Meeker-Driftwood Canal SCADA and TCC Modernization Project

Recovery of Unmanaged Operational Spills on the Meeker-Driftwood Canal

Application for Funding Opportunity No. BOR-DO-19-F004, Fiscal Year 2019

By

Frenchman Cambridge Irrigation District

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Meeker-Driftwood Canal Automation Project
Frenchman Cambridge Irrigation District

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Date: March 15, 2019
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Project Name: Meeker Driftwood Canal SCADA and TCC Modernization Project

This project will increase water supply reliability in the Republican River Basin by eliminating operational spill to retain more water in Swanson Reservoir to create a more reliable water source for multiple beneficial uses. The project will install canal automation technology to precisely match supplied flows on the Meeker-Driftwood Canal to demand and thereby eliminate unmanaged operational spills. Precise flow measurement and control gates will be installed in each canal check structure and integrated into a SCADA radio telemetry network/controller that coordinates real-time flow setpoints at each check structure along the length of the canal so that the supplied flows always precisely match the downstream demand, and unintended operational spill is eliminated. This project is located on a Federal Facility and contributes to the goals of this FOA by creating quantifiable and sustained water savings to support a broad range of water reliability needs including better management of the Republican River interstate compact between Colorado, Nebraska and Kansas.

Background Data

Frenchman-Cambridge Irrigation District (District) is a political subdivision of the State of Nebraska organized under irrigation district laws of Nebraska on April 18, 1946. The District utilizes the storage supply from three Federal Reservoirs (Swanson, Hugh Butler and Harry Strunk Reservoirs) via Reclamation repayment contract No. 009D6B0122 to supply irrigation water to 45,669 Reclamation project acres located under four Reclamation Canal Systems. (Meeker-Driftwood, Red Willow, Bartley and Cambridge Canals) The District holds direct flow rights to divert waters of the Republican River basin into the four canal systems. Excessive groundwater development upstream of Swanson Reservoir, Hugh Butler Reservoir and Harry Strunk Reservoir has significantly limited the District's ability to provide a dependable and adequate water supply to all 45,669 project acres served by these three Reservoirs. In addition, groundwater development along the river and creek corridor downstream of the Reservoirs has greatly reduced the ability to convey the limited storage water to all Diversion Dams downstream.

THE MEEKER-DRIFTWOOD CANAL

The Meeker-Driftwood Canal consists of several continuous canals that were originally given different names as they were contracted to be designed and built. The original Meeker Canal that was privately constructed and owned was upgraded and extended and included the newer segments named Upper Meeker, Meeker Extension, Driftwood and Driftwood West Canals. The now named Meeker-Driftwood canal extends 39.2 miles along the south side of the Republican River to a point 7 miles east of McCook, Nebraska.

The Meeker-Driftwood Canal supplies water to 130 agricultural users. The upper canal has a design capacity of 284 cubic feet per second and the canal system serves 16,476 irrigable acres. The principal crops grown in the region are corn and soybeans.

The Meeker-Driftwood Canal services 34 laterals with a total length of 43 miles. The District has converted all laterals to pipelines and the majority of farmers have invested in high efficiency spray applicators such as pivots.

All structures in the canal and laterals are manually operated by the District. There are no actuated gates on the canal system.

INEFFICIENT HISTORICAL OPERATIONS

Historically the Meeker-Driftwood canal would divert a peak flow of 300 cfs, which is approximately 5% more than the designed capacity, but with improved on-farm irrigation efficiencies the typical maximum flow demand is presently less than 200 cfs.

From 2010 to 2014 the seasonal release through the dam to the canal has ranged from 8,035 to 32,955 acre-ft. During this same period, deliveries to farms from all turnouts and laterals on the

canal has ranged from 1,372 to 10,784 acre-ft per year. The average annual delivery efficiency during this period is 29.45%. The inefficiencies result from a combination of seepage and leakage, operational spill, inaccurate farm delivery measurement and to a smaller degree evaporation.

For comparison, the District's Cambridge Canal has historically experienced similar delivery efficiencies.

From 2010 to 2014 the seasonal release to the Cambridge Canal has ranged from 12,242 to 28,850 acre-ft. During this same period, deliveries to farms from all turnouts and laterals on the canal have ranged from 4,094 to 14,568 acre-ft per year. The average annual delivery efficiency during this period is 40.68%.

A HISTORY OF WATER SCARCITY

Farmers supplied by the Meeker-Driftwood Canal typically face shortages in their surface water supply, which is partially contributed to by unmanaged system losses.

Frenchman Cambridge Irrigation District has been operating at 67% of a full supply for the past two decades and for two consecutive years (2013 -2014) was significantly curtailed by State regulators so Nebraska could meet their Republican River Compact obligations.

A HISTORY OF INVESTMENT IN SYSTEM IMPROVEMENTS

The District has a long term structured and strategic plan to maximize it's distribution efficiency by converting all open ditch lateral to buried pipe and implementing SCADA control systems and precise measurement and control devices to precisely match supply to demand in the four canal systems.

The District has a successful history of past working relationships with Reclamation and the State of Nebraska. The recent history of supply system improvements implemented by the District include:

1. Conversion of inefficient open ditch laterals into buried pipe; (R and B Program)
2. Construction of a pumping plant and pipeline to utilize storage water from Harry Strunk Reservoir and eliminating over 60 miles of river transit losses with financial assistance provided by Reclamation WaterSMART Funding; (WaterSMART Funding Opportunity R11sf80303, Bartley Canal Pumping Plant and Piping Project awarded in 2011)
3. Pumping Plant Automation Project uses Total Channel Control (TCC) to eliminate spill during pump station operation, this project saves both water and electricity by pumping only the water needed to meet the demand. (Funding agreement number R12AP60072, awarded in 2012)
4. Cambridge Canal Automation Project automated the headgate and 7 miles of Cambridge Canal. This was implemented to capture all storage releases that arrived at the Cambridge

Diversion Dam during the night and adjusted the headgate to the correct opening and eliminated spills over the diversion dam each time a rate change was made at the Reservoir. (Funding opportunity number R12AP60053, awarded in 2012)

5. Adoption of Total Channel Control (TCC) automation technology on the upper reaches of the Cambridge Canal, to recover operational spill and hold this water in Harry Strunk Reservoir for future beneficial use. This highly successful project received financial assistance from the State of Nebraska's Water Sustainability Fund Program awarded in 2017.

6. The Adoption of Total Channel Control (TCC) automation on the lower reaches of the Cambridge Canal is presently being implemented. This project received financial assistance from the State of Nebraska's Water Sustainability Fund program awarded in 2018.

PROPOSED AUTOMATION OF THE MEEKER-DRIFTWOOD CANAL

This present project will implement the same Total Channel Control (TCC) technology that is successfully recovering unmanaged spill from the Cambridge Canal to further improve the distribution efficiency of the District's Meeker-Driftwood Canals to recover additional water for further beneficial use. This project helps the District meet its federal contractual water conservation obligations under the District's adopted Operating Plan (See Appendix C). This project would require some minor structure modification to several logging structures to install the Rubicon Water FlumeGates; the rest of the project consists of the installation of the SCADA components.

It is intended that if this grant is approved then the matching funds will come from Nebraska's Republican River Compact settlement money received from the State of Colorado. FCID staff will provide most of the labor. With this grant we will automate from station 0.0 down to station 29.3 on the main canal and the top 5.62 miles on the Driftwood West sub-canal. This will be the first phase of a two-phase project.

Project Location

The project location is shown in Figure 1 below. The Meeker-Driftwood Unit is in southwest Nebraska in Hitchcock and Red Willow Counties and begins approximately 22 miles west of McCook.

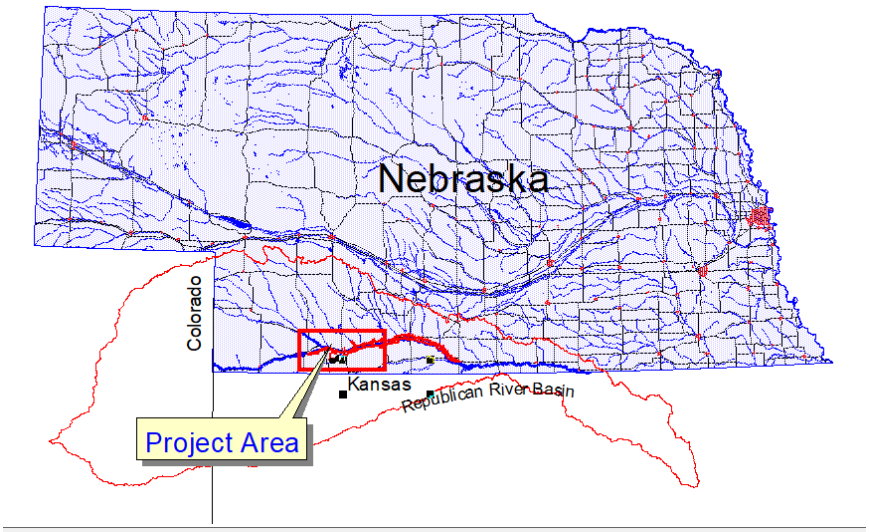

Figure 1 - Location of the Meeker-Driftwood Project Area

Figure 2-Google Earth Map of Frenchman-Cambridge ID Canals

The Meeker-Driftwood Canal begins at Trenton Dam, on the Republican River near Trenton, Nebraska. The dam impounds Swanson Lake. The Meeker-Driftwood canal runs east from Swanson Reservoir to approximately 10 miles east of McCook and follows the course of the Republican River on the south bank.

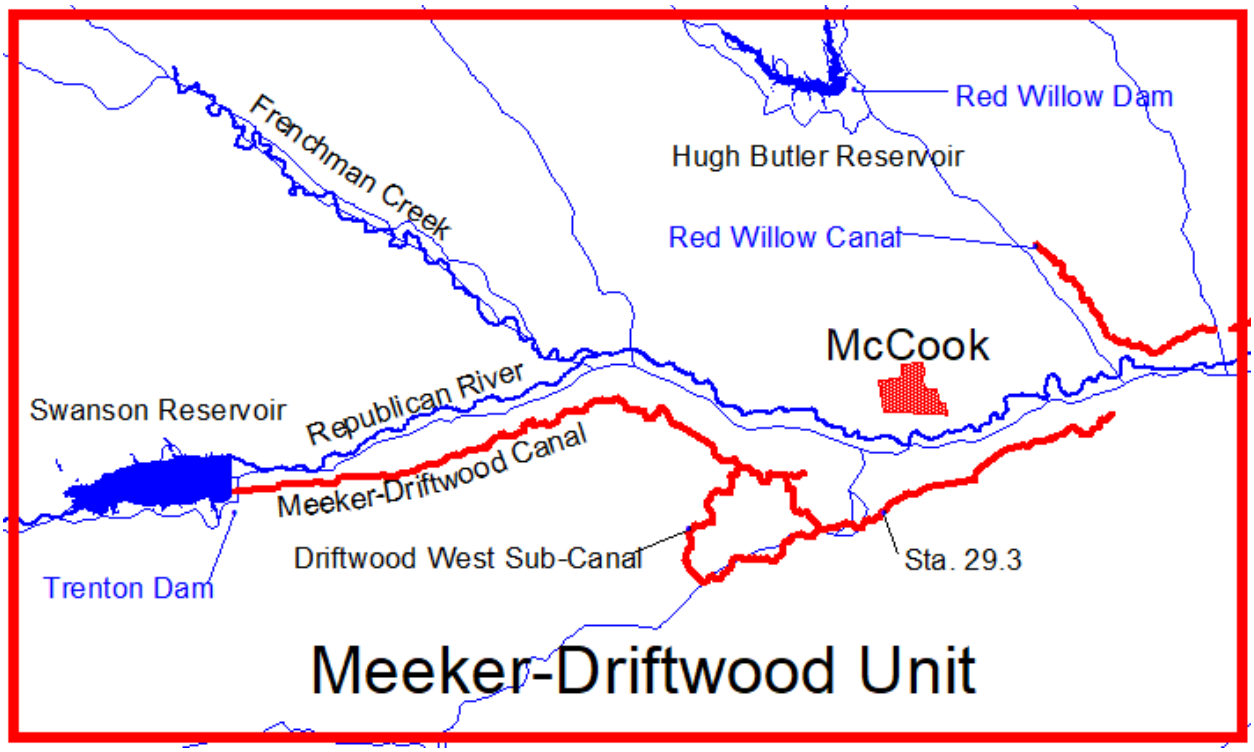

Figure 3 - Detailed Location of the Meeker-Driftwood Unit

Figure 4 - Meeker-Driftwood Canal Check Structures

Technical Project Description

This project will modernize 29.3 miles of Meeker-Driftwood Canal and 5.6 miles of Meeker-Driftwood West sub-canal by installing a precision flow management system to conserve water by recovering operational spill and over-deliveries. This project will be completed within two years of award.

The check structures on the canals will be fitted with FlumeGates to upgrade them to precision automated flow measurement and control structures. These modernized structures will be managed by a central SCADA system that precisely coordinates supplied flows to match demand in the canal. Rubicon's Total Channel Control (TCC) software will provide precise management of water delivery by continually writing flow setpoints to each check structure to precisely match all water extractions including farmer water deliveries, leakage and seepage. The Total Channel Control solution utilizes a combination of feed-forward and feed-back control to precisely match downstream water requirements:

- Flow measurements from downstream regulating structures and lateral offtakes are fed forward to upstream regulators.
- The water level in each pool is used to feed back unmeasured flow extractions so that these can be reported and responded to.

The net result of this combined feed forward and feed back response to canal demand is the maintenance of stable water levels in each pool in the canal; such that the canal operates as a distributed reservoir with water-tight check structures that eliminate unmanaged operational spill from the canal network.

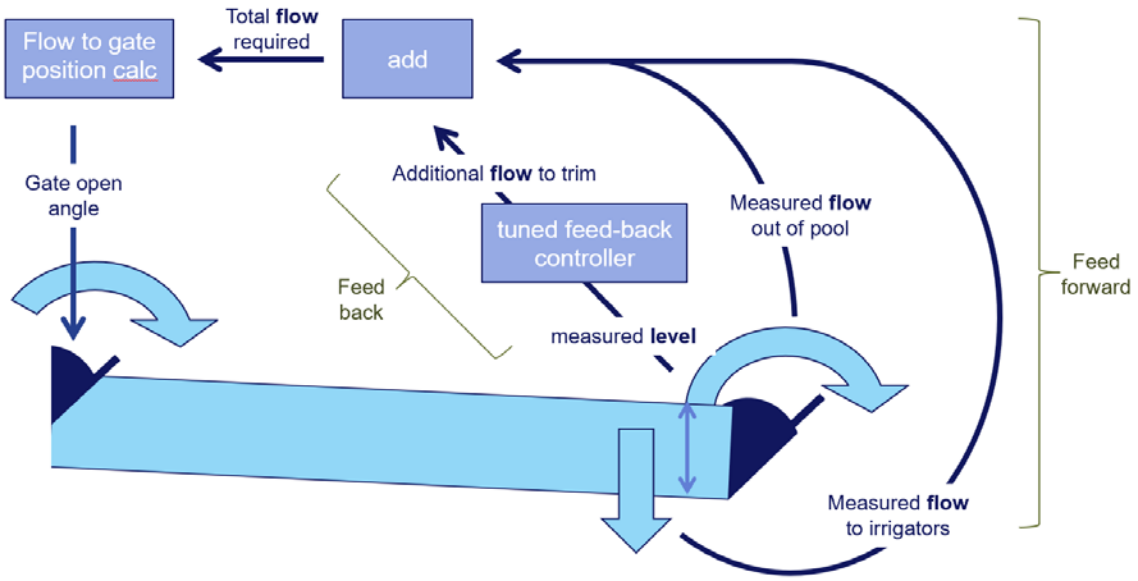

Figure 5 - Total Channel Control Management of Flows Through Canal Network

The YouTube video located at https://www.youtube.com/watch?v=I3RUFh1-87k illustrates the overall operation of the TCC system.

The FlumeGates are installed into the existing canal check structures as shown in Figure 6. These upgraded check structures are 100% water tight when the FlumeGates are in their closed position, allowing the pool upstream of the check structure to pass zero flow downstream when there is no flow demand scheduled. The canal is managed to operate as a distributed reservoir to supply instantaneous flow to farmers supplied by the pool with near on-demand service levels to maximize the farmers' opportunity for efficient management of on-farm irrigation practices.

The headworks of the reservoir are operated by another authority and cannot be directly controlled. The available volume in the first pools will be used as a buffering storage so that the headworks flow rate can be adjusted only 2-4 times a day as per present operations.

Figure 6 - FlumeGates installed into Frenchman Cambridge Irrigation District's Check Structures on the Cambridge Canal

The project will include works at the following check structures:

Canal	Location	Qty	Gate/Meter
Meeker-Driftwood	Check 2.4	3	FGB-1180-1804
Meeker-Driftwood	Check 3.9	3	FGB-1180-1804
Meeker-Driftwood	Check 4.4	3	FGB-1180-1804
Meeker-Driftwood	Check 5.8	2	FGB-2268-2186
Meeker-Driftwood	Check 8.2	3	FGB-1180-1804
Meeker-Driftwood	Check 9.1	2	FGB-2268-2186
Meeker-Driftwood	Check 10.4	4	FGB-1180-1804
Meeker-Driftwood	Check 12.4	3	FGB-1180-1804
Meeker-Driftwood	Check 14.3	3	FGB-1180-1804
Meeker-Driftwood	Check 15	3	FGB-1180-1804
Meeker-Driftwood	Check 15.3	4	FGB-1180-1804
Meeker-Driftwood	Check 16.2	3	FGB-1180-1587
Meeker-Driftwood	Check 20.5	3	FGB-1180-1587
Meeker-Driftwood	Check 22.38	1	FGB-1485-1804
Meeker-Driftwood	Check 22.4	2	FGB-2268-2186
Meeker-Driftwood	Check 23.1	3	FGB-1050-1437
Meeker-Driftwood	Check 24	2	FGB-1370-1587
Meeker-Driftwood	Check 24.7	2	FGB-1370-1077
Meeker-Driftwood	Check 25.2	2	FGB-1370-1077
Meeker-Driftwood	Check 25.4	2	FGB-1370-1077
Meeker-Driftwood	Check 25.8	2	FGB-1370-1077
Meeker-Driftwood	Check 26.1	3	FGB-1180-1273
Meeker-Driftwood	Check 28.2	1	FGB-2886-1587
Meeker-Driftwood	Check 28.4	1	FGB-2886-1587
Meeker-Driftwood	Check 28.9	1	FGB-2886-1587
Meeker-Driftwood	Check 29.3	1	FGB-2886-1587
Driftwood West	Check 0.47	2	FGB-1180-1273
Driftwood west	Check 0.94	2	FGB-1180-1273
Driftwood West	Check 1.2	2	FGB-1180-1077
Driftwood west	Check 1.64	2	FGB-1180-1077
Driftwood West	Check 2.9	2	FGB-1180-1273
Driftwood west	Check 3.53	1	FGB-1370-1273
Driftwood West	Check 4.67	1	FGB-1675-1273
Driftwood west	Check 5.05	1	FGB-1370-1077
Driftwood West	Check 5.15	1	FGB-1370-1077
Driftwood west	Check 5.25	1	FGB-1370-1077
Driftwood West	Check 5.47	2	FGB-1370-1077
Driftwood west	Check 5.62	1	FGB-1050-1077

Table 1 - Canal Check Structures to be upgraded in this project

Some structures will have minor concrete work done to accommodate the installation of the FlumeGates. This modification will consist of extending the concrete piers within the logging structures approximately three to four feet upstream. FCID is experienced in the civil modifications that will need to be made to the structures, and the District staff will undertake any required civil works as an in-kind contribution to the grant application.

The District's radio telemetry network will be expanded to provide SCADA coverage for all check structures on the Meeker-Driftwood Canal system as shown in Figure 7. This will require the installation of three new licensed radio system repeaters at the locations shown in Figure 7.

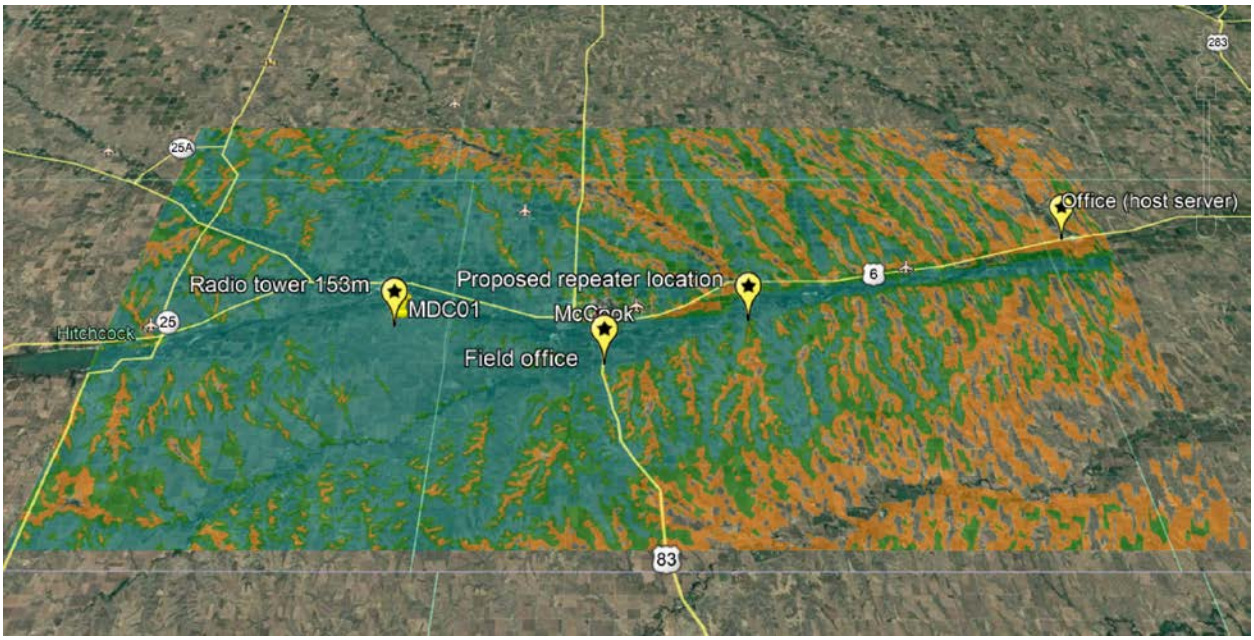

Figure 7 - Proposed SCADA System Coverage to be Achieved by this Project

FCID have an office and tower located just South of McCook which may be used for communications. We have been granted permission to make use of the existing 153m tall radio tower shown in Figure 7 and will install a new tower at the location marked "Proposed Repeater Location."

To provide additional resolution and performance from the controller, we also propose to measure flows into the larger lateral offtakes, in order to provide the feed-forward flow information shown as "Measured Flow to Irrigators" in Figure 5. The laterals that require measurement will be assessed on completion of this project and metering will be installed in a future modernization program.

Evaluation Criteria

E.1.1. Evaluation Criterion A—Quantifiable Water Savings (30points)

This project will conserve water and improve water use efficiency by modernizing existing infrastructure. Water savings can be achieved by addressing the loss components that are generally present in open canal systems. These loss components include:

- Operational Spills
- Leakage and Seepage
- Inaccurate Metering
- Evaporation

The proposed installation of Rubicon's Total Channel Control (TCC) will address operational spills and identify locations of leakage and seepage to allow targeted lining and remediation.

The quantity of water that will be conserved is equal to the quantity of water that has historically been lost to unmanaged operational spill. The Quantifiable Water Savings resulting from this project will be the operational spill that is recovered by precisely matching supply to demand along the length of the Meeker-Driftwood and Driftwood West Canals.

This project is expected to conserve an estimated 3,600 ac-ft of water per year.

WASTEWAY DATA FOR THE MEEKER-DRIFTWOOD AND DRIFTWOOD WEST CANALS

Operational spills are presently occurring as unmanaged flows out of the wasteways in the Meeker-Driftwood and Driftwood West Canals. These wasteways are located at the locations shown in Figure 8 below.

1. Meeker-Driftwood Mile 5.8 Wasteway and Check
2. Meeker-Driftwood Mile 9.1 Wasteway and Check
3. Meeker-Driftwood Mile 16.2 Wasteway and Check
4. Meeker-Driftwood Mile 20.5 Wasteway and Check
5. Driftwood West Station 5.47 Wasteway and Check
6. Meeker-Driftwood Mile 26.8 Wasteway and Check
7. Meeker-Driftwood Mile 32.2 Wasteway and Check (Brush Creek)
8. Meeker-Driftwood Mile 39.4 Wasteway and Check (Ash Creek)

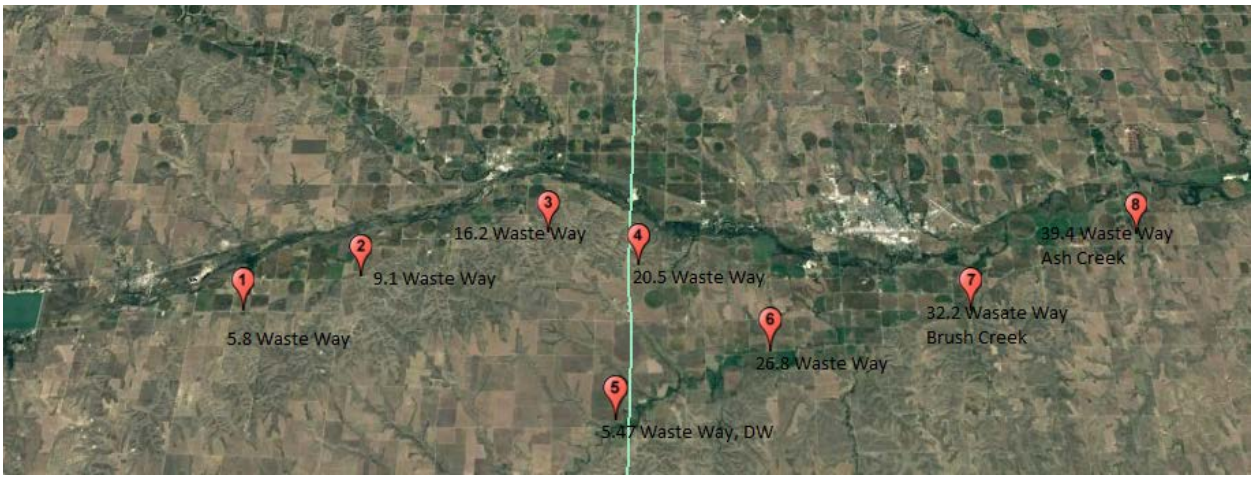

Figure 8 - Spill Locations on the Meeker-Driftwood and Driftwood West Canals

The HydroMet historical spill data for the Meeker-Driftwood Canal Waste way at Ash Creek is presented below. The average spill from this one spillway (of the eight listed above) has been 1,139 ac-ft per year. Note that in some years the spills have been as high as 3,348 ac-ft from this one spill structure alone.

Meeker-Driftwood Canal Waste way at Ash Creek					
Year	**June**	**July**	**Aug.**	**Sept.**	**Total**
2010	0	223	263	21	507
2011	48	461	642	13	1164
2012	**511**	**1425**	**1403**	**9**	**3348**
2013	6	170	90	0	266
2014	0	120	89	0	209
2015	0	218	242	72	532
2016	55	704	1200	84	2043
2017	49	895	543	98	1585
2018	0	363	225	12	600
Average	74	509	522	34	1,139

Note: 2013 and 2014 Reclamation's Reservoirs were issued Closing notices for the Republican River Compact Compliance. District Allocation was only 3.5 inches and 1.5 inches.

A second historical data source is provided by referencing telemetered flow data from an existing FlumeGate SCADA site on the Meeker-Driftwood Canal. The FlumeGate installed at the Meeker-Driftwood 26.8 Mile check structure has recorded upstream water levels over the duration of the 2018 irrigation seasons. This water level data has been used to compute the flow that has passed over the spillway escape shown in Figure 9.

Figure 9 - Escape upstream of Meeker-Driftwood 26.8 Mile Check

The spill recorded at this spillway over the 2018 irrigation season is logged in the District's SCADA database and totals 681 ac-ft.

The combined recorded historical spill from these two locations is 1,139 + 681 = 1,820 cfs per year. This represents historical flow data for 25% of the spill structures on the canal. If the assumption is made that the spills are consistent on the remaining six unmonitored structures, then the resultant spill would be 7,280 cfs per year.

To be conservative half of this number is being estimated for the purposes of this grant application. Although unmeasured we know from experience that spill occurs at the other wasteway locations, for example it is common for approximately 2cfs to spill from the Driftwood West Station 5.47 Wasteway, but we do not have historical data to support this observation.

COMPARISON TO CAMBRIDGE CANAL SPILL RESULTS

This project is a component of a system-wide modernization program that has been already seen to create significant water savings. The District's experience in the implementation of Total Channel Control on the Cambridge and Bartley Canals is that this operational spill has

been effectively reduced to zero under normal operations, and so the water saved is the full volume of historical spills that have been lost in the canal under existing manual operations.

Reclamation's Hydromet System provides spill summaries for the Cambridge Canal. The average yearly spill from the Cambridge Canal has been measured as:

Year	Net Supply	Main Canal Waste	% Spill
2014	12,242	1,543	13%
2015	29,156	4,372	15%
2016	30,337	3,884	13%
2017	25,406	2,561	10%

Typical spill losses on the Cambridge Canal have been on the order of 13% of average diversions.

If this same loss occurs on the Meeker Driftwood Canal (this would be expected given the canal is managed and operated by the same staff using the same methodology and equipment) then the spill for the Meeker-Driftwood Canal would be 13% of the 17,828 ac-ft average delivered over the period 2009-2018, which equals 2,320 ac-ft per year. Note that 2013 and 2014 diversions were very lows, as flows were heavily regulated by the State when the Bureau bypassed flow from the reservoir to make this available for downstream users in Kansas.

The following data shows the Meeker-Driftwood Canal diversions from 2009-2018 that were used to determine the average diversion value of 17,828 ac-ft presented above. This table also shows how problematic water security is on this canal and why investments in increasing water reliability are so important for the District's farmers and communities.

Year	District's Net Supply	Return Flows or Recharge	% Return Flows	Meeker-Driftwood Canal Diversions
2003*	18,332	8,309	45%	0
2004*	21,964	10,660	49%	0
2005*	19,732	9,974	51%	0
2006*	25,522	13,724	54%	0
2007**	26,000			0
2008*	23,476	13,502	58%	0
2009	63,112	45,319	72%	23,274
2010	52,338	34,671	66%	19,469
2011	60,106	31,558	53%	21,538
2012	68,710	27,691	40%	32,955
2013	21,785	13,763	63%	9,210
2014	20,277	13,059	64%	8,035
2015	53,096	32,664	62%	15,350
2016	56,395	30,879	54%	17,458
2017	49,535	28,977	58%	16,692
2018	44,472	25,958	58%	14,295
Average 2009-2018	**48,983**	**28,454**	**59%**	**17,828**

** Note: Meeker-Driftwood canal did not have a water supply from 2003-2008 due to drought and Colorado's many consecitive years violating the Republican River Compact agreement.*

** Note: In 2007 FCID's water supply was sold for Repubican River Compact Compliance, All 4 Canals did not operate in 2007*

Approach for verifying water savings upon completion of the project

The project will provide real-time flow measurement at all regulating structures and spillways in the system, and so the actual system spill in the future will be continually measured and recorded. The experience of the District's previous implementations of the Total Channel Control solution is that the spill will be zero under normal operations. We have data to demonstrate this on the Cambridge Canal, and following implementation of this project we will have data to verify the water savings resulting from this project.

The precision flow measurement provided by the FlumeGates in each check structure will also allow the determination of locations of excessive leakage and seepage by providing real-time

continuous pondage test information. This will allow targeted remediation works which we expect would result in higher water savings still. This leak location detection feature has been used successfully in other canal modernization projects to realize the best value in canal lining projects. Other benefits such as less mileage by operators on dusty roads (which saves time and influences air quality) and less damage to canal banks.

A PROVEN SOLUTION FOR RECOVERING OPERATIONAL SPILLS

In addition to the District's experience of successfully eliminating spill in our Total Channel Control implementations on the Cambridge and Bartley Canals, there are many other examples that demonstrate the effectiveness of this approach to creating water savings.

Many case studies and customer references have been provided in the Rubicon Scoping Study for our projects to establish the fact that the proposed Total Channel Control solution eliminates spill and precisely matches supply to demand to reduce the draw-down of stored water and make it available for further beneficial use later in the season. Direct meetings with the owners of these systems has validated the manufacturer's performance claims and we have found these to be accurate in our previous TCC projects.

Examples of references with contact details have been provided in Australia, California (Oakdale, Turlock and Solano Irrigation Districts), Washington (Naches Selah Irrigation District), Arizona (PIMA Maricopa Irrigation District) and Nebraska. The proposed solution has been proven in often more than fifteen years of operation in the irrigation districts referenced and has been put through extensive due-diligence assessments conducted by State governments in Australia and irrigation district engineering and operations staff. The experience of these broad implementations over fifteen years is that the Total Channel Control solution eliminates spill and allows that water to be retained in the reservoir to reduce draw down and be made available for managed streamflow retiming.

Coleambally

Coleambally Irrigation Cooperative is a farmer-owned co-operative located in Australia, providing irrigation water deliveries to 473 farms across 296 miles of gravity-fed canals. Faced with a significant reduction in water availability, Coleambally sought solutions to increase their water availability.

Coleambally chose Rubicon Water's Network Control Solution to modernize their canal system. The solution has largely eliminated spills, with water distribution efficiency increasing from around 75% in the 2002/03 season to 95% in 2012/13.

Each year Coleambally recovers between 49,000 to 57,000 acre-feet of water annually, which is now available to their farmers. Customers benefit from consistent flows through their outlets,

and water is delivered within two hours of ordering online. Farmers can now use their water much more effectively.

Oakdale

Oakdale Irrigation District is located in the Central Valley of California. In 2010, Oakdale undertook a comprehensive evaluation of their system performance and embarked on a program to modernize their gravity distribution system. In particular, they aimed to reduce operational spills and improve service by reducing fluctuations in canal water levels.

Rubicon and Oakdale identified two key laterals where improved control would realize significant benefits – the 6.5 mile 17 pool Claribel Lateral and the 8.5 mile 10 pool Cometa Lateral. Rubicon automated both laterals, replacing 42 gates in 30 structures with networked FlumeGates. The solution precisely matches supply with demand, eliminating operational spills. With near on-demand supply, farmers along the laterals now apply water to precisely meet crop requirements.

The resulting spill reduction has enabled Oakdale to recover 1,700 acre-feet per year from just one 8.5 mile lateral for further beneficial use.

NVIRP

In response to Australia's Millennium Drought, the irrigation infrastructure of Northern Victoria was modernized to make more water available for agricultural, environmental and urban uses. A once in a lifetime investment was made to modernize the canal networks of the Goulburn-Murray Irrigation Area. This area covers 840,000 acres of irrigated land which is supplied by 3,900 miles of open canals.

Rubicon Water delivered a modernized surface water delivery system to generate shared benefits for win-win outcomes. The Network Control solution made more water available for farmers, the environment and urban consumers.

Works to date include the supply and installation of nearly 12,000 automated gates and nearly 6,300 meters in turnouts. Rubicon installed the largest agricultural SCADA system in the world (7,445 PLCs over thousands of miles) operating on a private radio communications network.

To date the modernization works have completely automated 1,875 miles of primary canals operated by sophisticated management software to manage both demand and supply. The flow measurement capability of the FlumeGates was used to isolate leaking sections of canal, resulting in the lining of 75 miles of canal with HDPE. The ability to find the lossy pools in the network meant that only 4% of the network needed to be lined.

This project is creating savings of 182,250 ac-ft of water every year for further beneficial use.

E.1.2. Evaluation Criterion B—Water Supply Reliability (18points)

The water stored in Swanson Reservoir is required to improve water supply reliability for users in the Republican River Basin. This water supply reliability is improved by maximizing the volume of water stored in Swanson Reservoir by minimizing surplus diversions that result in over-deliveries and operational spills. The precise management of the volume and timing of supply releases improves water supply reliability by ensuring that water is available at the time of need of downstream users and that water does not pass through the system without benefit.

A History of Water Scarcity

Over the past decade, the supply reservoirs have not filled to adequate levels to allow the District to deliver irrigation water in adequate quantities to its farmers. Farmers have had to adjust accordingly by changing crops, fallowing plots, growing crops under stress and using supplemental wells where available. While diminished snowmelt and rainfall is the main reason for water shortage, testing and modelling have confirmed that pumping from the aquifer underlying the Republican River and its tributaries has also impacted flows in the streams, creeks and rivers. The District has taken measures to better use what water it still does store by improving delivery operations and implementing solutions that leverage technology.

The lack of water in the Republican River Basin has also significantly impacted other downstream surface water and ground water users within the Republican River Basin. As part of the three state compact between Colorado, Nebraska and Kansas, a formula-based quantity of water must be allowed to pass into Kansas via the Harlan County Reservoir located near the Nebraska-Kansas border. The water level in Harlan County Reservoir is closely monitored and its level at the start of year figures into the determination of how much water must be allocated to Kansas per the compliance agreement. As determined by the Nebraska Director of Natural Resources, if this forecasted quantity is not delivered then a Compact Call Year can be put into effect. This call has been enacted in the years 2013 to 2018 and had the impact of severely reducing all irrigation in the Republican Basin above Harlan County Reservoir.

Excessive groundwater development upstream of Swanson Reservoir, Hugh Butler Reservoir and Harry Strunk Reservoir has significantly limited the District's ability to provide a dependable and adequate water supply to all 45,669 project acres served by these three Reservoirs. In addition, groundwater development along the river and creek corridor downstream of the Reservoirs has greatly reduced the ability to convey the limited storage water to all Diversion Dams downstream.

Frenchman Cambridge Irrigation District has been operating at 67% of a full supply for the past two decades and for two consecutive years (2013 -2014) was significantly curtailed by State regulators so Nebraska could meet their Republican River Compact obligations. These severe

drought years prevented the planting of crops. This project will provide increased water supply reliability for the benefit of our farmers and rural communities.

Making Water Available for Multiple Beneficial Uses

The project addresses the impact of water scarcity by increasing the available stored water which can help many parties prosper through dry conditions, including the agricultural economy, the tourism economy, and the municipal and urban water users who rely on aquifers and stream flows for their water supplies. Maximizing the availability of this stored surface water provides additional opportunities and management options to enhance aquifer storage and increase streamflow. This project will enhance water supply reliability in the Republican River basin by providing the following benefits:

1. Reduced excess extractions from river, groundwater and surface reservoir storage in dry years - increased surface water availability reduces the need for river diversions and groundwater pumping - thereby reducing aquifer depletion.

2. Enhanced groundwater recharge in wet years - water-tight gates can be used to run specific sections of canals deeper for longer and therefore provide targeted incidental recharge, adding water availability to the system.

3. Improvements in water quality for downstream users and accompanying improvements in river health - water quality and river health improvements are achieved by minimizing the spill of irrigation water back into the river. In addition, river flows are increased along the reaches parallel to irrigation districts, with associated environmental benefits.

These benefits provide positive impacts to all users in the river basin. Experience in the west parts of the Basin has shown what can happen when canal flows cease to exist or have intermittent operations.

The project's method to increase water supply reliability.

This solution retains more surface storage water in Swanson Reservoir, allowing retiming of the release of this conserved water to maximize beneficial use for agricultural, environmental, recreational, municipal and industrial users.

By precisely managing the release of storage water, more water can be retained in storage to provide greater certainty of supply during extended dry periods.

The proposed project will enhance the operation of Swanson dam by providing real-time demand information which can be used to precisely set dam release flows to the exact value required to meet downstream demand. This information allows dam operators to operate with

a high degree of precision to reduce draw down and release of water which is presently passing through the system at unmanaged times and so is not providing maximal managed benefits.

By retaining more surface water in Swanson Reservoir, managers have more ability to maximize the beneficial use of this water in times of water scarcity. The ability to manage the time of release of stored water allows more stored water to be banked for future dry years, thereby preserving the water resource. These benefits of enhanced groundwater recharge, increased instream flows and improved water quality provide positive impacts to all users in the river basin.

A more reliable water supply for agricultural users

This project will provide a more reliable water supply for both surface water users and groundwater users.

The proposed solution will make more surface water available longer through the growing season and thereby extend water availability and resultant crop yields. For those farmers who rely solely on surface water, the additional water availability will increase crop yields. For farmers who use a mix of surface water and ground water, additional surface water will reduce pumping of groundwater and resultant aquifer overdraft and greenhouse gas emissions. In dry years, the additional water made available with this solution can mean the difference between a successful crop and a failed crop.

This project increases the water supply reliability of the Republican River Basin's aquifers and streams by increasing the opportunity for the surface water stored in supply dams to add to recharge and stream flow.

Ground water irrigators would benefit from the enhanced recharge that this project will enable. This Project also allows for much higher pool elevations and water depth that enhances the recharge rate with the project. In wet years the project's water-tight gates can be used to run specific sections of canals deeper for longer thereby allowing a deeper storage / canal driving head which enhances the recharge rate both before and after the commencement of the irrigation season, thereby adding water availability to the system along the length of the Meeker-Driftwood Canal. This targeted incidental recharge adds water availability to the system. This enhanced recharge will reduce the rate of aquifer depletion and enhance aquifer recovery to provide a more reliable ground water supply for pumpers.

And perhaps in some areas of too much recharge, the data that this project will provide would help with mitigating damages from too much recharge.

More reliable environmental flows

This project will provide better control of water stored in surface storages and provide increased in-stream flows in the later season for stream augmentation.

At present, operational spills pass downstream at times where there may not be sufficient stream flow to ensure that the spilled water arrives at a point where it can be beneficially used.

Most of the waste ways are located on dry tributaries to the Republican River and water spilled never reaches the River or if it does the river is so low the flows don't reach Harlan County Reservoir to support flows along the length of the river. In most years the spills enter a tributary that is normally dry and the flows never reach the river and, in some years, if the water does reach the river the river is found to be dry.

More reliable recreational facilities

Retaining more water in storage will sustain storage levels with resultant recreational benefits for reservoir users. This will benefit all recreational users of the reservoir. Nebraska Games and Parks has many examples demonstrating that higher reservoirs levels increase the number of visitations per day at the three Reservoirs associated with this project. Additional recreational benefits are provided by the ability to retime storage releases so that more water is available when the river flows are improved, providing benefit to recreational river users.

Better environmental outcomes

The solution provides improved water quality for downstream users and accompanying improvements in river health. Water quality and river health improvements are achieved by minimizing the spill of irrigation water back into the river, improving water quality for downstream users.

During normal canal operations chemicals are used to control algae and a variety of plant vegetation with the most common infestations being pond weed. The chemicals used have been deemed safe for this treatment. However, not allowing the chemicals to leave the canal system would be most desirable management approach, and this project would accomplish this outcome.

This project will also reduce the impact of invasive vegetation species and help prevent the Harlan Country Reservoir from becoming impaired with pollutants.

River flows are increased along the reaches parallel to irrigation districts, with associated environmental benefits. Wildlife habitat will benefit from an ability to retime release flows to buffer low flow situations that can occur late in the year.

The Republican River area within the District, especially including Reclamation project waters in Swanson Reservoir, is host to many additional migratory bird species that use the Central Flyway on their annual journeys. Swanson Reservoir is located on the western edge of the Central Flyway. The migratory species, including shorebirds and songbirds, travel through by the millions and land on and near our lake and waterways.

These species are highly benefitted by the availability of Reclamation waters. Low Reservoir pools at any of Reclamation Reservoirs in our area would pose a serious threat to these species. A low pool elevation for extended time also allows invasive vegetation to establish which also threatens animal habitat and recreation areas. The Environmental Protection Agency (EPA) has listed a few of the Federal Reservoirs as "impaired waters in Nebraska"; the 2010 pollutant identified Chlorophyll A, which is carried over from the 2008 list, total nitrogen and total phosphorus are new to the impaired waters list in 2010. Higher pool elevations would mitigate some if not all of these listed pollutants.

More reliable supply for municipal and industrial users

Increased surface water security reduces farmers' needs for river diversions and groundwater pumping – thereby increasing instream flows and reducing aquifer depletion and making more water available for Municipal and Industrial Users and better guaranteeing the quantity of supply and quality of drinking water supply.

Reduced excess extractions from river, groundwater and surface reservoir storage in dry years results in increased surface water availability that reduces the need for river diversions and groundwater pumping - thereby reducing aquifer depletion.

Municipalities and small villages along the River corridor would benefit from the canal recharge.

The retiming of release of storage water changes the time of availability of this water for downstream municipal and industrial users to times of scarcity later in the year around August.

It is much more efficient to move large amounts of water through the system during the winter months when vegetation is dormant and the river flows and alluvial aquifer have recovered from the mining of the aquifer during the irrigation season. The ability to control the release of this recovered water allows this water to be passed downstream later in the season when instream flows have recovered. This helps ensure that the water saved reaches the next Reservoir in the system, which would be Harlan County, a key source for the State of Kansas.

Resolving Water Related Conflicts in the Region

This project supports the goal of ensuring compliance with the Republican River Compact by increasing the availability of stored water in our reservoirs and providing the opportunity to make this water available for release at times that would best suit the needs of end users and of the Republican River Compact.

Administration of the Compact without sufficient water management tools such as the Total Channel Control solution has resulted in significant arbitration and financial penalties and caused significant conflict among the States of Colorado, Nebraska and Kansas. This project will provide precise management tools and real time scientific data to provide evidence-based documentation of compliance with the Compact and to allow each state to better manage its water to comply with its Compact obligations.

This project will improve cooperation and reduce conflict associated with the Republican River Compact. The saved water could be utilized to retime Compact augmentation water before it is actually pumped from the ground. This offset could be in lieu of the financial and energy expense of pumping expensive groundwater from the ground via N-CORPE. Recovering and retiming flows will help meet interstate compacts by providing more water availability late season or early fall that can be efficiently moved to Harlan County Reservoir along with augmentation flows from N-CORPE before the June 1st deadline. This would help insure that Nebraska meets all deadlines associated with future Compact resolutions.

This project will help Nebraska ensure compliance with the Republican River Compact by reducing the amount of storage water needed to operate the Meeker Driftwood Canal each year. A high reservoir elevation in Swanson Reservoir at the end of each irrigation season could result in that reservoir filling and spilling water downstream to Harlan County Reservoir. This will significantly enhance Compact compliance.

Harlan County Reservoir is the main source of supply for Kansas Bostwick Irrigation District. With the newly developed Integrated Management Plans (IMP) developed by the State of Nebraska and local Natural Resources Districts (NRD) one management action identified as a tool to help Nebraska achieve compliance is “Surface Water Leases”. This concept was successfully implemented in 2007 when Frenchman Cambridge Water users on the Cambridge Canal system agreed to forgo irrigation and allow Reclamation to move Storage water from Harry Strunk Reservoir downstream to Harlan County Reservoir as an offset to excessive groundwater depletions. The water was then available to the Kansas Bostwick Irrigation District. The water saved with this project could be available via this same marketing mechanism.

Flood Control

An additional benefit provided by this project is improved flood water warning and management. The regulation of canal flows and water levels remotely via remote telemetry provides early warning via SCADA utilizing text messaging and email warnings of high flows or high water levels within the canal system.

The ability to remotely control the flow control gates meaning that operational capability can be maintained when flood waters restrict vehicular access. This allows more capability to respond to flood events by maintaining the capability to operate structures when local access is not possible. The solution's water-tight gates can provide the capability to back water up and increase the rate of groundwater recharge to reduce the rate at which flood waters pass downstream.

The ability to operate the gates during a flood event also provides more routing opportunities and volume buffering opportunities to reduce localized flood damage.

With this project the risk of loss from flooding is greatly reduced. For example, any flows that enter the canal from runoff events or a power outage that would shut off nearly 100 center pivots at the same time would be safely passed through the system.

This project also has early warning alarms that would trigger actions by FCID personnel and local agencies and villages if the canal was at risk of overtopping. The public safety is always a high priority when running canal water through areas such as villages and towns.

E.1.3. Evaluation Criterion C—Implementing Hydropower (18points)

This project will provide the opportunity to reduce power consumption associated with pumping groundwater from the N-CORPE facility to ensure Nebraska's compliance with the Republican River Compact.

Most years Nebraska's consumption of its allocation exceeds their 49% share as defined in the Compact. Nebraska relies on the retiming of flows with conjunctive management and stream flow augmentation with N-CORPE to offset the overages in consumption of its Compact allocation. Under present administration of the compact Nebraska relies on significant groundwater pumping to fulfil its obligations.

The water saved by this project could be utilized to retime Compact augmentation water before it is pumped from the ground. This offset could be in lieu of energy intensive pumping of groundwater from the ground via N-CORPE. This project will provide more water availability late season or early fall that can be efficiency moved to Harlan County Reservoir along with augmentation flows from N-CORPE before the June 1st deadline.

Peak energy demand compliance by local REAs. With Total Channel Control (TCC) FCID water users can sign up at their local REA for a cheaper rate on electricity needed to operate pivot systems using canal water. Historically, water users under a canal system did not have the options to participate in the local power companies peak power control options due to the fact that if they turned off the center pivot during the peak power usage period the water they ordered from the ditch company would flow down the canal and spill from the canal system. With TCC this water can now be captured and precise adjustments to canal diversions can be made to ensure this water is not spilled from the canal and retained in the Reservoir for a time when the peak power period has ended.

The resultant reduction in energy consumed by the existing pumping operations will increase the power supply available in the region.

The solution is a zero-energy solar powered solution which will not create green-house gas emissions and which provides a zero energy zero emission alternative to groundwater pumping. Hence, this reduces power requirements, which has an equivalent impact to bringing more power generation online.

This will help meet the criterion of utilizing natural resources to ensure energy is available to meet our security and economic needs.

E.1.4. Evaluation Criterion D—Complementing On-Farm Irrigation Improvements (10 points)

All of the laterals on the Meeker-Driftwood Canal have been converted to pipeline and the majority of farmers have invested in high efficiency sprinkler applicators such as pivots. These farmers typically face shortages in their surface water supply, which is partially contributed to by unmanaged system losses. The shortfall in water supply can be mitigated by maximizing the volume of available storage water in Swanson Reservoir.

This project will complement on-farm irrigation improvements in the following ways:

1. The additional water available in storage will provide the ability to better plan for the next year's irrigation requirements when establishing seasonal allocations.

2. The ability to increase seasonal allocations as a result of increased water availability will make the difference between being able to irrigate and not being able to irrigate in dry years. Any investment in on-farm efficiency improvements relies on sufficient allocation to irrigate, and this project will increase the likelihood of this outcome in years of marginal allocation.

3. The upgrade of the supply canal system to provide farmers with near on-demand delivery of precise water schedules at constant ordered flow rates will precisely enable farmers to schedule their irrigations to match crop requirements, facilitating the full opportunity of on-farm water savings that can be realized through investment in pivots and precision drip and sprinkler systems, including improvements that may be eligible for NRCS funding. This project will create delivery system improvements that complement on-farm improvements supported by NRCS through the EQIP program.

This project will complement ongoing and future on-farm improvements by providing an on-demand delivery system to provide a stable and reliable water supply for on-farm solutions and equipment. Farmers in the region are making significant investments in pivots and micro irrigation. The majority of farm diversions are distributed to field by method of low-pressure pivot for mostly forage and cereal crops. On-farm turnouts are generally through-bank pipes feeding into pump pits, with pumps supplying pivots. These devices typically require constant flow rates, and the proposed Total Channel Control solution will enable these constant flow rates to be provided without requiring surplus deliveries or diversions to guarantee this.

The proposed project will maximize the overall distribution efficiency in the area, considered from the reservoir headworks to the root zone of the crops. Maximizing the delivery system efficiency will maximize the water available to be utilized by the on-farm efficiency investments.

The project will also allow the farmers to access an “Internet of Things” (IoT) backbone in the future, provided by the SCADA network that will be installed in this project. This IoT capability will facilitate the adoption of remote field data sources such as weather stations and soil moisture probes which will allow farmers to make irrigation scheduling decisions to precisely match the crop water requirement and prevent over-watering. It can be common in this area that cellular communications are difficult to establish; the provision of a communications gateway to “Internet of Things” devices at the proximity of the farmers’ fields will create a significant opportunity for science-based data driven irrigation scheduling to generate additional water savings.

The regulator FlumeGates also have the capability to host weather stations, and the project can be upgraded with high spatial resolution weather monitoring data so that farmers have access to relevant weather observations in the immediate vicinity of their crop with which to make informed irrigation decisions. The weather data will incorporate data on precipitation, solar radiation, wind speed and direction, and humidity, as required to determine local evapotranspiration data in the vicinity of the crops. This can create significant water savings opportunity by adding science to the irrigation decisions made by farmers such that they apply precisely the volume of water required by the crop based on real-time climatic conditions. Experience, documented in the literature, has demonstrated that this measurement-based irrigation demand scheduling can create significant water savings.

We understand that many of the farmers are utilizing government assistance including financial assistance from NRCS to employ these science-based tools.

E.1.5. Evaluation Criterion E—Department of the Interior Priorities (10 points)

1. Creating a conservation stewardship legacy second only to Teddy Roosevelt

The solution utilizes science and technology to manage water resources to adapt to changes in precipitation patterns. This project will help to better understand the total water balance of our canal systems.

This project will provide wildlife benefits to sustain the environment by increasing instream flows, in alignment with the objectives of conservation organizations. Increased water in the Swanson Reservoir will provide wildlife benefits for migratory bird species and a reduction in invasive vegetation with improved water quality outcomes. In addition, there will be enhanced recreational outcomes resulting from an increase in the volume of water retained in the reservoirs.

This project's ability to provide an IOT telemetry backbone for irrigators will provide additional real-time data resources such as on-site weather stations and evapotranspiration data for irrigators to allow them to utilize science to adopt best practices in managing their land and water.

2. Utilizing our natural resources

The project's ability to reduce the electricity consumption required by the NCORPE groundwater pumping infrastructure will ensure American Energy is available to meet our security and economic needs. It also has the potential to reduce the peak energy demand reductions established by the local power Companies.

The regulation of canal flows and water levels remotely via remote telemetry reduces vehicular usage and associated exhaust emissions and road wear and tear.

The project will also enhance the canal system's groundwater recharge to many wells (irrigation and domestic) that may not have a water supply without adequate recharge in dry periods that may occur in the future.

3. Restoring trust with local communities

This project will help build trust among surface water and ground water users and downstream users of Republican River water and will build trust in the correct distribution of water through Bureau conveyance networks.

This project will help ensure that surface water users assume their share to keep Nebraska in compliance by allowing them to continue to grow a crop with less water diverted. It improves the opportunity to grow a crop each year there and thereby reduces adverse economic, social, and environmental consequences.

4. Striking a regulatory balance

This project will conserve and use water more efficiently, mitigate conflict risk associated with disputes regarding the Republican River Compact, and will make more water available for the beneficial use of recreational, wildlife and agricultural interests in Colorado, Nebraska and Kansas. By providing automated high time resolution data and summary reports this system will reduce the administrative and regulatory burden associated with the Republican River Compact.

Accurate measurement of the water as it moves through the canal system will provide valuable data. This data will provide useful geologic information on rate of groundwater recharge. This project will use precise flow measurement at each check structure within the canal to assess the recharge rate at each pool within the canal network and thereby quantify the recharge rates of the underlying geology. A better understanding of the recharge rates will also help the Republican River Compact Administration (RRCA) investigate the beneficial consumptive use charged to Nebraska for water consumed by the canal systems. Currently 18% of all canal diversion is assumed to be a consumptive use charged to the state that has Federal Reclamation Projects located.

This project will allow better management of DOI water storage, transportation and distribution systems to resolve conflicts associated with the Republican River Compact and competing needs of surface water and groundwater users.

5. Modernizing our infrastructure

This project renovates existing infrastructure to create efficient water delivery systems that provide our farmers with the best available tools to maximize their agricultural output.

E.1.6. Evaluation Criterion F—Implementation and Results (6points)

E.1.6.1. Subcriterion F.1— Project Planning

The District has a Water Conservation Plan and System Optimization Review in place and this project forms a part of these plans. FCID has adopted a "District Operating Plan" that is approved by Reclamation and the Plan is an appendix to the repayment contract. Within this plan FCID has adopted Water Conservation Measures.

In the early 1980s under the R and B program FCID took out a loan for 5.5 million dollars and converted all open ditch laterals to buried PVC pipe. The District recently completed canal automation works which were supported by a 2016 Water Sustainability Fund application, and these have proven to be a valuable infrastructure upgrade with proven water use efficiency results. The extension of this project will further benefit the Republican River Basin, and so further installation of Total Channel Control (TCC) is a key component in the scope of FCID's District Operating Plan.

A canal system inspection has been performed to assess the condition of all regulating structures and to confirm the work required to make each structure good and to install the flow measurement and control equipment described in this proposal. This inspection has confirmed the existing location and condition of regulating structure assets against the original as-constructed plans. The Irrigation District has also worked with the equipment supplier to confirm the type and model of measurement and regulating equipment that will achieve the intended outcomes at the lowest whole of life cost.

E.1.6.2. Subcriterion F.2— Performance Measures

Historical canal spill records provide knowledge of the unmanaged return flows presently being returned as unplanned instream flows. Some of these spill volumes are provided by Reclamation's Hydromet System spill summaries.

The provision of real-time data through implementation of the project will demonstrate the resultant performance outcomes in eliminating operational spill. This reduction in spill will represent the additional volume retained in the reservoir.

E.1.6.3. Subcriterion F.3— Readiness to Proceed

The District plans to be ready to proceed immediately once funding approval is granted.

The gates and supporting SCADA and control system will be installed in a two-year program, and resultant water savings will be realized on an ongoing basis beginning one year after program commencement.

The process for the design and implementation of Rubicon's network control solution is:

1. Conduct detailed field inspections of the canals to be automated
2. Compile the cross sectional and longitudinal data for each canal
3. Survey the regulator check structures
4. Perform a radio field survey to verify the proposed Communications System is adequate and to verify proposed frequencies will not be subject to interference
5. Finalize gate sizing and selection
6. Order gates from Rubicon's factory
7. Scheduling of works to allow an implementation schedule to be committed to by Rubicon and Frenchman-Cambridge Irrigation District
8. Undertake required structure modifications
9. Install Gate External Frames
10. Gate Delivery
11. Install Gates and Meters
12. Test and Commission Gates and Meters
13. Commission the Radio Communications System
14. Installation and configuration of Network Control server software and any required hardware infrastructure
15. SCADA Host Engineering
16. Staff training in the operation, management, and maintenance of the technology with an emphasis on skill development and management.
17. Run hydraulic simulations and/or step tests to gather data for use in model calibration
18. Controller tuning to capture the characteristics of each of the pools to be controlled
19. Transition the canal to network control
20. Monitor the performance of the controllers

For project planning purposes, Rubicon will be able to complete each component of works for the system as follows:

- External frame delivery: Within 6 weeks of designs being approved.
- Gate / Meter delivery: Within 16 weeks of designs being approved.

- Radio communication system: Operational within 12 weeks of design approvals, on condition of license and permit approvals.
- SCADA host engineering: Operational within 12 weeks of design approval.

There are no permits required for this project. Reclamation owns all the lands associated with the project and holds the Storage permits for the Reservoirs and the Storage Use permits on all the project acres (45,669 acres). FCID holds the natural flow permits for the same 45,669 acres.

There are no new policies or administrative actions required to implement the project.

The environmental compliance estimate is based on the previous implementations of equipment installation over the previous three irrigation seasons. We understand the compliance requirements after having previously implemented these equivalent works. The plan of development will minimize the impact on the natural environment by ensuring the following: 1. Civil construction works will be limited to minimal modification to existing concrete structures and will not require excavation or moving of earth. 2. No chemicals will be released into soils or waterways as a part of these works.

The project will be fitting new flow measurement and flow control actuation to existing concrete check structures. These structure upgrades will not modify the structural loading of the upgraded check structures, and so there is no requirement to undertake a structural or foundation assessment on these existing check structures. Where new structures are proposed, these will be designed and constructed in accordance with existing approved plans to match existing check structures with consideration given to local geology and footing construction requirements

E.1.7. Evaluation Criterion G— Nexus to Reclamation Project Activities (4 Points)

Frenchman-Cambridge Irrigation District (FCID) utilizes the storage supply from three Federal Reservoirs via Reclamation repayment contract no. 009D6B0122. Reclamation constructed the Canals, Drains and Laterals for this Irrigation Project, and FCID has a repayment obligation for the Project. Reclamation owns all the lands associated with the project and holds the Storage permits for the Reservoirs and the Storage Use permits on all the project acres (45,669 acres). FCID holds the natural flow permits for the same 45,669 acres. Within its repayment contract FCID maintains the Irrigation project and funds a percent of the O&M associated with the three Reservoirs.

Reclamation has many water users under these federal projects that rely on the irrigation water for their livelihood.

E.1.8. Evaluation Criterion H— Additional Non-Federal Funding (4 points)

The State of Nebraska has funded equivalent modernization works on the District's Cambridge Canal in two rounds of funding awards, and will be contributing funding to this project. The reason for the State's support is the significant benefit that this project and the previous associated Cambridge Canal projects generate for the parties to the Republican River Compact and the cooperation of surface water and ground water users in the Republican basin.

The Federal funding will be matched by the State of Nebraska using money that it has received from Colorado for non-compliance with the Republican River Compact.

The total estimated project budget is $3,986,446 and the project is requesting $1.5 Million dollars in Federal funding.

The non-Federal contributions represent 62.3% of the project costs.

Section H – Other Information

H.1. Environmental and Cultural Resource Considerations

- Will the proposed project impact the surrounding environment?

  This project will not impact the soil, air, water or animal habitat of the Meeker-Driftwood Canal. The plan of development will minimize the impact on the natural environment by ensuring the following: 1. Civil construction works will be limited to minimal modification to existing concrete structures and will not require excavation or moving of earth. 2. No chemicals will be released into soils or waterways as a part of these works. 3. The solution is a zero-energy solar powered solution which will not create green-house gas emissions and which provides a zero energy zero emission alternative to groundwater pumping. 4. The solution provides wildlife benefits to sustain the environment by increasing instream flows. 5. The regulation of canal flows and water levels remotely via remote telemetry reduces vehicular usage and associated exhaust emissions and road wear and tear.

- Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designates critical habitat in the project area?

  No endangered species will be affected by any activities associated with the proposed project.

- Are there any wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “Waters of the United States?”

  No.

- When was the delivery system constructed?

  Original system plans indicate that the delivery system was constructed in 1956.

- Will the proposed project result in any modification of or effects to individual features of an irrigation system?

  Yes, the project will involve installing flow measurement and control gates into existing concrete check structures. These check structures were constructed in the late 1950s.

- Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?

  No.

- Are there any known archaeological sites in the proposed project area?

  No.

- Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?

  No.

- Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?

  No.

- Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

  No.

Project Budget

Funding Plan and letters of commitment

Frenchman Cambridge currently has funds which can be committed to this WaterSMART 2019 funding opportunity and will increase our budget item under water conservation to insure an awarded grant can be funded.

FCID has also had a verbal commitment from the Governor of Nebraska during his February 22, 2018 press conference to use a recent settlement agreement with the State of Colorado for water conservation activities in the Republican River for Surface water projects. (Press Release)

Currently the 4 million dollars in Settlement Funds needs to be approved for spending by the Nebraska Legislature. We are confident that a commitment letter will be available before this Funding opportunity is awarded.

Budget Proposal

Table 1. —Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	$ 1,500,000
Costs to be paid by the applicant	$ 486,446
Value of third-party contributions	$ 2,000,000
TOTAL PROJECT COST	**$ 3,986,446**

Table 2. —Budget Proposal, Tabulated

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	$/Unit	Quantity		
Salaries and Wages				
Project Manager	40.00	200	Per hour	$ 8,000
District General Labor	17.70	936	Per hour	$ 16.568
Heavy Equipment Operator	19.00	78	Per hour	$ 1,482
Office / Clerical	17.10	40	Per hour	$ 684
Fringe Benefits				
Full-Time Employees	16.41	1,254	Per hour	$ 20,578
Travel				
Structure prep and Installation	0.58 / mile	4,000	Per mile	$ 2,320
Pickup and Trailer	0.58 / mile	2,500	Per mile	$ 1,450
Equipment				
Backhoe CAT 450 (Region V)	$42.28	80	Per Hour	$ 3,382
Supplies and Materials				
FlumeGates	$39,125.02	80	Per gate	$ 3,130,002
Gate Commissioning	$1,500.00	80	Per gate	$ 120,000
Walkways	$1751.26	80	Per gate	$ 140,101
450 Mhz Radios and Repeaters	$3795.85	41	Per Radio	$ 155,630
Control Tuning and Project Mgt.	$7653.84	39	Per Structure	$ 298,500
Contractual / Construction				
Structure Modification	$2,250	39	Per Structure	$ 87,750
Third-Party Contributions				
Contributor A				$
Contributor B				$
Other				
Environmental and Cultural Resources (See Remarks Below)				$0.00
TOTAL DIRECT COSTS				**$3,986,446**
Indirect Costs				
Type of rate	percentage	$base		**$**
TOTAL ESTIMATED PROJECT COSTS				**$3,986,446**

Budget Narrative

Salaries and Wages (District Staff) **Estimated Total = $26,733**

Project Manager will be Brad Edgerton, General Manager for Frenchman Cambridge Irrigation District. The Project Manager will oversee the design, shipment, installation, commissioning, and initial operation of the system. This role will be responsible for all aspects of the installation, schedule, and business functions of the project. It is estimated that a total of 200 man-hours are required at $40.00 per hour.

General Construction Labor; Frenchman Cambridge Irrigation District will provide 4 fulltime employees with the job title as "Ditch Rider/Canal Maintenance" they will work on all aspects of the project, including site preparation, clean-up and restoration. It is estimated that a total of 936-man hours are required at $17.70 per hr.

Heavy Equipment operator's Salary and wages; Frenchman Cambridge Irrigation District will provide 1 full time employee with the job classification of "Heavy Equipment Operator" It's estimated that 78-man hours at $19.00 per hour is required. They will handle the duties of loading and unloading Rubicon Water FlumeGates and setting them in modified check structures. The Equipment will include one Caterpillar 450E Backhoe.

Office and Clerical staff; One Clerical position is required, it is estimated that 40 hours is required for this project at $17.10 per hour. This position will be responsible for all receipts and bills associated with the accounting and reporting.

Fringe Benefits: **Estimated Total = $20,578**

Project Manager fringe benefits based on 200 hours at $16.41 per hour.

General Construction Labor Fringe Benefits; Frenchman Cambridge Irrigation District will provide 4 fulltime employees with the job title as "Ditch Rider/Canal Maintenance" they will work on all aspects of the project, including site preparation, clean-up and restoration. It is estimated that a total of 300-man hours are required at $16.41 per hr.

Heavy Equipment operator's Fringe Benefits; Frenchman Cambridge Irrigation District will provide 1 full time employee with the job classification of "Heavy Equipment Operator" It's estimated that 70-man hours at $16.41 per hour is required. They will handle the duties of loading and unloading Rubicon Water FlumeGates and setting them in modified check structures. The Equipment will include a Caterpillar 450E Backhoe.

Office and Clerical staff Fringe Benefits; One Clerical position is required, it is estimated that 40 hours is required for this project at $16.41 per hour. This position will be responsible for all receipts and bills associated with the accounting and reporting.

All employees at FCID have the same benefit package. A total of 410 employee fringe benefit hours are estimated at $15.63 per hour and a total project cost of $6,408.30

Travel: **Estimated Total = $3,770**

This project is located south of Culbertson Nebraska and is over 40 miles from FCID's headquarters in Cambridge. It is estimated that 4000 miles will be needed to transport FCID personnel to and from the project area. An additional 2,500 miles are estimated that includes a pickup and trailer to transport FlumeGates and supplies to the project area. A total of 6,500 miles are estimated to complete the project at an IRS rate of $0.58 per mile totalling $3,770.00

Equipment: **Estimated Total = $3,382**

It is estimated that one Backhoe CAT 450 (Region V) will be needed for an estimated 80 hours to load and unload gates. The backhoe will also be used to set the gate into the modified canal structures. A rate of 42.28 per hours was obtained from the U.S. Army Corps of Engineers Construction Equipment Ownership and Operating Expense Schedule published November 30, 2016 for Region V. FCID will not need to purchase equipment to complete this project.

Supplies and Materials: **Estimated Total = $3,844,233**

The primary vendor for this project is Rubicon Water, who has prepared a project estimate for FCID (attached to this application).

The bulk of materials cost are the supply of FlumeGates, which are Rubicon's overshot gate/metering system that control and measure water levels and flows at each check structure. A total of 80 gates will be required to provide automated control of the canal. The FlumeGate is sold as a complete, ready-to-run package that includes all structure walkways, sensors, controllers, solar power system, installation hardware, and system commissioning.

Also included in the Rubicon estimate is the hardware for the radio data communication system, which includes a radio/antenna assembly at each control structure, as well as pair of repeater radio systems to be mounted at pre-existing towers to provide communication across the project.

Other materials include the SCADA software licenses needed to expand the system beyond its current size.

Contractual / Construction: **Estimated Total = $87,750**

Frenchman Cambridge Irrigation District may sub-contract most all the civil and concrete work needed to complete the project. Based on estimates and actual cost from a previously completed project on Cambridge Canal, this cost is estimated at $2,250.00 per control structure (39 structures total) to complete the project.

Total Estimated Project Cost = $3,986,446

FCID has contract repayment obligations to the Federal Government until the year 2060. Implementing projects such as this project is a step in the right director to ensure that this contract can be paid back as scheduled. See attached Contract 009D6B0122 and amendments

The equipment installed in the project is designed with a 30-year economic life and the ongoing maintenance costs are estimated to be less than 2.5% of the up-front capital costs per year. These ongoing maintenance costs are largely offset by reduced vehicular and operations costs and greater assurance that water deliveries will occur each and every year. The estimated construction period is 6 months commencing January 2019, and the estimated economic life of the installed equipment is 30 years. The accompanying FCID Project Costings and Economic Value spreadsheet demonstrates the economic value of this project.

The estimated construction cost of this project is $3,986,445.10. The outcome will be the ability to retime more than 3,600 acre-feet of water each year for release at the time of need of downstream users. The O&M costs over the 30-year asset life of this solution are estimated at less than 2.5% of the capex – or $99,661 per year. These O&M costs are expected to be largely offset by a reduction in existing costs such as vehicular usage and other operational costs. There are no land or water acquisition costs involved in this project.

When the capital costs of the project are amortized over the 30-year asset life, this water is made available at a cost of only $36.91 per acre-foot per year – the value of this water is significantly greater than the cost of making it available. Experience shows that the adopted Total Channel Control automation solution typically costs as little as 1/10 the price of converting larger canals to pipeline, and generally is significantly cheaper than constructing balancing storages.

Environmental and Cultural Resources Compliance

Past projects of this type on FCID's facility did not have an Environmental and Cultural Resources impact. FCID will request a compliance inspection from the Nebraska-Kansas Area Office prior to the project commencing. Past inspections were done at no cost to the District.

Required Permits or Approvals

No permits or approvals are required, this project is considered an O and M upgrade.

Letters of Project Support

FCID has obtained a letter of support from the State of Nebraska Department of Natural Resources (DNR) and the Middle Republican Natural Resources District (MRNRD). The Director for DNR, Jeff Fassett, is Nebraska's Commissioner for the 3-State, Republican River Compact. This project and all the project acres under the Meeker-Driftwood Canal are 100% within the MRNRD District boundaries.

Official Resolutions

On March 5, 2019 at the regular monthly meeting of the Board of Directors for Frenchman Cambridge Irrigation District, Dale Cramer, President; Todd Lichty, Vice President; Duane Vorderstrasse, Secretary / Treasurer; dually elected and authorized by Nebraska State Statutes to conduct all business on behalf of Frenchman Cambridge Irrigation District my unanimous vote adopted Resolution 2-2019. (attachment)

Unique Entity Identifier and System for Award Management

FCID is registered in the System for Award Management (SAM) and has a DUNS identification number.

NEBRASKA

Good Life. Great Water.

DEPT. OF NATURAL RESOURCES

Pete Ricketts, Governor

March 14, 2019

Brad Edgerton, Manager
Frenchman Cambridge Irrigation District
P.O. 116
Cambridge, NE 69022

Dear Brad:

Please consider this letter a formal expression of the Department's support for your Bureau of Reclamation WaterSMART grant application for the automation project associated with the Meeker-Driftwood Canal system portion of the FCID irrigation project. These types of projects, aimed at increasing water supply reliability in the Republican River Basin, are critical to sustaining irrigation operations over the long term, particularly during periods of drought. Your district's commitment to investing in canal efficiency improvements represents the types of proactive actions that are necessary to most effectively manage water supplies for the future. The current integrated management plan and recently adopted Republican River Basin-Wide Plan recognize the benefits of these types of activities in supporting goals aimed at the long-term sustainability of irrigation uses in the basin.

The use of more precise flow measurement and control gates with integrated telemetry should allow your district to most effectively match canal diversions and storage water releases with your users demands. These types of investments can also support further collaborative efforts with local natural resources districts and the state to implement new and innovative conjunctive management projects in the future that can further enhance the certainty of water supplies within the basin.

Once again, the Department fully supports your district's efforts to expand its implementation of canal efficiency improvement projects and appreciates your district's efforts in working to support the states integrated management plan and basin-wide plan goals.

Sincerely,

Gordon W. Fassett

Gordon "Jeff" Fassett

Director

Gordon W. "Jeff" Fassett, P.E., Director

Department of Natural Resources

301 Centennial Mall South
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Middle Republican Natural Resources District

220 Center Ave
Curtis, NE 69025
office@mrnrd.org
(308) 367 – 4281
www.mrnrd.org

March 12, 2019

Brad Edgerton, Manager
Frenchman Cambridge Irrigation District
P.O. Box 116
Cambridge, NE 69022

Subject: Support for WaterSMART Grant Application

Brad:

This is a letter of support for the Frenchman Cambridge Irrigation District (FCID) Grant application for the Meeker Driftwood Canal improvements through the BOR WaterSMART Grant program. This canal is located within the Middle Republican Natural Resources District (MRNRD) and this project would provide benefits to surface water users as well as groundwater users. The FCID has a successful history of improving the efficiency of their delivery system.

This project also addresses several of the Republican River Basin-Wide Plan goals and objectives, especially Goal 2. "Maximize Nebraska's efficient and beneficial consumptive use of its portion of the water supply, increase certainty for long-range planning of water supplies to reduce the need for regulatory actions, and increase collaborative efforts among water management entities and stakeholders across the Basin".

It takes concerted effort from all water users to insure the long term viability of irrigation in the Republican River Basin. The MRNRD encourages and supports efforts to increase efficiency in water management efforts.

Sincerely,

Jack Russell, Manager
Middle Republican NRD

Q500952 Rev.2

March 15, 2019

Frenchman Cambridge Irrigation District
1310 US-6
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System Quotation – Meeker-Driftwood Canal

Dear Brad,

It is with pleasure that **Rubicon Water** submits this quotation for the implementation of Rubicon's Network Control system on Frenchman Cambridge Irrigation District's (FCID) Meeker-Driftwood Canals.

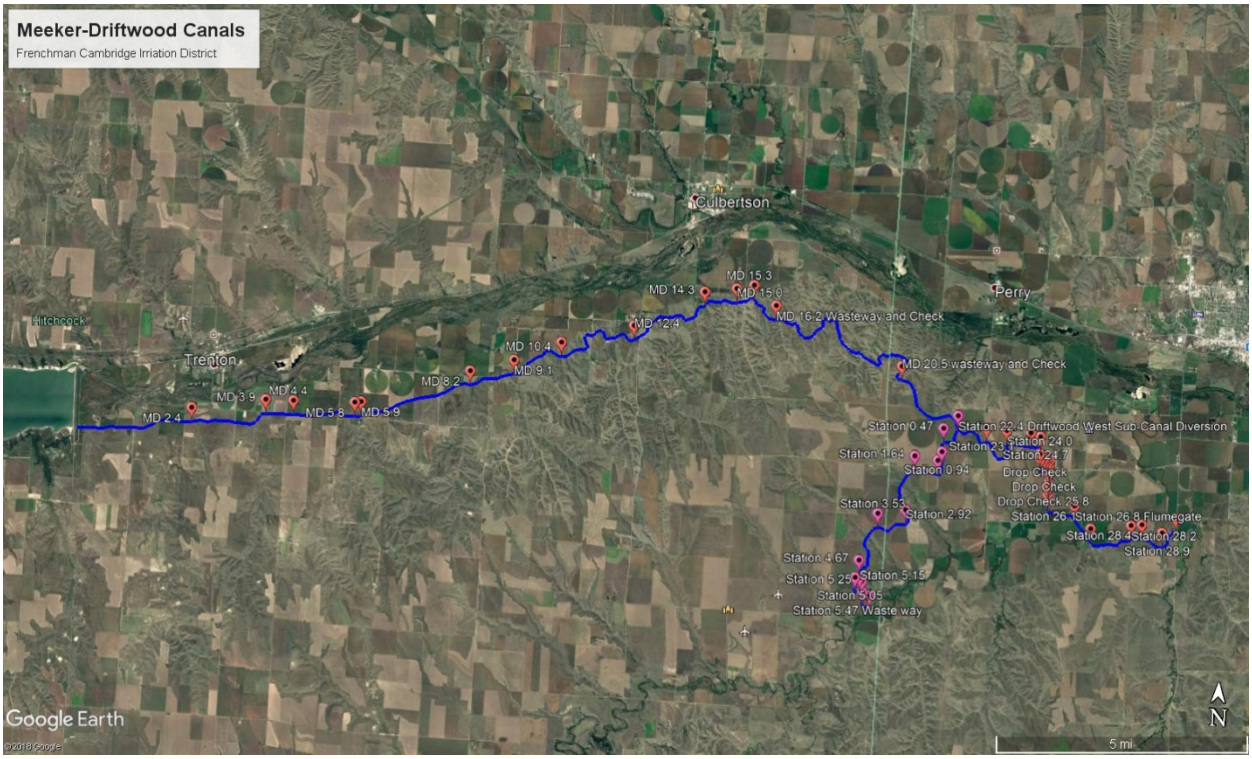
This proposal has been prepared on the basis of discussions with FCID staff, a desktop review of information provided by FCID, and a review of data from the USBR's Hydromet records. Any assumptions will be stated as such.

The implementation of Network Control on the Meeker-Driftwood will involve the following key activities:

1. The securing of funding for construction.
2. A kick-off meeting at FCID to a) verify schedule and b) provide any site confirmations needed.
3. Perform a radio survey to confirm desktop analysis of radio requirements.
4. File for FCC radio license for the needed frequencies.
5. Place order with Rubicon's factory for all hardware.
6. Undertake all structural modifications needed.
7. Run hydraulic simulations to build system controllers.
8. Install gate external frames.
9. Install gates.
10. Test/commission all gates and stations.
11. Commission the radio communication system.
12. Updating of FCID's server to include the new sites and algorithms.
13. Charge the system; run hydraulic step tests to confirm system calibrations.
14. Transition to Network Control, monitor system performance.

System Design Specification and Intended Outcomes

FCID is an experienced user of Network Control, having implemented it on the Cambridge and Bartley canals. FCID proposes to expand the Network Control system to the Meeker-Driftwood canals. The goal of the implementation is to save water, improve customer service, and to give FCID's staff a tool for improved management of the canal.



The Figure 1- Meeker-Driftwood Canal, Satellite View

The Cambridge Canal has been automated in two stages, the first being in 2014 and the second phase in 2018. The Bartley Canal was added to Network Control in 2015. The Rubicon FlumeGate has ben the gate of choice to control FCID's flows and levels. All of the individual sites report back to the FCID office in Cambridge via a licensed, 450MHz radio network.

The Meeker-Driftwood Canal project will involve include integration into the existing system (TCC server) and is proposed to share assets with other, existing parts of the project.

Pricing

This quote has been developed on the basis of Rubicon's standard pricing methodology. All designed discharge rates have been specified by FCID, and FlumeGate selection at each drop has been undertaken collectively by Rubicon, with presentation to FCID for verification.

Rubicon's suggested equipment for the Meeker-Driftwood Canals Network Control system are priced as follows:

Fall 2018 – Winter 2019 Install Program

Gates and Monitoring Sites:

Canal	Location	Qty	Gate/Meter	Price, Ea	Subtotal
Meeker-Driftwood	Check 2.4	3	FGB-1180-1804	$39,600	$112,200
Meeker-Driftwood	Check 3.9	3	FGB-1180-1804	$39,600	$112,200
Meeker-Driftwood	Check 4.4	3	FGB-1180-1804	$39,600	$112,200
Meeker-Driftwood	Check 5.8	2	FGB-2268-2186	$70,021	$140,042
Meeker-Driftwood	Check 8.2	3	FGB-1180-1804	$39,600	$112,200
Meeker-Driftwood	Check 9.1	2	FGB-2268-2186	$70,021	$140,042
Meeker-Driftwood	Check 10.4	4	FGB-1180-1804	$39,600	$149,600
Meeker-Driftwood	Check 12.4	3	FGB-1180-1804	$39,600	$112,200
Meeker-Driftwood	Check 14.3	3	FGB-1180-1804	$39,600	$112,200
Meeker-Driftwood	Check 15	3	FGB-1180-1804	$39,600	$112,200
Meeker-Driftwood	Check 15.3	4	FGB-1180-1804	$39,600	$149,600
Meeker-Driftwood	Check 16.2	3	FGB-1180-1587	$35,255	$105,765
Meeker-Driftwood	Check 20.5	3	FGB-1180-1587	$35,255	$105,765
Meeker-Driftwood	Check 22.38	1	FGB-1485-1804	$41,608	$41,608
Meeker-Driftwood	Check 22.4	2	FGB-2268-2186	$70,021	$140,042
Meeker-Driftwood	Check 23.1	3	FGB-1050-1437	$31,097	$93,291
Meeker-Driftwood	Check 24	2	FGB-1370-1587	$36,526	$73,052
Meeker-Driftwood	Check 24.7	2	FGB-1370-1077	$29,942	$59,884
Meeker-Driftwood	Check 25.2	2	FGB-1370-1077	$29,942	$59,884
Meeker-Driftwood	Check 25.4	2	FGB-1370-1077	$29,942	$59,884
Meeker-Driftwood	Check 25.8	2	FGB-1370-1077	$29,942	$59,884
Meeker-Driftwood	Check 26.1	3	FGB-1180-1273	$29,827	$89,481
Meeker-Driftwood	Check 28.2	1	FGB-2886-1587	$69,226	$69,226
Meeker-Driftwood	Check 28.4	1	FGB-2886-1587	$69,226	$69,226
Meeker-Driftwood	Check 28.9	1	FGB-2886-1587	$69,226	$69,226
Meeker-Driftwood	Check 29.3	1	FGB-2886-1587	$69,226	$69,226
Driftwood West	Check 0.47	2	FGB-1180-1273	$29,827	$59,654
Driftwood West	Check 0.94	2	FGB-1180-1273	$29,827	$59,654
Driftwood West	Check 1.2	2	FGB-1180-1077	$28,672	$57,344

Driftwood West	Check 1.64	2	FGB-1180-1077	$28,672	$57,344
Driftwood West	Check 2.9	2	FGB-1180-1273	$29,827	$59,654
Driftwood West	Check 3.53	1	FGB-1370-1273	$30,982	$30,982
Driftwood West	Check 4.67	1	FGB-1675-1273	$33,638	$33,638
Driftwood West	Check 5.05	1	FGB-1370-1077	$29,942	$29,942
Driftwood West	Check 5.15	1	FGB-1370-1077	$29,942	$29,942
Driftwood West	Check 5.25	1	FGB-1370-1077	$29,942	$29,942
Driftwood West	Check 5.47	2	FGB-1370-1077	$29,942	$59,884
Driftwood West	Check 5.62	1	FGB-1050-1077	$28,094	$28,094

Note pricing includes epoxy-ceramic coating for all FlumeGates and frames.

The total price for the gate sites and monitoring sites is $3,130,002.

Commissioning services are priced at $120,000 ($1,500 per gate).

Walkways are priced at $140,101.

These gate hardware and installation prices total $3,390,103.

Communications and Software:

Hardware	Qty	Price	Total
MDS SD4 450MHz licensed radios installed at regulator sites – including radio, co-ax cable, antenna and bracket (price per remote site)	39	$1,850	$72,150
Radio Base Station – MDS SD4P located in district office cabinet, including collinear antenna and cable, and rigging labor*	0	$13,350	$0
Repeater Radio Cabinet for Field Installation (actual tower not included)*	2	$18,500	$37,000
Repeater Tower Antenna and Rigging**	2	$3,000	$6,000
Motorola MDLC-TCP/IP Communications Gateway*	0	$7,200	$0
Dell PowerEdge Database and Application Server with backup tape media, UPS, firewall, switch, console, and industrial rack enclosure*	0	$16,500	$0
Oracle Database Software License*	0	$12,000	$0
First Year's Oracle Database Software Maintenance Plan*	0	$2,400	$0
Rubicon SCADAConnect Base Software License*	0	$15,000	$0
SCADAConnect Site Licenses (unlimited tags, price is per site)	39	$600	$23,400
First Year's SCADAConnect Software Maintenance Plan (adder to existing commitment)	1	$4,680	$4,680
Central Software Updates and Build Labor	1	$12,400	$12,400

*Two repeaters are estimated to be added based on a desktop survey. See Item 4 for more information.
**Estimated cost – actual cost may vary.

The total cost of the communications and software expansion is $155,630. Note this price does not include any tower installation, just radio equipment to be added to the towers.

TCC Control & Management:

Item	Qty	Price	Total
TCC Controller Development and Tuning (price per pool)	39	$6,500	$253,500
Project Management, Training & First Year Oversight	1	$45,000	$45,000

The total cost for the controls and management of the Total Channel Control expansion is $298,500.

Summing up the various subcategories results in the following project cost:

Project Totals:

Assumptions and Clarifications

Item	Subcategory	Estimated Price
1	Supply of Control Gates and Actuation	$3,130,002
2	Supply and Installation of Walkways	$140,101
3	Installation and Commissioning	$120,000
4	Radio Network and Network Control Installation	$155,630
5	Controller Tuning and Project Management	$298,500
	Estimated Project Total	**$3,844,233**

Item 1 – System Performance

Combinations of FlumeGates have been selected by Rubicon based on field surveys and performance planning. Rubicon has evaluated the flow values and is confident these gates will perform successfully in the TCC implementation; flow values are generally chosen with a 25% factor of safety. The FlumeGates have been selected to meet the required discharge capacity per FCID guidelines at each check structure as follows:

Canal	Station (mi)	Design water depth (ft)	Design downstream water level (ft)	Required flow rate (cfs)	FlumeGate Model	Number of FlumeGates	Notes	% of required flow (%)
Meeker-Driftwood	2.4	5.03	3.50	250	FGB-1180-1804	3		126%
Meeker-Driftwood	3.9	5.03	3.50	250	FGB-1180-1804	3		126%
Meeker-Driftwood	4.4	5.03	3.50	250	FGB-1180-1804	3		126%
Meeker-Driftwood	5.8	6.75	6.41	250	FGB-2268-2186	2		176%
Meeker-Driftwood	5.9	0.00	#N/A	250		0	Not used	#N/A
Meeker-Driftwood	8.2	5.03	3.50	250	FGB-1180-1804	3		126%
Meeker-Driftwood	9.1	6.78	6.44	250	FGB-2268-2186	2		177%
Meeker-Driftwood	10.4	5.18	4.89	250	FGB-1180-1804	4		130%
Meeker-Driftwood	12.4	5.20	4.00	250	FGB-1180-1804	3		127%
Meeker-Driftwood	14.3	5.20	4.00	250	FGB-1180-1804	3		127%
Meeker-Driftwood	15	5.20	4.00	250	FGB-1180-1804	3		127%
Meeker-Driftwood	15.3	4.90	4.50	250	FGB-1180-1804	4		127%
Meeker-Driftwood	16.2	4.59	0.00	250	FGB-1180-1587	3	Suggest new structure and FG resize	123%
Meeker-Driftwood	20.5	4.59	0.00	250	FGB-1180-1587	3		123%
Meeker-Driftwood	22.38	4.94	4.65	50	FGB-1485-1804	1	Could also use SMB-1200 (20mm clearance refer CAL-003)	195%
Meeker-Driftwood	22.4	5.80	5.46	250	FGB-2268-2186	2	Remove orifice, rebuild central pier	137%
Meeker-Driftwood	23.1	3.84	3.62	100	FGB-1050-1437	3		132%
Meeker-Driftwood	24	4.42	4.17	100	FGB-1370-1587	2	Retrofit outside bays (drop)	146%
Meeker-Driftwood	24.5	0.00	#N/A	100		0	Not used	
Meeker-Driftwood	24.7	2.68	0.00	100	FGB-1370-1077	2	New structure upstream	129%
Meeker-Driftwood	25.2	2.68	0.00	100	FGB-1370-1077	2	New structure upstream	129%
Meeker-Driftwood	25.4	2.68	0.00	100	FGB-1370-1077	2	New structure upstream	129%
Meeker-Driftwood	25.8	2.68	0.00	100	FGB-1370-1077	2	New structure upstream	129%
Meeker-Driftwood	26.1	3.17	2.80	100	FGB-1180-1273	3		126%
Meeker-Driftwood	26.8	0.00	#N/A	100		0	FlumeGate already installed	
Meeker-Driftwood	27.3	0.00	#N/A	0		0	Not used	
Meeker-Driftwood	28.2	3.23	2.98	100	FGB-2886-1587	1	Remove central pier, Upstream extension	130%

Meeker-Driftwood	28.4	3.23	2.98	100	FGB-2886-1587	1	Remove central pier, Upstream extension	130%
Meeker-Driftwood	28.9	3.23	2.98	100	FGB-2886-1587	1	Remove central pier, Upstream extension	130%
Meeker-Driftwood	29.3	3.23	2.98	100	FGB-2886-1587	1	Remove central pier, Upstream extension	130%
Driftwood West	0.47	3.20	3.01	50	FGB-1180-1273	2		152%
Driftwood West	0.94	3.20	3.01	50	FGB-1180-1273	2		152%
Driftwood West	1.2	3.00	2.84	50	FGB-1180-1077	2		133%
Driftwood West	1.64	3.00	2.84	50	FGB-1180-1077	2		133%
Driftwood West	2.9	3.20	3.01	50	FGB-1180-1273	2		152%
Driftwood West	3.53	3.40	2.60	50	FGB-1370-1273	1		127%
Driftwood West	4.67	3.20	2.80	50	FGB-1675-1273	1		126%
Driftwood West	5.05	2.50	0.00	50	FGB-1370-1077	1	U/S extension with lowered floor	129%
Driftwood West	5.15	2.50	0.00	50	FGB-1370-1077	1	U/S extension with lowered floor	129%
Driftwood West	5.25	2.50	0.00	50	FGB-1370-1077	1	U/S extension with lowered floor	129%
Driftwood West	5.47	2.50	0.00	50	FGB-1370-1077	2	U/S extension with lowered floor	257%
Driftwood West	5.62	3.00	0.00	25	FGB-1050-1077	1	Could be replaced with just a level sensor?	181%

Item 2 – Gate Walkways and Handrails
This price is based on the provision of Rubicon standard operating platforms or walkways. This pricing does not include transition walkways between the operating platform and any existing structure.

Rubicon personnel will provide modifications needed to our standard designs in order to ensure the gate walkways and will comply with OSHA standards.

Item 3 – Gate Delivery, Install and Commissioning
This price includes gate delivery from Rubicon's warehouse, and will involve the installation of the external frame, supply of all frame mounting hardware, supervision of gate installation, field wiring, and gate commissioning. Due to the size and schedule of this project, Rubicon may elect to use Rubicon field technicians from other regions and/or contract personnel to assist with the installation of the gate and meter frames in order to meet the project's deadlines.

This price does not include the provision of cranes or other lifting equipment.

Item 4 – Data Radios and Communications Infrastructure
This quote is inclusive of 450MHz MDS data radios and antennas required to connect each device in the TCC system to FCID's server via the existing radio network. Also inclusive are two repeater radio cabinets to extend the needed network from the very west end of this expansion to the FCID office in Cambridge. Where possible, Rubicon's analysis has used an existing tower to minimize cost. The locations are as follows:

- Existing 500' radio tower at 40°11'28.42"N, 100°48'31.31"W
- (Proposed) new tower at the end of Meeker Canal at 40°11'47.40"N, 100°29'29.40"W

Not inclusive to this quote is the cost of any new tower needed to extend the network.

It is assumed for the purposes of this proposal that FCID can rent/lease space on the noted 500' tower to install an antenna and repeater cabinet, and that said tower shall have line power. Also assumed is that local line power can be provided at the new tower site; if not, assume an additional $10,000 for a solar power supply for the repeater cabinet.

Rubicon has not priced in the cost of application for or ongoing subscription costs for a frequency license that will be required for this licensed 450MHz radio network. The estimated cost of this license is $300-400 for a 10 year license.

Item 5 – IT Infrastructure Expansion
The servers and Oracle database acquired and configured on the previous projects can also facilitate the needs of the Superior project as well. No additional IT hardware should be needed. Fees are included to install all TCC and SCADA software on the existing servers, as well as configuration of the Meeker-Driftwood system into the Oracle database. Likewise, the existing Motorola IP gateway can also be configured to serve the new system. No provision is made in this quote for redundant servers, storage, area networks, offsite backup systems, disaster recovery planning, etc. FCID may choose to procure this equipment directly in accordance with Rubicon's specifications.

Item 6 – Host Engineering
This item includes installation of system software, the construction of schematics and screens for the Superior Canal system and the configuration of each site in the Rubicon software system. The existing SCADA "front screen" will be expanded to provide a simple, single point of entry for FCID's staff.

Item 7 – Software Licenses
This item includes access to the required Rubicon software modules. These modules are:

1. Oracle Database license (single processor), including first year of annual maintenance - $0 (already acquired in the previous project)
2. SCADAConnect - $300 license fee per site and turnout
3. Neuroflo Network Control- $300 license fee per pool

There is an ongoing annual maintenance and support fee at the rate of 20% of license fee to provide ongoing access to software updates and upgrades and help desk services.

Item 8 – Professional Services - Network Control Tuning, Project Management
This item requires detailed analysis of the canal land survey data obtained as Item 1 and then the customized design of controller algorithms and tuning parameters for each pool in the system. This includes hydraulic modelling and calibration of the open channel predictive model, the design of controllers on the basis of these models and the configuration of these controller parameters into the software system.

This item also includes management of the project implementation over a twenty-four month period. This management function includes coordination of hardware supply to match FCID's installation program, working with FCID to coordinate frame and gate install and commissioning schedules, coordination of controller tuning, and consulting and assisting FCID in change-management processes.

Exclusions

The abovementioned prices are exclusive of

1. Civil design and construction costs.
2. The provision of personal computers or tablet devices for NBID staff.

Terms

1. Rubicon's standard terms of trade are applicable to this offer and located at our website.
2. Rubicon will manufacture and deliver gate hardware and controller and software implementations to match an agreed installation schedule.
3. It is assumed that SID will limit the growth of aquatic weeds to maintain consistent hydraulic performance.
4. It is proposed that progress payments will be made as follows: -

   For FlumeGates™ and Monitoring Pedestals (FlumeLinks™):
   - 20% of the value of the Purchase Order within thirty days of placing the order for the hardware.
   - 20% of the value of the Purchase Order within thirty days following receipt of the frames.
   - 60% of the value of the Purchase Order within thirty days following receipt of the FlumeGates™ and Monitoring Pedestals (FlumeLinks™).

   For other services and hardware:
   - At the end of each month, all time and materials will be charged based on that month's actual work. This includes all services and hardware (walkways, IT and communications infrastructure) as outlined above.

     All payments are to be made by check to Rubicon Systems America Inc.

5. This quote is valid for 90 days.

Please do not hesitate to contact me or Eric Umbreit, your Sales Representative, should you have any questions or require any further information.

Yours Sincerely,

Darren McGregor
General Manager, North America
Darren.McGregor@rubiconwater.com

Attachments

- Rubicon's Terms and Conditions
- FlumeGate Data Sheet
- Network Control Data Sheet
- Confluent Software Data Sheet

RUBICON WATER
STANDARD TERMS AND CONDITIONS

1. APPLICATION OF TERMS AND CONDITIONS

Unless otherwise agreed in writing, these terms will apply to the provision of all Products, Software and Services within the USA by Rubicon Systems America Inc of 1501 Lemay Avenue, Suite 101, Fort Collins, Colorado 80524. Any terms and conditions contained in your purchase order or otherwise notified to us will apply only if they are specifically accepted in writing by us.

2. ORDERS

(a) Purchase orders, including agreement to our quotations, are to be submitted in writing and are subject to our final acceptance. Subject to (b) below, purchase orders will be deemed accepted when we receive them, unless we advise you otherwise in writing.

(b) Written quotations of prices payable by you for the Products, Software and/or Services (Prices), will remain valid for 60 days and after that will be subject to our revalidation.

3. PRODUCTS

(a) Unless otherwise specified in writing, we warrant that for a period of 12 MONTHS from the date of commissioning (Product Warranty Period) all Products of our own manufacture will conform to our applicable design specifications.

(b) It is your responsibility to ensure that the Products you order are fit for your intended purpose.

(c) We reserve the right to replace Products with new or alternative Products with similar functionality.

4 SOFTWARE

(a) Unless otherwise specified in writing, we warrant that for a period of 12 MONTHS from the date of delivery (Software Warranty Period) all Software of our own manufacture will substantially perform in accordance with our functional specifications. This does not mean that we warrant that the Software will be error or bug free.

(b) We grant you a revocable, non-exclusive, non-transferable license to use the Software in conjunction with our Products subject to any restrictions we specify in writing. This license is subject to revocation upon any breach by you of these Standard Terms and Conditions or the termination of any contract between Rubicon and, you. You may use the Software for the operations or applications for which it was furnished by us, but not for any other purpose without our prior written consent. You may not use of the Software in violation of any other restriction contained in these Standard Terms and Conditions, or after termination of the license.

(c) You acknowledge that ownership in the Software does not pass to you and your rights are limited to the conditions specified in these terms.

(d) You may use and copy the Software as reasonably required for back-up, maintenance or training purposes but otherwise the Software is not to be copied or altered without our prior consent. All copies of the Software must bear our original copyright and other proprietary notices, and shall remain property of Rubicon. You may not permit any third party to use or make copies of the Software.

(e) You will not reverse assemble or reverse compile the Software in whole or part. Only Rubicon may alter, enhance or modify the Software. All rights to any idea, process, discovery, enhancement or improvement arising from your use of the Software shall automatically become the sole property of Rubicon and shall be deemed to have been assigned to Rubicon in consideration for Rubicon's provision of the Software.

(f) Without our prior written consent, which may be withheld in our sole discretion, you may not: (i) sell, assign or otherwise transfer in any manner to any third party any rights in or to the Software, (ii) allow any third party to use the Software; or (iii) sublicense, publish, display, distribute, or otherwise transfer to a third party the Software or any copy, in whole or in part.

5. SERVICES

(a) We warrant that for a period of 12 MONTHS from the date they are performed (Services Warranty Period), all Services will be provided by us with due expedition and consistent with the required industry standards or professional skills and advice required for carrying out such Services.

(b) We will act professionally at all times and exercise skill, care and diligence in performing the Services.

6. OUR OBLIGATIONS

(a) In providing the Products, Software and/or Services, we will:

(i) act in a skilful, diligent, workmanlike, careful, safe and proper manner;

(ii) keep you appropriately informed of the progress of the provision of the Products, Software and/or Services;

(iii) act in accordance with standards and practices normally exercised in the water industry;

(iv) be entitled to exercise our judgment and use our skills as we considers most appropriate;

(v) complete the provision of Products, Software and/or Services in a timely manner.

(b) If we are delayed or we become aware of the likelihood of a delay in the provision of the Products, Software and/or Services, we will notify you as soon as possible after becoming aware of those circumstances.

7. YOUR OBLIGATIONS

In engaging us, you will:

(a) provide us with all relevant information necessary for the provision of the Products, Software and/or Services including site information, technical environment, relevant data, intelligence and instructions on an ongoing and timely basis as may be necessary and prudent;

(b) provide us with access to your personnel, premises, systems, facilities, confidential information, and/or records to enable us to provide the Products, Software and/or Services.

(c) acknowledge that if you do not meet these obligations you may cause or contribute to an increase in our estimated fees; we may incur additional costs, charges and expenses; and there is likely to be delays in the completion of the supply of the Products, Software and/or Services.

(d) not be obliged to disclose information that is not reasonably relevant.

8. WARRANTY

(a) Products, Software and/or Services not manufactured by us are excluded from our Warranty but we will seek to extend to you any warranty received from the original manufacturer or supplier so far as we are permitted to do so.

(b) In the event of a defect, malfunction or failure to conform to specification during the applicable Warranty Period we will, as determined by us:

(i) repair or replace defective Products;

(ii) replace or correct all reproducible deficiencies and errors in Software manufactured by us which fail as a direct result of our defective materials or workmanship;

(iii) re-perform the Services; or

(iv) refund the Price for such defective Products, Software or Services.

(c) Product warranty repair is provided at our facility and Software warranty is provided online. You will pay the return transport costs for sending the Products for repair. Where warranty repairs are required to be undertaken on site, you will pay all costs incurred by us other than the cost of actually undertaking the repairs. In the event that the defects are due to causes outside our warranty obligation, you will pay for the cost of repair or replacement at our then current charges.

(d) Product and Software warranties will not apply to any Products or Software other than in their original condition which we determine have not been subjected to operating or environmental conditions in excess of the their maximum limits, or otherwise have not been subjected to misuse, improper installation, repair, alteration, or accidental damage, whether or not caused by you.

(e) EXCEPT FOR THE LIMITED WARRANTIES SET FORTH IN THESE STANDARD TERMS AND CONDITIONS, ALL PRODUCTS, SOFTWARE AND SERVICES ARE PROVIDED "AS IS." THESE LIMITED WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. We shall not be liable to you or any user of any Products, Software or Services for any indirect, special, incidental, exemplary or consequential damages (including, without limitation, lost profits) related to these Standard Terms and Conditions or resulting from use or inability to use the Products, Software or Services, arising from any cause of action whatsoever, including contract, warranty, strict liability, or negligence, even if we have been notified of the possibility of such damages. Under no

circumstances shall our liability to you or any user of the Products, Software or Services exceed the amounts paid to us by you for the Product, Software or Service involved. No action under the foregoing limited warranties or these Standard Terms and Conditions may be brought more than one (1) year after the cause of action arises. Exclusive subject matter and personal jurisdiction for all disputes arising under this Agreement shall be the Larimer County District Court in Fort Collins, Colorado.

(f) You warrant that you have not relied on any representation, description, illustration, specification or any other material which has not been expressly published by us or agreed by us in writing.

(g) You warrant that the information you need to provide to us will be sufficiently comprehensive to enable us to meet our obligations and will be free from errors and omissions.

(h) Please note that whilst we warrant that all Products of our own manufacture will conform to our applicable design specifications for a period of 12 MONTHS from the date of shipment, unless you engage our services to evaluate your needs and accept our written recommendations it is your responsibility to ensure that the Products you order are correctly sized and fit for your intended purpose.

9 SOFTWARE MAINTENANCE AND SUPPORT SERVICES

(a) From the time of installation we will provide you with your desired level of Software maintenance and support services.

(b) Software maintenance and support services do not include services involving correction of faults, errors or defects caused by:

(i) operation of the Software in a manner which contravenes your obligations;

(ii) failure by you to operate the Software in accordance with the relevant specifications which have been made known by us to you;

(iii) use of the Software in an environment other than that provided for in the relevant specifications;

(iv) Product maintenance performed by a person other than us or persons approved by us;

(v) modifications to the Software made by you or a third party, unless authorized by us.

(c) A condition of the provision of Software maintenance and support is that you must purchase the Software maintenance and support on a continuous basis from the time of installation. In the event that there is any period during which we do not provide Software maintenance and support, as a condition precedent to us undertaking any future Software maintenance and support we reserve the right to undertake at your expense an investigation of the Software and provide any required remedial maintenance to bring the Software to an acceptable level.

10 PRICES

(a) In consideration of the provision of the Products, Software and/or Services, You will pay the applicable Prices and at the times specified in our quotations or as specified in our published Price lists.

(b) We reserve the right:

(i) without liability on our part, to correct any errors or omissions in any offer, quotation, order confirmation, invoice or other documentation issued by us;

(ii) to pass on to you any additional costs (including merchant fees) incurred by us where you pay us by credit card;

(iii) to adjust the Prices to cover any exchange rate variations on imports and variations in labor and material costs to the date of invoice. We will reimburse to you any cost or benefit of variations incurred by us.

(c) All Prices are specified in US dollars.

11 TAXES

Unless expressly stated by us, Prices quoted or agreed do not include sales, goods and services, value added or any other applicable government tax or duty payable either before or after invoice from us. Such taxes and duties are payable in addition to the Prices.

12 PAYMENT

(a) We may invoice you for Products, Software and/or Services and all other amounts payable by you under these terms and conditions at any time after we notify you that the Products, Software and/or Services are ready for collection or we otherwise deliver or attempt to deliver the Products, Software and/or Services.

(b) Unless otherwise agreed and subject to you maintaining an acceptable credit rating, you must pay all invoices within 30 days of the date of the invoice.

(c) If you dispute an invoice you must (except in the case of non-delivery) nonetheless pay the entire amount. We will refund any agreed amount following resolution of the dispute. If you fail to pay any invoice by the due date then, without affecting any other right or remedy available to us, we may:

(i) Suspend any further deliveries to you of the Products or Software in question or any other Products or Software and suspend or refuse to perform any Services to you whether under an existing or new order;

(ii) Charge you interest on the amount unpaid at the rate 5% above our then current overdraft rate until payment in full is made. Such interest is to be compounded daily.

(iii) Exercise a general lien on all of your property in our possession to cover the amount unpaid for the Products, Software and/or Services; and

(iv) Recover from you, in addition to the outstanding amount, all reasonable costs incurred by us in collection of the outstanding amount.

13 DELIVERY TITLE AND RISK

(a) Delivery schedules are estimates only and are subject to adjustment at any time. We will notify you of any changes in our delivery schedule but will not be liable for any additional costs that you may incur.

(b) All Products will be delivered in our standard packaging and will be accepted by you at the time of delivery.

(c) Property and risk in relation to the Products passes to you at the point of delivery to your carrier at our facility or, if you request us to arrange delivery and insurance, upon delivery to you.

(d) Title to the Products passes to you upon the earlier of payment in full for those Products or upon integration of the Products so that they are no longer capable of repossession.

(e) Until Title passes, we may repossess any Products for which payment has not been made in full by the due date.

14 CONFIDENTIALITY

(a) You agree not to disclose any information provided by us to you relating to us and our related entities that we may reasonably regard as confidential or commercially sensitive (including without limitation our pricing information) unless you can establish the information was:

(i) at the time of disclosure, in the public domain;

(ii) subsequent to disclosure, entered into the public domain other than through the breach of a duty owed to us; or

(iii) required to be disclosed by law.

(b) We will use reasonable endeavors to preserve the confidentiality of information supplied to us by you that you designate as confidential information. Nothing in these terms and conditions will impose on us the obligation not to disclose or use information already known to us prior to its disclosure to us by you, or lawfully received by us from a third party, or information published at the date of such disclosure, or information which enters the public domain through no fault of our own, or is required to be disclosed by law.

15 INTELLECTUAL PROPERTY RIGHTS

(a) Intellectual Property Rights includes copyright, trade mark, design, patent, semiconductor or circuit layout rights, know how, trade or other proprietary rights or any rights to registration of such rights or protected by statute.

(b) You will retain ownership of any pre-existing Intellectual Property Rights in materials provided by you to us for use by us for the purposes of providing Products, Software and/or Services.

We will retain ownership of any pre-existing Intellectual Property Rights in materials, information, tools, and methodologies provided by us for the purposes of providing the Products, Software and/or Services (or undertaking any improvements to the Products, Software and/or Services).

(c) You indemnify us against any claims of infringement of any Intellectual Property Rights or misuse of a third party's Confidential Information brought against us as a result of the provision of Products, Software and/or Services in relation to this contract or arising directly or indirectly from the use of any materials or information provided to us by you.

RUBICON WATER
STANDARD TERMS AND CONDITIONS

16 EXCLUSIONS AND LIMITATIONS

(a) We exclude all implied conditions and warranties except any implied condition or warranty that the exclusion of which would contravene any law, statute or cause any part of this paragraph to be void.

(b) To the extent permitted by law:

(i) we exclude liability (including from our breach of any express or implied condition or warranty or our negligence) for loss of profits or consequential or indirect loss or damage; and

(ii) our liability to you from our breach of any express or implied condition or warranty or our negligence is limited, at our option, to supplying the Products, Software and/or Services in respect of which the breach or negligence occurred again; or' to paying the cost of having those Products, Software and/or Services supplied again; or refunding the Price for the Products, Software and/or Services.

17 FORCE MAJEURE

We will not be liable for any failure to perform or delay in performance of any obligation where such failure or delay is due to anything beyond our reasonable control, including but not limited to adverse weather or terrain, strikes, lockouts and other industrial action, material shortages, failure of any of our suppliers to supply, accidents, power failure, breakdowns of plant or machinery or import or export regulations or embargoes.

18 LIABILITY

Except as expressly stated in these terms and conditions, we will not be liable in contract or otherwise for any loss, damage, expense or injury of any sort whatsoever, consequential, indirect or otherwise, arising out of or in connection with the installation, use or failure of the Products, Software and/or Services sold or any defect in them or from any other cause.

19 TERMINATION

(a) We may, without affecting any other rights we may have, terminate or suspend any contract between us with immediate effect by giving notice to you if:

(i) you breach any provision of our contract and fail to remedy the breach within 7 days after our notice requiring you to do so;

(ii) if you breach a material provision of our contract where that breach is not capable of remedy;

(iii) you cease to be able to pay your debts as they become due;

(iv) you become subject to any form of insolvency or bankruptcy action that is not dismissed within 60 days or;

(v) any step is taken by a receiver or mortgagee to take possession or dispose of the whole or any part of your assets.

(b) If we exercise our rights to terminate or suspend a contract, we will immediately be entitled to invoice you for work in progress at our current rates. This paragraph does not limit or affect any other remedy which may be available to us including seeking compensation for any loss or damage suffered by us.

(c) If we are unable to perform or complete performance of our obligations wholly or in part due to causes beyond our control, we may unilaterally rescind the contract, or the outstanding portion, without any further liability to any party other than the obligation for you to pay for Products, Software and/or Services provided to the time of such termination.

20 SEVERENCE

If part or all of any provision of these terms and conditions or its application to any person or circumstance is illegal or unenforceable the provision will be interpreted so as to ensure it is not illegal or unenforceable. If any provision or part of it cannot be so interpreted, the provision or part of it will be severed from these terms and conditions and the remaining provisions of these terms and conditions continue in force.

21 GOVERNING LAW

These Standard Terms and Conditions and all contracts between us will be governed by and interpreted according to the laws of the State of Colorado, without regard to conflicts of law's provisions.

22 DISPUTE RESOLUTION; ENFORCEMENT

In the event of any dispute arising between us who are unable to be resolved by negotiation, the matter will be exclusive subject matter and personal jurisdiction shall be the Larimer County District Court in Fort Collins, Colorado. In any such proceeding, the prevailing party shall be entitled to recover from the other party, in addition to any other relief granted, all costs reasonably incurred by the prevailing party in the proceeding, including court costs, witness fees and reasonable attorney's fees.

If you violate any license granted by us or violate or infringe upon any of our intellectual property or other proprietary rights, we may institute proceedings either at law or in equity to obtain damages or equitable relief to enforce our rights. You acknowledge that monetary damages would not be a sufficient remedy for a breach of a license or violation of our intellectual property or other proprietary rights, and that we shall not be required to prove the inadequacy or insufficiency of monetary damages as a remedy in order to obtain equitable relief. No bond or other form of security shall be required in connection with any such injunctive or other equitable relief.

23 RUBICON AGENTS

i. Our sales agents are only authorized to promote the sale of our Products, Software and/or Services in accordance with our published specifications or variations thereto that we have approved in writing.

ii. We cannot take responsibility for any representation made by our sales agents that has not been published or authorized by us.

iii. Our sales agents are expected to comply with all applicable laws, regulations, codes of ethical conduct and where applicable government purchasing requirements and are instructed not to engage in any unethical conduct, payment of kickbacks or gratuities, or provision of any inappropriate benefits.

24 ENTIRE AGREEMENT AND VARIATIONS

(a) Any variation to these terms will only be effective if in writing and signed by both parties.

(b) You may, with our prior approval and subject to agreement for an adjustment of Prices, by written order make changes in accordance with the general scope of the contract to the drawings, designs or specifications or method of delivery or packing.

(c) In the case of such changes, there will be an equitable adjustment to the Prices, delivery schedule and any other provisions of the contract affected by the changes.

(d) Unless otherwise agreed, all works will be suspended pending agreement on any adjustments to be made resulting from such changes.

FlumeGate®

RUBICON™

Overview

The FlumeGate is a combined flow measurement and control gate designed for open canal applications. Accurate flow measurement, precise motor control, power supply and radio telecommunications are fully integrated in a single device.

In free-flow or submerged conditions, flow is calculated from the gate's own measurements of upstream water level, downstream water level and gate position.

The FlumeGate can be operated as a stand-alone unit, or can coordinate with other gates along the canal to optimize the whole network's flow. It can be managed and monitored on-site or operated remotely when connected to a scada network.

The FlumeGate automatically controls the flow of water by varying the gate position based on a desired set-point or on irrigation demand as shown in the table.

Control objective		Gate action
Local	Position	Moves to a desired set-point and stays there
	Flow	Maintains a constant flow regardless of upstream or downstream levels
	Upstream level	Maintains a desired level in the pool immediately upstream
	Downstream level	Maintains a desired level in the pool immediately downstream
Network*	Demand	Changes the flow to match measured outflow from the network below the pool while maintaining a stable downstream water level
	Supply	Changes the flow to match the flow supplied from the network above the gate while maintaining a stable upstream water level

* Network control is only available when used with other Rubicon gates and Rubicon's NeuroFlo® network control software.

A TCC® product

The FlumeGate is one of the products making up a modular family of precision hardware and software called TCC (Total Channel Control®). TCC is an advanced technology set designed to improve the management and productivity of water in open canal and gravity pipeline distribution. Unlike traditional infrastructure, TCC products can interact and work together to help managers improve:

- the availability of water
- service and equity to users
- management and control
- health and safety for canal operators

Features

- Ultrasonic water level measurement
- Integrated flow calculation and control software
- Solar-charged or 120V AC charged battery system
- SCADA ready communication system; can be integrated to many SCADA platforms
- Robust high duty cycle operation
- Overshot design for better water level control
- Not affected by sand, silt or other contaminants

Ideal solution for …

- Headgates, turnouts, or check structures requiring low headloss and high accuracy
- Gate modernization projects (more cost-effective than automating an existing gate)
- Remote locations without AC power
- Highly corrosive environments including salt water
- Maintaining canal diversions or upstream water levels
- Measuring flow in canal-to-siphon applications

FlumeGate®

Local control pedestal

Each FlumeGate installation includes a robust pedestal that provides power and control to the gate and is a secure, weather proof housing for electronic components and batteries.

The pedestal also serves as a local user interface. A keypad and LCD display are located under the pedestal lid, allowing farmers to monitor, or operators to control and troubleshoot on-site.

High strength construction

FormiPanel™ is Rubicon's high strength gate leaf construction that uses techniques adopted from the aerospace and marine industries.

The gate panel assembly is a laminate construction that utilizes high strength industrial adhesives to bond structural grade aluminum extrusions and skin plates to a synthetic core material. The result is strong, lightweight, and corrosion resistant.

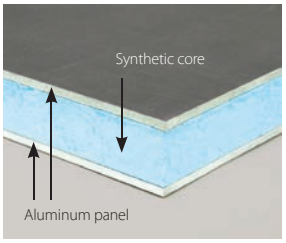
Flow measurement

The FlumeGate calculates flow using measurements of upstream water level, downstream water level and gate position, achieving independently verified measurement accuracy of ±2.5%†. This accuracy is attributed to its unique design and precision manufacture.

Rubicon's MicronLevel® water level measurement sensors are housed within the internal frame. A water-tight seal separates the upstream and downstream sensors.

- Unique, integrated stilling wells unaffected by surrounding objects, debris, foam, silt or other contaminants
- Self-calibrates on every reading to eliminate drift in speed of sound variations due to changes in temperature or humidity
- Specifically designed for use in harsh irrigation canal environments

Local user interface



FormiPanel™ construction

SolarDrive® electronics

Gate control technology

CableDrive™ is Rubicon's actuation system designed to provide precision gate position accuracy and repeatability in harsh environments. The drive is a wirerope (cable) and drum mechanism that provides positive drive in both the raise and lower directions. It is designed for high duty cycle operation and provides precise gate positioning to within ±0.5mm (±0.02in).

The drive is managed by Rubicon's SolarDrive® technology – a purpose built integrated circuit board that manages gate positioning, solar power regulation, battery charge and the pedestal user interface.

Low maintenance

The FlumeGate's modular design allows it to be maintained in the field with minimal tools, training, and easily replaceable parts.

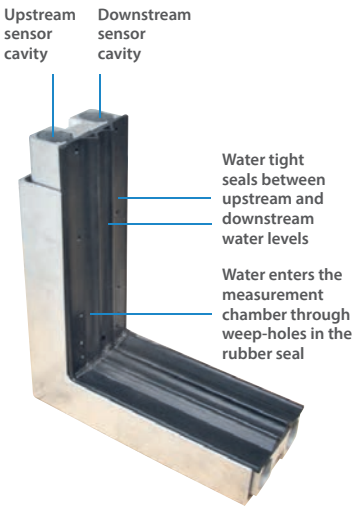
- Retractable level sensors allow for easy in-field servicing
- Seals can be replaced
- On-site diagnostics
- Service can be done by local Rubicon field technicians or authorized/trained independent local integrators

Easy to install

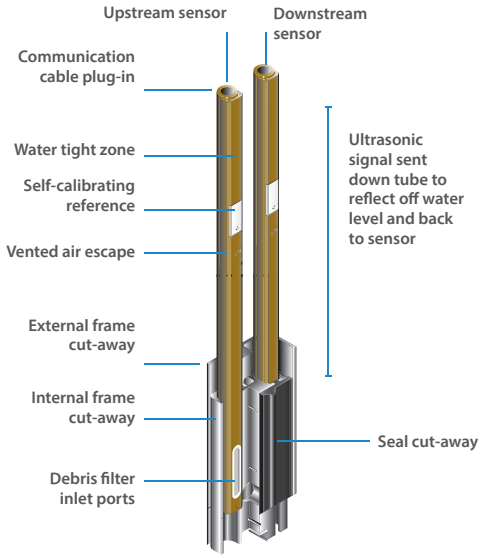
Rubicon's FlumeGate products are designed to retrofit to existing check type regulating structures as well as purpose built emplacements significantly reducing costs associated with civil work.

- Installed and operational in two days during irrigation or off-season
- Factory calibrated and pre-commissioned

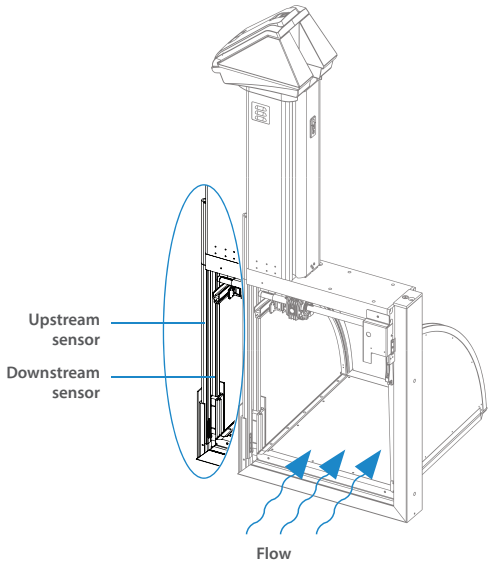
Frame corner section



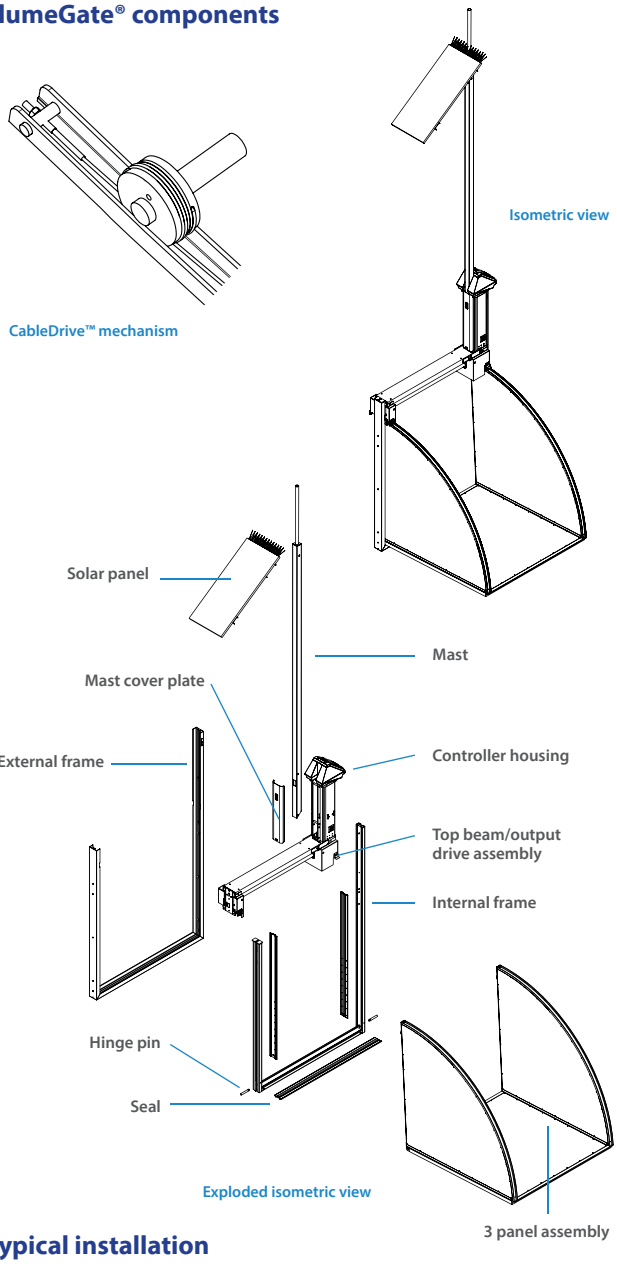
Sensor detail



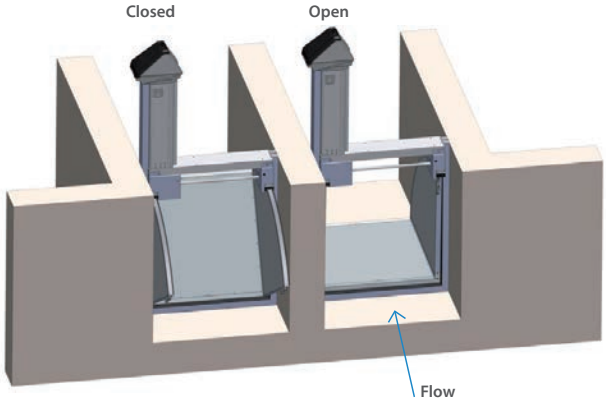
Sensor location



FlumeGate® components



Typical installation



FlumeGate® specifications

General	
Maximum flow rate	Varies by gate size, refer to flow rating table
Data interface	Local display (4 line LCD with keypad), Modbus serial, data radio
Unit of measure	User definable (metric / imperial (US))
Local interface language	English, Spanish, French, Chinese and Italian
Data tags	140+ available for integration into scada systems
Control	Local or remote via scada
Drive mechanism	CableDrive™ stainless-steel wire rope and cable drum assembly for precision positioning and long life
Electronics	SolarDrive® power management and control technology housed in the local control pedestal. Each unit passes a 12hr heat soak prestress and 100% functional test.
Motor	12V DC
Gate position	256 count magnetic encoder
Seal performance	Less than 0.1 gallons/minute/foot of seal (exceeds AWWA** 513 leakage standards)
Actuation options	12V DC powered (solar); 120V AC powered; Manual with hand-crank or car battery
Flow measurement	
Accuracy	±2.5% †Accuracy of FG-M-626-620 model verified by Manly Hydraulics Laboratory, August 2005
Measurement frequency	10 seconds
Calibration method	Factory pre-calibrated and internal self-calibrating sensors
Water level measurement	
Technique	Ultrasonic
Accuracy	0.5mm
Resolution	0.1mm
Material	
Frames	Extruded marine grade aluminum
Gate panels	Composite laminate construction using marine grade aluminum sheet bonded to RTM Styrofoam on aluminum extrusion
Hardware	Stainless steel
Shafts	Stainless steel
Seals	EDPM rubber (Durometer 70 (Shore A))
Hinge	Duplex stainless steel
Water level sensors	Anodized aluminum and copolymer acetyl plastic with stainless steel fittings and gold-plated connectors
Standards	All materials compliant with relevant US standards
Power	
Power supply	12V DC self-contained battery charged from solar panel or AC line power
Solar panel	85W monocrystalline
Batteries	2 or 3 12V 28 Ampere-hour with temperature sensor (~5yr life, provides ~5 days of operation without solar or AC line power)
Communications	
Protocols	Modbus, DNP3, MDLC

**AWWA (American Water Works Association). Specifications subject to change.

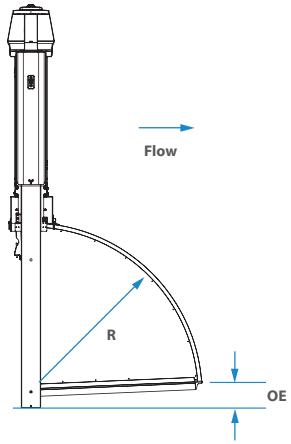
RUBICON™

Dimensions and maximum flow rates

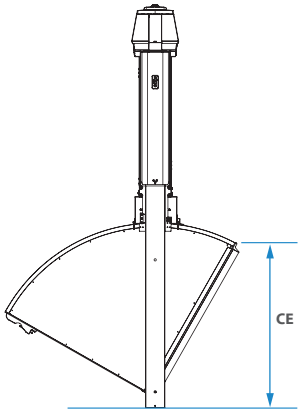
Model	Structure width	Weight	OE	CE	HUmax	HDmax	Q_F	Q_S
	ft	lb	in	in	in	in	cfs	cfs
FGB-2½-2.3	2.5	220	4.9	28	28	24	18	13
FGB-2½-2.9		254	5.3	35	35	31	25	18
FGB-2½-3.4		353	6.3	41	41	37	30	21
FGB-2½-4.0		408	6.5	48	48	44	43	29
FGB-3-2.9	3	265	5.3	35	35	31	31	22
FGB-3-3.4		375	6.3	41	41	37	38	26
FGB-3-4.0		430	6.5	48	48	44	54	36
FGB-4-2.3	4	254	4.9	28	28	24	31	23
FGB-4-2.9		342	5.3	35	35	31	42	30
FGB-4-3.4		408	6.3	41	41	37	54	38
FGB-4-4.0		496	6.5	48	48	44	78	52
FGB-4-4.5		551	7.5	55	55	51	92	60
FGB-4-5.0		694	7.9	60	60	56	107	68
FGB-4-5.5		772	7.7	68	68	64	127	79
FGB-4½-2.9	4.4	364	5.3	35	35	31	48	34
FGB-4½-3.4		419	6.3	41	41	37	62	43
FGB-4½-4.0		507	6.5	48	48	44	88	59
FGB-4½-4.5		562	7.5	55	55	51	105	68
FGB-4½-5.0		717	7.9	60	60	56	122	78
FGB-5-2.3	5	320	4.9	28	28	24	40	30
FGB-5-2.9		386	5.3	35	35	31	56	40
FGB-5-3.4		441	6.3	41	41	37	72	50
FGB-5-4.0		529	6.5	48	48	44	104	69
FGB-5-4.5		595	7.5	55	55	51	123	80
FGB-5-5.0		739	7.9	60	60	56	144	92
FGB-5-5.5		827	7.7	68	68	64	170	106
FGB-5½-2.0	5.4	287	4.1	24	24	20	38	29
FGB-5½-3.4		452	6.3	41	41	37	79	55
FGB-5½-4.0		551	6.5	48	48	44	113	75
FGB-5½-4.5		705	7.5	55	55	51	132	86
FGB-5½-5.0		761	7.9	60	60	56	157	100
FGB-5½-5.5		849	7.7	68	68	64	185	116
FGB-6-2.3	6	353	4.9	28	28	24	50	37
FGB-6-2.9		419	5.3	35	35	31	70	50
FGB-6-3.4		507	6.3	41	41	37	90	62
FGB-6-4.0		573	6.5	48	48	44	128	85
FGB-6-4.5		728	7.5	55	55	51	150	98
FGB-6-5.0		794	7.9	60	60	54	178	114
FGB-6-5.5		882	7.7	68	68	64	211	132
FGB-6-7.2		1598	16.3	87	87	83	271	164
FGB-6-9.5		2866	18.7	115	115	111	390	224
FGB-6½-3.4	6.4	529	6.3	41	41	37	96	67
FGB-6½-5.0		805	7.9	60	60	56	191	122
FGB-6½-7.2		1631	16.3	87	87	83	292	177
FGB-8-5.0	8	882	7.9	60	60	56	246	157
FGB-8-7.2		1720	16.3	87	87	83	378	229
FGB-8-9.5		4409	18.7	115	115	111	558	320

Contact Rubicon for complete dimensions and flow rating tables. Consultation with a Rubicon engineer or agent is recommended prior to gate sizing. Weights are approximate.

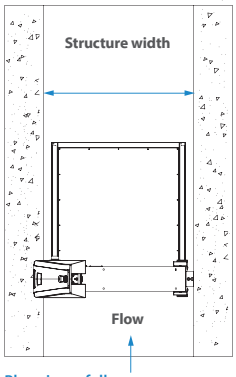
Side and plan views



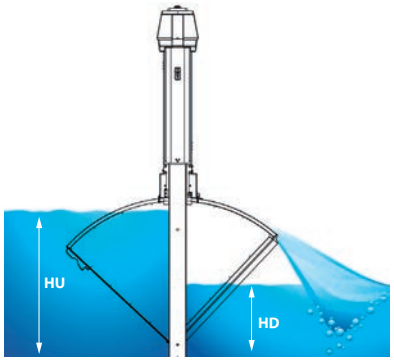
Side view – fully open



Fully closed



Plan view – fully open



Upstream and downstream water levels

OE	Fully open gate elevation
CE	Fully closed gate elevation (checking height)
Structure width	Compatible structure width
HUmax	Maximum upstream water level. Note: standard practice is to allow 4 inches of freeboard but this is not mandatory.
HDmax	Maximum downstream water level
Q_F	Maximum flow at freefall condition (HU=HUmax, D=0)
Q_S	Maximum flow at fully submerged condition (HD=HDmax)
R	Gate radius

About Rubicon Water

Rubicon Water delivers advanced technology that optimizes gravity-fed irrigation, providing unprecedented levels of operational efficiency and control, increasing water availability and improving farmers' lives.

Founded in 1995, Rubicon has more than 20,000 gates installed in TCC systems in 10 countries.

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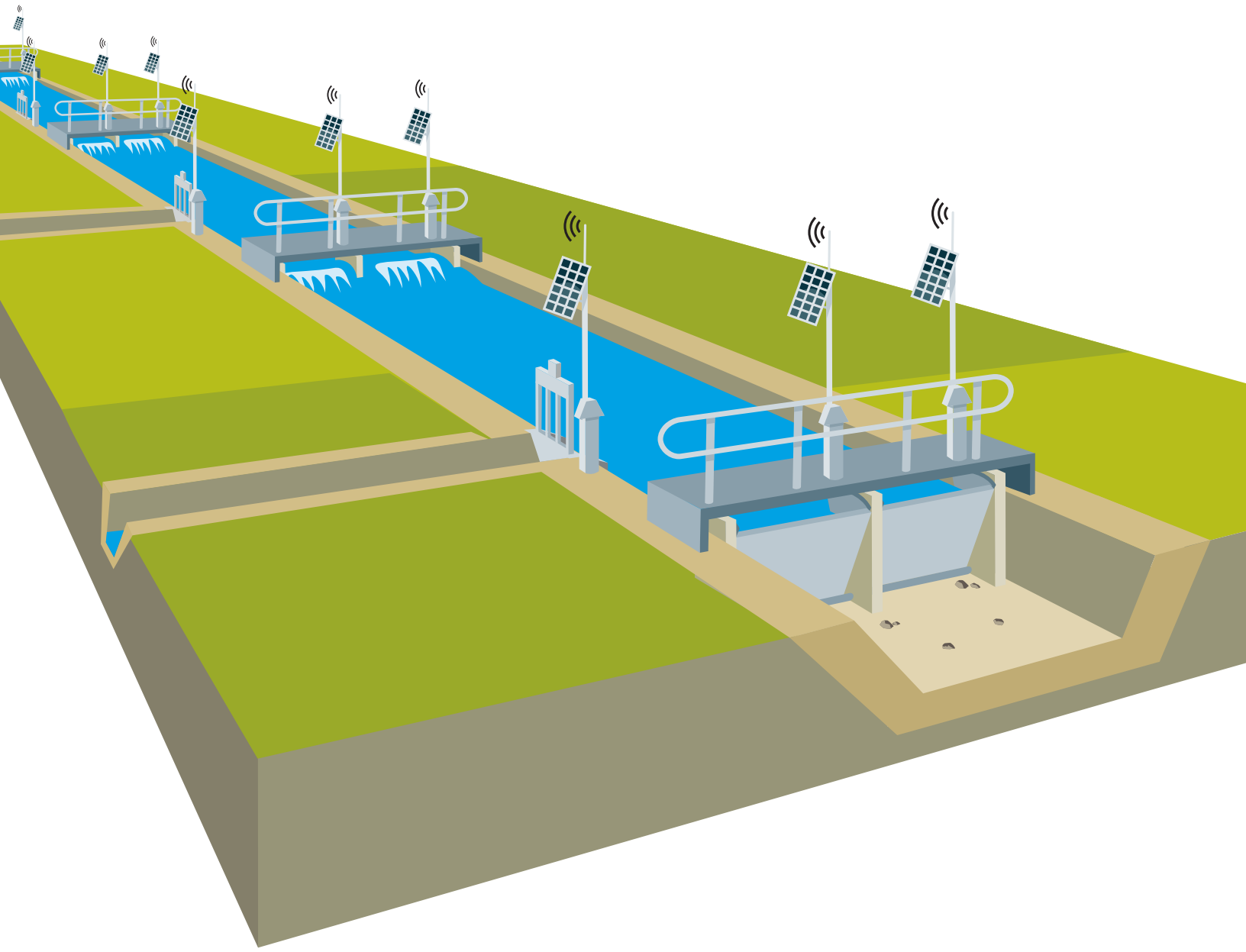
Network Control Solution

RUBICON™



Solution

Network Control Solution

By automatically coordinating a sequence of FlumeGates® in a conveyance or distribution canal system, delivery of water can be optimized to maintain high and consistent flow to farmers and simultaneously eliminate spills at the end of the canal.

The advantages

More water

By eliminating the spills that are common in canal operation, more water remains available in the river or in storage for irrigation at another time.

Less energy cost

If water is pumped into the canal instead of coming from storage, eliminating spills can substantially reduce energy costs.

More flexible

Instead of rigid irrigation schedules like rotations, water can be delivered when a farmer needs it because water is automatically transferred from the section of canal just upstream of the farmer instead of from the distant head-works of the canal system.

Fairer

All farmers receive the same quality of service: high, consistent flows on request, regardless of whether they are towards the beginning or end of the canal system.

Less leakage

It is easier to detect seepage occurring in the network with precise real-time data on water levels. Costs can thereby be reduced with targeted remediation. And leakage that can occur through the crown of the canal when operating the network above design-level is also reduced.

Higher productivity

High, consistent flows to farms means quicker surface irrigations, less nutrient leaching through infiltration and less plant shutdown from waterlogging. It's also easier to determine surface irrigation run times and so avoid excess water runoff. The net result is higher crop productivity using less water

RUBICON™

The challenge

To reliably deliver water on-demand, with high flows to all farmers equally is the ultimate goal of open canal irrigation.

But without accurate and real-time measurement of flow throughout the canal network or the ability to make frequent changes to manually operated check gates, this is a real challenge.

In addition, unknown leakage and seepage, unexpected weather events and human misjudgement make canal regulation more of an art than a science. This is especially true in long or slow moving systems where water can take days to flow from the head of the canal to the tail or where water is shared with other uses such as hydro-electric generation.

As a result, unpredictable water levels and potential shortages of water occur, especially at the far downstream end of the distribution network where the effects are magnified.

To prevent this, a typical approach is often to supply excess water from the dam or river, but any water in excess of that used by farmers is then spilt through the tail escape or expensive reservoirs are built to recirculate the water.

In a world of increasingly scarce resources, the consequences can be serious. They range from unnecessary energy costs of over-pumping; to declining crop production from insufficient water availability at peaks; to over-extraction affecting the sustainability of future production and the environment.

The Network Control Solution could help if you:

have problems controlling levels and flows in your network

want to only release water from storage that closely matches actual irrigator usage

need to reduce extraction pumping costs

need to improve the consistency and reliability of supply to farms

want to reduce relining costs with targeted remediation

want to improve field operator productivity and safety

A TCC® solution

The Network Control Solution is one of the products making up a modular family of precision hardware and software called TCC (Total Channel Control®).

TCC is an advanced technology set designed to improve the management and productivity of water in open canal distribution. Unlike traditional infrastructure, TCC products can interact and work together to help managers improve:

- the availability of water
- service and equity to users
- management and control
- health and safety for canal operators

Network Control Solution

The solution

Rubicon's solution has proven to be simple to install and quick to get up and running.

It involves installing

- a new generation of check gates called FlumeGates
- FlumeGates or SlipMeters™ at large turnouts
- a data-radio network to enable gate-to-gate communication
- canal network control software called NeuroFlo® to coordinate the actions of the FlumeGates
- a remote monitoring and management telemetry system called SCADAConnect®
- network visualization and analysis software

All of the check gates along the length and breadth of a canal system are coordinated so that water levels remain stable while just the amount of water needed is supplied from the dam or river. The canal system behaves with nearly the same responsiveness and efficiency as a pipe but without the high cost of piping.

FlumeGate®

FlumeGates are installed at check structures in series along the canal. The FlumeGate's overshot design (meaning water flows over like a weir) and precision motor control provides fine control of the flow through the gate. Its integrated sensors provide accurate measurement of levels and flow in real time. SlipMeters provide real-time flow measurement and automated control at laterals or large turnouts.

Data Radio

The FlumeGate's integrated data radio communication system enables each FlumeGate to send information to its adjacent FlumeGate.

The gate-to-gate communication means much faster response because long distance transmissions to the control center are unnecessary. It also provides redundancy because the network solution operates even in the event of a temporary failure in communications back to the control center.

NeuroFlo®

When a FlumeGate receives flow and level information from its neighbor or from a lateral heading, the NeuroFlo software determines the response. NeuroFlo determines by how much the FlumeGate should open or close, by how much it should increase or decrease flow to supply water flowing out and to keep water levels at the desired level.

The response needs to be carefully determined to change flow as quickly as possible, but not too quickly that it would cause overflow or drain a canal. The optimal response calculated by NeuroFlo also ensures that the change in flow has the effect of dampening the transient, wave-like impacts that occur elsewhere in the canal network as a result of a flow change. Without NeuroFlo such impacts can cause instability throughout the canal system.

SCADAConnect® & Network Visualization

The SCADAConnect software constantly monitors canal operation to alert human operators to any potential abnormal behavior. Detailed visualization, navigation and dynamic analysis of canal flows and levels in real time and clever alarms ensure that human operators have all the information they need.

Like security guards, operators only intervene to avoid, diagnose and resolve problems. And with the tools built into SCADAConnect they can do so efficiently and rapidly.

These components operate together, passing level and flow information along the length of the canal ensuring a coordinated response right up to the dam or pumping station. Any increase in water extraction anywhere in the system (including leaks and evaporation) can be supplied by all the FlumeGates opening the right amount. Any reduction in extraction (including local rainfall and irrigation rejections) results in FlumeGates closing along the canal, effectively storing the water for later use.

NeuroFlo® controller design

The cornerstone of the solution is NeuroFlo which determines the optimal response of each and every FlumeGate.

NeuroFlo determines the optimal response based on exact knowledge of the hydraulic behavior in each section of canal and the operating strategy chosen by the canal managers (see box Operating strategy).

Hydraulic behavior

During the implementation project, Rubicon configures a mathematical model for every section of canal.

The models are calibrated using measurements of the real system in the field: water is released in controlled steps and its behavior is precisely measured in a process called System Identification. In this way the unique characteristics of each section of canal can be taken into account without the guesswork usually associated with modeling. Variations in geometry or alignment, the impact of aquatic growth or obstructions and the state of the lining become known to NeuroFlo.

Rubicon then uses the calibrated model to design a controller, which is the part of NeuroFlo that is able to predict the behavior of water in that section of canal in any combination of flow and water height (the combinations are called control states).

Finally, once designed, the NeuroFlo Controller is validated through computer simulations.

Optimal Response

The result is that NeuroFlo is perfectly tuned to control each FlumeGate to respond optimally to changes in water use in the canal system.

Operating strategy

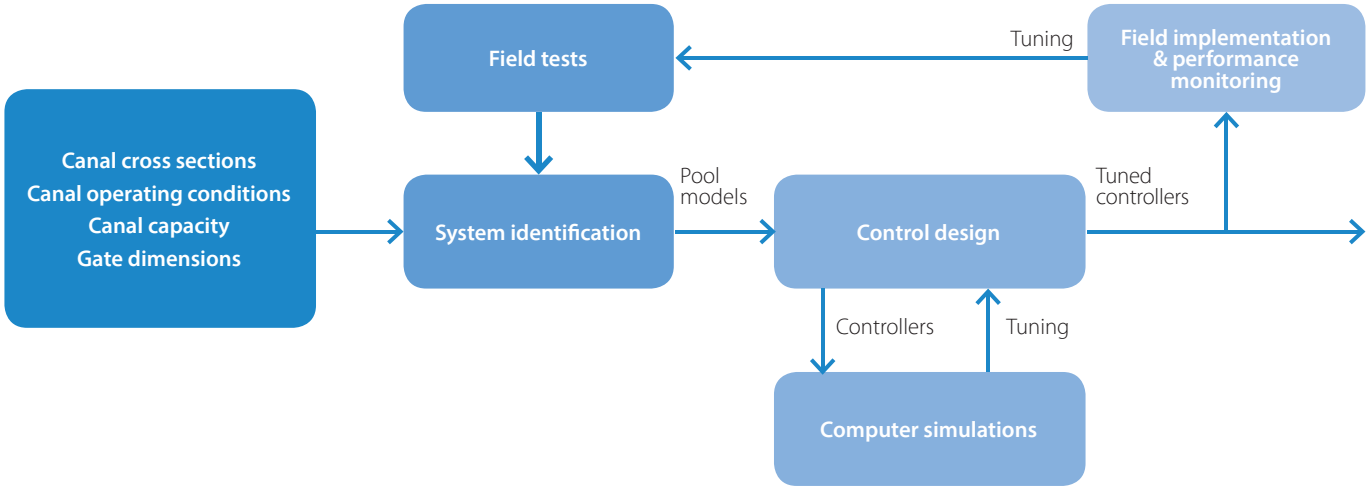
The operating or regulation strategy is the overall plan for controlling the delivery of water in a canal network or system. An irrigation manager chooses a strategy to balance factors like responsiveness to change in demand, need for volume storage, basin topology and construction costs.

The general types of operating strategies are:

- Upstream or Supply control
- Downstream or Demand control
- Hybrid or Mixed control – a combination of the above

Rubicon's Network Control Solution can work with any of these operating strategies.

NeuroFlo® controller design and tuning

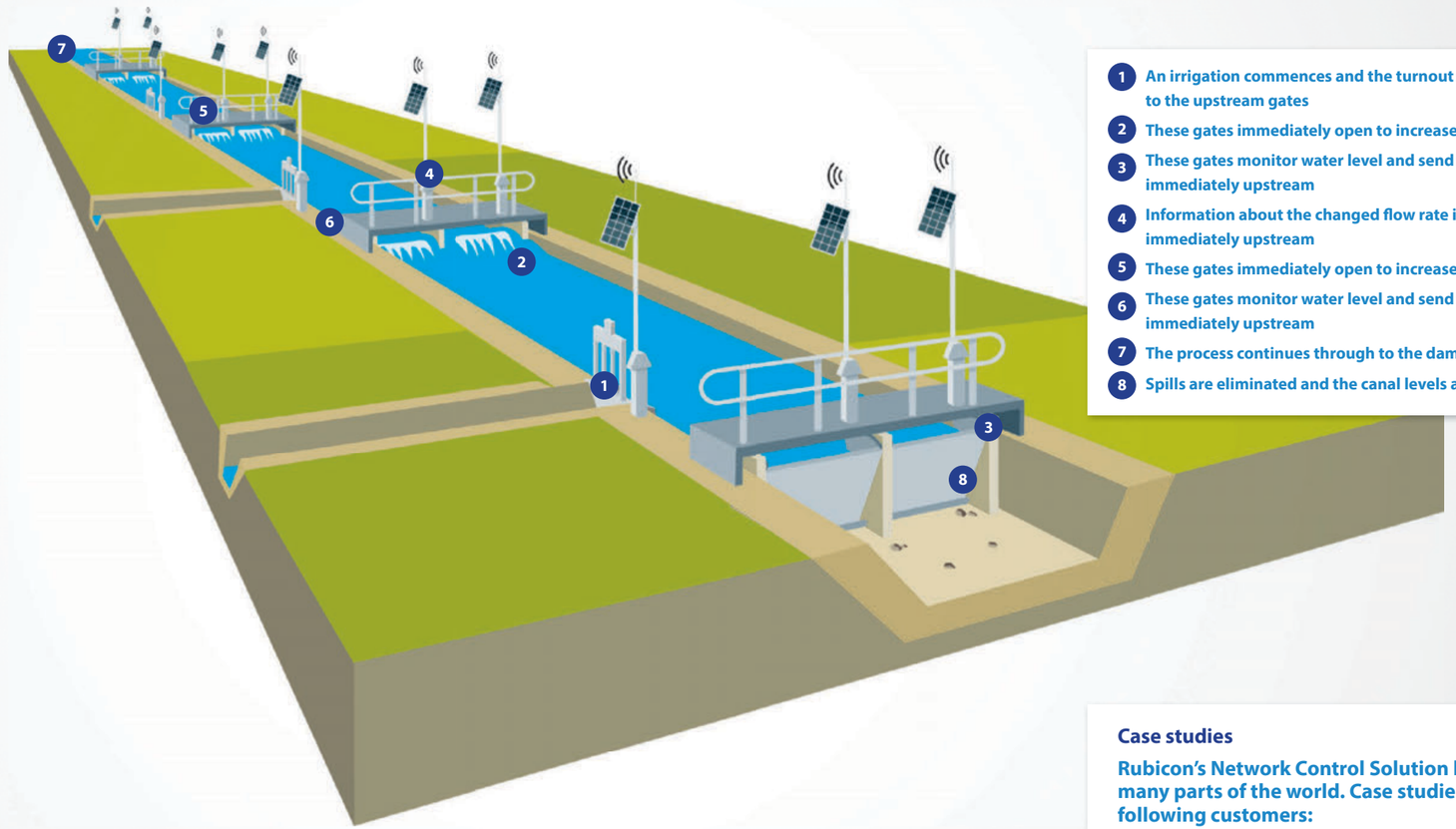


Network Control Solution

How does the NeuroFlo® demand operating strategy work?

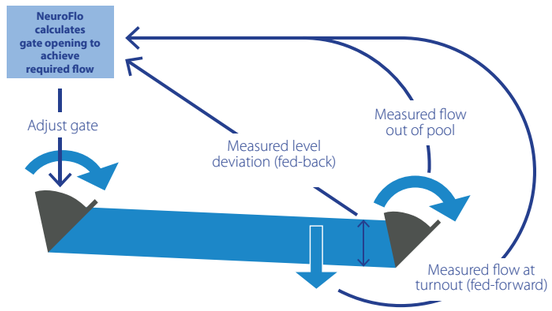
- When a farmer begins to irrigate, the turnout immediately sends information about the flow to the gates upstream.
- The upstream gates respond by changing the flow rate to send additional volume into this section of the canal.
- The gates downstream of the farm monitor any variation in desired water level and send this information to the upstream gates to make minor adjustments to the changed flow rate to ensure the water level maintains its proper level.
- At the same time, the upstream gates send information about the high flow rate they are passing to the next upstream gates.
- Those next upstream gates open to increase flow rate into this section of the canal.
- The gates at the downstream end of this section of the canal also monitor the levels and send the information to the upstream gates to make minor adjustments to their flow to ensure the water level in this section stays at its proper level.
- The process continues along the length of the canal so that just the right flow is passed to maintain proper water level and no spillage occurs.
- Spills at the end of the canal are eliminated.

Conversely when a farmer stops irrigating, the information is sent from the turnout to the gates upstream of the farm which reduces flow and downstream gates monitor the water evel and send this information to the upstream gates to make minor adjustments to the flow. Then this too repeats itself in every section of the canal along the length of the canal as before, using the storage capacity available in the canal to capture any water that has been released into the canal.



1. An irrigation commences and the turnout sends the flow information to the upstream gates
2. These gates immediately open to increase flow
3. These gates monitor water level and send this information to gates immediately upstream
4. Information about the changed flow rate is sent to the gates immediately upstream
5. These gates immediately open to increase flow
6. These gates monitor water level and send this information immediately upstream
7. The process continues through to the dam or river
8. Spills are eliminated and the canal levels are stabilized

Network Control uses feedback and feed-forward control loop technology



Scan or visit http://youtu.be/I3RUFh1-87k to see an animation of Network Control

Case studies

Rubicon's Network Control Solution has been proven in many parts of the world. Case studies are available for the following customers:

Oakdale Irrigation District in California has completely eliminated spills on their 6.5 mile Claribel lateral making an extra 1,700 acre-feet of water available annually

Shepparton Irrigation District in Australia has improved distribution efficiency from 75% to 90% for their 425 miles of canals, making an additional 32,000 acre-feet available, resulting in more sustainable farming and improving the environment

Fen River Irrigation District in Shanxi Province in China is reducing water losses at 25% of the cost of traditional approaches

Network Control Solution

Components

The solution is made up of several components of Rubicon's modular TCC technology.

FlumeGates are combination overshot flow measurement and control gates used in line to regulate the canal system. They provide accurate flow measurement, precise motor control, power supply and radio telecommunications, fully integrated in a single device.

Rubicon's engineers will design and install a communication system that will enable the inter-communication between FlumeGates along the length of the canal and the remote monitoring of all field equipment from the control center.

NeuroFlo is the software that determines the response of each FlumeGate, and coordinates the propagation of flow information up (or down) the canal.

SCADAConnect is Rubicon's SCADA software designed specifically for irrigation. It provides the ability to monitor and manage all field devices, with comprehensive alarm management, and the ability to do sophisticated trend analysis.

The Network Visualization software module provides a visual, schematic representation of the irrigation network making it easy to navigate the network and provides a dynamic summary analysis of the operating behavior.

SlipMeters are combination undershot flow measurement and control gates designed for use at farm entry points or tertiary canal headings. Using SlipMeters can help further optimize the canal control strategy, making it faster to respond.

About Rubicon Water

Rubicon Water delivers advanced technology that optimizes gravity-fed irrigation, providing unprecedented levels of operational efficiency and control, increasing water availability and improving farmers' lives.

Founded in 1995, Rubicon have more than 20,000 gates installed in TCC systems in 10 countries.

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Confluent™

RUBICON™

Irrigation district management software

Rubicon's Confluent software transforms the way irrigation districts manage water, administer operations and serve their customers.

Innovative, modular and scalable, Confluent enables you to plan, manage, deliver, invoice and communicate better, cheaper and faster while providing your customers with a world-class service.

By combining the latest internet and smartphone technology, innovative scheduling and network visualization tools, advanced remote control engineering, and an industry standard database, Confluent helps you to meet the significant challenges you face in managing your water resources.

Automate all operations and administration

Confluent consists of a core database and fundamental tools, and your choice of a number of function packs. Each pack is a collection of tools that streamlines a part of your business. For example SCADAConnect® helps you remotely manage automated devices in the field and Customer Connect enhances communication with your customers.

So whether your need is to remotely manage meters, automate water ordering, adapt to new laws, or modernize your entire district's infrastructure, you only buy what you need. Your investment in software and training is future-proof because you can add functionality over time as your needs change or to support ongoing modernization and change.

Designed for irrigation

Unlike generic software packages designed for factories or the office, Confluent is designed specifically for irrigation districts.

The software knows about water demand such as orders and rotations, about delivery operations and gates and canals and about customers, turnouts and invoices. When this information is integrated you can

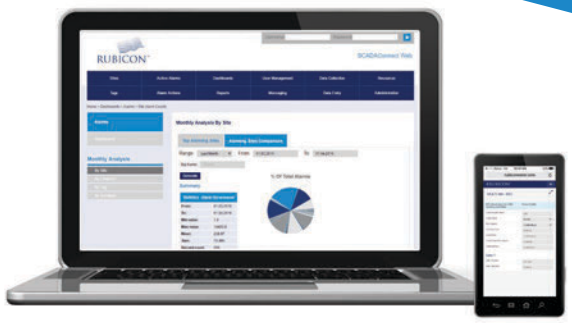
- Plan better, make smarter decisions and fewer mistakes
- Report using meaningful performance indicators such as overall system efficiency
- Calculate volumetric accumulation and determine farmer satisfaction

Irrigation also demands robust, reliable 24 x 7 operation, with alarm escalation and notification by phone and text message or internet. Having 24 hour Interactive Voice Response (IVR) and web access helps farmers in their interaction with the district when and where they need it.

In-field tools like mobile internet to manage water deliveries and smartphone apps for meter reading are also essential for efficient management.

And an irrigation system needs to be able to scale. Thousands of devices providing real-time information covering hundreds of customers' farms can add up to a data explosion that your system needs to handle. Confluent turns that data into information. Analysis and reporting tools help build management insight for better control and for future planning.

Best of all, we're here to help. With more than 20 years' experience helping districts manage irrigation operations in 10 countries, we have the skills to quickly design and build custom modules or reports for your unique needs.



A TCC® product

Confluent is one of the products making up a modular family of precision hardware and software called TCC (Total Channel Control®). TCC is an advanced technology set designed to improve the management and productivity of water in open canal and gravity pipeline distribution. Unlike traditional infrastructure, TCC products can interact and work together to help managers improve:

- the availability of water
- service and equity to users
- management and control
- health and safety for canal operators

Industry-standard relational database

As the cornerstone of your information technology strategy it's good to know that Confluent is underpinned by an industry-standard relational database management system. This means Confluent is scalable, secure, open and reliable.

Scalable

Confluent expands to a virtually limitless number of users, sites, customers, orders and field measurements. And additional sites can be added while the system is online, ensuring no disruption to service.

Secure

Integration with Microsoft Active Directory is standard, and multi-level authorization tools can be configured to limit access to functions or sites. Actions are logged for auditing.

Open

Confluent can interface with your existing business applications such as accounting and asset management systems or share data with external systems such as a geographic information system (GIS).

Reliable

Multiple backup and redundancy options ensure minimal downtime, with standard utilities provided for database backup and recovery, data replication, and secure data access.

Confluent™

SCADAConnect®

Remote management of infrastructure

SCADAConnect enables you to improve safeguards, reduce costs and enhance control of your network with real-time remote management of field equipment.

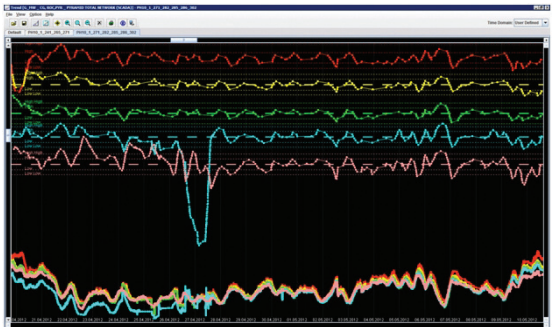
A comprehensive suite of remote device monitoring tools and sophisticated alarms can transform your operation by giving your team the detailed real-time performance information they need to rapidly respond to issues before they become problems and without having to travel to site.

SCADAConnect's data analysis and graphing tools (also called trending) convert the huge quantities of field data into information you can use to manage, to plan and to improve.

For users with a small number of sites, SCADAConnect can be deployed as an entry level cloud solution whereby you can manage your field equipment over the internet using just a web browser and connection to cellular communications networks. This can provide a low cost, rapidly deployed alternative to installing a traditional in-house SCADA system.

Features:

- Real-time remote supervision and management of gates, meters and other field devices (using MDLC or Modbus protocols)
- Geographic visualization of devices using satellite maps and customizable overview screens
- Alarm notification, acknowledgement and critical alarm escalation from operator's desktop, text message, email or pager
- Data analysis and graphing for performance management
- Can be used by multiple users simultaneously
- Secure storage of years of data



Tools for real-time supervision and management, data analysis and graphing

Customer Connect

Efficient customer interaction

The Customer Connect function pack streamlines the communication process, helping you get close to your customers cost-effectively. A range of tools enable you to communicate in the way that best suits you both.

A dedicated web portal with customer login gives you the ability to communicate directly with individuals or groups of farmers all at once. Messages can be sent and received or up-to-date reports and bulletins can be posted for browsing.

Alternatively a customer can elect to receive messages and bulletins by text or email. And the Interactive Voice Response (IVR) system means you can handle most customer needs 24 hours a day.

Customer Connect can also enable farmers to manage their water orders when used in conjunction with the Orders, Rotations & Scheduling function pack. Invoices and water usage statements can also be delivered electronically to customers through Customer Connect when used in conjunction with the Tariffs, Rates & Invoicing function pack.

It's all about providing better customer service and support and improving the efficiency of your operations.

Customer Connect provides farmers and districts with a range of efficient communication options

Features:

- Communicate using the technology your customers want: telephone, web, SMS, email or IVR
- Keep a record of communication between operator and customer
- Smartphone compatible
- Target a single customer or any group of customers with broadcast messaging
- Use automatic, event-based messaging

Tariffs, Rates & Invoicing

Streamlined revenue generation

Tariffs, Rates & Invoicing streamlines revenuedata management.

Complex tariff or rate structures can be defined, made up of any combination of charges such as water usage, property size or farm assets, and combinations of fixed or variable costs, whether one-off or regular.

Invoices can be generated by schedule or the data formatted for input into to your own accounting package.

Features:

- Management of rate structures based on complex combinations
- Interface with external accounting systems
- Invoice generation or data export

Network Visualization

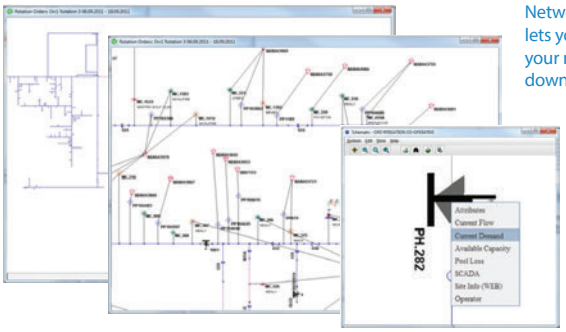
Dynamic visibility of network behaviour

The Network Visualization function pack provides a visual, schematic representation of the entire irrigation network so that operators have an intuitive 360°, high and low-level feel of total network behaviour.

Our innovative real-time dynamic analysis provides a visual summary of actual demand and flow at any point in the network, and future demand when used in conjunction with the Automatic Delivery function pack.

You can quickly navigate to any part of the network and drill down to individual items for more detail, including SCADAConnect screens.

Easy configuration lets you add and remove infrastructure "on the fly".



Network Visualization lets you quickly navigate your network and drill down for detail

Features:

- On-screen visualization of network
- Fast navigation through even complex networks
- View total demand and downstream usage at any point in the network
- Segment network into areas and groups for reporting, performance monitoring, user messaging or operational management

Hydrological Data

Streamlined data collection, analysis and reporting

The Hydrological Data function pack collects, stores and organizes data from different systems and sources throughout your irrigation district and allows you to present only the high-level data essential for medium and long-term planning and decision making.

And by automatically collating and uploading this data to external systems you can meet complex government reporting obligations with minimal effort and cost.

With a data model designed especially for irrigation, Hydrological Data sets the standard for irrigation data warehousing. So it's ideal if you want to efficiently manage bulk water demand and supply, report dam water levels, and analyze rainfall patterns or water quality metrics over time.

Features:

- Automatic data collection from field devices and software packages
- Manual data entry with remote option via web browser/mobile device
- Interfaces with existing SCADA systems
- Supports common data formats including the WaterML industry standard
- Analyze multi-year trends using integrated tools or external software
- Report to external stakeholders

Orders, Rotations & Scheduling

Tools for planning of water delivery

Orders Rotations & Scheduling improves operational efficiency by automating the collection, management and planning of requests for water delivery.

Farmers can place requests using telephone, IVR (Interactive Voice Response) or the web or smartphone (with the Customer Connect function pack). Farmers have the power to delete or modify requests with all actions logged. If required you can also enforce notice periods on these actions.

If you manage your network through rotations, you can define multiple rotations and apply requested delivery changes.

Clever visual planning tools enable you to maximize your ability to deliver while fitting into your network's physical limitations and operational capacity to deliver. Operator running sheets can then be printed with up-to-date instructions.

By making the planning and scheduling process more efficient, notice periods for delivery requests can be shortened and equitable services provided to customers.

By running reports you gain insight into farmer demand. You can also view the demand dynamically and visually if you have the Network Visualization function pack.

Farmers can manage their delivery requests via the web and smartphone

Features:

- Farmers can order and manage their water delivery requests through the method of their choice
- Define and manage pre-planned deliveries (rotations or rosters)
- Demand and service reporting by section or entire canal system
- Logging of order history
- Easy definition of planning areas
- Generation of running sheets to provide operator instructions to field staff

Unlock the automation potential of Rubicon's gates and meters

Rubicon's gate and meter products come embedded with software which enables remote monitoring and control using Confluent without the need for costly integration.

The SCADAConnect function pack seamlessly links with Rubicon gates and meters for remote monitoring and management.

For a powerful control solution, the NeuroFlo® function pack works with the FlumeGate's® embedded software to automatically control check structures to maintain stable canal levels and eliminate spills at the ends of canals.

SlipMeters™ installed at turnouts receive electronic instructions to automatically open and close according to schedule when they are managed by the Automatic Delivery function pack.

RUBICON™

Automatic Delivery

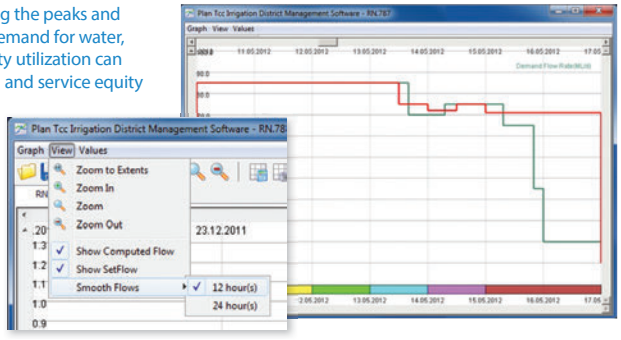
Automatic water order confirmation and optimized scheduling and delivery

The Automatic Delivery function pack completely automates the scheduling of water deliveries to utilise the available capacity of the canal system, and then schedules the turnout to automatically open and close the gate at the planned time, day or night.

Farmers requesting water online (through Customer Connect) can receive immediate confirmation of their orders and can be certain that their water will be reliably and accurately delivered.

Sophisticated demand-scheduling and order-linking techniques ensure that all parts of the canal system from the storage to the farm have capacity to deliver the order. At the same time the number of check and storage gate movements are minimized to reduce canal level fluctuations.

By smoothing the peaks and troughs in demand for water, canal capacity utilization can be increased and service equity enhanced.



Features:

- Demand scheduling to fit demand within network limitations
- Automatic confirmation of delivery at time of delivery request or order
- Automatic download of delivery instructions to turnouts

NeuroFlo®

Intelligent automated regulation

The NeuroFlo function pack automatically controls and coordinates a sequence of gates installed at check structures along the length of a canal to optimize the whole network operation in response to customer requirements. Constant flows to farmers are maintained while simultaneously eliminating spills at the end of the canals. By eliminating unnecessary spills, more water remains available in the dam or river for use at another time.

With NeuroFlo, canal networks can be operated almost on-demand, providing farmers with more flexibility, equity and productivity. Distribution efficiencies of up to 90% have been achieved, and where canals are fed by pumping, results in substantially reduced energy costs.

Features:

- Automatic coordination of all check gates
- Rapid, near on-demand response to farmer need
- Response optimized by real measurements of specific hydraulic behaviour in every section of canal
- No unnecessary spills

Rights & Compliance

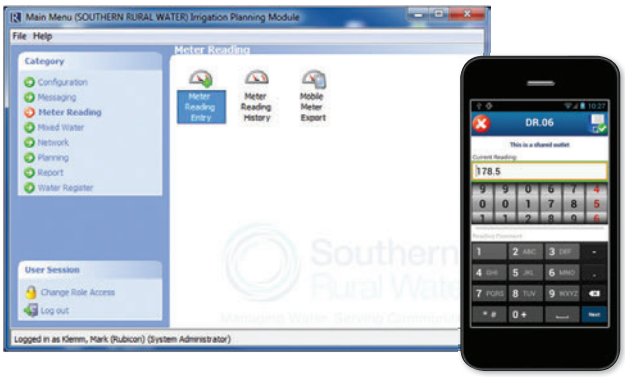
Water rights management

The Rights and Compliance function pack helps you take control of the complexity of managing water allocation rights, ensuring compliance with those rights and complying with increasing government regulation.

You have the flexibility to define water rights or entitlements in the way that reflects your legal structure. You can effect permanent or temporary transfer of rights or alternatively interface to an external water rights register where an external body manages the rights.

Tools are provided for checking water rights before or after water delivery, and for ensuring deliveries conform with regulations. You can report to farmers on usage and on the fairness of distribution and to regulatory authorities or other stakeholders.

Meter reading is cheaper and easier with automated remote meter reading when meters have telemetry. Alternatively you can use our smartphone app if your staff manually collect meter readings, or you can use Customer Connect to enable farmers to self-report and save on meter reading costs.



Smartphone app options streamline meter data collection.

Features:

- Management of rights and entitlements, equity shares, delivery shares or environmental variables
- Management of transfers of rights and entitlements
- Automatic checking of deliveries to adhere to rights
- Generation of customer water statements
- Reporting to demonstrate compliance
- Automatic or manual recording of meter readings
- Farmer self-reporting of meter readings via web or IVR

About Rubicon Water

Rubicon Water delivers advanced technology that optimizes gravity-fed irrigation, providing unprecedented levels of operational efficiency and control, increasing water availability and improving farmers' lives.

Founded in 1995, Rubicon have more than 20,000 gates installed in TCC systems in 10 countries.

DS-CF-02/17-US

1501 S. Lemay Avenue
Suite 101
Fort Collins, CO 80524

615 Kansas Avenue, Unit B
Modesto, CA 95351

415 W Aten Road
Imperial, CA 92251

Toll free: 1 877 440 6080
Telephone: +1 209 846 9814
Fax: +1 209 409 8544
inquiry@rubiconwater.com

www.rubiconwater.com

A Resolution By:

Frenchman Cambridge Irrigation Districts:

Resolution 2-2019

WHEREAS, Dale Cramer, President; Todd Lichty, Vice President; Duane Vorderstrasse, Secretary, (Directors) In their official capacity, dually elected to the Board of Directors, and authorized by Nebraska State Statutes to conduct all business on behalf of the Frenchman Cambridge Irrigation District.

Whereas, the Directors have reviewed the WaterSMART 2019 grant application and support all aspects of this application and are willing to work with Reclamation to meet all deadlines in signing a cooperative agreement.

Whereas, the Directors have secured funding and will commit the necessary Staff, Personnel and Equipment capable to perform the in-kind match required in this Project funding plan.

NOW, THEREFORE, BE IT RESOLVED BY THE FRENCHMAN CAMBRIDGE IRRIGATION DISTRICT ACKNOWLEDGE THE IMPORTANCE OF THIS RESOLUTION AND PLEDGE OUR FULL COOPERATION AND SUPPORT IN ALL MATTERS PERTAINING TO THE FUNDING PLAN.

Acknowledged March 5, 2019 by:

Frenchman Cambridge Irrigation District:

Dale Cramer

Dale Cramer, President

Todd Lichty

Todd Lichty, Vice President

Duane Vorderstrasse

Duane Vorderstrasse, Secretary / Treasurer

Frenchman Cambridge Irrigation District
WaterSMART Grant Proposal Costings

ject Budget

Item	Project Component	Estimated Price
1	Supply of Control Gates, Telemetry and Control System	$3,844,233
2	Structure Upgrade Costs	$142,213
	TOTAL	**$3,986,446**

	Amortized Annual Costs for Water Savings		
	Expected Operations and Maintenance Costs per year (2.5% of capital cost)	$	99,661
	Expected Asset Life (years)		30
	Expected Average Yearly Water Savings (ac-ft)		3,600
	Capital Cost/(Ac-Ft Recovered Each Year x Asset Life)	$	36.91
	(Capital + Maintenance Cost)/(Ac-Ft Recovered Each Year x Asset Life)	$	64.60
	Value of Corn Grown with Recovered Water		
a	Value of Corn For Grain (bushel)	$	5.11
b	Typical Volume of Corn Produced Per Acre		205 bushels per acre
c	Typical Corn Crop Water Requirement per Acre		26 inches
d	Bushels grown per acre-foot (b x 12inches / c)		95
e	Economic Value of Project Water Per Year ($/ac-ft) (calculated as a x d)	$	483.48
f	**Yearly Economic Value of Project ($/ac-ft) (e x 1,400 ac-ft)**	**$**	**1,740,545**

	Summary of Economics over 30 year Asset Life (based on corn crop value)	
g	Capital Cost (in year 1)	$3,986,446
h	Operation and Maintenance Cost over 30 years	$2,989,835
i	TOTAL Cost = Capital Cost + O&M Cost over 30 years (g + h)	$6,976,281
j	Economic Value over 30 years (30 x f)	$52,216,338
k	Net Economic Value over 30 years (j - i)	**$45,240,058**

ATTACHMENT B

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Frenchman-Cambridge Irrigation District
Meeker-Driftwood, Red Willow and Cambridge Units
Pick-Sloan Missouri Basin Program, Nebraska

"DISTRICT OPERATING PLAN"

This "District Operating Plan" hereinafter referred to as "Plan" is made for the purpose of providing a means to implement the contractual commitment made by the District to the United States concerning the operation of the District and the performance of certain water conservation and environmental activities which are part of the consideration for a 40 year repayment term. The District hereby agrees to honor the commitments in this Plan. The parties shall annually, or as otherwise agreed, review the Plan and may, by mutual agreement of the parties, modify and amend the operating criteria of the initial Plan necessary to achieve the District's commitments, Provided, That the District's commitments shall not be diminished or eliminated.

BACKGROUND:

The Frenchman-Cambridge Division is located in southwestern Nebraska along the Republican River and includes the tributaries of Red Willow and Medicine Creeks. The Frenchman-Cambridge Division includes the Meeker-Driftwood, Red Willow, and Cambridge Units. The Meeker-Driftwood Unit consists of Trenton Dam and Swanson Lake and a system of canals, laterals, and drains that currently serves 16,562 acres of project lands. The Red Willow Unit consists of Red Willow Dam and Hugh Butler Lake, Red Willow and Bartley Diversion Dams, and a system of canals, laterals, and drains that currently serves 11,312 acres of project lands. The Cambridge Unit consists of Medicine Creek Dam and Harry Strunk Lake, Cambridge Diversion Dam, and a system of canals, laterals, and drains that currently serve 17,297 acres of project lands. In addition to storing water for irrigation the three units protect the downstream areas from floods, and offer opportunities for recreation and for conservation and development of fish and wildlife resources.

Due to a depleting water supply, the District is willing to limit its irrigation deliveries in order to maintain higher reservoir levels and undertake water conservation measures to improve the efficiency of the project delivery system and encourage on-farm efficiency improvement.

IRRIGATION DELIVERIES:

It is understood that from time to time the United States shall accomplish sediment re-surveys of the reservoirs which shall change the area-capacity data and the elevation-capacity relationship. It is further understood that when the data is officially revised and placed into use it shall be used in determining the contents for the shutoff elevations. In the event the re-survey necessitates changes in reservoir elevations for flood control and irrigation this Plan shall be revised to incorporate those changes.

The available water supply to the District shall be flows of the Republican River, Red Willow Creek, and Medicine Creek, and the storage waters available for release above the established reservoir shutoff elevations.

1. By January 15 of each year, the United States shall provide the District an estimate of the releases available for the irrigation season. The amount of storage water released during any one irrigation season shall be restricted to no more than the waters available above the established reservoir shutoff elevations, based on the following:

    A. Swanson Lake

        1. The space available for irrigation use in Swanson Lake is established as the space available between elevations 2752.0 and 2725.0. The current contents are 112,214 acre-feet (El. 2752.0) and 20,855 acre-feet (El. 2725.0) which establishes the current irrigation space as 91,359 acre-feet.

        2. The annual shutoff elevation is established as El. 2725.0.

    B. Hugh Butler Lake

1. The space available for irrigation use in Hugh Butler Lake is established as the space available between elevations 2581.8 and 2561.0. The current contents are 36,224 acre-feet (El. 2581.8) and 11,212 acre-feet (El. 2561.0) which establishes the current irrigation space as 25,012 acre-feet.

2. The annual shutoff elevation is established as El. 2561.0.

C. Harry Strunk Lake

1. The space available for irrigation use in Harry Strunk Lake is established as the space available between elevations 2366.1 and 2343.0. The current contents are 35,705 acre-feet (El. 2366.1) and 8,859 acre-feet (El. 2343.0) which establishes the current irrigation space as 26,846 acre-feet.

2. The annual shutoff elevation is established as El. 2343.0.

2. The United States reserves the right to make any releases necessary to protect the project facilities and the public in accordance with appropriate safety procedures.

WATER CONSERVATION MEASURES:

The District agrees to:

1. Establish a revolving water conservation fund to be utilized for annual costs associated with the water conservation program activities. The funding shall be provided by an annual assessment on all project lands collected by the District as part of their annual operation and maintenance charge. It is provided that these funds may be fully utilized on an annual basis or accumulated to allow the District to perform water conservation projects that would not otherwise be within the District's financial capability should such projects have to be funded through collections or charges during any one year period. It is specifically provided that these funds may be utilized for Reclamation or other cost-share assistance that may be available to the District for water conservation activities.

2. Continue, when permitted, the practice of seasoning canals with stream flows or flood waters to reduce canal losses and control the growth of vegetation. Diversion of natural flows or flood waters to season canals

shall not be initiated without concurrence of the Contracting Officer, and may not be permitted during those times that the resulting flow reduction would negatively impact the storage of water in downstream reservoirs.

3. Continue the established practice of providing assistance to irrigators who upgrade on-farm irrigation facilities by improving turnout locations, installing meters, assisting with buried pipe projects to allow the use of gated pipe or center pivots, and implementation of other new technology.

4. Continue to work with Reclamation on evaluating computer software and other new technology that shall improve water scheduling and accounting.

The District also agrees to: continue and/or improve its existing policies and practices that further the goals of water conservation; provide educational opportunities for District employees, such as canal operations training, water scheduling, water use seminars, etc.; and work with irrigators through educational type demonstrations or projects that measure on-farm efficiencies and crop water requirements in terms of the type of irrigation methods employed by individual irrigators.

The District further agrees to provide for proper accounting for all water deliveries and operational waste within five years of the date of this Plan. Water delivery and operational waste accounting records shall be provided to the United States on or before November 1 of each year. Prior to March 1 of each year, the District and the Contracting Officer's representative shall meet to assess the past year's water supply and delivery records and accounting, and to evaluate the upcoming irrigation season. Through the use of these records and other available data, the Contracting Officer shall assess the delivery efficiency and on-farm efficiency improvements resulting from the District's implementation of water conservation commitments. The improvements shall be measured against pre-Plan water use data. On that basis, it is the general goal of the District to increase the delivery efficiency of the District by a total of 4 percent and on-farm efficiencies by a total of 5 percent. If the "improvements" are not expected to result in the individual or cumulative increase in efficiencies during the first ten year period of this Plan as determined by the Contracting Officer, additional water conservation measures shall be identified, by mutual agreement of the parties, to be undertaken to ensure the increased efficiencies are realized during the succeeding five year period.

Prior to July 1 of each year, the District shall provide the Contracting Officer an annual

report of water conservation activities/accomplishments for the prior year, and a statement of water conservation funds collected, expended, and water conservation fund balance as of the end of the prior calendar year.

ENVIRONMENTAL MEASURES:

The District agrees to:

1. Install or create better screening devices to prevent the passage of fish, crayfish, etc., into turnouts and lateral systems.
2. Establish policies to preserve lake levels.

In addition to accepting the changes in operation the District is willing to cooperate with Reclamation and others in improving fish and wildlife habitat and recreational access at Swanson Lake, Hugh Butler Lake, and Harry Strunk Lake. If requested, the District shall annually furnish 30 man-days of labor at the above referenced lakes provided the work is coordinated through Reclamation and scheduled during the non-irrigation season at least one month in advance. In lieu of the man-days of labor, the district shall furnish a district-owned machine and operator for 8 days. It is further provided that the District, if requested, may agree to perform more man-days and/or more machine and operator days during one calendar year than the annual commitment, and that any man-days and/or machine and operator days furnished in excess of the annual commitment shall apply as a credit to the succeeding years' commitment(s).

Reclamation is committed to determine the significance of selenium concentration levels for fish and wildlife resources in the Republican River Basin. This commitment by Reclamation shall be implemented through an adaptive management process as outlined in the Record of Decision for the Final Environmental Impact Statement, Long-Term Water Supply Contract Renewals, Republican River Basin, Kansas and Nebraska dated July 22, 2000. The adaptive management process includes, but is not limited to: identification and selection of objectives, implementation and monitoring of response, and assessment of accomplishment that can conclude or refine management actions. The District agrees to cooperate with the United States in implementation of the adaptive management plan which could include, but is not limited to, maintenance of the outfall drains to allow free flow/discharge of drainage water to the stream so as to prevent ponding of drainage effluent, and monitoring the water quality of the project drains.

Prior to July 1 of each year, the District shall provide the United States an annual report

of environmental activities/accomplishments for the prior year.

THE UNITED STATES OF AMERICA

By _____
Area Manager

Date July 25 - 2000

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

By _____
President

Date July 25 - 2000

ATTEST:

_____
Secretary

DUPLICATE ORIGINAL

Contract No. 009D6B0122

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Meeker-Driftwood, Red Willow, and Cambridge Units
Frenchman-Cambridge Division, Nebraska
Pick-Sloan Missouri River Basin Program

CONTRACT BETWEEN THE UNITED STATES OF AMERICA
AND THE FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

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DUPLICATE ORIGINAL

Contract No. 009D6B0122

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Frenchman-Cambridge Division
Pick-Sloan Missouri Basin Program, Nebraska

REPAYMENT CONTRACT BETWEEN THE UNITED STATES AND THE FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT PROVIDING FOR A PROJECT WATER SUPPLY AND FOR REPAYMENT AND OPERATION AND MAINTENANCE OF THE PROJECT WATER SUPPLY AND DISTRIBUTION SYSTEM

THIS CONTRACT, made this 25th day of July, 2000, between the UNITED STATES OF AMERICA, hereinafter called the "United States," acting through the Secretary of the Interior, pursuant generally to the Act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, particularly, but not limited to, Sec. 9(d) of the Act of August 4, 1939 (53 Stat. 1187), as amended and supplemented, the Act of December 22, 1944 (58 Stat. 887), and the Act of July 2, 1956 (70 Stat. 483), all collectively known as the Federal Reclamation laws, and the FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT, an irrigation district organized and existing pursuant to the laws of the State of Nebraska, with its principal place of business in Cambridge, Nebraska, hereafter called the "District."

WITNESSETH, THAT:

The following statements are made in explanation:

EXPLANATORY RECITALS

a. WHEREAS, the United States has constructed the Frenchman-Cambridge Division of the Pick-Sloan Missouri Basin Program, Nebraska, pursuant to the Act of December 22, 1944 (58 Stat. 887), as set forth in House Document 475 and Senate Document 191, as revised and coordinated by Senate Document 247, 78th Congress, Second Session, to provide benefits for irrigation, flood control, sediment control, fish and wildlife enhancement, and recreation; and

b. WHEREAS, the parties hereto have entered into Contract No. 2-07-70-W0033 (formerly IIr-1500), dated July 19, 1951, as amended and supplemented, hereinafter called the "1951 contract," for the furnishing of a project water supply and for construction, operation and maintenance, and repayment of the District's water supply, distribution and drainage facilities; and

c. WHEREAS, Part A of the 1951 contract, which otherwise would have terminated on December 31, 1996, was extended through December 31, 2000, pursuant to P.L. 104-326, dated October 19, 1996 (110 Stat. 4000); and

d. WHEREAS, the District has requested conversion of Part A of the 1951 contract to a repayment contract pursuant to the Federal Reclamation laws and the laws of the State of Nebraska, and has fulfilled its obligations to date under the 1951 contract; and

e. WHEREAS, the United States agrees to conversion of Part A of the 1951 contract to a repayment contract pursuant to applicable Federal and state laws, rules and regulations, particularly Subsection 9 of the Reclamation Project Act of 1939 (53 Stat. 1187) and the Administration of Contracts under Subsection 9, Reclamation Project Act of 1939, Act of July 2, 1956 (70 Stat. 483); and

f. WHEREAS, Part B of the 1951 contract would not otherwise expire, but the United States and the District desire to supersede and replace its provisions by this Contract for ease of contract administration; and

g. WHEREAS, the 1951 contract provided, among other things, for the United States to construct water supply and distribution facilities, and provided for the District to repay portions of the costs of constructing, operating and maintaining these facilities, and the United States and the District desire to continue this relationship and provide for a finality of the capital payments toward these facilities.

NOW, THEREFORE, in consideration of the mutual and dependent covenants herein contained, it is hereby mutually agreed as follows:

GENERAL DEFINITIONS

1. Where used in this contract, the terms:

a. "1951 contract" shall mean the specific contract the parties hereto entered into July 19, 1951, which is numbered contract no. 2-07-70-W0033 (formerly Ilr-1500), as amended and supplemented.

b. "Contract" shall mean and include articles 1 through 35 hereof.

c. "Contracting Officer" shall mean the Secretary of the United States Department of the Interior or his duly authorized representative.

d. "Distribution works" shall mean all of the works beyond the farm and lateral turnouts in the Meeker-Upper Meeker Canal, the Red Willow Canal, the Cambridge Canal, the Bartley Canal, and works appurtenant thereto, which have been constructed by the United States for the distribution of water to such tracts of irrigable acreages within the District as the Contracting Officer and the District may determine; together with all drains and drainage works constructed for the drainage of District lands including any and all facilities appurtenant to such works; also, any machinery, equipment, Cambridge headquarters, and other buildings for the operation and maintenance of such distribution and drainage works, as determined by the Contracting Officer and the District.

e. "District lands" shall mean the irrigable lands of the District upon which the District water supply may be put to beneficial use, as contained in the official records of the Contracting Officer and the District, which lands may be modified through inclusions and exclusions as provided herein.

f. "District water supply" shall mean that portion of the project division water supply to the use of which the District shall become entitled under the provisions of this Contract within the provisions of the Republican River Compact and any order issued by the United States Supreme Court in Kansas v. Nebraska, No. 126 Original, as may be beneficially used on District lands, or such portion thereof on which the District water supply may be beneficially applied in any irrigation season.

g. "District's remaining distribution works construction charge obligation" shall mean the remaining unpaid reimbursable distribution works costs of the District after taking into account payments which were made and/or scheduled through December 31, 2000 under the 1951 contract.

h. "District's water supply repayment obligation" shall mean the portion of

the remaining unpaid water supply costs of the Frenchman-Cambridge Division(which Division includes the District, the Frenchman Valley Irrigation District, and the H&RW Irrigation District) allocated to irrigation ($51,763,871 as of September 30, 1999) which the District shall repay under the terms of Article 5 of this Contract.

i. "Federal Reclamation laws" shall mean the Act of June 17, 1902 (32 Stat. 388) and all acts amendatory thereof and supplementary thereto.

j. "Irrigation season" shall mean the period within any year, May 1 through October 15, or such additional period from April 1 to May 1 of each year as may be agreed upon between the United States and the District.

k. "Operation, maintenance, and replacement costs" shall mean those expenses incurred in connection with the water control, operation, maintenance and replacement of the project works, including appropriate charges for associated indirect costs and administration as determined by the Contracting Officer, and shall include such additional costs as hereinafter provided. Such expenses shall include those required to remedy conditions brought about by ordinary use of the project works or to restore or replace components of the existing project water facilities and shall not include expenses to increase or enlarge such works beyond the purposes for which they were originally authorized and constructed.

l. "Project" shall mean the Cambridge Unit, Meeker-Driftwood Unit, and the Red Willow Unit of the Frenchman-Cambridge Division of the Pick-Sloan Missouri Basin Program.

m. "Project division water supply" shall mean the total supply of water made available in any irrigation season for the Frenchman-Cambridge Division of the Pick-Sloan Missouri Basin Program by or through the United States under the Reclamation laws and as appropriated under the laws of the State of Nebraska and water rights issued thereunder as conclusively determined by the Contracting Officer.

n. "Project works" shall mean all of the works defined as water supply works and distribution works.

o. "Reserved water supply works" shall mean Medicine Creek Dam and Harry Strunk Lake, Trenton Dam and Swanson Lake, Red Willow Dam and Hugh Butler Lake, and all works appurtenant thereto.

p. "Transferred water supply works" shall mean Cambridge Diversion Dam, and Cambridge Canal; Upper Meeker Canal, Upper Meeker Subcanal, Driftwood Canal, Driftwood West Canal, Driftwood Subcanal, and Meeker Extension Canal; Red Willow Creek Diversion Dam, Red Willow Canal, Bartley Diversion Dam, Bartley Canal, the residence at Cambridge Diversion Dam, and all works appurtenant thereto.

q. "Water supply repayment period" shall mean the 40 year period beginning with the year in which the first water supply capital payment is made pursuant to Article 5 hereof.

r. "Water Supply Works" shall mean all of the works defined as reserved water supply works and transferred water supply works.

s. "Year" shall mean the period January 1 through the following December 31.

EFFECTIVE DATE AND TERMINATION OF 1951 CONTRACT

2. This Contract shall become effective January 1, 2001, and on that date shall supersede and replace the 1951 contract in its entirety.

WATER SUPPLY WORKS -WATER TO BE FURNISHED TO THE DISTRICT DISTRICT OPERATING PLAN

3. a. The United States has constructed the water supply works to supply the District with the District water supply. For each irrigation season, the United States shall deliver to the District the District water supply and the District shall pay for such water supply pursuant to the provisions of Article 5 herein. Water deliveries shall be made at such times during the irrigation season and in such quantities, within the capacity of the system works, as provided herein.

b. The District does not warrant the quality of water and is under no obligation to construct or furnish water treatment facilities to maintain or better the quality of water, except as may be necessary to meet the terms of Article 28 of this Contract.

c. The Contracting Officer shall determine the extent to which the available water supply shall be delivered to the District based on the following:

(1) For each irrigation season, the amount of irrigation water released shall be restricted to no more than the waters available above an established reservoir shutoff elevation at Swanson, Hugh Butler, and Harry Strunk Lakes.

(2) The amount of irrigation water for release, shutoff elevations, and other reservoir operating provisions for the Water Supply Works shall be established by the parties annually in accordance with a document developed in a manner and form as the initial "District Operating Plan" which is attached hereto as Attachment B and by this reference made a part hereof. The parties shall annually, or as otherwise agreed, review the "District Operating Plan" and may, by mutual agreement of the parties, modify and amend the operating criteria of the initial plan necessary to achieve the District's commitments, Provided, That the District's commitments shall not be diminished or eliminated.

d. As part of the consideration for a 40 year water supply repayment period, the District hereby agrees to continue its ongoing water conservation program and to establish and fund a water conservation fund to finance ongoing and planned water conservation related activities. Water conservation and environmental related commitments by the District, including the establishment and funding of the water conservation fund, are further described in the "District Operating Plan." The District agrees to honor these commitments, as further described in the "District Operating Plan."

DISTRIBUTION WORKS

4. a. The United States has constructed distribution works to distribute water to, and drain water from, district lands. The district shall repay the unpaid costs of these distribution works in accordance with the provisions of Article 6 herein.

b. The United States and the District recognize that drainage works in addition to those that have been constructed pursuant to (a) above, may be required from time to time for the preservation of the District lands. The District, without further cost to the United States, shall undertake such additional drainage works as the Contracting Officer, after consultation with the District, determines to be necessary. Such drainage works, when constructed, shall be considered to be a part of the distribution works. Any funds which may be available in accordance with Articles 7 and

8 may be used for construction of such drainage works, subject to Contracting Officer approval as required by those Articles.

DISTRICT'S WATER SUPPLY REPAYMENT OBLIGATIONS

5. a. The District shall repay the District's water supply repayment obligation through payment of the charges in (b) and (c) below.

b. The District shall make a base payment annually of $22,586 from the effective date of this Contract through the year 2010. Beginning in the year 2011 through the year 2040, this annual base payment shall be $67,756. It is the intention of the parties that the increase in the annual base payment shall occur in the year following the final repayment of the capital costs of the distribution works under Article 6 of this Contract; and that if for any reason that final payment is delayed, the change in the base payment shall be likewise delayed to coincide with the year following the delayed final capital payment for the distribution works. The parties agree that any base payments that are in excess of the calculated ability to pay of the District are made in part in consideration of the conversion of Part A of the 1951 contract to a repayment contract pursuant to Subsection 9(d) of the Reclamation Project Act of 1939. The parties further agree that notwithstanding the future determinations regarding ability to pay, the annual base payments set forth herein shall not be reduced.

c. The District shall also repay such additional sums against the water supply works costs as may be within the District's ability to pay as determined by the Contracting Officer in accordance with Reclamation policy; Provided, that such additional payment shall not be assessed unless and until the District's ability to pay exceeds the base payment called for in (b) above, at which time the District's annual water supply payment shall be the sum of the base payment called for in (b) above plus an ability to pay payment which shall be the net amount by which the District's determined ability to pay exceeds the District's base payment in (b) above. The parties agree that the District does not have any ability to pay at the time of the execution of this Contract.

d. Each annual installment of the District's water supply repayment obligation as provided in (b) and (c) above shall be paid one-half on or before June 1 and one-half on or before October 1 of the year in which it is due.

e. The parties agree that the District's water supply repayment obligation for

the existing water supply works shall be fully satisfied upon fulfillment of the payments provided in (b) and (c), and that these payments shall constitute full and complete payment of all sums required by law of the District for the capital repayment of the existing water supply works, and that no capital payments beyond the water supply repayment period shall be due from the District for repayment of the existing water supply works.

DISTRICT'S DISTRIBUTION WORKS REPAYMENT OBLIGATION

6. a. The United States has made reimbursable expenditures of $5,471,138 for construction of distribution works. The District, under the 1951 contract, has already repaid or is scheduled to repay $4,221,572.61 of this amount by January 1, 2001, and shall repay to the United States, as scheduled, the then remaining unpaid balance of $1,249,565.39. [All of the preceding amounts exclude rehabilitation and betterment amounts, which amounts have been repaid by the District in accordance with the Loan Asset Sale program (P.L. 98-470.)] This unpaid balance is hereinafter called the "District's remaining distribution works construction charge obligation." The District shall repay the District's remaining distribution works construction charge obligation through annual installments in accordance with the payment schedule in Attachment A, which is attached hereto and made a part hereof.

b. Each annual installment of the District's remaining distribution works construction charge obligation shall be paid one-half on or before May 1 and one-half on or before October 1 of the year in which it is due.

c. The parties agree that the District's repayment obligation for the existing distribution works shall be fully satisfied upon fulfillment of the payments provided in (a), and that these payments shall constitute full and complete payment of all sums required of the District by law for the capital repayment of the existing distribution works, and that no other capital payments shall be due from the District for repayment of the existing distribution works.

DISTRICT'S WATER SUPPLY RESERVE FUND OBLIGATIONS

7. a. Commencing with the effective date of this Contract, the District shall establish and maintain a water supply reserve fund, which the District shall keep available to meet costs incurred on the water supply works as identified in (e) below.

b. The District shall annually deposit into the water supply reserve fund the sum of $9,034 from the effective date of this Contract through the year 2010. Beginning in the year 2011, annual deposits to the fund shall be $42,912. It is the intention of the parties that the increase in the reserve fund annual deposits shall occur in the year following the final repayment of the capital costs of the distribution works under Article 6 of this Contract; and that if for any reason the final payment is delayed, the change in reserve fund deposits shall be likewise delayed to coincide with the year following the delayed final capital payment for the distribution works.

c. The water supply reserve fund shall be deposited in accordance with the State laws governing the District and in a federally insured interest- or dividend-bearing account, or in securities guaranteed by the Federal Government; Provided, That money in the fund shall be available within a reasonable time to meet expenses for such purposes as those identified in (e) below.

d. Such annual deposits into the water supply reserve fund and the accumulation of interest to the fund shall continue unless and until the funds which have been accumulated reach the ceiling amount of $1,377,700. At such time the annual deposits may be discontinued upon mutual agreement of the Contracting Officer and the District; however, the interest earnings shall continue to accrue to the fund. Following any expenditure or transfer from the fund, the District shall resume annual deposits into the fund in the amount in (b) above from the year following the expenditure or transfer, unless and until the greater of the largest previous balance or the ceiling amount is accumulated, at which time the annual deposits may be discontinued upon mutual agreement of the Contracting Officer and the District; however the interest earnings shall continue to accrue to the fund.

e. The water supply reserve fund shall be available for the purposes of meeting the District's share of costs incurred on the water supply works for: 1) extraordinary operation, maintenance and replacement; 2) ordinary operation, maintenance and replacement incurred during periods of special stress caused by damaging droughts, storms, earthquakes, flood, or other emergencies threatening or causing interruption of water supply to the District; and 3) additions and/or modernization, including, but not limited to, activities which improve the operation, reduce the need for future maintenance, and modify and improve the operating efficiencies of the water supply works. Water supply reserve funds may be used for previously planned activities involving these types of costs, or for these types of costs incurred during emergency actions necessitated by periods of special stress as

described in (2) above. The parties agree that the fund shall be used to make extraordinary repairs, replace, and renew project facilities to assure that the project works remain in a state which will allow the Project as a whole to operate efficiently, appropriately, and in accordance with advancements in irrigation program technologies.

f. Expenditures of less than $10,000 per emergency event from the fund for emergency actions on transferred water supply works may be made by the District without prior consent of the Contracting Officer. This initial $10,000 amount shall increase $1,000 for each year this Contract has been in effect after the initial effective year. The Contracting Officer shall be given written notice within 48 hours of any emergency expenditure not initially authorized in writing. All other proposed expenditures from the fund shall be submitted to the Contracting Officer in writing for review and written approval prior to disbursement. Except for emergencies, all expenditures shall be in accordance with: a plan of action developed by the District in cooperation with the Contracting Officer, State law, and sound and accepted accounting practice and procedure.

g. Any expenditures from the water supply reserve fund shall be limited to work associated with the existing water supply works, or components thereof, associated with the irrigation purpose of the Project and shall not result in expenditures to increase or enlarge such water supply works beyond the purposes for which they were originally authorized and constructed.

h. During any period in which any of the transferred water supply works are operated and maintained by the United States, the water supply reserve fund shall be available for like uses by the United States, as defined in (e) above.

i. Upon written mutual agreement between the District and the Contracting Officer, all or any portion of the water supply reserve fund balance may be transferred to the distribution works reserve fund, as established in Article 8 of this Contract, to supplement those funds for the uses provided for in that reserve fund.

j. Upon written mutual agreement between the District and the Contracting Officer, the water supply reserve fund ceiling amount may be adjusted to account for risk and uncertainty stemming from the size and complexity of the project, the size of the annual operation and maintenance budget, additions to, deletions from, or changes in water supply works, and addition and modernization costs not contemplated when this Contract was executed.

k. By July 1 of each year, the District shall provide an annual statement of the balance and composition (principal and accumulated interest) of the water supply reserve fund account to the Contracting Officer.

DISTRICT'S DISTRIBUTION WORKS RESERVE FUND OBLIGATIONS

8. a. Commencing with the effective date of this Contract, the District shall establish and maintain a distribution works reserve fund, which the District shall keep available to meet costs incurred on the distribution works as identified in (e) below.

b. On the effective date of this Contract the District shall deposit the sum of $100,000 into the distribution works reserve fund, and shall annually deposit into the fund the sum of $4,517 from the effective date of this Contract through the year 2010. Beginning in the year 2011, annual deposits to the fund shall be $38,395. It is the intention of the parties that the increase in reserve fund annual deposits shall occur in the year following the final repayment of the capital costs of the distribution works under Article 6 of this Contract; and that if for any reason the final payment is delayed, the change in reserve fund deposits shall be likewise delayed to coincide with the year following the delayed final capital payment for the distribution works.

c. The distribution works reserve fund shall be deposited in accordance with the State laws governing the District and in a federally insured interest- or dividend-bearing account, or in securities guaranteed by the Federal Government; Provided, That money in the fund shall be available within a reasonable time to meet expenses for such purposes as those identified in (e) below.

d. Such annual deposits into the distribution works reserve fund and the accumulation of interest to the fund shall continue unless and until the funds which have been accumulated reach the ceiling amount of $1,297,020. At such time the annual deposits may be discontinued by mutual agreement of the Contracting Officer and the District; however, the interest earnings shall continue to accrue to the fund. Following any expenditure or transfer from the fund, the District shall resume annual deposits into the fund in the amount in (b) above from the year following the expenditure or transfer, unless and until the greater of the largest previous balance or the ceiling amount is accumulated, at which time the annual deposits may be discontinued upon mutual agreement of the Contracting Officer and the District; however the interest earnings shall continue to accrue to the fund.

e. The distribution works reserve fund shall be available for the purposes of meeting the District's share of costs incurred on the distribution works for: 1) extraordinary operation, maintenance and replacement; 2) ordinary operation, maintenance and replacement incurred during periods of special stress caused by damaging droughts, storms, earthquakes, flood, or other emergencies threatening or causing interruption of the distribution of the District's water supply; and 3) additions and/or modernization, including, but not limited to, activities which improve the operation, reduce the need for future maintenance, and modify and improve the operating efficiencies of the distribution works. Distribution works reserve funds may be used for previously planned activities involving these types of costs, or for these types of costs incurred during emergency actions necessitated by periods of special stress as described in (2) above. The parties agree that the fund shall be used to make extraordinary repairs, replace, and renew project facilities to assure that the project works remain in a state which will allow the Project as a whole to operate efficiently, appropriately, and in accordance with advancements in irrigation program technologies.

f. Expenditures of less than $10,000 per emergency event from the fund for emergency actions on distribution works transferred to the District may be made by the District without prior consent of the Contracting Officer. This initial $10,000 amount shall increase $1,000 for each year this Contract has been in effect after the initial effective year. The Contracting Officer shall be given written notice within 48 hours of any emergency expenditure not initially authorized in writing. All other proposed expenditures from the fund shall be submitted to the Contracting Officer in writing for review and written approval prior to disbursement. Except for emergencies, all expenditures shall be in accordance with: a plan of action developed by the District in cooperation with the Contracting Officer, State law, and sound and accepted accounting practice and procedure.

g. Any expenditures from the distribution works reserve fund shall be limited to work associated with the existing distribution works, or components thereof, associated with the irrigation purpose of the Project and shall not result in expenditures to increase or enlarge the use of the available water supply beyond the level and purposes for which it was originally authorized and developed.

h. During any period in which any of the distribution works which have been transferred to the District are operated and maintained by the United States, the distribution works reserve fund shall be available for like uses by the United States, as defined in (e) above.

i. Upon written mutual agreement between the District and the Contracting Officer, all or any portion of the distribution works reserve fund balance may be transferred to the water supply reserve fund, as established by Article 7 of this Contract, to supplement those funds for the uses provided for in that reserve fund.

j. Upon written mutual agreement between the District and the Contracting Officer, the distribution works reserve fund ceiling amount may be adjusted to account for risk and uncertainty stemming from the size and complexity of the project, the size of the annual operation and maintenance budget, additions to, deletions from, or changes in the distribution works, and addition and modernization costs not contemplated when this Contract was executed.

k. By July 1 of each year, the District shall provide an annual statement of the balance and composition (principal and accumulated interest) of the distribution works reserve fund account to the Contracting Officer.

DISTRICT'S OBLIGATIONS FOR OPERATION, MAINTENANCE AND REPLACEMENT COSTS, ADMINISTRATIVE COSTS, AND RELATED FEDERAL COSTS

9. a. In addition to the charges and deposits set forth in Articles 5 though 8 of this Contract, the District shall also pay the costs outlined in (1) through (3) below. All such costs shall be paid annually, one-half due on or before January 1 and the remaining one-half due on or before July 1 of each year. Payment shall be based on an estimate of such costs with adjustments made on the July 1 bill to reflect the actual costs of the previous year; Provided, That in order to avoid incurring a deficit in the funding of such costs, the Contracting Officer may bill the District for any projected deficit and the District shall pay such amount within 30 days after receipt of such notice thereof.

(1) The District's share, as determined by the Contracting Officer, of the annual operation, maintenance and replacement (OM&R) costs incurred by the United States on the Project works. For the first year of this Contract, this charge shall also include the District's share of any OM&R costs incurred under the 1951 contract which remain unpaid.

(2) Such costs which are not included under (1) above that the United States incurs for administration of this Contract which are properly

chargeable to the District plus an appropriate share of the costs for administration, supervision, general expense and indirect costs as are properly chargeable to the District as determined by the Contracting Officer.

(3) Such costs for inspections, investigations, reviews and repairs of transferred works, as provided for in Subarticles 14 (c) and 17 (e), as determined by the Contracting Officer to be reimbursable by the District.

b. The Contracting Officer shall, to the extent practicable and foreseeable, inform the District of the estimate of the costs to be paid by the District in accordance with this Article in advance for the District's use in its budgeting process.

POINTS OF DELIVERY, MEASUREMENT, AND RESPONSIBILITY FOR DELIVERY OF WATER

10. a. Water to be delivered to the District pursuant to this Contract shall be delivered at the canal headgates in the Meeker-Upper Meeker Canal, the Red Willow Canal, the Cambridge Canal, and the Bartley Canal. For the purpose of computing the amount of water furnished to the District, such water shall be measured by the United States at or near the headgates of each of the above-named canals with equipment owned, installed, operated and maintained by the United States. The Contracting Officer's determination as to such measurements shall be final.

b. The United States shall not be responsible for the control, carriage, handling, use, disposal, or distribution of water furnished to the District hereunder beyond the points of furnishing as provided in (a) of this article, and the District shall hold the United States harmless on account of damage or claim of any nature whatsoever, including property damage, personal injury, or death arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such water beyond said points of furnishing.

c. The United States reserves the right to claim all of the waste, seepage, or return flow derived from the water furnished pursuant to this Contract, and the same is hereby reserved and retained by the United States for use in a manner consistent with the provisions of State law and the Republican River Compact.

RIGHTS TO BENEFICIAL USE OF WATER

11. a. Rights to the beneficial use of the District water supply shall be governed by the Federal Reclamation laws, other applicable Federal laws, and the laws of the State of Nebraska, as the same may at any time apply to this Contract; but any such rights to beneficial use shall in no way extend or enlarge the rights of the District to the delivery of water through the water supply works involved herein other than as provided in this Contract; Provided, That the right to delivery of water under this Contract shall not be abrogated so long as the District is not in violation of any of the provisions of this Contract, or in violation of applicable Federal or state laws, rules, or regulations.

b. Rights to the beneficial use of the water provided hereunder shall be subject to the provisions and requirements of the Republican River Compact, including any changes, revisions or additions thereto, as well as any order issued by the United States Supreme Court in Kansas v. Nebraska, No. 126, Original.

c. No rights or interests in or to the District water supply other than to receive water annually pursuant to the terms and limitations of this Contract shall accrue to the District or to anyone claiming by, through, or under the District, by reason of any provision(s) of this Contract.

d. Rights to the beneficial use of the water provided hereunder shall not be diminished because of conservation activities, reductions in annual deliveries, or other water management practices to provide for carryover storage in accordance with Attachment B of this Contract.

UNITED STATES NOT LIABLE FOR WATER SHORTAGE

12. On account of drought, hostile diversion, or any other causes beyond the control of the parties hereto, there may occur at times during any year a shortage in the quantity of water available for delivery to the District by the United States pursuant to this Contract. In no event shall any liability accrue against the United States or against any of its officers, agents, or employees, acting within the scope of their employment, for any damage, direct or indirect, arising out of such shortage. In any year in which there may occur a shortage, as described herein, the United States reserves the right to apportion the project division water supply among those entitled to receive water from that water supply. In making such apportionment, the shortages shall be equalized among all such beneficiaries of the water supply. The apportionment as herein

provided shall be made only after consultation with the District.

TRANSFER OF TITLE TO PROJECT WORKS

13. The Contracting Officer shall cooperate with the District and shall support the District's efforts in pursuing transfer of title to the Project works; Provided, That such title transfer effort be in accordance with Federal law and Reclamation policy; Provided further, That title to the Project works shall remain in the United States until otherwise provided by Congress, notwithstanding that some of the Project works may be transferred to the District for care, operation and maintenance.

OPERATION AND MAINTENANCE TRANSFER OF CERTAIN WORKS

14. a. The United States has transferred to the District and the District has assumed and undertaken the care, operation and maintenance of certain of the Project works to be utilized in the carriage and distribution of water to lands within the District's boundaries and for the drainage of District lands together with facilities appurtenant to such works. At the time of execution of this Contract, these transferred works include all of the Project distribution works and the transferred water supply works as defined herein. Following written notification, the Contracting Officer may transfer other reserved water supply works to the District, with the understanding that arrangements to compensate the District for any operation and maintenance expenses allocated to purposes of any such transferred water supply works that were not payable by the District previously shall be made for any such transfers. Except as otherwise provided herein, the District shall care for, operate and maintain all transferred works at its own expense, and without expense to the United States, in full compliance with the Federal Reclamation laws, applicable rules and regulations, and the terms of this Contract, and in such a manner that the transferred works shall remain in as good and efficient condition and of at least equal capacity for the carriage and distribution of irrigation water as at the date such works were turned over to the District. No substantial physical or operational changes shall be made by the District in any of such transferred works without first obtaining written consent of the Contracting Officer.

b. Moveable operation and maintenance equipment transferred to the District as part of the distribution works has become the property of the District; Provided, That in the event the United States should at any time resume the operation and maintenance of any part of the transferred Project works, the District's operation and maintenance equipment shall be made available for use by the United States.

c. The District shall make promptly any and all repairs to the transferred works which the Contracting Officer may determine to be reasonable and necessary. If the Contracting Officer determines that any part of such transferred works is for any cause unfit for service, he may order the water shut off and turned out of such transferred works until he determines that such transferred works are put in proper condition for service. In case of neglect or failure of the District to make such repairs the Contracting Officer may cause the repairs to be made and the cost thereof, as determined by the Contracting Officer, shall be paid by the District to the United States as provided in Article 9 hereof.

d. In the event the District is at any time in default of any of its obligations to the United States under this Contract, or is found by the Contracting Officer to be operating the transferred works or any part thereof in violation of the provisions of this Contract, then at the election of the Contracting Officer, the United States shall take over from the District the care, operation and maintenance of the transferred works by giving written notice to the District of such election and of the effective date thereof. Thereafter, during the period of government operation, the District shall pay to the United States annually in advance of the use of such transferred works the cost of the operation and maintenance of said works as fixed in notices from the Contracting Officer to the District.

e. Any excess of payments by the District to the United States over the actual cost of such operation and maintenance as determined by the Contracting Officer shall be applied to advances next required of the District or shall be refunded to the District upon retransfer of such works to the District. Such works may be retransferred to the District at the election of the Contracting Officer in the manner as originally transferred to the District. The District shall surrender possession and accept the retransfer on being given the notice provided for herein.

f. The District agrees to indemnify the United States for, and hold the United States and all of its representatives harmless from, all damages resulting from suits, actions, or claims of any character brought on account of any injury to any person or property arising out of any act, omission, neglect, or misconduct in the manner or method of performing any construction, care, operation, maintenance, supervision, examination, inspection, or other duties of the District or the United States required under this Contract on any of the transferred water supply works or distribution works, regardless of who performs those duties.

STANDARD CONTRACT ARTICLES

CHARGES FOR DELINQUENT PAYMENTS

15. a. The District shall be subject to interest, administrative, and penalty charges on delinquent installments or payments. When a payment is not received by the due date, the District shall pay an interest charge for each day the payment is delinquent beyond the due date; Provided, that no interest shall be charged the District unless such delinquency continues for more than 30 days, in which event interest shall accrue from the initial due date. When a payment becomes 60 days delinquent, the District shall pay an administrative charge to cover additional costs of billing and processing the delinquent payment. When a payment is delinquent 90 days or more, the District shall pay an additional penalty charge of 6 percent per year for each day the payment is delinquent beyond the due date. Further, the District shall pay any fees incurred for debt collection services associated with a delinquent payment.

b. The interest charge rate shall be the greater of the rate prescribed quarterly in the Federal Register by the Department of the Treasury for application to overdue payments or the interest rate of 0.5 percent per month prescribed by Section 6 of the Reclamation Project Act of 1939 (Public Law 76-260). The interest charge rate shall be determined as of the due date and remain fixed for the duration of the delinquent period.

c. When a partial payment on a delinquent account is received, the amount received shall be applied, first to the penalty, second to the administrative charges, third to the accrued interest, and finally to the overdue payment.

GENERAL OBLIGATION--BENEFITS CONDITIONED UPON PAYMENT

16. a. The obligation of the District to pay the United States as provided in this Contract is a general obligation of the District notwithstanding the manner in which the obligation may be distributed among the District's water users and notwithstanding the default of individual water users in their obligation to the District.

b. The payment of charges becoming due hereunder is a condition precedent to receiving benefits under this Contract. The United States shall not make water available to the District through project facilities during any period in which the District may be in arrears in the advance payment of water rates and/or operation and

maintenance charges due the United States or in arrears for more than 12 months in the payment of any construction charges due the United States. The District shall not furnish water made available pursuant to this Contract for lands or parties which are in arrears in the advance payment of water rates and/or operation and maintenance charges or in arrears more than 12 months in the payment of construction charges levied or established by the District.

EXAMINATION AND INSPECTION OF PROJECT WORKS FOR DETERMINING ADEQUACY OF OPERATION AND MAINTENANCE

17. a. The Contracting Officer may, from time to time, examine the District's books, records, and reports; the project works being operated by the District to assist the District in determining the condition of the project works; and the adequacy of the operation and maintenance program, the reserve fund, and the water conservation program. The Contracting Officer may examine any or all of the project works which were constructed by the United States and transferred to the District, or project works which were constructed by the District with funds advanced or reimbursed by the United States.

b. The Contracting Officer may, or the District may request the Contracting Officer to, conduct special inspections of any project works being operated by the District and special audits of the District's books and records to ascertain the extent of any operation and maintenance deficiencies, to determine the remedial measures required for their correction, and to assist the District in solving specific problems. Except in an emergency, any special inspection or audit shall be made only after written notice thereof has been delivered to the District by the Contracting Officer.

c. The District shall provide access to the project works, operate any mechanical or electrical equipment, and be available to assist in the examination, inspection, or audit.

d. The Contracting Officer shall prepare reports based on the examinations, inspections, or audits and furnish copies of such reports and any recommendations to the District.

e. The District shall reimburse the actual cost incurred by the United States in making operation and maintenance examinations, inspections, and audits, and preparing associated reports and recommendations.

f. The Contracting Officer may provide the State an opportunity to observe and participate in, at its own expense, the examinations and inspections. The State may be provided copies of reports and any recommendations relating to such examinations and inspections.

CONFIRMATION OF CONTRACT

18. The District, after the execution of this Contract, shall promptly seek to secure a decree of a court of competent jurisdiction of the State of Nebraska confirming the execution of this Contract. The District shall furnish the United States a certified copy of the final decree, the validation proceedings, and all pertinent supporting records of the court approving and confirming this Contract, and decreeing and adjudging it to be lawful, valid, and binding on the District. This Contract shall not be binding on the United States until such final decree has been secured.

NOTICES

19. Any notice, demand, or request authorized or required by this Contract shall be deemed to have been given, on behalf of the District, when mailed, postage prepaid, or delivered to the Regional Director, Great Plains Region, Bureau of Reclamation, P.O. Box 36900, Billings, MT 59107-6900, and on behalf of the United States, when mailed, postage prepaid, or delivered to the President, Frenchman-Cambridge Irrigation District, West Highway 6 & 34, P.O. Box 116, Cambridge, NE 69022. The designation of the addressee or the address may be changed by notice given in the same manner as provided in this article for other notices.

CONTINGENT ON APPROPRIATION OR ALLOTMENT OF FUNDS

20. The expenditure or advance of any money or the performance of any obligation of the United States under this Contract shall be contingent upon appropriation or allotment of funds. Absence of appropriation or allotment of funds shall not relieve the District from any obligations under this Contract. No liability shall accrue to the United States in case funds are not appropriated or allotted.

OFFICIALS NOT TO BENEFIT

21. No Member of or Delegate to Congress, Resident Commissioner, or official of the District shall benefit from this Contract other than as a water user or landowner in

the same manner as other water users or landowners.

CHANGES IN DISTRICT'S ORGANIZATION

22. While this Contract is in effect, no change may be made in the District's organization, by inclusion or exclusion of lands, dissolution, consolidation, merger, or otherwise, except upon the Contracting Officer's written consent.

ASSIGNMENT LIMITED--SUCCESSORS AND ASSIGNS OBLIGATED

23. The provisions of this Contract shall apply to and bind the successors and assigns of the parties hereto, but no assignment or transfer of this Contract or any right or interest therein shall be valid until approved in writing by the Contracting Officer.

BOOKS, RECORDS, AND REPORTS

24. The District shall establish and maintain accounts and other books and records pertaining to administration of the terms and conditions of this Contract, including: the District's financial transactions, water supply data, project operation, maintenance and replacement logs, and project land and rights-of-way use agreements; the water users' land-use (crop census), land-ownership, land-leasing and water-use data; and other matters that the Contracting Officer may require. Reports thereon shall be furnished to the Contracting Officer in such form and on such date or dates as the Contracting Officer may require. Subject to applicable Federal laws and regulations, each party to this Contract shall have the right during office hours to examine and make copies of the other party's books and records relating to matters covered by this Contract.

COMPLIANCE WITH RECLAMATION LAWS

25. The parties agree that the delivery of irrigation water or use of Federal facilities pursuant to this Contract is subject to Federal reclamation law, including, but not limited to, the Reclamation Reform Act of 1982 (43 U.S.C. 390aa et seq.), as amended and supplemented, and the rules and regulations promulgated by the Secretary of the Interior under Federal reclamation law.

ADMINISTRATION OF PROJECT LANDS

26. The lands and rights-of-way acquired and needed by the United States for the purposes of care, operation, and maintenance of project works may be used by the District for such purposes. The District shall ensure that no unauthorized encroachment occurs on project lands and rights-of-way. The District shall not issue rights-of-way across project land, issue land rights to project lands, or issue leases, licenses, permits, or special use agreements involving project land, rights-of-way, or transferred works. All such land-use instruments shall only be issued by the Contracting Officer.

QUALITY OF WATER

27. The operation and maintenance of project facilities shall be performed in such a manner as is practicable to maintain the quality of raw water made available through such facilities at the highest level reasonably attainable, as determined by the Contracting Officer. The United States does not warrant the quality of water and is under no obligation to construct or furnish water treatment facilities to maintain or better the quality of water.

WATER AND AIR POLLUTION CONTROL

28. The District, in carrying out this Contract, shall comply with all applicable water and air pollution laws and regulations of the United States and the State of Nebraska, and shall obtain all required permits or licenses from the appropriate Federal, State, or local authorities.

WATER CONSERVATION

29. Prior to the delivery of water provided from or conveyed through federally constructed or federally financed facilities pursuant to this Contract, the District shall develop an effective water conservation program consistent with the current "Guidelines for the Development of Irrigation Water Conservation Plans" and acceptable to the Contracting Officer. The water conservation program shall contain definite water conservation objectives, appropriate economically feasible water conservation measures, and time schedules for meeting those objectives. At subsequent 3-year intervals, the District shall submit a report on the results of the program to the Contracting Officer for review. Based on the conclusions of the review, the Contracting Officer and the District shall consult and agree to continue or to revise the existing water

conservation program.

EQUAL OPPORTUNITY

30. During the performance of this Contract, the District agrees as follows:

a. The District will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The District will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The District agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

b. The District will, in all solicitations or advertisements for employees placed by or on behalf of the District, state that all qualified applicants will receive consideration for employment without discrimination because of race, color, religion, sex, or national origin.

c. The District will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Contracting Officer, advising the said labor union or worker's representative of the District's commitments under Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

d. The District will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

e. The District will furnish all information and reports required by said amended Executive Order and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Contracting Officer and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

f. In the event of the District's noncompliance with the nondiscrimination clauses of this Contract or with any of such rules, regulations, or orders, this Contract may be canceled, terminated, or suspended, in whole or in part, and the District may be declared ineligible for further Government contracts in accordance with procedures authorized in said amended Executive Order, and such other sanctions may be imposed and remedies invoked as provided in said Executive Order, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

g. The District will include the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by the rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of said amended Executive Order, so that such provisions will be binding upon each subcontractor or vendor. The District will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, That in the event the District becomes involved in, or is threatened with, litigation with a subdistrict or vendor as a result of such direction, the District may request the United States to enter into such litigation to protect the interests of the United States.

COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS

31. a. The District shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d), Section 504 of the Rehabilitation Act of 1973 (P.L. 93-112, as amended), the Age Discrimination Act of 1975 (42 U.S.C. 6101, et seq.) and any other applicable civil rights laws, as well as with their respective implementing regulations and guidelines imposed by the U.S. Department of the Interior and/or Bureau of Reclamation.

b. These statutes require that no person in the United States shall, on the grounds of race, color, national origin, handicap, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving financial assistance from the Bureau of Reclamation. By executing this Contract, the District agrees to immediately take any measures necessary to implement this obligation, including permitting officials of the United States to inspect premises, programs, and documents.

c. The District makes this agreement in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property discounts or other

Federal financial assistance extended after the date hereof to the District by the United States, including installment payments after such date on account of arrangements for Federal financial assistance which were approved before such date. The District recognizes and agrees that such Federal assistance will be extended in reliance on the representations and agreements made in this article, and that the United States reserves the right to seek judicial enforcement thereof.

MEDIUM FOR TRANSMITTING PAYMENTS

32. All payments from the District to the United States under this Contract shall be made by the medium requested by the United States on or before the date payment is due. The required method of payment may include checks, wire transfers, or other types of payment specified by the United States.

PRIVACY ACT COMPLIANCE

33. a. The District shall comply with the Privacy Act of 1974 (5 U.S.C. 552a) (the Act) and the Department of the Interior rules and regulations under the Act (43 CFR 2.45 et seq.) in maintaining landholder acreage certification and reporting records, required to be submitted to the District for compliance with Sections 206 and 228 of the Reclamation Reform Act of 1982 (96 Stat. 1266), and pursuant to 43 CFR 426.18.

b. With respect to the application and administration of the criminal penalty provisions of the Act (5 U.S.C. 552a(i)), the District and the District's employees responsible for maintaining the certification and reporting records referenced in (a) above are considered to be employees of the Department of the Interior. See 5 U.S.C. 552a(m).

c. The Contracting Officer or a designated representative shall provide the District with current copies of the Interior Department Privacy Act regulations and the Federal Register Privacy Act System of Records Notice (Acreage Limitation--Interior, Reclamation-31) which govern the maintenance, safeguarding, and disclosure of information contained in the landholders' certification and reporting records.

d. The Contracting Officer shall designate a full-time employee of the Bureau of Reclamation to be the System Manager who shall be responsible for making decisions on denials pursuant to 43 CFR 2.61 and 2.64, and amendment requests pursuant to 43 CFR 2.72. The District is authorized to grant requests by individuals for

access to their own records.

e. The District shall forward promptly to the System Manager each proposed denial of access under 43 CFR 2.64, and each request for amendment of records filed under 43 CFR 2.71; notify the requester accordingly of such referral; and provide the System Manager with information and records necessary to prepare an appropriate response to the requester. These requirements do not apply to individuals seeking access to their own certification and reporting forms filed with the District pursuant to 43 CFR 426.18, unless the requester elects to cite the Privacy Act as authority for the request.

CONTAMINATION OR POLLUTION OF FEDERAL PROPERTY

34. a. The District may not allow contamination or pollution of Federal project lands, waters or project works of the United States administered by the Contracting Officer for which the District has the responsibility for care, operation, and maintenance by its employees or agents and shall take reasonable precautions to prevent such contamination by third parties.

b. The District shall comply with all applicable Federal, State, and local laws and regulations, and Reclamation policies and instructions, existing or hereinafter enacted or promulgated, concerning any hazardous material that will be used, produced, transported, stored or disposed of on or in lands, waters or facilities of the project.

c. "Hazardous Material" means any substance, pollutant or contaminant listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 1901, et seq., and the regulations promulgated pursuant to that Act. In addition it shall include thermal pollution, refuse, garbage, sewage effluent, industrial waste, petroleum products, mine tailings, mineral salts, misused pesticides, pesticide containers or any other pollutants.

d. Upon discovery of any event which may or does result in pollution or contamination of Federal project lands, water or project works the District shall initiate emergency measures to protect health and safety and the environment if necessary and shall report such discovery with full details of the actions taken to the Contracting Officer. Reporting shall be within a reasonable time of discovery if it is an emergency and the first working day thereafter if it is a nonemergency.

e. Violation of any provisions of this Article, upon which the District does not take immediate corrective action, may, as determined by the Contracting Officer, constitute grounds for termination of this contract and shall make the District liable for the cost of full and complete remediation and/or restoration of any Federal resources or facilities that are adversely affected as a result of the violation.

f. The District agrees to include the provisions contained in paragraphs (a) through (e) of this Article in any subcontract or third party contract it may enter into pursuant to this Contract.

g. The Contracting Officer agrees to provide information necessary for the District, using reasonable diligence, to comply with the provisions of this Article.

ENTIRE AGREEMENT

35. This Contract, including the Preamble, and the Explanatory Recitals, and the Attachments thereto, constitute the entire agreement between the parties concerning the delivery of water to the District and the repayment the District shall make for the distribution and water supply works of the Project, and on January 1, 2001, supersedes all prior agreements, whether written or verbal, between the parties regarding this subject.

IN WITNESS WHEREOF, the parties hereto have signed their names the day and year first above written.

THE UNITED STATES OF AMERICA

By _____
Regional Director

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

By _____
President

ATTEST:

_____
Secretary

ATTACHMENT A

ANNUAL DISTRIBUTION WORKS CONSTRUCTION CHARGE
OBLIGATION PAYMENTS

YEAR	AMOUNT
2001	$136,804
2002	$136,804
2003	$136,804
2004	$136,804
2005	$136,804
2006	$136,804
2007	$136,804
2008	$136,804
2009	$136,804
2010	$ 18,329.39

ATTACHMENT B

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Frenchman-Cambridge Irrigation District
Meeker-Driftwood, Red Willow and Cambridge Units
Pick-Sloan Missouri Basin Program, Nebraska

"DISTRICT OPERATING PLAN"

This "District Operating Plan" hereinafter referred to as "Plan" is made for the purpose of providing a means to implement the contractual commitment made by the District to the United States concerning the operation of the District and the performance of certain water conservation and environmental activities which are part of the consideration for a 40 year repayment term. The District hereby agrees to honor the commitments in this Plan. The parties shall annually, or as otherwise agreed, review the Plan and may, by mutual agreement of the parties, modify and amend the operating criteria of the initial Plan necessary to achieve the District's commitments, Provided, That the District's commitments shall not be diminished or eliminated.

BACKGROUND:

The Frenchman-Cambridge Division is located in southwestern Nebraska along the Republican River and includes the tributaries of Red Willow and Medicine Creeks. The Frenchman-Cambridge Division includes the Meeker-Driftwood, Red Willow, and Cambridge Units. The Meeker-Driftwood Unit consists of Trenton Dam and Swanson Lake and a system of canals, laterals, and drains that currently serves 16,562 acres of project lands. The Red Willow Unit consists of Red Willow Dam and Hugh Butler Lake, Red Willow and Bartley Diversion Dams, and a system of canals, laterals, and drains that currently serves 11,312 acres of project lands. The Cambridge Unit consists of Medicine Creek Dam and Harry Strunk Lake, Cambridge Diversion Dam, and a system of canals, laterals, and drains that currently serve 17,297 acres of project lands. In addition to storing water for irrigation the three units protect the downstream areas from floods, and offer opportunities for recreation and for conservation and development of fish and wildlife resources.

Due to a depleting water supply, the District is willing to limit its irrigation deliveries in order to maintain higher reservoir levels and undertake water conservation measures to improve the efficiency of the project delivery system and encourage on-farm efficiency improvement.

IRRIGATION DELIVERIES:

It is understood that from time to time the United States shall accomplish sediment re-surveys of the reservoirs which shall change the area-capacity data and the elevation-capacity relationship. It is further understood that when the data is officially revised and placed into use it shall be used in determining the contents for the shutoff elevations. In the event the re-survey necessitates changes in reservoir elevations for flood control and irrigation this Plan shall be revised to incorporate those changes.

The available water supply to the District shall be flows of the Republican River, Red Willow Creek, and Medicine Creek, and the storage waters available for release above the established reservoir shutoff elevations.

1. By January 15 of each year, the United States shall provide the District an estimate of the releases available for the irrigation season. The amount of storage water released during any one irrigation season shall be restricted to no more than the waters available above the established reservoir shutoff elevations, based on the following:

   A. Swanson Lake

      1. The space available for irrigation use in Swanson Lake is established as the space available between elevations 2752.0 and 2725.0. The current contents are ~~112,214~~ acre-feet (El. 2752.0) and ~~20,855~~ acre-feet (El. 2725.0) which establishes the current irrigation space as ~~91,359~~ acre-feet.

110175 AF 91,217 AF 18958 AF

      2. The annual shutoff elevation is established as El. 2725.0.

   B. Hugh Butler Lake

Based on May 2011 Survey.

1. The space available for irrigation use in Hugh Butler Lake is established as the space available between elevations 2581.8 and 2561.0. The current contents are 36,224 acre-feet (El. 2581.8) and 11,212 acre-feet (El. 2561.0) which establishes the current irrigation space as 25,012 acre-feet.

2. The annual shutoff elevation is established as El. 2561.0.

C. Harry Strunk Lake

1. The space available for irrigation use in Harry Strunk Lake is established as the space available between elevations 2366.1 and 2343.0. The current contents are 35,705 acre-feet (El. 2366.1) and 8,859 acre-feet (El. 2343.0) which establishes the current irrigation space as 26,846 acre-feet.

2. The annual shutoff elevation is established as El. 2343.0.

2. The United States reserves the right to make any releases necessary to protect the project facilities and the public in accordance with appropriate safety procedures.

WATER CONSERVATION MEASURES:

The District agrees to:

1. Establish a revolving water conservation fund to be utilized for annual costs associated with the water conservation program activities. The funding shall be provided by an annual assessment on all project lands collected by the District as part of their annual operation and maintenance charge. It is provided that these funds may be fully utilized on an annual basis or accumulated to allow the District to perform water conservation projects that would not otherwise be within the District's financial capability should such projects have to be funded through collections or charges during any one year period. It is specifically provided that these funds may be utilized for Reclamation or other cost-share assistance that may be available to the District for water conservation activities.

2. Continue, when permitted, the practice of seasoning canals with stream flows or flood waters to reduce canal losses and control the growth of vegetation. Diversion of natural flows or flood waters to season canals

shall not be initiated without concurrence of the Contracting Officer, and may not be permitted during those times that the resulting flow reduction would negatively impact the storage of water in downstream reservoirs.

3. Continue the established practice of providing assistance to irrigators who upgrade on-farm irrigation facilities by improving turnout locations, installing meters, assisting with buried pipe projects to allow the use of gated pipe or center pivots, and implementation of other new technology.

4. Continue to work with Reclamation on evaluating computer software and other new technology that shall improve water scheduling and accounting.

The District also agrees to: continue and/or improve its existing policies and practices that further the goals of water conservation; provide educational opportunities for District employees, such as canal operations training, water scheduling, water use seminars, etc.; and work with irrigators through educational type demonstrations or projects that measure on-farm efficiencies and crop water requirements in terms of the type of irrigation methods employed by individual irrigators.

The District further agrees to provide for proper accounting for all water deliveries and operational waste within five years of the date of this Plan. Water delivery and operational waste accounting records shall be provided to the United States on or before November 1 of each year. Prior to March 1 of each year, the District and the Contracting Officer's representative shall meet to assess the past year's water supply and delivery records and accounting, and to evaluate the upcoming irrigation season. Through the use of these records and other available data, the Contracting Officer shall assess the delivery efficiency and on-farm efficiency improvements resulting from the District's implementation of water conservation commitments. The improvements shall be measured against pre-Plan water use data. On that basis, it is the general goal of the District to increase the delivery efficiency of the District by a total of 4 percent and on-farm efficiencies by a total of 5 percent. If the "improvements" are not expected to result in the individual or cumulative increase in efficiencies during the first ten year period of this Plan as determined by the Contracting Officer, additional water conservation measures shall be identified, by mutual agreement of the parties, to be undertaken to ensure the increased efficiencies are realized during the succeeding five year period.

Prior to July 1 of each year, the District shall provide the Contracting Officer an annual

report of water conservation activities/accomplishments for the prior year, and a statement of water conservation funds collected, expended, and water conservation fund balance as of the end of the prior calendar year.

ENVIRONMENTAL MEASURES:

The District agrees to:

1. Install or create better screening devices to prevent the passage of fish, crayfish, etc., into turnouts and lateral systems.
2. Establish policies to preserve lake levels.

In addition to accepting the changes in operation the District is willing to cooperate with Reclamation and others in improving fish and wildlife habitat and recreational access at Swanson Lake, Hugh Butler Lake, and Harry Strunk Lake. If requested, the District shall annually furnish 30 man-days of labor at the above referenced lakes provided the work is coordinated through Reclamation and scheduled during the non-irrigation season at least one month in advance. In lieu of the man-days of labor, the district shall furnish a district-owned machine and operator for 8 days. It is further provided that the District, if requested, may agree to perform more man-days and/or more machine and operator days during one calendar year than the annual commitment, and that any man-days and/or machine and operator days furnished in excess of the annual commitment shall apply as a credit to the succeeding years' commitment(s).

Reclamation is committed to determine the significance of selenium concentration levels for fish and wildlife resources in the Republican River Basin. This commitment by Reclamation shall be implemented through an adaptive management process as outlined in the Record of Decision for the Final Environmental Impact Statement, Long-Term Water Supply Contract Renewals, Republican River Basin, Kansas and Nebraska dated July 22, 2000. The adaptive management process includes, but is not limited to: identification and selection of objectives, implementation and monitoring of response, and assessment of accomplishment that can conclude or refine management actions. The District agrees to cooperate with the United States in implementation of the adaptive management plan which could include, but is not limited to, maintenance of the outfall drains to allow free flow/discharge of drainage water to the stream so as to prevent ponding of drainage effluent, and monitoring the water quality of the project drains.

Prior to July 1 of each year, the District shall provide the United States an annual report

of environmental activities/accomplishments for the prior year.

THE UNITED STATES OF AMERICA

By _____
Area Manager

Date July 25 - 2000

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

By _____
President

Date July 25 - 2000

ATTEST:

_____
Secretary

United States Department of the Interior

BUREAU OF RECLAMATION
Great Plains Regional Office
P.O. Box 36900
Billings, MT 59107-6900

IN REPLY REFER TO:

NOV 17 2016

GP-4100
WTR-4.03

PRIORITY MAIL

Mr. Brad Edgerton
Manager
Frenchman-Cambridge Irrigation District
P.O. Box 116
Cambridge, NE 69022-0116

Subject: Transmittal of Executed Amendment No. 1 (Amendment) to Contract No. 11SD6B0084 (Safety of Dams Contract) for Safety of Dams Repairs to Red Willow Dam, Frenchman-Cambridge Irrigation District, Frenchman-Cambridge Division, Pick-Sloan Missouri Basin Program, Nebraska

Dear Mr. Edgerton:

Attached is the executed duplicate original Amendment to the subject contract for your files. The original Amendment has been forwarded to our Financial Management Office for their records.

If you have any questions concerning this Amendment, please contact Sheri Fredericksen at 406-247-7735 or by email at sfredericksen@usbr.gov.

Sincerely,

L. Ann Petersen

L. Ann Petersen
Supervisory Repayment Specialist

Enclosure

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Frenchman-Cambridge Division

Red Willow Dam

CONTRACT BETWEEN THE UNITED STATES OF AMERICA AND THE FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT FOR REPAYMENT OF SAFETY OF DAMS COSTS ASSOCIATED WITH RED WILLOW DAM

PICK-SLOAN MISSOURI BASIN PROGRAM, NEBRASKA

THIS AMENDMENT, made this 15TH day of November, 2016, pursuant to the Act of June 17, 1902 (32 Stat. 388), including acts amendatory thereof and supplementary thereto, particularly, but not limited to, the Reclamation Safety of Dams Act of November 2, 1978 (Public Law 95-578, 92 Stat. 2471) (SOD Act), as amended by the Reclamation Safety of Dams Act Amendments of August 28, 1984 (Public Law 98-404, 98 Stat. 1481), October 27, 2000 (Public Law 106-377, 114 Stat. 1441A-67), December 3, 2004 (Public Law 108-439, 118 Stat. 2627), and December 19, 2015 (Public Law 114-113, 129 Stat. 2406), all collectively referred to as the Federal Reclamation Laws, is between the UNITED STATES OF AMERICA, hereinafter referred to as the "United States," represented by the Contracting Officer executing this Amendment, and the FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT, an irrigation district organized and existing pursuant to the laws of the State of Nebraska, with its principal place of business in Cambridge, Nebraska, hereinafter referred to as the "District" The United States and the Contractor are sometimes referred to individually as "Party" and collectively as "Parties."

WITNESSETH THAT

The following preliminary statements are made for the purpose of explanation:

EXPLANATORY RECITALS

a. WHEREAS, the United States completed construction of Red Willow Dam (Red Willow) in 1962, which served the purposes of irrigation, flood control, fish and wildlife conservation, and recreation; and

b. WHEREAS, the Parties entered into Contract No. 009D6B0122 on July 25, 2000, (Existing Contract) for repayment of the District's remaining construction obligation costs

associated with the Project water supply works, distribution works and operation, maintenance and replacement (OM&R) of the Project water supply and distribution works; and

c. WHEREAS, the sinkhole previously discovered on the downstream face of Red Willow has been repaired under the Safety of Dams (SOD) modifications required pursuant to the SOD Act, as amended, to preserve the structural stability and integrity of the facility; and

d. WHEREAS, the Contracting Officer and the District entered into a SOD Contract (Contract No. 11SD6B0084) (SOD Contract) for repayment of its share of the costs allocable to the irrigation purpose; and

e. WHEREAS, the SOD Modifications were deemed substantially complete on April 8, 2014; and

f. WHEREAS, the final SOD Modifications Project Costs totaled $25,891,603.34; and

g. WHEREAS, it is Reclamation policy to allocate fifteen (15) percent of the SOD costs incurred only to those authorized purposes which are fully reimbursable, which in the case of the Red Willow SOD Modifications is irrigation; and

h. WHEREAS, the reimbursable SOD Modifications Project Costs are required to be made within 50 years following the date the SOD Modification is deemed substantially complete; and

i. WHEREAS, at the time of execution of this Amendment, the District has no ability-to-pay beyond their financial obligations under the Existing Contract but has agreed to start payments on the SOD Modifications upon payout of the Existing Contract; and

j. WHEREAS, the Existing Contract pays out in 2040; and

k. WHEREAS, the Contracting Officer will continue to review the District's ability-to-pay but at a minimum the District will pay $81,347 starting in 2041 toward the SOD Modifications Project Costs; and

l. WHEREAS, the District will continue to make at least this annual payment until the year 2064 (50 years after the date of substantial completion); and

m. WHEREAS, any costs allocated to the District but beyond the District's ability-to-pay will be paid by Pick-Sloan Missouri Basin Program power revenues; and

n. WHEREAS, the Contracting Officer and the District desire to amend the SOD Contract to reflect the final SOD Modifications Project Cost; and

o. WHEREAS, language has been added to the Reclamation standard article titled "Equal Employment Opportunity" to prohibit discrimination based on sexual orientation or gender identity.

NOW THEREFORE, in consideration of the mutual and dependent covenants herein contained, it is hereby mutually agreed as follows:

1. Article 4, titled "Final Statement of Costs" is hereby deleted in its entirety and replaced by the following article.

FINAL STATEMENT OF COSTS

"4. The final SOD Modifications Project Costs are $25,891,603.34. Fifteen percent (15%) of the final SOD Modification Project Costs are assigned to irrigation which equates to $3,883,740.50. The schedule of costs and associated repayment is attached as Exhibit A, which is hereby made a part of the Contract. This obligation will be repaid in accordance with Article 6 of the SOD Contract."

2. Subarticles 18 (a) and (b) of the article titled "Equal Employment Opportunity" are hereby deleted in their entirety and replaced by the following subarticles.

EQUAL EMPLOYMENT OPPORTUNITY

"a. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, disability, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, disability, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

b. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, disability, or national origin."

3. Exhibit A, titled "Final Statement of Costs and Repayment Schedule" is hereby deleted in its entirety and replaced with Exhibit A, herein which reflects the total SOD Modifications Project Costs and the District's minimum annual payments.

4. Except as specifically altered herein, the SOD Contract remains in full force and effect.

IN WITNESS WHEREOF, the Parties hereto have executed this Amendment as of the day and year first above written.

UNITED STATES OF AMERICA

By _____
Michael J. Ryan
Regional Director
Great Plains Region
Bureau of Reclamation

FRENCHMAN-CAMBRIDGE
IRRIGATION DISTRICT

By Dale Cramer
President

ATTEST:
Secretary, Frenchman-Cambridge Irrigation District

EXHIBIT A

Red Willow Safety of Dam's Modification
Contract No. 11SD6B0084

Final Safety of Dams Modifications Project Costs	$25,891,603.34
Irrigation Share (15%)	$3,883,740.50
Substantial Complete Date	2014
Final Payout Date (50 years beyond substantial completion date)	2064
District's Payment Begin Date	2041
District's Minimum Annual Payment Amount (2041-2064)	$81,347.00
District's Payment Date (1/2 by June 1)	$40,673.50
District's Payment Date (1/2 by October 1)	$40,673.50
Projected Aid-To-Irrigation Payment in 2064	$1,931,412.50

Year	Beginning Balance	Payment	Ending Balance
2041	$3,883,740.50	$81,347.00	$3,802,393.50
2042	$3,802,393.50	$81,347.00	$3,721,046.50
2043	$3,721,046.50	$81,347.00	$3,639,699.50
2044	$3,639,699.50	$81,347.00	$3,558,352.50
2045	$3,558,352.50	$81,347.00	$3,477,005.50
2046	$3,477,005.50	$81,347.00	$3,395,658.50
2047	$3,395,658.50	$81,347.00	$3,314,311.50
2048	$3,314,311.50	$81,347.00	$3,232,964.50
2049	$3,232,964.50	$81,347.00	$3,151,617.50
2050	$3,151,617.50	$81,347.00	$3,070,270.50
2051	$3,070,270.50	$81,347.00	$2,988,923.50
2052	$2,988,923.50	$81,347.00	$2,907,576.50
2053	$2,907,576.50	$81,347.00	$2,826,229.50
2054	$2,826,229.50	$81,347.00	$2,744,882.50
2055	$2,744,882.50	$81,347.00	$2,663,535.50
2056	$2,663,535.50	$81,347.00	$2,582,188.50
2057	$2,582,188.50	$81,347.00	$2,500,841.50
2058	$2,500,841.50	$81,347.00	$2,419,494.50
2059	$2,419,494.50	$81,347.00	$2,338,147.50
2060	$2,338,147.50	$81,347.00	$2,256,800.50
2061	$2,256,800.50	$81,347.00	$2,175,453.50
2062	$2,175,453.50	$81,347.00	$2,094,106.50
2063	$2,094,106.50	$81,347.00	$2,012,759.50
2064	$2,012,759.50	$81,347.00	$1,931,412.50

February 22, 2018

Media Contacts:

Taylor Gage, Governor Ricketts, 402-471-1970

Jacque Montgomery, Governor Hickenlooper, 303-518-0915

LINCOLN – Today, the Governors and Attorneys General of Nebraska and Colorado announced their settlement of claims regarding Colorado's past use of water under the Republican River Compact. A new agreement between the states was signed by Governor John Hickenlooper of Colorado and Governor Pete Ricketts of Nebraska in recent weeks. The agreement builds upon the states' recent collaborative water management efforts and approval of detailed interstate Compact accounting procedures of water in the Republican River basin. While the States are currently in compliance with the terms of the Compact, this settlement resolves potential claims related to alleged past violations. The two-page settlement:

- Avoids any future litigation on these matters, by forever barring Nebraska from bringing claims against Colorado for violation of the Compact and the prior 2002 Final Settlement Stipulation for the accounting period ending on or prior to December 31, 2013; and,
- Subject to appropriation, provides a negotiated level of payment to the State of Nebraska; and,
- Establishes no precedent for water valuation in any of the States, including this river basin; and
- Requires payment by December 31, 2018.

Governor Hickenlooper commented that "the settlement provides funds that could be used in the Republican River Basin within Nebraska and creates additional opportunities for cooperative water management between the states."

Attorney General Cynthia Coffman of Colorado said the agreement "avoids the costs and uncertainty of litigation and furthers the principles of the Compact, including removing controversy, fostering interstate cooperation, and ensuring the most efficient use of water in the Republican River basin."

Governor Ricketts agreed that "Nebraska and Colorado can now continue to focus on providing their water users with greater certainty and to pursue other collaborative opportunities to benefit their shared economies."

Attorney General Doug Peterson of Nebraska also expressed his approval, stating that "this settlement is in the best interest of the State, and builds on our previous collaborative efforts."

The agreement resolves the existing controversies between the two states regarding Colorado's past use of water under the Republican River Compact and allows them to continue to work cooperatively.

BACKGROUND ON THE REPUBLICAN RIVER COMPACT

Governor Ricketts underscored the importance of these State-to-State collaborative efforts and the ongoing dialogue and water planning efforts between the State of Nebraska and the water users in this particular river basin. Through cooperation and targeted water resources investment, greater certainty, predictability, and stability for the overall economy has been brought to the over 1.1 million acres of irrigated land, just in Nebraska. The agricultural economies of the three states' surface and groundwater users in this interstate river basin are tied together and can mutually benefit from the ongoing collaboration.

After signing the agreement, Governor Ricketts recommended that the Legislature invest the funds provided through this settlement in surface water resource conservation projects in the Republican River basin. Nebraska water users were affected by the reduced water supply allocated to the State, as a result of Colorado's past years of use. These water users should benefit from further investments. Since establishing their streamflow augmentation project and other measures, Colorado has been in full compliance with the Compact since 2015.

Governor Ricketts praised the efforts of his Department of Natural Resources and the Office of the Attorney General to open and establish a long-term commitment to dialogue among water users, regulators and States, and support the movement away from the era of litigation and controversy that began over 20 years ago. Dialogue and recent court decisions supporting the State's views have created an environment for advancing solid strategies for future water planning and investment in water management, efficiencies, and conservation.

Pending approval by the Colorado and Nebraska legislatures, the funds provided through this settlement, expected sometime later in 2018, will be managed by the Department of Natural Resources for surface water related projects that will add to the existing ongoing implementation of the integrated management plans led by the Natural Resource Districts in the basin. Their past significant investments include augmentation projects, proposed new excess water diversions, incentives for reducing irrigated acreage, and water efficiency technologies.