Annual Progress Report

For the

Texas Water Development Board - Agricultural Water Conservation Demonstration Initiative Grant

Maximization of On-Farm Surface Water Use Efficiency by Integration of On-Farm Application and District Delivery Systems

On-Farm Flow Measurement Data Collection

Delta Lake Irrigation District

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Appendix "A"

Executive Summary

The Delta Lake Irrigation District (DLID) has been contracted to collect manual on-farm metering information to be used for comparison with the automated metering system being installed in the Harlingen Irrigation District. The manual collection of data is in the third year of a three year process. Upon competition of the three year period DLID will have collected data to help determine the cost and effectiveness of manual meter reading as compared to the automated system used in Harlingen.

Scope of Work

The Delta Lake Irrigation District (DLID) has been monitoring on farm irrigation sites via manual meter readings for the past seven years. These sites encompass a variety of crops including, but not limited to carrots, onions, watermelons, cabbage, sugar cane, cotton, grain, citrus, and pastures. Data collected consists of Field ID, Grower Name, Start and Ending Times, Dates, and Meter Readings, Hours of Irrigation, Gallons per Minute, and Total Acre-Feet.

After collection and tabulation of the data, the numbers can be used to calculate information vital to the efficiency and well being of the water district.

There are a variety of meters that the field technician must become accustomed to reading. Some meters use acre-feet, and some use gallons as their unit of measure. Another challenge faced by the meter reader is to locate the meter, which can vary from field to field. For example, Pictures 1 and 2 For example, Pictures 1 and 2 show a meter that is affixed in the most common location, near the valve. Pictures 3, and 4 however illustrate a meter that has been affixed to the top of a drip pump filtration system, on which the meter reader must climb on top of to get the daily readings.

Picture 1

Picture 2

Picture 3

Picture 4

Picture 5

Picture 6

Pictures 5 shows the meter installed on a permanent drip pump site. Picture 6 is a meter installed on to of a pipeline incased in a concrete pipe for protection. An example of a meter that measures in acre-feet can be seen in picture 7

Picture 7

Pictures 8 and 9 demonstrate the progression of the watering process in a cabbage field. Picture 8 is in the early morning when the farmer began watering and picture 9 is in the afternoon approximately 6 hours after the water was started. Pictures 1 and 2 show the meter setup used for flood irrigation in this cabbage field.

Picture 8

Picture 9

A major step in the evaluation of manual meter readings vs. automated systems is the budget. Without this, it would be impossible to compare and contrast the validity of the opposing methods.

One field technician can efficiently read 5 to 7 meters per hour with an average of 5 to 8 miles per meter. Once a week the technician will input the data collected from the daily readings… this will generally take 1 to 3 hours depending on the

number of sites that are in operation.

The District will generally have 40 to 80 meters running under normal irrigation, which can be handled by the technician and canal riders for backup if needed. When heavy irrigation starts we have to add technicians to read the additional meters, which in the past has been as many as 230 meter running at one time, this usually last for a few weeks at a time, two to three times a year. We have estimated a cost of $6.50 to $8.00 per meter to read the meter and input the data in to the system.

Below is an example of the data collected during irrigation. These tables represent the data collected on each metering site as well as an example of miles traveled and hours required to read meter.

9and10Blk3
Meter # 99-7915-5
Ticket#61200158
72Acres 60% of field watered = 43 Acres
Cantaloupe

DATE	*Start Time*	*Start Reading*	*End Time*	*End Reading*	GPM	*Ac/Ft*	*Gallons*	*Inches*	*Info*
1/19/2007	10:30A.M.	148.141			300				
1/20/2007	9:54A.M	151.631			300				
1/21/2007	8:38A.M.	153.183			300				
1/22/2007	2:55P.M.	155.926			300				
1/23/2007			3:00P.M.	157.186	300	9.045	2947322	2.52	

Date	Start Mileage		End Mileage		ADI Miles		DLID Miles		Hours
1/19/2007	5536		5653		46		71		1Hour30Min
1/20/2007	5650		5704		41		10		1Hour30Min
1/21/2007	5704		5745		21		20		30Min
1/22/2007	5745		5850		28		77		30Min
1/23/2007	5850		5945		18		77		30Min

Another part of our project was for the District to set up a Variable Speed Pump Site. The District has installed the pumps and motors for Re-lift Station No. 45 (the Variable Speed Pump Site), as well as the security fencing and trash rake. This site will ultimate be equipped with automatic start, shutdown, remote throttle control and any other hardware necessary to provide remote control of these pumps. The components for total automation will be ordered within the upcoming months. The District's expense to-date for the Variable Speed Pump System is $131,102.26. This expense is for the Pumps, Motors, security fence and trash rake.

The District is in the process of ordering all the components to complete the Variable Speed Pump project. The pumps are installed and currently in service. We hope to get the automated system online within the next few months. Below are pictures of the Pumps and Motors.

The above pictures were taken shortly after installation; we have since finished the catwalk and painting.