FEASIBILITY OF THE CRAWFORD FEEDER CANAL LANDSLIDE EMERGENCY WATERSHED PROTECTION PROJECT AND SCADA OPTIMIZATION

Sponsored by the Crawford Water Conservancy District in conjunction with the Colorado Water Conservation Board

May 2024

Feasibility Study Approval
Pursuant to Colorado Revised Statutes 37-60-121 & 122, and in accordance with policies adopted by the Board, the CWCB staff has determined this Feasibility Study meets all applicable requirements for approval.

Joshua Godwin
Digitally signed by Joshua Godwin
Date: 2024.10.29 19:34:57 -06'00'

Signed Date

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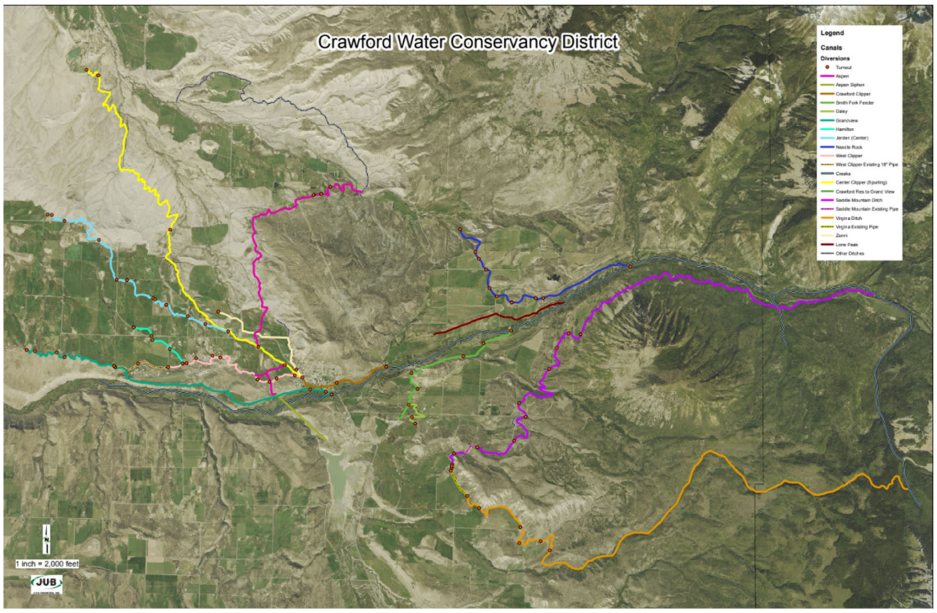
Appendix A: State of Colorado Statutes.

Appendix B: Ayres and Lithos Engineering Report.

Appendix C: CWCB Loan Application CWCB Portal

Appendix D: Financial Statements and Budgets: 2021 - 2023.

Background



Crawford Water Conservancy District was formed in 1957 as part of the Bureau of Reclamation's (BOR) federal Smith Fork Project. The Smith Fork Project was constructed by Reclamation as a participating irrigation project as part of the Colorado River Storage Project Act (CRSP, 1956). Revenues are collected in an annual fee assessment based on water shares and a small number of additional funds through a district mill levy.

The district operates and maintains the Smith Fork Project, which includes the Crawford Reservoir Dam. Its primary mission is to promote the wise use of natural resources to ensure a quality water supply for farmers and ranchers in the area.

The project utilizes flows from the Smith Fork, Iron, Muddy, and Alkali Creeks. CWCD operates and maintains two main canals:

- Aspen Ditch
- Smith Fork Feeder Canal

Additionally, the district supplies project water to six other private canals:

- Clipper Ditch

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- Grandview Canal
- Saddle Mountain Ditch
- Virginia Ditch
- Needle Rock Ditch
- Daisy Ditch

The project stores the water In Crawford Reservoir for these Canals and Ditches.

CWCD System Overview of Reservoir, Canals and Diversions

Crawford Reservoir

The Crawford Reservoir is an earth-filled dam 162 feet high and 575 feet long. The spillway, located on the left abutment, has a discharge capacity of 1,420 cfs. The reservoir has a storage decree of 14,395 acre feet and an active storage capacity of 14,064 acre feet. The Reservoir is located on Iron Creek and is filled from Iron Creek and Smith Fork Creek via the Smith Fork Feeder Canal. There are other miscellaneous seeps and minor drainages that can contribute to water to the reservoir.

Aspen Canal

The Aspen Canal is part of the Bureau of Reclamation's (BOR) Smith Fork Project. It is operated and maintained by CWCD. The existing Aspen Canal conveys Smith Fork Project water and direct flow decree water stored in the Crawford Reservoir to approximately 8,000 acres of agricultural land. The Aspen Canal has an approximate total length of 30,600 feet. The Aspen Canal is virtually all piped. The Aspen Canal has a capacity of 125 cfs.

Smith Fork Feeder Canal

The Smith Fork Feeder Canal is part of the Bureau of Reclamation's (BOR) Smith Fork Project. It is operated and maintained by CWCD. The Smith Fork Feeder Canal has an approximate total length of 13,260 feet. The Smith Fork Feeder canal is primarily an unlined open canal. However, the canal includes an inverted siphon crossing of the county road with 36" and 24" pipes. Additionally, there are concrete diversion structures on the canal for delivery of Daisy Ditch water through the canal. During high flows in the spring, a lot of runoff isn't able to be diverted through the Smith Fork Feeder to the Crawford Reservoir because of capacity restrictions.

Clipper Ditch

The Clipper Ditch System is composed of six (6) separate ditches, Main Crawford Clipper, Zanni, Center, Jerden, West Clipper and Hamilton. Sections of the Center, West Clipper, and Zanni have been piped. The table below contains approximate lengths.

Grandview Canal
The Grandview Canal is approximately 22,000 feet in length and has a capacity of 100 cfs.

Saddle Mountain Ditch
The Saddle Mountain Ditch is approximately 50,100 feet in length and has a capacity of 40 cfs. Approximately 1,100 has been piped.

Virginia Ditch
The Virginia Ditch is approximately 51,000 feet in length and has a capacity of 7 cfs. Approximately 2,200 has been piped.

Needle Rock Ditch / Lone Rock Ditch
The Needle Rock and Lone Rock Ditches have been combined. They now share a common headgate off of Smith Fork Creek, and water from the ditches is delivered via a common pipe. The pipeline is approximately 18,000 feet in length and has a capacity of 42 cfs.

Daisy Ditch
The Daisy Ditch is fed directly from the Smith Fork Feeder and is approximately 13,000 feet in length and has a capacity of 16 cfs.

Iron Creek and Aspen Control Houses
The Iron Creek and Aspen Control Houses are located at the Crawford Reservoir. They are used to control reservoir releases into Iron Creek and into the Aspen Canal, respectively. The outlet capacity to Iron Creek is 200 cfs, and the outlet capacity to the Aspen Canal is 125 cfs. These flows are controlled by four high-pressure gates.

Smith Fork Diversion Dam Structure
The Diversion Dam is located on Smith Fork Creek and forms the headgate to the Smith Fork Feeder Canal. The diversion structure stands about 10 ft above the streambed and has a crest length of 790 ft. The structure consists of a concrete ogee weir and embankment wings. The Diversion Dam is used to regulate flow into the canal and also manage debris. An on-site Supervisory Control and Data Acquisition (SCADA) system is used to control and to monitor flow into the Smith Fork Feeder Canal.

Kevin's Splitter Structure

Kevin's Splitter is a large diversion structure. Water flows into the structure from Crawford Reservoir via the Aspen Canal. From there, water can be diverted into the West Clipper, Center Clipper, Aspen Valley, and the downstream portion of the Aspen Canal. A SCADA system at Kevin's Splitter allows for off-site control and monitoring of flow. Power for the SCADA system is provided by solar cells and battery storage.

Grandview CHO Structure

The Grandview Constant Height Orifice (CHO) is a diversion off of the Aspen Canal to provide water to the Grandview Canal. The Grandview CHO also has a solar-powered SCADA system.

Zanni Diversion Structure

The Zanni Diversion delivers water from the Aspen Canal to the Zanni Lateral of the Clipper Ditch. A solar-powered SCADA system is on-site but is currently only used to monitor flow.

Water Sources: The Smith Fork Feeder Canal has absolute water rights for 150 cfs and a conditional water right of 50 cfs, for a total of 200 cfs out of Smith Fork Creek. The Crawford Reservoir does not have water rights for Iron Creek. However, the reservoir can be filled by Iron Creek if the creek is not on call.

Purpose of the Project

On December 4, 2024 the Crawford Water Conservancy District (CWCD) became aware of a landslide that had taken place on their Feeder Canal, carrying an average 32,000 Ac-Ft of water into Crawford State Park Reservoir for public recreation and the irrigation of over 10,300 acres of farmland and hayland in the North Fork Valley of the Gunnison River. On December 14, 2024 the CWCD Board of Directors held a special meeting to discuss alternatives that were brought forth from the Bureau of Reclamation (BOR) engineers who had come out to the site for an initial inspection.

Immediately the CWCD secured the landslide area by turning off the canal and contracted a construction firm to implement an emergency alternative through CWCD funding. The canal was surveyed, regraded and reconstructed to allow for better flow. CWCD then applied bentonite and compacted the canal to eliminate seepage in the landslide area. The canal was then re-opened to allow spring runoff water to once again fill Crawford Reservoir and supply irrigation and stock water to shareholders for the coming season.

Open channel flow measurements conducted by Ayres Associates in May of 2024 showed no significant water loss within the bentonite-lined canal. A geological study completed by Lithos Engineering in June of 2024 also confirmed the bentonite lining solution was effective, with no notable seepage occurring at the site. The same study found that the canal was originally installed in a geologic area prone to landslides due to the Mancos Shale layer and a recent landslide had occurred adjacent to this current one in the timeframe between June 2016 – August 2019, no specific date is known.

This proposed landslide stabilization project aims to secure the slide area and prevent further disturbances. The chosen design will stabilize the region to a sufficient factor of safety via buttressing, providing temporary stability until the recommended long-term solution of underground piping can be funded and implemented. The CWCD is currently working with the Bureau of Reclamation (BOR) on an MOA application to enclose the earthen canal into pipe, this would be a second phase in the next year or two and utilize BOR funding. While piping the feeder canal is highly preferred, it is not required – the buttress alternative by itself achieves the target factor of safety, 1.3.

This emergency landslide work is needed to safeguard lives and property from an imminent hazard of loss of irrigation water to over 10,000 acres in the North Fork Valley of the Gunnison River and the loss of water for the public that utilizes Crawford Reservoir in Crawford State Park.

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Commented [MS7R6]: Include requested loan amount.

Commented [MS8R6]: Describe what work will be accomplished with the loan funds, particularly that this is a partial solution proposed by the consulting engineering team. You also need to address the current plan for the remaining work to secure the landslide formation portion of the canal (piping).

Commented [MS9R6]: Describe the other funders and funding amounts involved in the project

Commented [MS10R6]: Include a history of the landslides in this area, the currently understood reason(s) for it, and the potential for future landslides until the full engineering solution is implemented.

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The CWCD is asking for $300,000 in CWCB loan funds to support costs for final engineering, design, construction and certification services to stabilize the landslide area and potentially facilitate clean-up of the canal and restoration. These funds would be utilized to help with up-front project costs, while waiting for NRCS project reimbursement. An additional Emergency Community Funding Partnership grant of $121,687 was awarded from the Colorado River Water Conservancy District to support landslide bank stabilization and rehabilitation.

Project Sponsor

The CWCD was created on May 31, 1957, by legal decree in District Court as part of the Water Conservancy and Irrigation Districts and operates under the 1953 Colorado Revised Statutes, Section 1, Section 17 of Article 6, Chapter 149.

The district can deliver up to 32,000 acre-feet of water per year from the Smith Fork drainage and Crawford Reservoir to downstream water users in the CWCD service area through the Aspen Canal. The CWCD has 225 water users and provides supplemental irrigation water supplies for approximately 8,200 acres and full water supplies for 1,423 acres in Delta and Montrose Counties. Residents located in the CWCD, from south of Crawford directly north and west towards the Town of Hotchkiss. The district service boundary ends approximately 4 miles south of the Town of Hotchkiss on Spurlin Mesa Road at Highway 92 and Fobare Road (end of the project) at Crawford Road. The area consists of livestock production and primary crops grown include alfalfa, grass hay, pasture, barley, oats, wheat, and corn. There are also limited fruit orchards, wine grapes, and related niche crops.

Approximately 90% of the CWCD's Revenue is collected from the 225 shareholders on a fee per share basis. The remaining 10% of revenue is collected through individuals living in the CWCD taxing mill levy area from Delta and Montrose Counties.

Commented [MS18]: What statute was the district created under?

Commented [MS19R18]: What year was it formed?

Commented [MS20R18]: How many individuals (or farms) are served by the district?

Commented [MS21R18]: Is there any potential for expansion of the acres irrigated? If any acreage is dried up, can the water be used on new land or must it be used on currently irrigated land?

Commented [MS22R18]: Provide a history of the district.

Commented [MS23R18]: Describe the revenue sources for the district and who collects those various revenue sources.

Commented [MS24R18]: Provide an overview of the entire system that the district manages and/or owns - water sources, diversion structures, ditches, storage, regulating reservoirs, etc.

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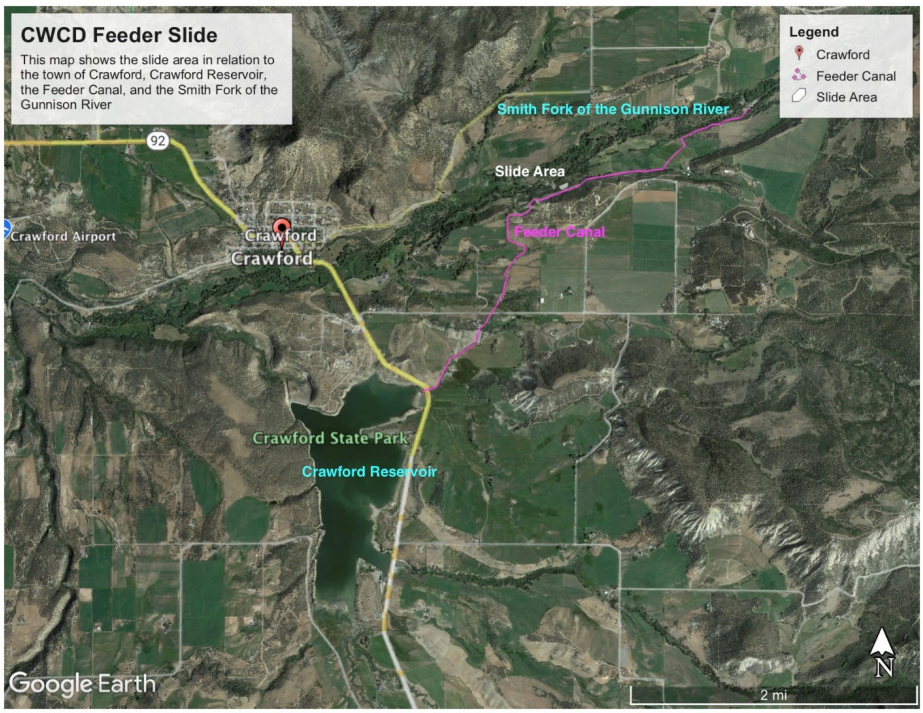
Project Service Area

Crawford Water Conservancy District services parts of both Delta and Montrose Counties. The District resides in Delta County, located on Colorado's western slope at the base of Grand Mesa, the largest flat top mountain in the world. Agriculture constitutes about 36 million in GDP for Delta County.



Commented [MS27]: Include a narrative that covers the county/counties served by the district, towns and cities that the project supports, general description of the topography and soil types including highlighting the area currently prone to landslides), current cropping patterns, and current crop yields. Also cover the service area population, general employment information, and major land uses.

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Water Rights

Historical Ditch Water Rights

Adjudication Date: 1/31/1964, 12/31/1981

Appropriation Date: 9/3/1946, 12/10/1978

Priority Admin No.: 38064.35309, 47847.47095

Priority No.: K79

CFS: 85.62, 64.38 Total: 150 CFS

Case No.: CA4808, 81CW0074

Reservoir Water Rights

Adjudication Date: 1/31/1964, 8/11/1969

Appropriation Date: 9/3/1946, 9/3/1946

Priority Admin No.: 38064.35309, 41668.35309

Priority No.: K78, L40

Ac-Ft: 13,650, 745 **Total: 14,395 Ac-Ft**

Case No.: CA4808, CA5873

In 2023, the CWCD Board authorized a feasibility study to ascertain the lost storage water due to the canal limited structural capabilities. Operationally, it was found that increasing the capacity of the canal would benefit the entire system based on the current practice of system ditches delaying their start-up date to allow more water to be stored in Crawford Reservoir.

The CWCD would like to be able to capture as much spring runoff as possible when available which could potentially allow for ditches in the system to begin diverting earlier according to their rights. Another potential approach to increasing the amount of water captured is to address the seepage that occurs during winter flows. Specifically, the wide earthen canal experiences greater losses when it carries only 5-15 cfs between November and April. Assuming approximately 20%, or about 2 cfs, is lost due to seepage throughout an average winter, the

Commented [MS29]: Is this just for the feeder canal? If so, are there other water rights the district owns?

Commented [MS30R29]: Need annual flow information, average monthly flows.

Commented [MS31R29]: Need the district's amounts of decreed rights (CFS) for the canal, and storage rights (ac-ft) in the reservoir. Also, need appropriation date, adjudication date, water court case number, flow rate, etc. for the new water right (increase to 200 CFS) that was recently acquired.

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equivalent amount of volume associated with this flow rate over those months is 600 ac-ft. By piping in the future these losses can be captured.

Based on this data the CWCD filed for an additional 50 CFS water right with the State of Colorado.

NEW Ditch Water Right

Adjudication Date: 12/31/2023

Appropriation Date: 11/22/2016

Priority Admin No.: 63187.60957

CFS: 50 **Total: 200 CFS**

Case No.: 23CW0037

Project Description and Alternatives

This landslide rehabilitation is a part of a solution to address concerns arising from two recent landslides on the slope below the Smith Fork Feeder Canal. Aerial imagery indicates the first one occurred between 2016 and 2019 and the second in 2023. The first landslide was undetected by the CWCD and did not disrupt operations and water supply. It is believed that seepage and freeze and thaw mechanisms for winter stock-water, in combination with low existing soil stability in the area, contributed to the slope failure. The CWCD regraded, lined and compacted the canal with bentonite in January 2024 to reduce seepage; however, the lining is not a full proof solution to prevent future seepage.

The CWCD already had a BOR-MOA application into piping the canal prior to the landslide emergency. This pipeline would provide a long-term solution to address the seepage potential in the future. This would involve constructing a 63" pipeline to convey the 200 cfs flow through the area identified as having a high risk of landslides. The CWCD is working closely with the BOR to get this pipeline project constructed in the next three years, project preliminary estimates are 8 – 14 million dollars.

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Commented [MS34R33]: I'd also like this section to have information about the piping option from Ayres as the engineers see this as critical, but that the district is not using this loan to fund. Since that is a critical piece of the engineered solution, you must identify it and provide a description of how you plan to accomplish that, including the timing.

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Existing Slope Stability

Based on geotechnical research the entire 4000' segment of the canal has been constructed through a historic landslide. Lithos Engineering based their analysis on site observations, the presence of the historic landslide, erosion of the toe of the historic landslide and recent landslides by the Smith Fork River. Tension cracks were observed along the two-track maintenance road. Lithos has judged the overall slope stability ranges from very unstable to marginally stable.

Slope Stability Mitigation Alternatives

Lithos has considered numerous alternatives for stabilization of the subject landslide failure at the site. They identified potential landslide mitigation alternatives for the subject landslide and noted the importance of a long-term solution of future piping as the best alternative. The Lithos Engineering recommendations are listed below.

Buttress at Landslide Toe considerations:
Constructing a buttress at the toe of the landslide can be utilized to stabilize the subject landslide; this alternative would increase the resisting forces to sliding, thus raising the overall factor of safety. A coarse, angular, granular material is typically used to buttress landslides and would typically consist of cobble and boulder sized materials which have high internal strength and free draining properties. The Ayres Associates CWC Landslide Repair Page 5 of 17 primary consideration for construction of a buttress would be material sourcing, trucking and placement costs, site access, and permitting and easement considerations. We are confident that a properly design and constructed buttress would stabilize the subject landslide and should be considered in conjunction with the piping of the canal, however, the District must consider that other portions of the canal located within the historic landslide still pose significant risk of future failure from other landslides.

Tie-Back Anchors considerations:
Tie-back anchors can be utilized to mitigate the subject landslide. Tie-back anchors could consist of either steel tendons or multiple cable strands that are installed at a specific angle relative to the slope, grouted, and post-tensioned. The tie-back anchors would increase the resisting forces to sliding, thus raising the overall factor of safety. Either a shotcrete facing or concrete anchor blocks would be required to make the system effective and are typically installed on the slope face to provide a reaction to the slope surface when post-tensioning the strands or tendons. Consideration will be given to the out-of-plane spacing and concrete block sizes such that local

failures or flowing of soil do not occur in between tie-back anchors. Access to the slide area would need to be improved and permitting and easement considerations would need to be considered for tie-back anchor installation. Local grading and benching would likely be needed to reach higher elevation tie-backs. Equipment and material laydown areas require considerations for storage of anchors, blocks, and grout materials. Tie-back installation and slope facing will require additional clearing and grubbing on the subject landslide in comparison to buttressing. We are confident that a properly design and tie-back anchor system would stabilize the subject landslide and should be considered in conjunction with the piping of the canal, however, the District must consider that other portions of the canal located within the historic landslide still pose significant risk of future failure from land sliding.

Piped Canal considerations:
Seepage from the canal into the slope is a significant contributing factor to localized slope instability at the subject landslide and for the entire canal constructed through the historic landslide. Eliminating seepage from the canal will improve the overall slope stability at the subject landslide, the recent landslide to the west, and reduce risk of future slides developing within the historic landslide. Various piped options are available for raw water supply conveyance and the general configuration could be modified to flatten the overall slope by placing the maintenance road on top of a buried, piped canal. We recommend the district consider not just piping the canal through the area of the subject landslide and other recent landslide, but consider piping the ditch for the entire, approximately 4,000 feet, across the historic landslide. Pipe type alternatives and cost and schedule impacts of placing the canal in a pipe are discussed in the Ayres Associates memorandum submitted in tandem with this memorandum.

Design Parameters

All construction plans (engineering deliverables) and construction practices will need to meet NRCS standards.

Preliminary Design Factors of Safety

The software utilized by Lithos Engineering analyzes the resisting forces against the driving forces for a range of user defined slip surfaces to determine a slope stability factor of safety; a factor of safety of less than one would represent an actively failing slope.

As part of the analysis, a back calculation was performed to determine the strength parameters of the in-situ material. A back calculation is performed by adjusting the soil strength parameters

until the resulting slope failure closely matches the observed failure geometry. Back calculation served as the basis for preliminary analysis of the feasible slope stability mitigation alternatives, for which the resultant factors of safety are presented below in Table 1.

Additional stability analyses are being completed based on soil borings conducted on June 10th and lab testing is being conducted to determine soil strength parameters. For reference, target factors of safety of 1.3 were utilized for a long-term slope stabilization alternatives (FHWA, 1999).

Table 1 - Feasible Slope Stability System Factors of Safety

Load Case	Factor of Safety Non-Piped Canal	Factor of Safety Piped Canal (Seepage through Slope Eliminated)	Target Factor of Safety
Existing Subject Landslide (Back Calculation Analysis)	≤1	≤1	1.3
Alt. 1 - Existing Global Stability at Subject Landslide	1.09	1.18	
Alt. 2 – Buttress at Landslide Toe	1.31	1.38	
Alt. 3 - Tie-back Anchors	1.30	1.57	

Alternatives

1. No Action Alternative – sustain the bentonite compacted liner the CWCD has put in place with no further stabilization mitigation
2. Buttressing Alternative (with and without Piping)
3. Tie-Back Alternative (with and without Piping)

Alternative No. 1 is an emergency solution to transport water for the current 2024 season. This "No Action" alternative was considered unacceptable due to future damage that could occur by not fixing the problem for shareholders, downslope property owners, and the public who utilizes Crawford State Park. Based on recent landslide activity and site observations including the presence of tension cracks along the two-track maintenance road, overall slope stability along the canal has been classified as very unstable to marginally stable. If no action is taken, landslides in the area will likely continue. Over time these landslides may not only damage the road but also threaten the integrity of the canal.

Alternative No. 2 involves constructing a buttress at the toe of the landslide to increase the resisting forces to sliding and raise the overall factor of safety. This buttress would be built using a coarse, angular fill made up of cobble- and boulder-sized materials to provide high internal strength and adequate drainage capabilities. A piped solution could be implemented with this design, which would help improve long-term slope stability by reducing seepage from the canal. However, the non-piped version of this alternative was preferred due to funding considerations. The NRCS will only allocate funds for emergency programs to secure the existing landscape. They

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Commented [MS41R39]: Provide cost information for each of these alternatives.

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Commented [DA44]: Expand on this with geotech information that the current canal is at risk?

will not put funds for future infrastructure projects through this program. The buttressing would be considered Phase 1 and the CWCD would later follow-up with the installation of underground pipeline through this landslide area. Ultimately, CWCD has chosen the engineers' preferred design but in a staged manner as their financial situation allows.

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Alternative No. 3 uses tie-back anchors, consisting of either steel tendons or multiple cable strands, that are installed at a specific angle relative to the slope, grouted, and post-tensioned. Tie-back anchors increase the resisting forces to sliding, leading to a higher factor of safety. This alternative is inherently more expensive than the buttress option due to higher construction and upfront material costs. Similar to Alternative No. 2, this design could implement a piping solution to further increase long-term slope stability. This alternative was not selected due to cost considerations.

Alternative Selected

In discussion with the NRCS and what their funding will allow under the Emergency Watershed Protection Program the CWCB Board is going with the Buttressing alternative presently to secure the slope, this will be Phase 1. Ultimately, Piping is the preferred option, and the Board is working with the BOR to complete this alternative in the next couple of years and will be Phase 2.

Buttressing – Updated Cost Estimate

Project Bid Number	CDOT Description	Unit	Unit Cost $	Estimated Quantity	Engineers Estimate	General Notes
001	Mobilization	LS	50,000.00	1	50,000.00	Mobilization/demobilization for one construction cycle
002	Clearing and Grubbing	Acre	5,000.00	1.5	7,500.00	Landslide area and potential staging area clearing veg and shrubbery
003	Erosion Control and Management	LS	8,000.00	1	8,000.00	SWMP plan, permitting and installation of control measures off site and into canal
004	Rock Fill (Special)	CY	130.00	500	65,000.00	Base material - complete in place
005	Embankment Material (Complete In Place) (Special)	CY	120.00	2000	240,000.00	Angular, gravel fill material - complete in place. Includes excavation, compaction, material harvest and transport
006	Temporary Stream Crossing	LS	5,000.00	1	5,000.00	Installation and removal for access across feeder canal to staging area
007	Traffic Control (Special) LS	LS	3,000.00	1	3,000.00	Signage needed for haul route and truck traffic direction
008	Sanitary Facility	EACH	5,000.00	1	5,000.00	Sanitary facility including maintenance
009	Construction Surveying	LS	3,000.00	1	3,000.00	Slope verification as needed
010	Equipment	Day	4,500.00	60	270,000.00	Includes loader, excavator, SKID steer - with fuel and operators
011	Haul Road	LS	50,000.00	1	50,000.00	Road repair, temporary construction access and removal, and seeding
					706,500.00	
				Contingency +25%	176,625.00	
				Opinion of Cost	**$883,125.00**	

Alternative 3. Tie Back Anchors

Task #	Task	% of Subtotal	Unit	Quantity	Unit cost	Total
1	Mobilization/Demobilization	2%	LS	1	$ 25,000	$ 25,000
2	Equipment	23%	Day	102	$ 3,000	$ 306,000
3	Site Preparation	8%	LS	1	$ 100,000	$ 100,000
4	Materials (Tiebacks, Concrete Block Facing)	48%	SF	3333	$ 190	$ 633,333
5	Labor	18%	Day	102	$ 2,250	$ 229,500
6	Construction Staking, SWPP, SUE	1%	LS	1	$ 15,000	$ 15,000
		100%			Task Subtotal	$1,308,833
				8%	Overhead	$ 104,706.67
				5%	Fee	$ 65,441.67
				2%	Bond	$ 26,176.67
				5%	Markup	$ 65,441.67
				50%	Contingency	$654,400
					Opinion of Cost	**$2,225,000**

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Implementation Schedule

Ayres Engineering has started the design of the selected alternative, with preliminary plans being distributed on August 26th. Final construction bid documentation will be completed by early-September, and the bidding and contracting phase will occur in mid-September. Construction on the landslide stabilization is expected to begin by November 28th, 2024 (Thanksgiving Day) and be completed by December 31st barring any weather delays. If construction is paused or delayed due to inclement weather, the canal will be left in a fully operative state. Recent seepage mitigation efforts have ensured that the current global stability at the landslide site is sufficient (factor of safety >1) to carry peak spring runoff until work can continue. Construction should be resumed as soon as possible following any delays to reduce the risk of slope failure.

Permitting

The CWCD has legal easements and BOR owned Right – of - Way for the Feeder Canal to Crawford Reservoir. CWCD has spoken with landowners for potential ROW conflicts, all potential conflicts will be resolved prior to construction. Additionally, USDA-NRCS has cleared the project for NEPA Compliance and the Cultural Resources through the State Historical Preservation Office by submitting a CPA-52 Environmental Evaluation Worksheet. This form, which has been signed by the State Conservationist as of September 2024, clears the project for all wetland, cultural resource, and habitat related criteria. If the project exceeds one acre of disturbance, then a CDPHE stormwater construction permit will be required prior to construction starting. Fill material is expected to be sourced and permitted through the county. Alternatively, if the source material does not meet the necessary criteria, local permitted quarries will be utilized.

Institutional Considerations

Entities that are, or may be, involved in the design, construction, and financing of the project include:

Crawford Water Conservancy District; financing and project management. CWCD has hired Ayres Engineering for Design and NRCS to oversee construction.

Colorado Water Conservation Board (CWCB); Natural Resource Conservation Service (NRCS); Colorado River Water Conservation District (CRWCD); financing and construction.

The CWCD will be the lead for the financing, design, and construction of the project and will be the entity entering into contracts and agreements with the various entities for the services provided by each.

Commented [MS46]: Winter weather is a major concern - how does that factor into the implementation schedule. What happened if the project needs to stop between November and the spring? Is there a point where the entire project will be postponed to the spring?

Commented [MS47R46]: This section needs to identify the current time frame for completion of the final design. Additionally, since this is time sensitive, I want to see the bidding and contracting timeframes included to show that the schedule is reasonable.

Commented [DA48R46]: I made a new schedule we can include that has this information. However what is plan B if weather does delay? No one wants to answer this. I think we can construct during canal operations if it comes down to it.

Commented [DA49R46]: From CWCD - likley Thanksgiving for start time, what does schedule look like if pushed back.

Commented [RR50R46]: Added mention of Thanksgiving start time

Commented [DA51]: Revise statement for clarity

Commented [RR52R51]: Done

Commented [MS53]: What construction permits are needed? Stormwater, etc? Who is responsible for getting those? Is there a cost? Is there potential for wetland impacts (404 permit) related to construction access?

Commented [MS54R53]: Where is the fill material coming from? Is there any permitting around that?

Commented [DA55R53]: Need to follow up with construction team here.

Commented [DA56R53]: No wetland impact, Fill material does not need a permit.

Commented [DA57R53]: Over an Acre of impact will require a general construction permit, this will be obtained by contractor.

Commented [RR58R53]: Added

Commented [MS59]: I need a writeup about TABOR impacts, particularly the limit of increased tax/ fee revenue without voter authorization.

Commented [MS60R59]: I also need something about how cost increases could impact TABOR and wha ... [1]

Commented [MS61R59]: Does the River District grant cause TABOR issues?

Commented [MS62R59]: Where are we with the preliminary bond counsel opinion?

Commented [DA63R59]: Shana has been talking with Matt Sterns about this.

Tabor considerations have been considered working with the CWCD Attorney concerning the amount of debt that can be accrued. A letter is attached in the Portal.

Financial Analysis

Several entities will be involved in financing the estimated total project cost of $883,125. The CWCD is applying for a loan from the CWCB in maximum amount of $300,000 for the loan and a maximum amount of $400,000 for loan fees and interest, to accommodate the upfront project costs and increases that may occur in the construction time. The CWCD will need to cover any costs that exceed the estimated project cost.

Approximately 90% of the CWCD's Revenue is collected from the 225 shareholders on a fee per share basis. The remaining 10% of revenue is collected through individuals living in the CWCD taxing mill levy area from Delta and Montrose Counties. Current Assessment fees can be raised as needed to facilitate loan repayment and the mill levy can be raised as TABOR allows annually at 3.4%.

CWCD is bringing a ballot measure to the voters in the special district in October 2024. To allow the district to raise the borrowing debt amount to $1,000,000 and the fees and interest to $1.8 million.

The actual or estimated amounts by entity are given in Table 6.

Table 3: CWCD Database for Reservoir Water Orders:

Number of shareholders	225
Number of shares of stock	10,896
Current Assessment per share	$ 9

Table 4: Delta County CWCD Mill Levy (0.424) (2023)

Number of shareholders	996
Assessed Valuation	$17,535,614
Total Revenue	$7,435

Commented [MS64]: Provide a table showing funding entities and amounts, and whether they are secured or pending.

Commented [MS65R64]: Describe interest in using some CWCB loan funds to cover NRCS grant amounts. Since the loan is less than the grant amount, cove, how the district intends to pay the contractor in a reasonable time or include language that will be used in the construction contract to provide protection for the district.

Commented [SH66R64]: On page 21

Commented [MS67]: How exactly?

Commented [SH68R67]: Done

Table 5: Montrose County CWCD Mill Levy (0.424) (2023)

Number of shareholders	38
Assessed Valuation	$513,900
Total Revenue	$ 218

Table 6. Funds applied by Entty

Funding Source	Funded Amount
USDA-NRCS Water Management Entity (EWP)- Funded	$662,344
CRWCD Community Funding Partnership (CFP)- Funded	$121,687
CWCB Loan Ask	$300,000
TOTAL	**$1,084,031**

The CWCD is requesting a 27-year loan from the CWCB. These funds would be utilized to help with up-front project costs, while waiting for NRCS project reimbursement. The standard agricultural lending rate would be 2.10%, resulting in annual interest payments of $6,300. Table 7 is a summary of the financial aspects of the project. An increase in annual assessments has been approved by the board on September 4, 2024, from $9 per share to $14 per share.

Commented [MS69]: Include requested loan amount and any district cash contributions.

Commented [SH70R69]: District will provide "in kind" with staff managing project. Do you want these quantified?

Commented [DA71]: 27-year loan , 2.1% rate

Commented [RR72R71]: Shana to add more details about funding

Table 7. Financial Summary

Project Cost	$883,125
Loan Amount	$300,000
CWCB Loan Amount including 10% loan reserve	$300,000
Number of shareholders	225
Number of shares of stock	10,896
Current Assessment per share	$9
Future Assessment of share	$14

Since all other funding for the project is in the form of grants, the Company would have no other debt service on this project.

Credit worthiness

CWCD has no existing debt. The Board has voted this year to raise 2025 Assessment Rates from $9 to $14 per share. Rates had been at $9/share for many past years. The Mill Levy will also be increased in 2026 to the maximum allowed under our current vote allocation. Rates are generally set to cover anticipated annual operating costs and develop reserve cash for the coming year. Financial Summaries attached and indicated average to strong ability to repay the project.

(Please see financial statements)

Alternative financing considerations

CWCD has obtained grants from the NRCS and CRWCD for combined total grant income of $784,031 in cost share (grant) to cover 94% of the construction costs. The CWCD attorney has concurred that CWCD is allowed to take on the debt of $300,000 as voted upon in 2019 and a future ballot consideration of $1,000,000 is being presented in the October election.

Commented [MS73]: Does the district have any other alternative if TABOR issues preclude us from participating in the project at this time?

Commented [SH74R73]: We have a letter from the attorney attached in the portal

Commented [DA75]: Mention the maximum of 400,000 in relation to the 27-year loan.

Commented [DA76R75]: Also mention ballet measure from 300,000 to 1million

Commented [RR77R75]: Shana to add this

Collateral

As security for the CWCB loan the CWCD can pledge assessment income. The CWCD does own the building and land it operates from at 183 Highway 92 in Crawford.

Commented [MS78]: As a district I don't believe the district can pledge real property as collateral. In this case, what is the existing infrastructure? Is it the canal (isn't that owned by the Federal government?) or the buttress fill?

Social and Physical Impacts

This work is needed to protect economic livelihood from an imminent hazard of loss of irrigation water to over 10,000 acres in the North Fork Valley of the Gunnison River and the loss of water for the public that utilizes Crawford Reservoir in Crawford State Park. The CWCD is asking for support to stabilize the landslide area, as it is currently at risk of failure due to unstable soils and frequent seepage through the canal.

Commented [MS79]: I don't believe lives or property are at risk if the canal collapses. I do think it is reasonable to say that a significant number of livelihoods in a agriculturally driven local economy are at risk though.

Commented [SH80R79]: There our houses downslope that will be affected if the canal fails and the water floods them out

Commented [DA81R79]: For the landslide area there is no risk to property. Comment can be resolved by simply leaving at the economic lively hood comment. Could pull some verbiage from Geotech report about the canal currently being at risk.

Conclusions

1. The Crawford Water Conservancy District is a Special District in the State of Colorado with the ability to enter into a contract with the CWCB for the purpose of obtaining a loan.

2. BOR owned Rights-of Way are deeded, established easements for the construction of this project adjacent to the canal. The landslide rehabilitation project is on private property and permission has been obtained from the landowner.

3. The project would provide for the continued delivery of stored irrigation water to 225 shareholders.

4. The total estimated cost of the project is $883,125 and this will be financed, in part, by in-house financing and grants totaling $784,031.

5. The project is technically and financially feasible.

Commented [MS82]: Right of way is a specific type of easement. Which do you mean? Also, are the easements prescriptive or deeded. We will likely require that the easements are formalized (deeded) before disbursement of loan funds, but we can discuss that since it is a unique situation.

Commented [SH83R82]: addressed

Commented [MS84]: Stored water correct?

Commented [SH85R84]: Yes, added stored to text