



Design of Kingman Lateral Sta. 0+00 to Sta. 58+80



Table of Contents

Problem Statement	3
Executive Summary	3
Project Location	4
C.1.2.2. Technical Project Description	6
Evaluation Criteria	6
Work Plan and Schedule	7
C.1.2.3. Project Budget	8
C.1.2.4. Environmental and Cultural Resources Compliance	10
C.1.2.5. Required Permits or Approvals	11
C.1.2.6. Overlap or Duplication of Effort Statement	11
C.1.2.7. Uniform Audit Reporting System	12
C.1.2.8 Letters of Support and Letters of Partnership	13
C.1.2.9. Official Resolution	16
Appendix A (SIP pg. 14)	17
Appendix B (SIP pg. 44)	18
Appendix C (SIP pg. 45)	19
Appendix D (SIP pg. E-1)	20

Problem Statement

OID is seeking to pipe the first ~5,800ft of the Kingman Lateral due to slope instability and water losses. Most of the funding for the project of constructing the pipeline has been secured through direct appropriations via the FY2023 omnibus spending bill’s community directed project funding. The remaining funds are being sought from the state of Oregon through various programs. However, these programs have a high bar for project design. OID typically does pipe design in-house with OID staff, but OID does not a licensed engineer on staff to meet the requirements. This design project will allow OID to hire an engineer to design plans for the construction project. The design of the construction project would allow for a more efficient use of the Owyhee Project water supply by saving the seepage and will provide slope stability to ensure the delivery of water to the water users on the Kingman Lateral system.

C.1.2.2. Technical Proposal Content

The technical proposal and evaluation criteria (10 pages maximum) include:

- (1) Executive summary
- (2) Project location
- (3) Technical project description
- (4) Evaluation criteria

(1) Executive Summary

15 December 2022

Owyhee Irrigation District

422 Thunderegg Blvd

Nyssa, Malheur County, OR 97913

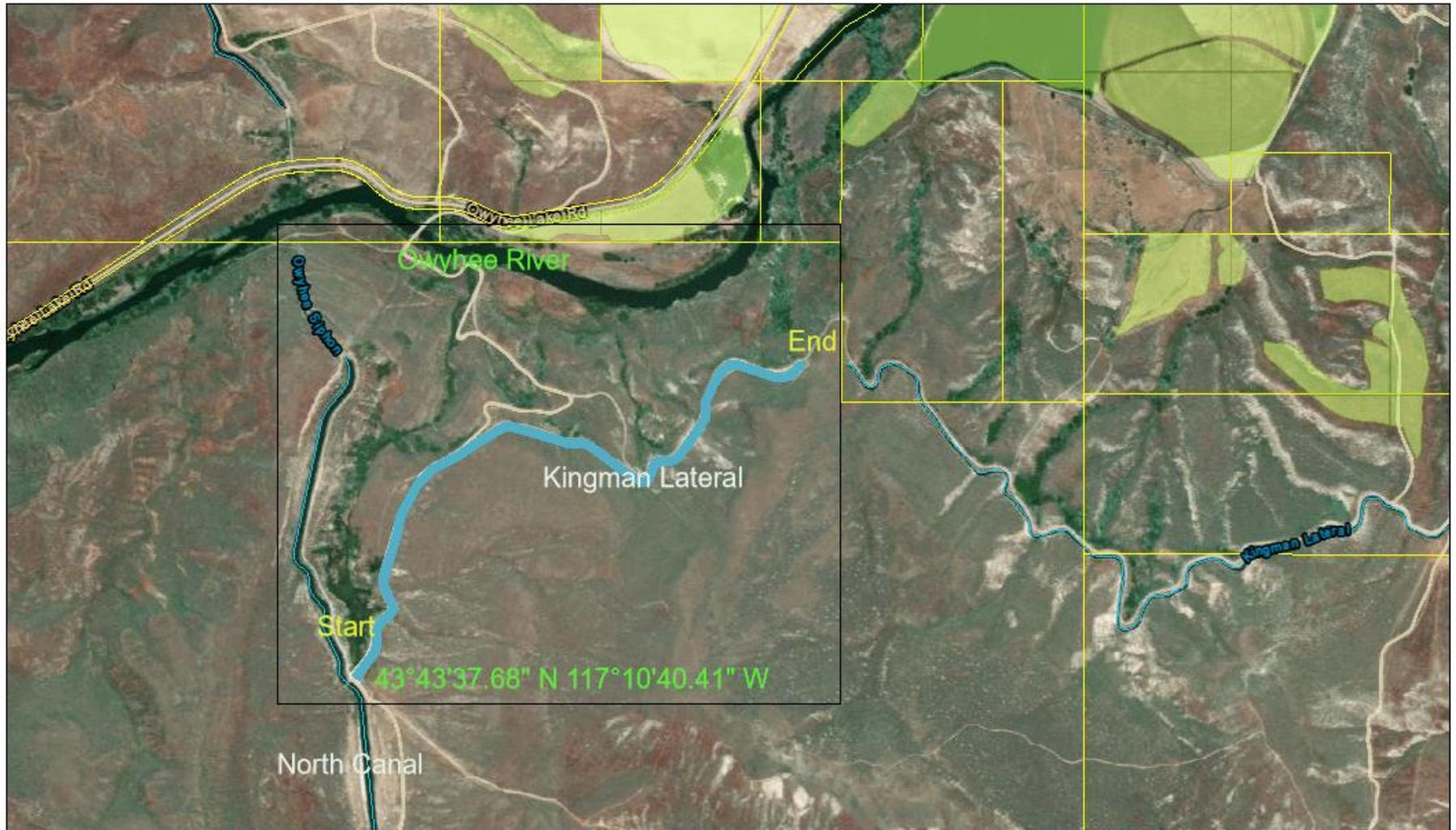
The project is the design for piping of 5,880 ft of open canal, and design of the inlet and outlet structures. The Kingman lateral is the first major sub-lateral of the North Canal, OID’s main canal, and has a maximum diversion of 125 CFS. With an anticipated award notice in spring 2023 the project will be complete by July 2023. This project is located on a federal facility that is operated by the OID under a transferred works contract with USBR.

North Canal Addition of Automated Check at 32.2mi (R22AS00195)

(2) Project Location

The coordinates for the project are 43°43'37.68" N 117°10'40.41" W, as the crow flies 13.7 miles southwest of the OID office at 422 Thunderegg Blvd Nyssa, OR 97913.

Kingman Lateral Project Area



12/14/2022, 8:34:24 AM

- World Transportation
- Override 1
- Override 1
- Override 1 Place of Use (Certificate)
- Canals
- 75691
- Taxlots (2021)



For reference purposes only. This map is not for official use.

(3) Technical Project Description

The design project this application is prepared for will allow OID to select a qualified engineer or engineering firm to design the conversion of the Kingman Lateral from an open channel to a piped canal. This conversion is expected to provide a lasting repair to a canal segment that has been a slope stability concern of OID since the 1970s. During that time OID has performed many patches to the lining materials all of which have proved to have been temporary fixes because the hillside that supports the canal is subject to periodic movement. This movement has proven to be too much of a stressor to all the different canal linings that have been implemented. Piping the canal with HDPE will provide the needed permanent fix of the canal segment that will ensure the reliability of irrigation water some ~6,500 acres of productive farmland. It is also expected to save 475AF annually. All the benefits of the piped canal are not possible without the needed funding. The funding from the state requires engineering. OID doesn't employ a licensed engineer and the cost of the engineering is a heavy burden on the OID rate payers who have struggle through a third straight year of drought and reduced water allotments.

The expected activities necessary regarding this design project are development of criteria for the engineering needed and qualifications required; publish an RFP that follows applicable competitive bidding laws; select an engineer and provide oversight and reporting of the project until completion.

(4) Evaluation Criterion: Section E.1.3 Technical Proposal

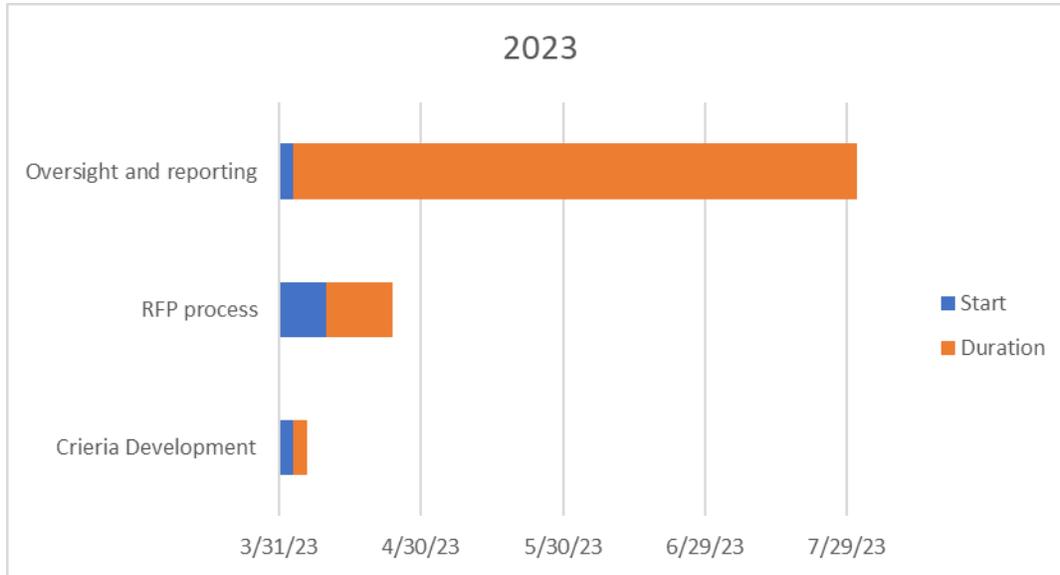
- A- Association with Reclamation project water supplies. OID is part of the USBR's Owyhee Project.
- B- Extent to which the applicant's Water Management Plan is complete and updated. OID's water management plan was completed in 2018.
- C- Extent to which the proposed activity will result in the applicant to be better suited to implement a project expected to improve the water management and modernization existing water delivery infrastructure. OID with the funding of this project will be able to secure needed funding to accomplish the construction project piping the Kingman Lateral. Converting open canals to piped canals saves water, reduces O&M and provides a modern solution to water conveyance.
- D- Extent to which the proposed design is related to a water management improvement project identified in a previous planning effort led by the applicant. The piping of the Kingman lateral was identified in the system improvement plan of OID (pages 14, 44, 45 and E-1).
- E- Reasonableness of cost: the design elements listed here represent 3% of the cost of the construction project while many times the cost of engineering is closer to 10% of construction project budget.

- F- Extent to which Federal funding would promote completion of an activity that might otherwise be delayed or postponed. OID would likely postpone this project to another budget cycle due to the excessive rising cost already experienced because of inflation which has caused OID to raise assessments for 2023.
- G- Amount and source of non-Federal funding is 51.1% of the project cost, \$52,383.
- H- Presidential and Department of the Interior Priorities
 - D.1.1.1 Sub-criterion No. E.1. Climate Change: this design project has no direct climate change response or benefit. However, the associated construction project of piping the Kingman lateral will save water and by so doing make the OID more resilient to the scarcity of water connected with the changing climate.
 - D.1.1.2 Sub-criterion No. E.2. Disadvantaged or Underserved Communities: According to census.gov the median income for Malheur County is \$47,906 or \$20,436 per person and 20% of the county lives below poverty levels. Compare this to the national figures (\$70,784 median \$37,638 per person and 11.6% in poverty) and the largest county in Oregon (\$76,290 median \$44,675 per person and 12.4% in poverty) the picture of the residents of Malheur County facing persistent poverty becomes clear. Residents of Malheur County meet the definition of an underserved community from E.O. 13985 section 2 (a) as Malheur County is rural (3.2 people per mi²) and has persistent poverty as illustrated above and section 2 (b) because the population of the county are a geographic community.
 - D.1.1.3 Sub-criterion No. E.3. Tribal Benefits: this project has no known direct benefits to any tribal community.

Work Plan and Schedule

The completion of this project is manageable within the timeframe of April 2023 to July 2023. The limiting factors to this time frame include the time of award under this FOA and the selection of an engineer that can fit it into their current work schedule. The development of criteria for the engineering needed and qualifications required will take OID staff three days to complete. The RFP process will take 14 calendar days to allow for proper advertising. The oversight and reporting including the final report will take 119 days with the final report expected to be submitted by 31 July 2023.

Notice of Funding Opportunity No. R22AS00163



C.1.2.3. Project Budget

Funding Plan and Letters of Funding Commitment

OID will fund all non-federal portions of the project directly from its operating budget. OID currently allocates \$50k-\$100K annually for automation depending on the needs of the planned projects.

OID will contribute \$41,792 of in-kind labor and equipment time. The remaining \$52,211 of OID share of the project costs will be funded by OID’s budgetary line item for automation projects.

Budget Proposal

Table 1. —Summary of Non-Federal and Federal Funding Sources

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
1. OID In-Kind	\$3,187
2. OID match money	\$49,196
Non-Federal Subtotal	\$52,383
REQUESTED RECLAMATION FUNDING	

Table 2. —Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	\$ 50,000

Section H. Other Information

Costs to be paid by the applicant	\$ 52,383
Value of third-party contributions	\$ 0
TOTAL PROJECT COST	\$ 102,383

Table 3. —Sample Budget Proposal Format

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	\$/Unit	Quantity		
Salaries and Wages				
Project Manager	\$60.10	20	Hours	\$ 1,222
Fringe Benefits				
Full-Time Employees	\$/hour	60%	\$1,222	\$ 733

Table 3. —Sample Budget Proposal Format

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	\$/Unit	Quantity		
Engineering Contractor				
Plan and Profile	\$35,000	1		\$ 35,000
Headwall (Inlet Structure)	\$30,000	1		\$30,000
Outlet Structure	\$25,000	1		\$25,000
Other				
Contingency		10	%	\$9,196
TOTAL DIRECT COSTS				\$ 101,151
Indirect Costs				
Admin Staff	\$35.20	35	hours	\$ 1,232
TOTAL ESTIMATED PROJECT COSTS				\$102,383

Budget Narrative

Salaries and Wages

The General Manager of the Owyhee Irrigation District, Clancy Flynn, is estimated to spend 20 hours on this project at a rate of \$60.10/hour. This time is for supervision of the engineer to address design concerns and provided needed data. The Administrative assistant is estimated to spend 35 hours on tasks involved with this project at a rate of \$35.20/hour and this rate reflects an additional 60% to account for fringe benefits.

The expected hours for compliance with reporting are the 40 hours of administrative staff.

Notice of Funding Opportunity No. R22AS00163

The submission of this application certifies that the salaries, wages and fringe benefits are the actual labor rates of the identifies personnel of OID and are used for all works federal and non-federal, as of the time of this application's submission.

Fringe Benefits

The fringe benefits include OID's costs for employee health insurance, health reimbursement account, retirement, employer taxes, vacation, and sick leave. This costs the OID 60% over and above the employees' hourly wages, on average.

Travel

No travel is anticipated related to this project.

Equipment

No billable OID equipment is expected to be used for this design project.

Materials and Supplies

No materials or supplies are expected to be purchased by OID for this design project.

Contractual

OID plans to contract out the design of the pipeline.

Third-Party In-Kind Contributions

No third-party contributions are expected.

Environmental and Regulatory Compliance Costs

No earthwork will be done in relation to this design project. The cultural compliance will be done in conjunction with the construction project when the pipeline is constructed.

Other Expenses

None.

Indirect Costs

The indirect costs are anticipated to include the time that admin staff spends reviewing timesheets, invoices, and other documentation to ensure all cost are accurately attached to the project. Along with the time involved in preparing and submitting the reports associated with the grant.

C.1.2.4. Environmental and Cultural Resources Compliance

To allow Reclamation to assess the probable environmental and cultural resources impacts and costs associated with each application, all applicants should consider the following list of questions focusing on the NEPA, ESA, and NHPA requirements. Please answer the following questions to the best of your knowledge. If any question is not applicable to the project, please explain why. The application should include the answers to:

Section H. Other Information

- Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)?
No.
- Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area?
No.
- Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “Waters of the United States”?
No.
- When was the water delivery system constructed?
1932-1936
- Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)?
No, but the construction project it supports will.
- Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?
Yes, the canal itself is a feature that could be listed due to its age.
- Are there any known archeological sites in the proposed project area?
No.
- Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?
No.
- Will the proposed project limit access to, and ceremonial use of, Indian sacred sites or result in other impacts on tribal lands?
- Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?
No.

C.1.2.5. Required Permits or Approvals

No permits are necessary as all work will be on existing O&M rights-of-way and will not involve the removal of any existing structures.

C.1.2.6. Overlap or Duplication of Effort Statement

Notice of Funding Opportunity No. R22AS00163

This proposed project does not represent any duplication of efforts. The construction project for the piping of the Kingman Lateral has been awarded federal money as part of the community directed spending outline in the FY2023 omnibus spending bill. The design costs were not a part of the application that was awarded money in the spending bill.

C.1.2.7. Uniform Audit Reporting System

OID was not required to submit a Single Audit for OID's FY2021 but with the award mentioned in C.1.2.6 OID will be required to submit a Single Audit for OID's FY2023.

C.1.2.8. Letters of Support and Letters of Partnership



Owyhee Watershed Council
106 Owyhee Street
P.O. Box 275 • Adrian, OR 97901
Telephone: (541) 372-5782 • Fax: (541) 372-5785
Nicole Sullivan-Coordinator
Email: nicole.agratek@gmail.com

March 30, 2022

Clancy Flynn
Owyhee Irrigation District
422 Thunderegg Blvd
Nyssa, OR 97913

RE: Owyhee Irrigation District Kingman Lateral Pipeline

Dear Clancy,

Owyhee Watershed Council extends our support to Owyhee Irrigation District (OID) for the Kingman Lateral Pipeline Project.

The 5,800 foot long section of the Kingman Lateral proposed for piping has severely degraded over the past several years and is a highly important section of the lateral system delivering irrigation water to approximately 6,000 acres of high quality/high yielding cropland near Adrian. We are aware that OID has made several attempts to stabilize this section of the Kingman lateral, and each year the repairs become increasingly extensive. If this section of the Kingman lateral were to fail, there would be numerous implications to watershed health and local community economics.

Water quality and quantity are both top resource concerns and priorities for restoration in the Lower Owyhee Basin. Piping this section of the Kingman Lateral would support ongoing restoration actions addressing both resource concerns. Piping will eliminate the risk of irrigation lateral failure, which would transport sediment to the Lower Owyhee River and degrade water quality and aquatic habitat for our rainbow and brown trout fisheries. The Owyhee Basin experiences drought at least 5 of every 7 years. As we continue to experience above average dry periods, water quantity and conservation management strategies will ensure both economic and watershed health viability. Piping this section of the Kingman lateral will support water conservation management strategies by eliminating water loss through evaporation and seepage.

This project will improve watershed health/function and ensure economic viability for our small agricultural community here in Adrian and we look forward to seeing this project move forward to implementation.

Thank you,

Nicole Sullivan
Coordinator



2925 SW 6th Ave. STE#2
Ontario, OR. 97914

3/28/2022

Clancy Flynn
Owyhee Irrigation District
422 Thunderegg Blvd
Nyssa, OR 97913

RE: Owyhee Irrigation District Kingman Lateral Pipeline

Dear Clancy,

The Malheur Soil And Water Conservation District (MSWCD) strongly supports the Owyhee Irrigation District (OID) request for funding assistance for the construction of a 5,800-foot-long pipeline along a problem section of the Kingman Lateral. Despite numerous attempts at repair, the existing lined canal system loses up to 8 percent of its water to evaporation and seepage. The water loss exacerbates the impacts of ongoing drought and affects agricultural production in Malheur County. Erosion introduces sediment to the Owyhee River that adversely affects water quality. The seeping water also destabilizes the steep hillside that the Kingman Lateral transects, risking canal failure that would shut water deliveries off to over 6,000 acres of high-quality farmland near Adrian, Oregon.

Upgrading the Kingman Lateral to a pipe would eliminate water losses due to seepage and evaporation and dramatically reduce the risk of a canal failure. Drought impacts would be mitigated by providing more reliable water delivery to farms, saving at least 475 acre-feet of water annually. By legally protecting in-stream any amount of water that is conserved by piping, the project would enhance streamflow in the lower Owyhee River for the benefit of the popular fisheries of rainbow and brown trout and other aquatic species. Water quality in the Owyhee River would be enhanced by decreasing erosion. Finally, costly operations and maintenance charges incurred by the District to repair the failing canal liner could be avoided by piping, benefitting the bottom line of patrons who rely on dependable water deliveries from the Kingman Lateral.

The past several years of drought have demonstrated the importance of addressing both agricultural and environmental water needs in the Snake River Basin to ensure a vibrant community and resilient ecosystem. The Kingman Lateral Pipeline provides a much-needed example of a win-win solution that improves agricultural and environmental resiliency in the region.

Sincerely,

Bret D. Clavin
District Manager



United States Department of Agriculture

Natural
Resources
Conservation
Service

2925 SW 6th Ave.
Suite 2
Ontario, OR 97914
Voice 541-823-
5132

March 28, 2022

Clancy Flynn
Owyhee Irrigation District
422 Thunderegg Blvd
Nyssa, OR 97913

FE: Owyhee Irrigation District Kingman Lateral Pipeline

Dear Clancy,

I am writing to concur with the goals of the application to fund the conversion of the 5,800 feet of Kingman Lateral from open canal to pipeline.

NRCS understands the difficulties with the existing open lateral that continues to lose water due to excessive seepage and evaporation and the resulting issues with the destabilizing hillside that the Kingman Lateral transects. Upgrading the Kingman Lateral to a pipe would eliminate water losses due to seepage and evaporation and dramatically reduce the risk of a canal failure. Water quality in the Owyhee River would be enhanced by decreasing erosion. Finally, costly operations and maintenance charges incurred by the District to repair the failing canal liner could be avoided by piping, benefitting the bottom line of patrons who rely on dependable water deliveries from the Kingman Lateral.

This grant application proposes to continue the ongoing efforts to improve water quality and quantity in Malheur County. This is of particular interest to NRCS as it supports the local priorities and overall set forth in the Malheur County long range plan. Implementation of this project will leverage the ongoing NRCS conservation efforts in the area.

Thank you for your consideration,

A handwritten signature in black ink, appearing to read "Lynn Larsen".

Lynn Larsen
District Conservationist
USDA-NRCS
2925 SW 6th Ave. Ste 2
Ontario, OR 97914

C.1.2.9. Official Resolution

**OWYHEE IRRIGATION DISTRICT
Water Conservation Field Services Grant Application
for the Kingman Lateral Piping Project
Resolution 2022-7**

WHEREAS, the Owyhee Irrigation District has had difficulty with seepage and slope stability along the first mile of the Kingman Lateral since at least the 1970's; and

WHEREAS, these difficulties resulted in reduced flows in the Kingman Lateral to lessen seepage and protect slope stability in the 2021 water year; and

WHEREAS, the District has identified piping this lateral as the most viable option to resolve this persistent problem; and

WHEREAS, the District has applied for Oregon state monies to complete the construction of the pipeline; and

WHEREAS, the funding program of the State requires a more formal design for the pipeline; and

WHEREAS, the USBR has available the Water Conservation Field Services grant opportunity to help with designing of projects.

NOW THEREFORE, BE IT RESOLVED that the Owyhee Irrigation District authorizes the Managers application to the USBR for securing design funding through the Water Conservation Field Services program to complete the design of the Kingman Lateral project.

BE IT FURTHER RESOLVED that Owyhee Irrigation District is capable of and commits itself to providing the funds/in-kind contributions outlined in the grant application and to work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement.

Dated this 20th day of December 2022.

OWYHEE IRRIGATION DISTRICT



Dan Tschida, Chairman

Appendix A

Water Loss Assessment
Owyhee Irrigation District

3.2.2 KINGMAN LATERAL LOSSES

The measured data collected on the Kingman Lateral indicated total losses of 38.4 cfs, or approximately 76.2 af/day, as summarized in Table 3-4 and shown in Figure 1-4. The largest source of loss was in sub-reach KM-3. The channel along this sub-reach comprised mostly alluvial material, and field observations noted it was likely located on an abandoned Snake River and/or Owyhee River terrace. Sub-reaches that displayed lower loss amounts along this ditch tended to comprise more silts and clays (including several concrete-lined sections), and were perched much higher on the hillsides, above the old alluvial plain below.

Table 3-4. Owyhee Irrigation District’s Kingman Lateral Measured Losses

Sub-Reach	Description	Upstream Transect ID	Downstream Transect ID	Measured Flow Loss (cfs)	Sub-Reach Uncertainty (cfs)	Sub-Reach Loss (%)
KM-1	KM 0.0 to just above the 5.4 Lateral	KM 0.0	KM 5.4	10.1	4.26	7.94
KM-2	Just below 5.5 Lateral to split near "A Hill"	KM 5.4.1	KM 9.3	3.39	3.77	6.61
KM-3	From weir on 5.4 Lateral to Annabelle Spill	KM 5.4.2	KM 5.4.end	23.4	2.44	34.9
KM-4	Just below Mendiola Slide to end of 5.4-0.5 Lateral	KM 5.4.3	KM.pt.14	1.46	0.79	15.8

Total: 38.4

Notes: cfs: cubic feet per second

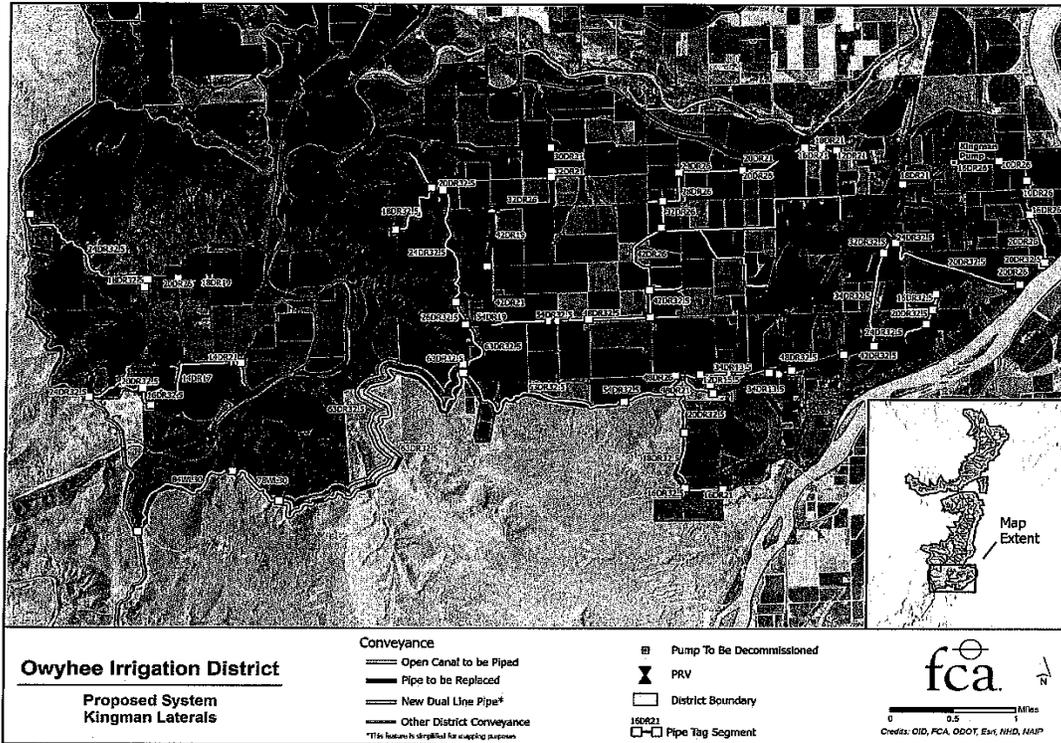
3.2.3 MITCHELL BUTTE LATERAL LOSSES

The measured data collected on the Mitchell Butte Lateral indicated total losses of 2.81 cfs, or approximately 5.73 af/day, as summarized in Table 3-5 and shown in Figure 1-4. The largest source of loss was in sub-reach MB-1, from the headgate off the North Canal to just below MB 9.4. The channel along this sub-reach comprised primarily silts and clays with sparse cobbles noted in several locations. The lower sub-reaches that displayed lower loss amounts along this ditch were much shorter in length, but field notes indicate that the channel was of similar composition. The negative values associated with sub-reach MB-3 were the result of a slight computed gain, although well below the acceptable level of uncertainty.

Table 3-5. Owyhee Irrigation District’s Mitchell Butte Lateral Measured Losses

Sub-Reach	Description	Upstream Transect ID	Downstream Transect ID	Measured Flow Loss (cfs)	Sub-Reach Uncertainty (cfs)	Sub-Reach Loss (%)
MB-1	Headgate to just below 9.4 Lateral	MB 0.0	MB 9.4	1.79	4.25	2.27

Appendix B



*** This map was compiled by FCA as a visualization tool and is not intended for legal purposes. FCA is not liable for any damages caused by omissions or errors in the data displayed herein ***

Figure 4-4. Delivery System Improvements – Kingman Lateral

Table 4-3. Capital Costs for Kingman Lateral Delivery System Improvements.

PIPELINE NAME	SUBLATERAL	CONSTRUCTION COSTS	ENGINEERING, CONSTRUCTION MANAGEMENT, SURVEY	GENERAL MANAGEMENT, GENERAL CONTRACTOR	CONTINGENCY COSTS	TOTAL COSTS ²
Kingman	Kingman Lateral	\$29,424,600	\$1,765,500	\$3,531,000	\$10,416,300	\$45,137,400
	5.4	\$13,647,100	\$818,800	\$1,637,700	\$4,831,100	\$20,934,700
	6.2	\$14,600	\$900	\$1,800	\$5,200	\$22,500
	7.4	\$454,500	\$27,300	\$54,500	\$160,900	\$697,200
	7.6	\$420,400	\$25,200	\$50,400	\$148,800	\$644,800
	7.6S	\$300,000	\$18,000	\$36,000	\$106,200	\$460,200
	7.7	\$277,300	\$16,600	\$33,300	\$98,200	\$425,400
	9.3	\$1,691,000	\$101,500	\$202,900	\$598,600	\$2,594,000

Appendix C

PIPELINE NAME	SUBLATERAL	CONSTRUCTION COSTS	ENGINEERING, CONSTRUCTION MANAGEMENT, SURVEY	GENERAL MANAGEMENT, GENERAL CONTRACTOR	CONTINGENCY COSTS	TOTAL COSTS ²
	10.0	\$37,400	\$2,200	\$4,500	\$13,200	\$57,300
	<i>Subtotal</i>	\$46,266,800	\$2,776,000	\$5,552,000	\$16,378,400	\$70,973,200
Kingman Pump	Kingman Pump Lateral	\$336,700	\$20,200	\$40,400	\$119,200	\$516,500
	0.1	\$18,300	\$1,100	\$2,200	\$6,500	\$28,100
	<i>Subtotal</i>	\$355,000	\$21,300	\$42,600	\$125,700	\$544,600
	Total	\$46,621,800	\$2,797,300	\$5,594,600	\$16,504,100	\$71,517,800

As well as serving 3,900 acres via 31.4 miles of mostly pressurized pipe, the Mitchell Butte Lateral is the largest interconnection between the North Canal and the Ontario-Nyssa Canal. A 1.6-mile section of large-diameter profile-wall HDPE convey the Mitchell Butte Lateral from its headgate to the District's existing hydroelectric power plant. Downstream of the plant, two 63-inch solid-wall pipelines serve the Mitchell Butte Lateral and its sub-laterals, as well as the Ontario-Nyssa Canal. When the Ontario-Nyssa Pumping Plant is discharging supplemental flows to the Ontario-Nyssa Canal, flow from Owyhee Reservoir reduces and one 63-inch pipeline of the Mitchell Butte dual pipeline closes. The District delivers water to lands with primary water rights via the remaining open pipeline. Like the Kingman dual pipeline, a single large-diameter solid-wall HDPE pipe could instead be used to pipe the Mitchell Butte Lateral below the hydroelectric facility, potentially reducing head loss and/or cost. Figure 4-5 shows proposed pipeline alignments in the Mitchell Butte Lateral, which largely follow existing alignments, as well as the location of necessary PRVs. Table 4-4 presents the capital costs associated with piping and pressurizing the Mitchell Butte Lateral.

Appendix D

Table E-1. Capital Cost of Piping Owyhee Irrigation District.

DIVISION	CONVEYANCE	LATERAL OR SUB-LATERAL	PROPOSED FEATURE	CONSTRUCTION COSTS	ENGINEERING, CONSTRUCTION MANAGEMENT, SURVEY	GENERAL MANAGEMENT, GENERAL CONTRACTOR	CONTINGENCY COSTS	TOTAL COST
Mitchell Butte	Kingman	Kingman Lateral	Junction	\$248,000	\$14,900	\$29,800	\$87,800	\$380,500
			Pipe	\$29,176,600	\$1,750,600	\$3,501,200	\$10,328,500	\$44,756,900
		5.4	Junction	\$424,000	\$25,400	\$50,900	\$150,100	\$650,400
			Pipe	\$12,743,100	\$764,600	\$1,529,200	\$4,511,100	\$19,548,000
			Valve	\$480,000	\$28,800	\$57,600	\$169,900	\$736,300
		6.2	Junction	\$8,000	\$500	\$1,000	\$2,900	\$12,400
			Pipe	\$6,600	\$400	\$800	\$2,300	\$10,100
		7.4	Junction	\$48,000	\$2,900	\$5,800	\$17,000	\$73,700
			Pipe	\$406,500	\$24,400	\$48,800	\$143,900	\$623,600
		7.6	Junction	\$48,000	\$2,900	\$5,800	\$17,000	\$73,700
			Pipe	\$372,400	\$22,300	\$44,700	\$131,800	\$571,200
		7.6S	Valve	\$300,000	\$18,000	\$36,000	\$106,200	\$460,200
		7.7	Junction	\$64,000	\$3,800	\$7,700	\$22,700	\$98,200
		Pipe	\$168,300	\$10,100	\$20,200	\$59,600	\$258,200	
		Valve	\$45,000	\$2,700	\$5,400	\$15,900	\$69,000	
	9.3	Junction	\$128,000	\$7,700	\$15,400	\$45,300	\$196,400	