MEMORANDUM

To: File No. 061-110.041

From: Wright Water Engineers, Inc.
Emily Becker, P.E. and Peter Foster, P.E.

Date: June 16, 2011

Re: Florida Mesa Ditch Companies
Installation of Telemetry, Additional
Water Measuring Devices and Automated Gates

INTRODUCTION

In 2009, Florida Mesa Canal Companies was awarded grant funding for installation of water measuring devices in the canal conveyance system, installation of telemetry on water measuring devices and installation of automated gates.

The purpose of these improvements was to assist with canal and ditch operations during changing water conditions. The improvements reduce administrative waste and help identify areas with water loss. Administrative waste is caused by delays between order and delivery of irrigation water to agricultural users, where irrigation water may not be diverted timely and left in the river, rather than down the canal where it is needed. These improvements allow the ditch riders to monitor flows in the canal system, and make adjustments in a timely manner.

This memo and the attached photo log have been prepared to document the improvements to the Florida Mesa Ditches including three automated gates and four flow measurement stations with telemetry.

INSTALLATION AND BUDGET

The three automatic gates were installed at the Florida Farmers Ditch West turnout, at the Pine Ditch turnout, and at the outlet of the Pastorius Reservoir/Reservoir Ditch. At each of these locations, actuators were installed on the existing gates. (The gates at the two ditch turnouts are slide gates, while the gate at the exit to the Pastorius Reservoir is a radial gate.) Also at each of these locations, a panel containing a radio, modem, and data logger were located adjacent to the gates. The panels for the ditch turnouts are mounted on struts. For the Pastorius Reservoir outlet, the panel (and the actuator) are housed in a control house adjacent to the gate. Also, at each of these location is a solar panel for power supply and an antenna for radio communication with the supervisory control and data acquisition (SCADA) system.

Each of the four flow measurement stations were installed in existing or new stilling well enclosures. Radios and modems are also installed at these locations. Three of the flow measurement stations are located on the Florida Farmers Ditch West and one is located on the Pine Ditch.

In addition, a receiving site for the data is set up at the residence of Charlie McCoy, Senior Ditch Rider for the Florida Mesa Canal Companies. At this location, a modem and antenna allow transmission of the data and communication with the SCADA computer.

The attached Table 1, Itemized Budget, provides a list of the equipment that was installed and the budget estimate for the capital costs. Task 2 is specific to the telemetry costs, which include telemetry equipment such as modems, radios, data loggers, antennas, controllers, and cables; automated gates; and measuring device equipment, materials and labor. The total estimated capital costs for these improvements was $90,808.

PHOTO LOG

On May 5, 2011, Emily Becker with WWE and Charlie McCoy with Florida Mesa Canal Companies compiled the attached photo log to document installation of these telemetry improvements. At the time of the photo log preparation, the ditch was not running as it was prior to seasonal ditch operations.

Table 1 - 28 June 2011
Florida Mesa Canal Companies Water Loss Reduction Project
Itemized Budget

			Cost per Unit	Unit	Quanitity	Cost	WSRA
Task 1	**Ditch Loss Study**						
		Labor				$41,490	$41,188
		Equipment & Direct Costs				$4,992	$4,992
		In-Kind	25		140	$3,500	
	Total Ditch Loss Study					**$49,982**	**$46,180**
Task 2	**Telemetry**						
		VHF Radio Modem - RF500M-ST-SW-PB-MJ	$355		4	$1,420	$1,420
		FFRF401 - 900MHz Spectrum Radio	$465		1	$465	$465
		Measuement & Control Datalogger CR800-ST-SW-NC	$1,040		4	$4,160	$4,160
		SD-225 Midland Data Radio	$275		4	$1,100	$1,100
		CR206 Datalogger w/900MHz Spectrum Radio	$670		3	$2,010	$2,010
		900 MHz 9 dBi nYagi Antenna	$45		3	$135	$135
		Omnidirectional antrnna & misc. parts	$364		1	$364	$364
		Rainbow Cables	$35		4	$140	$140
		Sunsaver SS-6L-12V-Solar Charge Controller	$62		4	$248	$248
		POLIS-B50LN-CO-PolyPhaser Lightning Arrester	$77		7	$541	$541
		RP-SMA Plug to Male, Pigtail 195-Series	$21		4	$84	$84
		Subtotal Telemetry Equipment				**$10,667**	**$10,455**
		Telemetry Labor including Travel	$56		179	$10,024	
		Telemetry-Cleaning out existing wet wells	$100		4	$400	
		Subtotal Telemetry Labor				$10,424	
	Telemetry Labor and Equipment					**$21,091**	**$10,455**
	Automated Gates						
		Automated Gates Actuators & parts	$1,840		3	$5,520	
		Radial Gate Actuator	$4,632		1	$4,632	
		Subtotal Automated Gates Equipment				**$10,152**	
		Automated Gates Labor	$3,836		4	$15,344	
		Labor Trenching	$1,000		1	$1,000	
		Subtotal Automated Gates Labor				**$16,344**	
	Automated Gates Labor and Equipment					**$26,496**	
	Measuring Devices						
		Excavation	$86	$/hr.	27.5	$2,355	$2,355
		Labor	$35	$/hr.	328	$11,480	$6,253
		Well houses	$2,322	$/hse	3	$6,695	$6,695
		Drawings/Design	$55	$/hr.	32	$1,760	$1,760
		Travel per Diem	$150	$/day	23	$3,410	$2,400
		Concrete	$118	$/yd	34.5	$4,052	$4,052
		Culverts	$36	$/ft.	27	$966	$966
		Piping	$12	$/ft.	92	$1,105	$1,105
		Rebar	$15	$/ft.	197	$2,951	$2,951
		Valves and Fittings				$317	$317
	Measuring Devices Total Labor and Equipment					**$35,091**	**$28,854**
		Subtotal Total Water Activity Task 2				$82,678	$39,309
		Contingency 3%				$0	
		In-Kind	25	$/hr	100	$2,500	
	Total Water Activity Task 2					**$85,178**	**$39,309**
Task 3	**Hydropower**						
		Labor				$13,753	$13,752
		Direct Costs				$759	$759
		Inkind	25	$/hr	21	$525	
	Total Total Water Activity Task 3					**$15,037**	**$14,511**
Total Project						**$150,197**	**$100,000**

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Telemetry and Additional Water Measurement Devices and Automated Gates

Photo 1: Florida Farmers Ditch West turnout – actuated slide gates.

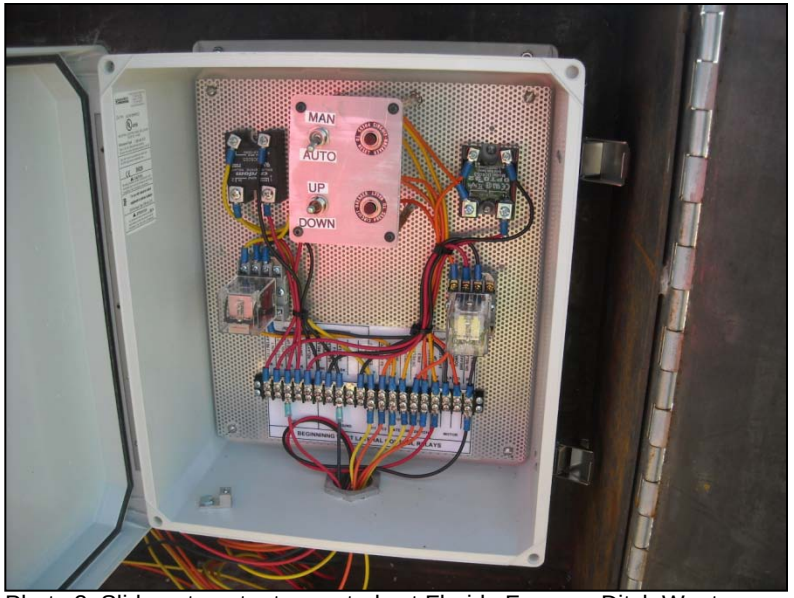

Photo 2: Slide gate actuator controls at Florida Farmers Ditch West.

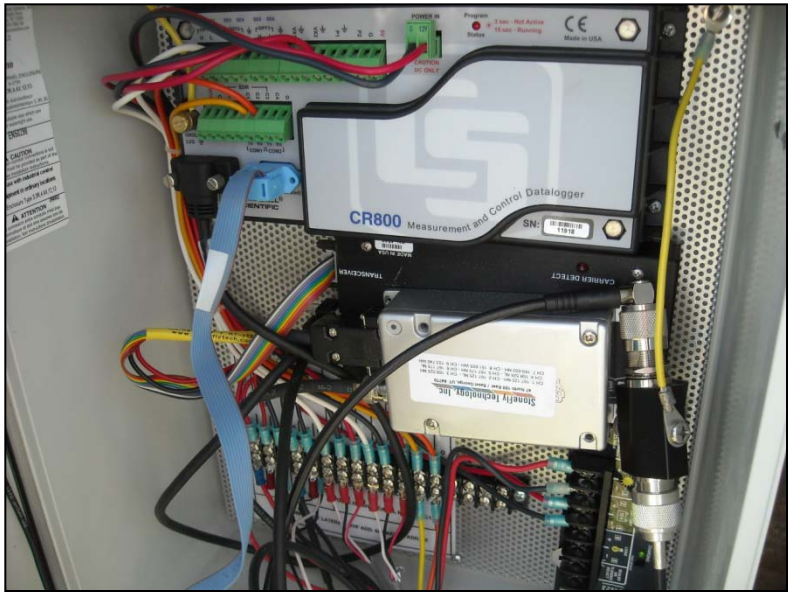

Photo 3: Florida Farmers Ditch West – Modern (by Campbell Enterprises) and Radio (by Stonefly Technology, Inc). This arrangement is typical of all three automated gate sites for ease of operation.

Photo 4: Florida Farmers Ditch West – Slide gate actuator.

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Photo 5: Florida Farmers Ditch West–slide gate.

Photo 6: Florida Farmers Ditch West – panel, actuator, solar panel and antenna.

Photo 7: Florida Farmers Ditch West – level sensor housed in stilling well covered by utility box, including solar panel and antenna. Staff gauge also shown. Arrangement is typical of level sensor used along Florida Mesa canals.

Photo 8: Pine lateral – measuring device – float level sensor.

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Photo 9: Pine lateral – Stilling well with staff gauge.

Photo 10: Pine lateral – stilling well house.

Photo 11: Pine Ditch turnout – actuated gates with control panel.

Photo 12: Pine Ditch turnout.

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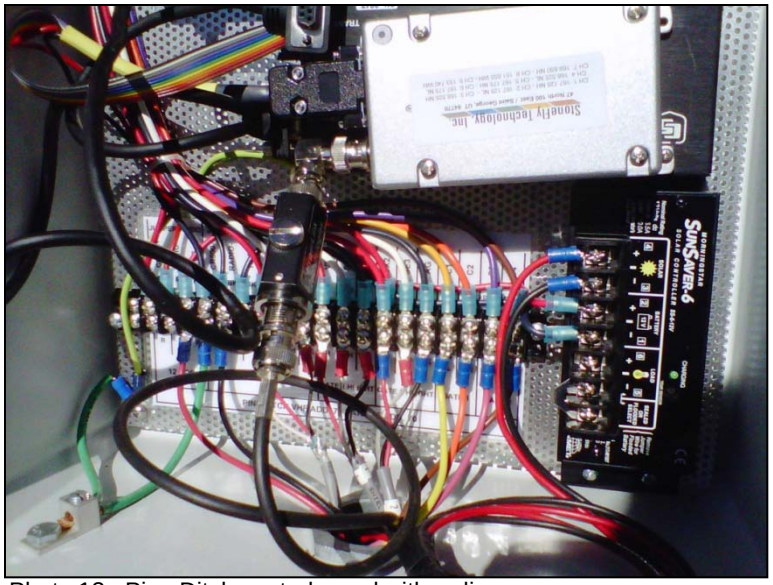

Photo 13: Pine Ditch control panel with radio.


Photo 14: Pastorius Reservoir outlet with staff gauge.


Photo 15: Pastorius Reservoir – looking upstream from outlet.


Photo 16: Pastorius Reservoir – gate actuator (by Rotork).

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Photo 17: Pastorius Reservoir – panel housing radio and modem.


Photo 18: Inside control house at Pastorius Reservoir.


Photo 19: Gate and control house at Pastorius Reservoir outlet.


Photo 20: Influent to Pastorius Reservoir - stilling well house with level measurement.