Wallowa Lake Dam Rehabilitation

Goals and Objectives

Wallowa Lake Dam was originally constructed in 1919 and does not meet current dam safety standards, putting at risk the downstream communities of Joseph, Enterprise and Wallowa. The objective of this project is to rehabilitate the existing dam to current design standards providing multi-discipline benefits to the agricultural community, the residents of Wallowa Valley, and enhanced benefits to fish and wildlife resources.

Existing Dam and Reservoir

Wallowa Lake Dam is located in Wallowa County (NE Oregon) approximately 1 mile south of Joseph. The dam is located on the natural outlet of Wallowa Lake and raises the lake 28.4 feet from natural conditions, providing over 50,000 acre-feet of storage in the reservoir. Constructed as a concrete gravity structure, the dam is over 35 feet high and has a crest length of 200 feet. The dam is owned and operated by the Wallowa Lake Irrigation District (WLID), based in Joseph, Oregon.

Project Owner

Wallowa Lake Irrigation District

Project Location

Joseph, OR

Project Duration

2019-2021

Project Estimate

$16.0M

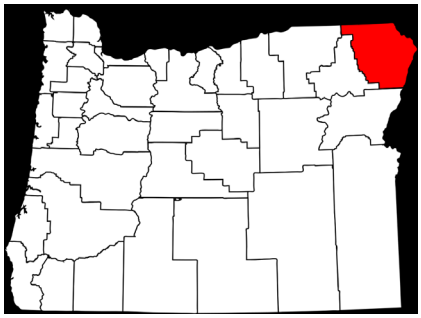
Project Contact

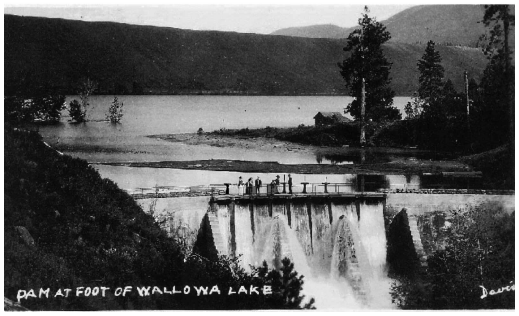
Dan Butterfield - President
Wallowa Lake Irrigation Dist.
butterfieldfarms@live.com

Consultant Contact

Morton D. McMillen, PE
mortmcmillen@mcmjac.com
208-342-4214

Image: Wallowa County – Oregon; Wallowa Lake Dam





Dam History

Wallowa Lake Dam was originally constructed in 1919 to provide irrigation water to the developing agricultural community in the upper Wallowa Valley. The dam was modified several times in the early years of operation with the final dam arrangement serving agricultural needs and multiple benefits to the community. The WLID has been working diligently to develop needed improvements to the existing dam ensuring public safety and long-term operation of the Project.

Date	Event
1919	Original curved dam section constructed.
1920	Curved dam section raised 3 feet, four buttress walls constructed, upstream concrete apron added, and outlet gates moved to the upstream side of the dam.
1929	Raised the dam crest 5 feet and added concrete on the downstream side to increase dam stability. Constructed a new penstock and powerhouse in Joseph for hydropower production.
1958	Powerhouse operation stopped following a fire in the powerhouse.
1979	USACE Dam Safety Inspection completed for the dam following Teton Dam failure as part of the National Dam Safety Inspection Program.
1996	Dam listed as a high hazard structure by Oregon Water Resources Department (OWRD) Dam Safety.
2001	Phase 1 Dam Safety Inspection and Phase 1 Report completed recommending outlet conduit repairs and planning of long-term dam safety improvements.

Wallowa Lake Dam Rehabilitation

Benefits

Wallowa Lake Dam is the centerpiece to water management within the Wallowa Valley. Fed from the wilderness area high in the Wallowa Mountains, the Wallowa Lake Reservoir provides high quality water supporting a wide range of uses, including the following:

- Irrigation of over 16,000 acres of prime agricultural land within the Upper Wallowa Valley.
- Secondary irrigation benefits to an additional 21,000 acres of agricultural land in the Lower Wallowa Valley.
- Potable water supply for the city of Joseph.
- Recreation with over 800,000 recreational users and tourists enjoying boating, water skiing, personal water craft, swimming, and fishing.
- Flood control with the active storage managed to provide flood protection to the cities of Joseph, Enterprise, and Wallowa during spring runoff periods.
- Base flows to the Wallowa River and Grande Ronde River, preserving and enhancing riparian habitat, fish stocks, water fowl, and overall water quality.

Completion of the Project will allow the WLID to return to the full reservoir pool operation, providing multiple benefits to the Wallowa Valley community, including:

- Flood protection
- Fish protection
- Water conservation
- Agricultural production
- Continued recreational use
- Economic stability
- Potable water supply
- Sockeye Salmon restoration
- Fish passage
- Improved fish and wildlife habitat
- Future low head and low impact hydropower production

Budget and Schedule

Project Phases 2 and 3 Budget Summary

Item No.	Description	Budget ($)
1	Phase 2 – Permitting/Regulatory and Final Design	$1,662,000
2	Phase 3 – Construction [1]	
	Dam Rehabilitation [2]	$12,440,000
	Upstream Fish Passage [3]	$1,498,000
3	Engineering and Supervision during Construction	$400,000
	TOTAL (Phase 2 + Phase 3)	$16,000,000

[1] Includes 20% estimating contingency.
[2] A new intake tower with intake exclusion fish screens will be constructed with the dam rehabilitation.
[3] Upstream fish passage is assumed to consist of a trap-and-haul facility located at the base of the dam with a fish entrance, holding pool, loading hopper, and jib crane lift.

Stakeholders

Coordination efforts include a diverse stakeholder group with continued collaborative efforts between the District and all affected stakeholder agencies/entities (Tribal, State, Federal, NGO's, Local Citizen Groups):

City of Enterprise, OR / City of Joseph, OR / Oregon Department of Fish and Wildlife / Nez Perce Tribe / Confederated Tribes of the Umatilla Indian Reservation / Oregon Water Resources Department - Dam Safety / National Oceanic and Atmospheric Administration Fisheries / United States Department of Agriculture Natural Resource Conservation Service / United States Fish and Wildlife Service / Wallowa County / Wallowa Resources / Farmers Conservation Alliance / Grande Ronde Model Watershed / The Freshwater Trust / Wallowa Lake Irrigation District

Wallowa Lake Dam Rehabilitation

Workplan




DRAFT
Revision No. 1

McMILLEN JACOBS ASSOCIATES

February 27, 2019

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Distribution

To: Dan Butterfield,
President
Wallowa Lake Irrigation District

Joe Dawson,
Secretary
Wallowa Lake Irrigation District

From: Morton D. McMillen, PE
McMillen Jacobs Associates

Prepared By: Morton D. McMillen, PE
McMillen Jacobs Associates

Barb Whiton
McMillen Jacobs Associates

Jeff Heindel
McMillen Jacobs Associates

Revision Log

Revision No.	Date	Revision Description
0	February 4, 2019	Initial Draft
1	February 27, 2019	Revised Draft

1.0 Introduction

1.1 Purpose

The purpose of this document is to present the proposed workplan to execute the Wallowa Lake Dam Rehabilitation (Project) utilizing State of Oregon funding. The Project workplan outlines the anticipated work tasks, budget, and schedule required to efficiently plan, design, permit, and construct the Project.

1.2 Wallowa Lake Dam Location

Wallowa Lake Dam is located in Wallowa County in northeast Oregon about 1 mile south of Joseph. The Wallowa Valley is circled by a series of mountain ranges, which include the Wallowa Mountains to the south, Blue Mountains to the west and north, and the Seven Devil Mountains across Hells Canyon to the east. The dam itself is situated at the outlet of Wallowa Lake, which sits at the base of the Wallowa Mountains. The lake is fed by the Wallowa River, which has a drainage basin of over 50 square-miles. Access to the dam is provided from the Joseph–Wallowa Lake Highway through property owned by the Wallowa Lake Irrigation District (WLID) at the south end of Wallowa Lake. Wallowa Lake and the dam location are illustrated on Figure 1-1.

1.3 Background

As indicated in the previous section, Wallowa Lake Dam is located on the natural outlet of Wallowa Lake. The existing dam currently raises Wallowa Lake 28.4 feet from natural conditions, providing over 50,000 acre-feet of storage in the reservoir. Constructed as a concrete gravity structure, the dam is over 35 feet high and has a crest length of 200 feet. The dam is owned and operated by the WLID, based in Joseph, Oregon. The dam history is summarized in Table 1-1. Historical dam photos are presented in Appendix A, along with photos of the dam in its current arrangement and condition.

Table 1-1. Wallowa Lake Dam History

Date	Event
1919	Original curved dam section constructed.
1920	Curved dam section raised 3 feet, four buttress walls constructed, upstream concrete apron added, and outlet gates moved to the upstream side of the dam.
1929	Raised the dam crest 5 feet and added concrete on the downstream side to increase dam stability. Constructed a new penstock and powerhouse in Joseph for hydropower production.
1958	Powerhouse operation stopped following a fire in the powerhouse.
1979	USACE Dam Safety Inspection completed for the dam following Teton Dam failure as part of the National Dam Safety Inspection Program.
Semi-Annual	Dam safety inspections completed by the Oregon Water Resources Department (OWRD) Dam Safety.
1996	Dam listed as a high hazard structure by Oregon Water Resources Department (OWRD) Dam Safety.
2001	Phase 1 Dam Safety Inspection and Phase 1 Report completed recommending outlet conduit repairs and planning of long-term dam safety improvements.

Wallowa Lake Dam was listed as a high hazard structure on March 6, 1996 by the Oregon Water Resources Department (OWRD) Dam Safety. The sudden failure and release of water may result in loss of life as well as severe economic and environmental damage downstream of the dam. During a subsequent dam safety inspection, OWRD recommended that the WLID retain an engineering consultant and complete an evaluation of the existing dam including stability, hydraulic capacity, and long-term operation. In 2000, WLID retained Montgomery Watson Harza and Woodward Clyde Consultants to perform the engineering analyses. Based on the engineering consultant's recommendations, the WLID implemented short-term structural improvements in 2002 to stabilize the dam. The reservoir has subsequently been held below full pool elevation to maintain dam safety.

The WLID has embarked on the planning and design of long-term improvements to Wallowa Lake Dam. The dam itself has been identified as the central structure for water management within the Wallowa Valley for irrigation storage, recreation, and flood control. The Nez Perce Tribe (NPT) in cooperation with the Oregon Department of Fish and Wildlife (ODFW), Confederated Tribe of the Umatilla Indian Reservation (CTUIR), U.S. Fish and Wildlife Service (USFWS), and National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) are actively planning and implementing salmon recovery measures throughout the Wallowa Valley. Fish passage at Wallowa Lake Dam has been identified by these agencies as a high priority design feature of the rehabilitated dam structure. The WLID moved forward with the fish passage design development originally in 2009 and updated the effort in 2017 to proactively develop an approved fish passage approach in conjunction with the resource agencies.

The WLID also completed the Probable Maximum Precipitation (PMP) and Probable Maximum Flood (PMF) analyses in 2017. The inadequate hydraulic capacity of the existing outlet conduits and spillway were identified by OWRD as a major issue with the existing dam. The overall dam resistance to sliding and overturning when the reservoir level exceeds the existing spillway elevation was also identified as a dam safety issue. With completion of these work elements, the WLID is prepared to move quickly into developing final design documents and advancing the permitting process to support construction. The recent addition of $16 million in the State of Oregon's Governor's budget provides the opportunity for the WLID to rapidly advance the design, allowing the Project to begin construction in 2020 with completion anticipated in 2021.

Figure 1-1. Wallowa Lake Dam Location

1.4 Wallowa Lake Dam Benefits

Wallowa Lake Dam is the centerpiece to water management within the Wallowa Valley. Fed from the wilderness area high in the Wallowa Mountains, the Wallowa Lake Reservoir provides high quality water supporting a wide range of uses, including the following:

- Irrigation of over 16,000 acres of prime agricultural land within the Upper Wallowa Valley.
- Secondary irrigation benefits to an additional 21,000 acres of agricultural land in the Lower Wallowa Valley.

- Potable water supply for the city of Joseph.
- Recreation with over 800,000 recreational users and tourists enjoying boating, water skiing, personal water craft, swimming, and fishing.
- Flood control with the active storage managed to provide flood protection to the cities of Joseph, Enterprise, and Wallowa during spring runoff periods.
- Base flows to the Wallowa River and Grande Ronde River, preserving and enhancing riparian habitat, fish stocks, water fowl, and overall water quality.

Completion of the Project will allow the WLID to return to the full reservoir pool operation, providing multiple benefits to the Wallowa Valley community, including:

- Flood protection
- Fish protection
- Water conservation
- Agricultural production
- Continued recreational use
- Economic stability
- Potable water supply
- Sockeye Salmon restoration
- Fish passage
- Improved fish and wildlife habitat
- Future low head and low impact hydropower production

It is important to point out that WLID manages the reservoir for flood control purposes. The reservoir provides flood control for the cities of Enterprise, Joseph, and Wallowa ensuring public safety and minimizing annual flood damage. Completion of the dam rehabilitation will ensure that effective flood protection is maintained for the community.

2.0 Project Approach

The Project approach was developed to meet the following basic goals and objectives:

- Develop a technical approach and rehabilitation options that address dam safety issues, restore the full reservoir operation, provide fish passage, and fall within the available funding.
- Execute the workplan in a step-by-step process with scheduled agency and stakeholder meetings to present and discuss the design development.
- Implement the workplan on a schedule that ensures completion within the State of Oregon funding cycles.

The WLID has been working closely with the local community, resource agencies, and stakeholders to coordinate the daily operation and advance discussions related to the Project. When the Governor's budget line item for Wallowa Lake Dam was announced, the WLID immediately conducted preliminary information meetings in December 2018 with Project stakeholders and interested parties to present the proposed Project approach, implementation process, and the proposed timeline. From this effort, the Project stakeholders have provided letters of support (presented in Appendix C) for the WLID. During these meetings, the workplan organization was presented and discussed with the meeting attendees. The

WLID has subsequently incorporated comments and finalized the workplan presented in the subsequent sections.

3.0 Work Completed to Date

The WLID has completed a range of work activities to maintain the existing dam stability for current operation, as well as advance the planning and design associated with the long-term dam rehabilitation. These work activities include coordination with stakeholders and agencies to discuss the dam rehabilitation and coordinate key issues, data collection and analysis, and schedules. The WLID has coordinated closely with the state and federal agencies responsible for fisheries management as well as the Nez Perce Tribe and CTUIR to plan implementation of upstream and downstream fish passage at the dam. Within these coordination meetings, the potential for future reintroduction of Sockeye Salmon *Oncorhynchus nerka* to Wallowa Lake was discussed to identify provisions within the dam rehabilitation to support the future reintroduction program.

The WLID has also been very active in implementing proactive water management and conservation programs. These activities include development of a watershed hydrologic model used to predict water runoff volumes and timing to effectively manage the reservoir storage and flood control. The WLID has also been converting open ditch and flood irrigation systems to piped conveyance and center pivot systems. These systems are designed to provide efficient water use and minimize drain flows. There has been over $6.5M of irrigation pipeline work planned and constructed with the WLID land-owner contributions exceeding $800,000. Participating agencies include USDA Natural Resource Conservation Service (NRCS), Oregon Water Enhancement Board (OWEB), Environmental Quality Incentives Program (EQIP), and Energy Trust. The investment made by the WLID provides a sound foundation for effective water management and conservation with the completion of the Wallowa Lake Dam rehabilitation and return to the full reservoir operating pool.

Table 3-1 presents a summary of the work activities completed to date along with the estimated expenditures by the WLID.

Table 3-1. Summary of Work Activities Completed to Date

Date Completed	Work Activity	WLID Expenditure
2000 - 2016	WLID Planning, Stakeholder Coordination	$918,000
2002	Dam Safety Analysis and Phase 1 Report	$150,000
2002	Topographic Mapping	$25,000
2003	Existing Dam Outlet Conduits 3, 4, and 5 Repairs	$150,000
2005	Existing Dam Outlet Conduits 1 and 2 Repairs	$75,000
2009	Conceptual Fish Passage Study	$100,000
2011	Snowpack Prediction Model	$30,000
2016	Updated Fish Passage Study	$20,000
2017	Probable Maximum Precipitation (PMP) Study	$75,000
2017	Probable Maximum Flood (PMF) Study	$35,000
2018	Project Planning and Stability Analysis Update	$40,000
Ongoing	Water Conservation, Irrigation Pipelines (land-owner contribution)	$840,000
	TOTAL	$2,458,000

4.0 Workplan

The Project workplan is organized into three work phases designed to efficiently plan and execute the Project design, permitting, and construction. The workplan is divided into three distinct phases and timelines as indicated in Table 4-1.

Table 4-1. Work Phases

Phase No.	Description	Timeline
1	Pre-Planning	1/19 – 6/19
2	Regulatory/Permitting and Final Design	7/19 – 7/20
3	Construction	8/20 – 6/21

The three work phases are designed to provide a step-by-step Project execution that ensures effective communication, design development, permit acquisition, and construction. A discussion of each work phase and the associated work tasks is presented in the following paragraphs.

4.1 Phase 1 – Pre-Planning

The Phase 1 work activities are designed to advance the Project planning and design to allow rapid execution of the Phase 2 regulatory/permitting and final design activities once full Project funding is available. The anticipated work activities include the following:

- Develop the detailed workplan and schedule.
- Meet with Project stakeholders to discuss and address technical issues.
- Meet with OWRD Dam Safety to present the proposed option for the dam rehabilitation.
- Meet with the regulatory agencies and develop a detailed permitting and regulatory strategy.
- Develop and implement a budget allocation and tracking system that will meet State of Oregon requirements for Phases 2 and 3 budget expenditures.

At the end of Phase 1, the completed pre-planning work will allow the Project to move quickly into the final design, regulatory, and permitting process. Coordination efforts completed with stakeholders to address technical issues are intended to resolve any outstanding design issues, allowing the dam configuration to be finalized and the Project ready for development of detailed construction plans and specifications.

4.2 Phase 2 – Regulatory/Permitting and Final Design

The Project will advance from the initial planning efforts through the detailed final design, permitting and regulatory coordination, and construction in a sequenced series of work tasks. The anticipated work tasks are as follows:

- Task 1.0 – Environmental/Permitting
- Task 2.0 – Fish Passage Planning and Design
- Task 3.0 – Topographic Mapping and Boundary Survey
- Task 4.0 – Geotechnical Site Investigations
- Task 5.0 – Alternatives Development and Evaluation
- Task 6.0 – Final Design
- Task 7.0 – Cost Estimates and Schedule
- Task 8.0 – Stakeholder Coordination
- Task 9.0 – Project Administration and Meetings

A brief description of each work task is presented in the following paragraphs.

4.2.1 Task 1.0 – Environmental/Permitting

Non-federal funding is anticipated for the design and construction of the Project. The use of non-federal funds eliminates the federal requirement for completing National Environmental Policy Act (NEPA) analysis of the proposed action. As a result, the environmental work efforts will be limited to potential

impacts due to the direct construction of the dam and those required to obtain the Oregon Department of State Lands (DSL) and U.S. Army Corps of Engineers (USACE) 404 permit. The scope of work for the permitting task of the Project consists of the tasks described below.

Permit Strategy Memorandum

The proposed Project is located on the existing Wallowa Lake Dam itself below the full pool level of Wallowa Lake, within the Ordinary High Water Mark (OHWM) of the Wallowa River, and within the floodplain of the Wallowa River. Minimal grading and/or clearing will be required to access the dam. The proposed Project consists of performing rehabilitation activities to stabilize the existing dam. Work within the lake, OHWM, and within a floodplain will require permits from federal, state, and local agencies.

McMillen Jacobs will contact the agencies listed in Table 4-2 to determine the permitting requirements for the Project. Based on discussions with each agency, a Permit Strategy Memorandum will be prepared describing the permitting requirements and approach to complete the permitting process to meet the construction schedule. A list of anticipated permits, agency review time, submittal requirements, and supporting documentation for the Project are summarized in Table 4-2. The review timeframes listed in Table 4-2 are estimated and are based on the recommendations presented in permit guidance documentation and our experience with other permitting projects in Oregon.

Table 4-2. Permits and Approvals / Submittal and Review Requirements

Permit/Approval	Agency Review Period*	Submittal / Document Type	Supporting Documentation
Federal			
USACE Section 404 Permit	120 days (4 months)	Joint Permit Application (JPA)	• Waters of the US and Wetland Delineation • Design Package Drawings
USFWS/National Marine Fisheries Service (NMFS) Section 7 Consultation	120 days (4 months)	Biological Assessment	
State			
Oregon DSL Removal-Fill Permit	120 days (4 months)	JPA	• Waters of the US and Wetland Delineation • USACE Review
Oregon Department of Environmental Quality (DEQ) 401 Water Quality Certification	120 days (4 months)	JPA	• Waters of the US and Wetland Delineation • USACE Review
Oregon Department of Fish and Wildlife Fish Passage Clearance	90 days (3 months)	JPA	• USACE Review
Oregon DEQ Stormwater Permit (1200-C)	60 days (2 months)	Application	• Stormwater Pollution Prevention Plan

Permit/Approval	Agency Review Period*	Submittal / Document Type	Supporting Documentation
State Historic Preservation Office (SHPO) Section 106 Review	60 days (2 months)	Concurrence Request Letter	• Cultural Resources Reports • Design Package
Local – Wallowa County			
Coordination with Wallowa County will be completed to determine required local permits	--	--	--

* Statutory processing timeline which may be extended as needed.

Permit Package Preparation

As indicated above, the Project falls under the regulatory jurisdiction of multiple federal, state, and local agencies; therefore, it is critical that federal and state permitting run concurrent with local permitting to secure the needed approvals in a timely manner. However, prior to submittal of permit applications, a field survey for waters of the U.S. (WOTUS) and wetlands will be completed by McMillen Jacobs. It is assumed that there is enough existing cultural resource survey documentation to complete Section 106 consultation with the State Historic Preservation Office (SHPO).

As mentioned above, McMillen Jacobs will conduct a field survey for wetlands and WOTUS. Typically, these surveys are completed during the vegetation growing season. Due to the short timeline for the Project, the survey will commence immediately upon obtaining full Project funding. A draft Technical Memorandum (TM) will be produced for one round of review. The TM will include a delineation and characterization of any wetlands located in the proposed work area, WOTUS characterization, and figures displaying the OHWM and wetland boundaries. Precision Global Positioning System (GPS) technology will be used to capture wetland and OHWM boundaries. Following this review, a final TM will be produced for submittal with various permit applications.

Initial permitting coordination will commence with all applicable agencies upon approval of a preliminary plan set (approximately 30% level of completion). If any changes to the design are requested by the agencies, the changes will be included in the 60% plan set (if applicable) and official permit applications will be prepared using the 60% design package. While many of the necessary permits and approvals may be evaluated concurrently, some determinations such as the 401 Water Quality Certification, will be dependent on final approval from DSL and the USACE, and this may extend the permitting schedule.

McMillen Jacobs will prepare draft permit documents for review. Review comments will be incorporated into the final design package for submittal. McMillen Jacobs will act as the primary point of contact (authorized agent) on all permits, providing additional information to various agencies as needed. Monthly permit status updates will be provided throughout the duration of the Project. McMillen Jacobs is prepared to use all available resources needed to ensure timely permit approval for the Project.

Agency Coordination

It is our goal to have minimal agency comments on the application to obtain expedited permit approval. McMillen Jacobs will contact the agencies on a monthly basis or as needed to check the status of the permit applications. It may be necessary, at times, to enter discussions with the agencies, especially when more than one jurisdiction has authority over the proposed Project. We anticipate that some in-person discussion at the dam will be required to meet the permitting schedule. All discussions will be conducted in coordination with the Project team.

Potential Permitting Limitation

Table 4-3 lists possible permitting limitations and our approach to addressing them if needed.

Table 4-3. Permitting Limitations

Limitation	Response
USACE Section 404	
According to permitting guidance in Oregon, permit approval time ranges from 4 months to 1 year.	Permit approval time in eastern Oregon typically does not exceed a 1-year review period. McMillen Jacobs will coordinate with the USACE on a monthly basis (or as-needed) to expedite permit approval.
ODFW In-Water Work Window	
The ODFW guidelines for the timing of in-water work to protect fish and wildlife resources has been set for the Wallowa River from July 15 to August 15 of any given year.	This work window is only intended as guidance; however, many of the federal and state jurisdictional agencies have adopted these work windows when issuing permits. The work area surrounding the dam will be dewatered and no in-water construction activities will be performed. McMillen Jacobs will proceed as planned with construction activities occurring outside of this work window. If agency comments are received during pre-application conferences, McMillen Jacobs will negotiate with them to adjust the agencies' construction work window.
ODFW Fish Passage Requirement	
If fish passage is proposed for the Project, the fish passage design must be reviewed by the ODFW.	The dam rehabilitation may require both upstream and downstream fish passage. McMillen Jacobs will coordinate directly with the agencies during the design development for the specifics of this requirement.

4.2.2 Task 2.0 – Fish Passage Planning and Design

As part of Project development, the issue of fish passage will need to be addressed. WLID has completed a preliminary fish passage study and coordinated with the resource agencies concerning fish passage as part of a previous work effort. For downstream passage, two alternatives have been identified: (1) incorporate fish screens into a new intake tower on the upstream side of the dam, or (2) install individual fish screen structures in each of the irrigation canals downstream from the dam. Option 1 would be incorporated if a future hydropower facility was considered with the dam construction. Option 2 would be utilized if no future hydropower facility was provided. As currently envisioned, Alternative 2 would

be the recommended alternative because individual fish screens in each of the irrigation canals would streamline the permitting process and outside funding is available for these types of structures.

Upstream passage facilities would consist of a fish trap-and-haul facility. Currently, only resident trout and potentially some bull trout are found at the dam structure. The Nez Perce Tribe (NPT) has discussed long-term plans for re-introduction of Sockeye Salmon to Wallowa Lake. The Sockeye program would require extensive coordination with ODFW, NOAA Fisheries, and the USFWS. Through ongoing coordination with these agencies and the NPT, a trap-and-haul facility was identified as the most logical upstream fish passage facility. Incorporation of a WHOOSH system to transport upstream migrants from the tailrace to the forebay will also be considered. When designed properly, this system would provide a form of volitional fish passage for upstream migrants.

The goal of the fish passage analysis is to work with the regulatory agencies to arrive at recommended upstream and downstream fish passage facilities. The end-product would be signed memorandums of understanding (MOUs) with each of the regulatory agencies and the NPT outlining the recommended alternative and a timeline for implementation. It is anticipated that the upstream and downstream fish passage facilities located at the dam will be designed concurrently with the dam rehabilitation to provide a fully integrated Project design. Depending on the available levels of funding, it is the intent to construct the fish passage facilities concurrently with the dam rehabilitation construction.

Deliverables:

- Update the draft fish passage report summarizing the fish passage study analysis and results. Provide a draft copy to the WLID for review and comment. A revised draft will then be presented to the stakeholders for review and comment.
- Conduct a meeting with the fish passage stakeholders to review the revised draft report and outline the next steps for determining a selected alternative for fish passage at Wallowa Lake Dam.
- Prepare a final report incorporating the WLID and stakeholder comments.
- Prepare a draft and final MOU that will be used by the WLID and stakeholders.

4.2.3 Task 3.0 – Topographic Mapping and Boundary Survey

A detailed topographic map was completed for the existing dam site in 2001. The mapping extended from approximately the upstream end of the existing outlet channel to immediately downstream from the dam. The mapping was developed to support the conceptual design development and analysis. WLID completed additional evaluation of the property boundaries in 2016 to confirm the location of the private property owners on the south abutment, as well as the City of Joseph easement for its water supply pipeline.

This work task consists of obtaining supplemental mapping data as required to support the development of full plans and specifications. The existing property boundary pins will be set as part of this work effort to clearly illustrate the adjacent property owners and support easement acquisition for construction, if required. The work effort will also include determining the ground elevations in the existing State Park

marina at the south end of Wallowa Lake on the same vertical datum as the dam. This information will be required to correlate the maximum reservoir level with the marina parking lot area, allowing a more accurate determination of the impacts of full reservoir pool on the existing parking lot.

Deliverables:

- Updated and expanded topographic map, as required to support development of construction documents.
- Property boundary survey with property boundary pins found or set in the field.
- Spot elevations established in the State Park marina parking lot.

4.2.4 Task 4.0 – Geotechnical Site Investigations

In order to support the dam design, a geotechnical investigation of the subsurface conditions upstream and downstream from the dam must be completed. This requires drilling borings to characterize the subsurface conditions. If possible, piezometers will be installed upstream and downstream from the dam to measure the hydraulic seepage net under the dam as well as through the abutments. It could be difficult to install piezometers in the glacial till material located in this area, which could limit their use at this dam. The data obtained from the geotechnical evaluation will serve as the basis for the dam foundation design as well as any required seepage controls. The investigation work will be completed in the fall of 2019 when the lake level has been drawn down at the end of the irrigation season.

Deliverables:

- A total of six borings with three upstream and three downstream from the dam.
- Installation of two piezometers, if possible.
- Collection of soil samples and laboratory analysis to determine the soil characteristics.
- Draft geotechnical report provided to WLID for review and comment.
- Final geotechnical report that incorporates WLID comments. The final report will be provided to Oregon Dam Safety.

4.2.5 Task 5.0 – Alternatives Development and Evaluation

A dam safety and conceptual design analysis was completed for Wallowa Lake Dam in 2001. Within this analysis, it was determined that the existing dam did not meet current dam safety guidelines for sliding and overturning when the reservoir level exceeded the spillway crest. It was also determined that the existing outlet conduits and spillway did not have adequate hydraulic capacity to pass the Probable Maximum Flood (PMF), which would result in overtopping, erosion of the dam abutments, and subsequent dam failure with uncontrolled release of the reservoir stored water. The dam rehabilitation plan was identified to address these dam safety issues and allow the reservoir to return to its full reservoir elevation.

The Probable Maximum Precipitation (PMP) and PMF analyses were completed in 2017. The results from this analysis indicated that modifications to the existing spillway and outlet conduits could be made

to achieve the required hydraulic capacity to pass the estimated PMF. These results make the alternative of a major rehabilitation fully feasible with the existing dam left in place.

The intent of Task 5 is to build on the analysis that has been completed to date and update the preliminary design. The design criteria, PMF analysis, and final spillway configuration will drive the final dam configuration. It is important at this stage of the dam design to meet with OWRD Dam Safety to review the design criteria. With these criteria established, the alternatives analysis will be completed and a final dam layout will be developed. Two basic alternatives will be considered: (1) rehabilitate the existing dam with the goal of maintaining as much of the existing dam structure as possible, and (2) replace the existing dam. Sufficient details will be developed for each alternative to allow full evaluation and selection of the optimum alternative considering a full range of criteria. This work task will be coordinated with Task 2 – Fish Passage Planning and Design, to allow integration of the fish passage system into the dam design approach.

A draft report will be prepared presenting the assumptions, criteria, and results of the engineering analyses. The report will be provided to WLID and OWRD Dam Safety for review. The construction cost estimate will be updated to reflect the final established design criteria and spillway configuration.

Deliverables:

- Kickoff meeting with WLID and OWRD Dam Safety to review the dam and establish design criteria, outlet conduit and spillway options, and dam alternatives.
- TM summarizing the design criteria agreed upon with OWRD Dam Safety.
- Final report presenting the updated alternative dam configurations, design criteria, PMF analysis, fish passage analysis, updated construction cost estimates, and construction schedule.
- Preliminary design drawings illustrating the recommended dam rehabilitation design option.

4.2.6 Task 6.0 – Final Design

Within this work task, the preliminary design details will be advanced to detailed construction plans and specifications. The construction drawings will be organized by engineering discipline and will present the details required to construct the dam structure. Technical specifications will be prepared outlining the technical requirements for the construction of the new dam as well as the requirements for concrete, metals, gates, and electrical materials. A preliminary list of drawings and technical specifications is presented in Appendix B. Interim submittals will be prepared and submitted at the 60%, 90%, and 100% levels of completion. Review meetings will be held with the WLID and OWRD Dam Safety to review the interim submittals and address comments. All comments will be incorporated into the final submittal and issued in the final stamped and signed drawings.

McMillen Jacobs will prepare a Design Documentation Report (DDR) that contains the design assumptions, calculations, and associated design data used to develop the detailed plans and specifications. The DDR is intended to document the design development process from the initial kickoff meeting through the issuance of the final construction documents. The DDR will build on the preliminary design report completed under Task 5.0, then updated to reflect the final design data presented in the

subsequent design submittals. The main body of the report will present the design criteria, facility component data, operating parameters, and overview of the proposed facility. The design development and calculations will be assembled in separate report appendices.

Deliverables:

- 60% interim design submittal for WLID review and approval.
- 90% interim design submittal for WLID review and approval.
- 100% final check submittal for WLID review and approval.
- Final stamped, signed construction documents.
- DDR submittal for WLID review and approval at 60%, 90%, and 100% level of completion.

4.2.7 Task 7.0 – Cost Estimates and Schedule

A detailed construction cost estimate and schedule will be developed for each of the final design submittals. The construction schedule will provide a breakdown of each work task by work element and duration, providing a fully developed schedule from the pre-construction work phase through construction and startup/commissioning activities. The schedule will be developed based on completing the dam construction between August and April of the selected construction year. Pre-construction activities consisting of early equipment procurement, shop drawing and submittal development, mobilization, site clearing, and field office setup will occur prior to the August timeframe. It is assumed that the lake level will be lowered by late fall to allow the cofferdam and dewatering system to be installed, and the site dewatered for construction. A bypass pipe will be installed to provide a minimum flow to the river as well as stock maintenance flows to the WLID irrigation ditches. The construction cost estimate will provide a breakdown of the major work elements anticipated during construction. The cost estimate will reflect the construction schedule in terms of overall duration, work sequence, and required resources. The updated construction cost estimate will be used to track the Project budget to ensure that the proposed design falls within the budget.

Deliverables:

- 60% interim construction budget and schedule for WLID review and approval.
- 90% interim construction budget and schedule submittal for WLID review and approval.
- 100% final check construction budget and schedule.
- Final construction budget and schedule.

4.2.8 Task 8.0 – Stakeholder Coordination

As part of the Project development, McMillen Jacobs will work closely with the WLID to engage and coordinate with the Project stakeholders to provide periodic status reports of the design and permitting progress, timeline, and work execution. We anticipate that this effort will include one-on-one meetings to coordinate a specific design issue, such as the City of Joseph water supply pipeline route through the dam, as well as public meetings designed to provide an overall Project update and schedule. For each meeting, McMillen Jacobs will develop the meeting materials and presentation, coordinate the meeting invite

distribution list, and conduct the meetings. A brief set of meeting minutes will be prepared and distributed to the meeting attendees following each meeting. For the purpose of budget development, the following meetings were assumed:

- Four (4) public meetings held over the course of the design development.
- Two (2) site visits coordinated during construction.
- Ten (10) individual one-on-one stakeholder meetings to coordinate a specific design element related to the Project.

Deliverables:

- Preparation of meeting materials for each meeting.
- Preparation of meeting minutes following each meeting.

4.2.9 Task 9.0 – Project Administration and Meetings

Task 9.0 is organized in two basic subtasks as presented in the following paragraphs.

Subtask 9.1 – Administration

Mort McMillen will serve as the Project Manager and will be responsible for the overall work direction as well as serving as the primary contact for the McMillen Jacobs team. Mr. McMillen will coordinate directly with the WLID as required to execute the Project. As a first step, Mr. McMillen will develop a detailed Project Management Plan (PMP) that outlines the detailed Project management activities required to execute our workplan. The PMP will identify the staffing plan and individual budget allocation, communication protocol, documentation protocol and directories, and a detailed quality assurance/quality control (QA/QC) plan. On a monthly basis, Mort will attend a progress review meeting with WLID to discuss the work progress, coordinate work tasks, and discuss the schedule and budget status. This work task includes the work effort required to set up the Project budget and schedule, develop and manage the QA/QC process, and overall tracking of the work effort.

Deliverables:

- Draft PMP for WLID review and comment.
- Draft QA/QC plan for WLID review and comment.
- Final PMP and QA/QC plan.
- Daily coordination of the work execution.
- Monthly progress reports and invoices.

Subtask 9.2 – Meetings

A key to success of any project effort is effective communication throughout the project execution. To ensure effective communication between McMillen Jacobs and the WLID, we anticipate that a range of meetings will be required. These meetings include the use of web-based meeting tools as well as face-to-face meetings in Enterprise. Table 4-4 outlines the proposed meetings.

Table 4-4. Proposed Project Meetings

Meeting Type	Overview
Coordination Conference Calls	These calls will occur on a bi-weekly basis and include the McMillen Jacobs key staff and WLID Project Manager, will be approximately 1 hour in length, and will be used to coordinate the ongoing work activities. McMillen Jacobs will prepare and distribute a 2-week look-a-head schedule, action items list, and agenda 1 day prior to each meeting. Brief meeting minutes from the coordination calls will be prepared and distributed by the McMillen Jacobs team.
Monthly Progress Meetings	The progress meetings will be attended by our Project Manager and design team members, as required, and will be designed to update WLID on the Project status including budget, schedule, and coordination issues. These meetings will also be an opportunity to provide support to the stakeholder and agency meetings as discussed under Task 8. Meeting minutes will be prepared and distributed by McMillen Jacobs following the review meeting.
Design Review Meetings	We anticipate formal design review submittals at the 60%, 90%, and 100% design completion levels. McMillen Jacobs will schedule these meetings in Enterprise to present the interim design packages, discuss design details, and respond to WLID comments. The design review meetings will be approximately 4 hours in length. All comments will be entered into a formal comment documentation form and responded to in writing by McMillen Jacobs. Meeting minutes will be prepared and distributed by McMillen Jacobs following the review meetings.
Periodic Coordination Calls and Meetings	We anticipate that coordination calls and meetings will be periodically required with WLID throughout the Project execution. McMillen Jacobs will be available upon request to provide support and documents required for these meetings.

4.3 Phase 3 – Construction

Under Phase 3 of the Project, the dam and related structures will be constructed. As outlined in the milestone schedule, early procurement would occur in March 2020, which would allow for the long-lead equipment such as gates, operators, and steel embeds and facilitate completion of the dam by April 2021. The construction schedule is tied to bringing the lake level down in the fall of 2020. The cofferdam will be installed in early August, allowing the existing dam to be dewatered for demolition. The dam concrete placement will occur through January 2021 with the spillway gate installation, electrical work, and final mechanical work completed by March 2021. With this schedule, the cofferdam can be removed and the new dam startup and testing completed by mid-April, allowing the dam to be available to start filling with the normal spring runoff. The remaining site restoration, fencing, and site improvements will continue through June. The final demobilization will occur by July 2021.

A brief description of the major dam construction activities is presented in the following paragraphs. This description is based on the dam rehabilitation option.

Pre-Construction

The short construction window dictated by the irrigation season and winter conditions will require early procurement and construction planning work to be completed to fully prepare for the main construction window. During the pre-construction period, the following major work activities will include, but are not limited to the following:

- Issue procurement packages for long-lead items such mechanical gates and operators, metal embeds, fish screens, electrical panels, and controls.
- The onsite QA/QC program will also be developed including developing testing protocols and setting up laboratory testing contracts and testing plans.
- The site-specific construction workplans will be developed during the pre-construction period. These plans include the erosion and sediment control, cofferdam and dewatering, demolition, hazardous materials handling, excavation, and traffic control plans.

Mobilization and Site Preparation

WLID owns the open field on the north abutment of the dam, which will be used for the construction office and staging area. In July 2020, this field will be cleared, the access road improved, and the construction office set up. The construction equipment will be mobilized to the site along with concrete forms, construction materials, tool trailers, generators, pumps, and associated material required for the dam construction. Erosion and sediment control measures will be established on the Project site in preparation for initiation of earth moving activities.

Cofferdam and Dewatering

During the course of the summer months, the WLID will be lowering the reservoir through irrigation releases to the downstream irrigation ditches. It is anticipated that the reservoir will reach its minimum lake level with the flow controlled by the upstream natural outlet section. At this point, a bypass pipe will be installed along the existing channel from the natural outlet to the dam where it will be routed to the penstock pipe on the south abutment. A new pipe section will be welded on the downstream end of the penstock with piping and valves installed to allow the directing of flow to the Silver Lake Ditch flume and the Wallowa River. This flow bypass will remain in place during the construction period. A cofferdam constructed from natural materials along the outlet channel and Super Sack material will be installed across the upstream outlet of the reservoir. The cofferdam and bypass pipe will provide for flow control and bypass during construction.

Excavation and Demolition

With the cofferdam and dewatering system in place, the channel immediately upstream from the dam will be excavated to expose the dam foundation. Select demolition of the existing concrete will be completed on the upstream face to remove severely deteriorated concrete and provide a suitable surface to pour new concrete against. Similarly, the surface concrete will be removed from the existing spillway crest, downstream spillway, and abutment. In addition, the existing outlet conduit gates and operators will be removed along with the spillway piers.

Outlet Conduit Repairs

The five existing outlet conduits will be repaired by removing the temporary tunnel steel lining, cleaning the existing concrete surface, and installing new steel liners. The steel liners will extend from the concrete dam face to the conduit outlets in the stilling basin.

Dam Concrete Repair

The existing concrete dam surfaces will be enclosed in a new concrete shell. This work effort will require sandblasting the existing concrete surface to remove loose materials and expose the aggregate. Epoxy anchors will be installed within the existing concrete dam face and tied to a new steel reinforcement mat. A new concrete surface will then be placed on the existing dam surfaces, effectively encasing the existing dam and utilizing the existing concrete weight in the dam stability. The concrete repair work will start in the stilling basin on the downstream side of the dam and extend upstream to the existing dam crest and face.

Upstream Concrete Face

A new concrete face will be placed on the dam. The concrete will extend vertically from the exposed dam foundation up to the dam crest. It will also extend along the dam width through the main section of the dam and into the dam abutments.

New Intake Structure

A new cast-in-place concrete intake structure will be constructed on the north side of the dam. The intake will be located on the upstream side of the dam and supply water to conduits 1 and 2, which feed the Silver Lake Ditch. Fish screens will be installed on the intake structure along with water control gates.

Upstream Fish Passage

The upstream fish passage facility will be located on the downstream side of the dam on the south side of the existing dam stilling basin. The water supply for the facility will be provided from the existing penstock pipe.

Dam Access Bridge

It is anticipated that a new access bridge will be constructed over the spillway to provide access from the north side of the dam to the south. The bridge structure will either be a cast-in-place concrete deck or a pre-fabricated steel bridge.

Electrical and Instrumentation

During the course of the main dam construction, embedded electrical conduits will be installed in the concrete placements. As a final step, power and instrumentation lines will be pulled through the embedded conduits, gate operators and electrical equipment connections made, and the final electrical systems installed.

Dry Testing

With the dam construction complete, the mechanical and electrical systems will be tested in the dry to confirm the operation. This will include testing the operation of water level sensors, gate operator cycles, electrical motors, and all other associated equipment.

Cofferdam Removal

Water will be released past the cofferdam and routed through the dam outlet conduits. The bypass pipe will be removed, then the remainder of the cofferdam will be removed and the existing outlet channel graded. The new debris booms will be installed across the outlet channel.

Startup and Commissioning

With the cofferdam removed, the reservoir will be allowed to fill on the dam face. While the lake level is raising, the dam will be monitored. When the lake level reaches approximately 8 feet on the gage, the conduit outlet gates will be cycled from closed to open in series to ensure that the gate operators are functioning as required, the electrical and instrumentation systems are fully functional, and the dam is functioning as required. Field measurements will be recorded and provided as part of the overall startup and commissioning plan documentation. The same tests will be repeated again at the 16-foot, 24-foot, and full lake level.

Site Restoration

The office trailers will be removed, the stockpile and staging area regraded, and final seeding placed. The construction access road will be graded and final surfacing material installed to provide long-term access to the dam. Final fencing will also be installed during this period, providing Project protection and security. Permanent erosion and sediment control protection measures will also be installed.

Demobilization

At the completion of all field activities, the remaining construction equipment will be removed from the Project site.

5.0 Milestone Schedule

Figure 5-1 presents the milestone schedule for the Project from initial Notice to Proceed (NTP) for the design through final startup and commissioning. The schedule was developed based on the following assumptions:

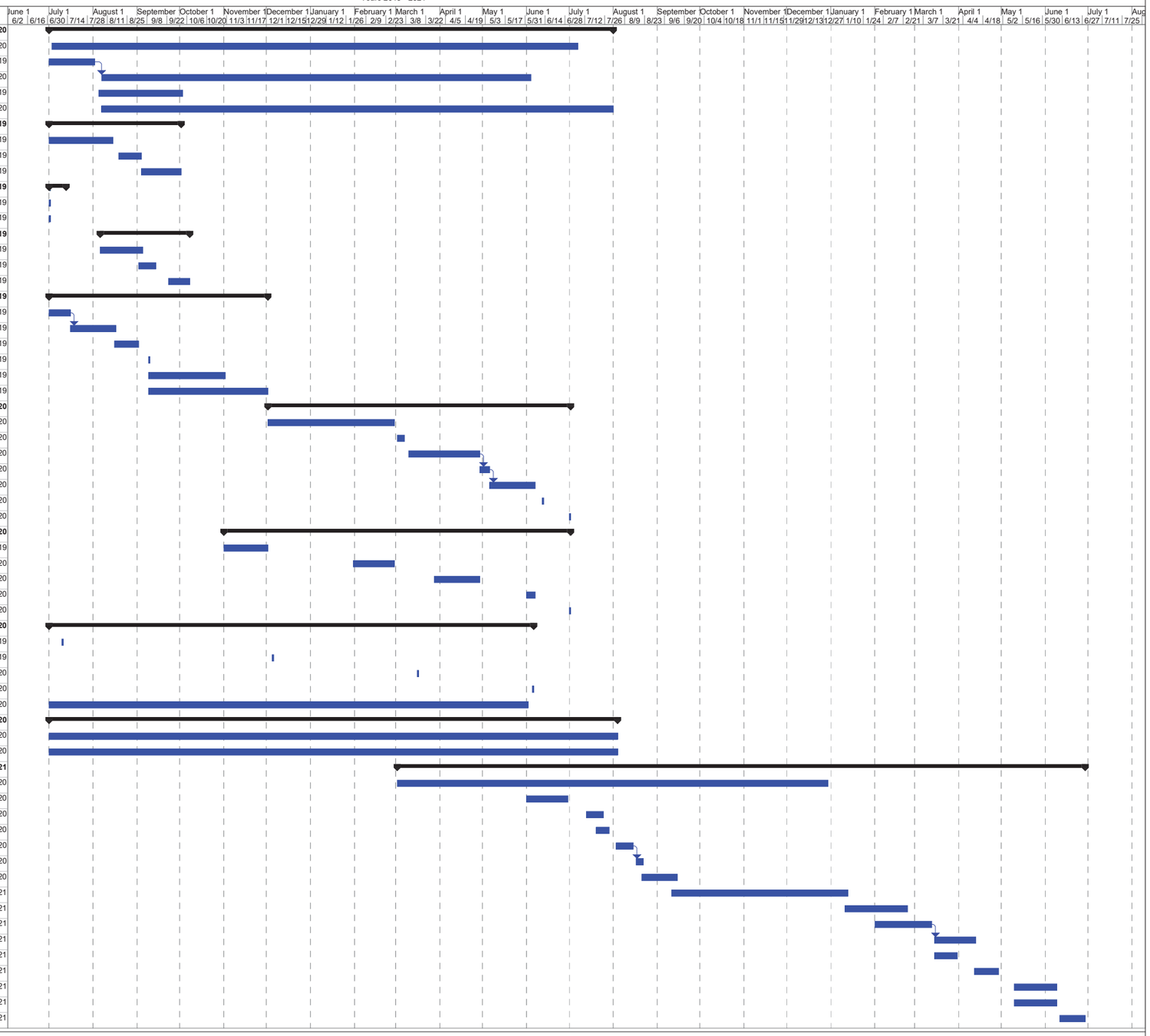
1. State funding would be available in June 2019.
2. Site investigations and mapping would be completed by October 2019.
3. Fish passage and dam alternatives analysis would advance concurrently.
4. The final design with full review and approval from the State Dam Safety would be completed within 12 months.

5. Permitting and regulatory compliance work would be completed with permits issued by July 2020.
6. Wallowa Lake would be lowered to allow installation of the cofferdam and dewatering system by September 2020.
7. The dam construction would be substantially complete allowing the reservoir to be filled by April 2021.
8. Final Project completion and demobilization would be complete by July 2021.

With the proposed schedule, construction could be initiated in the fall of 2020 with the reservoir restored to full level in 2021. This schedule would require the final design and permitting to be completed in approximately 12 months.

Figure 5-1. Wallowa Lake Dam Rehabilitation
Ph. II / III Planning, Design, and Construction Schedule
Years 2019 - 2021

ID	Task No.	Task Name	Start	Finish
1	**1**	**Environmental/Permitting**	**Mon 7/1/19**	**Fri 7/31/20**
2		Joint Permit Application (USACE-DSL)	Wed 7/3/19	Mon 7/6/20
3		Permit Application and Submittal	Mon 7/1/19	Thu 8/1/19
4		Agency Review and Approval	Wed 8/7/19	Wed 6/3/20
5		Cultural Site Survey	Mon 8/5/19	Wed 10/2/19
6		Oregon Dam Safety Review	Wed 8/7/19	Fri 7/31/20
7	**2**	**Fish Passage Planning and Design**	**Mon 7/1/19**	**Tue 10/1/19**
8		Update Conceptual Design Report	Mon 7/1/19	Wed 8/14/19
9		Conduct Agency Meeting	Mon 8/19/19	Tue 9/3/19
10		Issue Final Design Report	Wed 9/4/19	Tue 10/1/19
11	**3**	**Topographic Mapping**	**Mon 7/1/19**	**Fri 7/12/19**
12		<New Task>	Mon 7/1/19	Mon 7/1/19
13		<New Task>	Mon 7/1/19	Mon 7/1/19
14	**4**	**Geotechnical Site Investigations**	**Tue 8/6/19**	**Mon 10/7/19**
15		Conduct Field Investigations	Tue 8/6/19	Wed 9/4/19
16		Conduct Laboratory Analysis	Mon 9/2/19	Fri 9/13/19
17		Prepare Geotechnical Report	Mon 9/23/19	Mon 10/7/19
18	**5**	**Alternatives Development and Evaluation**	**Mon 7/1/19**	**Sun 12/1/19**
19		Kickoff Meeting with WLID / OWRD Dam Safety	Mon 7/1/19	Mon 7/15/19
20		Develop Dam Options	Tue 7/16/19	Fri 8/16/19
21		Develop Technical Memorandum (TM)	Fri 8/16/19	Sun 9/1/19
22		Review Meeting with WLID / OWRD Dam Safety	Mon 9/9/19	Mon 9/9/19
23		Develop Final TM	Mon 9/9/19	Fri 11/1/19
24		Prepare Preliminary Design	Mon 9/9/19	Sun 12/1/19
25	**6**	**Final Design**	**Mon 12/2/19**	**Wed 7/1/20**
26		Prepare 60% Plans, Specifications and DDR	Mon 12/2/19	Fri 2/28/20
27		Submittal Review and Meeting	Mon 3/2/20	Fri 3/6/20
28		Prepare 90% Plans, Specifications and DDR	Tue 3/10/20	Tue 4/28/20
29		Submittal Review and Meeting	Wed 4/29/20	Tue 5/5/20
30		Prepare 100% Plans, Specifications and DDR	Wed 5/6/20	Sat 6/6/20
31		Submittal Review and Meeting	Fri 6/12/20	Fri 6/12/20
32		Issue Stamped/Signed Documents	Wed 7/1/20	Wed 7/1/20
33	**7**	**Cost Estimate and Schedule**	**Fri 11/1/19**	**Wed 7/1/20**
34		Prepare Preliminary Design Cost Estimate / Schedule	Fri 11/1/19	Sun 12/1/19
35		Prepare 60% Cost Estimate / Schedule	Fri 1/31/20	Fri 2/28/20
36		Prepare 90% Cost Estimate / Schedule	Sat 3/28/20	Tue 4/28/20
37		Prepare 100% Cost Estimate / Schedule	Mon 6/1/20	Sat 6/6/20
38		Issue Final Cost Estimate / Schedule	Wed 7/1/20	Wed 7/1/20
39	**8**	**Stakeholder Coordination**	**Mon 7/1/19**	**Fri 6/5/20**
40		Coordination Meeting #1	Wed 7/10/19	Wed 7/10/19
41		Coordination Meeting #2	Thu 12/5/19	Thu 12/5/19
42		Coordination Meeting #3	Mon 3/16/20	Mon 3/16/20
43		Coordination Meeting #4	Fri 6/5/20	Fri 6/5/20
44		Individual Stakeholder Meetings	Mon 7/1/19	Mon 6/1/20
45	**9**	**Project Administration and Coordination**	**Mon 7/1/19**	**Mon 8/3/20**
46		Administration	Mon 7/1/19	Mon 8/3/20
47		Meetings	Mon 7/1/19	Mon 8/3/20
48	**10**	**Construction**	**Mon 3/2/20**	**Mon 6/28/21**
49		Early Equipment Procurement	Mon 3/2/20	Tue 12/29/20
50		EPA ESC Permit	Mon 6/1/20	Mon 6/29/20
51		Mobilization/Office Setup	Mon 7/13/20	Fri 7/24/20
52		Site Clearing/Grubbing	Mon 7/20/20	Tue 7/28/20
53		Cofferdam Construction	Mon 8/3/20	Fri 8/14/20
54		Dewatering	Mon 8/17/20	Fri 8/21/20
55		Demolition and Foundation Preparation	Fri 8/21/20	Mon 9/14/20
56		Concrete Placement	Fri 9/11/20	Tue 1/12/21
57		Gate Installation	Mon 1/11/21	Tue 2/23/21
58		Electrical	Mon 2/1/21	Fri 3/12/21
59		Startup and Testing/Final Inspection	Mon 3/15/21	Mon 4/12/21
60		Cofferdam Removal	Mon 3/15/21	Tue 3/30/21
61		Final Site Grading	Mon 4/12/21	Wed 4/28/21
62		Site Restoration/Planting	Mon 5/10/21	Tue 6/8/21
63		Fencing	Mon 5/10/21	Tue 6/8/21
64		Demobilization	Fri 6/11/21	Mon 6/28/21



PRELIMINARY

Task — Summary — External Milestone — Manual Task — Manual Summary — External Tasks — Deadline
Split — Project Summary — Inactive Milestone — Duration-only — Start-only — External Milestone
Milestone — External Tasks — Inactive Summary — Manual Summary Rollup — Finish-only — Progress

6.0 Budget

The Phase 1 work activities are underway by the WLID. These activities are being funded directly by the WLID through user assessments. The Table 6-1 presents a summary of the proposed Project budget for Phases 2 and 3. A detailed breakdown of the cost associated with Phases 2 and 3 is presented in Appendix D. The Phase 2 budget will be expended between July 2019 and June 2020. The Phase 3 budget will start in March 2020 with pre-construction and early procurement activities, with the majority of the budget expended between July 2020 and April 2021. All funds will be utilized and the Project closeout by July 2021.

Table 6-1. Project Phases 2 and 3 Budget Summary

Item No.	Description	Budget ($)
1	Phase 2 – Permitting/Regulatory and Final Design	$1,662,000
2	Phase 3 – Construction [1]	
	Dam Rehabilitation [2]	$12,440,000
	Upstream Fish Passage [3]	$1,498,000
3	Engineering and Supervision during Construction	$400,000
	TOTAL (Phase 2 + Phase 3)	$16,000,000

[1] Includes 20% estimating contingency.

[2] A new intake tower with intake exclusion fish screens will be constructed with the dam rehabilitation.

[3] Upstream fish passage is assumed to consist of a trap-and-haul facility located at the base of the dam with a fish entrance, holding pool, loading hopper, and jib crane lift.

Appendix A:

Wallowa Lake Dam Current and Historic Photos

Current Photos

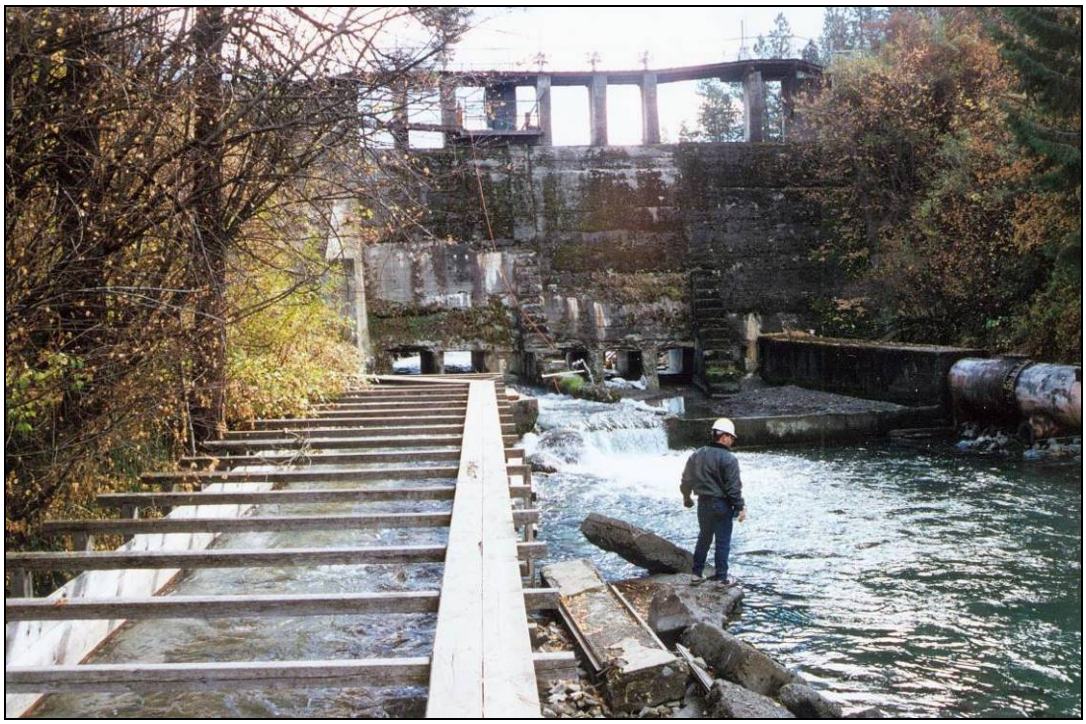


Photo 1. Downstream face of dam.

Photo 2. Looking downstream from the dam.

Photo 3. Downstream face of dam looking at the spillway.

Photo 4. Downstream face of dam looking at the sill.

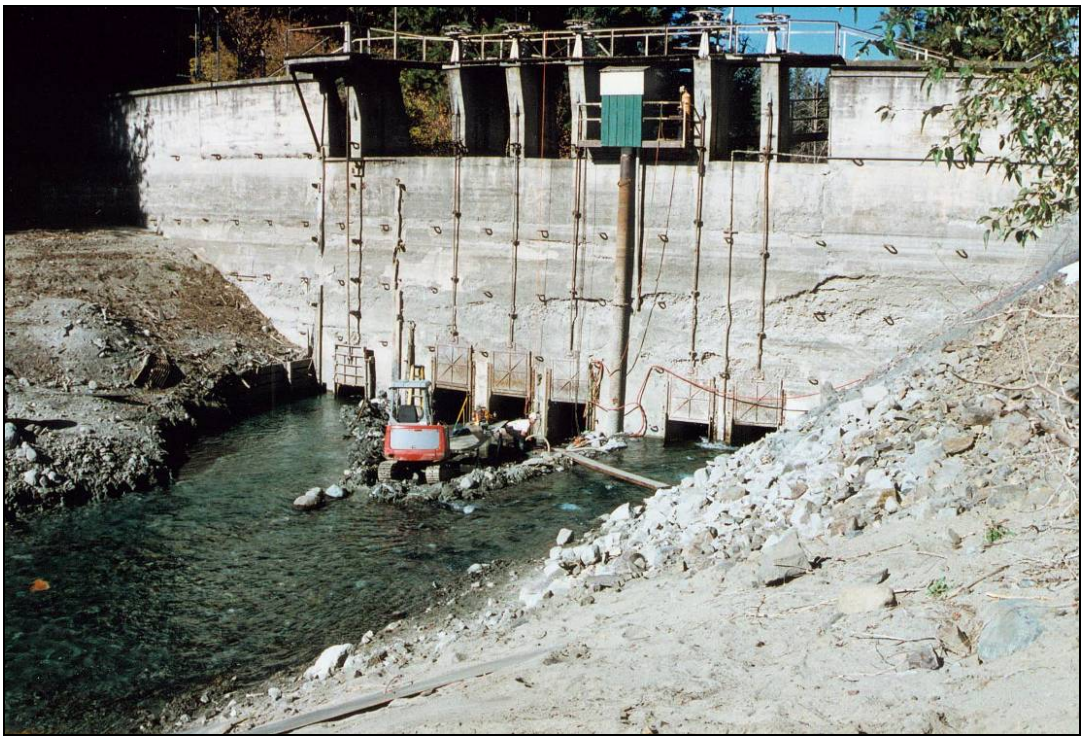


Photo 5. Upstream face of dam showing gates.

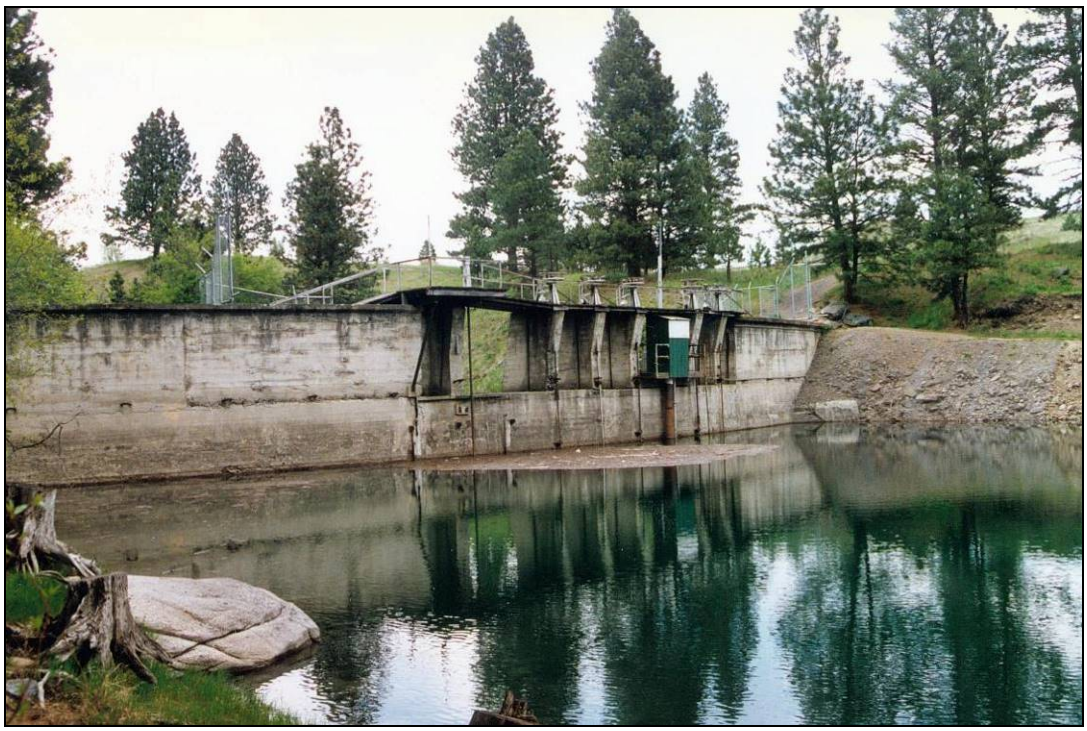


Photo 6. Upstream face of dam – 5 feet below full pool.

Photo 7. Upstream face of dam.

Photo 8. Looking upstream from the dam.

Photo 9. Aerial photograph of the dam area.

Historic Photos

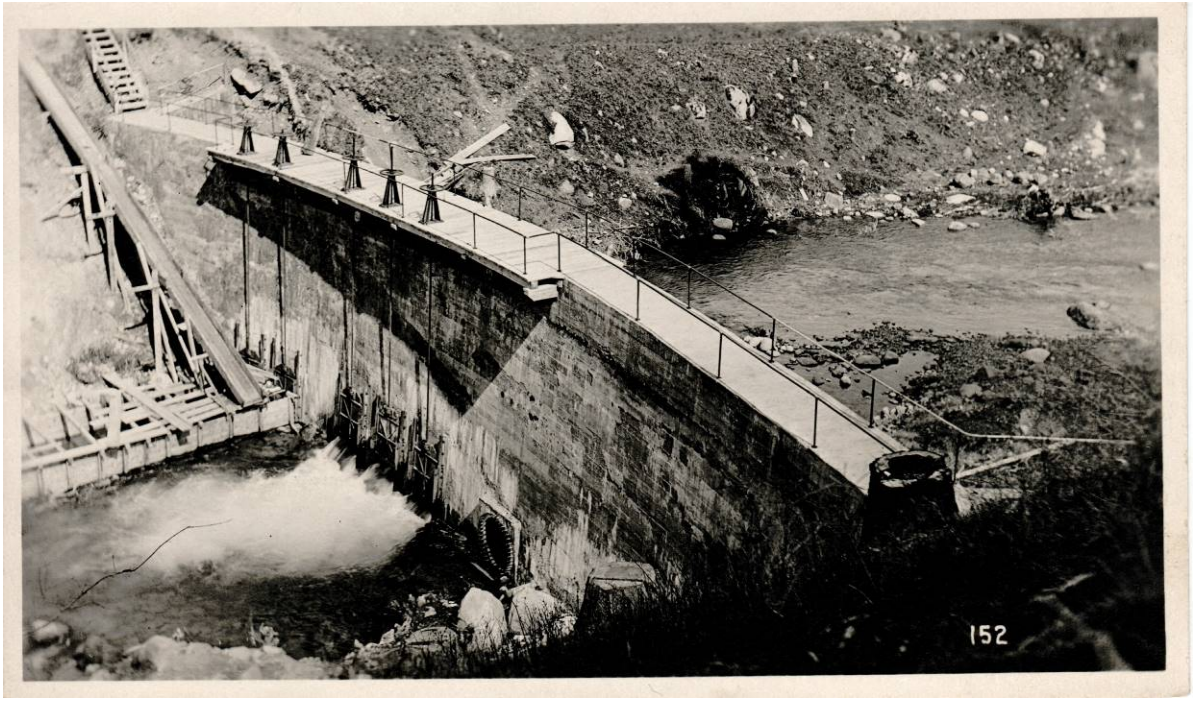


Photo 10. 1919 dam construction.

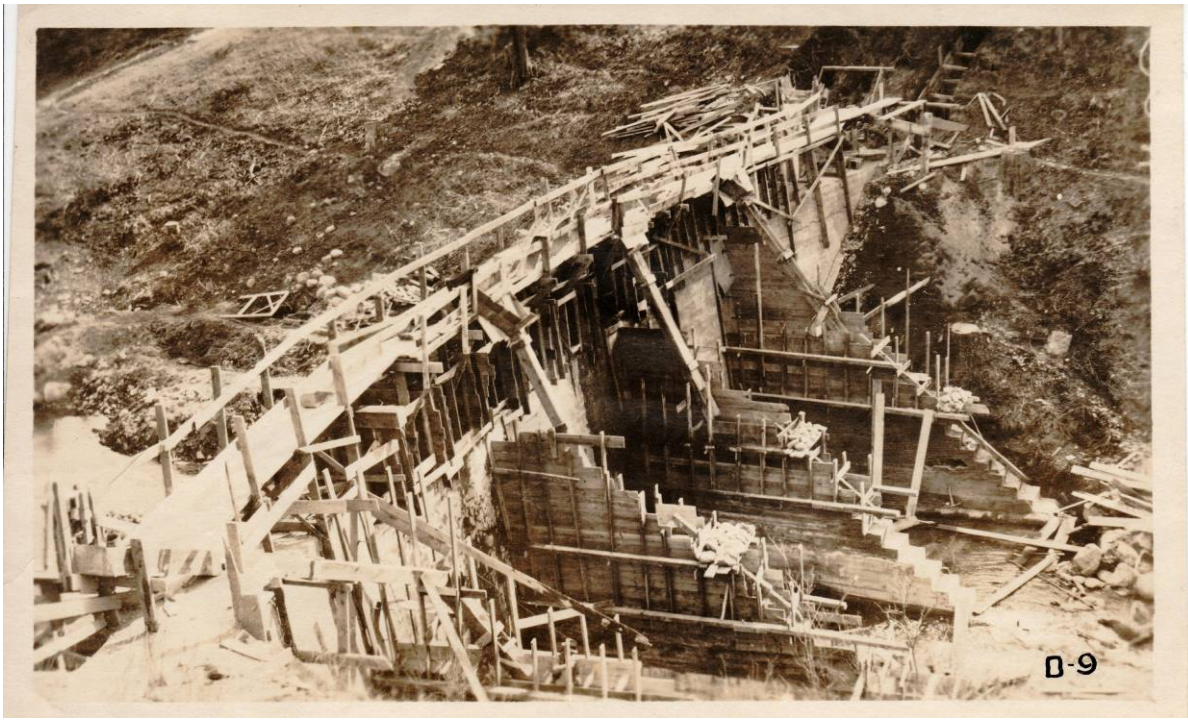


Photo 11. 1920 dam raise and adding downstream buttresses.

Photo 12. 1920 dam raise and adding downstream buttresses.

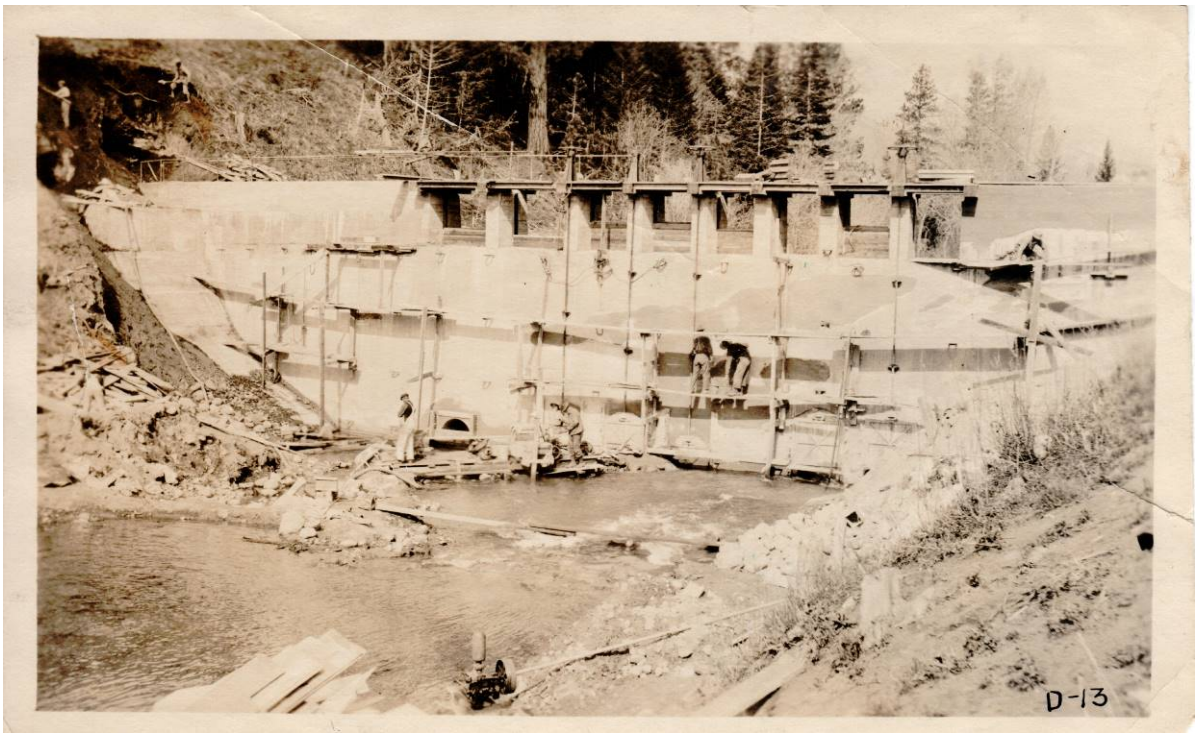


Photo 13. Dam construction in 1920.

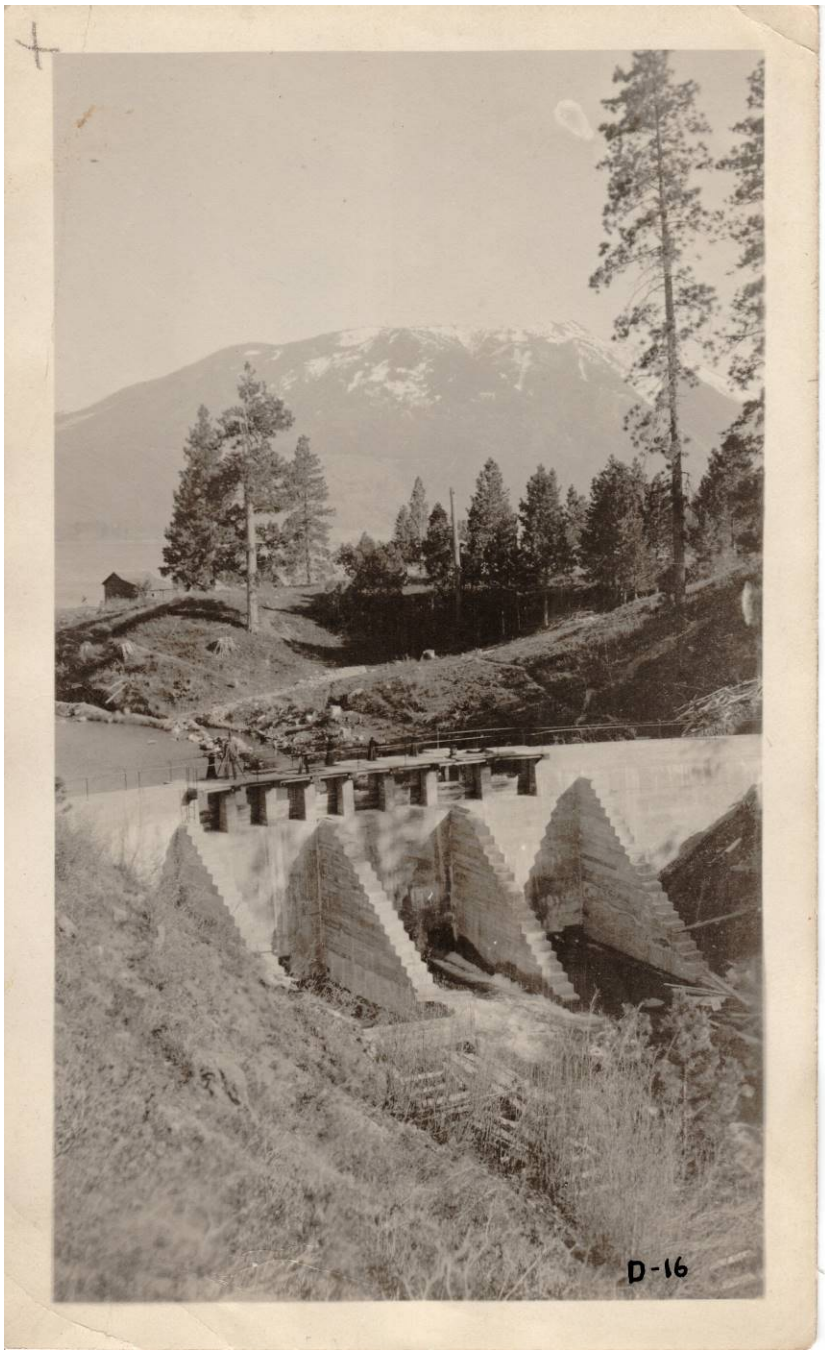


Photo 14. Dam construction in 1920.

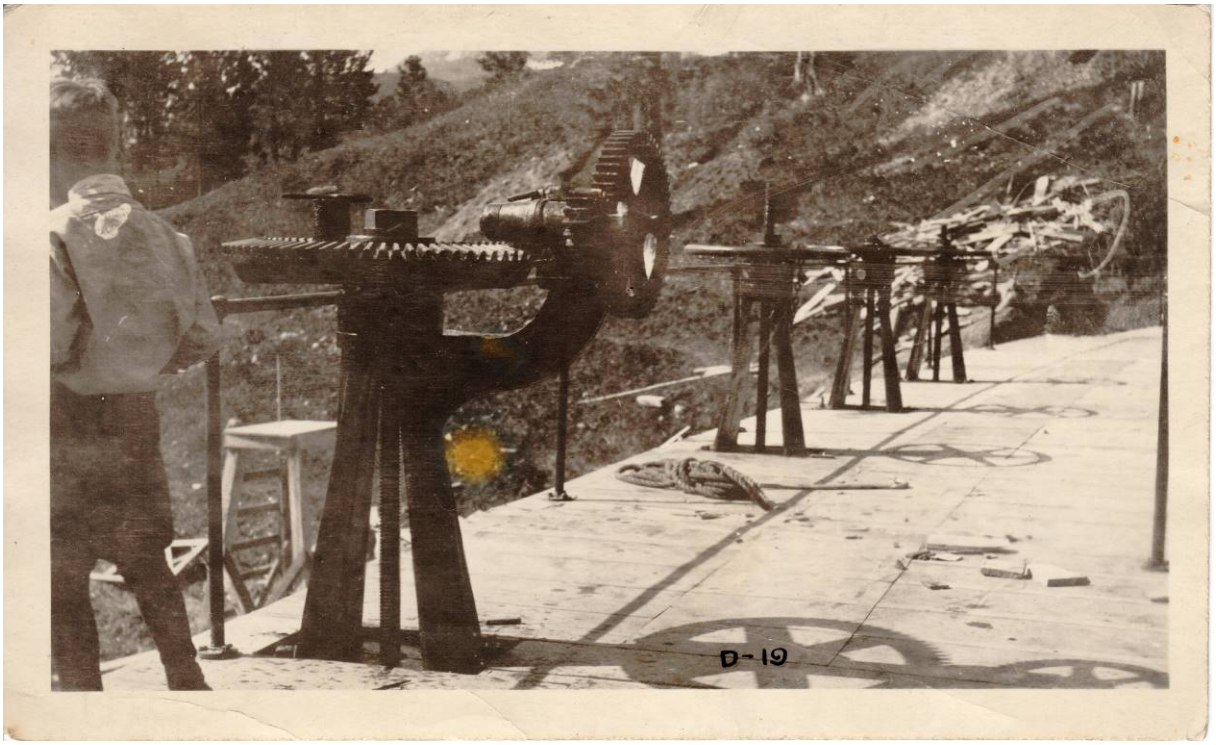


Photo 15. Dam construction in 1920.

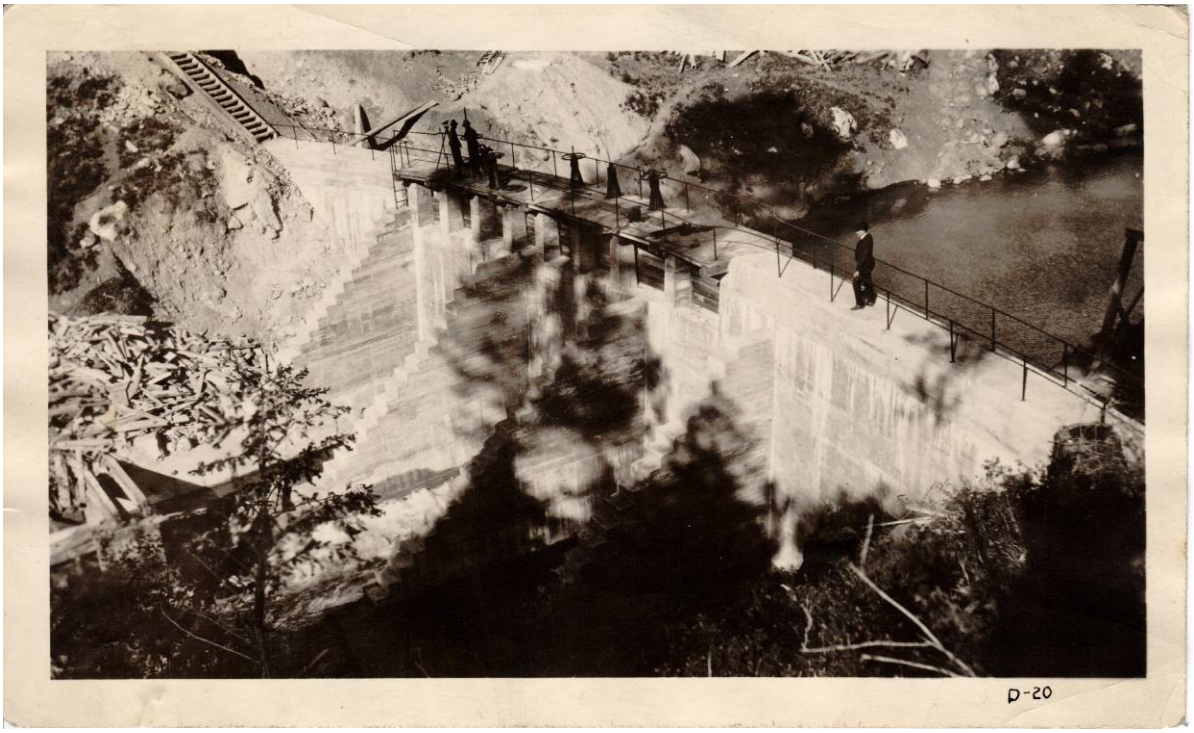


Photo 16. Dam construction in 1920.

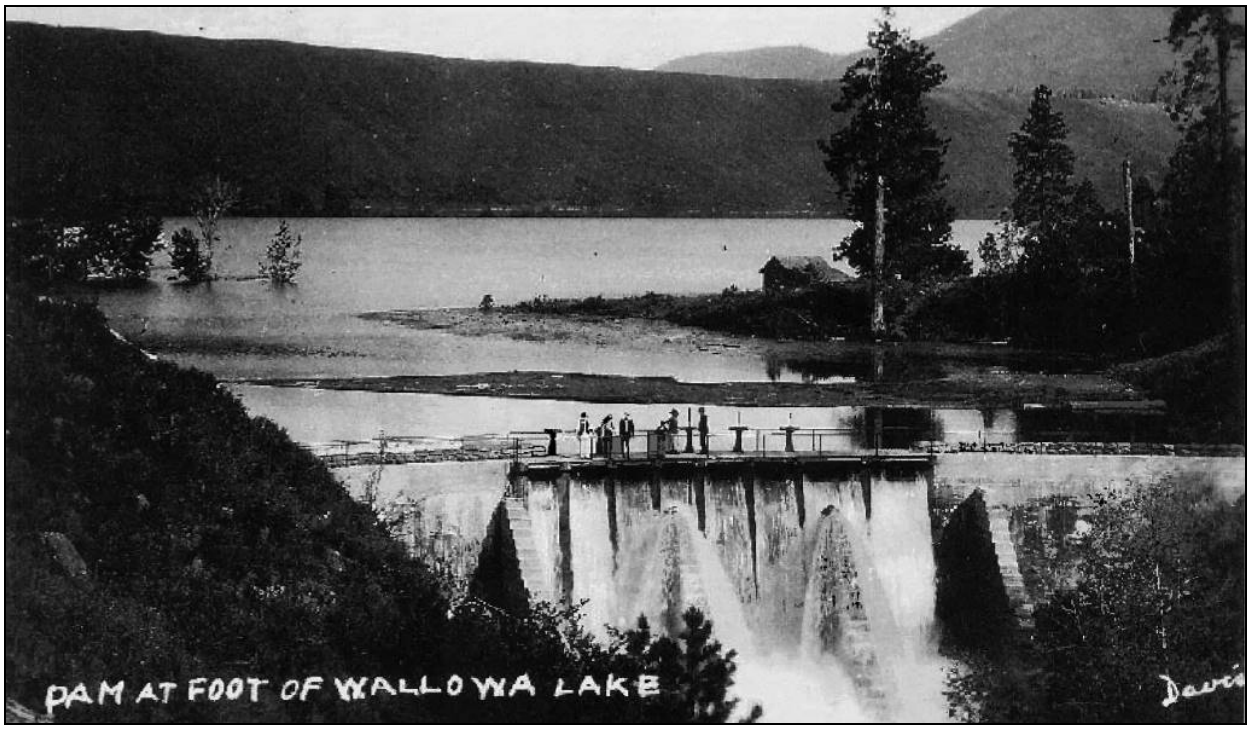


Photo 17. 1920 dam with water flowing.

Appendix B:

Preliminary Drawing and Specifications List

Drawing List

Wallowa Lake Dam Rehabilitation

Sheet No.	Drawing No.	Description
		General
		Cover Sheet
1	G001	Location Map, Vicinity Map
2	G002	Index of Drawings
3	G003	Standard Abbreviations and Symbols
4	G004	Overall Site Plan
5	G005	General Site Plan, Contractor Staging, and General Arrangement
6	G006	Hydraulic Profile and Design Criteria
7	G007	Piping Schedule
		Demolition
8	D101	Demolition Overall Plan
9	D102	Demolition -Plan and Photographs 1
10	D103	Demolition - Plan and Photographs 2
11	D104	Demolition - Sections and Details 1
12	D105	Demolition - Sections and Details 2
		Erosion and Sediment Control
13	ESC101	ESC Plan
14	ESC102	Access Road and Staging Area - Plan
15	ESC103	Dam Plan
16	ESC104	ESC Details 1
17	ESC105	ESC Details 2
		Civil
18	GC001	Standard Civil Notes and Conditions
19	GC002	Standard Civil Details 1
20	GC003	Standard Civil Details 2
21	GC104	Standard Civil Details 3
22	C100	Overall Site Plan and Project Control
23	C101	Upstream Cofferdam and Dewatering Plan
24	C102	Upstream Cofferdam and Dewatering Sections 1
25	C103	Upstream Cofferdam and Dewatering Sections 2
26	C104	Bypass Pipeline - Plan and Profile
27	C105	Bypass Pipeline - Sections and Details
28	C106	Downstream Cofferdam - Plan and Section
29	C110	Excavation Plan
30	C111	Excavation Sections 1

Sheet No.	Drawing No.	Description
31	C112	Excavation Sections 2
32	C113	Foundation Preparation - Plan and Section
33	C120	Site Grading - Plan
34	C121	Site Grading - Sections 1
35	C121	Site Grading - Sections 2
36	C122	Right Abutment Access Road - Plan and Profile
37	C123	Right Abutment Access Road - Sections and Details
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Wallowa Lake
Irrigation District

Wallowa Lake
Dam Rehabilitation

Technical Specification
Draft Outline

Prepared for:
Wallowa Lake Irrigation District

Prepared by:
McMillen Jacobs Associates

McMILLEN JACOBS ASSOCIATES

February 2019

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WALLOWA LAKE DAM REHABILITATION

WALLOWA LAKE IRRIGATION DISTRICT

TECHNICAL SPECIFICATIONS

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Letters of Support

CITY OF JOSEPH

201 N. Main
Joseph, Oregon 97846

January 30, 2019

Mr. Dan Butterfield
Wallowa Lake Irrigation District
85393 Bicentennial Lane
Joseph, OR 97846

Subject: Wallowa Lake Dam Rehabilitation
Letter of Support

Dear Mr. Butterfield:

We appreciate the opportunity to participate in the Wallowa Lake Irrigation District (WLID) information and strategy meeting held at the City of Joseph Community Center on January 16, 2019 for the Wallowa Lake Dam Rehabilitation (Project). The presentation provided by Mort McMillen provided us with a firm understanding of the history of Wallowa Lake Dam, the work completed to date, and the proposed strategy to move forward with the Project development and implementation utilizing the potential State of Oregon funding. We recognize the importance of Wallowa Lake Dam and Reservoir to the community. The reservoir storage provides flood protection to the downstream communities of Joseph, Enterprise, and Wallowa, as well as serving as the engine for the local economy. Incorporating fish passage into the dam as part of the Project implementation provides the stakeholders and resource agencies valuable facilities in managing local fishery resources and planning for potential Sockeye Salmon re-introduction in Wallowa Lake.

We have worked with the WLID over the past years in the planning of the Project and discussion of issues important to consider in the Project implementation. We are excited about the opportunity to obtain State of Oregon funding which would allow the Project to move rapidly forward with a construction completion by spring of 2021. The three-phase project development strategy outlined by Mort McMillen provides a logical process and timeline to implement the Project while maintaining strong stakeholder participation. We are excited to participate in the process to discuss and develop the final Project rehabilitation design which incorporates features to address our specific concerns. We fully support the WLID proposed strategy, work activities, and timeline, and are committed to working closely with the WLID to advance the project through the preplanning, final design and regulatory/permitting, and construction phases.

We look forward to working with the WLID and the project stakeholders to advance the Project in the coming months. Please do not hesitate to contact us if you need additional information.

Sincerely,

Teresa Sajonia, Mayor

Teresa Sajonia
Mayor, City of Joseph

State of Oregon
WALLOWA COUNTY
BOARD of COMMISSIONERS
101 S. River Street #301
Enterprise, Oregon 97828

541-426-4543 ext#130
Fax: 541-426-0582
Email: commissioners@co.wallowa.or.us

CHAIRMAN, SUSAN ROBERTS
COMMISSIONER, TODD NASH
COMMISSIONER, JOHN HILLOCK

Mr. Dan Butterfield
Wallowa Lake Irrigation District
85393 Bicentennial Lane
Joseph, OR 97846

January 22, 2019

Dear Mr. Butterfield;

The Wallowa County Board of Commissioners attended the recent information and strategy meeting concerning the Wallowa Lake Dam Rehabilitation Project presented by Mort McMillen of McMillen Jacobs Associates on behalf of the Wallowa Lake Irrigation District. The presentation was extremely informative and provided not only a historical view of the dam and its original construction and safety upgrades; the presentation included the current rehabilitation and safety upgrade plans. The attendees were able to get a clear picture of the preceding 17 years of preliminary engineering, fish passage discussions, mapping etc. up to the final design.

The Wallowa Lake Dam has been an integral part of flood control, water storage, irrigation and recreation for Wallowa County for 100 years. The Dam has provided critical flood control for the downstream communities. In the past 50 years the City of Enterprise and portions of the Wallowa Valley have suffered two flooding events from sudden snowmelt that caused significant damage. These could be yearly events if the Wallowa Lake Dam is not functional.

The Wallowa Lake Irrigation District (formerly Associated Ditch Company) has been very active in addressing this issue for many years. The ADC recognized the need for the rehabilitation and began working on re-organizing their structure to better position themselves to negotiate the intricacies of the three phase project development strategy outlined by Mr. McMillen. The County is very supportive of this project and feels that the

plan as presented answers and assuages the concerns that our citizens have articulated over the years.

The Commissioners look forward to working with WLID in the future to bring this much needed project to fruition.

Sincerely,

Susan Roberts
Chairman

Todd Nash
Commissioner

John Hillock
Commissioner

Confederated Tribes *of the*
Umatilla Indian Reservation

Board of Trustees

46411 Timíne Way
Pendleton, OR 97801

www.ctuir.org email: GaryBurke@ctuir.org
Phone: (541) 429-7030

February 5, 2019

The Honorable Kate Brown
Office of the Governor
900 Court Street NW, Suite 254
Salem, OR 97301

Re: Oregon State Budget Allocation of $16 million for Wallowa Lake Dam

Dear Governor Brown:

It was with great interest that we learned of the $16 million grant included in your 2019 budget to rebuild the Wallowa Lake dam. This project presents a tremendous opportunity to benefit not only out-of-stream uses, but to also restore summer in-stream flows to the benefit of regional downstream and upstream ecosystems and the species that depend upon them. While we are encouraged to see the proposed investment of public dollars in this project, we are concerned that the approach utilized is unduly narrow.

In its Treaty of 1855, 12 Stat. 945, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) reserved rights to fish, hunt, and gather in its traditional use areas. The CTUIR has been a steward of the salmon since time immemorial, and for the past many decades has worked with its co-managers in the Columbia Basin to restore salmon throughout this vast ecosystem, including the Wallowa Valley. As a fisheries co-manager in common with other tribal, state, local and federal entities, it is incumbent that the CTUIR be included in the discussions and planning regarding this auspicious project.

We also are concerned by the selection of the Special Public Works Fund for this water supply development project. The proposed $16 million public investment in Wallowa Lake dam will increase the storage capacity of Wallowa Lake by up to 15,000 acre-feet annually. This additional stored water will create a tremendously valuable new asset. However, unlike the Water Supply Development Account (ORS 541.656), the Special Public Works Fund includes no assurances that the public will receive any of the benefits of this new stored water. Given the substantial public investment in this project, we are confident the State wishes to ensure that the public will enjoy the benefits of this new water.

This project offers a tremendous opportunity to respond to economic, social, and environmental benefits by storing water for the irrigated agricultural community, increasing the security of downstream municipalities, and providing both in-lake and in-stream fisheries benefits that will in turn contribute to the region's tourism economy, as well as provide for new and improved treaty-reserved fishing opportunities.

Confederated Tribes *of the*
Umatilla Indian Reservation

Board of Trustees

46411 Timíne Way
Pendleton, OR 97801

www.ctuir.org email: GaryBurke@ctuir.org
Phone: (541) 429-7030

To that end, we are including with this letter an assessment we conducted last year regarding the in-stream flows needed below the Wallowa Lake dam to support the reintroduction of sockeye salmon, which have been extinct in the Wallowa for more than a century. As your representatives in *United States v. Oregon* will tell you, sockeye restoration to the Wallowa River has been a goal of co-managers for many years. Further, restoring summer in-stream flows also would revitalize the local recreation economy, supporting rafting and angling businesses that have been severely impacted by a changing climate. These gains can be accomplished without detriment to the local agriculture industry.

Your stated goals in the 2017 Integrated Water Resources Strategy include investing in both Oregon's in-stream and out-of-stream needs. This project provides a tremendous opportunity to do so. We look forward to working together closely to ensure that it does.

Respectfully,

N. Kathryn Brigham

for Gary Burke,
Chairman, Board of Trustees
Confederated Tribes of the Umatilla Indian Reservation

Encl.

CC: WLID
NPT
ODFW
Oregon Water Resources Congress
WaterWatch

Nez Perce

TRIBAL EXECUTIVE COMMITTEE
P.O. BOX 305 • LAPWAI, IDAHO 83540 • (208) 843-2253

4 February 2019

Governor Kate Brown
Office of the Governor
900 Court Street NE, Suite 254
Salem, OR 97301-4047

Re: Wallowa Lake Dam Rehabilitation and Fish Passage

Dear Governor Brown:

The Nez Perce Tribe (Tribe) writes to state its support for state funding of rehabilitation of the Wallowa Lake Dam, and for fish passage to and from Wallowa Lake. The Tribe is copying the Wallowa Lake Irrigation District (WLID), the owner of the dam, with this letter to indicate our support as a cooperating partner.

The Nez Perce Tribe is a co-manager of the fisheries resources in Northeast Oregon, including those in the Wallowa River and its lake. Most of what is now Northeast Oregon, and all of what is now Wallowa County, whose name is a *Nimiipuu* word, is the homeland of the Nez Perce Tribe. In the Nez Perce Treaty of June 11, 1855 with the United States, the Tribe reserved all rights not expressly ceded to the United States and – in partial consideration for ceding land that became parts of the future states of Oregon, Washington, and Idaho – specifically reserved rights it had exercised since time immemorial, including the right to take fish at all usual and accustomed places, and the right to hunt, gather, and pasture animals on all open and unclaimed lands. The treaty rights reserved by the Tribe are vested solely in the Nez Perce Tribe and its members. United States v. Oregon, 29 F.3d 481 (9th Cir. 1994). The Tribe's reserved rights in Northeast Oregon are continually exercised by its members, and are critical to the present-day subsistence, culture, religion, and economy of the Tribe.[1]

The Tribe has long partnered with state and local governments and private entities to help restore fish populations and to create a sense of stewardship, throughout Nez Perce treaty territory in Oregon, Washington, and Idaho. The Tribe provided congressional testimony in support of the

[1] The Tribe's work as a fisheries co-manager through the federal case of U.S. v. Oregon, and its coordination with the Oregon Department of Fish and Wildlife, has provided for local fisheries that benefit both Indians and non-Indians alike in Oregon. The Tribe's Department of Fisheries Resource Management office in Joseph, Oregon employs 19 full-time staff, and eight to ten part-time workers. These individuals staff Research, Production, and Watershed divisions throughout Northeast Oregon. The Tribe's local office has an annual budget of approximately $2.4 million that provides a significant contribution to the Northeast Oregon economy through implementation of multiple fisheries projects on Northeast Oregon rivers.

Wallowa Lake Dam Rehabilitation and Water Management Act of 2005. We wrote letters to congressional delegations urging their backing, submitted multiple press releases, participated in numerous public and private meetings, and made commitments to seek further funding. The Tribe's driving concern was and remains the historic opportunity to reintroduce Sockeye salmon and ecologically reconnect Wallowa Lake to its river. The Tribe also supports and acknowledges that rehabilitation of the dam will provide many other benefits to Wallowa County, including enhanced flood control, improved water management for irrigation withdrawals and downstream flow releases, and greater stability of the City of Joseph's water supply.

The Tribe intends to continue collaborative dialogue with the State of Oregon, the Oregon Department of Fish & Wildlife (ODFW), and local public and private partners, to learn more about the WLID's rehabilitation plan. The Tribe's particular focus will be on additional detail in fish passage planning, including involvement with ODFW's Fish Passage Program, and on planning for water releases for purposes of additional instream flow. The Tribe believes that due diligence as a fisheries co-manager requires focus on volitional fish passage options as part of dam rehabilitation planning. Oregon's statutory and regulatory requirements with respect to fish passage at constructed or maintained dams should be viewed as a positive opportunity for the region, through the significant economic, recreational, and ecological benefits fish passage to and from Wallowa Lake would represent.

Repairing the dam also will result in additional water storage capacity. Consequently, the Tribe is interested in what the anticipated purpose and timing of downstream water releases will be, and to continue to work with Oregon, the WLID, and downstream water users to maximize the ecological benefit of releases. Additional stored water made available after the dam is restored represents a unique opportunity that merits the careful consideration of all stakeholders.

The Nez Perce Tribe strongly supports your proposal to allocate funds needed to rehabilitate the Wallowa Lake Dam. The Tribe appreciates your leadership on this important issue. It is our belief that healthy fish populations and healthy communities are not mutually exclusive – and indeed should be naturally linked. The Tribe is hopeful that the collaborative efforts of many individuals, local governments, non-profits, and the State of Oregon will result in the return of Sockeye salmon to Wallowa Lake and a vibrant economy for Wallowa County.

Thank you for your time and consideration of this important matter and please contact me directly at any time to discuss any aspects of it.

Sincerely,

Mr. Shannon F. Wheeler
Chairman

cc: Dan Butterfield, Wallowa Lake Irrigation District

GRANDE RONDE MODEL WATERSHED

1114 J Ave.
La Grande, Oregon 97850

(541) 663-0570
Fax: (541) 962-1585

http://www.grmw.org

January 28, 2019
Mr. Dan Butterfield
Wallowa Lake Irrigation District
85393 Bicentennial Lane
Joseph, OR 97846

Subject: Wallowa Lake Dam Rehabilitation Letter of Support

Dear Mr. Butterfield:

Grande Ronde Model Watershed (GRMW) attended the Wallowa Lake Irrigation District (WLID) information and strategy meeting held in Joseph, Oregon on January 16, 2019. The presentation given by Mort McMillen of McMillen Jacobs Associates (MJA) informed attendees what the project is; who the project team is comprised of; anticipated implementation schedule; and expected deliverables at completion. This project, preceded by 17-years of preliminary engineering, mapping, fish passage concept development, and watershed hydrology analysis includes preplanning, permitting, final design, and construction led by the project team of WLID and MJA. This 3-phased approach to rehabilitate the Wallowa Lake Dam has begun with preplanning work in progress followed by permitting and design in the fall of 2019. Construction is anticipated during the 1-year period starting in June 2020 and ending in June of 2021. Final deliverables include a rehabilitated structure that continues to provide downstream flood protection for Wallowa Valley communities; a structure that includes fish passage; a dam that meets or exceeds Oregon dam safety requirements; allows WLID to store their permitted amount of water; and a facility that is the foundation for future water conservation efforts in Wallowa County.

Irrigation water stored in Wallowa Lake serves just over 16,000 irrigated acres in the Prairie Creek area. Water storage and delayed runoff in the Wallowa River system has allowed for the development of additional supplemental water rights in the middle and lower areas of the Wallowa Valley. The Cross-Country Canal built in 1935 conveys water from the Wallowa River to irrigated areas of the Lostine River and Bear Creek. These additional irrigated acres, permitted after the construction of Wallowa Lake Dam, demonstrate the value of stored water to agriculture in Wallowa County. This stored water has also benefited fisheries by keeping irrigation influenced river reaches watered during irrigation season. Without stored water, additional reaches of the Wallowa River, Lostine River and Bear Creek would be dry during irrigation season. Restoring reservoir storage capacity to permitted elevation will benefit both farming and fisheries in Wallowa County.

WLID Irrigators have been proactive in water conservation over the past decade. In that time, they have converted irrigation delivery to 11,000-acres from open earthen canal to enclosed pipeline eliminating seepage and evaporation, reducing pumping cost, reducing waste water, and improving flow in the Wallowa River. This near 70% conversion of Prairie Creek irrigated acres from open canal to pipeline conveyance; the recent formation of the Wallowa Lake Irrigation District; and their willingness to engage stakeholders regarding the Wallowa Lake Dam

demonstrates the proactive nature of the District.

Consistent with the Oregon Plan for Salmon and Watersheds this project benefits community, economy and watersheds. The rehabilitation of the Wallowa Lake Dam provides the foundation for future improvements including fisheries and the reintroduction of sockeye salmon to Wallowa Lake, potential hydropower generation, and improved water management in both Prairie Creek and the rest of the Wallowa Valley. As such, GRMW looks forward to supporting this effort to the extent we are capable.

GRMW feels that the team of WLID and MJA is well qualified to plan, permit and implement this project. For the reasons stated in this letter GRMW supports State of Oregon funding for the rehabilitation of the Wallowa Lake Dam.

Sincerely,

Jesse Steele, GRMW Executive Director

Susan Roberts, GRMW Board Chair

Oregon
Kate Brown, Governor

Department of Fish and Wildlife
East Region
107 20th Street
La Grande, OR 97850
(541) 963-2138
FAX (541) 963-6670
www.dfw.state.or.us/

January 30, 2019

Mr. Dan Butterfield
Wallowa Lake Irrigation District (WLID)
85393 Bicentennial Lane
Joseph, OR 97846

VIA Email

Subject: Wallowa Lake Dam Project

Dear Mr. Butterfield:

The Oregon Department of Fish and Wildlife (Department) appreciated participating in the recent Wallowa Lake Dam Project (Project) meeting and the effort WLID has made to involve us in this process.

Resolving concern over the status of Wallowa Lake Dam has been a priority for northeastern Oregon for some time. The Dam provides unique benefits for agriculture, flood control, recreation, tourism and the economy of the region. Governor Brown's initiative to resolve concerns over its status provides a unique opportunity to secure these benefits and address Department and Nez Perce Tribal goals.

The Department has been involved in planning the renovation of Wallowa Lake Dam for quite a while. Most of our involvement has been in trying to help the Project comply with Oregon fish passage statutes and Administrative Rules. The Project design and construction timeline proposed by WLID's consultant Mort McMillen is ambitious. We believe, however, it is achievable with an open and collaborative design effort to complete the fish passage approval process.

The Department is eager to provide assistance and is encouraged by this opportunity.

Please feel free to contact Jeff Yanke at 541 426 3279 directly for assistance.

Sincerely

Bruce Eddy
East Region Manager

CC:
Nez Perce Tribe
Dave Johnson

ODFW
Curt Melcher
Shannon Hurn
Ed Bowles/Bruce McIntosh
Jeff Yanke

Oregon Solutions
Courtney Crowell

Mort McMillen

Oregon
Kate Brown, Governor

Water Resources Department
725 Summer St NE, Suite A
Salem, OR 97301
(503) 986-0900
Fax (503) 986-0904

February 11, 2019

Mr. Dan Butterfield
Wallowa Lake Irrigation District
85393 Bicentennial Lane
Joseph, OR 97846

Reference: Wallowa Lake Dam Rehabilitation Letter of Support

Mr. Butterfield,

We appreciate the opportunity to comment on the proposed Wallowa Lake Dam Rehabilitation project, and recognize the value of Wallowa Lake Dam and Reservoir to the community and the citizens of Oregon. Public safety, flood control, fisheries, irrigation, and recreation all benefit from the dam rehabilitation. We have worked with the Wallowa Lake Irrigation District and their predecessors in the planning of the Wallowa Dam rehabilitation, and continue to support the effort. The funding in the Governors' budget is a unique opportunity, and I am confident that WLID and MacMillen-Jacobs will get the job done in a timely, collaborative fashion with all stakeholders.

Please do not hesitate to contact me at the number below if you need further information or we can be of assistance.

Sincerely,

Jason Spriet
Manager, Eastern Region
Oregon Water Resources Department
1995 3rd Street, Suite #180
Baker City, OR 97814
541-523-8224 Ext. 224

CC: Mort MacMillen,
David Bates, Watermaster District 7

January 28, 2019

Mr. Dan Butterfield
Wallowa Lake Irrigation District
85393 Bicentennial Lane
Joseph, OR 97846

Subject: Wallowa Lake Dam Rehabilitation
Letter of Support

Dear Mr. Butterfield:

NRCS is currently working with Irrigators in the WLID (Wallowa Lake Irrigation District) and has had great success in the past working on irrigation efficiency improvements within the WLID. We are excited for the opportunity to assist and potentially leverage additional Federal funds to support the overall irrigation modernization within WLID. The rehabilitation of the dam will not only help to ensure the safety of the communities downstream but will allow water storage to return to its former capacity allowing more water to be stored for irrigation and fish. We are encouraged that State of Oregon funding will allow the Project to move rapidly forward with a construction completion by spring of 2021. We are eager to participate in the process to discuss and develop the final Project rehabilitation design. We look forward to working with the WLID and the project stakeholders to advance the Project in the coming months. Please do not hesitate to contact us if you need additional information.

Sincerely,

Abe Clark
USDA-Natural Resources Conservation Service
401 NE 1st Street Suite E
Enterprise, Oregon 97828
(541) 263-3044 Direct Line (541) 426-4521 Office
Abe.clark@or.usda.gov

January 31, 2019

Mr. Dan Butterfield
Wallowa Lake Irrigation District
85393 Bicentennial Lane
Joseph, OR 97846

Subject: Wallowa Lake Dam Rehabilitation: Letter of Support

Dear Mr. Butterfield:

Thanks for the invitation to participate in the Wallowa Lake Irrigation District (WLID) information and strategy meeting held at the City of Joseph Community Center on January 16, 2019 for the Wallowa Lake Dam Rehabilitation (Project). Mort McMillen's presentation provided a good summary of the history of Wallowa Lake Dam, the work completed to date, and the proposed strategy to move forward with the Project development and implementation with State of Oregon funding. The Wallowa Lake Dam and Reservoir are vital to the community – including flood protection to the downstream communities of Joseph, Enterprise, and Wallowa, as well as serving as the engine for the local economy. Incorporating fish passage into the dam as part of the Project implementation provides the stakeholders and resource agencies valuable facilities in managing local fishery resources and planning for potential Sockeye Salmon re-introduction in Wallowa Lake.

We look forward to working with the WLID in the planning of the Project and discussion of issues important to consider in the Project implementation. We are excited about the opportunity to obtain State of Oregon funding which would allow the Project to move rapidly forward with a construction completion by spring of 2021. The three-phase project development strategy outlined by Mort McMillen provides a logical process and timeline to implement the Project while maintaining strong stakeholder participation. We are excited to participate in the process to discuss and develop the final Project rehabilitation design which incorporates features to address our specific concerns. We fully support the WLID proposed strategy, work activities, and timeline, and are committed to working closely with the WLID to advance the project through the preplanning, final design and regulatory/permitting, and construction phases.

We look forward to working with the WLID and the project stakeholders to advance the Project in the coming months. Please do not hesitate to contact us if you need additional information.

Sincerely,

Nils D Christoffersen
Executive Director

Appendix D:

Phases 2 and 3 Budget Detail Breakdown

Wallowa Lake Dam Rehabilitation
Workplan Summary Cost Estimate

Line Item	Item	Dam Rehablitation	Trap and Haul Facility	Total (Dam plus US Fish Passage)
1	Division 01 - General Requirements	$ 1,110,286	$ 151,935	$ 1,262,221
2				
3	Division 02 - Existing Conditions	$ 100,000	$ -	$ 100,000
4				
5	Division 03 - Concrete	$ 4,262,600	$ 73,500	$ 4,336,100
6				
7	Division 04 - Masonry	$ 60,000	$ -	$ 60,000
8				
9	Division 05 - Metals	$ 480,200	$ 104,300	$ 584,500
10				
11	Division 06 - Wood and Plastic	$ 47,280	$ -	$ 47,280
12				
13	Division 07 - Thermal and Moisture Protection	$ 3,500	$ -	$ 3,500
14				
15	Division 08 - Openings	$ 4,500	$ -	$ 4,500
16				
17	Division 09 - Finishes	$ 5,000	$ -	$ 5,000
18				
19	Division 11 - Equipment	$ 1,340,000	$ 350,000	$ 1,690,000
20				
21	Division 23 - Heating, Ventilating and AC	$ 3,000	$ -	$ 3,000
22				
23	Division 26 - Electrical	$ 130,000	$ 100,000	$ 230,000
24				
25	Division 31 - Earthwork	$ 522,500	$ 205,000	$ 727,500
26				
27	Division 32 - Exterior Improvements	$ 143,325	$ -	$ 143,325
28				
29	Division 33 - Utilities	$ 25,000	$ -	$ 25,000
30				
31	Division 40 - Instrumentation and Controls	$ 125,000	$ 40,000	$ 165,000
32				
33	Division 41 - Matl Processing & Handling	$ -	$ -	$ -
34				
35	Division 42 - Process Water Systems	$ 150,000	$ 140,100	$ 290,100
36				
37	Division 43 - Land Acquisition	$ -	$ -	$ -
38				
39	Project Subtotal	$ 8,512,191	$ 1,024,735	$ 9,536,926
40				
41	Overhead and Profit (13%)	$ 1,106,585	$ 133,216	$ 1,239,800
42				
43	Bonds and Insurance (3.5%)	$ 297,927	$ 35,866	$ 333,792
44				
45	Construction Total	$ 9,916,702	$ 1,193,816	$ 11,110,518
46				
47	Contigency (20%)	$ 1,983,340	$ 238,763	$ 2,222,104
50				
51	TOTAL PROJECT COST (1/19$)	$ 11,900,043	$ 1,432,580	$ 13,332,622
52	Escalate to June 2020 @ 3% per Year	$ 12,439,541	$ 1,497,527	$ 13,937,068

Wallowa Lake Dam Rehabilitation
Dam Construction Cost Estimate

Line Item	Item	Quantity	Unit	Unit Cost	Subtotal	Contingency	Cost	Total
	Division 01 - General Requirements							**1,110,286**
	Mobilization/Demobilization		%	0.15	$1,110,286	0.0%	1,110,286	
	Division 02 - Existing Conditions							**100,000**
	Demolition of Existing Structures	1000	CY	$100.00	$100,000	0.0%	100,000	
	Division 03 - Concrete							**4,262,600**
	Upstream Dam Foundation - El 4345 - 4350	300	CY	$700.00	$210,000	0.0%	210,000	
	Upstream Concrete Mass - El. 4350 - 4381	1,837	CY	$700.00	$1,285,900	0.0%	1,285,900	
	Dam Spillway Piers - El 4381 - 4394	1,600	CY	$1,000.00	$1,600,000	0.0%	1,600,000	
	Dam Intake Deck - El 4394	90	CY	$1,500.00	$135,000	0.0%	135,000	
	Dam Intake Deck - Parapet Wall	31	CY	$800.00	$24,800	0.0%	24,800	
	Stilling Basin Top Concrete	266	CY	$800.00	$212,800	0.0%	212,800	
	Stilling Basin - End Sill - El 4350 - 4356	67	CY	$800.00	$53,600	0.0%	53,600	
	Intake Tower Foundation - El 4350 - 4354	59	CY	$800.00	$47,200	0.0%	47,200	
	Intake Tower Walls - El 4354 - 4394	178	CY	$1,000.00	$178,000	0.0%	178,000	
	Intake Tower Top - El 4393 - 4394	15	CY	$1,500.00	$22,500	0.0%	22,500	
	North Bank Retaining Wall	233	CY	$800.00	$186,400	0.0%	186,400	
	Center Retaining Wall	116	CY	$800.00	$92,800	0.0%	92,800	
	South Bank Retaining Wall	260	CY	$800.00	$208,000	0.0%	208,000	
	Intake Tower Splitter Box Wall	7	CY	$800.00	$5,600	0.0%	5,600	
	Division 04 - Masonry							**60,000**
	CMU Block Structure	400	SF	$150.00	$60,000	0.0%	60,000	
	Division 05 - Metals							**480,200**
	Intake Tower - Fish Screen Guides	2,900	LBS	$5.00	$14,500	0.0%	14,500	
	Intake Tower - Stoplog/Porosity Guides	2,900	LBS	$5.00	$14,500	0.0%	14,500	
	Intake Tower - Stoplogs	800	SF	$100.00	$80,000	0.0%	80,000	
	Intake Tower - Grating	20	SF	$55.00	$1,100	0.0%	1,100	
	Intake Tower - Handrail	60	LS	$55.00	$3,300	0.0%	3,300	
	Dam - Roadway Deck Grating	768	SF	$100.00	$76,800	0.0%	76,800	
	Outlet Conduits - 54" Steel Inserts	58000	LBS	$5.00	$290,000	0.0%	290,000	
	Division 06 - Wood and Plastic							**47,280**
	Control Building - Interior Framing	764	SF	$10.00	$7,640	0.0%	7,640	
	Control Building - Interior Plywood Sheathing	764	SF	$10.00	$7,640	0.0%	7,640	
	Intake Tower - Grating	400	SF	$80.00	$32,000	0.0%	32,000	
	Division 07 - Thermal and Moisture Protection							**3,500**
	Control Building - Insulation	1	LS	$3,500.00	$3,500	0.0%	3,500	
	Division 08 - Openings							**4,500**
	Control Building - Double Man Doors	1	LS	$4,500.00	$4,500	0.0%	4,500	
					$0	0.0%	0	
	Division 09 - Finishes							**5,000**
	Control Building - Painting	1	LS	$5,000.00	$5,000	0.0%	5,000	
	Division 11 - Equipment							**1,340,000**
	Intake Tower - Fish Screens	800	SF	$150.00	$120,000	0.0%	120,000	
	Intake Tower - Porosity Plate	800	SF	$100.00	$80,000	0.0%	80,000	
	Intake Tower - Screen Cleaner	1	LS	$150,000.00	$150,000	0.0%	150,000	
	Intake Tower - Isolation Gates	2	EA	$30,000.00	$60,000	0.0%	60,000	
	Spillway Gates - 20x12	2	EA	$150,000.00	$300,000	0.0%	300,000	
	54" Sluice Gates	5	EA	$35,000.00	$175,000	0.0%	175,000	
	54" Sluice Gate Operators	5	EA	$25,000.00	$125,000	0.0%	125,000	
	60" Penstock Gate	1	EA	$35,000.00	$35,000	0.0%	35,000	
	60" Penstock Gate Operator	1	EA	$25,000.00	$25,000	0.0%	25,000	
	Air Compressor, Dryer, Tank, Filters - System	1	LS	$250,000.00	$250,000	0.0%	250,000	
	Debris Booms	200	LF	$100.00	$20,000	0.0%	20,000	
	Division 23 - Heating, Ventilating and AC							**3,000**
	Control Building	1	LS	$3,000.00	$3,000	0.0%	3,000	
	Division 26 - Electrical							**130,000**
	Improve Existing to 480V Power from Highway	1	LS	$50,000.00	$50,000	0.0%	50,000	
	Electrical Panels	1	LS	$10,000.00	$10,000	0.0%	10,000	
	Dam Power and Lighting	1	LS	$50,000.00	$50,000	0.0%	50,000	

Wallowa Lake Dam Rehabilitation
Dam Construction Cost Estimate

	Control Building Power and Lighting	1	LS	$20,000.00	$20,000	0.0%	20,000	
					$0	0.0%	0	
	Division 31 - Earthwork							**522,500**
	Site Clearing	1	Acre	$10,000.00	$10,000	0.0%	10,000	
	Excavation	1200	CY	$75.00	$90,000	0.0%	90,000	
	Erosion and Sediment Control	1	LS	$40,000.00	$40,000	0.0%	40,000	
	Structural Backfill & Compaction	1000	CY	$55.00	$55,000	0.0%	55,000	
	Dewatering Pipe - 2 pipes @ 36" Dia.@600 ft	1	LS	$200,000.00	$200,000	0.0%	200,000	
	Upstream Cofferdam/Dewatering	1	LS	$40,000.00	$40,000	0.0%	40,000	
	Downstream Cofferdam/Dewatering	1	LS	$50,000.00	$50,000	0.0%	50,000	
	Intake Channel Excavation	1500	CY	$25.00	$37,500	0.0%	37,500	
							0	
	Division 32 - Exterior Improvements							**143,325**
	Improve Access Road - Subgrade Preparation	18000	SF	$1.00	$18,000	0.0%	18,000	
	Improve Access Road - 12" Road Base	533	CY	$75.00	$39,975	0.0%	39,975	
	Improve Access Road - 4" Gravel Surfacing	178	CY	$75.00	$13,350	0.0%	13,350	
	Dam Security Fencing	200	LF	$60.00	$12,000	0.0%	12,000	
	Site Fencing	1000	LF	$60.00	$60,000	0.0%	60,000	
	Division 33 - Utilities							**25,000**
	Utility Water System at Intake Tower	1	LS	$25,000.00	$25,000	0.0%	25,000	
	Division 40 - Instrumentation and Controls							**125,000**
	Reservoir Level Monitoring System	1	LS	$25,000.00	$25,000	0.0%	25,000	
	SCADA	1	LS	$50,000.00	$50,000	0.0%	50,000	
	Dam Instrumentataion	1	LS	$50,000.00	$50,000	0.0%	50,000	
	Division 41 - Matl Processing & Handling							**0**
	(NOT USED)							
	Division 42 - Process Water Systems							**150,000**
	City of Joseph Water Supply Pipeline Relocate	1	LS	$150,000.00	$150,000	0.0%	150,000	
				$0.00	$0	0.0%	0	
	Division 43 - Land Acquisition							**0**
	(NOT USED)	0	LS	$0.00	$0	30.0%	0	
	Project Subtotal (without Division 01)							**7,401,905**
	Project Construction Subtotal							**8,512,191**

Wallowa Lake Dam Rehabilitation
Upstream Trap and Haul Fish Passage Construction Cost Estimate

Line Item	Item	Quantity	Unit	Unit Cost	Subtotal	Contingency	Cost	Total
	Division 01 - General Requirements							**151,935**
	Mobilization/Demobilization		%	0.15	$151,935	0.0%	151,935	
	Division 02 - Existing Conditions							**0**
	(NOT USED)				$0	0.0%	0	
	Division 03 - Concrete							**73,500**
	Trap Walls	75	CY	$750.00	$56,250	0.0%	56,250	
	Trap Slab	11	CY	$500.00	$5,500	0.0%	5,500	
	Hopper Well Walls	7	CY	$750.00	$5,250	0.0%	5,250	
	Hoper Well Slab	1	CY	$500.00	$500	0.0%	500	
	Tram Column Footings	6	CY	$750.00	$4,500	0.0%	4,500	
	Sampling/Sorting Area Slab	3	CY	$500.00	$1,500	0.0%	1,500	
	Division 04 - Masonry							**0**
	(NOT USED)			$0.00	$0	0.0%	0	
	Division 05 - Metals							**104,300**
	Structural Steel - Tram Poles	6	EA	$6,000.00	$36,000	0.0%	36,000	
	Roof Structure	1	LS	$20,000.00	$20,000	0.0%	20,000	
	Grating	40	SF	$50.00	$2,000	0.0%	2,000	
	Handrail	100	LF	$45.00	$4,500	0.0%	4,500	
	Water Supply Floor Diffusers	40	SF	$45.00	$1,800	0.0%	1,800	
	Miscellaneous Metals	1	LS	$40,000.00	$40,000	0.0%	40,000	
	Division 06 - Wood and Plastic							**0**
	(NOT USED)							
	Division 07 - Thermal and Moisture Protection							**0**
	(NOT USED)				$0	0.0%	0	
	Division 08 - Openings							**0**
	(NOT USED)				$0	0.0%	0	
					$0	0.0%	0	
	Division 09 - Finishes							**0**
	(NOT USED)							
	Division 11 - Equipment							**350,000**
	Vee Trap/Crowder	1	LS	$50,000.00	$50,000	0.0%	50,000	
	Hopper	1	LS	$30,000.00	$30,000	0.0%	30,000	
	Tram Cable and Drive	1	LS	$100,000.00	$100,000	0.0%	100,000	
	Hoist	1	LS	$50,000.00	$50,000	0.0%	50,000	
	Brail Floor	1	LS	$40,000.00	$40,000	0.0%	40,000	
	Intake Screens/Cleaning System	1	LS	$50,000.00	$50,000	0.0%	50,000	
	Entrance Gate	1	LS	$30,000.00	$30,000	0.0%	30,000	
	Division 23 - Heating, Ventilating and AC							**0**
	(NOT USED)							
	Division 26 - Electrical							**100,000**
	Complete System	1	LS	$100,000.00	$100,000	0.0%	100,000	
	Division 31 - Earthwork							**205,000**
	Site Clearing	0.2	Acre	$10,000.00	$2,000	0.0%	2,000	
	Excavation	1600	CY	$75.00	$120,000	0.0%	120,000	
	Structural Backfill & Compaction	100	CY	$30.00	$3,000	0.0%	3,000	
	Erosion Control	1	LS	$30,000.00	$30,000	0.0%	30,000	
	Dewatering/Cofferdam	1	LS	$50,000.00	$50,000	0.0%	50,000	
	Division 32 - Exterior Improvements							**0**
	(NOT USED)							
	Division 33 - Utilities							**0**
	(NOT USED)							
	Division 40 - Instrumentation and Controls							**40,000**

Wallowa Lake Dam Rehabilitation
Upstream Trap and Haul Fish Passage Construction Cost Estimate

Line Item	Item	Quantity	Unit	Unit Cost	Subtotal	Contingency	Cost	Total
	Operators	1	LS	$40,000.00	$40,000	0.0%	40,000	
	Division 41 - Matl Processing & Handling							**0**
	(NOT USED)	1	LS	$0.00	$0	0.0%	0	
	Division 42 - Process Water Systems							**140,100**
	18" PVC	100	LF	$75.00	$7,500	0.0%	7,500	
	8" PVC	20	LF	$20.00	$400	0.0%	400	
	Diffuser Screen	1	LS	$2,200.00	$2,200	0.0%	2,200	
	Pipe Fittings/Valves/Materials	1	LS	$30,000.00	$30,000	0.0%	30,000	
	City of Joeseph Water Supply relocate	1	LS	$100,000.00	$100,000	0.0%	100,000	
					$0	0.0%	0	
	Division 43 - Land Acquisition							**0**
	(NOT USED)							
	Project Subtotal (without Division 01)							**1,012,900**
	Project Construction Subtotal							**1,164,835**

WLID - Wallowa Lake Dam Rehab - Phase II Budget
Tasks 1 - 9

Task	Staff Rates	Total Labor	Total Expenses	TOTAL
1.0	**Environmental/Permitting**	**$ 120,052**	**$ 8,500**	**$ 128,552**
	Determine Required Permits	$ 6,376	$ -	$ 6,376
	Permitting Strategy & Schedule	$ 10,216	$ -	$ 10,216
	Submit Complete Permit Application Packages	$ 71,320	$ -	$ 71,320
	Agency Coordination/Negotiations	$ 32,140	$ 8,500	$ 40,640
2.0	**Fish Passage Planning & Design**	**$ 55,428**	**$ 2,400**	**$ 57,828**
	Conduct Kickoff Meeting	$ 5,160	$ 600	$ 5,760
	Prepare Meeting Minutes	$ 728	$ -	$ 728
	Update Conceptual Design Report	$ 16,512	$ -	$ 16,512
	Conduct Agency Review Meeting	$ 5,160	$ 600	$ 5,760
	Prepare Meeting MInutes	$ 728	$ -	$ 728
	Prepare Final Conceptual Design Report	$ 12,900	$ -	$ 12,900
	Additional Coordination Meetings	$ 14,240	$ 1,200	$ 15,440
3.0	**Topographic Mapping**	**$ 3,920**	**$ 30,000**	**$ 33,920**
	Obtain Supplemental Mapping	$ 1,960	$ 30,000	$ 31,960
	Complete Boundary Survey	$ 1,960	$ -	$ 1,960
4.0	**Geotechnical Site Investigation**	**$ 35,454**	**$ 111,700**	**$ 147,154**
	Prepare Investigations Plan	$ 10,858	$ -	$ 10,858
	Conduct Field Explorations	$ 13,540	$ 104,700	$ 118,240
	Conduct Laboratory Testing	$ 3,578	$ 7,000	$ 10,578
	Prepare Geotechnical Report	$ 7,478	$ -	$ 7,478
5.0	**Alternatives Development & Evaluation**	**$ 123,428**	**$ 750**	**$ 124,178**
	Develop Dam Rehablitation Options	$ 82,624	$ -	$ 82,624
	Prepare Draft Technical Memorandum	$ 22,728	$ -	$ 22,728
	Present to WLID and Oregon Dam Safety	$ 5,464	$ 750	$ 6,214
	Prepare Final Technical Memorandum	$ 12,612	$ -	$ 12,612
6.0	**Final Design**	**$ 838,984**	**$ 1,400**	**$ 840,384**
	Prepare 60% Construction Drawings	$ 332,440	$ -	$ 332,440
	Prepare 60% Construction Specifications	$ 39,232	$ -	$ 39,232
	Prepare 60% DDR	$ 34,108	$ -	$ 34,108
	Submittal Review and Meeting	$ 4,692	$ 700	$ 5,392
	Prepare 90% Construction Plans	$ 263,156	$ -	$ 263,156
	Prepare 90% Construction Specifications	$ 31,636	$ -	$ 31,636
	Prepare 90% DDR	$ 25,068	$ -	$ 25,068
	Submittal Review and Meeting	$ 4,692	$ 700	$ 5,392
	Prepare100% Check Set	$ 49,996	$ -	$ 49,996
	Compelte Final Review and Check	$ 22,912	$ -	$ 22,912
	Issue Stamped/Signed Plans and Specification	$ 20,356	$ -	$ 20,356
	Issue Final DDR	$ 10,696	$ -	$ 10,696
7.0	**Cost Estimates & Schedule**	**$ 57,932**	**$ -**	**$ 57,932**
	Prepare 60% Cost Estimate and Schedule	$ 22,300	$ -	$ 22,300
	Prepare 90% Cost Estimate and Schedule	$ 22,300	$ -	$ 22,300
	Issue Final Cost Estimate and Schedule	$ 13,332	$ -	$ 13,332
8.0	**Stakeholder Coordination**	**$ 92,152**	**$ 14,644**	**$ 106,796**
	Four Public Meetings	$ 26,704	$ 3,444	$ 30,148
	Two Site Visits	$ 14,212	$ 1,700	$ 15,912
	Ten Individual Staekholder Meetings	$ 29,260	$ 6,000	$ 35,260
	6 State of Oregon Meetings	$ 21,976	$ 3,500	$ 25,476
9.0	**Project Administration & Meetings**	**$ 165,256**	**$ -**	**$ 165,256**
	Project Administration	$ 30,104	$ -	$ 30,104
	Meetings	$ -	$ -	$ -
	Coordination Conference Calls	$ 87,400	$ -	$ 87,400
	Monthly Progress Meetings	$ 23,520	$ -	$ 23,520
	Design Review Meetings (see Task 6.0)	$ -	$ -	$ -
	Periodic Coordination Calls and Meetings	$ 24,232	$ -	$ 24,232
	Total Hours			
	Total Budget	**$ 1,492,606.00**	**$ 169,394**	**$ 1,662,000**

WLID - Wallowa Lake Dam Rehab - Phase III Budget
Engineering Support during Construction

Task	Staff Rates	Total Labor	Airfare	Hotel / Car	Meals	Total Expenses	TOTAL
	Engineering Support during Construction	**$ 373,380**	**$ -**	**$ 23,400**	**$ 3,220**	**$ 26,620**	**$ 400,000**
	Early Equipment Procurement	$ 28,360		1400	520	$ 1,920	$ 30,280
	Workplan Development	$ 14,700				$ -	$ 14,700
	Permitting Support	$ 24,040		5000	1000	$ 6,000	$ 30,040
	Shop Drawings Review	$ 48,480				$ -	$ 48,480
	RFI Response	$ 35,896		2,000.00	300.00	$ 2,300	$ 38,196
	Weekly Construction Meetings	$ 23,532				$ -	$ 23,532
	Specialized Construction Inspection	$ 40,340		7000	500	$ 7,500	$ 47,840
	Monthly Site Visits	$ 43,832		6000	500	$ 6,500	$ 50,332
	Startup and Commissioning Plan Development	$ 6,544				$ -	$ 6,544
	Startup and Commissioning	$ 9,168		1500	300	$ 1,800	$ 10,968
	Final Inspection and Punch List	$ 3,920		500	100	$ 600	$ 4,520
	Operationa and Maintenance Manual	$ 1,960				$ -	$ 1,960
	As-Constructed Drawings	$ 35,848				$ -	$ 35,848
	Final Construction Report	$ 9,560				$ -	$ 9,560
	Administration	$ 47,200				$ -	$ 47,200
	Total Hours						
	Total Budget	**$ 373,380.00**				**$ 26,620**	**$ 400,000**