

Border Environment Cooperation Commission Hidalgo and Cameron Counties Irrigation District No. 9 (Mercedes, Texas) Water Conservation Improvement Project

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 four components: 1) rehabilitation of approximately 500 feet of siphon under the International Boundary Water Commission (IBWC) floodway channel south of Mercedes, Texas; 2) rehabilitation of a 600-foot section of siphon under the Arroyo Colorado south of Mercedes, Texas and just North of the other siphon under the floodway; 3) repair of the overhead Anacuitas Aqueduct next to Expressway 83 in Mercedes, 4) lining of one mile of the main canal, and 5) installation of automated canal gates on the “K” lateral to increase the efficiency of the system.

The five activities are priority improvement needs of the Hidalgo and Cameron Counties Irrigation District No. 9 (H&CCID#9) conveyance system to substantially reduce evaporation, leakage, seepage losses and operation and maintenance costs. The estimated cost of the project is \$2,500,000.

2. Project Location

H&CCID#9 was established on October 3, 1927, covering 78,515 acres. The District is located in the Texas Rio Grande Valley in western portion of Cameron County and the eastern portion of Hidalgo County. The District’s infrastructure and service area are located adjacent to the U.S./Mexico border and continue north about 20 miles. The District encompasses areas surrounding the cities of Weslaco and Mercedes, with its headquarters in downtown Mercedes, Texas.

The District contains significant urbanization and its water conveyance system provides agricultural and municipal water to approximately 112.5 square miles of the far western portion of Cameron County and the eastern portion of Hidalgo County. H&CCID#9 delivers raw water to the cities of Elsa, Edcouch, La Villa, Mercedes, Weslaco, and North Alamo Water Supply Corporation, as well as an estimated 350 agricultural producer accounts.

A location map of the district is shown below.



3. Project Description and Work Tasks

The Project Sponsor is the H&CCID#9, which is a tax-exempt entity, proposed in 1927 when the farmers who owned the land in the District purchased the irrigation portion of the American Rio Grande Land and Irrigation Company. The temporary directors of the district authorized a vote for the election of five directors and confirmation of the district, with the district being duly and legally organized on January 20, 1928. In June 1984, the Hidalgo and Cameron Counties Water Control and Improvements District was converted to an Irrigation District and was renamed Hidalgo and Cameron Counties Irrigation District No.9 and is a political subdivision of the State of Texas, organized under and by virtue of Article XVI, Section 59 of the Constitution of the State of Texas. The District is operated under the statutes of Chapter 58 and Chapter 49, in part, of the Texas Water Code and is located in the counties of Hidalgo and Cameron with the cities of Weslaco and Mercedes occupying the central portion of the District.

The District has the largest amount of authorized water rights of the 28 districts in the Lower Rio Grande Valley. The District has 5,663 acre-feet of municipal water rights and 177,151 acre-feet of irrigation water rights. According to the Rio Grande Watermaster's Office, the District's agricultural water diversions for the years 1986 through 1998 average 113,138 acre-feet per year with a low of 49,795 acre-feet in 1997 and a high of 166,103 acre-feet in 1989.

The District holds from the TCEQ the Certificate of Adjudication No. 812-007, which authorizes this District to divert from the Rio Grande a maximum quantity of 177,151 acre-feet of "Class A" irrigation water. The District also holds the Certificate of Adjudication No. 812-000 which authorizes the District to divert 4,163 and Certificate of

Adjudication No. 812-008 which authorizes the District to divert 1,500 acre-feet both of Municipal Surface Water Rights from the Rio Grande River.

Water is diverted from the District's pumping station located on the United States side of the Rio Grande located at Mercedes, Texas. After pumping from the river, the water is transported by the main canal. The District contains approximately 20 miles of unlined canals, 55 miles of lined laterals and 250 miles of pipeline. The District's pumping facility is 13 years old with a 650 cfs maximum pumping capacity and a typical peak rate of 600 cfs. The District houses two re-lift stations and three 200 acre-foot storage reservoirs. The net evaporation in the Rio Grande Valley is approximately 5 feet per year. The approximate recent system losses from the canals and reservoirs are of approximately 34,000 acre-feet per year by evaporation, seepage, canal charging, and leakage, and this at a 70% reported system efficiency. (Re-checked 1/28/04)

The District is proposing to repair and replace water conveyance structures on the irrigation water supply system. This project will consist of the following project components:

- 1) The first project component will be the rehabilitation of approximately 500 feet of siphon under the International Boundary and Water Commission (IBWC) floodway channel south of Mercedes, Texas. This siphon consists of 4-8 foot concrete pipes under the floodway. These were installed in 1908 and are leaking significantly and in need of urgent repairs.
- 2) The second component includes the 600 foot section of siphon under the Arroyo Colorado south of Mercedes, Texas and just North of the other siphon under the Floodway. This siphon was built at the same time and also consists of 4-8 foot concrete pipes which present major leaking problems and also in need of urgent repair.
- 3) The third area that is in need of repairs is the overhead Anacuitas Aqueduct next to Expressway 83 in Mercedes. Plans are to shore up this structure in place.
- 4) The fourth project component is the lining of one mile of the main canal.
- 5) The fifth component is the automation of canal gates on the "K" lateral to increase the efficiency of this system and reduce the overspill of approximate 993 acre-feet per year. Lateral "K" is located in the Southwest corner of the district. It is 5.6 miles in length. Plans are to install six (6) automatic gate structures and level control sensors to monitor this system.

These improvements will provide greater operational efficiencies not only in terms of annual operation and maintenance expenditures, but also with respect to energy and water conservation. The repair and replacement of these water conveyance structures will result in conservation of water, which would otherwise be lost to seepage, leakage and evaporation. This water conservation project will result in energy conservation through reduced pumping requirements.

NRS engineers estimate the annual water savings resulting from the implementation of this project to average 27,883 acre-feet per year. The estimated energy savings is estimated to average 2,365,601 KWH per year.

The construction cost for this project is estimated at \$2,232,143, and the total project cost including planning studies, design, construction, and contingencies is estimated to be \$2,500,000. The proposed schedule for the project is shown below.

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|---|-------------------------------------|
| 1. Final Plans and Specifications | (March 2004 to August 2004) |
| 2. Rehabilitation of IBWC Siphon | (September, 2004 to November, 2004) |
| 3. Rehabilitation of Anacuitas Aqueduct | (December, 2004 to April, 2005) |
| 4. Canal Lining | (May, 2005 to Mid September, 2005) |
| 5. Rehabilitation of Arroyo Colorado Siphon | (September, 2005 to November, 2005) |
| 6. Automation of “K” Lateral | (December, 2005 to June, 2006) |

4. Compliance with International Treaties and Agreements

The TCEQ and the IBWC are the authorities for allocation of water to the District. The 1944 Water Treaty between the United States and Mexico applies. HCCID#9 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. 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 Watermaster also cooperates with IBWC and its Mexican counterpart to monitor U.S. and Mexican compliance with the U.S.-Mexico Treaty of 1944. 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. There is no reported non-compliance by HCCID#9 under the TCEQ permit.

Human Health and Environment

1. Human Health and Environmental Need

The human health effects from this project would be all positive from the sense that through water conservation, additional water would be made available for growing crops for human consumption as well as for municipal use. This water conservation would partially offset water shortages during periods of drought. Through water conservation and a more efficient use of the allocated waters for irrigation and municipal use, a growing population of the region can be sustained over a longer period without creating health risks through diseases due to unsanitary conditions because of lack of water. The Rio Grande traditionally runs from 500 to 1000 mg/L of TDS, which meets TCEQ primary water standards.

The Rio Grande Valley has in the past 7 years experienced a drought, which has limited the amount of surface water available for irrigation and municipal use. The drought in northern Mexico and the entire Rio Grande Basin, which includes the Rio Conchos Basin in northern central Mexico, has contributed significantly to the water shortages for irrigation in the Lower Rio Grande Valley. This water shortage has created an economic hardship in the region through reduction of crops and subsequent reduced revenue. The proposed water conservation project will provide a modern, centralized means of controlling and monitoring flows to the various accounts/parcels and eliminate water

seepage losses with resulting water savings and respective energy savings through reduced pumping.

2. Environmental Assessment

2.1 Archaeological Background Review

The project was subject to review by the Texas Historical Commission (THC) under the Texas Antiquities Code and possibly under Section 106 of the National Historic Preservation Act for its potential to impact significant cultural resources.

The Environmental Summary contains the Hidalgo County listing from the National Register Information System of the National Register of Historic Places. Nine registered sites exist within Hidalgo County. None of the federally listed sites lie within or in close proximity to the project area. Other the canal and its associated structures, there no Official State Historical markers or structures 50 years old or older (built prior to 1953) located within the limits of the project.

The National Park Service maintains a Native American Consultation Database (NACD) generally suitable for determining the need for additional investigation associated with compliance with the Native American Graves Protection and Repatriation Act (NAGPRA). The Environmental Summary contains information downloaded from the Park Service NACD web site. Review of the information contained in the Environmental Summary revealed that no federally listed Indian Reservations exist within Hidalgo County. The Full Data Report from the NACD did not indicate any tribal information for Hidalgo County.

Given that the entire alignment has been previously disturbed by irrigation canal construction, the possibility of discovering meaningful intact archeological resources is unlikely. The Texas Historic Atlas lists no known archeological sites within the project area. In the unlikely event any archeological or other culturally significant artifacts and/or structures are discovered, construction activity will cease until the appropriate local and state authorities are notified. In a letter dated January 27, 2004, the Texas Historical Commission confirmed that there is no adverse affect by the project.

2.2 Endangered Species Assessment

Seven species included on the Federal Endangered Species List potentially inhabit Hidalgo County. In addition, Texas Parks and Wildlife lists 58 species of plants that are rare, endangered, threatened or potentially threatened within Hidalgo County. The Federal and State Species lists are included in the Environmental Summary. A significant number of species detailed in the Environmental Summary are known to inhabit a narrow corridor along the Rio Grande or along the Texas Gulf Coast. Excluding any bank-clearing activity, other than for routine maintenance to the existing site, will help ensure minimal impact to these groups. It is not expected that any species will be adversely affected as the project is expected to occur within the existing canal and its embankments.

The brush habitat along canals supports a variety of unique wildlife. The ocelot and jaguarundi inhabit dense native brush land, generally occurring near water courses,

throughout South Texas. Population declines in both species of felines are primarily due to habitat loss associated with clearing brush. The disruption of wildlife habitat for this proposed water conservation project is anticipated to be minimal. As no improvements are proposed outside the existing canal, the surrounding habitat should remain unaltered and exhibit no long-term impact on the vegetative and/or diversity of the area.

3. Compliance with Applicable 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

Repair and replacement of conveyance structures is urgently required in order to conserve water and reduce the substantial losses due to the age and condition of the existing system. The following corrective actions were identified to improve the District's water conveyance delivery rate and efficiency, as well as reduce energy consumption and maintenance costs.

IBWC Siphon Repair: This 500 foot-long siphon was installed around 1908 and consists of four 8-foot concrete pipes under the floodway. The siphon is leaking significant amounts of water and is in need of repairs. Based on a visual inspection, not more than 350 feet of siphon. Two options were evaluated to repair leaks on a section of the siphon approximately 350 ft long. . It should be noted that the 350 feet is an estimate that still has to be verified with a pending detailed internal inspection of the pipes. The first option for repairs involves the introduction of an *Insituform* liner inside the concrete pipes and the second option is grouting the concrete pipes from the outside to repair the leaks. Both options require the assistance of a contractor/supplier to perform the leak repairs. The grouting option of these leaks could become a short-term fix rather than a long-term solution. The potential exist for the grouting option to resurface these leaks over time. Therefore, the long term solution and cost effective option will be to install an *Insituform liner* inside the concrete pipes. Both options require dewatering of the canal and blocking of two concrete pipes while diverting water to the other two available concrete pipes to continue District operations at a reduced flow. The dewatering, blocking and diversion of water will be performed by the District. The District will utilize its own equipment and personnel. The District will also provide personnel and equipment to install the liner with the assistance of the *Insituform* liner supplier. Arroyo Colorado Siphon Repair: This 600-foot long siphon consists of four 8-foot diameter concrete pipes, which is also presently leaking significant amounts of water and in need of repair. Based on a visual inspection of water leaking downstream of the siphon, not more than 350 feet on siphon were identified as need repair. Again, the two above

options were evaluated to repair leaks on approximately a 350-foot section on this siphon. The option selected was an *Insituform* inside the concrete pipes, with the same construction procedures as for the IBWC siphon.

Anacuitas Aqueduct Repair: This aqueduct not only presents structural problems but also is a source of approximately 1,000 acre-feet per year of over-spilling water. The aqueduct will be shored up with a levee requiring approximately 45,000 cubic yards of earthfill under the existing aqueduct which is supported by reinforced concrete columns. The aqueduct will also be repaired with concrete to fill the overflow drop structure currently spilling water to one side of the aqueduct. Drainage of the area will be addressed by placing two culvert structures with dimensions of 10'x10'x250' underneath the aqueduct structure and through the proposed levee. This project will be completely accomplished by the District.

Canal Lining: This project component consists of the lining of approximately one mile of the main canal located northeast of the Aqueduct. Two options were evaluated for this project component: 1) Synthetic liner and; 2) Concrete liner. The synthetic liner option, covered with a concrete mat, was selected since it has been found that concrete liners alone are more susceptible to leaks and seepage due to the nature of the soils. This option is considered to be the better long-term solution and more cost effective option.

Automation of "K" Lateral: This includes the automation of six canal gates on the "K" Lateral in an effort to increase the efficiency of the District water delivery system through the reduction of overflow flow spills. The "K" Lateral distributes irrigation water to farmlands south of U.S. B83 in the southwest quadrant of the District. The "K" Lateral extends 5.6 miles south from the Main Canal and contains four sluice gates along its reach. The "K10" Lateral branches off the "K" Lateral approximately 2.7 miles downstream from its confluence with the Main Canal. The "K10" Lateral extends southeast 2.2 miles and contains two sluice gates; one at its beginning and another midway along its reach. Spillover weirs are also provided at the end of the "K" Lateral and "K10" Laterals to collect and transport excess irrigation water to nearby drains. This proposed activity will prevent approximately 1000 acre-feet of irrigation water to flow over the spillover weirs through the installation of an automated operating system consisting of telemetry and gate control equipment.

The proposed "K" Lateral work will consist of the following components:

- a. Replace six existing vertical gate structures with new automated vertical gates and enhanced gate support structures (see preliminary specifications in Attachment No.2).
- b. Install fourteen depth sensor stations to allow for water flow and level determination to control new automated gates.
- c. Install telemetry equipment for central control of gates

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 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 materials and equipment, including provision of O&M manuals.

3. Compliance with Applicable Design Regulations and Standards

The design and construction requirements will adhere to U.S. Bureau of Reclamation (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.

Financial Feasibility and Project Management

1. Financial Feasibility.

Funding for the proposed project will be provided by multiple sources. A Project Plan and Report, as well as Construction Plans and Specifications will be completed by seeking funds from the Texas Water Development Board (TWDB) through Public Law 106-576 for Texas Irrigation Projects. The construction cost for the project is estimated to be approximately \$2,500,000. The District will be provided with a grant from the Water Conservation Investment Fund (WCIF) of the North American Development Bank (NADB) for 50% of the construction cost. The District will provide funding for the remaining 50% of the construction cost.

The total estimated cost of the project is \$2,500,000, as shown below.

Cost Breakdown

Item	Total (USD)
Construction	\$2,232,143
Engineering & Const. Management	\$267,857
Total Project(NADBank & District Funds)	\$2,500,000

The sources of financing are shown below.

Sources of Funds

Sources of Funds	Total
NADB WCIF	\$1,250,000
District Cash	\$ 400,000
District In-kind	\$ 850,000
Total Project Cost	\$2,500,000

The HCCID#9 has indicated that in-kind contributions in the amount of \$850,000 will be used to fund this project. The funding through the Texas Water Development Board is not part of this project with NADBank.

The District charges an annual flat rate assessment on every acre that is irrigable whether it is irrigated or not. The flat rate assessment is for the maintenance and operation of the District. The flat rate assessment is currently set at \$10.00 per acre. The District charges a delivery fee of \$7.00 per acre-feet. The irrigation charge is paid by the water user prior to the date that water is to be delivered by the District to the water user.

Based on a review of the project, and the financial assessment of the District's operations and financial condition, the District appears capable of providing the initial matching cash contribution and supporting the ongoing operation and maintenance expenses of the projects through the end of the evaluation period without adjustments to its current fee structure.

This opinion addresses the current situation of the HCCID#9, reflecting economic conditions, financial conditions, and other conditions, as they exist as of this date.

2. Project Management.

The HCCID#9 will manage the project. 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 and equipment will be sufficient.

Prior to Certification, the District Board of Directors will issue a Resolution committing \$1,250,000 of their own resources to cover the District's contribution to the project.

Community Participation

1. Comprehensive Community Participation Plan

The Public Participation Plan (Plan) was developed per certification requirements and was submitted and approved in December 2003. It provided a framework to conduct public participation in the areas served by Hidalgo and Cameron Counties Irrigation District No. 9.

2. Steering Committee

The steering committee was made up of Bobby Sparks and Jack Harbison of the District Board and customers/growers of the District; Charles Browning of the North Alamo Water Supply Corporation; Esteban Peña, of the City of Mercedes; and Jo Jo White, General Manager for the District. Assisting the committee were the consulting engineers and John Mize, District's Foreman. The steering committee met three times during the public participation process.

3. Local Organizations

Per BECC requirements, local organizations were informed of the proposed project. The City of Mercedes, the Lower Rio Grande Authority, the Region “M” Water Planning Group, and the North Alamo Water Supply were identified as the agencies contacted to request their support. All of the entities provided letters of support.

4. Public Access to Project Information

The Project Plan and Environmental Information Summary were made available for public viewing thirty days prior to the first BECC public meeting. The documents were available for viewing during normal business hours at the District office, as well as the Hidalgo County Courthouse in Edinburg. For after hours the documents were available by contacting the District. In addition, the availability of this information was included in public meeting notice published in the Mercedes Enterprise 30-days prior to the first public meeting and distributed to walk in customers at time of water purchase with a fact sheet that included basic technical, environmental, financial and public participation information.

The response was overall in support of the project. Its cost was not a major issue but only the possibility of a rate increase. Members were advised the financial evaluation concluded that a rate increase would not become necessary. The District’s general manager was interviewed on the project by the Mercedes Enterprise newspaper.

5. Public Meetings

The first BECC public meeting held was a general information meeting to provide the public with the technical and environmental aspects of the proposed water conservation improvements. It was held on Tuesday, January 20, 2004. The second BECC public meeting held on January 27, 2004 focused on the financial impact to the District. No opposition was expressed to the project on any of the public meetings.

Sustainable Development

1. Definition and Principles

The project complies 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.” This project would 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 seepage leakage, evaporation, and reduction of energy needs by closely monitoring water distribution times and quantities of flow, the project provides 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 mature water resources 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 project's influence area 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. Besides the water conservation from mitigating seepage, leakage, and evaporation losses, there are energy savings both from pumping less water forthcoming from reducing losses.

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 strategies for reducing 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 /or grants.

The following projects/studies have been previously conducted by the District which involve water conservation: "K" Lateral Gate Replacement and Improvement Project by Axiom Blair Engineering, August 2003. This project was conducted to determine improvement needs of the "K" Lateral for water conservation.

The NADB WCIF will complement with grant funds the capital investment that will be spent by the District. The use of these grant funds allows the District to improve its infrastructure in order to reduce water losses in water conveyance.

The project will be managed by the local sponsor and be constructed and operated in conformance with the requirements of both regulatory and funding agencies. According to the project financial analysis, the HCCID#9 is capable of providing the initial matching cash contribution and supporting the ongoing operation and maintenance expenses of the project without adjustments to its current fee structure.

The District will be able to operate in as self-sufficient manner, supporting itself through user fees. The project will not require additional staffing. Therefore, the existing organizational structure will be sufficient.

The process used in the development of this project has followed a planning and public participation process that has developed alternatives and associated costs, solicited public

input in to the process, established priorities based on input of the stakeholders and proceed 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 following:

- “Rio Grande Regional Water Plan”, which recommends agricultural water conservation and improvement of on-farm water use efficiency, in order to reduce irrigation shortages.
- Drought Contingency Plan, August 2002. Prepared by the District to comply with TCEQ requirements

The Project Report for the project has been prepared in accordance with the guidelines of the BECC.

4. Natural Resources Conservation

The proposed project was developed with the intent of conserving water. The District irrigation water rights include 5,663 acre-feet per year of municipal water rights and 177,151 acre-feet per yr of “Class A” irrigation water; however, this water right is “as-available” and the actual water available to the District may vary from year to year. According to the Rio Grande Watermaster’s Office, the District’s agricultural water diversions for the years 1986 through 1998 average 113,138 acre-feet per year with a low of 49,795 acre-feet per year in 1997 and a high of 166,103 acre-feet in 1989.

The estimated annual water savings resulting from the implementation of this project, estimated by the Project Sponsor, is 27,883 acre-feet per year.. The expected water savings from this project, estimated by the Project Sponsor, is 510,000 acre-feet based on a 15-year life.

The energy savings, with the implementation of this water conservation project, is estimated by the Project Sponsor, is 2,365,601 KWH/year. The expected energy savings from this project over its expected productive life is 25,353,630 KWH.

Water conservation in the agricultural sector will not only reduce projected irrigation shortages, it will also “free up” additional Rio Grande water supplies for future domestic-municipal industrial needs. Therefore, the District would be able to manage sustainable growth within its available resources.

The project will not only have an impact in water resources, but it will also contribute in savings of natural resources required to generate the energy that will be saved with the implementation of the improvements in the HCCID#9.

5. Community Development

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

Agriculture has been the primary component of the region’s economy. Based on Texas Cooperative Extension data presented in “Alternative Approaches to Estimate the Impact of Irrigation Water Shortages on the Rio Grande Valley Agriculture”, the estimated economic benefit of an acre-foot of irrigation water is \$652 in business activity and 0.02 jobs. Based on this information, the water conserved from this project would allow the region to realize \$7,782,728 in business activities and 238 jobs.

Based on TWDB data presented in “1995 Per Capita Water Use For Texas Cities”, the per capita water use in Brownsville is 184 gallons per day, or 0.206 ac-ft per year. Regardless of whether the conserved water is applied to additional crop irrigation or to M&I usage, the conservation benefits are significant and will have a lasting impact on the region.

Available Documents

- Axiom Blair Engineering, “*Project Plan for the Hidalgo and Cameron Counties Irrigation District No. 9,”K” Lateral Gate Replacement and Improvement Project,*” June 18, 2003.
- Axiom Blair Engineering, “*Environmental Summary Report for the Hidalgo and Cameron Counties Irrigation District No. 9,”K” Lateral Gate Replacement and Improvement Project,*” May 2003.
- NRS Consulting Engineers, “*Project Report, Repair and Replacement of Water Conveyance Structures on the Irrigation Water Supply System, Hidalgo and Cameron Counties Irrigation District No. 9 Water Conservation Project,*” January 2004.

- NRS Consulting Engineers, “*Baseline Conditions Report for the Hidalgo and Cameron Counties Irrigation District No. 9 Water Conservation Project,*” January 2004.
- NRS Consulting Engineers, “*Project Summary, Hidalgo and Cameron Counties Irrigation District No. 9. Mercedes, Texas. Repair and Replacement of Water Conveyance Structures on the Irrigation Water Supply System.*” January 2004.
- Brown and Caldwell Engineering, “*Hidalgo and Cameron Counties Irrigation District No. 9, Financial Feasibility for Water Conservation Project,*” Letter from Brown and Caldwell to NRS Engineers dated January 23, 2004.
- NRS Consulting Engineers, “*Environmental Summary of the Hidalgo and Cameron Counties Irrigation District No. 9 Water and Conservation and Improvement Project,*” December 2003.
- Hidalgo and Cameron Counties Irrigation District No. 9, “*Proposal to the Texas Water Development Board Use of Oil Overcharge Proceeds for Preparation of a Project Report for a Water and Energy Conservation and Improvement Project under Public Law 106-576,*” June 25, 2002.
- Hidalgo and Cameron Counties Irrigation District No. 9 Project Steering Committee, “*Comprehensive Public Participation Plan for the Repair and Replacement of Water Conveyance Structures on the Irrigation Water supply System of the Hidalgo and Cameron Counties Irrigation District No. 9,*” January 2004.
- Fipps, Guy, “*Potential Water Savings in Irrigated Agriculture for the Rio Grande Planning Region (Region M) Final Report*”, Texas Agricultural Extension Service, Texas Agricultural Experiment Station and Texas A&M University, December 22, 2000.
- Texas Water Development Board, “*2001 Adopted Rio Grande Regional Water Plan (Region M)*”, January 2001.