**Introduction**

The Rio Grande region is one of the fastest growing regions in Texas, and the water demand of municipalities and industries is also rapidly increasing. Recent droughts have alerted local and state officials about the viability of the limited water supply of the Rio Grande River. Water is the most precious resource on earth. Irrigation is the most efficient way of utilizing water to meet the increasing demand. A water management strategy must be implemented to fulfill the increasing demand. A computerized irrigation management system would fulfill the increasing water demand which is a part of the overall water management strategy of the state of Texas. Delta Lake Irrigation District was established on June 22, 1914 as a political subdivision of the State of Texas. The District provides irrigation, drainage and flood control services to 10,960 acres of land located in Hidalgo and Willacy Counties. The design goal of the project is to demonstrate SCADA system by equipping the sites with automatic control and telemetry systems. The project is expected to improve resource management strategies, increase water use efficiency, and improve water management strategies.

**Delta Lake Irrigation District**

Delta Lake Irrigation District was established on June 22, 1914 as a political subdivision of the State of Texas. The District provides irrigation, drainage and flood control services to 10,960 acres of land located in Hidalgo and Willacy Counties. The District’s A System Canal was selected to conduct the Project (Figure 5) This canal is fed from West Reservoir by Main Relift Pump Station. This very old north gate structure will be equipped with SCADA equipment and will be controlled from District Office.

**Project Plan**

The main goal of the project is to demonstrate SCADA system by equipping the sites with automatic control and telemetry systems through the following:

- Implementation of automatic and remote control of the north gate. Since, the gate structure is very old, it must be replaced. Solar panel system will provide electric power. In addition, remote monitoring of the north gate will be monitored remotely.
- Implementation of automatic and remote control of each radial gate. The radial gate will be installed. Solar panel system will provide electric power. In addition, remote monitoring of the radial gate will be monitored remotely.
- Implementation of telemetry system to spread spectrum radio from all these locations.
- Evaluating existing Human Machine Interface (HMI) software and make modifications as needed in order to collect data from remote sensors and display this data in graphics, tables, trends, and reports that system users and operators can easily understand.

**Regional Water Planning Groups**

The Rio Grande region faces significant water needs over the next 50 years. Population growth and an aging irrigation infrastructure will continue to push the demand of water supply. In year 2060, the state’s water supply and management strategies are implemented. Local-level water supply and management strategies are critical to implement because of the water demand of the region. The Rio Grande region is one of the main sources of water for the region. The Rio Grande region is one of the main sources of water for the region. The Rio Grande region is one of the main sources of water for the region. The Rio Grande region is one of the main sources of water for the region.

**Regional Water Demand**

<table>
<thead>
<tr>
<th>Year 2000 Water Demand</th>
<th>Year 2060 Water Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation</td>
<td>Municipal</td>
</tr>
<tr>
<td>59.1%</td>
<td>37.7%</td>
</tr>
<tr>
<td>New Radial Gate</td>
<td>All Other</td>
</tr>
<tr>
<td>3.2%</td>
<td>15.5%</td>
</tr>
<tr>
<td>North Gate</td>
<td>Regional Water Demand</td>
</tr>
<tr>
<td>1.6%</td>
<td>50%</td>
</tr>
</tbody>
</table>

**Expected Results**

Engineers at Texas Cooperative Extension expect that implementation of SCADA system at Delta Lake Irrigation District will have the following results:

- An improvement in water use efficiency, allowing increasing water conservation and agricultural production in irrigated areas and/or a reduction in pumping costs.
- Improvements in water supply and distribution control will result in increasing demand in the river sectors.
- Implementation of telemetry management and record keeping (such as computerized flow calculations and computer databases) will facilitate efficient scheduling, as well as planning for existing maintenance and future rehabilitation programs.
- Finally, Delta Lake Irrigation District canal automation project will serve as a model for replication of similar projects around the Lower Rio Grande Valley.