Border Environment Cooperation Commission

Yuma County Water Users Association
Water Conservation Improvement Projects

I. General Criteria

1. Project Type

The project falls under the Border Environment Cooperation Commission (BECC) priority area of water conservation. The proposed projects are to line earthen canals to prevent water losses through seepage. The project consists of lining 25 miles of canals.

2. Project Location

The Yuma County Water Users Association was organized in 1903, about a year after the passage of the Reclamation Act in the United States Congress. The Association was organized as a private non-profit corporation for the purpose of dealing with the United States Bureau of Reclamation (BOR) in the development of the Yuma project. After Congress authorized the Yuma Project in 1904, the Bureau of Reclamation recorded water filings in the name of the United States, and shortly thereafter purchased three existing water filings and irrigation companies that had been serving water to the Valley Division. The members of the Association farm over 53,400 irrigable acres, with 45,000 to 46,000 acres in production, with principal crops grown being lettuce and other produce crops in the fall and winter months and wheat, cotton, hay, and melons in the spring and summer months.

The Association assumed through contract the care, operation and maintenance of the works of the Valley Division of the Yuma Project in 1951, such works to include irrigation and certain power transmission facilities in Arizona. The Siphon Drop Power Plant takeover, which included high voltage transmission lines and California irrigation works, was accomplished by a supplemental contract in 1962. Presently, water is conveyed from the All-American Canal in California through the Siphon Drop Power Plant into the Yuma Main Canal, then through the siphon under the Colorado River at Yuma and into the Association' s irrigation system in Arizona. The Valley Division of the Yuma Project is located in the extreme southwest corner of Arizona. The area encompasses all of the Colorado River flood-plain land, approximately 53,000 acres, between the City of Yuma and the International Boundary line with Mexico.

In 2001, annual gross diversion into the system at the Colorado River Siphon was 393,305 acre-feet (AF). The net supply to the system, adding well

inflows and deducting for the City of Yuma use and canal and lateral wasteway flows, was 368,353 AF.

3. Project Description and Work Tasks

Yuma County Water Users' Association seeks to certify a water conservation project valued at $6,023,045. The water conservation project entails lining of 25 miles of unlined earthen canals with concrete. The intention of the project is to eliminate groundwater drainage problems attributed to the existing unlined canal system and thus improve the quality of flows in the Colorado River, which will assist in compliance with the water quality requirements of the 1944 Mexican Treaty.

The project would be designed beginning in FY 2004. Construction would begin in 2004 and be completed during FY 2006. The following is a detailed count of the areas that will be rehabilitated.

Year 1 (2004) consists of the improvement of:

Lott Canal Lateral (from the 3.2 Check to the 3.8 Check)

Lott Canal Lateral Wasteway (from the 3.8 Check to the Main Drain)

Thacker Canal Lateral (from the existing pipeline at mile 0.3 to the 1.4 Check)

Adams Canal Lateral (its entire length, from mile 0.0 to it terminus at Highway 95)

Somerton Canal Lateral (from the 2.8 Check to the 3.8 Check)

Somerton Canal Lateral (from Co.18th St. & Ave. F to the 6.8 Check)

Central Main Canal (from the 7.7 Check to the 9.1 Check)

Cloyd Canal Lateral (from its head to the 0.9 Check)

Pesch Canal Lateral (from its head to the 1.0 Check)

Year 1 totals 8.4 miles of newly lined canal and the replacement of 39 turnouts and 8 checks.

Year 2 (2005) consists of the improvement of:

Central Main Canal (from the 6.2 Check to the 7.1 Check)

Cooper Canal Lateral (from 0.2R Turnout to the 2.7 Check)

Lott Canal Lateral (from the 0.3 Check to the 3.2 Check)

Gilbert Canal Lateral (from mile 0.25 to its terminus)

Potter Canal Lateral (from the 2.7CK Check to its terminus)

Year 2 totals 8.4 miles of newly lined canal and the replacement of 29 turnouts and 8 checks.

Year 3 (2006) consists of the improvement of:

Potter Canal Lateral (from its head to the 2.7 Check)

Ingraham Canal Lateral (from the 1.2 Check to it terminus)

Daniel Canal Lateral (from its head to the drain)

Cooper Canal Lateral (from the 2.7 Check to the 5.5 Check)

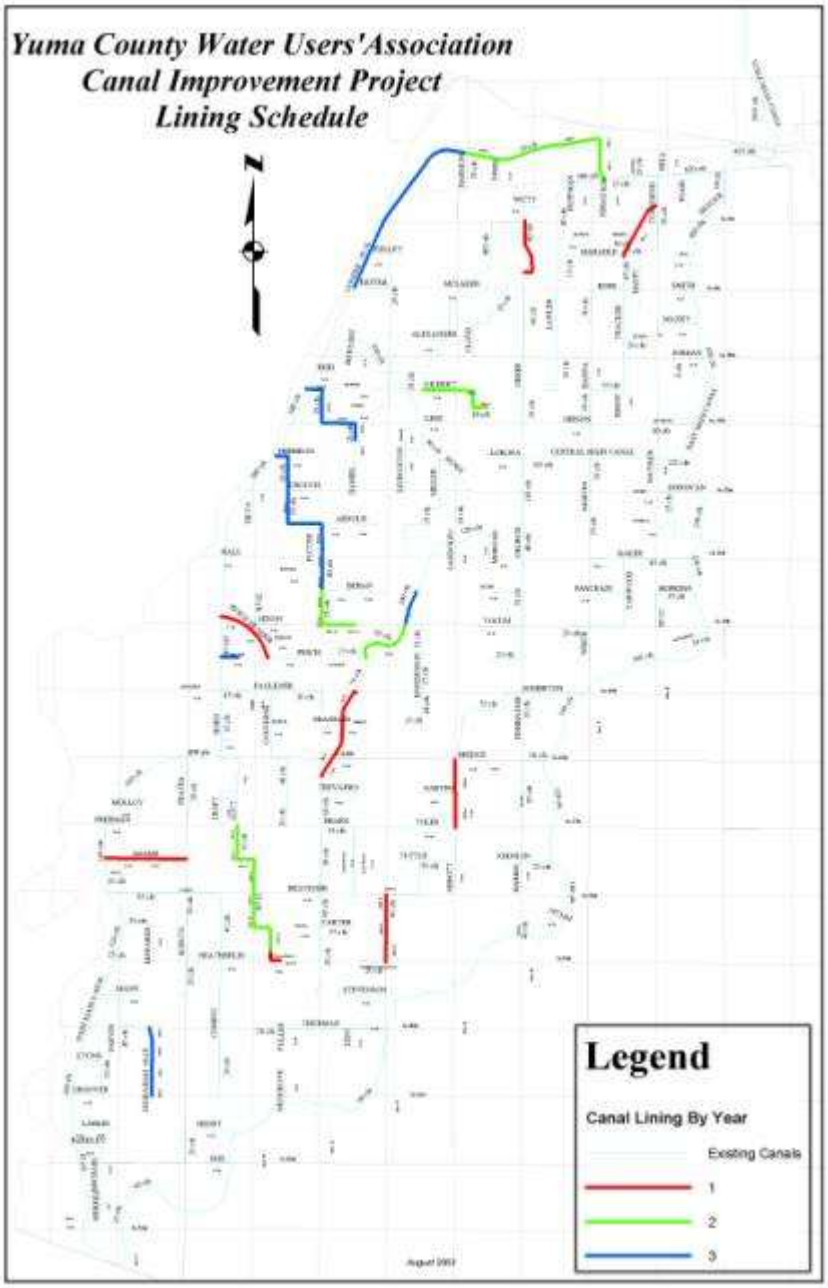
Walton Canal Lateral (its entire length from its head to its terminus)

Year 3 has a total of 8.0 of miles newly lined canal and the replacement of 32 turnouts and 11 checks.

Year 3 also has a contingency, depending on overall project costs, for the lining of the Central Canal from 5.7 Check to the 6.2 Check which will add 0.5 miles, 5 turnouts and 1 check.
The figure in the following page presents the segments of the canals what will be lined in the following three years.

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 Association will continue to meet all state surface water diversions from the Colorado River in accordance with the agreements in place and the restrictions of the Treaty.



II. Human Health and the Environment

1. Human Health and Environmental Need

The proposed projects address one of the most pressing problems facing the Colorado River, i.e., water shortages due to drought over the past years and an increasing demand

due to population growth in California, Nevada, and Arizona. 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 project addresses the critical water shortages by reducing water losses through canal lining.

The Canal Improvement Project will have significant water savings. An estimate of the water savings, based on the findings in the study " Irrigation District Efficiencies and Potential Water Savings in the Lower Rio Grande Valley of Texas" , is attached as Attachment C.

In general, irrigation water savings are achieved in two ways – (1) elimination of transmission losses (which will be achieved on this project through concrete lining of existing dirt canals) and (2) providing water flows at the right quantity and at the right time.

The estimate for water savings from seepage is 7,583 Acre-Feet per year. Significant additional water savings will also occur due to the overall greater delivery efficiencies of the concrete lined canals, the ability to completely drain the canals, and improved speed of irrigation, but are not easily quantified.

2. Environmental Assessment

According to Arizona law, no Environmental Review is required. However, a consultation was made with the Arizona Department of Environmental Quality (ADEQ) and the Arizona Department of Water Resources, and both agencies sent support letters for the project.

The NEPA process does not apply to this project since no federal funding is involved.

The BECC Criteria require that any project proposed for certification consider the following information:

a. Discussion of direct, indirect, cumulative, and short and long-term positive and negative effects of the project on the environmental components of the affected area

b. Description of unavoidable negative impacts and actions to be taken to mitigate these impacts

c. Discussion of the environmental benefits, risks, and costs of the proposed project as well as the environmental standards and objectives of the affected area.

The scope of the project is very simple in nature, in fact, similar projects elsewhere have received Categorical Exclusions since the improvements (i.e. lining) of the canals will be performed in already impacted areas. The project will provide benefits related to water savings.

The primary impact of project will be a reduction of seepage of irrigation from the canals to groundwater. While this reduction is significant in water conserved, the overall impact on the groundwater levels in the Yuma Valley will be negligible. The Yuma Valley has an excess of groundwater, caused by proximity to the Colorado River and from farming activities in the Yuma Valley and on the Yuma Mesa, and presently over 170,000 acre-feet of excess groundwater is pumped from groundwater wells and drains each year in order to control groundwater levels. Any effect, of the Canal Improvement Project on the reduction in seepage losses from canals would be limited to a reduction in this groundwater pumping by an amount equal to the amount of reduction in seepage.

3. Compliance with Environmental and Cultural Resource Laws and Regulations

While no environmental permit is required, ADEQ and ADWR have expressed their support for the project.

III. Technical Feasibility

1. Appropriate Technology

a. Project Plan – Alternative analysis and recommendation

The Canal Improvement Project consists of canals selected based on evaluations of a combination of their existing conditions, maintenance needs, and operational constraints.

The two basic alternatives for improving the water use efficiency of earth-lined canals are to either concrete line or pipeline the canals. Other alternatives such as lining with HDPE or other synthetic liners may work well for rehabilitating existing concrete lined canals but have not yet been proven for long term duration for use directly in earth lined canals. Based on a cost comparison of pipelining versus concrete lining, concrete lining is much more effective, with the complete costs of concrete lining typically about the same for only the purchase (and not installation of) equivalent sized pipe. Therefore, all of the improvements for the Association have been

identified as concrete lining projects (with one exception, about 550 feet of the Thacker Canal Lateral which must be pipelined in order to extend and existing pipelined section.)

Detailed plans and specifications are being developed for the projects to be constructed under the Canal Improvement Project. These sheets provide details of the canal alignments, provide typical canal cross sections and provide information on structure replacements and modifications.

By August 29, 2003 the Association will submit to BECC 60 percent complete design documents for the following canals scheduled for construction in 2004:

2004 Improvements
Lott Canal Lateral
Lott Canal Lateral Wasteway
Thacker Canal Lateral
Adams Canal Lateral
Somerton Canal Lateral
Central Main Canal
Cloyd Canal Lateral
Pesch Canal Lateral

By August 29, 2003 the Association will also submit to BECC 30 percent complete design documents for the following canals scheduled for construction in 2005 and 2006:

2005 Improvements
Central Main Canal
Cooper Canal Lateral
Lott Canal Lateral
Gilbert Canal Lateral
Potter Canal Lateral

2006 Improvements
Potter Canal Lateral
Ingraham Canal Lateral
Daniel Canal Lateral
Cooper Canal Lateral
Walton Canal Lateral

b. Project Report

The main features of the Canal Improvement Project are tabulated in Attachment E – Canal Improvement Project Costs. This table gives canal design flows, lining lengths, requirements for the replacements of turnout structures and check structures, and also any miscellaneous costs associated with the improvements.

2. Operation and Maintenance Plan

Operation and maintenance is an ongoing task performed by the Association's personnel. Operations are supervised by a watermaster and an assistant watermaster and manned by dispatchers and ditchriders. No increase in personnel is anticipated due to the improvements, and similarly, no decrease in personnel is expected, though individual workloads may decrease due to the operation of lined versus unlined canals.

Maintenance of the system is presently supervised by a maintenance and construction superintendent (who is also watermaster) and by two field supervisors, who supervise field maintenance and construction crews. The canal improvements will result in less maintenance performed on the 25 miles of canals to be improved (as concrete lined canals require much less maintenance than earthlined canals, especially with regards to aquatic weed control.) No increase or decreases are predicted in maintenance personnel.

O&M will continue to be funded by annual assessments to landowners, as is presently in place for the existing canal system. The canal improvements will result in no increase in future O&M expenses (and should result in long term savings of O&M expenses.)

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". The project is currently under design by a registered professional engineer in the State of Arizona.

IV. Financial Feasibility and Project Management

1. Financial Feasibility

The Yuma County Water Users' Association, a private non-profit corporation, was formed in 1903 to operate and maintain the Valley Division of the U.S. Bureau of Reclamation's Yuma Project. Located on the Colorado River near Yuma, Arizona, the members of the Association farm over 53,400 irrigable acres, 45,000 to 46,000 of those being in production, with principal crops grown being lettuce and other produce crops in the fall and winter months and wheat, cotton, hay and melons in the spring and summer months. Being constructed in the first decade of the 20th century, The Yuma Project is one of the USBR's oldest projects and is greatly in need of repair. The YCWUA Canal Improvement project consists of the

rehabilitation of existing unlined canals (replacing the unlined and badly deteriorated canals with concrete lined ones) as well as replacement of deteriorated structures. The lining of the canal laterals will significantly conserve water by reducing water loss by seepage.

Financial Statements - Historical.

Attached are the Association's Annual Reports for the last 5 years (1997 through 2001), which include audited Statements of Financial Positions. Also included is the Associations audited financial statements for 2002 (with the 2002 annual report still being in production. The Association receives annual revenue from its members (landowners of in the Yuma Valley), from sales of electrical power from its Siphon Drop Hydroelectric Power Plant, and from occasional reimbursable work performed for members and others.

The Association had unrestricted operational reserves of $6000000 as of December 31, 2002.

Financial Statements - Pro Forma.

The Association has received approval from its Board of Governors to provide matching funds for the North American Development Bank's Water Conservation Improvement Fund grant from a combination of use of its operational reserves and through the use of its employees and equipment for in-kind services.

As such, no loan will be required for the project nor will other debt be incurred as a result of the project.

Pro forma financial statements have prepared by BECC's financial consultant based on the Association's financial statements. It is understood that the pro forma results confirm the Associations ability to fund the project through a combination of reserves and in kind services.

Financial Structure of the Project.

Below is tabulated the financial schedule and contributions by BECC and the Association for the Project. The Association has substantial in-house labor and equipment resources to contribute to the construction of the project and intends to provide these throughout the course of the project.

	Final Design Development	Contract Work	Materials Provided	Labor Provided	Equipment Used	Totals
Year 1						
WCIF Funding	$0	$1,080,806	$0	$0	$0	$1,080,806
YCUWA Funding	$120,000	$35,806	$149,000	$388,000	$388,000	$1,080,806
Total	$120,000	$1,116,612	$149,000	$388,000	$388,000	$2,161,612
Year 2						
WCIF Funding	$0	$1,022,099	$0	$0	$0	$1,022,099
YCUWA Funding	$60,000	$117,099	$119,000	$363,000	$363,000	$1,022,099
Total	$60,000	$1,139,198	$119,000	$363,000	$363,000	$2,044,198
Year 3						
WCIF Funding	$0	$908,797	$0	$0	$0	$908,797

YCUWA Funding	$60,000	$117,825	$143,000	$363,000	$363,000	$1,046,825
Total	$60,000	$1,026,622	$143,000	$363,000	$363,000	$1,955,622
Grand Totals						
WCIF Funding	$0	$3,011,702	$0	$0	$0	$3,011,702
YCUWA Funding	$240,000	$270,730	$411,000	$1,114,000	$1,114,000	$3,149,730
Total	$240,000	$3,282,432		$1,114,000	$1,114,000	$6,161,432

Capital Improvement Plan/Budget.

The project requires no land or equipment purchases to construct the project (though the Association may purchase some equipment during the duration of the project, such would not be purchased exclusively for use on the Project.)

Operations & Maintenance Budget - Historical.

The attached annual reports include the operations and maintenance budgets for the Association for the last 5 years. These budgets, except for reimburseable works performed for other agencies and for adjustments for inflation, remain essentially constant from year to year.

Operations & Maintenance Budget - Pro Forma

The operations and maintenance budget for future years is expected to remain reasonably in line with past budgets. If any changes occur due to the project, it is anticipated that O&M costs may decrease due to the lower maintenance costs of lined versus unlined canals. A pro-forma O&M budget, if required, will be developed by BECC' s financial consultant.

Sensitivity Analysis

The Project is not generally sensitive to financial developments. O&M assessments have remained relatively constant for considerable periods and are anticipated to do so in the future.

Financial Break-Even Analysis

This Project will funded out of reserves and in-kind services and will not incur debt on the Association. As such, a break even analysis is not applicable to this project.

Demographic and Economic Information of the Proposed Service Area.

The Yuma Valley has stable demographics, with such dominated by an agricultural economy dependent on winter produce and summer field crops. The agricultural economy has existing for most of the last century and has expended recently due to value-added processing of the produce crops. There is some urbanization occurring due to the growth of the cities of Yuma, Somerton and San Luis. As there is no loan to be serviced with this Project, the Project is not sensitive to changes in demographics or economic conditions.

Fee/Rate Schedules - Historical.

Historical user fees (O&M assessments) are included in the attached annual reports. For the last 5 years these have remained constant at a rate of $62.00 per acre of assessed land, which entitles the land owner to 5 acre-feet of water per year, and at $12.40 per acre-foot of water for additional water.

User Fee Structure.

It is anticipated that the O&M assessments will remain at about a rate of $62.00 per acre of assessed land for the near future, subject to some increases due to inflation and cost of living. This project will not impact future assessments.

Institutional Capacity and Legal Framework.

Attached are meeting minutes from the Association's Board of Governor's meeting documenting their approval for the Association's Manager to enter into agreements with BECC for the Project.

2. Project Management

The project will be managed by the Association personnel. In addition, the Association employs James Davey, PE (James Davey and Associates) for engineering services. Mr. Davey, assisted by Tamara Stover and Ed Carpenter of the Association, will oversee the design and construction administration of the Project, including documentation of all BECC requirements.

V. Public Participation

1. Comprehensive Public Participation Plan

Initial contacts with the sponsor in early July led to the Yuma County Water Association and project steering committee to the submittal and approval of the project's public participation plan on July 31, 2003. The following elements are proposed in the plan to comply with BECC requirements.

2. Steering Committee

The steering committee members are Kelly Hughes and Mike Britain, Board Members of the Yuma County Water Users' Association; Larry Suciu, Attorney for the Association; Harold Maxwell, of the Yuma Farm Bureau; Roger Gingrich, City of Yuma Public Works; Terre Allen, Gowan Company; Barry Bequette, University of Arizona Cooperative Extension; Ken Rosevear, Yuma County Chamber of Commerce; Kurt Nolte, Arizona Western College Agricultural Director; Joyce Lobeck of the Yuma Daily Sun newspaper. The steering committee formation meeting was held on July 31, 2003.

3. Local Organizations

Presentations are scheduled before the Yuma County Water User's Association Board, the Natural Resources Conservation Service, the US Bureau of Reclamation, and the Cities of Somerton and Yuma.

4. Public Information

The Preliminary Engineering Report and draft Project Certification Document for the project have been available thirty days prior to the first BECC public meeting. The documents have been available during and after regular business hours (24-hours per

day) at the Yuma County Water Users' Association Offices, in Somerton, Arizona. Fact sheets that include basic information on the project such as, technical, environmental, financial and public participation components of the project have been developed to be made available to local organizations and been available at the Yuma County Water Users' Association.

5. Public Meetings

Public meetings have been scheduled for August 25 and 28, 2003 at the Yuma County Water Users Association office in Somerton, Arizona.

VI. 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." The project 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 seepage, 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 project 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 Arizona Department of Water Resources', Water Management Assistance Program (Third Management Plan, Chapter 9) is intended to provide financial and technical resources to assist water users in meeting their conservation requirements, facilitate renewable water supply utilization, and obtain information on hydrologic conditions and water availability in the Active Management Areas (AMAs).

Projects funded through the Water Management Assistance Program are:

- Conservation Programs and Projects
- Education and Information
- Municipal Sector
- Industrial Sector
- Agricultural Sector

The USBOR provided technical assistance to YCWUA to develop its Water Conservation Plan, according to USBOR Guidelines. Additionally, the USBOR in cooperation with the Irrigation Training and Research Center (ITRC) at California Polytechnic State University, San Luis Obispo, develop the plans for a Supervisory Control and Data Acquisition system for the YCWUA. The plans were funded by the USBOR.

The ITRC also developed the " Proposed Modernization of the Main Canal System" . The canal improvements included in the Yuma Project, were recommended in the report of the ITRC study. This study was funded by the USBOR.

The YCWUA has replaced 8 miles of canals with pipes, with the financial assistance from the City of Yuma and the Arizona Department of Transportation (ADOT). The YCWUA was reimbursed by the City of Yuma for the construction costs of one mile, and the ADOT reimbursed the YCWUA for the construction cost of 6 miles.

The National Resource Conservation Service has provided financial assistance to the YCWUA to line with concrete On-Farm ditches and to laser leveling of parcels.

In 1997, the YCWUA improved its Water Ordering and Delivering System, in order to allow a more flexible operation of the On-Farm irrigation systems

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

The project 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 project 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.

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

Rights to use Colorado River water are quantified by a string of legal authorities known as the "Law of the River." Based on this body of law, Arizona has the right to use 2.8 million acre feet annually of Colorado River water. Mohave, La Paz and Yuma county water users rely on Colorado River as their principal water supply. When fully utilized, the Central Arizona Project will deliver on average 1.5 million-acre feet of Colorado River water to Maricopa, Pinal and Pima Counties.

Arizona implemented the Groundwater Management Code in 1980. The Groundwater Code promotes water conservation and long-range planning of water resources.

The Code has three primary goals:

1. Control severe overdraft occurring in many parts of the state
2. Provide a means to allocate the state's limited groundwater resources to most effectively meet the changing needs of the state; and
3. Augment Arizona's groundwater through water supply development.

The Code established three levels of water management to respond to different groundwater conditions:

- The lowest level of management includes general provisions that apply statewide.
- The next level of management applies to Irrigation Non-Expansion Areas (Douglas, Joseph City and Harquahala).
- The highest level of management, with the most extensive provisions, is applied to Active Management Areas (Phoenix, Pinal, Prescott, Tucson and Santa Cruz), where groundwater overdraft is most severe.

The boundaries of AMAs and INAs generally are defined by groundwater basins and sub-basins rather than by the political lines of cities, towns, or counties.

The proposed project is in conformance with the planning and conservation plans considered in the State and Federal regulations mentioned above.

Also, the project is in compliance with the YCWUA Water Conservation Plan, approved by the USBOR in 2001.

4. Natural Resources Conservation

The proposed project was developed in order to reduce seepage water losses in 25.4 miles of unlined earthen canals. The District consists of 53,415 acres of irrigated area. In the District, the main drain runs through the central part of the area, terminating at the Boundary Pumping Plant adjacent to the Mexican border. The main drain and its several branches total approximately 56 miles in length. There are 16 drainage wells along the east side of the valley that intercept underground flows from Yuma Mesa and divert seepage from cultivated lands. Eleven of these wells are operated and maintained by the Yuma County Water Users' Association; the remaining five wells are operated by the Bureau of Reclamation. Most of the water pumped from the drainage wells is

discharged into the open drain system. A small quantity of Drainage water from wells and isolated open drains is pumped into irrigation canals.

According to an estimate of water savings, based on the findings in the study " Irrigation District Efficiencies and Potential Water Savings in the Lower Rio Grande Valley of Texas" ; the implementation of the project will allow an estimated water savings of 7,583 acree-feet/year. The expected water savings per mile of lined canal is 298.54 acre-fee/year, as result of the reduction of seepage in the improved areas.

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.