cartridge (#6). Remove the propeller assembly (#1) and reverse thrust bearing cartridge (#6) by turning Tool T-2402X-1 counterclockwise, unscrewing the reverse thrust bearing cartridge (#6) from the spindle (#12). The propeller assembly with reverse flow cartridge will now slide off the spindle. **WARNING:** If the reverse thrust cartridge does not unscrew easily, it may be because the set screw was not unscrewed enough. If unscrewing the reverse flow cartridge is continued with the set screw binding on spindle thread, damage to thread could occur.

3. **WATER LUBRICATION** of the ceramic sleeve bearing (#8) is achieved by means of two openings in the end of the thrust bearing cartridge (#5) which allows air to be purged from the bearing area. These should be cleared of any foreign material by running a small wire through the holes on either side of the screwdriver slot.

4. **CERAMIC BEARING CARTRIDGE (#8)** and drive magnet (#9) should be cleaned of any foreign material and inspected for damage. Using a bottle brush, thoroughly clean the ceramic bearing surface (#8) and the magnet inside diameter (#9). After cleaning the propeller, flush the inside out with water. The outside surfaces of the propeller should also be cleaned to assure a smooth, unrestricted flow across the surface of the propeller. Do not use an oil-based solvent in cleaning, as damage to the assembly could occur.

5. **SPINDLE CERAMIC SLEEVE** and the O.D. or surface of the separator should be cleaned and inspected for any substantial amount of wear. The reverse thrust bearing (#6) should be checked for any damage. If it is determined that the spindle ceramic sleeve or separator are worn sufficiently, the separator/support spindle assembly (#12) should be replaced.

6. **SEPARATOR / SUPPORT SPINDLE ASSEMBLY (#12)** can be removed for replacement by removing the four mounting screws (#13) which thread into the gearbox. The separator O-ring (#14) should be replaced and the new O-ring (#14) covered with a thin coat of silicone grease. The separator/support spindle assembly (#12) can then be replaced in the front of the gearbox (#16) with a firm push, gently rotating the assembly at the same time. Replace and tighten the four mounting screws (#19).

VII. REASSEMBLING METER

1. **PROPELLER INSTALLATION** is accomplished by following these steps:

a) The reverse thrust cartridge set screw (#7) should be protruding out of the reverse thrust bearing cartridge so it will not bind up on the spindle thread. **Note:** Look through the end of the propeller and hole in the reverse thrust cartridge to be sure the set screw is not showing.

b) Slide the propeller assembly onto the support spindle (#12) until the reverse thrust bearing cartridge (#6) contacts the threads on the end of the spindle (#12). Using Tool T-2402X-1, thread the reverse thrust bearing cartridge onto the spindle. If you feel any resistance when threading the reverse thrust cartridge on, stop at once and check to be sure the set screw is not binding on the thread. Be careful not to cross-thread the reverse thrust bearing cartridge. Thread the reverse thrust bearing cartridge (#6) onto the spindle (#12) until the trailing edge of the propeller contacts the gearbox (#16). Set the proper end play by inserting a 5/64" Allen wrench into the reverse thrust bearing set screw (through the side of the propeller) and loosening the reverse thrust bearing cartridge (#6) one half turn counterclockwise. Tighten the set screw in reverse thrust bearing cartridge. There should be approximately .02" clearance between the gearbox (#16) and trailing edge of the propeller when the propeller in pulled forward (away from the gearbox). The propeller must not contact the gearbox.

2. **THRUST BEARING CARTRIDGE ASSEMBLY (#5)** should be inspected for damage and replaced in the nose of the propeller. The thrust bearing cartridge (#5) is used to adjust the amount of longitudinal end play of the propeller assembly on its spindle (#12), which should be about 1/64 inch. End play can be adjusted by turning the thrust bearing cartridge assembly (#5) clockwise until it tightens against the end of the support spindle (#12), then turning thrust bearing cartridge (#5) counterclockwise 1/8 of a turn. Tighten set screw (#3). Check the longitudinal end play of the propeller to insure it's not excessive and does not allow the propeller (#2) to contact the gearbox (#16). Check the clearance between the propeller (#2) and gearbox (#16). The clearance should be approximately .01" between the gearbox (#16) and trailing edge of the propeller when the propeller is pushed back (toward the gearbox). The propeller assembly (#1) must spin freely.

3. **PROPELLER BEARING (#1)** can be checked for excessive radial play by rocking the propeller (#2) gently from side to side on the spindle (#12). Some play is required for proper operation of the water lubricated ceramic sleeve bearing.

VIII. SENSOR AND FC101 DIGITAL INDICATOR-TOTALIZER

1. **FC101 DIGITAL INDICATOR (#34)** should not be removed from the meter unless battery or sensor replacement is required. If the unit must be removed, proceed as follows:

2. **FC101 (#34)** can be removed from meter head by removing the four screws (#32) then slightly lifting unit up and turning over to disconnect the 2-lead sensor wires from the bottom of the FC101. If the meter is equipped with a transmitter, the transmitter wires must also be disconnected.

3. **SENSOR HOUSING** should be removed only if replacement is necessary. The sensor can be taken out of the separator after removing the gearbox backplate (#17). Once the backplate is removed, pull the sensor wire and sensor assembly out of the back of the gearbox.

4. **BEFORE REPLACING THE SENSOR** be sure the separator is dry. Slide sensor housing and wire assembly into the separator until it stops against the inside of separator. **Note:** It does not make any difference what rotation position sensor is installed, however, wire must be positioned toward back (open end) of separator. Feed the sensor wire up through the gearbox and out the meter head.

5. **LITHIUM BATTERY** should offer 6 to 10 years of operation. The FC101 has a low battery display that comes on when approximately six months of life is remaining. The battery should test at least 2.8 to 3.6 volts to be considered good. **NOTE: Batteries should be disposed of in an environmentally safe manner.**

6. **THE FC101 DIGITAL INDICATOR-TOTALIZER** (#34) can now be installed in one of four positions for more convenient reading with four screws (#32).

IX. PRIOR TO INSTALLING METER

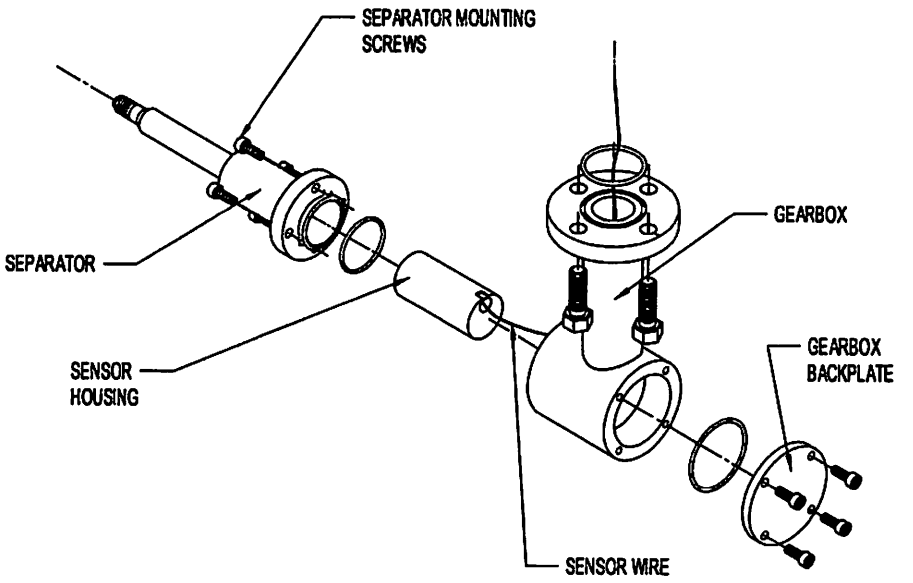
1. **PROPELLER ASSEMBLY (#1)** should be dipped in water to lubricate the propeller ceramic sleeve bearing (#8). Spin the propeller (#2) gently to make certain the meter operates smoothly and no bind or drag is apparent.

2. **FC101 (#34)** and sensor (#15) should be checked to be sure they are connected and that the battery is good. Turn the propeller by hand at a fairly fast even speed and the indicator should display a flow rate.

3. **METER SADDLE D-RING (#22)** should be inspected for any sign of damage and covered with a thin coat of silicone grease. The meter can now be installed in the service line. (See step II-F for proper installation.) When replacing the meter on the line, make certain that the top of the pipeline is smooth and free of any foreign material. Make certain that no foreign materials are attached to the inside of the service line pipe, as any flow disturbance or obstruction may affect the accuracy of the meter.

X. ORDERING PARTS OR RETURN TO FACTORY

Inspection of all meter components that may be replaced in the field has been accomplished at this point. Should any of the meter parts, upon inspection, appear to be damaged or excessively worn, they must be replaced to assure proper meter operation and prevent further damage. Cost for replacement parts not covered by warranty are available by contacting the factory. If it is determined that the meter should be returned for repair, please notify McCrometer prior to shipment. Each meter must be properly packaged to prevent damage to the meter in shipment.



6"-20" STRAP-ON LOW PRESSURE METERS
MODEL LP04D, LP12D, LP32D
PARTS LIST

No.	QTY	Part Number	Description
none	1	7-MLI1D-*	Model MLI1D Main Line Meter Head Assembly
1	1	5-2425-‡-PT	Propeller Assembly (Items 2 thru 8)
2	1	3-2425-‡-P	Propeller
3	1	1-1125-6	Set Screw, Nylon Point
4	1	1-1116-8-6	Screw, Bearing Cartridge Mounting
5	1	3-2356	Thrust Bearing Cartridge Assembly
6	1	3-2402-2	Reverse Thrust Bearing Cartridge Assembly (Items 6 and 7)
7	1	1-1101-8-5	Set Screw, Reverse Thrust Bearing
8	1	2-2426-P-1	Ceramic Bearing Cartridge
9	1	2-1601-2	Drive Magnet
10	1	1-2428-‡	Drive Magnet Retaining Plate
11	2	1-1115-3-18	Screw, Magnet Retaining Plate (each)
12	1	4-2455-2	Separator/Support Spindle Assy
13	4	1-1103-8-7	Screw, Separator/Spindle Mounting (each)
14	1	1-1551-24	O-ring, Separator
15	1	4-2730-3-‡	Sensor Housing, Sensor and Wire Assembly
16	1	3-2394-*-304	Gearbox
17	1	2-2731	Gearbox Backplate
18	1	1-1551-2	O-ring, Gearbox Backplate
19	4	1-1103-8-7	Screw, Gearbox Backplate Mounting (each)
20	4	1-1251-5-12	Bolt, Gearbox Mounting (each)
21	1	10110-10	O-ring, Gearbox
22	1	1-1552-23	D-Ring Meter Saddle
23	1	3-2414-‡‡	Meter Saddle Assembly
24	1	1-1551-25	O-Ring, Meter Head - Outer
25	1	1-1551-50	O-Ring, Meter Heat - Inner
26	1	1-2441	Meter Head (Sizes 6" thru 20")
27	6	1-1211-1	Nut, U Strap (each)
28	6	1-1301-14	Washer, U Strap Bolt (each)
29	3	3-2437-*	U Strap Assembly (each)
30	1	1-1707-19 or -20	InLine Terminal (19) 2 Wire (-20) 3 Wire For Remote
31	1	1-1551-38	O-Ring - 243 Buna
32	4	10605	Screw 10-32 x 1.25" Long
33	1	FC101-M	Magnet Wand
34	1	FC101-*	FC101 Flowcom Ind.-Tot. & Bonnet Complete - See IOM Manual
none	1	10015-00K	Desiccant Bag

**Insert meter size to complete part number - for example: use -06 for 6", -08 for 8", etc.)*
‡Consult factory to complete part number
‡‡Insert -06 for 6"; -08 for 8" - 20"

When ordering replacement parts, please specify:
• Meter Size • Meter Model • Meter Serial Number
Contact Factory For Pricing.

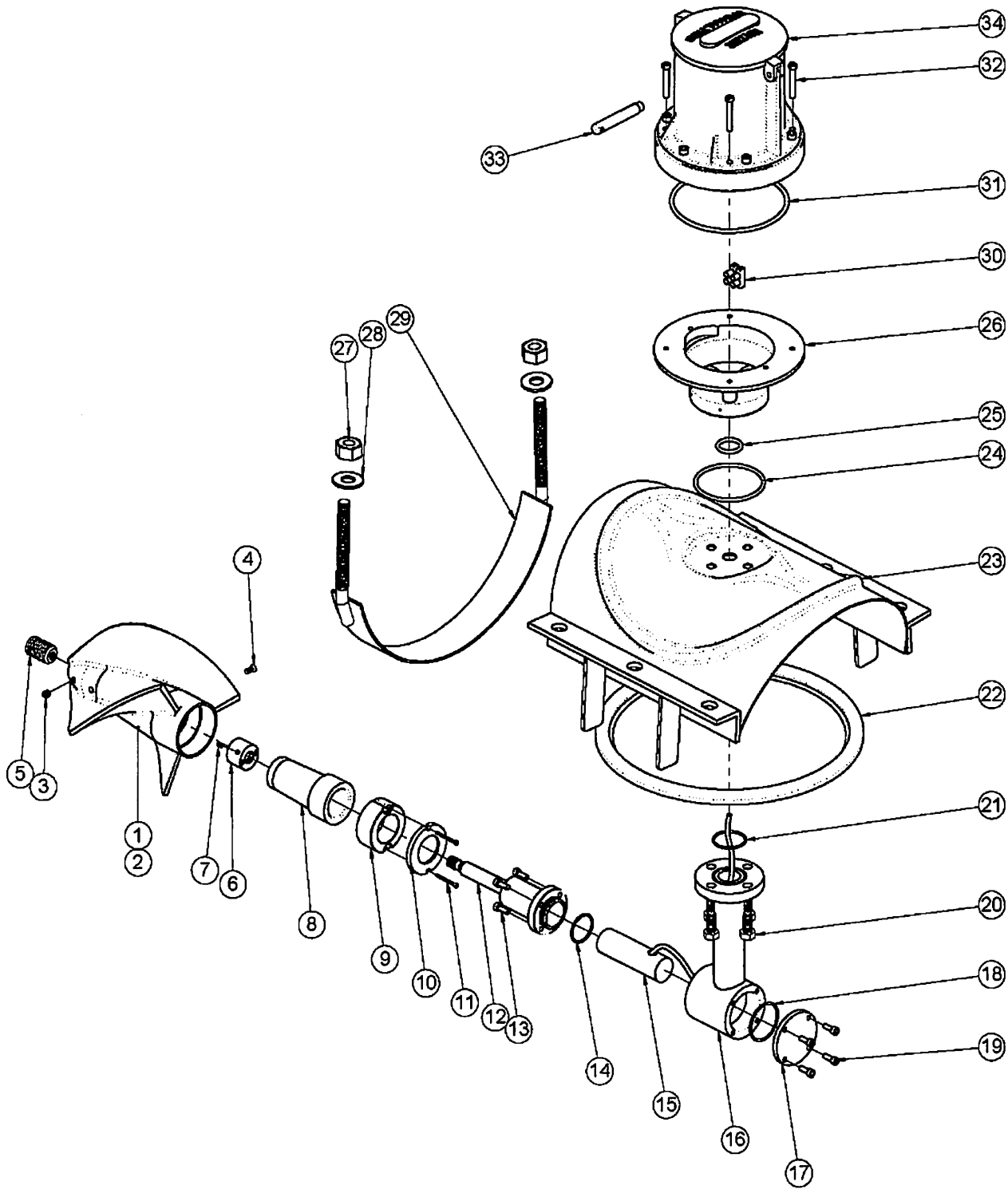
6"-20" STRAP-ON LOW PRESSURE METERS

MODEL LP04D, LP12D, LP32D

*MODEL FC101 INDICATOR-TOTALIZER ASSEMBLY

*CERAMIC BEARING CARTRIDGE PROPELLER

*ONE PIECE SEPARATOR/SPINDLE & THREADED REVERSE THRUST BEARING CARTRIDGE



WARNING:

BEFORE REMOVING THE METER SADDLE FROM THE PIPELINE THE WATER MUST BE TURNED OFF AND PRESSURE MUST BE RELIEVED FROM THE LINE. SERIOUS INJURY CAN RESULT FROM REMOVING A METER SADDLE UNDER PRESSURE.

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Appendix F
Resolution 2017-04: Establishment of Consumptive-Based Water Rates and Operation and Maintenance Charges for 2017

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RESOLUTION 2017-04

ESTABLISHMENT OF CONSUMPTIVE BASED WATER RATES AND OPERATION & MAINTENANCE (O&M) CHARGES FOR 2017

WHEREAS, the Board of Directors of BYRON BETHANY IRRIGATION DISTRICT has the authority to establish rates and charges for the operation of the DISTRICT;

BE IT RESOLVED, the Board hereby orders the following rates and charges for 2017:

- Agricultural Water Rate within the Byron & Bethany Agricultural Service Areas, with a minimum charge of one acre-foot per turn-on.....$65.00 per acre-foot;
- Industrial Raw Water Rate for sand-mining purposes and wetlands mitigation, within the Byron Service Area.....$95.00 per acre-foot;
- Annual Flat Rate Water Service Charge (Interruptible), within the Byron & Bethany Agricultural Service Areas, based on 2 acres or less.....$120.00 per year;
- Construction Water (District Wide) .....$6.00 per unit (3500 gallons);
- Water Availability/Stand-by Charge within the Byron & Bethany Agricultural Service Areas.....$8.00 per acre;
- Category 1 O&M Charge (Central Valley Project Service Area).....$5.15 per acre;
- Category 2 O&M Charge (Central Valley Project Service Area).....$66.00 per acre;
- Category 3 O&M Charge (Central Valley Project Service Area).....$145.50 per acre;
- Category 4 O&M Charge (Central Valley Project Service Area)..... WAIVED;
- Applicable rates and charges of the Bureau of Reclamation and San Luis & Delta-Mendota Water Authority, including the Authority membership assessment, shall constitute the per acre-foot water charge within the Central Valley Project Service Area.

PASSED AND ADOPTED at a Regular Board Meeting of the BYRON BETHANY IRRIGATION DISTRICT, Board of Directors on 15 February 2017 by the following vote:

AYES: **Brown, Enos, Kagehiro, M. Maggiore, T. Maggiore, Musco, Tuso**
NOES:
ABSENT:
ABSTAINED:

Mr. Russell Kagehiro President

Secretary's Certification

I, Kelley Geyer, Deputy Secretary of the Board of Directors of the Byron Bethany Irrigation District, do hereby certify that the foregoing Resolution is a true and correct copy entered into the Minutes of the Regular Board Meeting on 15 February 2017 at which time a quorum was present, and no motion to amend or rescind the above resolution was made.

Kelley Geyer, Deputy Secretary

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Appendix G
Byron Bethany Irrigation District Resolution Regarding Mountain House Community Services District and City of Tracy Urban Water Management Plan

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RESOLUTION 2017-6
BYRON BETHANY IRRIGATION DISTRICT CONCURRENCE WITH (ADOPTION OF/INCORPORATION OF) URBAN WATER MANAGEMENT PLANS FOR MOUNTAIN HOUSE COMMUNITY SERVICES DISTRICT (MHCSD) AND CITY OF TRACY WITH REGARD TO THEIR BBID RAW WATER SUPPLY

WHEREAS, BYRON BETHANY IRRIGATION DISTRICT (BBID) is considered an urban wholesale water supplier by the California Water Code by supplying over 3,000 acre-feet of raw water annually at wholesale for municipal purposes and is thereby required to adopt an Urban Water Management Plan (UWMP);

WHEREAS, BBID has the authority and the wholesale water supply agreements to provide raw water to Mountain House Community Services District (MHCSD) and the City of Tracy (City);

WHEREAS, MHCSD has adopted its UWMP in 2016 (*West Yost Associates. 2015 Urban Water Management Plan, Mountain House Community Services District, May 2016*) and included documentation of its water supplies including BBID's pre-1914 water up to 9,813 acre-feet per year;

WHEREAS, the City has adopted its UWMP in 2016 (*Erler & Kalinowski, Inc. 2015 Urban Water management Plan for the City of Tracy, July 2016*) and included documentation of its water supplies including BBID's pre-1914 water up to 4,500 acre-feet per year;

THEREFORE, BE IT RESOLVED, by the Board of Directors of the Byron Bethany Irrigation District, that in lieu of developing its own UWMP, BBID concurs with the characterization of BBID's water with regard to water supply of MHCSD and the City as depicted in their respective adopted UWMPs.

PASSED AND ADOPTED at a Regular Meeting of the Board of Directors of the Byron Bethany Irrigation District 23 May, 2017 by the following vote:

Ayes: Brown, Kagehiro, T. Maggiore, Tuso
Noes:
Abstained:
Absent: Enos, M. Maggiore, Musco

Mr. Russell Kagehiro, President

Secretary's Certification

I, Kelley Geyer, Deputy Secretary of the Board of Directors of the Byron Bethany Irrigation District, do hereby certify that the foregoing Resolution is a true and correct copy entered into the Minutes of the Regular Meeting on 23, May 2017 at which time a quorum was present, and no motion to amend or rescind the above resolution was made.

Kelley Geyer, Deputy Secretary

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