

**FUNDING OPPORTUNITY
BOR-DO-19-F005
FOR
WATERSMART GRANTS:**

**SMALL -SCALE WATER EFFICIENCY GRANT APPLICATION
FOR
CONVEYANCE IMPROVEMENTS
ACOMA LATERAL CONCRETE LINING PROJECT 2
FY 2019**

Submitted To:

Bureau of Reclamation Mail Services

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1. Technical Proposal and Evaluation Criteria

1.1 Executive Summary

This application is being submitted by: Bard Water District
1473 Ross Road
Winterhaven, Imperial County California 92283
760/572-0704

The Bard Water District is submitting this Water Conservation application for constructing conveyance improvements: concrete lining for a major section (2,125 linear feet) of the Acoma Lateral (Bard Unit, Area F) for better water management. This project was discussed during the USBR Reservation Division System Evaluation Project conducted in January 2017; Technical Memorandum No. 35-RDE-8150-STY-2016-02. After careful review by BWD in consultation with the USBR, BWD has updated their priority levels for the Acoma Lateral to a **Priority 1** and proposes to line 2,125 linear feet. The components of this project will include Construction Project Management (Design/Engineering /Testing), Excavation, Fill and Compaction, and finally the Concrete Lining. All construction work will be completed by Bard Water District. The Acoma Lateral's bottom width is 2 ft, with 5 ft sidewalls (1 to 1.5 slope ratio). The concrete lining will be 2.0 to 2.5 inches thick for the sidewalls and the bottom.

This complies with our approved Water Conservation 5-Year Plan and has been a priority to us for the last 3 years. However, as a small rural water district, lining the entire 2.5 mile Acoma lateral would cause undue financial hardship and limit our existing resources utilized for water delivery operations and O & M. Therefore, we plan to line 2,125 linear feet of this lateral, beginning with the areas identified by BWD and BOR as the most critical. This will minimize the negative impact on BWD and our water users. The concrete lining of this lateral would conserve approximately 58 acre feet per year of seepage (or 1,160 acre feet for 20 years- length of time for use of concrete before its deterioration). We will accomplish the goals established for the WaterSMART Water and Energy Efficiency Program by conserving water and increasing efficiency of our system.

The lining of the Acoma Lateral would be completed in four months and the installation would begin in the spring (April – July). Since the primary use of the water is agricultural and late spring produce crops are durable and more flexible to handle water outages for construction this is the best time interval and because there is less demand (quantity and time). Bard would schedule work to accommodate the demand, with by-pass flows, for water during this time-period.

This project is located on a Federal facility.

1. Technical Proposal and Evaluation Criteria (Continued)

1.2 Background Data

The project is in Imperial county, California. It is within the boundaries of the Fort Yuma Indian Reservation. It is bounded by Mexico to the South and the Colorado River and Arizona to the East. A map is attached on page 15.

Source of Water Supply:

Colorado River All American Canal Reservation Canal Acoma Lateral

Total Quantity of Water Supplied: 51,000 acre feet/year Indian Unit: 49,000 acre ft/year

Quantity of Water Supplied Acoma: 2,000 acre feet **Water Rights Involved:** 2nd Priority

Current Users: Agricultural **Number of Water Users Served:** 150

Current Water Demand: 51,000 acre feet/year **Projected Water Demand:** Same

Estimated Water Loss Reduction if Conveyance, Turnouts, or Pipelines installed:

Approximately 58 acre feet/year

Major Crops: Wheat, Sudan Grass, Produce, Dates and Cotton (Listed by demand: H L)

Total Acres Served: 7,120 **Acoma Lateral Acres Served:** 200

Potential Shortfalls in Water Supply: If drought continues, quantities could be reduced. Water conservation measures are critical. Farmers have already been encouraged to eliminate crops requiring large quantities of water (i.e. wheat or Sudan grass that require approximately 16-acre feet for 48 hours @ 4-6 intervals). We have also encouraged farmers to use sprinkler systems to germinate seeds. All these water conservation efforts have been very successful.

Bard Water District Water Delivery or Distribution System: Agricultural

Type and Approximate Total Lengths of Canals and Laterals:

Total: 67 Miles or 353,760 Linear Feet (LF)

Concrete Lined: 25 Miles 132,000 LF (37%) **Unlined:** 42 Miles or 221,760 LF (63%)

Number of Irrigation Turn-outs: 465 (Check Gates and Delivery Gates)

Type and Approximate Total Lengths of Canals, Laterals and Pipes: 67 Miles 353,760 LF

Concrete Lined/Pipe: 25 Miles 132,000 LF (37%) **Unlined:** 42 Miles or 221,760 LF (63%)

Type and Approximate Total Lengths of Laterals: 50 Miles 264,000 LF

Concrete Lined: 12 Miles 63,360 LF **Unlined:** 36 Miles 190,080 LF

Acoma Lateral: 2.5 Miles 13,200 LF

Fragmented/Deteriorated Concrete Lined: 1 Mile 5,280 LF

1. Technical Proposal and Evaluation Criteria (Continued)

1.2 Background Data (Continued)

Type and Approximate Total Lengths of Pipes: 3 Miles 15,840 LF

Number of Irrigation Turn-outs: 450

Significant Irrigation Improvements: Automated Controls Structures: 0 SCADA: 0
Remote Monitoring Devices: 5 Other: 3 Ram type Cipolletti weirs, 2 Long-throated flumes.

North American Development Bank grant with 25% Tribal and 25% Bard Water District matching funds Lined 12 miles of canals (2004) for a total of 8 million dollars. And \$225,000 from the BOR for Water Conservation for Measuring Devices. A new NCRS 2018 Canal Lining Project. BWD also Initiated a two-year pilot seasonal land fallowing project in 2016 (MWD) which we expanded threefold (approximately 500 acres initially to 1,500 acres in 2017 and 2018 with BOR, CAWCD, MWD, DW, and SNWA). The Bard Water District maintains a continuous working relationship with the Bureau of Reclamation's office in Yuma.

1.3 Technical Project Description and Milestones

Problems and Needs:

This project was discussed during the USBR Reservation Division System Evaluation Project conducted in January 2017; Technical Memorandum No. 35-RDE-8150-STY-2016-02. After careful review by BWD in consultation with the USBR, BWD has updated their priority levels for the Acoma Lateral to a **Priority 1** and proposes to line 2,125 linear feet (Bard Unit, Area F).

In 2018, BWD submitted an application to line 4,250 linear feet of this lateral under the larger Water and Energy Efficiency Program but were unsuccessful. During the de-briefing, it was recommended that we apply under this Small-Scale Water Efficiency Program. This required us to reduce the section to be lined by 50% from 4,350 to 2,125 linear feet. However. We currently have the resources and funds to complete the 4,250 linear feet, but because the costs exceeds this grants financial maximum, we are submitting two applications: Project 2 (this application) and Project 1 (first application) as recommended during the debriefing.

The Bard Water District proposes to construct concrete lining in the Acoma Lateral to reduce water consumption by reducing water lost through seepage and transpiration (by aquatic vegetation such as milfoil and canal bank vegetation such as salt cedars) along these canals. Bard estimates that these efforts will significantly reduce the quantity of water lost, approximately 58 acre feet of seepage per year or 1,160 acre feet over 20 years (Estimates provided by USDA Natural Resources Conservation Service Yuma Service Center).

1. Technical Proposal and Evaluation Criteria (Continued)

1.3 Technical Project Description and Milestones (continued)

Aquatic vegetation, such as Milfoil for example, in an earthen canal where ultraviolet light reaches the bottom of a canal can be a large factor in the consumptive use of water as well as dirt bank vegetation. Several water outages are scheduled annually to eradicate the moss mechanically and then flushed out of the system with water, this would be avoided with a concrete lined ditch. Scheduled water outages also contribute to additional water use as water users would rather water early than wait until after the three-day water outage. For example; a 12 hour irrigation on 35 acres of wheat using 15 cfs per hour is 14.88 acre feet.

Acoma Lateral Lining Dimensions:

Length: 2,125 Linear Feet

Widths: Top 6 Feet – Bottom 2 Feet

Sidewall Length: 5 Feet

Water Depth: 4 Feet

Annual Seepage Conservation Amount: Approximately 58 acre ft plus transpiration losses

Verification Amount: USDA National Resources Conservation Service calculation (Seepage and evapotranspiration) as well as actual real-time measurements (Volume change over time for section of canal blocked). Volume (Original Water Depth) – Volume (End Water Depth after 24 hours).

Addressing Problems and Needs:

This complies with our approved Water Conservation 5-Year Plan and has been a priority to us for the last 3 years. The concrete lining of this lateral would conserve approximately 58 acre feet per year of seepage (or 1,160 acre feet for 20 years- length of time for use of concrete before its deterioration). We will accomplish the goals established for the WaterSMART Water and Energy Efficiency Program by conserving water and increasing efficiency of our system

Conservation Estimation for each 2,125 section: 580 acre ft (10 years); 1,160 acre ft (20 years).
When All 2.5 miles (Phases): 360 acre ft per year. Approximately 3,603 acre ft (10 years); 7,206 acre ft (20 years).

1. Technical Proposal and Evaluation Criteria (Continued)

1.3 Technical Project Description and Milestones (continued)

Schedule and Milestones:

Tasks	MAR	APR	MAY	JUN	JUL	AUG
Award and NTP						
Pre-Construction						
Procurement: Eng/Design Subs		01-26				
Procurement: Equip & Matls		01-26				
Eng/Design/Survey			13-24			
Scheduling (Diversion) with subs/water users			13-24			
Site Preparation						
Remove Rip Rap				10-14		
Excavate Prism				10-14		
Import Fill Dirt				24-28		
Refill Prism & Compact				24-28		
Trimming				24-28		
Construction						
Concrete Lining					15-26	
Completion						
Reports and Closeout						19-30

The expected outcomes of the project are as follows:

- 1) Better Water Management for water delivery and distribution.
- 2) Reduction in quantity of water loss when water is delivered from the Colorado River via the All-American Canal and Reservation Canal to the Acoma Lateral (58+ acre feet/year).
- 3) Accomplish WaterSMART goals of conservation and efficiency.
- 4) Accomplish WaterSMART goal of preventing possible water-related crisis (shortfalls or flooding).
- 5) Mitigate conflict risk in this high-risk area for possible future.
- 6) Improvement to our overall system.
- 7) Every canal or lateral that is lined is easier to maintain, thus more time can be allotted to those sites that require more O & M, repair or replacement because of their poor condition.

1. Technical Proposal and Evaluation Criteria (Continued)

1.4 Evaluation Criteria

A. Project Benefits

Improve water delivery system (efficiency, control, flow, less water lost).

Improve overall reliability (Control overflow/flooding, water flow/quantity).

Geographic Scope Benefits (Conservation of lower Colorado River basin water and local area by reducing overflow, seepage, transpiration and evaporation

Agriculture – economic (less water needed, less restriction on crops types). Reduce O&M cost to BWD so funding can be used for other deteriorating structures and sites.

Environmental – health (less mosquito habitat, less noxious and invasive weeds, including aquatic safer structure).

Safety – Less residual flooding from overflow and spillage resulting in unsafe driving conditions and erosion of road and ditch banks.

Positive impact to entire system by reducing significant water loss of approximately 58 acre ft/yr (Based on type of crop and growth cycle, irrigation distribution method, and frequency and length of water delivery).

This project demonstrates collaboration between our water district, BOR, the Quechan Indian Tribe and our agricultural users. It can be used as an example to other water managers reflecting how assessment, planning, usage, need, and corrective measures can be achieved to benefit a district.

This will complement a NCRS 2018 Canal Lining Project at a nearby site

B. Planning Efforts Supporting the Project

This project entitled "Conveyance Improvements: Concrete Lining of Acoma Lateral" is part of our overall goals to save water and increase efficiency. Our existing "Reservation Improvement Project Plan" mandates that we periodically assess our water delivery system and identify problems or needs as we continue to mature and adapt to meet changing conditions as well as identifying new technologies and strategies.

Each year, we identify and prioritize our system needs and problems and projects not addressed in the previous year are added. Our criteria include:

- 1) Can the problem or need be remedied with existing resources and funds?
- 2) What benefits will occur from the corrective action taken (water/monetary savings, efficiency, sustainability, annual maintenance, acre foot savings).
- 3) Are additional resources and funds available if the existing funds are not available?

This project has been **second** on our priority list for the last 10 years, but we have not had the funds to complete the whole six mile length. This large scale project would be cost-prohibitive, especially the 50% matching as well time/resource constraints for our small irrigation district. We have identified this 2,125 ft section for this project.

1. Technical Proposal and Evaluation Criteria (Continued)

1.4 Evaluation Criteria (continued)

C. Project Implementation Project Schedule (Four Months)

Tasks	MAR	APR	MAY	JUN	JUL	AUG
Award and NTP						
Pre-Construction						
Procurement: Eng/Design Subs		01-26				
Procurement: Equip & Matls		01-26				
Eng/Design/Survey			13-24			
Scheduling (Diversion) with subs/water users			13-24			
Site Preparation						
Remove Rip Rap				10-14		
Excavate Prism				10-14		
Import Fill Dirt				24-28		
Refill Prism & Compact				24-28		
Trimming				24-28		
Construction						
Concrete Lining					15-26	
Completion						
Reports and Closeout						19-30

Permits: None **Engineering or Design Work:** Will be performed by Subcontractor.

No new policies/administrative actions are required to implement this project.

Environmental Compliance has been discussed with our Yuma BOR contact and an estimate was provided.

D. Nexus to Reclamation

This project is connected to the Reclamation activity of improving efficiency and conservation of our water systems and the Indian Unit.

The Bard Water District receives Reclamation Water via the All-American Canal.

Project on Reclamation lands or facilities: Yes

Project in same basin as Reclamation project or activity: Yes

Project contributes water to a basin where a Reclamation project is located: Yes

This project will help Reclamation meet their trust responsibilities to the Quechan Indian Tribe and as such will benefit them.

1. Technical Proposal and Evaluation Criteria (Continued)

1.5 Evaluation Criteria (continued)

E. Department of Interior Priorities

Creating a conservation stewardship legacy second only to Teddy Roosevelt:

Through our partnerships with our water users (farmers) we are creating a balance between water conservation, planning, efficiency, and cost savings. We are addressing issues brought about by changes in the environment, especially drought. We are using a “Best Practices” model by conserving water and subsequent watersheds and habitats) by a variety of voluntary activities as previously discussed (seasonal fallowing, irrigation method, crop vs. water requirements, system improvements, etc.).

Restoring trust with local communities:

As a small rural area, our trust has been tried and tested through several generations. We have depended upon each other for many years. We continue to foster that trust through our partnerships and public meetings. Our office is in Bard, surrounded by farmland. We and our staff are always assessible while working at various locations or at the office.

Striking a regulatory balance:

We primarily work together to support our community, our lifestyles, and our resources. Our only regulatory challenges are the environmental compliance requirements for projects, but most of our project areas are farmland and already disturbed. Watershed areas, drainages, and washes form a buffer zone and are not utilized or developed.

Modernizing our infrastructure:

We are diligently pursuing all funding opportunities to improve and maintain our antiquated system. This has included our water users’ contributions. Our only limiting factor for is funding (50% march) because these projects are quite costly. Improvements to our infrastructure have been based on priorities established by the BOR and BWD during their site visits and evaluation of our systems. We have utilized their technical guidance for this project for engineering design and construction. We currently utilize an O & M Agreement established between the BOR and BWG to maintain and operate both the Bard and Indian Units. This is implemented on a yearly basis.

2. Project Budget

Funding Plan and Letters of Commitment

2.1 Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the required Federal funding (41%)	\$75,000
Costs to be paid by BWD (59%)	\$107,927
Value of third-party contributions	\$0
TOTAL PROJECT COSTS	\$182,927

59 % Bard Water District – In-kind Contributions		41% Federal Share	
100% Labor and Fringe	\$18,441		
All Equipment Except Trencher	\$30,630	Trencher	\$46,750
All Materials and Supplies Except Concrete	\$ 7,976		
Concrete (Out of \$37,500)	\$ 9,250	Concrete	\$28,250
Engineering/Design	\$24,000		
Indirect Costs	\$16,630		
Other: Env, Compliance	\$ 1,000		

This in-kind and cash contribution will be provided by the Bard Water District. We will utilize our staff and heavy equipment. Bard will prepare the site, provide support during installation and construction and remove debris and material at completion.

2. Project Budget (continued)

2.2 Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	\$/Limit	Quantity		
Salaries and Wages				
Project Manager	\$48.83	60	HRS	\$2,930
Equipment Operators (2)	\$19.34	140	HRS	\$5,415
Laborers (2)	\$13.28	60	HRS	\$1,594
Administrative Asst.	\$24.31	12	HRS	\$292
Subtotal Salaries and Wages			HRS	\$10,231.00
Fringe Benefits				
Project Manager		49.70	%	1,456
Equipment Operators (2)		102.25	%	5,537
Laborers (2)		61.60	%	982
Administrative Asst.		80.54	%	235
Subtotal Fringe				\$8,210.00
Equipment (Bard Water District)				
Front End Loader CAT 938G	\$150.00	50	HRS	\$7,500
Rubber Tired Excavator CAT M318F	\$155.00	22	HRS	\$3,410
Trencher	\$22.00	2,125	LF	\$46,750
Dump Truck – Kenworth	\$135.00	60	HRS	\$11,510
Water Truck – GMC	\$85.00	24	HRS	\$2,040
Service Truck 1 Ton 2000 Ford	\$90.00	60	HRS	\$5,400
Project Manager Truck	\$35.00	22	HRS	\$770
Subtotal Equipment				\$77,380.00
Supplies and Materials				
Safety Supplies		1	LS	\$976
Fill Dirt	\$5.00	1000	CU YD	\$5,000
Concrete	\$100.00	375	CU YD	\$37,500
Forms/Traverse Structures	\$2,000.00	1	LS	\$2,000
Subtotal Supplies and Materials				\$45,476.00
Contractual/Construction				
Engineering/Design	\$24,000.00		LS	\$24,000.00
Other				
Env. and Regulatory Compliance				\$1,000.00
TOTAL DIRECT COSTS				\$166,297
Indirect Costs De-Minimus	10%			16,630
TOTAL ESTIMATED PROJECT COSTS				\$182,927.00

2. Project Budget (continued)

2.3 Budget Narrative

Salaries and Wages:

Project Manager: Ron Derma 60 Hrs @ \$48.83/Hr
Key Personnel: Equipment Operators (2) 140 Hrs Each @ \$19.34/Hr
Laborers (2) 60 Hrs Each @ \$13.28/Hr
Administrative Asst, 12 Hrs @ \$24.31/Hr

The Bard Water District certifies that the labor rates included in the budget proposal represent the actual labor rates of the identified personnel.

Fringe: Fixed rate for each employee category for all work done by Bard Employees.
See Budget Proposal on Page 11

Travel: No Travel Required

Equipment: Will use Bard equipment (Bard Schedule)
Front End Loader – site preparation and final cleanup, installation
Rubber Tired Excavator – site preparation and final cleanup, installation
Dump Truck – Haul away construction debris and material
Trencher – Excavate Prism
Water Truck – Dust Control
Service Truck – Used in support of Bard Crew on-site
Project Manager Truck – project management at site

Materials and Supplies:

Safety: Barriers, Level D Personal Vests, glasses, hard hats, gloves; Drinking Water
Concrete for Lining Canal
Fill Dirt to bring to required slope/grade
Forms/2 Transverse Joints/Structures for Concrete work

Contractual:

Engineering and design
George Cairo Engineering
Geotechnical Services, Inc.

Other:

Environmental Regulatory Compliance Costs: Verbal Quote from Yuma BOR
Earth disturbing activities done in partnership with BOR

Indirect Cost Rate: NO approved government rate so use De-Minimus on total Direct Costs

3. Environmental and Cultural Resources Compliance

3.1 Impact to Surrounding Environment

No significant impact, all earth-disturbing work will occur within existing canal and sidewalls.

3.2 Threatened or Endangered Species, or Designated Critical Habitat

This area is greatly disturbed and in constant agricultural use. There are no threatened or endangered species present or critical habitat.

3.3 Wetlands or Other Surface Waters (CWA – Waters of the United States)

There are no wetlands within the project boundary.

3.4 Water Deliver System Date of Construction

The Acoma Canal was constructed in 1940.

3.5 Modifications or Effects to Individual Features of a Delivery System (i.e., head gates, canals, or flumes)

There will be no effect on the existing delivery system.

3.6 Features in the Bard Irrigation District Listed or Eligible for Listed on the National Register of Historic Places

These include The All- American Canal, USBR Dams, Head Gates, and Retention Areas, Old Southern Pacific Rail Line and Bridges, Fort Yuma, Pothole, Petroglyphs.

3.7 Archaeological Sites in Proposed Project Area

There are no archaeological sites in the project area.

3.8 Disproportionately High or Adverse Effects on Low Income or Minority Populations

No disproportionally high or adverse effects on low income or minority populations.

3.9 16-Limit Access to and Ceremonial Use of Indian Sacred Sites or Impact on Tribal Lands

Not limit access to and ceremonial use of sacred sites or impact Tribal lands.

3.10 Contribution to Introduction, Continued Existence, or Spread of Noxious Weeds or Non-Native Invasive Species

This project will reduce noxious weeds and non-native invasive species.

4. Required Permits or Approvals

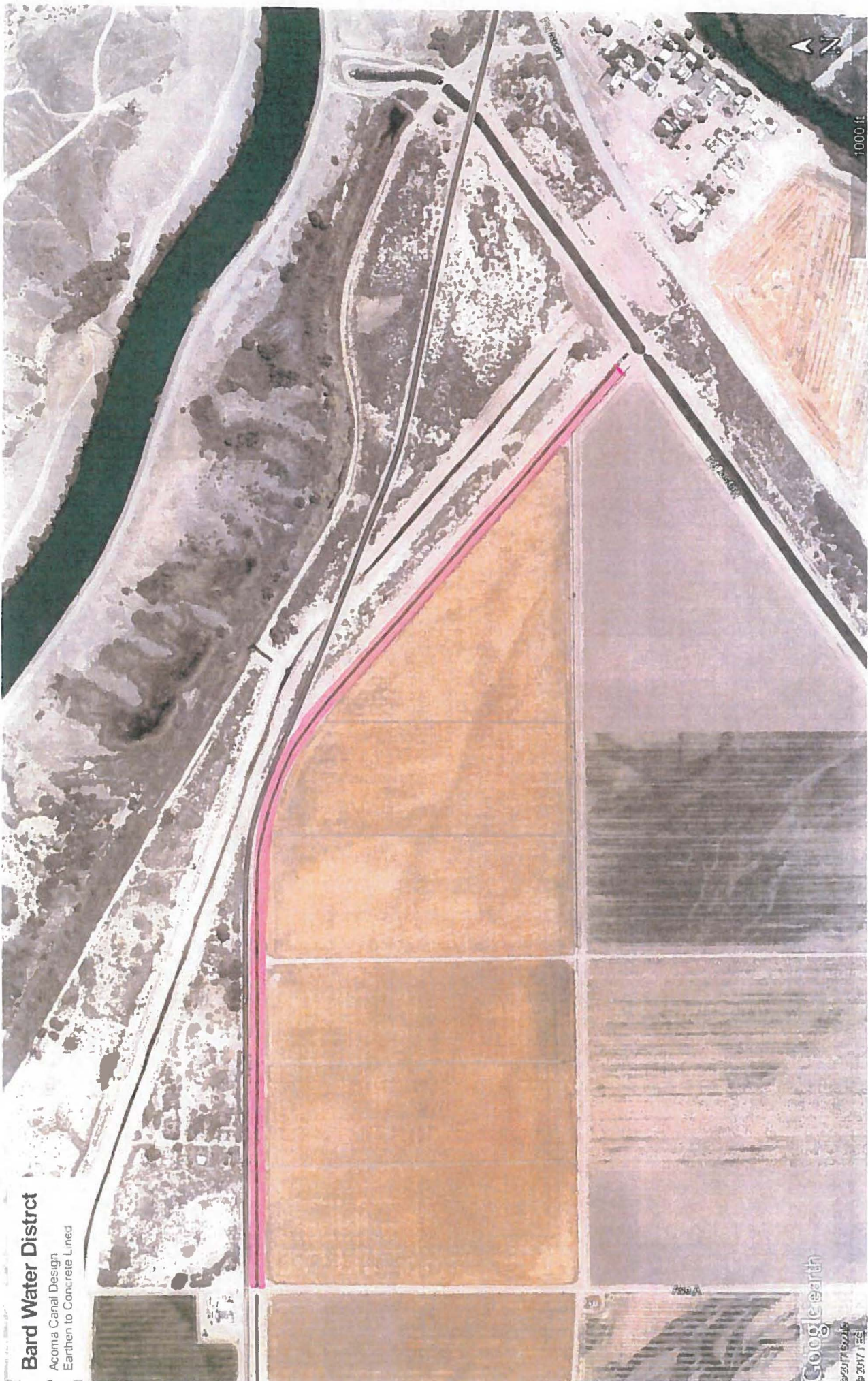
There are no permits or approval required for this project.

5. Official Resolution

Resolution will be provided within 30 days of this application submission.

6. Map





Bard Water District

Acoma Canal Design
Earthen to Concrete Lined

Google Earth

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6/2017 1:55

1000 ft