AGRICULTURAL WATER MANAGEMENT PLAN 2016

Prepared Pursuant to Water Code Section 10826

RECLAMATION DISTRICT 2068
7178 Yolano Road
Dixon, Ca 95620-9621

July 2016

Prepared by

455 University Avenue, Suite 100
Sacramento, CA 95825

Table of Contents

SECTION I: INTRODUCTION 1

A. Description of Previous Water Management Activities 1

B. Coordination Activities 2
1. Notification of AWMP Preparation 2
2. Public Participation 2

C. AWMP Adoption and Submittal 2
1. AWMP Adoption 2
2. AWMP Submittal 2

D. AWMP Implementation Schedule 3

SECTION II: DESCRIPTION OF AGRICULTURAL WATER SUPPLIER AND SERVICE AREA 4

A. Physical Characteristics 4
1. Size of the Service Area 4
2. Location of the Service Area and Water Management Facilities 5
3. Terrain and Soils 8
4. Climate 11

B. Operational Characteristics 12
1. Operating Rules and Regulations 12
2. Water Delivery Measurements or Calculations 13
3. Water Rate Schedules and Billing 13
4. Water Shortage Allocation Policies and Detailed Drought Management Plan 14
5. Basis for Reporting Quantities During the current Plan Cycle (2013 – 2015) 15

SECTION III: DESCRIPTION OF QUANTITY OF WATER USES 16

A. Agriculture Water Use 16

B. Environmental Water Use 19

C. Recreational Water Use 19

D. Municipal and Industrial Use 19

E. Groundwater Recharge Use 19

F. Transfer and Exchange Use 19

G. Other Water Use 19

SECTION IV: DESCRIPTION OF QUANTITY AND QUALITY OF THE WATER RESOURCES OF THE AGRICULTURAL WATER SUPPLIER 20

A. Water Supply Quantity 20

1. Surface Water Supply 20
2. Groundwater Supply 20
3. Other Water Supplies 24
4. Drainage from District's Service Area 24

B. Water Supply Quality 24
1. Surface Water Supply 24
2. Groundwater Supply 24
3. Other Water Supplies 25
4. Drainage from District's Service Area 25

SECTION V: WATER ACCOUNTING AND WATER SUPPLY RELIABILITY 26

A. Quantifying the Water Supplies 26
1. Agricultural Water Supplies 26
2. Other Water Sources 27

B. Quantification of Water Uses 28

C. Overall Water Budget 29
Effective precipitation (summary total from 30
Table 17) 30

D. Water Supply Reliability 30

SECTION VI: CLIMATE CHANGE 32

SECTION VII: WATER USE EFFICIENCY INFORMATION 33

A. EWMP Implementation and Reporting 33
Critical EWMPs (Implemented/Planned/Ongoing) 33
Conditional EWMPs (Implemented/Planned/Ongoing) 33

SECTION VIII: WORK CITED 38

SECTION IX: APPENDICES 39

Appendix A: AWMP Checklist

Appendix B: Coordination Activities

Appendix C: AWMP Adoption and Submittal

Appendix D: Rules and Regulations

Appendix E: Water Rates and Billing

Appendix F: NDWA Contract and MOU

FIGURES

Figure 1. RD 2068 Vicinity Map 4
Figure 2. District Service Area and Surface Water Conveyance System 7
Figure 3. Soils and Terrain in Yolo County 9
Figure 4. Soils and Terrain in Solano County 10
Figure 5. Solano County Groundwater Sub-basin Map (Luhdorff and Scalmanini, 2014) 21
Figure 6. Groundwater Monitoring Well Network within RD 2068 (West Yost, 2013) 23

TABLES

Table 1. Summary of Coordination, Adoption, and Submittal Activities 3
Table 2. Water Supplier History and Size 5
Table 3. Summary of Climate Characteristics for the 11
Table 4. Detailed Climate Characteristics for the Period 1995 – 2015 at CIMIS Station No. 121 (Dixon) 12
Table 5. Lead Times for Water Orders 13
Table 6. Summary of Farmgate Turnouts and Method of Delivery Measurement 13
Table 7. Plan Cycle Years 15
Table 8. Agricultural Water Deliveries for 2013 – 2015 16
Table 9. Agricultural Crop Data for 2013 17
Table 10. Agricultural Crop Data for 2014 18
Table 11. Agricultural Crop Data for 2015 18
Table 12. Summary of Surface Water Rights 20
Table 13. Surface Supply Water Quality Monitoring Practices 24
Table 14. Summary of Diversions from Haas Slough at Pumping Plant No. 1 26
Table 15. Summary of Inflow from Upstream Districts 27
Table 16. Summary of Estimated Recirculated Flow within the District 27
Table 17. Effective Precipitation (AF) 28
Table 18. Summary of Water Uses within RD 2068 29
Table 19. Water Leaving the District 29
Table 20. Water Irrecoverable Losses 29
Table 21. Quantification of Total Water Supplies (acre-feet) 30
Table 22. Water Budget Summary 30

Section I: Introduction

Reclamation District 2068 (RD 2068 or District) has prepared this Agricultural Water Management Plan (AWMP) to comply with both the requirements of SBx7-7, and with Governor Browns' Executive Order B-29-15 (April 1, 2015). The District received grant funds from the Department of Water Resources (DWR), under Proposition 50, to develop this AWMP. This AWMP was prepared in accordance with the *Guidebook to Assist Agricultural Water Suppliers to Prepare a 2015 Agricultural Water Management Plan*[1]. A checklist of the Water Code requirements for the AWMP content, preparation and adoption is included in **Appendix A** of this AWMP.

A. Description of Previous Water Management Activities

The District proactively manages operations to facilitate effective and efficient water deliveries. Examples of previous water management activities that have improved overall District operations include:

- Infrastructure improvements to the District's main pumping facilities to consolidate facilities and improve overall conveyance system efficiency
- Installation of automated controls on pumps at main pumping plants 1 - 4
- Installation of a regulating reservoir at main pumping plant facilities providing for optimal system flexibility
- Installation and maintenance of lift pumps throughout the District to recapture conveyance system spills and tailwater from landowner operations

In addition, the District is a founding member of the Solano Agricultural Water Conservation Committee[2] (SAWCC) which assists growers, and irrigators in Solano County with irrigation management and water use efficiency at the farm level. Activities of the SAWCC include:

- Operation of eight automated weather stations for use by growers for irrigation scheduling and farm management. Weather information is accessible by website, daily email or telephone.
- Weather website with local agricultural irrigation information, available at www.westernwx.com/sid
- Weather forecast services focusing on Solano County. The comprehensive agricultural forecast is available daily, at a cost of $120/year.
- Soil moisture monitoring
- Soil sensor installations and training

[1] http://www.water.ca.gov/wateruseefficiency/sb7/docs/2015/Approved%20Final%202015%20AWMP%20Guidebook%20June%202015.pdf

[2] The Committee is comprised of representatives from the Solano County Water Agency, Solano Irrigation District, Maine Prairie Water District, Reclamation District 2068, Dixon Resource Conservation District, Solano Resource Conservation District, U.C. Cooperative Extension, and the Natural Resources Conservation Service.

- Irrigation System Evaluations
- Irrigation Scheduling services
- Pump Efficiency Testing
- Annual Irrigation Efficiency Workshops
- Annual newsletter, *The Irrigator*
- Spanish language workshops

More information relative to the Solano Agricultural Water Conservation Committee may be accessed at http://www.scwa2.com/water-conservation/agricultural-water-conservation.

B. Coordination Activities

1. Notification of AWMP Preparation

Agricultural Water Suppliers are required to prepare an AWMP pursuant to SBx7-7, and must notify each city and county where they provide water supplies that the agricultural water supplier is preparing or reviewing a plan, and is considering changes or amendments to the plan. SBx7-7 does not specify how much advance notification to cities and counties is required, nor does it require notification to any other agency (or agencies). Furthermore, SBx7-7 does not require that comments from any city, county, or agency be solicited or considered. **Table 1** identifies the entities notified by the District. A copy of the public notice of the District's intention to prepare an AWMP is presented in **Appendix B**.

2. Public Participation

Notice of a public hearing to consider adoption of the AWMP, and to comply with the provisions of SBx7-7, was published July 22, 2016, July 29, 2016, and August 5, 2016 in the Dixon Tribune. The notice identified that the Draft AWMP was available for public review at the District's office, identified the time and date of the hearing for public comment, as well as the District's intention to adopt the AWMP. A copy of the notice was published in the Dixon Tribune, and is provided in **Appendix B**.

C. AWMP Adoption and Submittal

1. AWMP Adoption

Following the public hearing and input from stakeholders, the District reviewed and formally adopted the AWMP as part of the District's strategy to enhance overall system management. A copy of the resolution adopting the AWMP is provided in **Appendix C**.

2. AWMP Submittal

Consistent with California Water Code Section 10843, a copy of the AWMP was provided to the entities identified in **Table 1**.

The letter transmitting the AWMP to the DWR is provided in **Appendix C**. A copy of the letter and AWMP were transmitted to the entities above, pursuant to the requirements of California Water Code Section 10843. An electronic copy of the AWMP was also provided to DWR, consistent with California Water Code Section 10844.

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

Potential Interested Parties	Notified of Public Hearing and Intention to Adopt	Copy of Adopted AWMP/ Amendment Sent
Department of Water Resources	-	August 12, 2016
Yolo County	-	August 12, 2016
Solano County	-	August 12, 2016
LAFCO	-	August 12, 2016
Any cities wherein which water is supplied: The District does not supply water to any cities within its service area.	N/A	N/A
Urban water suppliers within which jurisdiction(s) water is supplied: The District does not supply water to any cities within its service area.	N/A	N/A
Any city or county library within which jurisdiction water is supplied	N/A	N/A
The California State Library	N/A	August 12, 2016
Local newspaper: Dixon Tribune	July 22, July 29 & August 5, 2016	

D. AWMP Implementation Schedule

The District has adopted this AWMP in accordance with the provisions of SBx7-7. As identified in this AWMP, the District has implemented many efficient water management practices (EWMPs), including the water measurement and volumetric pricing EWMPs.

Section II: Description of Agricultural Water Supplier and Service Area

A. Physical Characteristics

1. Size of the Service Area

RD 2068 encompasses approximately 13,200-acres in Solano and Yolo Counties (**Figure 1**). RD 2068 was formed in 1924, under the provisions of the reclamation district section of the California Water Code, currently Division 15 (Sections 50000 et. seq.). Reclamation works included levees, drains, and a drainage pumping plant. Concurrent with the reclamation work, an irrigation system of pumping plants, canals, and a distribution system were constructed to deliver surface water from the Delta. Surface water deliveries began in 1926.

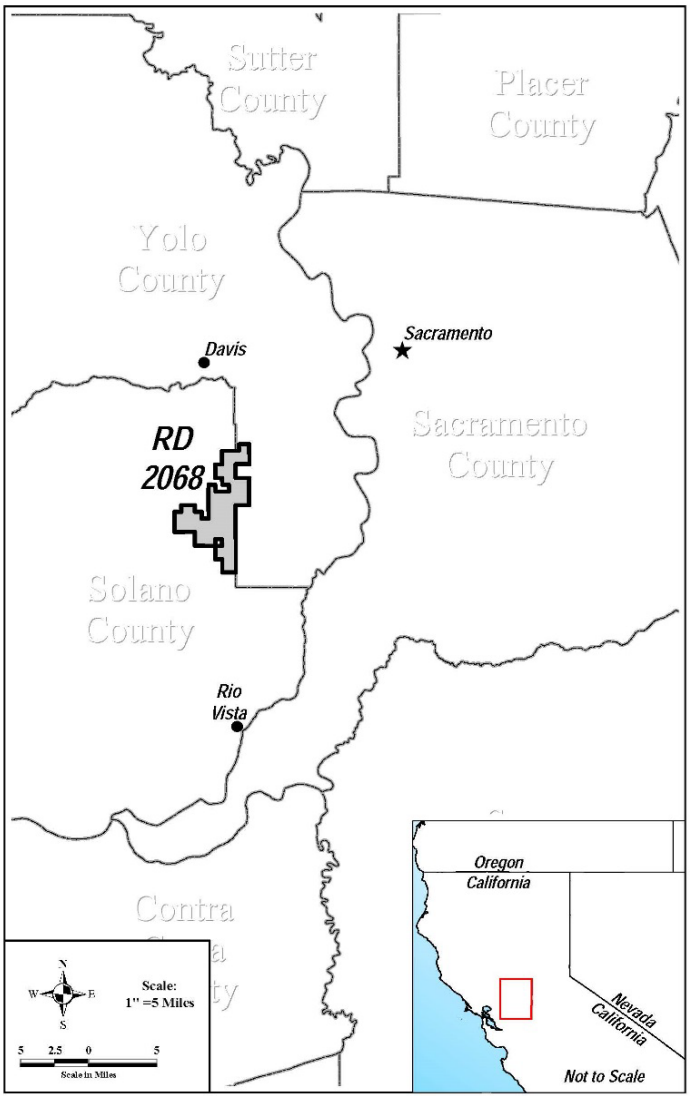

Figure 1. RD 2068 Vicinity Map

The District is a multi-county district, serving Solano and Yolo Counties. Solano County is the designated principal county, as 80 percent of assessed value lies within its county limits (Michael Brandman Associates, 2009).

Table 2. Water Supplier History and Size

Date of Formation	Date: April 7, 1924
Source of Water	
Local Surface Water	X
Local Groundwater	X 1/
Service Area Gross Acreage	13,200
Average Irrigated Acreage (2013 – 2015)	12,835
1/ The District owns one groundwater production well. Two individual landowners own and operate groundwater wells (4 total) within the District service area.	

Land use planning is under the authority and responsibility of the county, not the District. Accordingly, it is the responsibility of the county to assess existing and proposed land uses from the standpoint of impacts on groundwater supplies and contamination. The Solano County General Plan identifies the zoning for the District as intensive agriculture. A portion of the agricultural area lies within the Yolo Bypass, which is used to convey floodwaters from the Sacramento Valley at times when the Sacramento River flows exceed the river's physical capacity to move water into the Delta. The area served by the District is currently designated as a Resource Conservation Overlay. This designation is used to identify and protect areas with special resource management needs. There are no plans to convert agricultural lands to residential or commercial use in Solano County's General Plan. As a result, the District does not anticipate the need to update or expand the sphere of influence (Brandman Associates, 2009).

At various times, the District has considered minor property annexations. Because of the size of the District, and the variety of supplies available, these minor property annexations do not result in a material change in the available water supply. The District's most recent annexation occurred in the 1960s.

2. Location of the Service Area and Water Management Facilities

The District is located within the northwestern portion of Yolo County, the eastern portion of Solano County, and includes the unincorporated and undeveloped community of Yolano. The District's delivery system includes approximately 50 miles of open canals, four primary surface water pumping plants, numerous agricultural drain water recovery pumping plants, and 47 miles of associated drainage canals. The Haas Slough diversion (Pumping Plant No. 1) is capable of diverting approximately 320 cubic feet per second (cfs) for delivery to the second Pumping Plant (Pumping Plant No. 2), and subsequent delivery to Pumping Plants Nos. 3 and 4. Gravity inflow from upstream irrigation districts and operations contribute to the available water supplies at

Pumping Plants Nos. 1, 2, 3, and 4. In addition, the District maintains and operates 22 lift pumps to recapture operational spills and runoff from individual landowner operations. Effectively, all land within RD 2068 has been developed for irrigated agriculture.

A map showing the District and major facilities is included as **Figure 2**.

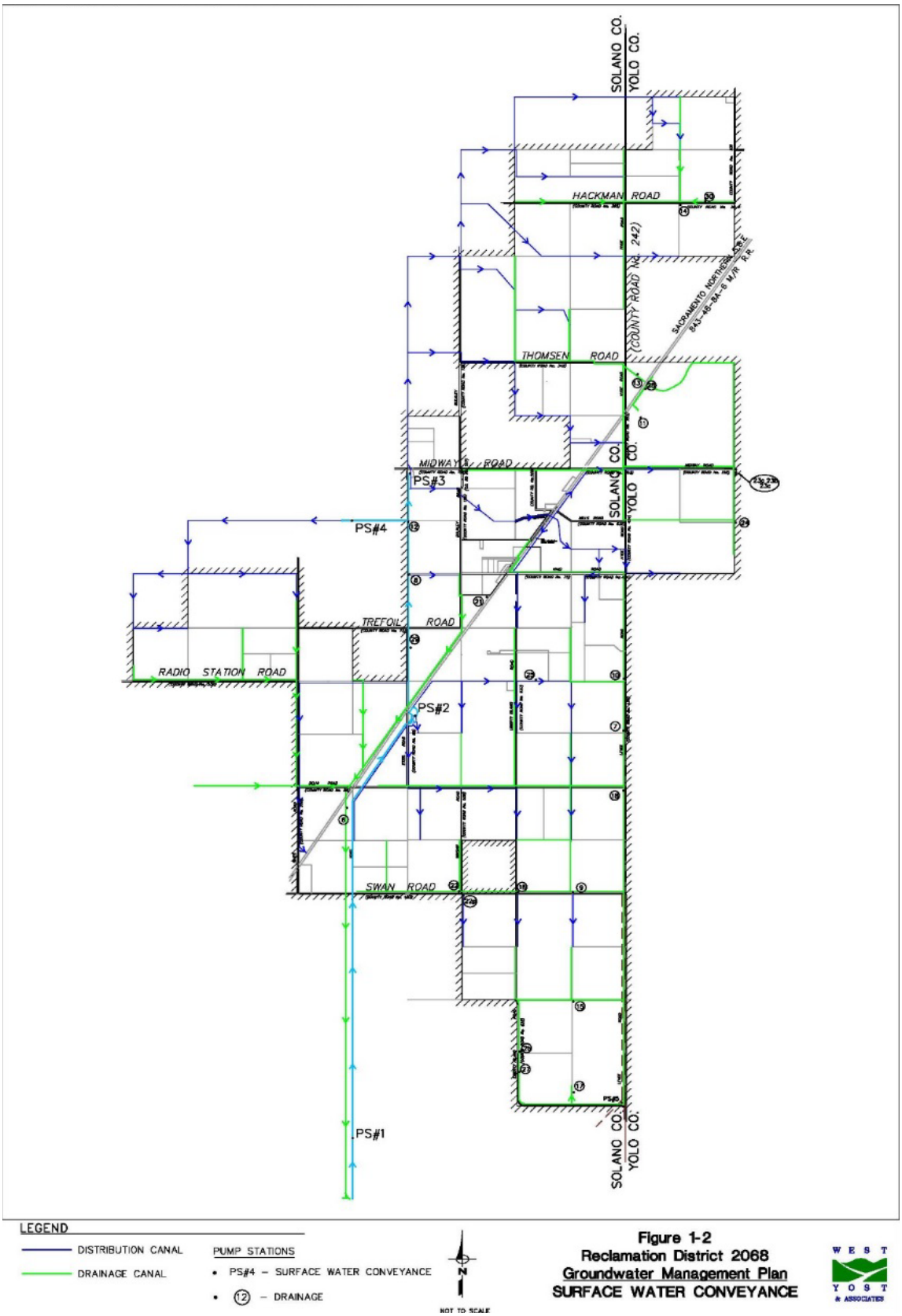

Figure 2. District Service Area and Surface Water Conveyance System

3. Terrain and Soils

RD 2068 is located in the Solano Sub-basin (Sub-basin 5-21.66) of the Sacramento Valley Groundwater Basin, as defined in the *DWR Bulletin 118* update (DWR, 2003). Land surface elevations within the Solano Sub-basin range from approximately 0 feet above mean sea level (AMSL) along the southeast edge, to approximately 550 feet AMSL along the west edge. The topographic relief is low, with the exception of the area near the western edge of the basin, where land surface elevations increase with proximity to the Coast Ranges. Land surface elevations within the RD 2068 service area range from approximately 10 to 40 feet (West Yost, 2006).

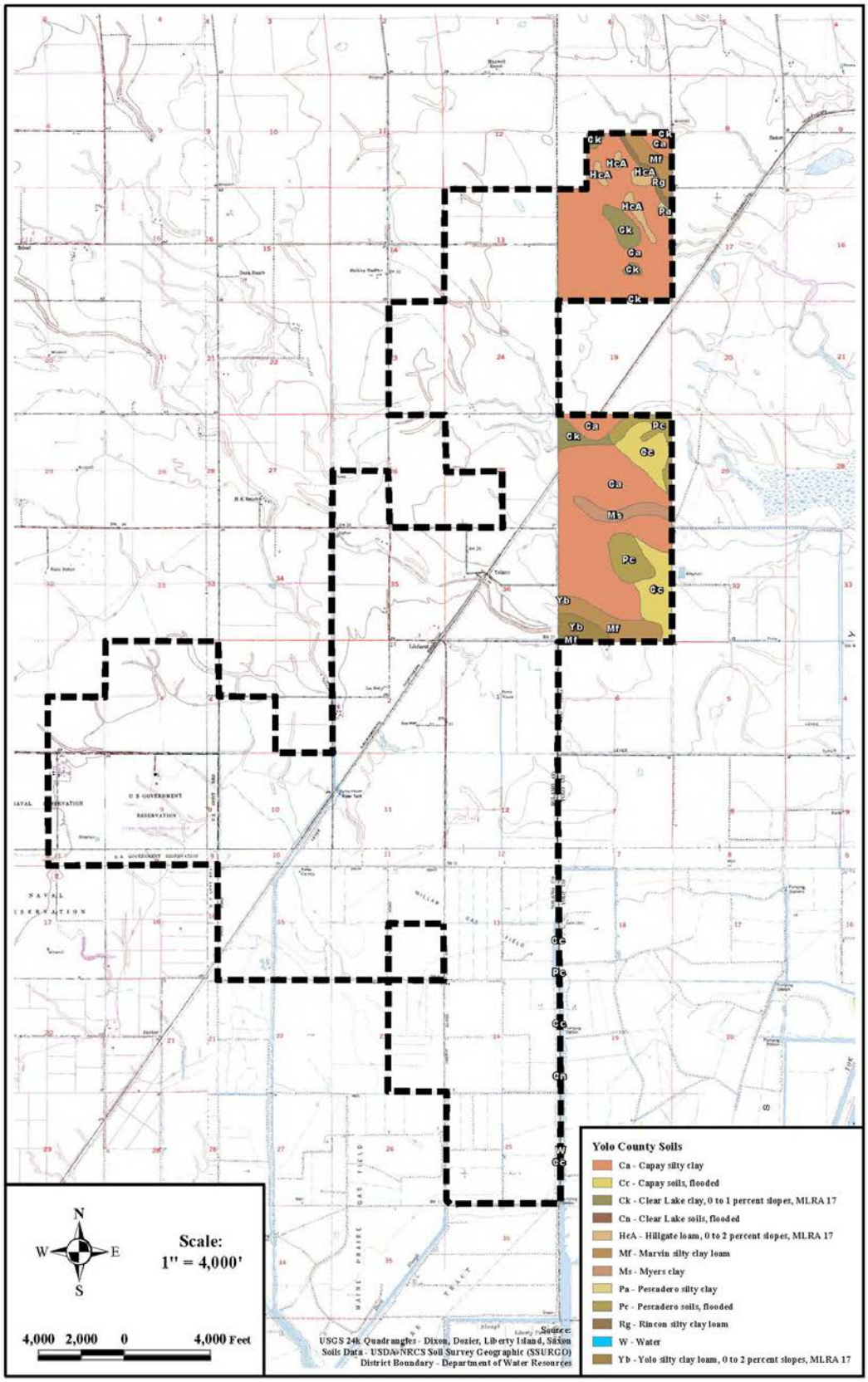

Figure 3. Soils and Terrain in Yolo County

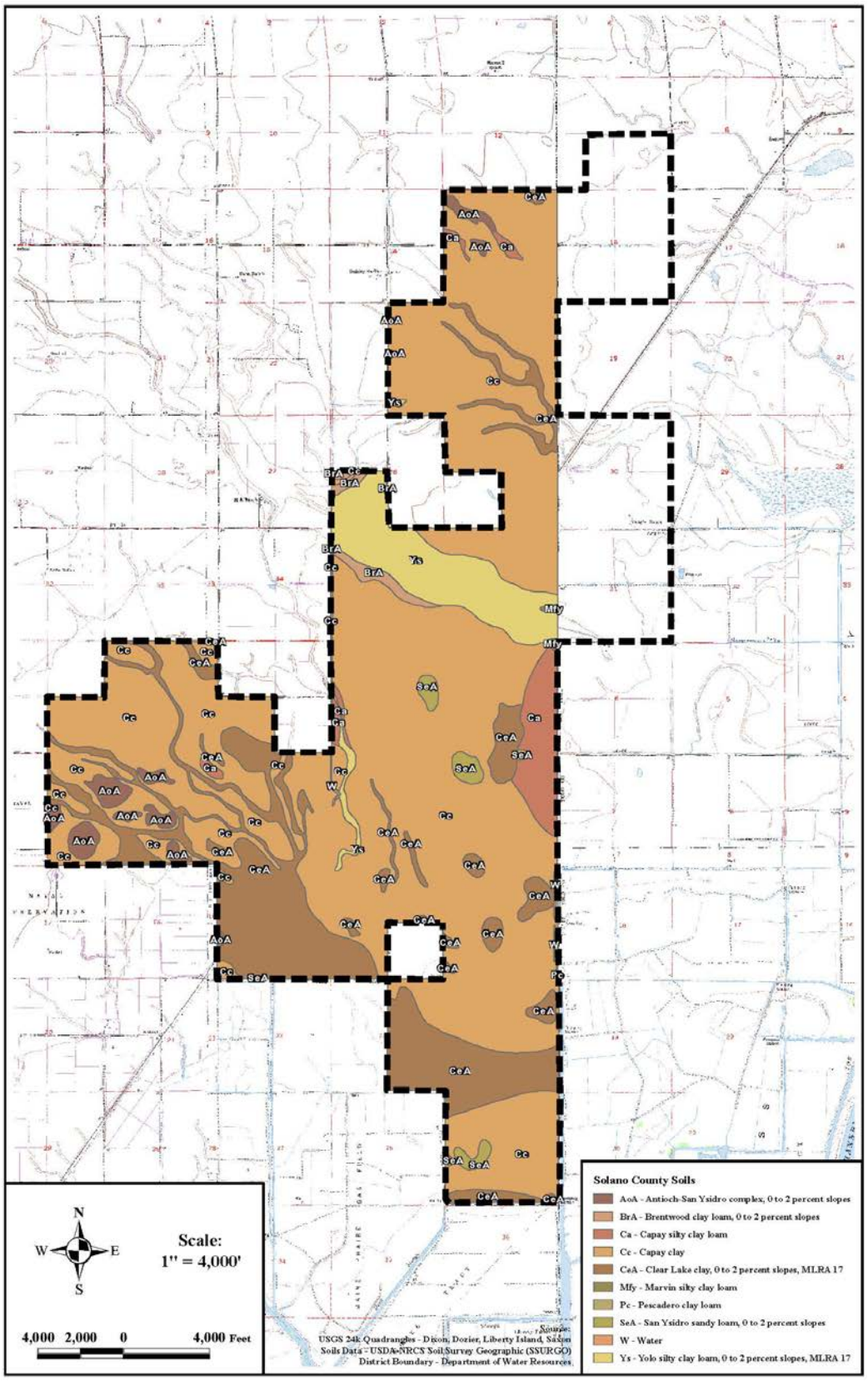

Figure 4. Soils and Terrain in Solano County

4. Climate

The Solano Sub-basin has a Mediterranean climate with cool, wet, winters and hot, dry, summers. Regionally, temperature and precipitation vary with elevation, with the lower temperatures and higher precipitation occurring at higher elevations. The average annual precipitation varies from 16 inches near the eastern edge of the sub-basin, to 23 inches near the western edge (DWR, 2004a). However, because of the low topographic relief over most of the sub-basin, temperature and precipitation do not vary greatly over the sub-basin (West Yost, 2006).

A summary of the climate characteristics for the period of 1995 to 2015 at California Irrigation Management Information System (CIMIS)[3] Dixon Station, Station No. 121, located near the District's service area, is shown in **Table 3**.

Table 3. Summary of Climate Characteristics for the Period 1995 – 2015 at CIMIS Station No. 121 (Dixon)

Climate Characteristic	Value
Average Annual Precipitation (inches)	17.7
Annual Minimum Precipitation (inches)	3.9
Annual Maximum Precipitation (inches)	29.9
Average Annual Minimum Temperature	45.6
Average Annual Maximum Temperature	78.2

[3] http://wwwcimis.water.ca.gov/

Table 4. Detailed Climate Characteristics for the Period 1995 – 2015 at CIMIS Station No. 121 (Dixon)

Month/Time	Average Precipitation, Inches	Average Reference Evapotranspiration (Et_o), Inches	Average Minimum Temperature, °F	Average Maximum Temperature, °F
January	3.6	1.2	35.9	55.3
February	3.5	1.9	38.4	60.0
March	2.3	3.7	40.8	65.8
April	1.1	5.2	42.8	70.4
May	0.6	6.9	48.6	77.9
June	0.1	7.9	53.8	84.6
July	0.0	8.3	56.4	88.8
August	0.0	7.3	55.5	88.5
September	0.1	5.6	53.1	85.8
October	0.6	4.0	46.7	76.8
November	1.7	1.9	39.9	64.1
December	4.1	1.2	35.5	55.2
Wet Season**	2.4	2.7	40.0	63.9
Dry Season**	0.2	7.2	53.5	85.1

Notes:
**Wet season is typically October through April

B. Operational Characteristics

The District is governed by a five-member board of trustees who are elected to four-year terms. Trustees must be landowners or legal representatives of landowners. The Board meets on the second Thursday of each month at 2 p.m. at 7178 Yolano Road in Dixon. Meetings are noticed according to the Brown Act.

The District has eight full-time employees: one executive staff member, one executive support staff member, and six operations staff people. The General Manager also acts as Secretary to the Board. The executive support staff is responsible for routine office operations and financial reporting. The operations staff is responsible for general maintenance and operation of the water distribution, drainage, and levee systems.

1. Operating Rules and Regulations

The Rules and Regulations, as last amended by the District's Board of Trustees in January 2014, govern the distribution of water, and defines the rates and charges for water service. The Rules and Regulations are presented in **Appendix D**.

The District's water delivery system is operated as a modified demand system. This manner of operation is the most efficient in terms of managing water within the District. The District delivers water at the request of the farmers. Fulfillment of any request for changes in deliveries, received by 3p.m., are made the following day. A summary of the lead times for water orders is provided in **Table 5**. This type of operation facilitates the most efficient use of water for irrigation.

Table 5. Lead Times for Water Orders

Operations	Hours
Water orders	16
Water shut-off (discontinue)	16

Information necessary for the start of seasonal water service is collected by District staff. The information collected includes the crop, number of acres of each field, the landowner's name, the tenant's name and address, the District turnout identification, and other information.

2. Water Delivery Measurements or Calculations

The District measures the volume of water delivered through each turnout by various devices including meter gates, weirs, and pumps. Unmeasured deliveries are closely monitored and estimated at a small number of turnouts where measurement is problematic. A summary of the farmgate turnouts and method of measurement is provided in **Table 6**.

Table 6. Summary of Farmgate Turnouts and Method of Delivery Measurement

Year	Method of Measurement					Total Farmgate Turnouts*
	Meter Gate	Weir	Pump Test/Hours	Propeller Meter	Estimated	
2013	99	20	21	3	7	150
2014	99	23	21	2	11	156
2015	102	22	19	2	7	152

* Total farmgate turnouts include all points of service and is the sum of meter gates, weirs, pumps, propeller meters and estimated delivery points.

The District calibrates the devices used to measure deliveries on an as needed basis, or when requested by a landowner.

3. Water Rate Schedules and Billing

The District provides water for agricultural irrigation purposes within the District's service area. The amount charged to landowners is based on a water rate, annual assessment, and standby charge. The total water rate changes each year. For 2015, the water rate was $13.00 per acre foot plus $0.55 per acre-foot for regulatory program costs.

The District's monthly bill statement includes information regarding irrigation event(s) from the previous month. This information includes a comparison of the actual volume of water delivered to a field with the theoretical Crop Evapotranspiration (ETc) and a target ETc based on an assumed irrigation efficiency. The irrigation efficiency is based on estimates by District staff, or if available, are determined from on-farm field evaluation of distribution uniformity. The theoretical ETc is determined based on the crop coefficient (Kc), irrigation start dates, and real-time reference evapotranspiration (ETo) data. Information is provided in both tabular and graphic display to assist farmers and landowners in evaluating on-farm irrigation efficiencies.

An example bill is provided in **Appendix E**.

4. Water Shortage Allocation Policies and Detailed Drought Management Plan

During the prolonged drought conditions in the early 1930s, diversions by the District demonstrated poor water quality characteristics (high electrical conductivity) as a result of tidal fluctuations and salt water intrusion into the interior delta channels. During this time, water quality was monitored and priority to better quality surface water supplies was given to permanent crops, when available. Since then, the District has not initiated water shortage allocation policies, as sufficient surface water of suitable quality has been available to meet demand. This is in part due to the construction of the Solano Project and facilities, which supply upstream irrigation districts with surface water; thereby making drainage water available to RD 2068. In addition, the formation of North Delta Water Agency (NDWA), and the subsequent negotiation and execution of the *Contract Between State of California Department of Water Resources and North Delta Water Agency for the Assurance of a Dependable Water Supply of Suitable Quality* (1981 Contract), provided further water supply benefits to lands within the northern Delta, including lands within RD 2068. A copy of the 1981 Contract is provided in Appendix F. The water supply and water quality assurances are affirmed in the *Memorandum of Understanding* between the NDWA and DWR, dated May 26, 1998 (**Appendix F**).

The 1981 Contract acknowledges the right of landowners within the NDWA to divert water for reasonable and beneficial uses, and provides assurance of a dependable water supply of suitable quality, to lands within the NDWA. To meet these assurances, the 1981 Contract requires the DWR to operate the State Water Project (SWP) to meet fixed water quality criteria at seven locations within the NDWA. These criteria are in effect throughout the year, and must be met, except under defined drought emergency conditions. Although a defined drought emergency was triggered, pursuant to the 1981 Contract in 2015, reduced water supplies (either of quality or quantity) were not experienced by RD 2068.

The District relies on the assurance of a dependable water supply and drought provisions identified in the 1981 Contract to address water shortage allocation policies and drought management during periods of dry hydrology. If the 1981 Contract and provisions are not sufficient to address potential shortages, and if drought conditions persist, the District will consider and adopt a water allocation policy and pricing structure necessary to respond to the then current circumstances.

5. Basis for Reporting Quantities During the current Plan Cycle (2013 – 2015)

The state has gone into a period of "exceptional drought", as defined by the U.S. Drought Monitor. The water year types in the Sacramento Region went from "dry" in 2013, to "critical" in 2014 and 2015. The District has elected to report water use and water supply data for 2013 through 2015 in subsequent sections of this AWMP (**Table 7**). Executive Order B-29-15 requires quantification of water demand for 2013, 2014, and 2015 to the extent data is available. Data for 2015 has not been reviewed for quality control/assurance; therefore, 2015 data included in this AWMP is provisional and subject to revision.

Table 7. Plan Cycle Years

	Description
Representative year(s) based upon	2013-2015
First month of representative year	January
Last month of representative year	December

Section III: Description of Quantity of Water Uses

A. Agriculture Water Use

Agricultural lands within the District are irrigated with surface water supplies and recirculated tailwater. Some landowners have privately owned groundwater wells, which have historically been used at times when District surface water is not available (generally, December through March). Some lands are irrigated with water from a combination of these surface water sources of supply.

Annual water deliveries ranged from 59,403 acre-feet to 65,073 acre-feet during the period of 2013 through 2015. The quantities in **Table 8** are based on the District's water sales, and include measured deliveries and estimates of unmeasured deliveries based on the knowledge and experience of District personnel, consistent with the District's Assembly Bill 1404 – *Agricultural Aggregated Farm-Gate Delivery Reporting Form for Article 2*. Farm-gate deliveries include diversions under the District's water rights, 1981 Contract, purchased contract water, and recaptured and recirculated tailwater. These quantities differ from the diversions reported under the District's water rights. All of the water was obtained from the Delta or from drainage channels flowing toward the Delta, and was used for agriculture.

Table 8. Agricultural Water Deliveries for 2013 – 2015

Source	2013	2014	2015
Agricultural Water Supplier Delivered			
Surface Water	64,234	59,403	65,073
District Groundwater	0	0	0
Other – Recaptured Tailwater	Quantity included in "Surface Water"	Quantity included in "Surface Water"	Quantity included in "Surface Water"
Other Water Supplies Used			
Private Groundwater	Quantity unknown	Quantity unknown	Quantity unknown

Land use within the District, and in the surrounding area, is primarily agricultural. Typical crops within the District's service area include alfalfa, beans, beets, corn, sudan grass, sunflower, safflower, wheat, tomatoes and pasture. In recent years, specialty agricultural operations with seasonal requirements for groundwater have developed. These specialty operations include turf grass and aquiculture operations and require a year-round water supply, which is enabled by groundwater pumping by private parties when the District's surface water distribution system is inoperative or during periods when application of groundwater is optimal for agronomic practices.

Crops have been grouped by crop type for the purposes of estimating crop water needs for this AWMP. **Table 9, Table 10, and Table 11** show the crop water needs for the major crop categories grown within the District during the Plan Cycle covered under this AWMP. The water requirements to meet ETc, cultural practices, and leaching requirements were determined for each crop based on

data from CIMIS and information developed by the Irrigation Training and Research Center (ITRC), located at California Polytechnic State University, San Luis Obispo. Reference Evapotranspiration (ETo) is based on the average monthly ETo published by CIMIS for the Dixon station (Station No. 121). Kc values were developed based on ETc data for Zone 14 contained in ITRC Report 03-001 - *California Crop and Soil Evapotranspiration* (January 2003), assuming surface irrigation in a typical year for 2013, and assuming surface irrigation in a dry year for 2014 and 2015. Leaching requirements are based on information contained in *FAO Irrigation and Drainage Paper 29*, Revision 1 (1994).

The crops and total irrigated acreage identified in **Table 9, Table 10, and Table 11,** include double cropped parcels. The total irrigated acres may exceed the gross acreage irrigable within the District boundary. However, these tables accurately identify the total demand based on crop water needs within the District. In addition, many crops grown within the District are permanent crops, and as such the ETc included in the tables below include estimated water use from January through December.

Table 9. Agricultural Crop Data for 2013

Crop Type	Total Acreage	ET crop (AF)	Cultural Practices (AF)	Leaching Requirement (AF)	Total Crop Water Needs (AF)
Alfalfa	2,754	11,392	-	303	11,695
Apples	75	378	-	12	390
Corn	277	727	-	39	766
Pasture and Misc. Grasses	8,250	34,310	-	248	34,558
Misc. field crops	41	96	-	7	103
Rice	193	678	241	12	931
Sunflower	192	485	-	12	497
Tomatoes	0	0	-	0	0
Walnuts	166	572	-	18	590
Wheat/Oats	634	1,196	-	114	1,310
Total	**12,582**	**49,834**	**241**	**765**	**50,840**

Table 10. Agricultural Crop Data for 2014

Crop Type	Total Acreage	ET crop (AF)	Cultural Practices (AF)	Leaching Requirement (AF)	Total Crop Water Needs (AF)
Alfalfa	2,613	11,302	-	0	11,302
Apples	75	388	-	5	393
Corn	0	0	-	0	0
Pasture and Misc. Grasses	9,520	41,949	-	1,523	43,472
Misc. field crops	50	126	-	4	130
Rice	0	0	0	0	0
Sunflower	183	500	-	0	500
Tomatoes	0	0	-	0	0
Walnuts	308	0	-	0	0
Wheat/Oats	804	1,484	-	32	1,516
Total	**13,553**	**55,749**	**0**	**1,564**	**57,313**

Table 11. Agricultural Crop Data for 2015

Crop Type	Total Acreage	ET crop (AF)	Cultural Practices (AF)	Leaching Requirement (AF)	Total Crop Water Needs (AF)
Alfalfa	2,923	12,643	-	175	12,818
Apples	75	388	-	0	388
Corn	510	1,415	-	41	1,455
Pasture and Misc. Grasses	8,502	37,465	-	0	37,465
Misc. field crops	126	318	-	0	318
Rice	0	0	0	0	0
Sunflower	30	82	-	0	82
Tomatoes	43	107	-	0	107
Walnuts	160	0	-	10	10
Wheat/Oats	0	0	-	0	0
Total	**12,369**	**52,418**	**0**	**226**	**52,643**

Of the 13,200 gross acres within the District boundary, approximately 12,144 net acres are irrigated in any given year. It is estimated that approximately 2 to 10 percent of the net acreage irrigated within the District boundary is double cropped.

B. Environmental Water Use

The District does not provide water for environmental uses inside the District service area.

C. Recreational Water Use

The District provides water for recreational duck hunting uses inside the District service area. In addition, excess agricultural tailwater is made available to the California Department of Fish and Wildlife for use on the Yolo Basin Wildlife Area properties for habitat uses.

D. Municipal and Industrial Use

The District does not provide water for municipal and industrial uses within the District service area.

E. Groundwater Recharge Use

The District does not provide water for direct groundwater recharge within the District service area.

F. Transfer and Exchange Use

The District participated in a temporary water transfer in 2011. A total of 411.1 acre-feet were made available by groundwater substitution to Solano County Water Agency (SCWA) in order to provide additional municipal, industrial, and domestic water supplies. The District participated in the 1991 fallowing transfer program with the DWR. No other water transfers have occurred.

G. Other Water Use

The District does not provide water for other water uses within the District's service area.

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

A. Water Supply Quantity

1. Surface Water Supply

RD 2068 holds water right Licenses 6103 (Application 2318) and 9339 (Application 19229), as well as Permit 19205 (Application 24961). **Table 12** summarizes these rights.

Table 12. Summary of Surface Water Rights

Water Right	License 6103 Application 2318	License 9339 Application 19229	Permit 19205 Application 24961
Source	Haas Slough	Haas Slough	Dixon Drainage
Season	March 1 to Oct 31	November 1 to March 1	March 1 to October 31
Priority Date	April 22, 1921	February 11, 1960	December 23, 1975
Purpose of Use	Irrigation	Irrigation and Recreation	Irrigation
Quantity	200 cfs	42 cfs	55 cfs 20,000 acre-feet/year

RD 2068 has filed 21 Statements of Diversion for water diverted from either constructed, and/or natural, drainages within RD 2068.

As previously described, RD 2068 lands are included in, and receive, the contractual protections of the 1981 Contract between NDWA and DWR. The 1981 Contract acknowledges the right of landowners within the NDWA to divert water for reasonable and beneficial uses at times when their water rights may otherwise be deficient.

2. Groundwater Supply

RD 2068 is located in the Solano Sub-basin (Sub-basin 5-21.66) of the Sacramento Valley Groundwater Basin, as defined in the *DWR Bulletin 118* update (DWR, 2003). **Figure 5** shows the location of the groundwater sub-basin. The sub-basin is bounded by Putah Creek on the north; the Sacramento River on the east; Delta channels to the southeast and south; and a hydrologic divide in the west (DWR, 2004a). The western hydrologic divide corresponds to the crest of the English Hills and Montezuma Hills and separates the Solano Sub-basin from the Suisun-Fairfield Groundwater Basin (West Yost, 2006).

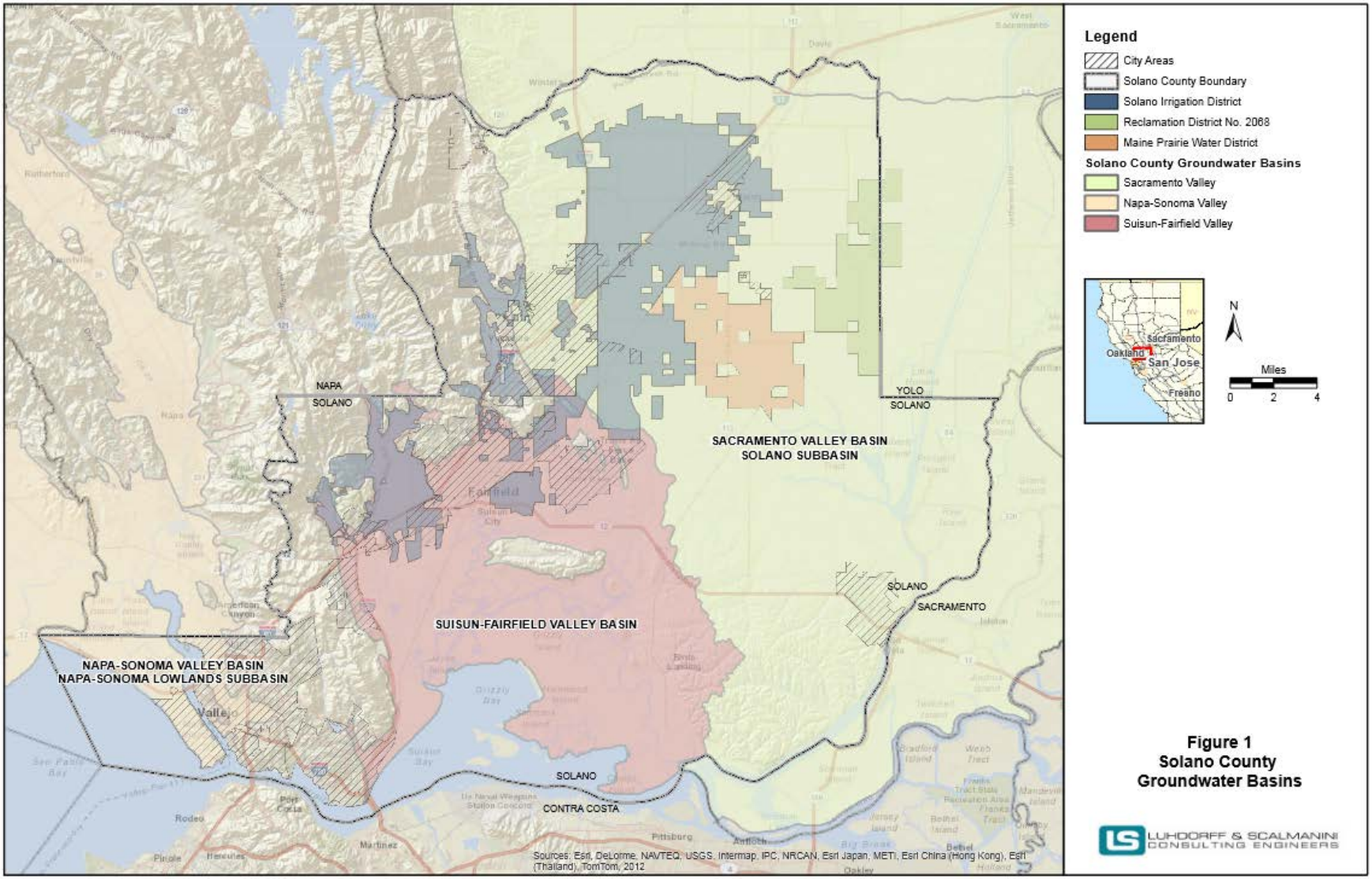

Figure 5. Solano County Groundwater Sub-basin Map (Luhdorff and Scalmanini, 2014)

Groundwater Monitoring

RD 2068 and other public entities monitor groundwater elevations within the Solano Sub-basin. Results of this monitoring identified typical fall to spring fluctuations in groundwater elevations in the monitored wells were roughly 20 feet or less. These seasonal fluctuations occurred in response to California's climate. Most precipitation occurs between November and March. Crop water needs, and groundwater pumping requirements, are minimal during this period. Groundwater recharge comes from precipitation, which contributes to increasing groundwater elevations through about April of each year. Minimal precipitation occurs between April and October during periods when crop demand is high. Reduced recharge of precipitation in addition to increased pumping, leads to decreasing groundwater elevations through about September of each year (West Yost, 2006).

Land Subsidence

Land subsidence of up to 5.4 feet has been documented over the past few decades, in a north-south trending zone, in the southwestern Sacramento Valley that extends from Zamora to Dixon (Ikehara, 1994). Down-well television surveys have been used to document well casings damaged by land subsidence over this same zone, at the Yolo/Colusa County line, and northward into central Colusa County. Of 81 wells found to be damaged, the substantial damage was concentrated in the sections of the well casings penetrating the Tehama Formation. A comparison of damaged and undamaged wells, in the main area of subsidence, showed similar amounts of compressible sediments and revealed the damaged wells were those where the greatest declines in head had occurred after well installation (Borchers, 1998). Recent studies have verified that subsidence is continuing to occur in the Yolo County portion of this zone (Frame, 2005).

The Yolo County GPS Subsidence Network has six land subsidence benchmarks, and the Delta Land Subsidence Monitoring Network has three, with both located in the vicinity of RD 2068 (**Figure 6**). In addition, RD 2068 installed a permanent land subsidence benchmark (**Figure 6**) using funding from the *2002-2003 Local Groundwater Assistance Program Grant* (West Yost, 2012).

No identifiable subsidence has been observed in the RD 2068 region.

The District continues to be an active participant in the monitoring of land subsidence within the Solano Sub-basin.

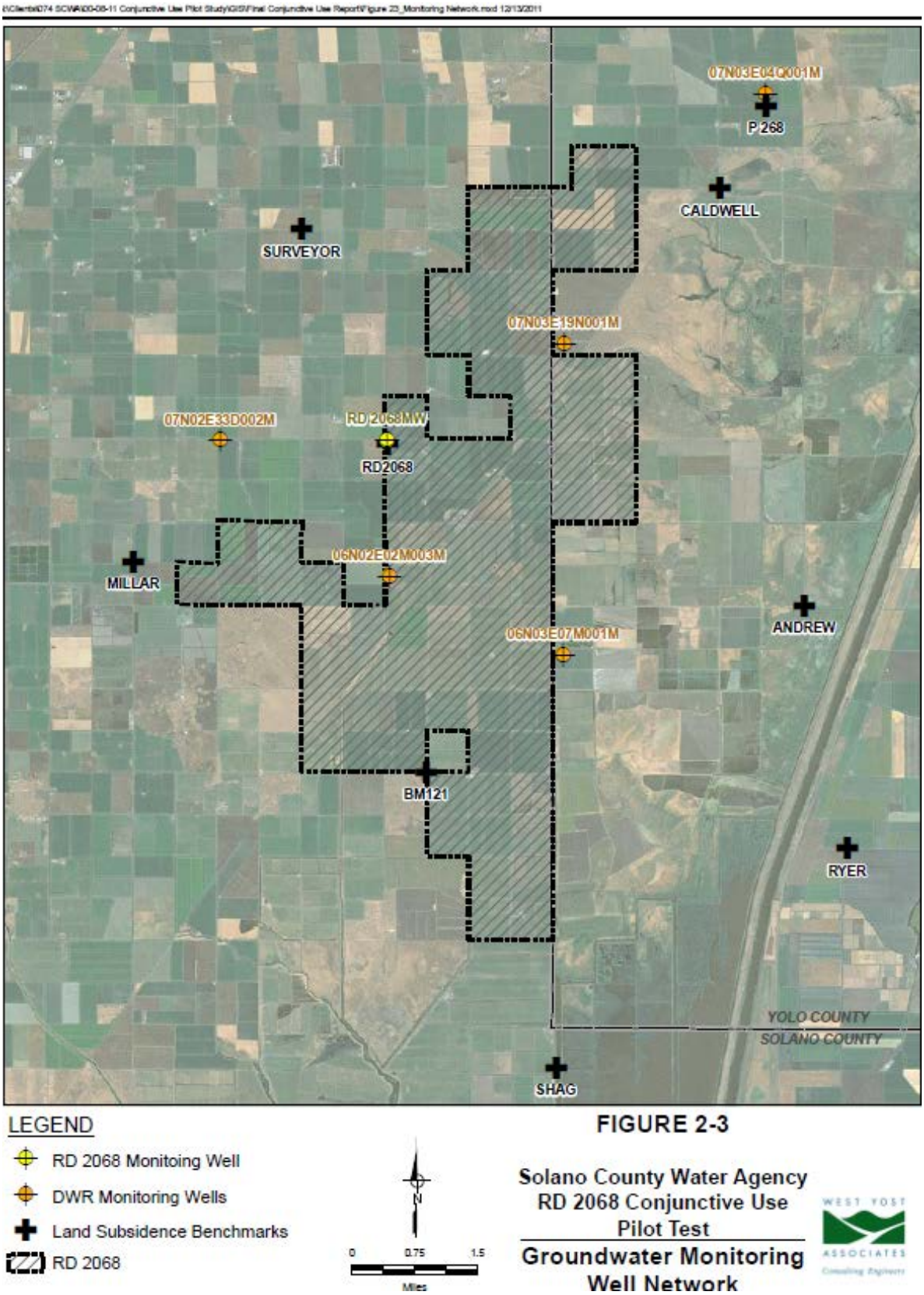

Figure 6. Groundwater Monitoring Well Network within RD 2068 (West Yost, 2013)

Groundwater Pumping

The District owns and operates one groundwater well. Surface water supplies are typically adequate to meet District demands and therefore, utilization of this groundwater well is infrequent. In 2011, the District pumped 411.1 acre-feet as part of a water transfer to SCWA. The 2011 water transfer was a result of a conjunctive use pilot test conducted by the District to explore future conjunctive use opportunities. No other groundwater pumping has occurred at this well.

Individual landowners own and operate private groundwater wells. The quantity of groundwater pumped by landowners within the District is unknown.

3. Other Water Supplies

Recaptured irrigation water is available to approximately 20 percent of District lands for direct reuse.

4. Drainage from District's Service Area

The District does not measure the outflow from its service area to Shag Slough, or to the two locations in the Yolo Bypass (Hackman Road and Midway Road).

B. Water Supply Quality

1. Surface Water Supply

The District monitors water quality at two locations within Haas Slough, approximately 0.65 miles upstream of Pumping Plant No. 1, and directly upstream of Pumping Plant No. 1. Electrical conductivity, water temperature, and water levels are monitored at this location.

Table 13. Surface Supply Water Quality Monitoring Practices

Water Source	Monitoring Location	Measurement/ Monitoring Method or Practice	Frequency
Hass Slough	0.65 miles upstream of Pumping Plant No. 1	Water quality sensor	15-min
Haas Slough	Pumping Plant No. 1	Water quality sensor	15-min

The District has not experienced any known surface water quality problems. It will continue to monitor surface water quality in Haas Slough.

2. Groundwater Supply

The District, in cooperation with DWR, monitors groundwater quality at the District's triple completed monitoring well within the RD 2068 service area. Regionally, RD 2068 cooperates with SCWA in monitoring, collecting data, publishing groundwater water levels, and quality, within the Solano Sub-basin. SCWA is identified as the CASGEM monitoring entity. DWR and other private entities monitor additional groundwater wells and these data are available on CASGEM.

According to DWR, groundwater in the Solano Sub-basin is good in quality and is suitable for domestic and agricultural purposes. Total dissolved solids concentrations generally range from 250 to 500 milligrams per liter (mg/L), and are comprised predominantly of calcium, magnesium and sodium cations, and bicarbonate anions (DWR, 2004). The groundwater is "hard" to "very hard" (West Yost, 2012).

The District is not aware of any concerns relative to the quality of the groundwater within its service area.

3. Other Water Supplies

The District does not monitor the water quality of inflow from upstream irrigation districts.

4. Drainage from District's Service Area

The District does not monitor the water quality of outflow from the District's service area.

Section V: Water Accounting and Water Supply Reliability

A. Quantifying the Water Supplies

1. Agricultural Water Supplies

As previously described, the District's surface water supplies originate from diversions from Haas Slough, inflow from upstream irrigation districts and internal recirculation of tailwater. Water diverted at Pumping Plant No. 1 includes water originating from Haas Slough inflow from upstream irrigation districts, and RD 2068 recaptured tailwater. For the purposes of this report, the quantity of water from each source has been estimated. Where measurements are available, upstream irrigation District inflow that is pumped at Pumping Plant No. 1 has been subtracted from the diversions identified in **Table 14**. Therefore, the total surface water available to the District is the sum of **Table 14**, **Table 15**, and **Table 16**.

Table 14. Summary of Diversions from Haas Slough at Pumping Plant No. 1

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2013	0	0	4,773	6,471	10,879	8,460	9,309	9,616	5,968	4,618	2,057	0	62,151
2014	2,640	360	0	1,644	9,614	8,629	9,523	9,101	5,374	4,395	839	0	52,119
2015	0	0	0	7,356	6,800	7,116	8,160	8,353	6,965	3,586	0	0	48,336
Avg.	880	120	1,591	5,157	9,098	8,068	8,997	9,023	6,102	4,200	965	0	54,201

In addition to its State issued water rights, RD 2068 has agreements with Maine Prairie Water District (MPWD) and the Dixon Resource Conservation District for the transfer and use of water conveyed to RD 2068 through their respective and/or common drainage collection systems.

Throughout 2013 to 2015, drainage inflow from these upstream districts averaged approximately 4,500 acre-feet, and ranged somewhere between 2,500 to 6,000 acre-feet, as shown in **Table 15**.

Table 15. Summary of Inflow from Upstream Districts

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2013	0	0	158	346	380	549	610	420	0	57	0	0	2,520
2014	0	0	0	154	636	1,122	1,122	1,022	653	203	0	0	4,912
2015	0	0	98	737	932	1,575	1,202	984	350	92	0	0	5,970
Avg.	0	0	85	412	649	1,082	978	809	334	117	0	0	4,466

Note: Includes inflow as measured at the following locations; DMD, PS #3, Dairy, V1, Lat 4/5, V3, V6, Robben, Y at Thomson, Top of Y, Top of Z, Upstream Z2, Thru Reis, Top Z1, Atkinson East, Atkinson Hay, and Atkinson West.

2. Other Water Sources

A summary of the estimated recirculated flow within the District is provided in **Table 15**.

Table 16. Summary of Estimated Recirculated Flow within the District

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2013	0	0	739	1,435	1,817	2,314	2,338	2,184	1,689	1,313	332	0	14,161
2014	0	0	0	20	1,899	2,459	2,102	2,070	1,681	1,319	42	0	11,592
2015	0	0	0	1,546	1,681	1,650	1,925	1,890	1,498	882	0	0	11,072
Avg.	0	0	246	1,000	1,799	2,141	2,121	2,048	1,623	1,171	125	0	12,274

Table 17 summarizes the effective precipitation for lands within the District that received surface water deliveries from the District throughout 2013 to 2015[4]. The table includes the estimated effective precipitation calculated for the months that irrigation deliveries are typically made, April through October.

[4] Effective Precipitation is estimated as 60% of the monthly growing season precipitation greater than 0.5 inch as recorded at the CIMIS Station No. 120 (Dixon) multiplied by the total crop acreage.

Table 17. Effective Precipitation (AF)

Month	2013	2014	2015
January	170	0	0
February	0	3,232	1,583
March	233	786	0
April	88	752	247
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	88	0	0
October	0	136	0
November	44	535	513
December	0	5,204	748
TOTAL	623	10,645	3,091

B. Quantification of Water Uses

Table 18 provides a summary of the estimated quantity of applied water within RD 2068.

Table 18. Summary of Water Uses within RD 2068

Water Uses		2013	2014	2015
Crop Water Use (from Table 9 through Table 11)				
1	Crop evapotranspiration	49,833	55,750	52,418
2	Leaching	764	1,564	226
3	Cultural practices	241	0	0
Conveyance System and Environmental Use				
4	Estimated percolation to groundwater and evaporation from conveyance system[1]	7,883	6,863	6,538
	Subtotal	**58,722**	**64,176**	**59,181**

1/ Estimated percolation to groundwater and evaporation from conveyance system are estimated based on a conveyance system seepage and evaporation of 10% of the available surface water supply.

The District does not currently measure unrecoverable outflow. The District recaptures and recirculates tailwater throughout its distribution system. There is significant outflow during the times water deliveries are being made. All water leaving the District percolates to usable groundwater basins or flows into the Yolo Bypass, and subsequently, the Sacramento and San Joaquin Delta where it is available for uses downstream. Therefore, there are no irrecoverable losses from the District.

Table 19. Water Leaving the District

Drain Water	2013 – 2015
Surface drain water leaving the service area	Significant
Sub-surface drain water leaving the service area	Unknown

Table 20. Water Irrecoverable Losses

	2013 – 2015
Flows to saline sink	None
Flows to perched water table	None

C. Overall Water Budget

Table 21 summarizes the District's water budget for January 2013 through December 2015. Total surface water supplies include diversions from Haas Slough, inflow from upstream irrigation

districts, and recirculated tailwater within the District. The effective precipitation is based on data from the CIMIS Station No. 121 (Dixon).

Table 21. Quantification of Total Water Supplies (acre-feet)

Water Supplies		2013	2014	2015
1	Surface water (summary total from **Table 14**, **Table 15** and **Table 16**)	78,830	68,626	65,377
2	District groundwater	0	0	0
3	Effective precipitation (summary total from **Table 17**)	623	10,646	3,092
4	Water purchases	0	0	0
	Subtotal	**79,453**	**79,272**	**68,469**

Table 22 summarizes the District's water budget for the 2013 through 2015 Plan Cycle. The "Drain Water Leaving Service Area and Additional Seepage to Groundwater Basin", described in **Table 22,** includes drain water leaving the service area, percolation from farms, canals, and ditches within the District's service area and unaccounted for errors in assumptions and calculations used to estimate water demand. Landowners pumped an undetermined quantity of groundwater from privately owned wells to supplement surface water deliveries in order to meet agronomic requirements during periods when surface water deliveries were not available. Negative values indicate insufficient surface supplies to meet crop water needs. Positive values indicate percolation to groundwater, in addition to the estimated quantities shown in **Table 18**.

Table 22. Water Budget Summary

Water Accounting		2013	2013	2015
1	Subtotal of Water Supplies **(Table 21)**	79,453	79,272	68,469
2	Subtotal of Water Uses (**Table 18**)	58,722	64,176	59,181
3	Drain Water Leaving Service Area and Additional Seepage to Groundwater Basin[1]	**20,731**	**15,096**	**9,288**

[1]*Drain Water Leaving Service Area and Additional Seepage to Groundwater* in this table is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc.

D. Water Supply Reliability

The District holds numerous water rights for surface water. Furthermore, the District is entirely within the boundary of NDWA, which allows for the diversion of surface water supplies to meet beneficial uses inside the District when the District's water rights may otherwise be deficient. Due to this reliable surface water supply, the District has not, in its history, experienced periods of water

supply shortage. Moreover, the District has pursued conjunctive use opportunities in the event of surface water supplies becoming less reliable. The District has drilled a groundwater well to supplement the surface water supply. In addition, some landowners in the District have the ability to utilize individual groundwater supplies in order to meet demands to augment surface water deliveries during periods when the District is not delivering water, or when groundwater utilization is beneficial to agronomic practices. Overall, the District is able to provide a reliable water supply to its customers, even during drought years, such as in this AWMP cycle.

Section VI: Climate Change

The Sacramento and San Joaquin Rivers Basin Study (Basin Study) provides an updated climate assessment using the most recently available climate studies to improve our understanding of regional climate impacts relevant to each of the resource categories in the Secure Water Act. Of all climate impacts identified in this Basin Study, two impacts have the greatest potential consequences for water management:

- **Earlier runoff**: Earlier runoff will refill reservoirs earlier, which may force earlier discharge due to the flood rule curves in effect for each reservoir. Implementing adaptive flood rule curves would provide for increased flexibility under future conditions.
- **Sea Level Rise:** Impacts from median sea level rise projected of 90 centimeters (cm) (36 inches) by the end of the 21st century will likely be profound. These increases will cause increases in salinity, which will have negative effects on water quality for both people, and endangered aquatic species, such as the Delta smelt. Factors such as tidal and storm surge, combined with sea level rise, could result in Delta island levee failures and more sea water intrusion into the Delta. Implementing actions that improve water deliveries combined with Delta restoration can help to reduce some of these water supply reliability and environmental risks (USBR, 2016).

The District's diversion facilities are located on Haas Slough in the north-western Delta. The majority of water diverted at the main pumping plant originates from the Delta pool. Earlier runoff and filling of upstream reservoirs would likely have little effect on the water supply or water quality available to the District in the spring and early summer months. Earlier discharge to meet flood rule curves in the fall could result in higher flows in the Sacramento River which could assist in the repulsion of ocean salinity and improvements in water quality over current operations. The true effect will be dependent upon changes in flood rule curves and project operations.

Of the potential impacts of climate change, sea level rise may be the most applicable to RD 2068. Sea level rise is likely to result in increases in ocean salinity intrusion to the Delta. The District will continue to monitor water quality within Haas Slough and evaluate the potential effect of climate change in the future.

Section VII: Water Use Efficiency Information

A. EWMP Implementation and Reporting

Critical EWMPs (Implemented/Planned/Ongoing)

Critical EWMP No. 1 – Water Measurement (Implemented)
The District currently measures/estimates deliveries to customers.

This EWMP is fully implemented.

Critical EWMP No. 2 – Volumetric Pricing (Implemented)
The District bills customers based in part on the quantity of water delivered.

This EWMP is fully implemented.

Conditional EWMPs (Implemented/Planned/Ongoing)

Conditional EWMP No. 1 – Facilitate Alternative Land Use (Technically Infeasible)
As defined in the *2015 Guidebook*, the facilitation of alternative land use is for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including that of problem drainage. *Section II. 3* of this AWMP (Terrain and Soils) indicates that the soils within the District are generally well drained, and therefore, do not exhibit areas of inadequate drainage. District lands do not include drainage problem areas or crops grown on inappropriate soil types.

Therefore, this EWMP is not technically feasible for implementation by the District.

Conditional EWMP No. 2 – Facilitate Use of Available Recycled Water (Implemented)
Upstream M & I water users release treated effluent into local channels that flow through the District. This water is diverted by District pursuant to its contracts with Dixon Soil Conservation District and Maine Prairie Water District and is delivered as part of the overall water supply.

There is no recycled water generated within the District boundaries.

Therefore, all available recycled water is used/delivered by the District, and this EWMP is fully implemented.

Conditional EWMP No. 3 – Facilitate the Financing of Capital Improvements for On-Farm Irrigation Systems (Not Implemented)
The District's policy is to provide water to its customers at the lowest possible cost. The District does not currently have the resources to offer financing for capital improvements for on-farm irrigation systems.

Conditional EWMP No. 4 – Incentive Pricing Structure (Implemented/Ongoing)
The District bills its customers based on the quantity of water delivered. The District does not implement a tiered pricing structure; however, it is in the landowners' economic interest to efficiently use water to meet crop demands.

This EWMP is implemented and ongoing.

Conditional EWMP No. 5. – Infrastructure Improvements (Implemented/Ongoing)
The District's conveyance and delivery system is fully developed. The District's main pumping facilities were replaced approximately 30 years ago. During the replacement, additional infrastructure improvements were made to consolidated facilities and improve overall conveyance system efficiency. The District added regulating reservoirs to all pumping plant facilities providing for optimal system flexibility. In addition, the District has installed 14 long-crested weirs to maintain water level within the canals and facilitate water deliveries.

This EWMP is considered implemented and ongoing.

Conditional EWMP No. 6 – Increase Flexibility in Water Ordering/Delivery (Implemented)
Water ordering for the subsequent day has proven satisfactory for its water users for many years. The District required water orders by 3 p.m. of the preceding day, in order to make adjustments at its diversion facilities, and to assure the changes are effective throughout the system. However, if a grower needs more immediate water service, District staff typically accommodates the landowner's request.

This EWMP is considered fully implemented.

Conditional EWMP No. 7 – Construct and Operate Spill and Tail Water Recovery Systems (Implemented/Ongoing)
The District recaptures conveyance system spills and tailwater from landowner operations and recirculates these flows at lift pumps located throughout the District. The District continues to evaluate opportunities to recapture and/or minimize operational spills to effectively and efficiently manage surface water deliveries within its service area.

This EWMP is considered implemented and ongoing.

Conditional EWMP No. 8 – Optimize Conjunctive Use (Ongoing)
RD 2068 conducted an initial conjunctive use feasibility study using funding from a 2002-2003 Local Groundwater Assistance Program Grant (West Yost, 2006). The study constituted a first look at the feasibility of conjunctive use in the RD 2068 service area. Evaluation of information on existing wells, review of published reports, and the preliminary hydrogeologic investigations, which included aquifer testing conducted during this effort, support the conclusion that the pumping capacities of irrigation wells in the RD 2068 service area are typical of the Solano Groundwater Sub-basin and can be 1,100 to 1,500 gpm per well or more. Groundwater quality sampling indicated that groundwater quality in the RD 2068 service area is typical of the Solano Groundwater Sub-basin, where it is used as an agricultural supply on a widespread basis.

Therefore, it is apparent that the groundwater resources underlying RD 2068 can be used for agricultural purposes. RD 2068 has also developed an application of the DWR Modeling Support Branch's Integrated Water Flow Model (IWFM) as part of the conjunctive use feasibility study. Analysis of the three conjunctive use scenarios indicated that RD 2068 could use groundwater to meet up to 20 percent of in-district needs in below-normal years, 30 percent in dry years, and 40 percent in critical years. Pumping at the listed percentages would produce an average of approximately 5,000 acre-feet in below-normal years, 10,000 acre-feet in dry years, and 15,000 acre-feet in critical years. Based on this initial assessment, implementation of a conjunctive use program by RD 2068 appears feasible.

Currently the District does not need additional water supplies to meet demand; however, the District continues to explore potential opportunities to optimize conjunctive uses.

The EWMP is ongoing.

Conditional EWMP No. 9 – Automate Canal Control Structures (Implemented/Ongoing)
The District has automatic controls at the main pumping plant facilities. In addition, the District has 14 long-crested weirs that maintain consistent water levels within the District's canals. These weirs provide passive control by maintaining water levels and facilitating deliveries within its service area.

This EWMP is implemented and ongoing.

Conditional EWMP No. 10 – Facilitate Customer Pump Testing and Evaluation (Implemented/Ongoing)
The District is a founding member of the Solano Agricultural Water Conservation Committee which operates and maintains an agricultural pump test program for RD 2068, the Solano Irrigation District, the Main Prairie Water District, and private landowners.

This EWMP is implemented and ongoing.

Conditional EWMP No. 11 – Water Conservation Coordinator (Implemented)
The District has named Mr. Mike Hardesty, General Manager, as Water Conservation Coordinator.

This EWMP is fully implemented.

Conditional EWMP No. 12 – Provide for the Availability of Water Management Services to Water Users (Implemented/Ongoing)
The District's monthly bill statement include information regarding irrigation event(s) from the previous month. This information includes a comparison of the actual volume of water delivered to a field with the theoretical Crop Evapotranspiration (ETc) and a target ETc based on an assumed irrigation efficiency. The irrigation efficiency is based on estimates by District staff, or if available, are determined from on-farm field evaluation of distribution uniformity. The theoretical ETc is determined based on the crop coefficient (Kc), irrigation start dates, and real-time reference evapotranspiration (ETo) data. Information is provided in both tabular and graphic display to

assist farmers and landowners in evaluating on-farm irrigation efficiencies. The District provides regional cooperation in the management of water and drainage in the Dixon regional watershed and the North Delta Water Agency. The District is among the agencies that operate the Dixon area regional drainage system[5].

The District has representatives on various committees related to delivery of irrigation water and water management. The District has a seat on the Solano County Water Agency, the Solano Water Advisory Commission, and the Solano County Water Authority. The District also participates in the Dixon Regional Watershed Joint Powers Authority and the Solano Agricultural Water Conservation Committee. The Solano Agricultural Water Conservation Committee[6] assists growers in Solano County with irrigation management and water use efficiency at the farm level.

Activities of the Solano Agricultural Water Conservation Committee include:

- Operation of eight automated weather stations, for use by growers, for irrigation scheduling and farm management. Weather information is accessible by website or telephone.
- Weather website with local agricultural irrigation information, available at www.westernwx.com/sid
- Weather forecast services focusing on Solano County. The comprehensive agricultural forecast is available daily, at a cost of $120/year.
- Soil moisture monitoring
- Soil sensor installations and training
- Irrigation System Evaluations
- Irrigation Scheduling services
- Pump Efficiency Testing
- Annual Irrigation Efficiency Workshops
- Annual newsletter, *The Irrigator*
- Spanish language workshops

More information relative to the Solano Agricultural Water Conservation Committee may be accessed at http://www.scwa2.com/water-conservation/agricultural-water-conservation.

In addition, the District is a partner in both funding, and management of, the Dixon Regional Aquatic Pesticide NPDES permit, from the Regional Water Quality Control Board. The District has joint facilities operations agreements with the Dixon Resource Conservation District and the Maine Prairie Water District.

This EWMP is implemented and ongoing.

[5] Other agencies include the Dixon Resource Conservation District, Maine Prairie Water District, and the City of Dixon.
[6] The Committee is comprised of representatives from the Solano County Water Agency, Solano Irrigation District, Maine Prairie Water District, Reclamation District 2068, Dixon Resource Conservation District, Solano Resource Conservation District, U.C. Cooperative Extension, and the Natural Resources Conservation Service.

Conditional EWMP No. 13 – Identify Institutional Changes (Implemented/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, RD 2068 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.

This EWMP is implemented and ongoing.

Conditional EWMP No. 14 – Evaluate and Improve Supplier Pump Efficiencies (Implemented/Ongoing)

The District believes that optimizing energy use efficiency may be best accomplished by evaluating and improving operational efficiency, such as with variable frequency drives, in conjunction with pump efficiency testing. The District performs pump efficiency testing on the four main pumping plants annually. Lift pumps and other pumps are evaluated every two years. Based on the performance evaluation the District conducts routine maintenance on the pumps to improve overall efficiencies.

This EWMP is implemented and ongoing.

Section VIII: Work Cited

(DWR, 2003). California's Groundwater: Bulletin 118 *Update 2003*. Sacramento, California. October, 2003.

(DWR, 2004a). California's Groundwater: Bulletin 118, *Sacramento Valley Groundwater Basin, Solano Sub-basin*. Sacramento, California. February 27, 2004.

(DWR, 2004b). California's Groundwater: Bulletin 118, *Sacramento Valley Groundwater Basin, Yolo Sub-basin*. Sacramento, California. February 27, 2004.

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(West Yost, 2006). Reclamation District 2068 Groundwater Management Plan. Dixon, California. December 8, 2005.

(West Yost, 2006). Reclamation District 2068 Conjunctive Use Feasibility Study. Dixon, California. January 31, 2006.

(West Yost, 2006). Reclamation District 2068 Conjunctive Use Pilot Test Report. Dixon, California. June 2012.

http://www.fao.org/docrep/003/T0234E/T0234E00.htm

Section IX: Appendices

The following supporting documentation is attached as Appendices:

Appendix A: AWMP Checklist

Appendix B: Coordination Activities

Appendix C: AWMP Adoption and Submittal

Appendix D: Rules and Regulations

Appendix E: Water Rates and Billing

Appendix F: NDWA Contract and MOU

Appendix A. AWMP Checklist

2015 Agricultural Water Management Plan Checklist

AWMP* Location	Guidebook Location	Description	Water Code Section (or other, as identified)
X	1.4	AWMP Required?	10820, 10608.12 Executive Order B-29-15
X	1.4	At least 25,000 irrigated acres *At least 10,000 irrigated acres*	10853 *Executive Order B-29-15*
X	1.4	10,000 to 25,000 acres and funding provided	10853
X	1.4	December 31, 2015 update *July 1, 2016 2015 AWMP for agricultural water* *suppliers 10,000 to 25,000 irrigated acres*	10820 (a) *Executive Order B-29-15*
X	1.4	5-year cycle update	10820 (a)
X	1.4	New agricultural water supplier after December 31, 2012 - AWMP prepared and adopted within 1 year	10820 (b)
NA	1.5, 5	USBR water management/conservation plan:	10828(a) *Executive Order B-29-15*
NA	1.5, 5.1	Adopted and submitted to USBR within the previous four years, AND	10828(a)(1)
NA	1.5, 5.1	The USBR has accepted the water management/conservation plan as adequate	10828(a)(2)
NA	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 **(use checklist)**	10829
I.A	3.1 A	Description of previous water management activities	10826(d)
I.B.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)
I.B.2	3.2 B.2	Was the proposed plan available for public inspection prior to plan adoption?	10841
I.B.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
I.B.2	3.1 B.2	14 days notification for public hearing	GC 6066
I.B.2	3.1 B.2	Two publications in newspaper within those 14 days	GC 6066
I.B.2	3.1 B.2	At least 5 days between publications? (not including publication date)	GC 6066

2015 Agricultural Water Management Plan Checklist

AWMP* Location	Guidebook Location	Description	Water Code Section (or other, as identified)
NA	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
Yes	3.1 C.1	After hearing/equivalent notice, was the plan adopted as prepared or as modified during or after the hearing?	10841
Yes	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)
Yes	3.1 C.2	The department.	10843(b)(1)
Yes	3.1 C.2	Any city, county, or city and county within which the agricultural water supplier provides water supplies.	10843(b)(2)
Yes	3.1 C.2	Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.	10843(b)(3)
Yes	3.1 C.2	Any urban water supplier within which jurisdiction the agricultural water supplier provides water supplies.	10843(b)(4)
Yes	3.1 C.2	Any city or county library within which jurisdiction the agricultural water supplier provides water supplies.	10843(b)(5)
Yes	3.1 C.2	The California State Library.	10843(b)(6)
Yes	3.1 C.2	Any local agency formation commission serving a county within which the agricultural water supplier provides water supplies.	10843(b)(7)
Yes	3.1 C.3	Adopted AWMP availability	10844
NA	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)
Yes	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)
Yes	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
II.A.1	3.2	Description of the agricultural water supplier and service area including:	10826(a)
II.A.1	3.2 A.1	Size of the service area.	10826(a)(1)
II.A.2	3.2 A.2	Location of the service area and its water management facilities.	10826(a)(2)
II.A.3	3.2 A.3	Terrain and soils.	10826(a)(3)

2015 Agricultural Water Management Plan Checklist

AWMP* Location	Guidebook Location	Description	Water Code Section (or other, as identified)
II.A.4	3.2 A.4	Climate.	10826(a)(4)
II.B.1	3.2 B.1	Operating rules and regulations.	10826(a)(5)
II.B.2	3.2 B.2	Water delivery measurements or calculations.	10826(a)(6)
II.B.3	3.2 B.3	Water rate schedules and billing.	10826(a)(7)
II.B.4	3.2 B.4	Water shortage allocation policies. *Drought Management Plan*	10826(a)(8) *Executive Order B-29-15*
III	3.3	Water uses within the service area, including all of the following:	10826(b)(5)
III.A	3.3 A	Agricultural.	10826(b)(5)(A)
III.B	3.3 B	Environmental.	10826(b)(5)(B)
III.C	3.3 C	Recreational.	10826(b)(5)(C)
III.D	3.3 D	Municipal and industrial.	10826(b)(5)(D)
III.E	3.3 E	Groundwater recharge.	10826(b)(5)(E)
III.F	3.3 F	Transfers and exchanges.	10826(b)(5)(F)
III.G	3.3 G	Other water uses.	10826(b)(5)(G)
IV.A	3.4 A	Description of the quantity of agricultural water supplier's supplies as:	10826(b)
IV.A.1	3.4 A.1	Surface water supply.	10826(b)(1)
IV.A.2	3.4 A.2	Groundwater supply.	10826(b)(2)
IV.A.3	3.4 A.3	Other water supplies.	10826(b)(3)
IV.A.4	3.4 A.4	Drainage from the water supplier's service area.	10826(b)(6)
IV.B	3.4 B	Description of the quality of agricultural waters suppliers supplies as:	10826(b)
IV.B.1	3.4 B.1	Surface water supply.	10826(b)(1)
IV.B.2	3.4 B.2	Groundwater supply.	10826(b)(2)
IV.B.3	3.4 B.3	Other water supplies.	10826(b)(3)
IV.B	3.4 C	Source water quality monitoring practices.	10826(b)(4)
IV.B.4	3.4 B.4	Drainage from the water supplier's service area.	10826(b)(6)
V.A	3.5	Description of water accounting, including all of the following:	10826(b)(7)
V.B	3.5 A	Quantifying the water supplier's water supplies.	10826(b)(7)(A)
V.C	3.5 B	Tabulating water uses.	10826(b)(7)(B)
V.D	3.5 C	Overall water budget.	10826(b)(7)(C)
VI	3.5 D	Description of water supply reliability.	10826(b)(8)

2015 Agricultural Water Management Plan Checklist

AWMP* Location	Guidebook Location	Description	Water Code Section (or other, as identified)
VII	3.6	Analysis of climate change effect on future water supplies analysis	10826(c)
VII.A	3.7	Water use efficiency information required pursuant to Section 10608.48.	10826(e)
VII	3.7 A	Implement efficient water management practices (EWMPs)	10608.48(a)
VII	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)
VII	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)
VII	3.7 A.2	Implement additional locally cost-effective and technically feasible EWMPs	10608.48(c)
VII	3.7 B	If applicable, document (in the report) the determination that EWMPs are not locally cost- effective or technically feasible	10608.48(d)
VII	3.7 A	Include a report on which EWMPs have been implemented and planned to be implemented	10608.48(d)
VII	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)
NA	5	USBR water management/conservation plan may meet requirements for EWMPs	10608.48(f)
NA	6 A	Lack of legal access certification (if water measuring not at farm gate or delivery point)	CCR §597.3(b)(2)(A)
NA	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)
NA	6 A, 6 B	Delivery apportioning methodology (if water measuring not at farm gate or delivery point)	CCR §597.3.b(2)(C),
NA	6 C	Description of water measurement BPP	CCR §597.4(e)(2)
NA	6 D	Conversion to measurement to volume	CCR §597.4(e)(3)
NA	6 E	Existing water measurement device corrective action plan? (if applicable, including schedule, budget and finance plan)	CCR §597.4(e)(4))

* Note where compliance with this requirement is located in your AWMP

Source: A Guidebook to Assist Agricultural Water Suppliers to Prepare a 2015 AWMP
Website: http://www.water.ca.gov/wateruseefficiency/sb7/

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Appendix B. Coordination Activities

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TELEPHONE
(707) 678-5412

7178 YOLANO ROAD
DIXON, CA 95620

IRRIGATION DRAINAGE

RECLAMATION DISTRICT NO. 2068

Date: May 12, 2016

From: Reclamation District 2068

To: Yolo County, Solano County, and Solano County Water Agency

Subject: Notice of Intent to Prepare an Agricultural Water Management Plan

Reclamation District 2068 (RD 2068) in accordance with the provisions of California Water Code Section 10821 is providing notification of its intent to prepare a 2016 Agricultural Water Management Plan (2016 AWMP). This 2016 AWMP is being prepared in accordance with the requirements of the SB X7-7 Water Conservation Act, the associated Agricultural Water Management Planning Act, the Agricultural Water Measurement Regulation, and Executive Order B-29-15. Opportunity for review and comment to the draft 2016 AWMP will be provided including a public notice and review period and a hearing prior to its adoption.

Please contact Sara Harper, 916 456-4400, to obtain additional information relative to the preparation of the draft 2016 AWMP.

PROOF OF PUBLICATION
(2015.5 C.C.P.)

This space is for the County Clerk's Filing Stamp

STATE OF CALIFORNIA,
COUNTY OF SOLANO, ss.

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the DIXON TRIBUNE, a newspaper of general circulation, printed and published weekly in the City of Dixon, County of Solano, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Solano, State of California, under the date of April 21, 1952, Case Number 25594; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil) has been published in each regular and entire issue of said newspaper and not in any supplement thereof

on the following dates, to wit: July 22, 29 Aug 5

all the year: 2016

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

Dated at DIXON, California, this 5th

day of Aug 2016

Karen Maldonado

(Signature)

Proof of Publication of

NOTICE OF PUBLIC HEARING

NOTICE OF PUBLIC HEARING

Notice is hereby given that, pursuant to Water Code §10841 et seq., the Reclamation District 2068 (District) has drafted an Agricultural Water Management Plan (Plan). The District's Board of Directors will hold a public hearing to consider the Plan on August 11, 2016 at 2:30 p.m. The hearing will be held at the District office, located at 7178 Yolano Road in Dixon, Ca 95620. The updated Plan is available for review at the District's office. For further information contact Mike Hardesty at (707) 678-5412.

jy22,29;au5

PROOF OF PUBLICATION

MBK ENGINEERS

Water Resources • Flood Control • Water Rights

TELEPHONE CONVERSATION RECORD

MBK Staff Person	Sara Harper	**Date**	07/25/2016
Project Name	RD 2068 AWMP	**Client Code**	4525-1
Spoke to	Marty Burbeck	**of**	DWR

Item(s) Discussed

Status of AWMP and re-notification of hearing.

Information Obtained

Mr. Burbeck did not identify any issues with the re-notification of public hearing to adopt RD 2068's AWMP and delay in final adoption. Proposed notification of public hearing scheduled for August 11, 2016 will be published in the Dixon Tribune on July 29th and August 5th, consistent with the notification requirements. At the public hearing, RD 2068 will re-adopt the AWMP unless there are objections to the contrary.

Administration of the AWMP Grant was also discussed. Mr. Burbeck identified that submittal of the final documentation for the grant, including the invoice for reimbursement may be submitted with the final AMWP to DWR. There is no need to submit a quarterly report as a result of the delay in the AMWP adoption.

Action Required

None at this time. Following the public hearing and adoption of the AWMP, submit AWMP to DWR and include final report (and budget) to Mr. Burbeck. The invoice is to include the line item cost for each task. Addition documentation including daily descriptions of tasks for each sub-task are not required. However, in the unlikely event of an audit, these documents would need to be made available.

Appendix C. AWMP Adoption and Submittal

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RECLAMATION DISTRICT NO. 2068

RESOLUTION NO. 2016 08-01

Agricultural Water Management Planning

WHEREAS, the Legislature has codified the Agricultural Water Management Planning Act(AWMPA) at Water Code Sections 10800-10853;

WHEREAS, the AWMPA requires certain agricultural water suppliers to prepare and adopt an Agricultural Water Management Plan(AWMP);

WHEREAS, the AWMPA defines an "Agricultural Water Supplier" as a water supplier, either publicly or privately owned, providing water to 10,000 or more aces, excluding recycled water, and requires that an Agricultural Water Supplier serving at least 10,000 acres prepare an (AWMP);

WHEREAS, the district is an Agricultural Water Supplier under the AWMPA and must prepare an AWMP;

WHEREAS, an AWMP must contain information regarding an Agricultural Water Supplier's service area, quantity and quality of water supplies, a Drought Management Plan, and specific water use efficiency information.

NOW, THEREFORE, BE IT RESOLVED by the Board of Trustees of Reclamation District No. 2068 hereby approves and adopts the Reclamation District 2068 2016 Agricultural Water Management Plan to comply with the requirements of Water Code Section10826.

PASSED AND ADOPTED by the Board of Trustees of the Reclamation District No. 2068 on August 11, 2016, by the following vote:

AYES:	C. Detar, R. Rasmussen, L. Detar, M. Emigh, D. Crossley
NOES:	None
ABSENT:	None
ABSTAIN:	None

I, T. M. Hardesty, Secretary of the Board of Trustees of Reclamation District No. 2068, hereby certify that the foregoing Resolution was duly adopted, on motion made, seconded, and carried at the regular meeting of the Board of Trustees held January 14, 2016

T. M. Hardesty, Secretary Board of Trustees

MBK ENGINEERS
Water Resources • Flood Control • Water Rights

GILBERT COSIO, JR., P.E.
MARC VAN CAMP, P.E.
WALTER BOUREZ, III, P.E.
RIC REINHARDT, P.E.
GARY KIENLEN, P.E.
DON TRIEU, P.E.
DARREN CORDOVA, P.E.
NATHAN HERSHEY, P.E., P.L.S.
LEE BERGFELD, P.E.
BEN TUSTISON, P.E.

ANGUS NORMAN MURRAY
1913 -1985

CONSULTANTS:
JOSEPH I. BURNS, P.E.
DONALD E. KIENLEN, P.E.

September 14, 2016

Agricultural Water Use Efficiency
Department of Water Resources
Statewide Integrated Water Management
Water Use and Efficiency Branch
PO Box 942836
Sacramento, CA 94236-0001

Subject: Reclamation District No. 2068
2016 Agricultural Water Management Plan

To Whom It May Concern:

On behalf of Reclamation District No. 2068 (District), enclosed is a copy of the 2016 Agricultural Water Management Plan (AWMP) adopted by the District pursuant SBx7-7, Water Code Section 10826, and the April 1, 2015 Governor's Executive Order B-29-15. Copies of the 2015 AWMP have also been sent to the applicable parties and is posted on the California Department of Water Resources website.

Sincerely,
MBK ENGINEERS

Gary Kienlen, P.E.

GK/oh
4525/RD 2068 2016 AWMP 2016-09-14

Enclosures

cc: California State Library
Department of Water Resources
County of Yolo
County of Solano
Local Agency Formation Commission

Appendix D. Rules and Regulations

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RULES AND REGULATIONS

COVERING THE DISTRIBUTION OF WATER

WATER RULES

for

RECLAMATION DISTRICT NO. 2068

Pursuant to Section 50911(a) of the Water Code
of the State of California

TRUSTEES

Cliff DeTar, President
Ross Rasmussen Luke DeTar
Martin Emigh Dale Crossley

Mike Hardesty, Manager

7178 Yolano Road, Dixon, CA 95620
(707) 678-5412
January 2014

To the Land Owners and Water Users of

Reclamation District No. 2068

The rules and regulations contained in the following pages were adopted by the Board of Trustees and are intended as a guide for landowners, irrigators and District personnel in the operations of District facilities.

Copies of these rules and regulations are available at the District office, and it is hoped that landowners and irrigators will familiarize themselves with these rules.

January 2014

BOARD OF TRUSTEES

Reclamation District No. 2068

RULE 1 - CONTROL OF SYSTEM

The operation of the pumping plants, canals and irrigation works of the District shall be under exclusive management and control of the Board of Trustees, such officials as they may designate and their regularly employed assistants, superintendents and watertenders, and no other person shall have any right to interfere with said pumping plants, canals and works in any manner, unless especially authorized by the Board of Trustees of the District.

RULE 2 - EMPLOYEES

The Board will employ a Manager and such assistants, superintendents, pump operators, and watertenders as may be necessary for the proper operation of the system. All employees shall be directly responsible to their immediate superiors and to the Board for the proper discharge of their duties.

RULE 3 - DISTRIBUTION OF WATER

A - The District will operate the several pumping plants, which are included within the adopted irrigation and drainage systems of the District, and will deliver water into the main canals, laterals, and drains forming the said irrigation systems and will maintain the water level in said canals, laterals, and drains at such level as is feasible and economical with the equipment contained within the said pumping plants, and, where applicable, as set forth in Rule 25. Water will be delivered in sufficient quantity, at least 10 gallons per minute per irrigated acre per irrigation, to meet the needs of all qualified irrigators, except, when in the judgment of the watertender, ditches or equipment won't handle this capacity or in case of shortage as specified in Rule 9. It is understood the District shall be required to deliver water for irrigation into said main canals and laterals only, and the charges paid by the respective irrigators for water are for service of the District, in delivering said water into said main canals and laterals.

B - Water will be delivered as shown on the current turnout map of the District. Changes in delivery points, whether by pump or gravity, shall be made upon application of the landowner to the Board of Trustees and subject to approval by the Board. All costs involved in such changes shall be paid by the landowner unless such costs are otherwise apportioned by the Board of Trustees. Easements or rights-of-way required for such changes shall be deeded to the District at no charge if it is determined by the District that the facilities occupying such easements or rights-of-way are to be maintained by the District. Work or construction required to make any such changes shall be done by or under the supervision of the District and shall meet all specifications as required by the District. The District may require a deposit before the start of any work. Such deposit shall be in the amount of the estimated cost of materials and non-District services required to construct the requested changes. The District will assume no responsibility or obligation in connection with said changes or with any but its own equipment and laterals.

C - All land division and subdivision maps for lands within the District boundaries shall be presented to the District for review and signature. In the case of subdivision or reapportionment of a tract, the subdivider must come to an agreement with

the District on the irrigation and drainage of all parcels involved. Such review shall be subject to payment of a fee to the District in accordance with a Schedule of Rates set by the Board of Trustees. In the event that existing District facilities are within the map area and easements and rights-of-way for these facilities have not been previously recorded, such easements and rights-of-way, with boundaries as determined appropriate by the District, shall be conveyed to the District in form approved by the District and after acceptance by the District, recorded with the map at no cost to the District. The District will not be responsible for facilities or changes required to serve such properties (see 3B & 7).

Prior to subdivision and upon written request of the subdivider, the District will, in accordance with 3B, install facilities necessary to serve water and drainage to the various parcels. The entire cost of design and construction shall be the responsibility of the subdivider. Work or construction required to make such changes shall be done by or under the supervision of the District and shall meet all specifications as required by the District. The District may require a deposit before the start of any work. Such deposit shall be in the amount of the estimated cost of materials and non-District services required to construct the requested changes. The District will not accept new facilities, easements, or rights-of-way not on the current District map except by order of the Board of Trustees prior to the construction of such facilities. Acceptance must be obtained, and shown on the deed, prior to recordation.

Parcels severed from water service turnouts or drainage facilities may be refused such services and the District will not extend service to such severed parcels except under B and C above. The District assumes no responsibility or liabilities for such severed parcels. Water will not be delivered across property not owned by the water user without a written agreement in satisfaction of Rule 7 or recorded easement.

Suitable ingress and egress must be provided as set forth in Section 51893 of the Water Code of California.

RULE 4 - CONTROL OF REGULATION STRUCTURES

The District's employees alone will be allowed to open, close, or regulate the head gates, spillways, turnouts, related water control equipment, and pumping equipment of the irrigation and drainage system, provided that the Board or its employees may temporarily authorize landowners (or irrigators) to regulate turnouts or pumping plants delivering water to them, if such special authority will not interfere with the just distribution of water and the efficient operation of the system.

RULE 5 - RESPONSIBILITY OF THE DISTRICT

The District shall not be liable for any damage resulting directly or indirectly from any private ditch of the water flowing therein, but its responsibility shall absolutely cease when the water leaves the canals or laterals of the District according to these rules and regulations.

RULE 6 - LIABILITY OF IRRIGATORS

Any person who cuts, injures, destroys, or encroaches upon reclamation works in the District is responsible for all damages occasioned thereby to such works, and upon

their failure to repair such damage after notification by the watertender or other District representative, such repairs shall be made at his expense by the District.

RULE 7 - PARTY DITCHES

Before water is furnished to any private distributing ditch, i.e., a ditch not part of the District's system, but one which serves water to two or more landowners or across property not owned by the landowner using water, the landowners involved must agree upon and sign rules and regulations satisfactory to the Board of Trustees providing for the operation, repair, and maintenance of such ditches and distribution facilities in the ditch. Such agreement shall authorize some person to represent the landowners before the District and provide for the apportionment of water and shall be subject to all rules and regulations of the District. District shall have no responsibility for distribution or disposition of water after it leaves the District system.

RULE 8 - WASTE OF WATER

The District will not allow the waste of water and will not be responsible for any damage, which may result from the flooding of land or other property by water from fields that are being irrigated. Irrigators will be required to keep their ditches and facilities for conveyance and distribution in good condition, so that water can be used without undue loss or waste of time. An irrigator wasting water on roads or vacant land or on land previously irrigated or by excessive use on irrigated land, through willful carelessness or on account of defective ditches, will be refused the use of water until the conditions causing such waste are remedied. Further, penalty will be assessed for misuse of water under this rule as specified by Rule 24 - Penalties.

RULE 9 - SHORTAGE OF WATER

A - When, for any reason, it is not possible to deliver the full supply of water desired by the irrigators, such supply as can be delivered will be apportioned among the various users as determined by the District.

B - It is the policy of the District to cooperate in every reasonable way with the pertinent state or federal agency in all matters having to do with water conservation in the Sacramento River. In case of extreme low water in the river, all restrictions as to water use which may be imposed by such agency or their regularly appointed watermaster will be enforced by the Board of Trustees and such restrictions will be sufficient reason for failure to deliver a full supply of water to irrigators as specified in Rule 9A.

RULE 10 - COST OF OPERATION

The total charge to be collected by the District for water furnished under these rules and regulations shall be estimated and based on the total cost of operating the irrigation pumping plants, headgates, main canals, structures and laterals of the District during each season, which shall include the cost of electric power, supplies, salaries of employees and other incidental expenses of operation, together with such additional amounts as the Board of Trustees may determine to be necessary to provide a current expense fund, and an appropriate allocation of District overhead. Costs of operation of

the drainage system for conveyance of irrigation drainages shall be included in estimates for cost of operating the irrigation system.

RULE 11 - APPLICATIONS FOR WATER

The District may require all landowners whose lands will be irrigated to file with the District information on location of crops, amounts of land to be irrigated, tenants, or other information the Board desires.

RULE 12 - CHARGES FOR WATER

A - The Manager of the District shall estimate the acreage to be irrigated and amounts of water to be used each season. These figures shall be considered by the Board when they establish charges for water each year.

B - The said irrigators shall be billed monthly for the water diverted and such bills shall become due and payable immediately.

C - A credit policy shall be adopted by the District and shall be distributed annually with the water rate schedule.

RULE 13 - DEFAULT IN PAYMENTS

A - The District shall be entitled to refuse to serve water if any water charges provided for by these rules or any charges established by the Water Code of California are not paid when due.

B- Landowners are ultimately responsible for payment of water tolls whatever their relationship with their tenants in accordance with Section 51440 of the Water Code of California.

RULE 14 - ACCESS TO LAND

The authorized watertenders and other employees of the District shall have free access at all times to all lands irrigated with District water and to all canals, laterals and ditches for the purposes of inspection, examination, measurements, surveys, maintenance or other necessary purposes of the District with the right of installation, maintenance, control and regulation of canals, pumps, meters or other measuring devices, gates' pipes, turn-outs, drainage inlets and other facilities necessary or proper for the movement, measurement and distribution of water.

RULE 15 - OBSTRUCTION OF RIGHT OF WAY

No fences, canals, structures, vegetation, other obstructions or encroachments shall be placed in, across, upon or along any canal bank or right of way of any canal or ditch belonging to or maintained by the District without the special permission of the Board of Trustees. At a minimum, the area adjacent to all ditches from the upper bank extending twenty feet landward shall remain clear of any obstructions. Some District canals, due to their size or configuration, may require additional space as determined by the District, for operation of equipment, spoils storage or unique circumstances. Whenever such special permission shall be granted, it shall always be with the explicit understanding that proper openings or passageways for vehicle or equipment movement and operation shall be provided, and that such fences or obstructions must be removed whenever requested by the Board or their representatives. In the event that the District

finds it necessary to remove or relocate an encroachment, such work will be at the landowner's expense.
The District recognizes that existing conditions in places may not conform to these regulations. It is expected that these non-conforming conditions will be remedied at such time as these obstructions are repaired or replaced. Additionally, existing obstructions must be removed whenever requested by the Board or their representatives. Long term maintenance of non-conforming encroachments shall be permitted only withBoard permission as provided above.

RULE 16 – POLLUTION, WATER QUALITY, AND ABATEMENT OF NUISANCE

No sewage, septic tank drainage, rubbish, swill, garbage, manure, refuse, pesticides, dead animals or animal matter, vegetative matter from any source, or any other polluting or contaminating material, shall be placed or allowed to be emptied into any canal, lateral, or drain of Reclamation District No. 2068, and the employees of said District are hereby instructed to see that this rule is strictly enforced. Each landowner and operator shall remain exclusively responsible for all activities that are or might be determined to constitute the generation, release, discharge of any pollutant from their property. The District will not contribute to the monitoring, analysis, abatement or cleanup of such pollution or nuisance, except at the landowner's expense.

District shall not be liable for the quality of water received at its intake, and shall have no liability for any detriment to drainage water attributable to activities of the individual water user who shall be responsible if the quality of the District drainage water is challenged as a result of the water user's activities. All costs attributable to any issue relevant to the quality of water discharged from the water user's field shall be the responsibility of the owner who must, for this purpose, be aware of the activities of their tenant.

RULE 17 - DETERMINATION OF ACREAGE IRRIGATED

If the District finds it necessary to survey the land for the purpose of determining the acreage to be paid for, it will include all land within the exterior boundaries of the planted area on which water has been allowed to stand.

RULE 18 - MEASUREMENT OF WATER

The District will make reasonable calculation of the water delivered at each turnout for billing purposes. This will be done by employing various methods that may include meters, weir measurements, water measurement tables or charts and pump tests. The determination of the amount of water used shall be made by the District and shall be considered final. If the accuracy of the District's calculation is a concern, a landowner may choose to provide a District approved meter or other device for the turnout to measure water delivered and the District will install it at the landowner's expense.

In cases where a single turnout serves more than one irrigator, the landowner may be required to designate a single recipient for the water bill. The District may not be able to apportion such bills to each irrigator without additional facilities for billing purposes.

RULE 19 - INSTALLATION OF DELIVERY GATE

A - No openings shall be made nor structures placed in any District maintained canal, lateral, or drain without a permit issued by the Board of Trustees. All structures in the canals, laterals, and drains must be built in accordance with plans adopted by the District and must be maintained in a condition satisfactory to the Board and must not be altered in any way without the approval of the Board.

B - Installation or replacement of gates or pipes leading from district ditches or pumps to landowner's ditch or field will be made by District at landowner expense including the cost of material and an amount for installation to be fixed by the District Board from time to time. Installation or replacement of existing check structures, within district ditches will be performed by District at District expense unless a further structure is requested which benefits only one owner in which event installation or replacement shall be performed by District and paid for by landowner including material costs and an amount for installation to be fixed from time to time by the District Board. New gates, pipes and check structures shall be installed only upon application of the owner and Permit from District Board except for additional check structures determined by the District Board to be required for District Benefit.

RULE 20 - COMPLAINTS

All complaints as to service, lack of water or other unsatisfactory conditions shall be communicated by the landowner directly to the watertender or other employee of the District in direct charge of the distribution of water. From the rulings or action of the watertender or other employees, a verbal or written appeal may be made to the Board of Trustees at any meeting of said Board.

RULE 21 - DRAINAGE INLETS

All landowners or tenants using irrigation water from any of the District systems shall provide drainage inlets at all points where water is turned from the fields into drainage ditches of the District. Such drainage inlets shall be approved by the District and shall be constructed in accordance with the standard plans furnished by the District.

Drainage inlets shall be constructed entirely at the expense of the landowner or water user, but where deemed necessary or advisable, the District may undertake to construct such inlets at the expense of the landowner.

RULE 22 - ENFORCEMENT OF RULES

Refusal to comply with the requirements hereof, or transgression of any of the foregoing rules and regulations, or failure to pay any water toll or charge, or any interference with the discharge of duties of any official, shall be sufficient cause for cessation of water deliveries, and water will not again be furnished until full compliance has been made with all requirements herein set forth.

RULE 23 - DELIVERY OF WATER

A - Advance notice must be given for all water orders. Watertenders will be available to take water orders; however, it is not the policy of the District for watertenders to be responsible to locate irrigators to obtain water orders.

B - For service (turn-ons, turn-offs or changes) notice must be received before 2:00 p.m. the day before service is desired.

C - Irrigators may set up delivery schedules in advance with the District and in cooperation with other irrigators on the same lateral. As long as schedules are kept, lack of notice will be interpreted to be a firm order. If schedules are interrupted by an irrigator without notice or because he has not prepared to accept water delivery, a penalty will be assessed as shown in Rule 24.

D - No partial irrigations on less than forty acres will be made without penalty, as established by the Board of Trustees, except for cases specifically approved in advance or when due to emergency, equipment failure or inclement weather.

E - Irrigation water, once delivered, will be used continuously, without interruption, until the irrigation is completed.

F - If an irrigator gets off schedule through his own operations, water will not be delivered to him if it will interfere with other irrigators participating in the same schedule. No credits on irrigation bills will be given if caused by this type of disruption of schedule.

RULE 24 - PENALTIES

A penalty may be added to the water bill for misuse of water or failure to comply with these rules. Penalties will be charged on each water delivery (head of water) where an infraction occurs and where the Manager has determined that such infractions have been wasteful of water or District resources, or repetitive. Penalties will be established annually by the Board, along with the water rates, for the following:

A - For water shut-offs without timely notice (Rule 23-B)

B - For partial irrigations (Rule 23-D)

C - For waste of water (Rule 8)

D - For interruption of scheduling (Rule 23-C)

RULE 25 - DRAINAGE SYSTEM

A - The District maintains a drainage system to accommodate both summer and winter drainage water. This is the primary function of this system. Use of drainage ditches during irrigation season for the transport and storage of both irrigation and drainage water makes good use of District facilities, and consequently this multiple use of these ditches is made part of standard operating policy of the District. The goal for maintenance of levels for drainage water during the irrigation season are determined in order to maximize the efficient use and reuse of water. The District will attempt to achieve such goals in so far as it is practicable during the irrigation season, subject , however, to periodic variations and to circumstances which may be beyond the District's control. The District does not, however, warrant that such goals can or will be achieved.

B - Whenever a landowner or tenant requests a temporary change in the irrigation drainage level, and such change is reasonable and neither affects District operations nor other landowners, to the extent practical, such change may be made by District personnel.

C - Whenever a landowner or tenant requests a temporary change in the irrigation drainage level goal, and such change interfered with the normal operation of District facilities or another landowner's operations, no such change will be allowed unless an

equitable cost sharing is agreed upon either (a) between the parties involved, or (b) by decision of the District Board, and accepted by the parties involved.

D - Whenever a landowner or tenant requests a permanent change in the irrigation drainage level goal for more than one year, the Board of Trustees shall decide on the matter and equitably apportion whatever costs are involved.

E - The expense of changes from the goal for irrigation drainage level shall ordinarily be borne by the party benefited by such change and the District will not contribute to such expense except to the extent that general benefits to the District from such change can be identified.

RULE 26 – GRADING AND LEVELING

Landowners grading or leveling land are responsible for assuring that new elevations are compatible with District water service and drainage requirements. In the event that District facilities or operations can be altered to accommodate newly created land surface elevations, all planning, design, materials and construction costs associated with that work shall be the sole responsibility of the landowner. The District will not permit alterations that adversely affect the operation and maintenance of the District facilities or those of adjacent properties.

Appendix E. Water Rates and Billing

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Irrigation Billing

Irrigation Year: 2015

Current Billing Period: **10/2015**

Reclamation District No. 2068

Tuesday, February 09, 2016

Billed To:

LandOwner:

Crop: PASTURE **Field ID:** **APN:**

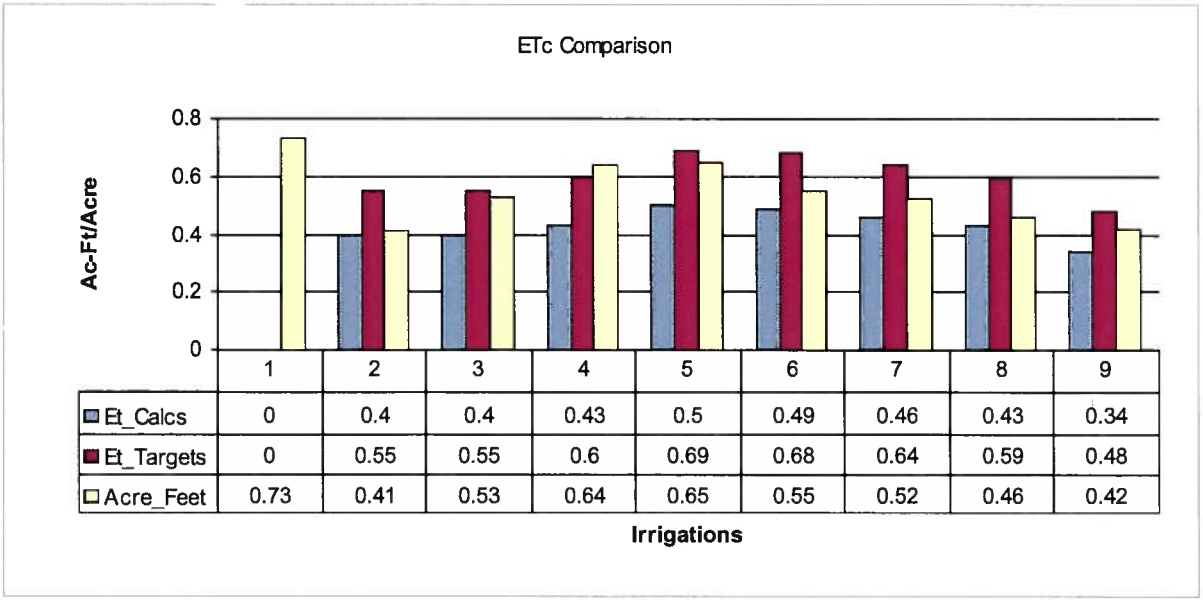
Billing Date	Irrig#	Date On	Date Off	Interval	Irrig Acres	Ac-Ft	Ac-Ft/Ac	Rate/Ac-Ft	Amount	Current Billing Amt
5/31/2015	1	4/14/2015	5/2/2015		150.00	109.63	0.73	13.00	$1,425.19	
	2	5/4/2015	5/20/2015	20	150.00	61.31	0.41	13.00	$797.03	
6/30/2015	3	5/25/2015	6/11/2015	21	150.00	79.24	0.53	13.00	$1,030.12	
7/31/2015	4	6/15/2015	7/3/2015	21	150.00	95.43	0.64	13.00	$1,240.59	
	5	7/6/2015	7/24/2015	21	150.00	97.39	0.65	13.00	$1,266.07	
8/31/2015	6	7/27/2015	8/13/2015	21	150.00	81.82	0.55	13.00	$1,063.66	
9/30/2015	7	8/17/2015	9/3/2015	21	150.00	77.54	0.52	13.00	$1,008.02	
	8	9/7/2015	9/24/2015	21	150.00	69.11	0.46	13.00	$898.43	
10/31/2015	9	9/28/2015	10/15/2015	21	150.00	63.71	0.42	13.00	$828.23	$828.23

Acre Feet Used Through Billing Period:..... **735.18** (Completed Irrigations: 9)

Average Ac-Ft Used Per Acre Per Irrigation:..... **0.54**

Acre Feet Used Per Acre To-Date:..... **4.90** Field Irrig Acres: 150

Key: .-PASTURE



	1	2	3	4	5	6	7	8	9
Et_Calcs	0	0.4	0.4	0.43	0.5	0.49	0.46	0.43	0.34
Et_Targets	0	0.55	0.55	0.6	0.69	0.68	0.64	0.59	0.48
Acre_Feet	0.73	0.41	0.53	0.64	0.65	0.55	0.52	0.46	0.42

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Appendix F. NDWA Contract and MOU

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CONTRACT
BETWEEN
STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
AND
NORTH DELTA WATER AGENCY

FOR THE ASSURANCE
OF A DEPENDABLE WATER SUPPLY OF SUITABLE QUALITY

TABLE OF CONTENTS

Topic	Page
RECITALS	1
AGREEMENTS	1
1. Definitions	1
2. Water Quality	2
3. Monitoring	2
4. Emergency Provisions	2
5. Overland Water Supply Facilities	2
6. Flow Impact	2
7. Place of Use of Water	3
8. Scope of Contract	3
9. Term of Contract	3
10. Amount and Method of Payment for Water	3
11. Participation of the United States	3
12. Remedies	3
13. Comparable Treatment	4
GENERAL PROVISIONS	
14. Amendments	4
15. Reservation with Respect to State Laws	4
16. Opinions and Determinations	4
17. Successors and Assigns Obligated	4
18. Assignment and Subcontract	4
19. Books, Records, Reports and Inspections Thereof	4
20. Waiver of Rights	4
21. Assurance Relating to Validity of Contract	4
22. Notices	4
ATTACHMENTS	
Attachment A. Water Quality Contract Criteria	5
Part 1 of 4. Sacramento at Emmaton	
Part 2 of 4. North Fork Mokelumne at Walnut Grove, Sacramento at Walnut Grove, Steamboat Slough at Sutter Slough	
Part 3 of 4. San Joaquin at San Andreas Landing, Sacramento at Rio Vista	
Part 4 of 4. Mokelumne at Terminous	
Attachment B. Location of Water Quality Stations	6

CONTRACT BETWEEN THE STATE OF CALIFORNIA DEPARTMENT OF WATER RESOURCES AND THE NORTH DELTA WATER AGENCY FOR THE ASSURANCE OF A DEPENDABLE WATER SUPPLY OF SUITABLE QUALITY

THIS CONTRACT, made this 28 day of Jan., 1981, between the STATE OF CALIFORNIA, acting by and through its DEPARTMENT OF WATER RESOURCES (State), and the NORTH DELTA WATER AGENCY (Agency), a political subdivision of the State of California, duly organized and existing pursuant to the laws thereof, with its principal place of business in Sacramento, California.

RECITALS

(a) The purpose of this contract is to assure that the State will maintain within the Agency a dependable water supply of adequate quantity and quality for agricultural uses and, consistent with the water quality standards of Attachment A, for municipal and industrial uses, that the State will recognize the right to the use of water for agricultural, municipal, and industrial uses within the Agency, and that the Agency will pay compensation for any reimbursable benefits allocated to water users within the Agency resulting from the Federal Central Valley Project and the State Water Project, and offset by any detriments caused thereby.

(b) The United States, acting through its Department of the Interior, has under construction and is operating the Federal Central Valley Project (FCVP).

(c) The State has under construction and is operating the State Water Project (SWP).

(d) The construction and operation of the FCVP and SWP at times have changed and will further change the regimen of rivers tributary to the Sacramento-San Joaquin Delta (Delta) and the regimen of the Delta channels from unregulated flow to regulated flow. This regulation at times improves the quality of water in the Delta and at times diminishes the quality from that which would exist in the absence of the FCVP and SWP. The regulation at times also alters the elevation of water in some Delta channels.

(e) Water problems within the Delta are unique within the State of California. As a result of the geographical location of the lands of the Delta and tidal influences, there is no physical shortage of water. Intrusion of saline ocean water and municipal, industrial and agricultural discharges and return flows, tend, however, to deteriorate the quality.

(f) The general welfare, as well as the rights and requirements of the water users in the Delta, require that there be maintained in the Delta an adequate supply of good quality water for agricultural, municipal and industrial uses.

(g) The law of the State of California requires protection of the areas within which water originates and the watersheds in which water is developed. The Delta is such an area and within such a watershed. Part 4.5 of Division 6 of the California Water Code affords a first priority to provision of salinity control and maintenance of an adequate water supply in the Delta for reasonable and beneficial uses of water and relegates to lesser priority all exports of water from the Delta to other areas for any purpose.

(h) The Agency asserts that water users within the Agency have the right to divert, are diverting, and will continue to divert, for reasonable beneficial use, water from the Delta that would have been available therein if the FCVP and SWP were not in existence, together with the right to enjoy or acquire such benefits to which the water users may be entitled as a result of the FCVP and SWP.

(i) Section 4.4 of the North Delta Water Agency Act, Chapter 283, Statutes of 1973, as amended, provides that the Agency has no authority or power to affect, bind, prejudice, impair, restrict, or limit vested water rights within the Agency.

(j) The State asserts that it has the right to divert, is diverting, and will continue to divert water from the Delta in connection with the operation of the SWP.

(k) Operation of SWP to provide the water quality and quantity described in this contract constitutes a reasonable and beneficial use of water.

(l) The Delta has an existing gradient or relationship in quality between the westerly portion most seriously affected by ocean salinity intrusion and the interior portions of the Delta where the effect of ocean salinity intrusion is diminished. The water quality criteria set forth in this contract establishes minimum water qualities at various monitoring locations. Although the water quality criteria at upstream locations is shown as equal in some periods of some years to the water quality at the downstream locations, a better quality will in fact exist at the upstream locations at almost all times. Similarly, a better water quality than that shown for any given monitoring location will also exist at interior points upstream from that location at almost all times.

(m) It is not the intention of the State to acquire by purchase or by proceeding in eminent domain or by any other manner the water rights of water users within the Agency, including rights acquired under this contract.

(n) The parties desire that the United States become an additional party to this contract.

AGREEMENTS

1. **Definitions.** When used herein, the term:

(a) "Agency" shall mean the North Delta Water Agency and shall include all of the lands within the boundaries at the time the contract is executed as described in Section 9.1 of the North Delta Water Agency Act, Chapter 283, Statutes of 1973, as amended.

(b) "Calendar year" shall mean the period January 1 through December 31.

(c) "Delta" shall mean the Sacramento-San Joaquin Delta as defined in Section 12220 of the California Water Code as of the date of the execution of the contract.

(d) "Electrical Conductivity" (EC) shall mean the electrical conductivity of a water sample measured in millimhos per centimeter per square centimeter corrected to a standard temperature of 25° Celsius determined in accordance with procedures set forth in the publication entitled "Standard Methods of Examination of Water and Waste Water", published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation, 13th Edition, 1971, including such revisions thereof as may be made subsequent to the date of this contract which are approved in writing by the State and the Agency.

(e) "Federal Central Valley Project" (FCVP) shall mean the Central Valley Project of the United States.

(f) "Four-River Basin Index" shall mean the most current forecast of Sacramento Valley unimpaired runoff as presently published in the California Department of Water Resources Bulletin 120 for the sum of the flows of the following: Sacramento River above Bend Bridge near Red Bluff; Feather River, total inflow to Oroville Reservoir; Yuba River at Smartville; American River, total inflow to Folsom Reservoir. The May 1 forecast shall continue in effect until the February 1 forecast of the next succeeding year.

(g) "State Water Project" (SWP) shall mean the State Water Resources Development System as defined in Section 12931 of the Water Code of the State of California.

(h) "SWRCB" shall mean the State Water Resources Control Board.

(i) "Water year" shall mean the period October 1 of any year

through September 30 of the following year.

2. **Water Quality.**

(a) (i) The State will operate the SWP to provide water qualities at least equal to the better of: (1) the standards adopted by the SWRCB as they may be established from time to time; or (2) the criteria established in this contract as identified on the graphs included as Attachment A.

(ii) The 14-day running average of the mean daily EC at the identified location shall not exceed the values determined from the Attachment A graphs using the Four-River Basin Index except for the period February through March of each year at the location in the Sacramento River at Emmaton for which the lower value of the 80 percent probability range shall be used.

(iii) The quality criteria described herein shall be met at all times except for a transition period beginning one week before and extending one week after the date of change in periods as shown on the graphs of Attachment A. During this transition period, the SWP will be operated to provide as uniform a transition as possible over the two-week period from one set of criteria to the next so as to arrive at the new criteria one week after the date of change in period as shown on the graphs of Attachment A.

(b) While not committed affirmatively to achieving a better water quality at interior points upstream from Emmaton than those set forth on Attachment A, the State agrees not to alter the Delta hydraulics in such manner as to cause a measurable adverse change in the ocean salinity gradient or relationship among the various monitoring locations shown on Attachment B and interior points upstream from those locations, with any particular flow past Emmaton.

(c) Whenever the recorded 14-day running average of mean daily EC of water in the Sacramento River at Sacramento exceeds 0.25 mmhos, the quality criteria indicated on the graphs of Attachment A may be adjusted by adding to the value taken therefrom the product of 1.5 times the amount that the recorded EC of the Sacramento River at Sacramento exceeds 0.25 mmhos.

3. **Monitoring.** The quality of water shall be measured by the State as needed to monitor performance pursuant to Article 2 hereof with equipment installed, operated, and maintained by the State, at locations indicated on "Attachment B". Records of such measurements shall at regular intervals be furnished to the Agency. All monitoring costs at North Fork Mokelumne River near Walnut Grove, Sacramento River at Walnut Grove, and Steamboat Slough at Sutter Slough incurred by the State solely for this contract shall be shared equally by the Agency and the State. All monitoring costs to be borne by the Agency for monitoring at the above locations are included in the payment under Article 10.

4. **Emergency Provisions.**

(a) If a structural emergency occurs such as a levee failure or a failure of an SWP facility, which results in the State's failure to meet the water quality criteria, the State shall not be in breach of this contract if it makes all reasonable efforts to operate SWP facilities so that the water quality criteria will be met again as soon as possible. For any period in which SWP failure results in failure of the State to meet the water quality criteria, the State shall waive payment under Article 10, prorated for that period, and the amount shall be deducted from the next payment due.

(b) (i) A drought emergency shall exist when all of the following occur:

(1) The Four-River Basin Index is less than an average of 9,000,000 acre feet in two consecutive years (which occurred in 1933-4 and 1976-7); and

(2) An SWRCB emergency regulation is in effect providing for the operation of the SWP to maintain water quality different from that provided in this contract; and

(3) The water supplied to meet annual entitlements of SWP agricultural contractors in the San Joaquin Valley is being reduced by at least 50 percent of these agricultural entitlements (it being the objective of the SWP to avoid agricultural deficiencies in excess of 25 percent) or the total of water supplied to meet annual entitlements of all SWP contractors is being reduced by at least 15 percent of all entitlements, whichever results in the greater reduction in acre feet delivered.

(ii) A drought emergency shall terminate if any of the conditions in (b) (i) of this Article ceases to exist or if the flow past Sacramento after October 1 exceeds 20,000 cubic feet per second each day for a period of 30 days.

(iii) Notwithstanding the provisions of Article 2 (a), when a drought emergency exists, the emergency water quality criteria of the SWRCB shall supersede the water quality requirements of this contract to the extent of any inconsistency; provided, however, that the State shall use all reasonable efforts to preserve Delta water quality, taking into consideration both the limited water supply available for that purpose and recognizing the priority established for Delta protection referred to in Recital (g).

(iv) When a drought emergency exists, and an overland supply is not available to an individual water user comparable in quality and quantity to the water which would have been available to the user under Attachment A, the State shall compensate the user for loss of net income for each acre either (A) planted to a more salt-tolerant crop in the current year, (B) not planted to any crop in the current year provided such determination not to plant was reasonable based on the drought emergency, or (C) which had a reduced yield due to the drought emergency, calculated on the basis of the user's average net income for any three of the prior five years for each such acre. A special contract claims procedure shall be estalished by the State to expedite and facilitate the payment of such compensation.

5. **Overland Water Supply Facilities.**

(a) Within the general objectives of protecting the western Delta areas against the destruction of agricultural productivity as a result of the increased salinity of waters in the Delta channels resulting in part from SWP operation, the State may provide diversion and overland facilities to supply and distribute water to Sherman Island as described in the report entitled "Overland Agricultural Water Facilities Sherman Island" dated January 1980. Final design and operating specifications shall be subject to approval of the Agency and Reclamation District No. 341. The Agency or its transferee will assume full ownership, operation, and maintenance responsibility for such facilities after successful operation as specified. After the facilities are constructed and operating, the water qualitry criteria for the Sacramento River at Emmaton shall apply at the intake of the facilities in Three Mile Slough.

(b) The State and the Agency may agree to the construction and operation of additional overland water supply facilities within the Agency, so long as each landowner served by the overland facilities receives a quality of water not less than that specified in Attachment A for the upstream location nearest to his original point of diversion. The design and operation of such facilities and the cost sharing thereof are subject to approval of any reclamation district which includes within its boundaries the area to be served. The ownership, operation, and maintenance of diversion works and overland facilities shall be the subject of a separate agreement between the Agency or its transferees and the State.

6. **Flow Impact.** The State shall not convey SWP water so as to cause a decrease or increase in the natural flow, or reversal of the natural flow direction, or to cause the water surface elevation in Delta channels to be altered, to the detriment of Delta channels or water users within the Agency. If lands, levees, embankments, or revetments adjacent to Delta channels within the Agency incur seepage or erosion damage or if diversion facilities must be modi-

fied as a result of altered water surface elevations as a result of the conveyance of water from the SWP to lands outside the Agency after the date of this contract, the State shall repair or alleviate the damage, shall improve the channels as necessary, and shall be responsible for all diversion facility modifications required.

7. **Place of Use of Water.**

(a) Any subcontract entered into pursuant to Article 18 shall provide that water diverted under this contract for use within the Agency shall not be used or otherwise disposed of outside the boundaries of the Agency by the subcontractor.

(b) Any subcontract shall provide that all return flow water from water diverted within the Agency under this contract shall be returned to the Delta channels. Subject to the provisions of this contract concerning the quality and quantity of water to be made available to water users within the Agency, and to any reuse or recapture by water users within the Agency, the subcontractor relinquishes any right to such return flow, and as to any portion thereof which may be attributable to the SWP, the subcontractor recognizes that the State has not abandoned such water.

(c) If water is attempted to be used or otherwise disposed of outside the boundaries of the Agency so that the State's rights to return flow are interfered with, the State may seek appropriate administrative or judicial action against such use or disposal.

(d) This article shall not relieve any water user of the responsibility to meet discharge regulations legally imposed.

8. **Scope of Contract.**

(a) During the term of this contract:

(i) This contract shall constitute the full and sole agreement between the State and the Agency as to (1) the quality of water which shall be in the Delta channels, and (2) the payment for the assurance given that water of such quality shall be in the Delta channels for reasonable and beneficial uses on lands within the Agency, and said diversions and uses shall not be disturbed or challenged by the State so long as this contract is in full force and effect.

(ii) The State recognizes the right of the water users of the Agency to divert from the Delta channels for reasonable and beneficial uses for agricultural, municipal and industrial purposes on lands within the Agency, and said diversions and uses shall not be disturbed or challenged by the State so long as this contract is in full force and effect, and the State shall furnish such water as may be required within the Agency to the extent not otherwise available under the water rights of water users.

(iii) The Agency shall not claim any right against the State in conflict with the provisions hereof so long as this contract remains in full force and effect.

(b) Nothing herein contained is intended to or does limit rights of the Agency against others than the State, or the State against any person other than the Agency and water users within the Agency.

(c) This contract shall not affect, bind, prejudice, impair, restrict, or limit vested water rights within the Agency.

(d) The Agency agrees to defend affirmatively as reasonable and beneficial the water qualities established in this contract. The State agrees to defend affirmatively as reasonable and beneficial the use of water required to provide and sustain the qualities established in this contract. The State agrees that such use should be examined only after determination by a court of competent jurisdiction that all uses of water exported from the Delta by the State and by the United States, for agricultural, municipal, and industrial purposes are reasonable and beneficial, and that irrigation practices, conservation efforts, and groundwater management within areas served by such exported water should be examined in particular.

(e) The Agency consents to the State's export of water from the Delta so long as this contract remains in full force and effect and the State is in compliance herewith.

9. **Term of Contract.**

(a) This contract shall continue in full force and effect until such time as it may be terminated by the written consent and agreement of the parties hereto, provided that 40 years after execution of this contract and every 40 years thereafter, there shall be a six-month period of adjustment during which any party to this contract can negotiate with the other parties to revise the contract as to the provisions set out in Article 10. If, during this period, agreement as to a requested revision cannot be achieved, the parties shall petition a court of competent jurisdiction to resolve the issue as to the appropriate payment to be made under Article 10. In revising Article 10, the court shall review water quality and supply conditions within the Agency under operation of the FCVP and SWP, and identify any reimbursable benefits allocated to water users within the Agency resulting from operation of the FCVP and SWP, offset by any detriments caused thereby. Until such time as any revision is final, including appeal from any ruling of the court, the contract shall remain in effect as without such revision.

(b) In the event this contract terminates, the parties' water rights to quality and quantity shall exist as if this contract had not been entered into.

10. **Amount and Method of Payment for Water.**

(a) The Agency shall pay each year as consideration for the assurance that an adequate water supply and the specific water quality set forth in this contract will be maintained and monitored, the sum of one hundred seventy thousand dollars ($170,000.00). The annual payments shall be made to the State one-half on or before January 1 and one-half on or before July 1 of each year commencing with January 1, 1982.

(b) The payment established in (a) above shall be subject to adjustment as of January 1, 1987, and every fifth year thereafter. The adjusted payment shall bear the same relation to the payment specified in (a) above that the mean of the State's latest projected Delta Water Rate for the five years beginning with the year of adjustment bears to $10.00 per acre foot; provided that, no adjusted payment shall exceed the previous payment by more than 25 percent.

(c) The payments provided for in this article shall be deposited by the State in trust in the California Water Resources Development System Revenue Account in the California Water Resources Development Bond Fund. The trust shall continue for five years (or such longer period as the State may determine) but shall be terminated when the United States executes a contract as provided in Article 11 with the State and the Agency at which time the proportion of the trust fund that reflects the degree to which the operation of the FCVP has contributed to meeting the water quality standard under this contract as determined solely by the State shall be paid to the United States (with a pro rata share of interest). In the event that the United States has not entered into such a contract before the termination of the trust, the trust fund shall become the sole property of the State.

11. **Participation of the United States.** The Agency will exercice its best efforts to secure United States joinder and concurrence with the terms of this contract and the State will diligently attempt to obtain the joinder and concurrence of the United States with the terms of this contract and its participation as a party hereto. Such concurrence and participation by the United States in this contract shall include a recognition ratified by the Congress that the excess land provisions of Federal reclamation law shall not apply to this contract.

12. **Remedies.**

(a) The Agency shall be entitled to obtain specific perfor-

mance of the provisions of this contract by a decree of the Superior Court in Sacramento County requiring the State to meet the standards set forth in this contract. If the water quality in Delta channels falls below that provided in this contract, then, at the request of the Agency, the State shall cease all diversions to storage in SWP reservoirs or release stored water from SWP reservoirs or cease all export by the SWP from Delta channels, or any combination of these, to the extent that such action will further State compliance with the water quality standards set forth in this contract, except that the State may continue to export from Delta channels to the extent required to meet water quality requirements in contracts with the Delta agencies specified in Section 11456 of the California Water code.

(b) To the extent permitted by law, the State agrees to forego the use of eminent domain proceedings to acquire water rights of water users within the Agency or any rights acquired under this contract for water or water quality maintenance for the purpose of exporting such water from the Delta. This provision shall not be construed to prohibit the utilization of eminent domain proceedings for the purpose of acquiring land or any other rights necessary for the construction of water facilities.

(c) Except as provided in the water quality assurances in Article 2 and the provisions of Article 6 and Article 8, neither the State nor its officers, agents, or employees shall be liable for or on account of:

(i) The control, carriage, handling, use, disposal, or distribution of any water outside the facilities constructed, operated and maintained by the State.

(ii) Claims of damage of any nature whatsoever, including but not limited to property loss or damage, personal injury or death arising out of or connected with the control, carriage, handling, use, disposal or distribution of any water outside of the facilities constructed, operated and maintained by the State.

(d) The use by the Agency or the State of any remedy specified herein for the enforcement of this contract is not exclusive and shall not deprive either from using any other remedy provided by law.

13. **Comparable Treatment.** In the event that the State gives on the whole substantially more favorable treatment to any other Delta entity under similar circumstances than that accorded under this contract to the Agency, the State agrees to renegotiate this contract to provide comparable treatment to the Agency under this contract.

GENERAL PROVISIONS

14. **Amendments.** This contract may be amended or terminated at any time by mutual agreement of the State and the Agency.

15. **Reservation With Respect to State Laws.** Nothing herein contained shall be construed as estopping or otherwise preventing the Agency, or any person, firm, association, corporation, or public body claiming by, through, or under the Agency, from contesting by litigation or other lawful means, the validity, constitutionality, construction or application of any law of the State of California.

16. **Opinions and Determinations.** Where the terms of this contract provide for action to be based upon the opinion, judgment, approval, review, or determination of either party hereto, such terms are not intended to be and shall never be construed as permitting such opinion, judgment, approval, review, or determination to be arbitrary, capricious, or unreasonable.

17. **Successors and Assigns Obligated.** This contract and all of its provisions shall apply to and bind the successors and assigns of the parties hereto.

18. **Assignment and Subcontract.** The Agency may enter into subcontracts with water users within the Agency boundaries in which the assurances and obligations provided in this contract as to such water user or users are assigned to the area covered by the subcontract. The Agency shall remain primarily liable and shall make all payments required under this contract. No assignment or transfer of this contract, or any part hereof, rights hereunder, or interest herein by the Agency, other than a subcontract containing the same terms and conditions, shall be valid unless and until it is approved by the State and made subject to such reasonable terms and conditions as the State may impose. No assignment or transfer of this contract or any part hereof, rights hereunder, or interest herein by the State shall be valid except as such assignment or transfer is made pursuant to and in conformity with applicable law.

19. **Books, Records, Reports, and Inspections Thereof.** Subject to applicable State laws and regulations, the Agency shall have full and free access at all reasonable times to the SWP account books and official records of the State insofar as the same pertain to the matters and things provided for in this contract, with the right at any time during office hours to make copies thereof, and the proper representatives of the State shall have similar rights with respect to the account books and records of the Agency.

20. **Waiver of Rights.** Any waiver at any time by either party hereto of its rights with respect to a default, or any other matter arising in connection with this contract, shall not be deemed to be a waiver with respect to any other default or matter.

21. **Assurance Relating to Validity of Contract.** This contract shall be effective after its execution by the Agency and the State. Promptly after the execution and delivery of this contract, the Agency shall file and prosecute to a final decree, including any appeal therefrom to the highest court of the State of California, in a court of competent jurisdiction a special proceeding for the judicial examination, approval, and confirmation of the proceedings of the Agency's Board of Directors and of the Agency leading up to and including the making of this contract and the validity of the provisions thereof as a binding and enforceable obligation upon the State and the Agency. If, in this proceeding or other proceeding before a court of competent jurisdiction, any portion of this contract should be determined to be constitutionally invalid, then the remaining portions of this contract shall remain in full force and effect unless modified by mutual consent of the parties.

22. **Notices.** All notices that are required either expressly or by implication to be given by one party to the other shall be deemed to have been given if delivered personally or if enclosed in a properly addressed, postage prepaid, envelope and deposited in a United States Post Office. Unless or until formally notified otherwise, the Agency shall address all notices to the State as follows:

Director, Department of Water Resources
P.O. Box 388
Sacramento, California 95802

and the State shall address all notices to the Agency as follows:

North Delta Water Agency
921 - 11th St., Rm. 709
Sacramento, California 95814

IN WITNESS WHEREOF, the parties hereto have executed this contract on the date first above written.

Approved as to legal form and sufficiency:

By /s/ P. A. TOWNER
Chief Counsel
Dept. of Water Resources

STATE OF CALIFORNIA

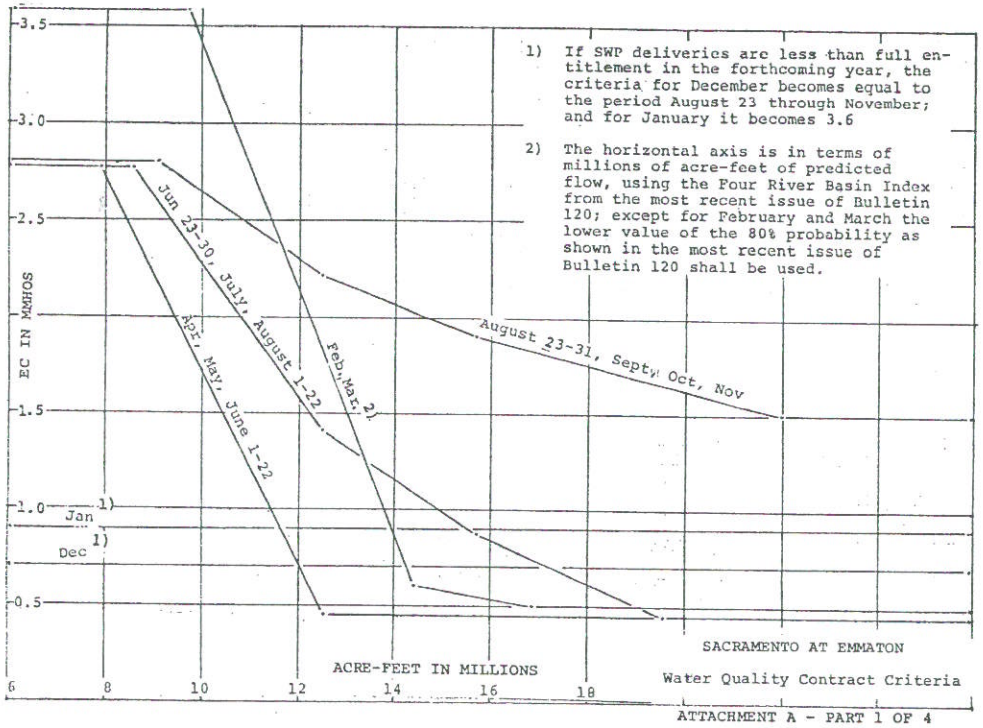
By /s/ RONALD B. ROBIE
Dept. of Water Resources

Approved as to legal form and sufficiency:

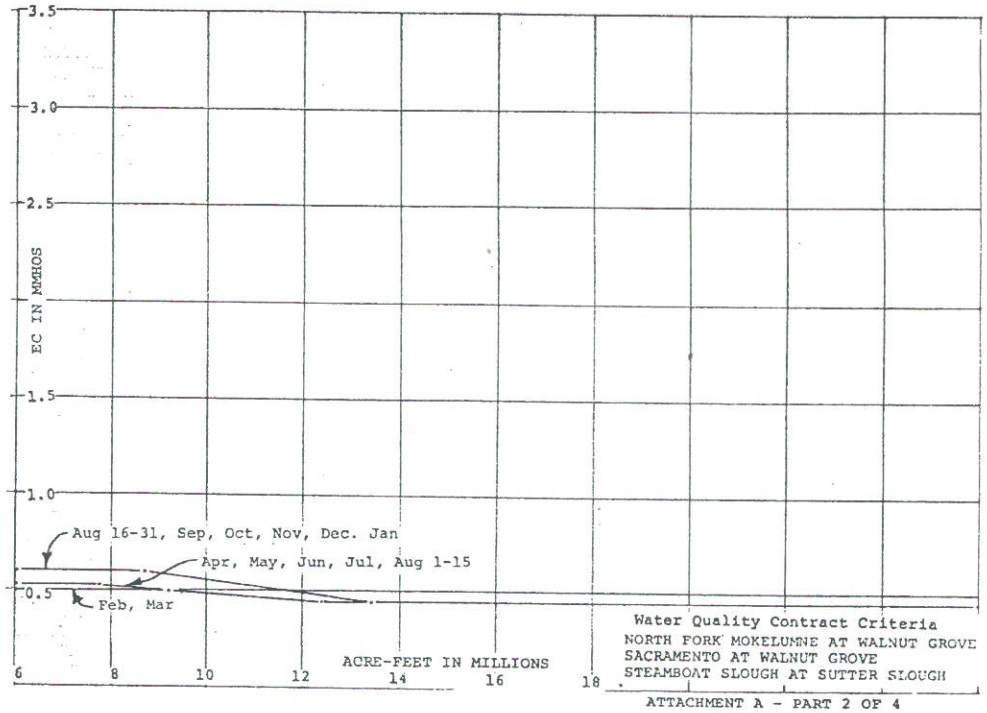
By /s/ GEORGE BASYE
General Counsel
North Delta Water Agency

NORTH DELTA WATER AGENCY

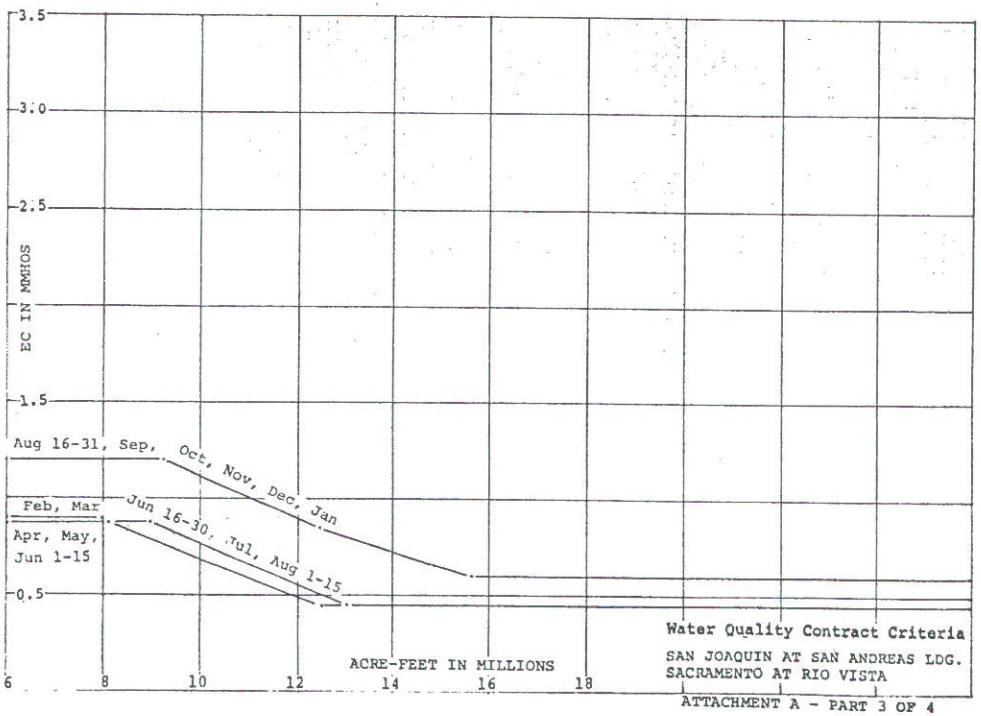
By /s/ W. R. DARSIE
Chairman
Board of Directors



ATTACHMENT A - PART 1 OF 4



ATTACHMENT A - PART 2 OF 4



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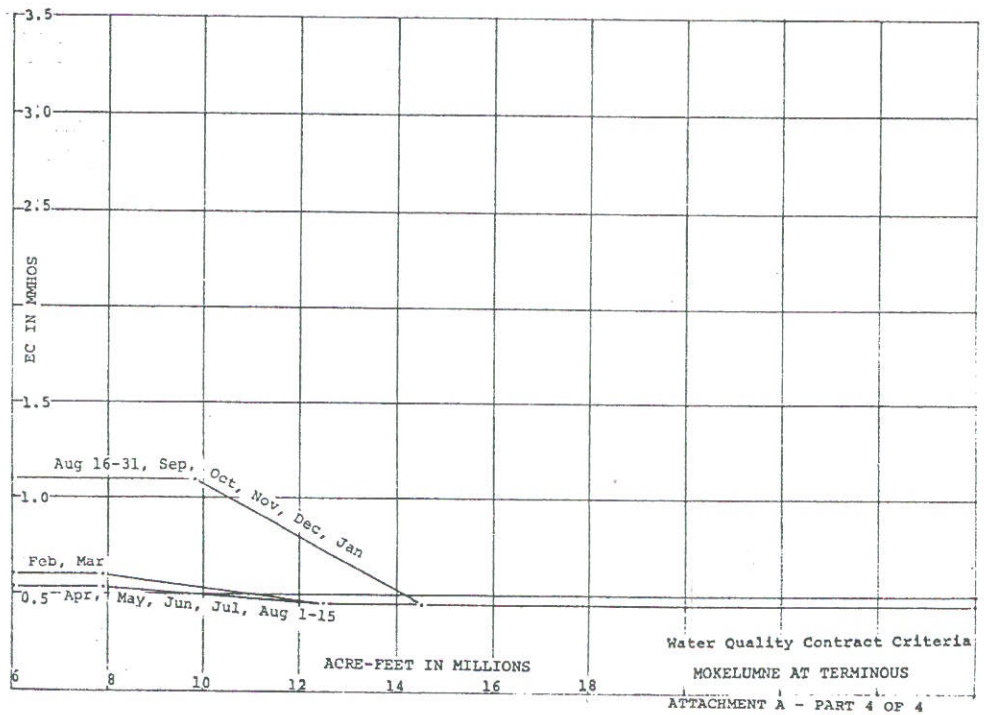
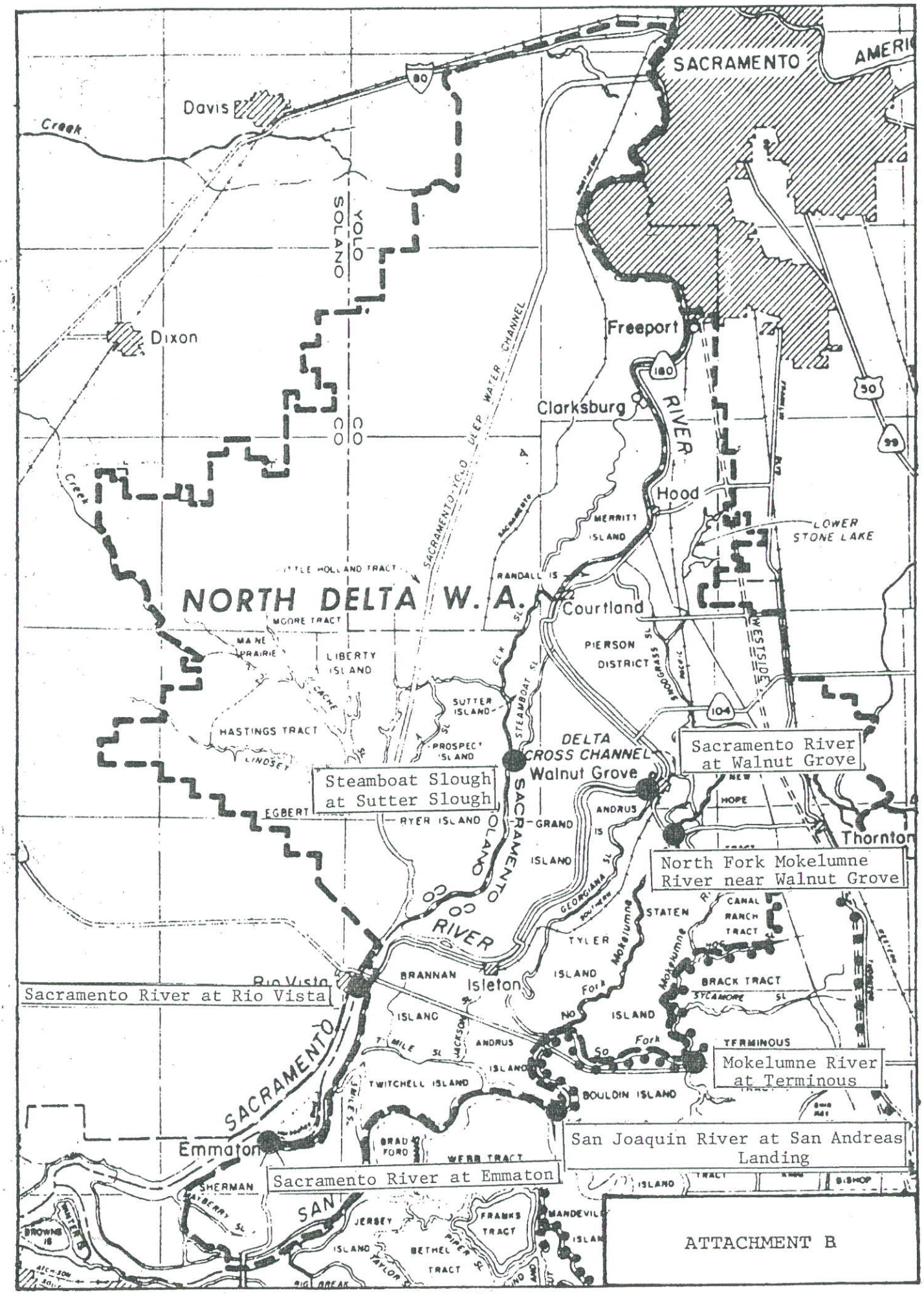


ATTACHMENT A - PART 4 OF 4


SACRAMENTO
Davis
Creek
Dixon
SOLANO
YOLO
CO
CO
Freeport
Clarksburg
RIVER
Hood
LOWER STONE LAKE
MERRITT ISLAND
RANDALL IS
NORTH DELTA W. A.
Courtland
MOORE TRACT
MANE PRAIRIE
LIBERTY ISLAND
PIERSON DISTRICT
SUTTER ISLAND
HASTINGS TRACT
PROSPECT ISLAND
DELTA CROSS CHANNEL
Walnut Grove
Sacramento River at Walnut Grove
Steamboat Slough at Sutter Slough
EGBERT
RYER ISLAND
GRAND ISLAND
ANDRUS IS
HOPE
Thornton
North Fork Mokelumne River near Walnut Grove
SACRAMENTO CO
RIVER
STATEN
CANAL RANCH TRACT
TYLER ISLAND
BRANNAN ISLAND
Isleton
Rio Vista
Sacramento River at Rio Vista
BRACK TRACT
SYCAMORE SL
NO Fork
SO Fork
TERMINOUS
Mokelumne River at Terminous
ANDRUS ISLAND
TWITCHELL ISLAND
BOULDIN ISLAND
SACRAMENTO
Emmaton
San Joaquin River at San Andreas Landing
WEBB TRACT
Sacramento River at Emmaton
SHERMAN
SAN
JERSEY ISLAND
BETHEL TRACT
FRANKS TRACT
MANDEVILLE ISLAND
BISHOP
BROWNS IS
ATTACHMENT B

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding is entered into this 26th day of May, 1998, by and between North Delta Water Agency (hereinafter "Agency") and Department of Water Resources, State of California (hereinafter "DWR").

RECITALS

A. In 1981, DWR entered into a contract (hereinafter "1981 Contract") with Agency under which Agency agreed to make certain payments to DWR in exchange for DWR making water of a specified quality and adequate quantity available for the use of diverters within the boundaries of Agency. The 1981 Contract remains in full force and effect.

B. The State Water Resources Control Board ("State Board") has initiated a water right proceeding in order to allocate the obligation to implement water quality objectives contained in the Bay-Delta Water Quality Control Plan adopted by the State Board on May 22, 1995 (hereinafter "1995 Plan").

C. The purpose of this Memorandum of Understanding is to set forth the joint position of Agency and DWR as to the legal effect of the 1981 Contract with respect to the obligation of water users within Agency, if any, to implement water quality objectives contained in the 1995 Plan.

UNDERSTANDINGS

1. DWR agrees that any obligation to curtail or modify diversions in order to assist in achieving any flow or salinity objective of the 1995 Plan imposed upon the use of water within Agency is entirely in the scope of the existing obligation of DWR under the 1981 Contract to provide water from the State Water Project supply, subject to the

limitations of reasonable and beneficial use. During the term of this Memorandum of Understanding, no party shall assert, before the State Board or in any court, that any other party must reduce or eliminate any of its direct diversions, diversions to storage or re-diversion of stored water, or release any previously stored water so long as the other party's method of use and method of diversion are reasonable under Article X, Section 2 of the California Constitution.

2. The parties agree that the payments made by Agency to DWR pursuant to the 1981 Contract constitute full and adequate consideration for the obligation of DWR described in paragraph 1 of this Memorandum of Understanding.

3. The parties agree that the assurances contained in the 1981 Contract, including the obligation of DWR to provide water to Agency users from State Water Project supplies, and in paragraph 1 of this Memorandum of Understanding, do not apply to any transfer of water outside Agency. The parties agree that the 1981 Contract does not affect any underlying rights the water users within the Agency may have to transfer water to the extent that such a transfer would be permissible under California law in the absence of the 1981 Contract.

4. Nothing in this Memorandum of Understanding constitutes an admission by Agency, express or implied, that the State Board has authority to limit or otherwise modify any right to divert water for use within Agency.

5. Nothing in this Memorandum of Understanding constitutes an amendment of the 1981 Contract as it presently exists.

6. This Memorandum of Understanding shall be effective only for the purposes of the currently pending SWRCB water right hearings to allocate the obligation to implement the 1995 Plan's water quality objectives, and for no other purpose.

THE NORTH DELTA WATER AGENCY

By: Dennis Leary

Date: 4/20/98

Title: Chairman

COUNSEL:

THE DEPARTMENT OF WATER RESOURCES

By:

Title: Director

Date: 5/26/98

APPROVED FOR LEGAL FORM & SUFFICIENCY:

Susan N. Weber
Chief Counsel

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