

**Border Environment Cooperation Commission
Hidalgo County Irrigation District No. 2 (San Juan)
Wisconsin Canal and Lateral A
Water Conservation Improvement Projects**

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General Criteria

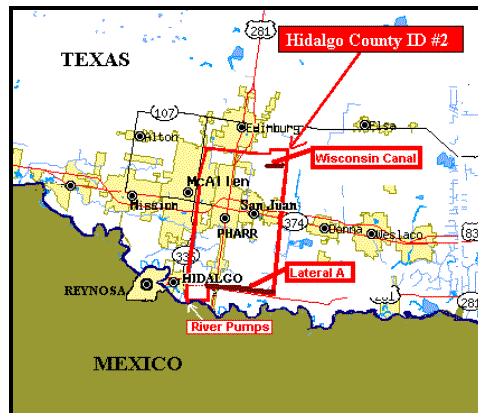
1. Project Type

This document includes two distinct projects proposed by Hidalgo County Irrigation District (HCID) No. 2. The two projects fall under the Border Environment Cooperation Commission (BECC) priority area of water conservation. The proposed projects are to implement priority improvements to the conveyance system of the District to reduce evaporation and seepage losses and operation and maintenance costs. The projects include the upgrading of two of primary canals, the 2-mile Wisconsin Canal and the 7.26-mile Lateral A canal.

2. Project Location

HCID No. 2, originally established in 1928, covers 64,828.12 acres located in the central part of Hidalgo County in the lower Rio Grande Valley of Texas. The southwest corner of the District borders the Rio Grande River near the City of Hidalgo and the District extends from State Hwy. 281 north to the vicinity of Edinburg, Texas. The District pumps water directly from the Rio Grande into a settling basin (reservoir) via a gravity canal, and then into a conveyance system of pipelines and canals.

The District delivers water to 47,000 acres of irrigable land under 4,000 water accounts, and also delivers raw water to five (5) municipalities and one water supply corporation - Alamo, McAllen, Pharr, San Juan, and Edinburg and the North Alamo Water Supply Corporation. The District has an authorized irrigation water right of 137,675 acre-feet of water per year (168.8 million cubic meters of water per year); the fourth largest water right of the 28 irrigation and water supply districts in the Lower Rio Grande Valley. In addition, the District holds domestic, municipal and industrial water rights totaling 12,732 acre-feet per year. Below is a location map of the District.



3. Project Description and Work Tasks

The District obtains water directly from the Rio Grande River near the vicinity of Hidalgo, Texas, with a pumping plant consisting of ten-65cfs electric pumps. The District pumps are located 3,200 feet upstream of an overflow dam (weir) on the Rio Grande River which raises the river level about one foot at the pump intake point. The water used by the District is released by IBWC from the upstream Falcon Reservoir. The District diversion pumps discharge into a main canal flowing via gravity into a 1,800 acre-foot (586.5 million gallon or 2.2 million cubic meter) unlined settling basin or reservoir near the pump station. Water is then gravity fed from the reservoir into the conveyance system consisting of 71 miles of canals (24.3 miles lined) and 230.8 miles of pipelines. The southern part of the conveyance system is gravity fed from the reservoir, and the northern part is reached with a re-lift pump station and gravity flow thereafter.

Irrigation is undertaken by 4,000 water accounts for farms ranging from 200 acres to 2,500 acres. Irrigation occurs using furrow irrigation delivered by polyethylene field distribution systems or traditional open laterals. Farm turnouts supply water either to open ditches or gated pipes. A typical turnout delivers water to about 40 acres and the landowner receives about 6 inches of flood irrigation water per acre of irrigation. Each irrigation takes 3-4 days, and deliveries are not metered. There is some use of drip/micro-jet systems in citrus fields, which account for about 3.5% of the total 47,000 acres of irrigated acreage. Water is delivered to the municipalities via canals to their respective reservoirs and treatment plants. In 2002 the District had an overall estimated conveyance efficiency of 80%, thus based on the average annual diversion of water by the district of 55,880 acre-feet from 1998 through 2002, the loss due to evaporation and seepage was about 11,176 acre-feet per year.

The proposed projects include the upgrading of two of primary District canals, the Wisconsin Canal and Lateral A, to eliminate water loss from evaporation and seepage and to reduce maintenance requirements. These two projects are priorities among overall repair and upgrading needs of the District.

Wisconsin Canal

The existing 2-mile long Wisconsin Canal is concrete-lined; constructed in 1911 and renovated in 1986. The renovation consisted of raising the depth of the canal from 1 to 1.5 feet. The canal has a parabolic section varying from 12 feet at the 16 feet upstream to 12 feet at the downstream end, with a depth running from 6.75 feet to 5 feet. The canal is located just north of Wisconsin Road in the northeast part of the District. The canal serves 1,872 acres of land and is supplied by a 48-inch reinforced concrete gravity pressure main from the District's reservoir. The demand for this area is 23.8 cfs. The existing lining of the Wisconsin canal was originally constructed without any barrier lining and is now severely cracked. Seepage will eventually result in failure of the canal. Replacement of the canal with a 48-inch reinforced concrete pipe is proposed to eliminate losses in this primary section of the system and reduce maintenance costs. The estimated savings of water with replacement of the canal with a pipeline is 977 acre-feet per year; including savings from evaporation, seepage and improved metering. This savings is based on a ponding tests and economic and conservation analyses completed by the Texas Water Resources Institute, Texas A&M University.

The final design for the project is planned to be completed by July 2003, with competitive bidding and award of a contract for construction by August 2003 and construction completion by mid-January 2004 (5.5 month construction period).

Lateral A

The existing Lateral A canal is a concrete lined canal running east along the south boundary of the district form 7.26 miles starting at the District's reservoir. The canal was constructed in 1911 and renovated in 1986. The renovations consisted of raising the depth from 18 inches at the reservoir to 6 inches at the downstream end. The canal has a parabolic section with a top width varying from 18 feet at the reservoir to 12 feet at the downstream end, with a depth running from about 4.5 feet to 2.5 feet. The canal serves 6,640 acres of land with an estimated demand of 82 cfs. The existing lining of Lateral A is severely cracked with the potential for failure due to continued deterioration and seepage. Lateral A is proposed to be lined with a geomembrane covered with a 3-inch shotcrete cover, and field turnouts are proposed to be reconstructed so that portable meters can be used to set flow rates to fields. With these improvements, the estimated reduction in seepage and metering losses will be 2,542 acre-feet per year. This savings is based on a ponding tests and economic and conservation analyses completed by the Texas Water Resources Institute, Texas A&M University.

The final design for the project is planned to be completed by September 2003, with competitive bidding and award of a contract for construction by mid-October 2003 and construction completion by the end of February 2004 (4.5 month construction period).

4. Conformance with International Treaties and Agreements

The International Boundary and Water Commission (IBWC) is an independent bi-national public organization that ensures implementation of the 1944 Water Treaty between the United States and Mexico related to water and boundary issues. The projects do 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. HCID No. 2 diverts water from the Rio Grande River in accordance with a Permit issued by TCEQ, governed by Chapters 49 and 58 of the Texas Water Code and Article XVI, Section 59 of the Texas Constitution. 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 No. 2 under the TCEQ permit.

Human Health and Environmental

1. Human Health and Environmental Need

The proposed projects 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

In accordance with the Council of Environmental Quality (CEQ) Regulations (Section 1508.4) under the National Environmental Policy Act (NEPA) the U.S. Bureau of Reclamation (USBOR) has adopted the procedure in compliance with CEQ (1507.3 [b]) to issue a Categorical Exclusion after the evaluation of the possible environmental effects that would occur with the implementation of the proposed projects. The required Categorical Exclusion Checklist was completed and signed on May 23, 2003, whereby the USBOR determined that the proposed actions do not individually or cumulatively have a significant effect on the human environment and for which, therefore, neither an environmental assessment (EA) nor an environmental Impact Statement (EIS) is required.

Mitigation measures identified in the environmental review which will be required to be implemented under the project, are:

- A mixture of grasses and forbs appropriate to address potential erosion problems and long-term cover would be planted over disturbed areas.
- Existing trees and woody vegetation would remain undisturbed if possible. If not avoidable, stands of native brush and woods would be surveyed for nesting migratory birds during the nesting period of March through August, and then not be disturbed if any were found.
- All State and Federal permit conditions necessary for the construction or operation of the proposed project would be acquired and complied with.

Overall, the construction of the proposed water conservation measures will have a 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 USBOR environmental review of the projects and the proposed mitigation measures comply with all environmental and cultural resource laws and regulations. The District has the required water rights and is fully compliant with the terms of its water use permit.

Technical Feasibility

1. Appropriate Technology

Project Plans for each project were completed in accordance with USBOR guidelines, funded by the Texas Water Development Board (TWDB) State Energy Conservation Office (SECO) funds. Various alternatives were considered for the conveyance of water in the Wisconsin and Lateral A canals to reduce water losses and reduce operation and maintenance costs. USBOR Design Criteria were applied. The options considered for improvements under each project included: 1) canal lining with a fluid-applied membrane; 2) concrete lining; 3) exposed geomembrane lining; 4) shotcrete with geomembrane underlining; and 5) replacement with underground piping.

In February 2001, the firm of Siglar, Greenwood & Associates, Inc. completed an engineering report for the proposed improvements for the canals, including an analysis of the options. Based on this report, including more recent analyses contained in USBOR Project Reports for each project dated May 2003, the selected canal improvements are summarized below.

Wisconsin Canal

The 2-mile Wisconsin Canal is proposed to be replaced with a buried 48-inch reinforced concrete pipe running parallel and within the right-of-way of the existing canal based on the Siglar, Greenwood & Associates engineering report. Existing canal structures and concrete lining will be either buried or salvaged as appropriate. Farm turnouts will require replacement with the new pipeline and will be designed to accommodate the use of drop-in portable meters at a minimum 3 cfs. Gates/valves will be designed such that once flows are adjusted by the ditch rider, they can be locked in place for the duration of the delivery. With this method, only one or two flow meters will be required for each ditch rider rather than having a flow meter dedicated for each delivery point. A drain turnout will be required at the end of each lateral pipeline, and a surge structure will be required at the end of the new pipeline. Road crossings over the existing canal will be evaluated on a case-by-case basis for replacement or left in place. U.S Bureau of Reclamation standards and design criteria will be applied.

The proposed 2-mile pipeline will convey 24 cfs of water to serve an area of 1,872 acres. The estimated amortized annual water savings is 977 acre-feet per year, based on the Texas Water Resources Institute (Texas A&M University) Economic Methodology for South Texas Irrigation Projects, which was approved by the USBOR. The Texas Water Resources Institute economic study also estimated an amortized energy savings of 109,289 kwh/yr. at the main pumping plant and a relief pump station with completion of the proposed project.

Lateral A

The proposed improvements to the 7.26-mile Lateral A canal include the placement of a geomembrane underliner with a 3-inch shotcrete cover based on the USBOR Project Report of May 2003. The geomembrane provides the water barrier and the shotcrete protects the geomembrane, with an estimated 50-year life. The membrane will consist of a 15-mil (0.381 mm) geomembrane sandwiched between two layers of 6-oz. (170.1 gram) geotextile. The geomembrane will have thermal-bonded seams every 20 feet. The membrane is estimated to have a long-term seepage reduction effectiveness of 95%. This lining option is the most costly of the lining options at \$2.60 installed cost per sq. ft., but it has the longest service life, the highest seepage reduction effectiveness and the lowest O&M costs of all other lining options. Other membrane options have estimated 20-year service lives, a maximum 90% seepage reduction effectiveness and require more maintenance and repairs (perhaps twice as much) due to their exposure to the weather and potential for mechanical damage. Farm turnouts will be reconstructed so that portable meters can be used to set flow rates to fields, with characteristics similar to those proposed for the Wisconsin canal will be used, including the application of U.S. Bureau of Reclamation standards and design criteria.

Replacement of the canal with piping was considered but was not selected due to the excessive construction cost, estimated at \$9.1 million, coupled with the environmental impact of construction near a wildlife area.

The canal serves an area of 6,640 acres. The estimated amortized annual water savings is 2,542 acre-feet, based on the Texas Water Resources Institute Economic Methodology for South Texas Irrigation Projects, which was approved for by the USBOR. The Texas Water Resources Institute economic study also estimated an amortized energy savings of 161,705 kwh/yr. at the main pumping plant with completion of the proposed project.

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 are considered sufficiently capable and experienced to undertake required maintenance of the new pipeline and canal. The meter supplier will be required to provide training on the operation and maintenance of meters when delivered.

3. Compliance with Applicable Design Standards and Regulations

The design and construction requirements adhere to USBR requirements under the "Guidelines for Preparing and Reviewing Proposals for Water Conservation and Improvement Projects under Public Law 106-576" as per the memorandum of agreement between the HCID No. 1 and the USBR. USBR design standards and criteria were applied and USBR quality control procedures will be applied during construction.

Financial Feasibility and Project Management

1. Financial Feasibility

BECC reviewed information concerning the projects and the District's financial condition to obtain sufficient support of the District's capability to sustain the proposed funding structure of the projects and the on-going operation and maintenance of the improvements. The estimated project costs for the two projects based on preliminary design information are as follows:

Cost of the Project for the Wisconsin Canal

ITEM	Funding Source	TOTAL
Planning	SECO/HCID#2	\$ 66,560
Design	SECO/HCID#2	\$ 27,566
Construction	WCIF/HCID#2	\$1,580,300
TOTAL		\$ 1,674,426

Cost in Dollars. June 2003

Cost of the Project for the Lateral A Canal

ITEM	Funding Source	TOTAL
Planning	SECO/HCID#2	\$ 104,815
Design	SECO/HCID#2	\$ 114,300
Construction	WCIF/HCID#2	\$ 3,154,170
TOTAL		\$ 3,373,285

Cost in Dollars. June 2003

The funding sources for the project are summarized in the table below. Based on the WCIF 2Guidelines, the WCIF grant may support 50% of the project costs up to a maximum of \$4,000,000. The funding sources for the projects are as follows:

Financial Structure for the Wisconsin Canal

Source	Type	Amount USD	% Project Cost
NADB	WCIF- Grant	\$ 600,000	35.9%
State of Texas	SECO Grant	\$ 94,126	5.6%
HCID #2	Cash	\$ 846,300	50.5%
HCID #2	In-Kind	\$ 134,000	8.0%
TOTAL		\$ 1,674,426	100.0%

Financial Structure for the Lateral A Canal

Source	Type	Amount USD	% Project Cost
NADB	WCIF- Grant	\$ 586,383	17.4%
State of Texas	SECO Grant	\$ 330,669	9.8%
HCID #2	Cash	\$ 2,423,233	71.8%
HCID #2	In-Kind	\$ 33,000	0.9%
TOTAL		\$ 3,373,285	100.0%

The BECC requested a third party review of the capability of the District for supporting the initial investment and the sustainability of operations and maintenance for the project. BECC's financial consultant, Brown and Caldwell, rendered an opinion concluding that the District does provide this capability without an adjustment to the current Fee and Assessment Structure. This capability includes the support of those project costs to be requested for later reimbursement by the Bureau of Reclamation.

The District has developed the project in accordance with requirements for funding participation by the United States Bureau of Reclamation (USBOR). The District has submitted the project for consideration by USBOR. Should the USBOR funding become available, the District will request reimbursement for approved cash expenditures.

2. Rate Model

The rate model for this type of Project Sponsor is better described as a Fee and Assessment Structure. The District charges an annual operations and maintenance assessment (tax) of \$8.25 per irrigable acre. The tax is levied by October 1 of the prior year. In addition, the District charges a water assessment of \$7.50 per acre per irrigation. The fee structure for Hidalgo County Irrigation District #2 has not been adjusted during the historic five-year period. The table below summarizes the existing structure.

Existing Assessment Fee Structure

Fees	Per Acre
Annual O&M Tax	\$8.25
Water Assessment (per acre irrigated)	\$7.50

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 by Hidalgo County Irrigation District #2. The District has managed the construction of similar magnitude. The District will operate in a self-sufficient manner, supporting itself through user fees. The project will not require additional staffing. Therefore, the existing organizational structure, which has been provided, will be sufficient.

Community Participation

1. Comprehensive Public Participation Plan

HCID No. 2 prepared and submitted a draft public participation plan covering both projects to the BECC and it was approved with changes. The plan comprises the development of a steering committee, meeting local organizations, providing project information to the public, holding public meetings and submitting a final report for the project. Activities planned to be carried out in fulfillment of the plan are presented below.

2. Steering Committee

The steering committee was formed with Mr. John Salazar, landowner/producer; Fred Schuster, landowner/producer; Allen Sturdivant, economist, Texas Cooperative Extension; Allen Arnold, landowner/producer/HCID No. 2 Board Member; Karl Obst, landowner/producer/HCID No. 2 Board Member; M.G. Dyer, landowner/producer/HCID No. 2 Board Member; and Sonny Hinojosa, General Manager HCID No. 2. The Steering Committee was supported by a Technical Work Group consisting of Messrs. Thomas Michalewicz, USBOR, and Mr. Charles Greenwood, Siglar, Winston, Greenwood & Associates.

3. Local Organizations

Local groups and organizations such as the Lower Rio Grande Authority, the Lower Rio Grande Valley Development Council, the Rio Grande Regional Water Planning Group and others are planned to be contacted to solicit their support for the two projects.

4. Public Information

Copies of the Preliminary Engineering Reports, Environmental Assessment Reports and draft Project Plans were made available to the public at HCID No. 2 offices in San Juan, TX, 30 days prior to the 2nd public meeting. Fact sheets were developed, in both Spanish and English, including descriptions of the technical, environmental, financial and public participation project components. These fact sheets are to be used in educating the community about the proposed projects and distributed in the public meetings.

5. Public Meetings

The public meetings were advertised on May 17, 2003. The first meeting was held on May 21, 2003, covering the technical aspects of the project. The second meeting was held on June 17, 2003, to cover the financial aspects of the project.

Sustainable Development

1. Definition and Principles

Both projects comply with BECC's definition of Sustainable Development: "Conservation oriented social and economic development that emphasizes the protection and sustainable use of resources, while addressing both current and future needs, and present and future impacts of human actions." The projects will positively impact the area and sustainable life of the area's residents through the conservation of water which is becoming a scarce resource and critical for sustainability of life and economic growth. Through elimination of water loss through evaporation, seepage and reduction of energy needs by closely monitoring water distribution times and quantities of flow, the projects provide a positive impact on the overall environment by conserving and effectively using a limited water supply resource. Local residents will benefit from better agricultural yields within a sustainable development framework and from a better quality of life within a mature conservation scheme, being careful not to compromise water and soil resources for the future, considering that modernization and technical improvements within the District's operational system provide a net positive effect. The required public review process ensures that residents in the influence areas of the projects participate in the development process fully aware that the decisions they make will focus on the sustainable management of environmental resources to achieve a better environmental and socio-economic improvement in their community.

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 efficiency 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 plans and the necessary documentation required to meet the requirements for federally appropriated funds. In addition, the Texas A&M University Texas Water Resources Institute completed an economic and conservation assessment of the projects with funds provided through the "Rio Grande Basin Initiative," administered by the Cooperative State Research, Education, and Extension Service of the U.S. Department of Agriculture. The USBOR approved the methodology for the economic and conservation analyses.

The project plans for each proposed project 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 for conservation projects, including the Lateral A improvements and modifications to the Wisconsin Canal. The USBOR Project Reports for the two projects were prepared in compliance with the requirements of the Act.

The District entered into a contract with the TWDB whereby the TWDB will reimburse the District (with grant funds) for the costs of preparing the Project Plans, Project Reports, Plans and Specifications, and Monitoring Reports for the proposed projects.

The NADB Water Conservation Infrastructure Fund (WCIF) will complement, with grant funds, the capital investments required by the District for construction of the projects. The use of WCIF grant funds allows the District to fully finance and improve 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 input of the stakeholders and proceeded according to the priorities established in the planning process.

A monitoring program will be established for a two-year period to evaluate and quantify actual water and energy savings following construction of the projects. The monitoring program will consist of the following:

- The electrical use per acre foot of water pumped will be determined on a monthly basis and reported annually. The annual report will include the historic electrical costs per acre foot for comparison.
- The 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 projects comply with all local and regional conservation and development plans. In particular, the projects comply 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 Reports for each of the two projects have 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 the Interior, Bureau of Reclamation (Reclamation), June 2001.

The projects are in conformance with local conservation efforts already developed by the District and served communities. Conservation of water is stressed and penalties are assessed for the 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 water is restored to the Districts irrigation account.

4. Natural Resources Conservation

The proposed projects were developed with the intent of conserving water. The District irrigation water right is 137,675 ac-ft per year; however, this water right is “as-available” and the actual water available to the District may vary from year to year.

In addition to their irrigation water right, the District holds domestic, municipal, and industrial water rights of 12,732 ac-ft per year. The District contracts to deliver raw water to five (5) municipalities: Alamo, McAllen, Pharr, San Juan, and Edinburg; and to North Alamo Water Supply Corporation (NAWSC). The District holds the municipal water rights for the following cities: McAllen (6140 acre-feet per year), Pharr (2946 acre-feet per year), San Juan (2030 acre-feet per year), and Alamo (1202 acre-feet per year). The District also supplements the above entities with its domestic, municipal, and industrial water rights. The District has 4,000 water accounts in the District with 47,000 acres of irrigable farmland.

According to the Economic and Conservation Evaluation of Capital Renovation Projects for the HCID No. 2, prepared by the Texas Water Resources Institute of the Texas A&M University, the implementation of the two projects will allow an estimated water savings of 3,519 acre-feet/year, and an energy savings of 270,994 KWH/year, on an average annual basis, as shown in the following table.

ANNUAL WATER & ENERGY SAVINGS			
Project	Description	Annual Water Savings (Acre-feet)	Annual Energy Savings (KWH)
48" Pipeline replacing Wisconsin Canal	Replacement of 2 miles of canal with 48" diameter reinforced concrete pipe	977	109,289
Lining of Lateral A Canal	Re-Lining of 7.26 miles of what is now a concrete lined canal, with a geomembrane underlining and shotcrete protection cover.	2,542	161,705
Total Annual Savings		3,519	270,994

The construction of the proposed project improvements will conserve sufficient water to allow continued development in the Cities of Alamo, McAllen, Pharr, San Juan, Edinburg and the North Alamo Water Supply Corporation as well as other small rural communities which depend on the Rio Grande for their water supply. The Cities and the District will be able to manage sustainable growth within their available resources [\[NCL\]](#).

The projects will not only have an impact on water resources, but it will also contribute to saving of natural resources required to generate the energy that will be saved with the implementation of the two improvement projects.

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

Available Documents

- Draft Project Report - Rehabilitation of Lateral A, Hidalgo County Irrigation District No. 2," prepared by U.S. Bureau of Reclamation, Oklahoma-Texas Area Office, May 2003.
- "Draft Project Report - Modification of Wisconsin Canal, Hidalgo County Irrigation District No. 2," prepared by U.S. Bureau of Reclamation, Oklahoma-Texas Area Office, May 2003.
- "Baseline Conditions Report and Irrigation District Indicators, Hidalgo County Irrigation District No. 2," prepared by U.S. Bureau of Reclamation, Oklahoma-Texas Area Office, March 2003.
- Engineering Report, "Proposed Wisconsin Canal Improvements," Siglar, Winston, Greenwood and Associates, February 2001.
- Engineering Report, "Proposed Lateral A Canal Improvements," Siglar, Winston, Greenwood and Associates, February 2001.
- Regional Water Plan (Region M), Rio Grande Regional Water Planning Group, January 2001.
- Economic Methodology for South Texas Irrigation Projects - RGIDECOM, Texas Water Resources Institute, Texas A&M University, October 2002.
- U. S. Bureau of Reclamation - Approved Categorical Exclusion Checklist for Lateral A, May 21, 2003.
- Final Report, April 28, 2003 - "Measured Water losses of Lateral A in Hidalgo County Irrigation District No. 2," by Eric Leigh and Guy Fipps.
- "Economic and Conservation Evaluation of Capitol Renovation Projects: Hidalgo County Irrigation District No. 2 (San Juan) - 48" Pipeline Replacing Wisconsin Canal - Preliminary," May 2003, by M. Edward Rister, et.al., Texas Water Resources Institute, Texas A & M University.

