

**Border Environment Cooperation Commission
Hidalgo County Irrigation District No. 6 (Mission, Texas)
Water Conservation Improvement Project**

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General Criteria

1. Project Type

The proposed project falls under the Border Environment Cooperation Commission (BECC) priority area of water conservation. The project consists of 3 components: 1) renovating the existing lining of approximately 9.3 miles of the District's main canal, 2) replacement of existing slide-gate structures on the main canal, and 3) expansion of the existing reservoir storage system and installation of a telemetry system to improve regulation of water supply in the District and reduce losses from spills from the canals.

The purpose of this project is to conserve water by eliminating seepage and increasing the efficiency of the irrigation distribution network. These improvements will result in an increase of water delivered to individual fields and/or will allow a greater number of fields to be simultaneously irrigated. The proposed activities will improve management and conservation of water, reduce evaporation, seepage losses and operation and maintenance costs, and will conserve energy.

2. Project Location

Hidalgo County Irrigation District No. 6 (HCID#6) was created in February 1927, and its infrastructure and service area are located adjacent to the US-Mexico Border along the western part of Hidalgo County. The District boundaries extend west of the City of Mission, Texas and northward about 12.5 miles from U.S. Highway 281. HCID#6 serves an area covering approximately 18,900 acres. The Rio Grande River is the only source of water for the District, providing irrigation and water supply functions to 35.8 square miles of Hidalgo County. A general location map of the District is shown below.



3. Project Description and Work Tasks

The District serves about 2,219 irrigation accounts with a reported 75% conveyance efficiency. The District's conveyance system also provides raw water to the La Joya Water Supply Corporation, the La Frontera Power Generation Plant, Bates Electric Power Generation Plant and the U.S. Department of Agriculture at Moore Field. The District holds a State of Texas Certificate of Adjudication (No. 23-828), which authorizes the diversion of 5,816 acre-feet of Rio Grande water per annum for multi-use and 34,913 acre-feet of Rio Grande water for Class "A" irrigation. Between the years 1986 and 1998, the average amount of water diverted by the District for irrigation was 18,575 acre-feet; the lowest annual diversion being 10,133 acre-feet and the highest annual diversion being 30,599 acre-feet during that timeframe.

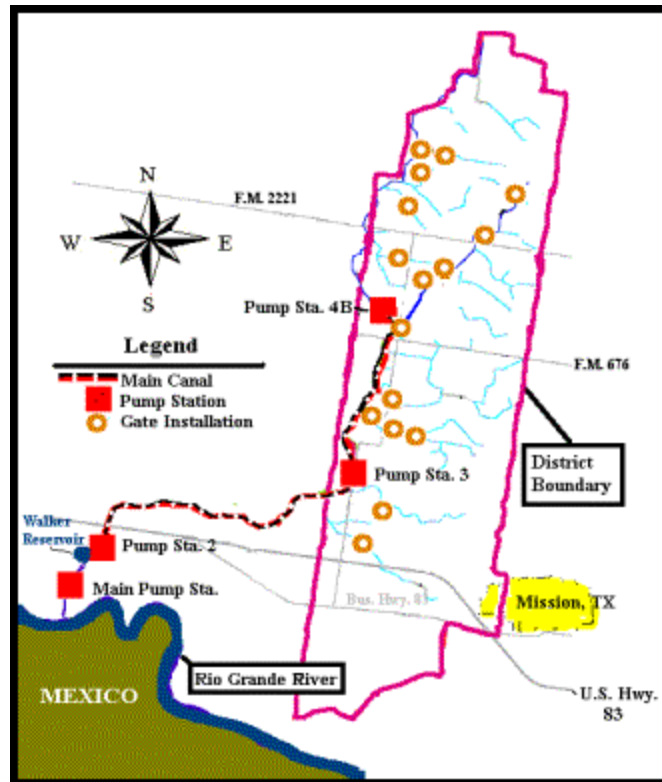
The District pumps water northward from its main pump station (Pump Station 1), located 3,200 feet north of the Rio Grande on an artificial inlet of the river. The District also maintains three re-lift stations on its main canals: Pump Stations 2, 3 and 4B. A 60-acre regulating reservoir functions off line between Pump Stations 1 and 2 to the east of the main canal. The reservoir is used as a buffer to absorb changes in daily user consumption. Water flow into and out of the regulating reservoir is controlled by means of a radial gate located at the southwest corner of the reservoir. Walker Lake is a 116-acre area west of the main canal facing the current regulating reservoir. The area was formerly used as a regulating reservoir, but was decommissioned in 2001 due to its large surface area relative to its storage capacity, which resulted in excessive evaporation losses. At present the area is dry. The District water supply system consists of approximately 45 miles of lined canals, 72 miles of pipelines and 0.5 miles of unlined canal. The lined canals are decades old and are quite deteriorated in some reaches.

The proposed project consists of four components; canal lining replacement, slide-gate replacement, expansion of the District's regulating reservoir and installation of a telemetry system. The estimated construction completion period is projected to be 2

years from approval of funding. The total estimated water savings from the three components is 3,130 acre-feet.

- 1) Canal Lining Renovation: This component includes the renovation of the existing lining of approximately 9 miles of the District's main canal between Re-lift Pump Station No. 2 and Re-lift Pump Station No. 4B. The canal consists of approximately 30,500 feet of canal (5.8 miles) with a top width of 24 feet, and 17,100 feet of canal (3.2 miles) with a top width of 15 feet. The current concrete lining was installed in 1930 and is significantly deteriorated in some segments. The canal is proposed to be re-lined with a rubber liner to save water by eliminating seepage and their associated pumping requirements and costs. The water savings will permit the flow rate of water delivered to individuals to be increased or allow for a greater number of fields to be simultaneously irrigated. The estimated annual savings of water for this project component is 1,732 acre-feet, with an estimated construction cost of \$1,327,260.*
- 2) Radial Gate Bay Installation: This component includes replacement of 17 existing deteriorated slide-gate structures on the northern section of the main canal and major laterals with radial gate bays. Water savings will be obtained from the improved ability to avoid spills that result from inadvertently over-charging the canal system, as well as from preventing leaks from gate structures. The estimated annual savings from the replacement of the slide-gates structures is 491 acre-feet, with an estimated construction cost of \$252,150.*
- 3) Canal Regulation: This component includes expansion of the storage reservoir south of Re-lift Pump Station No. 2 and installation of instrumentation for remote reporting of water surface levels in storage reservoirs and adjacent to the three re-lift pump stations. The District has not used Walker reservoir for some years due to its existing large surface area relative to its storage capacity, so the plan is to re-establish Walker Reservoir as a component of the District's water management system. The capacity of the reservoir is proposed to be increased by 200 acre-feet. The increased storage capacity will provide a means for storing excess water when available and utilizing the stored water when needed. The reservoir, along with the three re-lift pump stations, will be provided with telemetry instrumentation to control and report water levels upstream and downstream of the pumps. The real-time data from the sensors will significantly improve the District management's ability to detect and prevent water over-charging of the canal the system, thereby reducing the incidence of spills. the annual estimated savings of water from this component is 907 acre-feet, with an estimated construction cost of \$876,000.*

A District layout, shown below, identifies the location of the project components.



4. Conformance with International Treaties and Agreements

The International Boundary and Water Commission (IBWC) is an independent binational public organization that ensures implementation of the 1944 Water Treaty between the United States and Mexico related to water and boundary issues. The HCID#6 project does not violate the allocation of water rights. The District will continue to meet all state surface water diversions from the Rio Grande in accordance with the agreements in place and the restrictions of the Treaty.

The Texas Commission of Environmental Quality (TCEQ) and the International Boundary and Water Commission (IBWC) are the authorities for allocation of water to the District. The 1944 Water Treaty between the United States and Mexico applies. The District is organized under Article XVI, Section 59 of the Texas Constitution and operates under the provisions of Chapters 49 and 58 of the Texas Water Code. HCID#6 diverts water from the Rio Grande River in accordance with a Permit issued by TCEQ. TCEQ's Rio Grande Watermaster Office in Harlingen is responsible for allocating, monitoring, and controlling the use of surface water by the District in coordination with IBWC. The State Watermaster also cooperates with IBWC and its Mexican counterpart to monitor U.S. and Mexican compliance with the U.S.-Mexico Treaty of 1944. There is no reported non-compliance by HCID#6 under the TCEQ permit.

Human Health and Environmental

1. Human Health and Environmental Need

The proposed project activities address one of the most pressing problems facing the Lower Rio Grande Valley of Texas, i.e., water shortages due to drought over the last seven years and an increasing demand due to population growth. Water conservation reduces the impact of drought conditions and makes available additional water resources that would otherwise be lost to meet both domestic and agriculture demands. The future health, social and economic well being of the population in the Rio Grande Valley will be dependent on conservation and maximizing beneficial use of available water to meet domestic and agricultural needs. The project addresses the critical water shortages by reducing water losses and providing for more efficient delivery of water, thus enhancing availability of water both domestic and agriculture use.

2. Environmental Assessment

Axiom-Blair Engineering completed an Environmental Summary (ES) for the project. Preparation of the ES information from a wide variety of sources including the TCEQ, the U.S. Census Bureau, the U.S. Fish and Wildlife Service, the National Park Service, the Texas Historical Commission, the National Weather Service, the U.S. Soil Conservation Service, the U.S. Department of the Interior, the Texas Department of Transportation and others. Additional information was collected through visual field reconnaissance and interviews of locally knowledgeable individuals. The information collected is sufficient to support the following conclusions:

- The proposed project is necessary and will help meet the need for water and energy conservation in the Lower Rio Grande Valley.*
- No short or long-term detrimental socioeconomic effects are expected as a result of the project. Socioeconomic impacts are expected to be wholly positive.*
- No short or long-term wildlife habitat disturbances are anticipated.*
- No significant, long-term air, water or vegetative impacts are anticipated.*
- No cultural resources will be impacted as a result of the proposed project.*
- From a regional perspective, this Water Conservation Improvement Project is expected to have a positive impact from environmental and socio-economic perspectives, and no impact on cultural-historical resources.*

Preparation of ES utilized information for a wide variety of sources including the TCEQ, the U.S. Census Bureau, the U.S. Fish and Wildlife Service, the Texas Parks and Wildlife Department, the Texas Historical Commission, the National Weather Service, the U.S. Soil Conservation Service, the Texas Department of Transportation and on-site field reconnaissance.

The ES was submitted to the Texas Parks and Wildlife Department, Texas Historical Commission, U.S. Army Corps of Engineers and the US Fish & Wildlife Agency for review. The U.S. Army Corps of Engineers has determined that since the project sites do not contain any areas subject to Section 10 of the Rivers and Harbors Act or Section 404 of the Clean Water Act, a Department of the Army permit is not required. The Texas Historical Commission reviewed the project under Section 106 of the National Historic Preservation Act of 1966 and the Antiquities Code of Texas and determined that “the project should have no effect on historic properties”. No further review is necessary from the Texas Historical Commission. A written response is

pending from the U.S. Fish and Wildlife Service and the Texas Parks and Wildlife Department but no objections or issues are expected.

Regardless of these jurisdictional determinations, it is the District's goal to protect the environment and its inhabitants. The construction drawings include specifications requiring the contractor to protect existing waterways, vegetation and wildlife from unnecessary disruptions during construction. In addition, the District will file the required Notice of Intent with the Texas Commission on Environmental Quality (TCEQ) and prepare a Storm Water Pollution Prevention Plan before construction.

The construction of the proposed water conservation measures will have an overall sustained positive environmental impact, enhancing the prospects for continued economic growth of the region, as well as the improved health and social well being of the region's growing population.

3. Compliance with Environmental and Cultural Resource Laws and Regulations

The environmental review of the project and the proposed mitigation measures comply with all environmental and cultural resource laws and regulations. All required permit conditions necessary for the construction or operation of the proposed project will be acquired and complied with. The District has the required water rights and is fully compliant with the terms of its water use permit.

Technical Feasibility

1) Appropriate Technology

The project plans were prepared and completed by Axiom-Blair Engineering with State Energy Conservation Funds (SECO) provided to the District by the Texas Water Development Board (TWDB). The activities are designed to address the 2001 Adopted Region M Water Plan which calls for conservation measures to offset the deficits, and in response to the enduring drought that has affected the lower Rio Grande Valley over the past several years. The drought and the projected decrease in irrigation water supply has required the District to place a greater emphasis on water conservation to ensure the delivery of water to the customers they serve.

The analyses for the design of the three project components are described below.

1) Canal lining renovation: Four potential project alternatives were considered for the repair of the deteriorating concrete lined canal segments. Alternatives include the following:

- Replace the existing canal with concrete.*
- Line the existing canal with a polyurethane liner.*
- Line the existing canal with EPDM (ethylene propylene diene terpolymer) rubber liner.*
- No-build alternative*

Preliminary cost estimates indicated that replacing the existing concrete was 100 to 200 percent more expensive than lining the canal with a polyurethane liner or EPDM rubber. Concrete lining is susceptible to cracking and separating caused by expansion and contraction of the soil as well as heat expansion of the concrete itself, resulting in the problems the District is currently experiencing. No benefits were found to justify the additional cost and future problems of replacing the existing concrete lining. Replacing the existing canal with concrete was therefore eliminated as a viable alternative.

Both lining the canal with a polyurethane liner and EPDM rubber liner have the positive benefit of virtually eliminating seepage and low maintenance costs. The polyurethane liner has certain advantages, such as the ability to bond to the concrete and mold itself to irregular and vertical channel sections. The liner has a self-adhesive property that eliminates the need for patching the seams. But typical installation costs are \$1.43 per square foot. Also, polyurethane liners are a relatively new technology, and while tests in the Lower Rio Grande region have shown promise, certain problems remain to be resolved, as described by the Bureau of Reclamation in their November, 2002 report R-02-03: It is difficult to maintain quality control, particularly in the presence of water, the heavy lining machine requires a large access area, and seams are weak.

EPDM rubber liners have been in use for more than 40 years and represent a proven alternative, having demonstrated long-term durability, puncture resistance, flexibility and ease of installation. The unit installation cost for EPDM rubber liner is about \$0.40 per square foot, making it the preferred alternative for this application. This alternative to fully relining the canal with EPDM rubber will be selected for sections where the lining is rated very good to excellent (according to the rating system used in the December, 2000 study by Texas A&M University entitled Potential Water Savings in Irrigated Agriculture for the Rio Grande Planning Region (Region M).

Taking into consideration the ongoing drought and the District's commitment to water and energy savings, the no-build alternative was eliminated from consideration. However, in certain sections of the Main Canal between Re-lift Pump Station No. 3 and Re-lift Pump Station No. 4B, the existing concrete canal is in quite good condition and may only require spot repairs using fiberglass-reinforced shotcrete. This alternative will be selected for sections where the lining is rated very good to excellent ((according to the rating system used in the Texas A&M study cited above).

- 2) *Slide-gate replacement: This component involves the replacement of seventeen existing slide-gate structures on the main canal and major laterals with radial gate bays. Radial gate check structures have the advantage of being more responsive and reliable and less prone to leaks than slide gate structures. A radial gate consists of a curved gate leaf, rubber seals, support arms, seal rubbing embedments and embedded pivot points. The gate leaf is of a welded construction varying in width and height as required by the size of the opening. Embedded rubbing seats are mounted flush with the wall to provide a smooth flat surface for*

the seals to slide on as the gate opens and closes. Water pressure applied against the curved gate leaf is transmitted through the support arms into the pivot points that are embedded in the concrete wall. Since the gate leaf is curved, the water also applies a pressure upward, thereby lowering the lifting force required. A smaller hoist is therefore necessary as compared to other types of gates.

The replacement of leaky gates will allow the District Manager to control the status of water storage in the main canal and reliably make adjustments as required. Water savings will be obtained from the improved ability to avoid spills that result from inadvertently overcharging the canal system, as well as from the prevention of leaks from deteriorated slide-gate check structures.

- 3) *Canal regulation: The main component of the regulation project is the reestablishment of the Walker Reservoir area as a component of the District's water management system. Due to its large surface area relative to its storage capacity, the District has not utilized the Walker Reservoir for some years. Material will be excavated from the former wetted area and placed in levees on site. Two radial gates will be constructed adjacent to the Main Canal west of the existing reservoir to control water intake and outlet from the Walker Reservoir. An additional component of the regulation project is the installation of a telemetry system to report water levels at both reservoir locations to a central control system to be located in the District office. The three re-lift pump stations will also be provided with telemetry systems to report water levels upstream and downstream of the pumps. The real-time data from the sensors will significantly improve management of the system.*

Each of the measurement devices on the individual sites will be connected to a single telemetry system to allow the District to periodically, and on demand, poll for data from the field devices (remote telemetry unit (RTU)), and process the data into a central database (base computer). A base system will be located at the District Headquarters and will consist of a base computer, which will hold the central database to store and convert all of the data from the RTUs, and an antenna to receive from the remote telemetry information. The base computer will be equipped with software that will display current, last 24 hours and monthly water and flow level data of any or all of the RTUs. A remote telemetry system will be installed at each of the flow measurement sites. Each system will consist of the following:

- a) Remote Telemetry Unit (RTU)*
- b) 2. Radio and RF Modem*
- c) AC/DC Linear Power Supply*

These items will be mounted inside a steel NEMA 12 enclosure on a panel with room for a storage battery to be placed on the bottom of the enclosure. A radio antenna will be mounted on a 20-foot antenna mast for transmitting and receiving data from the Base System. The telemetry system enclosure will be installed in a steel vandal box and wired to the existing power source. Once the telemetry system enclosures are mounted, the RTU will be wired to the metering devices and antenna.

2. Operation and Maintenance Plan

The operation and maintenance requirements for the improvements to the facilities are basically the same as already performed on the existing pipelines and canals of the system. The existing staff is considered sufficiently capable and experienced to undertake required maintenance of the new pipeline and canal. Equipment suppliers will be required to provide training on the operation and maintenance of equipment, including provision of O&M manuals.

3. Compliance with Applicable Design Standards and Regulations

The design and construction requirements will adhere to USBOR requirements under the "Guidelines for Preparing and Reviewing Proposals for Water Conservation and Improvement Projects under Public Law 106-576." USBOR design standards and criteria were applied and USBOR quality control procedures will be applied during construction.

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Financial Feasibility and Project Management

1. Financial Feasibility

Axiom-Blair Engineering prepared an analysis of project and the District's financial condition to provide matching funds for proposed funding structure of the project and the operation and maintenance of the system. The estimated project costs based on the design information are as follows:

PROJECT COSTS

ITEM	FUNDING SOURCE	TOTAL
<i>Planning</i>	<i>HCID#6 & SECO</i>	<i>\$70,060</i>
<i>Design/Construction Contracting</i>	<i>HCID#6 & SECO</i>	<i>\$255,000</i>
<i>Construction Administration</i>	<i>HCID#6</i>	<i>\$219,530</i>
<i>Construction Cost</i>	<i>HCID#6 & NADB</i>	<i><u>\$2,455,410</u></i>
TOTALS		\$3,000,000

Cost in U.S. Dollars. August 2003

The funding sources for the project are summarized in the table below. Based on the WCIF Guidelines, the WCIF grant may support 50% of the project costs up to, or a maximum of, \$4,000,000. The funding sources for the projects are as follows:

FINANCIAL STRUCTURE FOR THE PROJECT

Source	Type	Amount USD	% Project Cost
<i>NADB</i>	<i>WCIF-Grant</i>	<i>\$1,500,000</i>	<i>50%</i>
<i>State of Texas</i>	<i>SECO Grant</i>	<i>\$153,060</i>	<i>5%</i>

<i>HCID#6</i>	<i>Cash & In-Kind</i>	<i>\$1,346,940</i>	<i>45%</i>
TOTAL		\$3,000,000	100%

2. Rate Model

The table below summarizes the existing fee and assessment structure.

Existing Assessment Fee Structure	
Fees	Per Acre
<i>Annual O&M Tax</i>	<i>\$19.00</i>
<i>Water Assessment (per acre irrigated)</i>	<i>\$26.00</i>

In addition to the above, the District earns significant income from water allocation sales; revenues earned from the lease of water rights. The proposed projects and funding source structures do not require an adjustment to the current Fee and Assessment Structure implemented by the District.

3. Project Management

The project will be managed and implemented by HCID#6 over a two-year construction period (2004-2005), with contracted engineering services for the necessary technical and management support for project administration. The telemetry system is expected to be contracted, and the rest of the work is expected to be undertaken by District crews with District equipment (force-account work). The District has managed construction activities of similar magnitude. The District owns numerous pieces of heavy construction equipment such as track excavators, backhoes, boom trucks, concrete pumps, and dump trucks and has a long track record of constructing irrigation water conveyance systems. The District can operate in a self-sufficient manner, supporting itself through user fees, but is expected to apply for future potential USBOR grant resources for the project. The existing organizational structure which has been provided is considered sufficient and the project will not require additional District staffing, except for additional labor only for the proposed force-account construction.

Community Participation

1. Comprehensive Public Participation Plan

The Public Participation Plan submitted by HCID#6 and the Project Steering Committee was approved on April 30, 2003.

2. Steering Committee

The Steering Committee was composed of Thomas Thompson, President, Board of Directors, HCID#6; Norberto Salinas, Mayor, City of Mission; Joe Guerra, Manager,

AEP Bates Power Plant; and Cornelio Morales, Manager, HDIC#6. As a result of the effectiveness of this steering committee, the water conservation efforts proposed though these projects was well received by the water users in the District.

3. Local Organizations

Presentations were made by Cornelio Morales, District General Manager, to USDA-Moore Air Field, La Joya Real Estate, La Joya Water Supply and Frontera Power Plant. Joe Guerra made a presentation to American Electric Power Plant and Norberto Salinas provided information to the city of Mission. Letters of support have been provided by USDA-Moore Air Field, La Joya Real Estate, La Joya Water Supply Corporation and American Electric Power.

4. Public Information

Project Information such as the Project Proposal, Step I Application and draft Project Strategic Plan were available for review at the HCID#6 office. A fact sheet was developed and distributed to District water users and was made available at public meetings. Fact sheets were also available for walk-in customers at the HCID#6 office and were posted in local businesses. Notices of public meetings were published in the McAllen Monitor.

5. Public Meetings

Three public meetings were held in 2003. The first meeting took place on June 2, the second meeting took place on June 3 and the third meeting took place on August 21, 2003. Surveys collected at the end of each meeting indicated that the information received regarding the project was understood and there was no documented opposition to the project.

Sustainable Development

1. Definition and Principles

Sustainable Development Criteria is defined as conservation oriented social and economic protection and sustainable use of resources, while addressing both current and future needs, and present and future impacts of human actions. This definition is based on the Rio de Janeiro Declaration on Environment and Development, which states that development should meet the needs of the present without compromising the ability of future generations to meet their needs.

All of the proposed project components will comply with the definitions and principals of Sustainable Development in that they positively impact the area and sustainable life of the area's residents through the conservation of water. Water conservation is critical to quality and life and economic growth in the Rio Grande Valley. The Canal Rehabilitation, Radial Gate Bay Installation, and the Canal Regulation projects will help to reduce the seepage of valuable water. In addition to water savings, the District will experience energy savings through a more efficient delivery system.

2. Institutional and Human Capacity Building

The Rio Grande Regional Water Plan, in support for the implementation of agricultural water conservation strategies, includes the following actions for reduction of irrigation shortages:

- Expanded technical assistance should be available from local, state and federal sources to assist irrigation Districts with more detailed systematic evaluations of District facilities and management policies to identify cost effective water efficiency improvements.*
- The State of Texas and the federal government should assist with the financing of irrigation water improvements through the provision of low interest loans and grants.*

Accordingly, due to the limited financial capacity of irrigation Districts, the State of Texas through the State Energy Conservation Office (SECO) and the Texas Water Development Board (TWDB) provided financial assistance to the District for the preparation of the project plan and the necessary documentation required to meet the federally appropriated funds.

The project plans for the proposed projects were completed under the Lower Rio Grande Valley Water Resources Conservation and Improvement Act of 2000 (Act), Public Law 106-576. The Act also provides limited funding availability for engineering work, infrastructure construction and improvements. An amendment to the Act (H.R. 2990/S.1577) authorized funds provided by the for conservation projects, including the Canal Rehabilitation, Radial Gate Bay Installation, and the Canal Regulation projects.

The project plans for the four projects were prepared in accordance with the Guidelines for Preparing and Reviewing Proposals for Water Conservation and Improvement Projects, associated with the Act. Public Law 106-576. The project plan was prepared in partial fulfillment of between the TWDB and HCID#6.

The District entered into a contract with the TWDB, whereby the TWDB will reimburse the District, with grant funds, for the cost of preparing the project plan, project report, plans and specifications and monitoring reports for the proposed project.

The North American Development Bank (NADB) Water Conservation Infrastructure Fund (WCIF) will complement, with grant funds, the capital investments required by the District for construction of these projects. The use of WCIF grant funds allows the District to fully finance its infrastructure in order to reduce water conveyance losses.

The projects will be managed by the District and will be constructed and operated in conformance with Federal, State and NADB requirements. The process for the development of the projects has followed a planning and public participation process that developed alternatives and associated costs, solicited public input, established priorities based on the input of the stakeholders and proceeded according to the priorities established in the planning process.

The HCID#6 has an annual operating budget of approximately \$2.0 million. The District has funds and staff capable of meeting the obligations of the District for the proposed projects.

Contractors will be selected by competitive bidding pursuant to the requirements of Texas water Code Section 49.273.

Since, 1985, the District has systematically replaced their existing main canal pumps at lift stations 2, 3 and 4 with modern vertical shaft mixed flow pumps. These new pumps are approximately 5% more efficient than older horizontal shaft pumps.

There is a 300 acre-foot regulating reservoir located between Pump Station 1 on the Rio Grande and Re-lift Station No. 2 on the District's Main Canal. The District has not used the reservoir for some years due to its existing large surface area relative to its storage capacity. The regulating reservoir allows the District to store "no charge water" that would otherwise be lost downstream in the Rio Grande.

In 1989 the District developed a computer database that is used to account and manage water allocation, taxes, and water use invoices. The database contains flow-metering records for all turnouts in the District, and the amount of irrigable land owned by each landowner within the District.

A monitoring program will be established for a two-year period to evaluate and quantify the actual water and energy savings following construction of the projects. This program will serve as a systematic outline for documenting the successes of the project. The program will include, at a minimum, sufficient information to allow for completion of the following tasks:

- *Designation of a construction inspector not affiliated with the primary construction contractor to inspect and administer construction quality control documentation for the proposed projects.*
- *Hydrostatic seepage tests of the installed canal liners by the District or Texas A&M. Hydrostatic leakage tests of all structures.*
- *Inspection of the lined canal reaches one and two years after the initial installation. Inspection should check structural integrity, cracking and leakage. Photographs should be taken of the inspected portions and a letter from the project engineer should be prepared summarizing the condition of the liner and if the contractor pursuant to the construction contract documents warrants any repairs.*
- *Preparation of an annual report containing the monthly reports and any other data collected.*
- *The electrical use per acre-foot of water pumped will be determined on a monthly basis and submitted annually. The annual report will include the historic electrical costs per acre-foot for comparison.*
- *The amount of water pumped will be measured and compared with the water delivered on a monthly basis and submitted annually. The annual report will include historic water pumped and water delivered volumes for comparison.*

3. Conformance with Applicable Local and Regional Conservation and Development Plans

The proposed project complies with all local and regional conservation and development plans. In particular, the project complies with the “Rio Grande Regional Water Plan”, which recommends agricultural water conservation and on-farm water use efficiency in order to reduce irrigation shortages.

The project Report has been prepared in accordance with the “Guidelines for Preparing and Reviewing Proposals for Water Conservation and Improvement Projects Under Public Law 106-576” issued by the U.S. Department of Interior, Bureau of Reclamation, June 2001.

The project is in conformance with local conservation efforts already developed by the District and served communities. Conservation of water stresses and penalties are assessed for overuse of water. The municipalities served by the District have their own water conservation plans. A water allocation plan (Drought Contingency Plan), goes into effect for irrigation when the irrigation water account storage balance amounts to a maximum of three irrigations per acre. This program remains in effect until the water is restored to the District’s irrigation account.

4. Natural Resources Conservation

The proposed project was developed with the intent of conserving water. The District’s authorized irrigation water rights are 34,913 acre-feet per year. However, these water rights are on an “as available” basis and the actual water available to the District may vary from year-to-year.

In addition to the irrigation water right, the District holds authorized multi-use water rights for 5,816 acre-feet per year. The District contracts to deliver raw water to the La Joya Water Supply Corporation and the following industrial entities:

- *American Electric Power - Bates Power Plant*
- *Frontera Power Generation Plant*
- *USDA - @ Moore Air Field*

According to Axiom-Blair Engineering’s analysis of the project in accordance with the USBOR “Guidelines for Preparing and Reviewing Proposals for Water Conservation and Improvement Projects Under Public Law 106-576, Lower Rio Grande Valley Water Resources Conservation and Improvement Act of 2000,” implementation of the project will allow an estimated water savings of 3,130 acre-feet per year, and an energy savings of 255,676 KWH per year on an average annual basis, as shown in the following table.

Project Component	Project Description	Annual Water Savings (Acre-feet)	Annual Energy Savings (KWH)
<i>Canal Lining</i>	<i>Repair and Impervious Lining</i>	<i>1,732</i>	<i>171,110</i>

	<i>of Portions of Main Canal for transport of irrigation and municipal water</i>		
<i>Canal Gate Replacement</i>	<i>Replacement of Canal and Lateral water Level Control Structures</i>	<i>491</i>	<i>44,783</i>
<i>Canal Regulation and Telemetry</i>	<i>Renovation of Regulating Reservoir and Installation of Water Level and Flow Measurement Telemetry</i>	<i>907</i>	<i>39,784</i>
Total Annual Savings		<i>3,130</i>	<i>255,676</i>

Water conservation by the District has become increasingly important due to an enduring drought that has affected the lower Rio Grande Valley over the past several years. The drought and the projected decrease in irrigation water supply has required the District to place a greater emphasis on water conservation to ensure the delivery of water to the customers they serve.

The lining of canals and installation of telemetry to improve water management will increase the efficiency of the District and use of water. More controlled water delivery will reduce losses and will improve delivery at the farm level. The proposed improvements will also allow the District to reduce the impact of water shortages on agriculture versus water for municipal use due to continued growth in the Cities of Lyford, Raymondville and the North Alamo Water Supply Corporation as well as other small rural communities. The Cities and the District will be able to enhance sustainable growth within available resources.

5. Community Development

The benefit obtained by modernization of the irrigation facilities may directly impact agricultural production and may result in increased income and an improved quality of life for end users. Making residents active participants in development of their community may also enhance economic activity. An improved quality of life for the residents may also have a favorable impact on the development of health and education in the area.

Available Documents

- *Axiom-Blair Engineering, “Project Plan for the Hidalgo County Irrigation District No. 6 Water Conservation Improvements Project” July 2003.*
- *Axiom-Blair Engineering, “Draft Project Report for the Hidalgo County Irrigation District No. 6 Water Conservation Improvements Project”, August 2003.*
- *Axiom-Blair Engineering, “Draft Financial Feasibility Report, Hidalgo County Irrigation District No. 6 Water Conservation Project” August 2003.*
- *Axiom-Blair Engineering, “Environmental Summary for the Hidalgo County Irrigation District No. 6 Water Conservation Improvements Project”, June 2003.*
- *Axiom-Blair Engineering, “Draft Sustainable Development Report for the Hidalgo County Irrigation District No. 6 Water Conservation Improvements Project”, August 2003.*
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