RECLAMATION
Managing Water in the West

Tumalo Feed Canal Piping Project

Final Environmental Assessment

Tumalo Irrigation District
Bend, Oregon

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region

March 2010

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Acronyms and Abbreviations

cfs	cubic feet per second
District	Tumalo Irrigation District
DEA	David Evans and Associates, Inc.
EA	Environmental Assessment
ESA	Endangered Species Act
HAER	Historic American Engineering Record
ODFW	Oregon Department of Fish and Wildlife
ORNHIC	Oregon Natural Heritage Information Center
OWRD	Oregon Water Resources Department
PA	Programmatic Agreement
Reclamation	U.S. Bureau of Reclamation
RM	River Mile
SHPO	State Historic Preservation Office
USFWS	U.S. Fish and Wildlife Service

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1 INTRODUCTION

The Bureau of Reclamation proposes to partially fund the Tumalo Irrigation District's (District) replacement of approximately six miles of the Tumalo Feed Canal open channel with buried pipe. This proposed project would also give additional in-stream water rights to the State of Oregon for 20 cfs of conserved water.

Authorization for Reclamation's participation in this project is provided for in the "Tumalo Water Conservation Project Act of 2007" (Bill H.R. 496). The act authorizes the appropriation of Federal funds to assist with the project.

The District lies northwest of the city of Bend, in west-central Oregon, Deschutes County (Figure 1). The project would begin at the point where flow emerges from a siphon that diverts water from Tumalo Creek into the Tumalo Feed Canal. This southern terminus of the project is located about a quarter-mile south of Buck Drive, west of the city limits of Bend. The northern terminus would be immediately east of the Tumalo Reservoir (Figure 2).

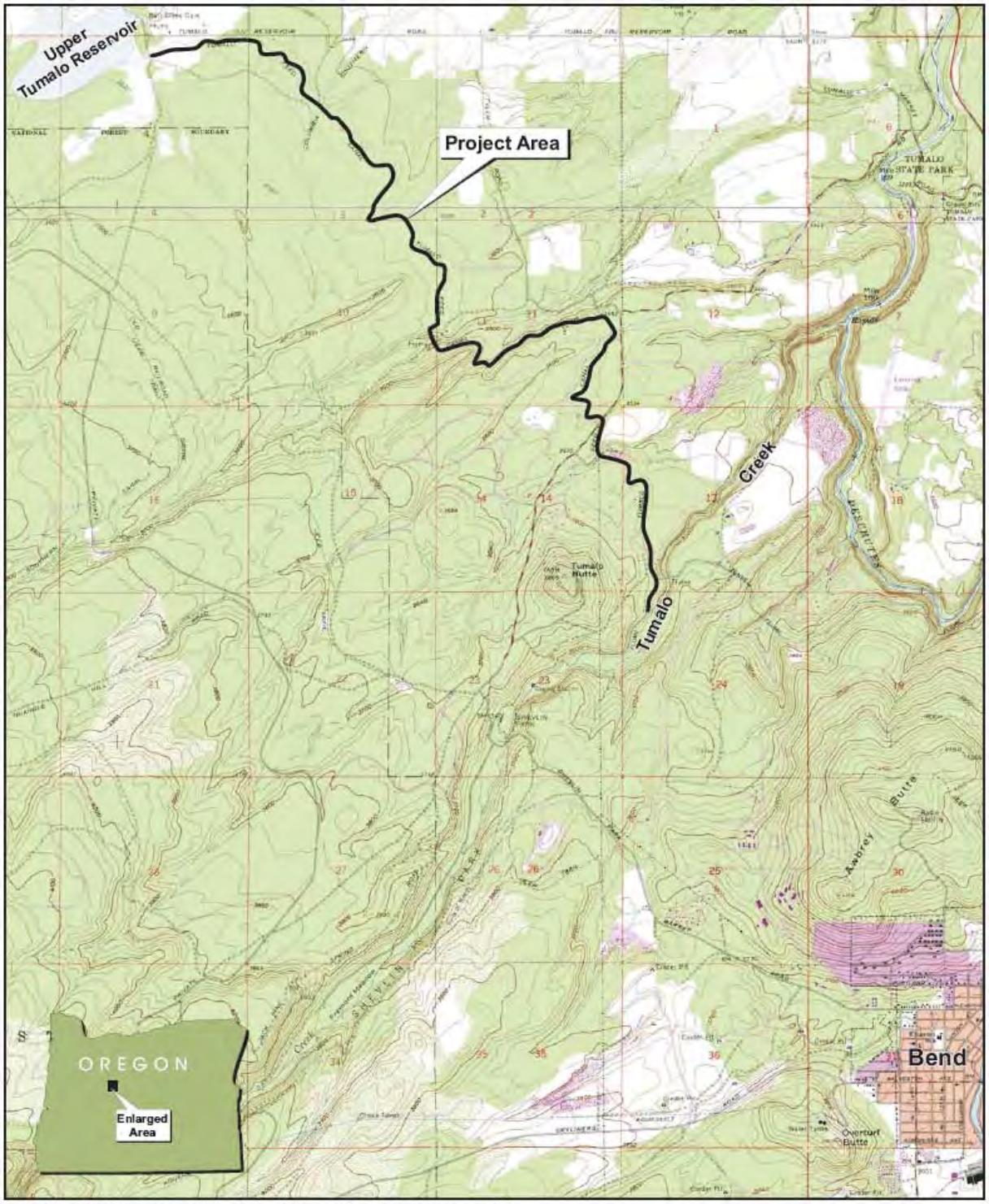
1.1 BACKGROUND

The Tumalo Feed Canal is a key part of the District's system for conveying water to irrigators. Diversions into the District occur at two main locations: one on the Deschutes River (the Bend Feed Canal), and one on Tumalo Creek (the Tumalo Feed Canal). Conversion of the Bend Feed Canal from open channel to pipe was completed in 2005.

The Tumalo Feed Canal is an excavated, maintained channel that ranges from four to six feet deep and approximately 20 to 25 feet wide at top-of-bank throughout its length. The Tumalo Feed Canal is the District's only diversion point on Tumalo Creek. While the canal has a capacity to divert up to 200 cfs, it must leave enough water in Tumalo Creek to maintain a minimum flow of 5.8 cfs. This minimum flow is a result of in-stream water rights generated through water conservation efforts by the District on the Bend Feed Canal.

The irrigation season averages 168 days from about April through September (DEA 2005). Flow is distributed to irrigators through numerous laterals. Any unutilized flows are discharged into Tumalo Reservoir (Figure 2 and Appendix A).

In 2000, the District submitted a Water Conservation Plan to the Oregon Water Resources Department (OWRD), outlining efforts and proposed actions to address its water conservation goals. After the conservation plan was accepted by the state, the District began to implement its conservation strategies, including piping of the remaining open-channel section of the Bend Feed Canal. The District updated its Water Conservation Plan in November of 2005. The updated plan was approved by OWRD, and shall remain in effect until May 17, 2016.

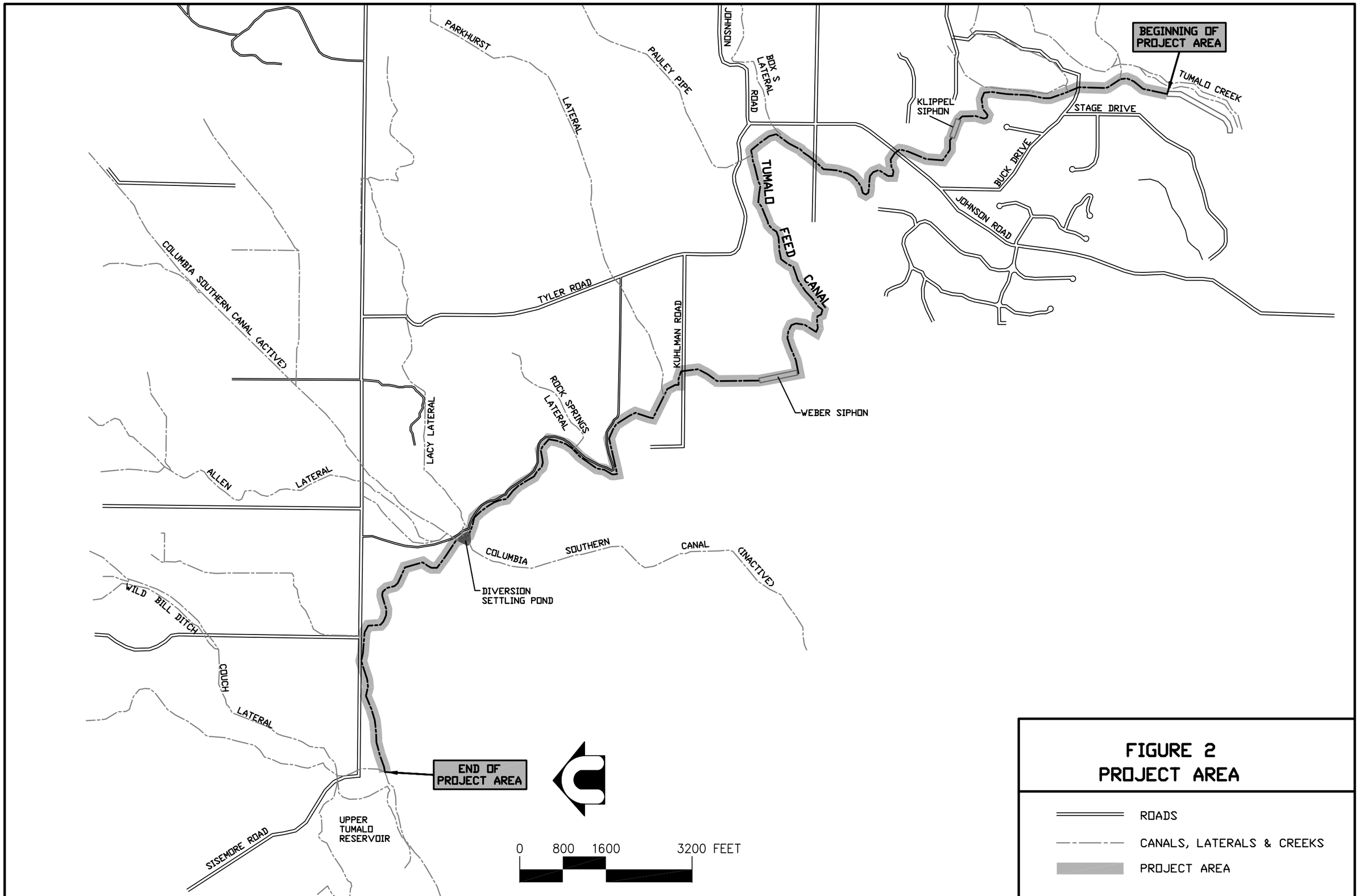


USGS 7.5 Minute Quadrangles: Bend, Oregon 1962 (Photorevised 1981); Shevlin Park, Oregon 1962 (Photorevised 1981); Tumalo, Oregon 1962 (Photoinspected 1975); and Tumalo Dam, Oregon 1962 (Photorevised 1981)

Figure 1
Vicinity

Scale - 1 : 48 000 (Original Scale - 1 : 24 000)

Figure 1. Vicinity Map


BEGINNING OF PROJECT AREA
TUMALO CREEK
STAGE DRIVE
KLIPPEL SIPHON
BUCK DRIVE
JOHNSON ROAD
TUMALO FEED CANAL
PARKHURST
LATERAL
PAULEY PIPE
JOHNSON
BOX S LATERAL
ROAD
COLUMBIA SOUTHERN CANAL (ACTIVE)
TYLER ROAD
KUHLMAN ROAD
WEBER SIPHON
ROCK SPRINGS LATERAL
LACY LATERAL
ALLEN
LATERAL
COLUMBIA
SOUTHERN
CANAL
(INACTIVE)
DIVERSION SETTLING POND
WILD BILL DITCH
COUCH
LATERAL
END OF PROJECT AREA
UPPER TUMALO RESERVOIR
SISEMORE ROAD
0
800
1600
3200 FEET
FIGURE 2
PROJECT AREA
ROADS
CANALS, LATERALS & CREEKS
PROJECT AREA

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2 PURPOSE AND NEED

The purpose of the proposed project is to: 1) reduce risks to public safety from the existing open canal, 2) eliminate seepage and evaporation losses in order to improve efficiency of water delivery and increase flows in Tumalo Creek and the Deschutes River, and 3) minimize operation and maintenance costs.

Improve Public Safety

The canal access road is used extensively for recreation, and there have been two recent drowning deaths in adjacent District canals (DEA 2005). In the summer, the water can be from two to six feet deep, with a flow rate of up to 200 cfs. The canal winds through private lands of pine forests, irrigated fields, and rural residences. Although the area is not heavily populated, the District's maintenance road, where not fenced off by private owners, is used by the public for walking, jogging, and horse-back riding. There is no barrier at the top of the bank of the canal to keep people from slipping and falling into the canal. Once in, people and animals can have serious difficulty gaining a purchase on the banks in order to climb out due to the volume and speed of the moving water. The areas where access is available to open canals present a potential liability to the District.

Canal bank failure is another public risk created by the open canals. In 2002, the District experienced an irrigation season canal bank breach that caused extensive off-easement damage. Other local irrigation districts have experienced similar issues with substantial property damage. The aged canal banks may become breached due to new construction, utility crossings, gopher holes, or rotting tree roots, among other causes.

Eliminate Water Loss

Water loss due to inefficient irrigation systems causes two key problems: 1) Less water is allowed to stay in-stream, degrading aquatic habitat, and 2) irrigators may not receive the water for which they have rights.

Conserving water is a key goal of the District. Historically, water losses in the system after diversions from natural stream courses have approached 60 percent. Details of water losses and demands can be found in the District's Water Conservation Plan (DEA 2005). In the last 10 years, the District has been especially concerned with its ability to deliver the full amount of water for which irrigators have water rights. In only two years between 1967 and 1990, and in 2003, was the district able to meet the target demand for water.

In the current phase of the Water Conservation Plan, conserved water is primarily returned to the Deschutes River and Tumalo Creek, improving aquatic habitat. In later phases of the Water Conservation Plan, more of the conserved water can be distributed to irrigators.

Reduce Operations and Maintenance Costs

Operation and maintenance requirements for the open canal include weed clearing, cleaning, and replacement or repair of water measurement structures. An open canal system also requires water users to expend power in order to pump water from the canals.

3 PUBLIC INVOLVEMENT

In 1997, the District proposed to replace its entire canal system with an enclosed pipeline. At the time, bond measures to fund the District's share of the project were not supported by a majority of District voters. Since then, the District has provided significant public and District patron information to the media and through its newsletter. With concurrent conservation projects being considered by other irrigation districts, and with the success of the Bend Feed Canal Project, the community is much more supportive of piping programs and river restoration. During the course of its Bend Feed Canal project, the District met with many local interest groups, homeowner associations, the newspaper and Oregon delegation representatives with very positive results and feedback from the public. Despite the generally positive response, some landowners who have property adjacent to the canal do not wish to loose the aesthetics of the open canal. With organizations in Central Oregon such as the Upper Deschutes Watershed Council and the Deschutes River Conservancy, much value has been placed on putting water back in stream. The Bend Feed Canal project also received State and National engineering awards for pioneering use of the state water conservation statutes and the use of large diameter, fully welded, high density polyethylene pipe. Generally speaking, the support for piping in Central Oregon has been increasing.

This Draft Environmental Assessment (EA) will be made available for comment. See Appendix F for the mailing lists.

4 ALTERNATIVES

4.1 DESCRIPTIONS OF THE NO ACTION AND PROPOSED ACTION ALTERNATIVES

4.1.1 No Action

Reclamation would not provide cost sharing for the piping of the Tumalo Feed Canal. No changes to the canal would be made other than regular maintenance activities. The canal would continue to be a public safety risk because water would continue to flow through the open canal for irrigation purposes. Water loss of an estimated rate of 20 cfs would continue and low seasonal flows in Tumalo Creek and the Deschutes River would not be increased. The State of Oregon and its people would not receive any new in-stream water rights from the District for increasing the flows of the Deschutes River and Tumalo Creek.

4.1.2 Proposed Action

Approximately six miles of open ditch in the Tumalo Feed Canal would be replaced by a pipe ranging in size from about 78 to 90 inches in diameter, conserving approximately 20 cfs of water. The funds for the project would come partially from the federal government

through Reclamation. Remaining funding would be supplied by the District and non-profit organizations interested in increasing stream flows. The total cost of the project is estimated to be 17.8 million dollars (Appendix E). The project may be constructed over five years, in five phases, depending upon the level of annual appropriation.

The project would begin at the point where flow emerges from a siphon that conveys water from Tumalo Creek into the canal (Appendix A). This southern terminus of the project is located about a quarter-mile south of Buck Drive (Figure 2). The outlet of the Bend Feed Canal into the Tumalo Feed Canal is located in this reach. The northern terminus of the project is Tumalo Reservoir. The project area does not interface with Tumalo Creek or any other natural water body. Approximately 1.5 miles of the canal right-of-way is located on lands managed by the Bureau of Land Management. The area is part of the Weirleske Allotment which is an active allotment that has been in nonuse for the last few years.

The pipe would be installed within the existing canal. Excavation two to four feet below the existing bottom of the canal would be needed to accommodate the larger diameter (90 inch) pipe. If additional bank excavation is found to be needed, it would still be confined to the District's 100-foot-wide Carey Act right-of-way.

Once the pipe is installed, the ditch would be backfilled first with gravel to about half-way up the side of the pipe, where geotextile fabric would be placed, and then backfilled with on-site or imported fill. Imported fill would be obtained from an active source, or by excavation from the Tumalo Reservoir during the off-season when the Reservoir bed is mostly dry. Only material deposited by the reservoir waters would be used for fill. No fill material would be taken from the undisturbed edges of the reservoir (Appendix C). If another source of fill material is used, the contractor will be responsible for environmental compliance.

After construction, the project area would be graded to match adjacent grades where feasible, and planted with a seed mix of native grasses and forbs. Any excess excavated material would be removed to active disposal sites. No new staging areas outside the District's Carey Act right-of-way would be required. The contractor would be responsible for ensuring that the plants are established within a year, and that they survive for two years afterwards. The project site would look similar to the post-construction Bend Feed Canal alignment as shown in Appendix A.

The State of Oregon would receive the water rights to the conserved water. The final order for these rights has already been established with OWRD. A copy of the final order can be found in Appendix D. The water rights would be held and monitored by OWRD.

The project will conserve an estimated 20 cfs of flow by eliminating seepage and evaporation losses. As identified in Appendix D most of this conservation will be from reducing seepage losses. Based on an average operational season of 168 days per year, conservation will amount to a total annual water volume of 6,664 acre-feet. Conserved

water will provide in-stream flow enhancement through the combination of conserved water in two reaches; 1) from TID's diversion at Tumalo Creek (11.8 cfs) and 2) from stored water in Crescent Lake Reservoir (2,732 AF) (DEA 2005). The 2,732 AF of stored water can be released as determined by the Oregon Water Resource Department to enhance flows in Crescent Creek and the Upper Deschutes River. If released throughout the irrigation season (168 days) this volume would equate to 8.2 cfs. The Proposed Action could triple the average dry-season flow in Tumalo Creek from 5.8 cfs to approximately 17.6 cfs. As a result of the reduction in seepage, in stream flow rights would be established from the diversion point on Tumalo Creek and from Crescent Lake Reservoir down to Lake Billy Chinook (Appendix D).

While seepage from the existing canal potentially ends up as surface water in the lower reaches of the Middle Deschutes, by conserving the water and placing it in stream, this project will benefit aquatic habitat in a much longer section of the Middle Deschutes while having no negative impact to stream flows in the lower reaches of the river.

Piping the Tumalo Feed Canal is part of the overall plan to pipe the entire District delivery system, which will eventually result in even more water conservation as the laterals are piped. Piping the Tumalo Feed Canal is integral to implementing the Water Conservation Plan and to meeting the needs of irrigators in the district.

Operation and maintenance requirements for the open canal include weed clearing and cleaning, and replacement or repair of water measurement structures. It is estimated that piping the Tumalo Feed Canal would reduce maintenance needs by about a ½ full-time staff member each year. The District intends to use those hours on piping other canals in the system, which would help to accelerate the Water Conservation Plan. A piping alternative will also provide energy savings through water system pressurization. The pressurized water may be utilized to minimize on-farm pumping costs.

Section 404 of the Clean Water Act states that construction or maintenance of irrigation ditches are exempt, and therefore, no removal/fill permits are anticipated to be required to implement the Proposed Action.

4.2 ALTERNATIVES CONSIDERED BUT ELIMINATED

Comments on the EA for a similar piping project on the nearby Bend Feed Canal requested that Reclamation evaluate an additional alternative of lining the canal to meet the need to reduce water loss. Lining the canal was not carried forward into the evaluation for this project because it would not meet a key purpose, which is to reduce the risk to public safety. In fact, lining the canal would increase the risk, because the smooth sides of a lined canal would increase the velocity of water flows and make the sides slippery and more difficult for people in the water to grasp onto, and climb out of, the canal. In addition, lining the canal would not reduce water lost through evaporation. Lastly, cementitious or

tarp-type liner alternatives require significantly higher operation and maintenance considerations than piping, especially in the severe Central Oregon climate.

5 ENVIRONMENTAL IMPACTS

This chapter describes the existing natural and social resources that could be affected by the implementation of the proposed project. Impacts associated with noise, air pollution, hazardous materials, paleontological resources, Indian trust assets, floodplains, and environmental justice were considered, but eliminated from detailed analysis because the potential for any effect is low. Mitigation measures, where applicable, are listed at the end of each resource section.

5.1 PUBLIC SAFETY

Public use of the Tumalo Feed Canal presents a growing safety concern for the District as described above under "Purpose and Need." In some areas, the canal and maintenance road are posted with warning signs to discourage use of the area because of the swift flows, depth of water, and steep banks. In other areas, property owners along the canals have fenced the right-of-way to reduce trespassing.

5.1.1 No Action

The Tumalo Feed Canal would continue to present a public safety risk. Public safety risk would be expected to increase with population growth in the rural residential areas.

5.1.2 Proposed Action

During construction, there would be typical risks of a construction site. Once the canal is converted to a covered pipeline, the risk to public safety from water in the open canal would be eliminated.

5.1.3 Mitigation Measures

The contractor would be required to provide customary safety precautions such as temporary fencing around construction site and signage across the ditch rider road advising the public that the area is closed to public access during construction. As the Proposed Action would accomplish the purpose of the project, and not have negative public safety impacts, no permanent mitigation is needed or proposed.

5.2 RECREATION

The maintenance road is used regularly by hikers, bikers, runners, and horse-back riders where the right-of-way is not fenced by property owners. The canal does not have game fish due to the installation of Oregon Department of Fish and Wildlife (ODFW) compliant fish screens on canal diversions. People have been known to swim and canoe or kayak in canals, although these activities are prohibited. All activities within the canal easement that are not connected with the District are prohibited. Although the District does not prohibit

public use of the maintenance road, users are technically trespassing on District or private land.

Downstream from the project area, the Middle Deschutes is designated as a Wild and Scenic River. This section of the river primarily provides recreation opportunities for hiking and fishing.

5.2.1 No Action

Current use by the public of the canal for recreation activities would not change. The potential enhancement of aquatic resources in Tumalo Creek and the Deschutes River through higher seasonal flows would not occur.

5.2.2 Proposed Action

During construction, access to segments of the maintenance road may be curtailed and construction noise could also affect the recreation experience in those areas. After construction, access to the District's maintenance roads is expected to remain the same.

By allocating conserved water to in stream use, summer time flows will be increased in the Wild and Scenic section of the Middle Deschutes between the confluence of Tumalo Creek and Lake Billy Chinook.

Downstream of the Tumalo Feed Canal Diversion structure, the Tumalo Creek summer stream flow would be increased by up to 11.8 cfs. The flow in the Upper Deschutes River would be increased by up to 8.2 cfs. The potential for increased fish populations could lead to an increase in recreational fishing along the Deschutes River and downstream portions of Tumalo Creek.

5.2.3 Mitigation Measures

No mitigation measures are proposed.

5.3 AESTHETICS

The Tumalo Feed Canal passes through ponderosa pine-western juniper uplands characteristic of the transition zone between drier sagebrush steppes to the east and the forested eastern slope of the Cascades to the west (Appendix A). Closer to the Tumalo Reservoir, the pine and juniper uplands are interspersed with irrigated pasture and croplands. Rural residences can be found scattered along the length of the canal, with some quite close to the canal's right-of-way. The open canal is dry in late autumn and winter, except during "stock runs" that occur every six weeks. The water canal is a pleasant visual feature that is a lively dimension in the landscape.

5.3.1 No Action

There would be no change to the aesthetics of the canal.

5.3.2 Proposed Action

During construction, the excavation would look like a typical construction site, with exposed earth, the pipe, staging areas for construction equipment, and stockpiles of native and imported fill (Appendix A). Trees may be pruned to allow passage of construction equipment and vehicles, and if deemed a safety hazard, some trees may be removed. During construction, TID will work with the contractor and local land owners to minimize removal of tress, particularly trees greater that 12" diameter. Construction noise could also affect the recreation and aesthetic experience in those portions of the canal.

After construction, the piped Tumalo Feed Canal would look like a broad path covered by natural ground cover, with the same elevation as the existing top of bank (Appendix A). The project area may be slightly mounded or dipped below grade in some locations, depending on the amount of fill needed or site excavation constraints. The canal alignment would no longer provide the same aesthetic atmosphere of the open water canal.

5.3.3 Mitigation Measures

The Proposed Action will provide increased flows to the Deschutes River and Tumalo Creek. This will enhance aquatic habitat and provide an improved aesthetic resource for all residents and visitors of Central Oregon.

The commitments made in the vegetation and wildlife section (5.6.3) to minimize tree removal and to plant native vegetation will mitigate for construction impacts to visual resources, and the long-term loss of the aesthetics of the open canal.

5.4 AGRICULTURAL AND DOMESTIC WATER SUPPLIES

Agricultural Water Supplies

The District provides water for irrigation of 8,110 acres. Approximately 35 percent is planted in alfalfa, 40 percent in hay/pasture, 15 percent in grains, and 10 percent in lawn and garden (Reclamation 2000). Historically, the District has been unable to meet the full demands of its water users during water-short years. In only two years between 1967 and 1990, and in 2003, did the District meet the targeted peak demand.

Domestic Water Supplies

For drinking water in unincorporated Deschutes County, residential users rely on private wells. The county is underlain by volcanic soils and fractured bedrock. This results in a highly permeable condition where surface water easily infiltrates to the large aquifer that is the source of most urban and rural potable water. To access the aquifer, wells must be drilled to a depth of 500 to 600 feet. Shallow wells having an intermittent water supply have likely tapped into a perched water table that essentially amounts to a temporary collection of surface water. The proposed project will potentially affect these shallow wells.

5.4.1 No Action

Water would continue to be lost from the Tumalo Feed Canal at a rate of approximately 20 cfs by seepage and evaporation.

5.4.2 Proposed Action

Agricultural Water Supplies

Eliminating seepage and evaporation by piping Tumalo Feed Canal would increase efficiency within the delivery system, allowing the District to better serve the irrigation needs of customers and enhance in-stream flows of the Deschutes River and Tumalo Creek.

To better meet the needs of its customers, the District proposes to increase the efficiency of its delivery system by preventing water loss through seepage in the open and unlined canals, and by creating a pressurized delivery system. Although initial piping projects may not create a significant water savings delivered directly to the water users, a completely piped system will eventually provide more water to the District users.

Piping the canal would also reduce pumping needs. The system currently works through gravity flows and siphon-action. Water subscribers typically need a pump on their property to deliver the water with enough pressure to irrigate. As more of the system is piped, the water will become pressurized so that less pumping will be required by water subscribers, which will reduce the cost to irrigate. If the entire system could be piped, it would become an enclosed, pressurized system, with the result that many water subscribers may not require pumps.

Domestic Water Supplies

The elimination of seepage into the ground from the canals may affect shallow wells, but is not likely to affect wells that are drilled down to the aquifer. No issues related to wells were reported during the Bend Feed Canal project implementation.

5.4.3 Mitigation Measures

Because one of the purposes of the proposed project is to improve the efficiency of the water delivery system, no mitigation measures are needed or proposed.

5.5 FISHERIES AND AQUATIC RESOURCES

The Tumalo Feed Canal supports no game fish, salmonids, or threatened and endangered aquatic species. Fish screens compliant with ODFW standards were installed on the Bend Feed Canal Diversion in 2004, and on the Tumalo Feed Canal Diversion in 2005. The diversion settling pond supported a seasonal population of three-spine stickleback (*Gasterostetus aculeatus*) in 2005, before the fish screens were installed. The fish were presumably conveyed from Tumalo Creek and were able to survive in the pond, but were trapped and perished as the system was de-watered for the off-season. Fish can no longer access the system since the fish screens have been installed.

Item 17 in the Final Water Order states that "ODFW, Department of Environmental Quality, and Oregon Parks and Recreation Department were consulted and indicated that additional streamflows are needed in Tumalo Creek, Crescent Creek, the Little Deschutes River and the Deschutes River to provide for the conservation, maintenance and enhancement of aquatic and fish life habitat." Increased flows in Tumalo Creek would reach the Middle Deschutes Wild and Scenic River as in-stream flows rather than through seepage. With this project, fisheries and aquatic habitat would be enhanced over a longer reach of the Middle Deschutes Wild and Scenic River. The majority of seepage water returns to the Deschutes immediately upstream of Lake Billy Chinook in the form of large springs. Below that point, instream flow benefits would not occur as the seepage being conserved would have returned to the river at that point.

Water diverted from Tumalo Creek is fully utilized in the irrigation system, with no residual flow back to the Creek or any other natural waterbody.

Tumalo Creek originates in the Cascade Range, 20 miles west of Bend, and flows eastward to its mouth at the Deschutes River, north of Bend. The primary native protected fish species inhabiting Tumalo Creek is redband rainbow trout (*Oncorhynchus mykiss*), which is protected as a game fish in Oregon. No bull trout (*Salvelinus confluentus*) are known to be present (ODFW 2010).

The mean measured flow in Tumalo Creek at river mile (RM) 3.0, near the Tumalo Feed Canal intake, is 102 cfs (Reclamation 2000). A minimum of 5.8 cfs are presently required to remain in-stream past the diversion during the irrigation season.

5.5.1 No Action

The present conditions would continue under the No Action alternative. Tumalo Creek stream flow would continue to be limited to about 5.8 cfs in the creek's lower reaches during the irrigation season. The Deschutes River would not receive any increases in water supply due to conserved water in the Tumalo Irrigation District.

5.5.2 Proposed Action

As described under Section 4.1.2, water rights to the conserved 20 cfs will be held by the State, and the water will be left in Tumalo Creek and the Upper Deschutes River. The Proposed Action could triple the minimum irrigation-season flows in Tumalo Creek from 5.8 cfs to 17.6 cfs at the point of diversion, which would in turn augment Deschutes River flows. With the stored water in Crescent Lake Reservoir, flows in Crescent Creek and the Upper Deschutes can be augmented at the discretion of the Oregon Water Resource Department to improve aquatic resources. This would increase available downstream habitat for redband rainbow trout, Mid-Columbia River steelhead and other local fish species as the area and depth of the wetted channel increases. Improved water quality would also benefit fish populations, as the current seasonally high water temperatures in Tumalo Creek would be reduced somewhat by the increased flow from the headwaters.

This flow would in turn improve aquatic habitat conditions in the Deschutes River downstream of the mouth of Tumalo Creek to Lake Billy Chinook which defines the lower limit of the instream reaches in the water right (Appendix D). Below that point, instream flow benefits would not occur as the seepage being conserved would have returned to the river by that point.

5.5.3 Proposed Mitigation Measures

No mitigation measures are proposed because the project would have an entirely beneficial effect on fisheries and aquatic resources below the diversion. The Tumalo Feed Canal itself has no habitat value for fish. The project would enable a decrease in diversions from Tumalo Creek and the Deschutes River, improving aquatic habitat conditions.

5.6 VEGETATION AND WILDLIFE RESOURCES

The Tumalo Feed Canal project area lies in the high lava plains province and the ponderosa pine (*Pinus ponderosa*) forest zone (Franklin and Dyrness 1988). The dominant vegetation in the project area is ponderosa pine with western juniper (*Juniperus occidentalis*). The understory is dominated by a variety of non-native grasses, as well as rabbitbrush (*Chrysothamnus nauseosus*), bitterbrush (*Purshia tridentata*), and wax currant (*Ribes cereum*). This vegetation community is prevalent throughout the vicinity of the project area, and is not associated with canal hydrology.

A fringe of hydrophytic (water-loving) plants has formed along the margins of the top of the canal bank in some areas. This community is only a few feet wide in scattered locations and does not function as a riparian zone or as a habitat type. Dominant plants in these locations are primarily bulrush (*Scirpus* spp.), black cottonwood (*Populus balsamifera*), and willow (*Salix* spp.). Appendix A includes typical photographs of this fringe vegetation.

Tumalo Feed Canal is maintained during the off-season by grading and clearing, and no vegetation community is allowed to develop within the channel. Canal leakage typically infiltrates into the fractured rock substrate, thus limiting the development of a raised water table adjoining the canal. The entire length of the project area was inspected by wetland biologists. Soils and hydrology were inspected in all areas having hydrophytic vegetation communities. No wetlands were found in the project area.

Typical wildlife in the project vicinity includes mule deer, coyote, beaver, cottontail rabbits, jack rabbits, gray squirrels, golden-mantle ground squirrels, chipmunks, and bats. Typical reptiles include western fence lizards, horned lizards, and gopher snakes. A wide variety of passerine birds as well as osprey may occur in the project area.

5.6.1 No Action

The No Action alternative would have no effect on vegetation and wildlife in the vicinity. The Tumalo Feed canal would continue to be a seasonal water source and migration barrier for wildlife.

5.6.2 Proposed Action

The project could affect vegetation and wildlife both temporarily during construction and long-term by the elimination of the open canal. Most wildlife would easily avoid construction activity, but some individual ground-dwelling species would be inadvertently killed. Some vegetation along the canal access road would be displaced.

The canal offers no significant habitat for water-dependent wildlife such as beaver because of its intensive seasonal maintenance, and because of its extreme seasonal flow variations. Piping the open canal would eliminate a seasonal source of water for wildlife. However, the piping of the canal will happen over the span of five to ten years, and many nearby laterals will also remain open during the piping of the Tumalo Feed Canal. Access to water by wildlife will be lost gradually, allowing an adaptation to other sources of water. The Tumalo Reservoir and Tumalo Creek are at each end of the project area, and the maximum straight-line distance to either of these water sources is approximately two miles.

Some trees that were dependant upon the canal for survival may not survive the piping of the canal. Experience with the piping of the Bend Feed Canal showed that some trees that would not normally have survived in such a location without the canal did die off after piping, but the majority of the well-established trees survived.

5.6.3 Avoidance and Mitigation Measures

The project alignment will be re-contoured and planted with a seed mix of native shrubs, grasses, and forbs. Appendix A includes a photograph of the Bend Feed Canal alignment about four months after a similar pipe installation project. During the three years following construction, the contractor would be required to ensure that native plants become established in the first year (including by irrigation, if necessary) and to weed, fertilize, or otherwise maintain the minimum plant density in the subsequent two years.

Although no trees can be planted along the buried pipe because they may interfere with future maintenance, the contractor would be required to ensure that existing trees greater than three inches in diameter at breast height be protected in place wherever feasible. To minimize the impacts associated with removing vegetation and excavating, tree pruning would be limited to trees within the existing Carey Act right-of-way, and all pruning would be performed or supervised by a licensed arborist. Pruning would only be allowed when necessary for equipment passage, and must not exceed what is required for approximately 12 inches of equipment clearance.

The Migratory Bird Treaty Act prohibits disturbance of active nests of migratory birds. Most of the birds found in the project area are considered migratory. Tree and shrub clearing will occur between August 1 and March 15. This makes the chance of physically impacting an active nest very low.

5.7 THREATENED AND ENDANGERED SPECIES

Listed and proposed threatened and endangered species under the Federal Endangered Species Act (ESA) that may occur in Deschutes County are presented in Table 1. This

information was obtained from the U.S. Fish and Wildlife Service (USFWS) in 2005, 2007, and updated in 2010 (Appendix B). A site-specific data search by the Oregon Natural Heritage Information Center (ORNHIC) showed no occurrence of any of these species in the project area. In February 2010, Mid-Columbia River steelhead were not identified by the USFWS as occurring in Deschutes County, but the steelhead were recently reintroduced into a tributary of the Deschutes River, approximately 35 miles downstream of the project area . Big Falls, a natural barrier to steelhead, is about 25 miles downstream of the project area.

Bald eagles are identified only along the Deschutes River, several miles east of the project area (ORNHIC 2005), and are no longer listed under the ESA. While still protected under the Bald and Golden Eagle Protection Act, nesting eagles will not be disturbed during this project because there are no nests in proximity to this site. National Bald Eagle Management Guidelines require that active eagle nests are not disturbed by human activity. This project complies with these guidelines because there are no nests in proximity to the project site.

Northern spotted owls have not been documented in the project area (ORNHIC 2005). Spotted owls concentrate their foraging and roosting in old-growth or mixed-age stands of mature and old-growth trees. Definitions of stands used by spotted owls have often varied among studies. Old-growth forests have usually been defined as having a dominant overstory of trees greater than 200 years old with a multi-layered, multiple tree species canopy, relatively high canopy closure, snags and down logs (Thomas et al 1990). No such habitat occurs in the project area.

The closest occurrence of bull trout is also the Deschutes River, over 15 miles downstream of the project area (ODFW 2010). Critical habitat has been designated for the Northern spotted owl, Columbia River bull trout, and Mid-Columbia River steelhead, but does not include the project area. Recently proposed revisions to the critical habitat for bull trout have been announced but no critical habitat for bull trout is proposed for the project area.

Table 1. Federally listed, proposed, and candidate species that may occur in Deschutes County, OR.

Common Name	Latin Name	Jurisdictional Agency	Federal Status	Occurrence in Project Area
Bald eagle	*Haliaeetus leucocephalus*	USFWS	de-listed	none
Northern spotted owl	*Strix occcidentalis caurina*	USFWS	threatened	none
Bull trout (Columbia River)	*Salvelinus confluentus*	USFWS	threatened	none
Pacific fisher	*Martes pennanti pacifica*	USFWS	candidate	none
Yellow-billed cuckoo	*Coccyzus americanus*	USFWS	candidate	none
Oregon spotted frog	*Rana pretiosa*	USFWS	candidate	none

None of the other federal candidate species in the County have any potential to occur in the project vicinity. Fishers require mature closed-canopy coniferous forest (Csuti et al. 1997). No such habitat exists in the project vicinity. The yellow-billed cuckoo requires large blocks of dense riparian cottonwood and willow woodlands (USFWS 2001). Such habitat does not occur in the project vicinity. The Oregon spotted frog is entirely aquatic, and requires inundated emergent wetlands or vegetated stream and lake margins throughout the year (Csuti et al. 1997). No such habitat occurs in the project area. The Tumalo Feed Canal itself provides no habitat for Oregon spotted frogs because of the extreme flow fluctuations and lack of emergent inundated vegetation. None of these species have been documented as occurring in the project area (ORNHIC 2005).

5.7.1 No Action

Diversions from Tumalo Creek and the Deschutes River would continue at current levels, with continuing impacts to flows in Tumalo Creek and the Deschutes River.

5.7.2 Proposed Action

The project has no potential to directly affect species addressed here because they do not occur in the project area. The threatened species that are closest to the project area (Bull trout and Mid Columbia River steelhead) are over 15 miles downstream, and will not be directly or indirectly affected by the project.

The proposed project would not generate any short-term construction impacts to Tumalo Creek because water diverted from Tumalo Creek is fully utilized in the irrigation system, with no residual flow back to the Creek or any other natural water body. In addition, the project area begins at the downstream end of the siphon that diverts water from Tumalo Creek, does not come within 500 feet of the creek, and will have erosion control measures to prevent any sediment from entering the creek.

Conserved water returned to the State will result in a 20 cfs increase of in-stream flow in the Deschutes River below the mouth of Tumalo Creek. Of the 20 cfs, 11.8 cfs will be from increased flows in Tumalo Creek. Calculations have shown that the additional 11.8 cfs of cold Tumalo Creek water entering the Deschutes River will reduce temperature in the Deschutes River by approximately one degree Fahrenheit (TID 2006). It is not known how far downstream this cooling effect would be maintained.

Northern spotted owls have not been documented in the project area and habitat does not exist within the project site, therefore, there will be no effect to Northern spotted owls.

5.7.3 Mitigation Measures

No mitigation measures are needed.

5.8 HISTORIC PROPERTIES

The term "historic property" is defined in the National Historic Preservation Act as "any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion on the National Register." The term "historic properties" includes traditional cultural properties. Historic properties are also sometimes referred to as "cultural resources."

The District's irrigation system was determined to be eligible for the National Register of Historic Places as a linear district by Reclamation, with the Tumalo Feed Canal listed as a contributing feature to that district. The State Historic Preservation Office (SHPO) concurred with this determination on April 16, 1997 (Appendix C).

Where it fell within the area of potential effect, the Tumalo Feed Canal Carey Act right-of-way was surveyed by an archeologist along its full length and width in November of 2006. The canal was empty at the time of the survey, allowing an examination of the canal banks and the full width of the right-of-way. The Tumalo Reservoir was not surveyed as part of this project, with the understanding that borrow material would come only from sedimentary material deposited in the drawdown zone. Communication with SHPO on this topic is in Appendix C. Aside from the canal itself, no historic properties of an historic or archeological nature were found (Stuemke 2006).

In 1996, an historic context was prepared of the district features, including the Tumalo Feed Canal (Pfaff nd), and that information was subsequently incorporated into Historic American Engineering Record (HAER) Number OR-151 documenting the history of Tumalo Irrigation District (Luttrell and Pfaff 2006). The following information is extracted from the HAER report. The Tumalo Irrigation District system construction began in 1900, with other substantial building phases circa 1903, 1913-1914, and 1922-1923. More recently, the District has entered a new building phase during which improvements to failing structures have been completed, required fish screens installed, and some critical segments of canal have been placed in pipelines for public safety and water conservation purposes.

The Tumalo Diversion structure and Feed Canal is one of two major diversion and delivery features operated by the District (the other is the Bend Feed Canal). The Tumalo Diversion and Feed Canal were designed by Olaf Laurgaard and constructed in 1913-14. As built, the canal extended 7.2 miles overland from the creek, running northwesterly along the southwestern edge of the irrigated lands to Tumalo Reservoir on Bull Flat. It consisted of open ditch, 14 feet wide with a water depth of four feet. It had three state-of-the-art metal flumes collectively totaling 6,381 feet in length, each 10 feet wide by five feet deep, elevated on wooden trestles set on concrete piers. All the structures appurtenant to the Tumalo Feed Canal, such as drops, canal crossings, and turnouts were constructed of concrete. Immediately below the headgates, the canal was lined with concrete for a distance of 373 feet (Winch 1985, Laurgaard 1914). Thereafter, it was unlined open ditch.

Beginning with a rehabilitation program in 1974, substantial changes have occurred to the canal structures. In 1974, the original flume at the head of the Tumalo Feed Canal, just beyond the lined section, was replaced with 54-inch diameter concrete pipe siphon. The Tumalo Feed Canal was also piped between its diversion point with Tumalo Creek and to within a quarter mile of its intersection with the Bend Feed Canal. After the Bend Feed Canal junction, the Tumalo Feed Canal remains open, in its original design configuration. Since completion of the 1996 historical overview, the other two original wooden trestle flumes, the Klippel and Weber flumes, have been removed and replaced with buried steel siphons. The adjacent twin flumes downstream from the Klippel Siphon have also been removed. A mortared rock footing that once supported the outlet of the twin flumes now functions as the support for a bridge. Finally, a concrete delivery has been constructed to the Pauley Lateral.

5.8.1 No Action

The No Action alternative would have no effect on any historic properties.

5.8.2 Proposed Action

The Proposed Action would have an adverse effect on the Tumalo Feed Canal. Consultation with SHPO was initiated by a July 25, 2006 letter from the District attached to a Section 106 Level of Effect form stating that the project would have an adverse effect on the Tumalo Feed Canal; the consultation also addressed replacement of the Highline/Couch headgate, which was addressed under a separate NEPA document. The SHPO concurred with the determination on September 1, 2006 (Appendix C). As a note of interest, the Tumalo Feed Canal Diversion structure and headgate, neither of which would be impacted by the proposed canal piping, continue to be included on the County's inventory of Historic Sites.

Other than the canal system itself, no historic properties will be affected by the proposed project. A copy of Stuemke's report and a determination of no effect form was submitted to SHPO on December 14, 2006. SHPO concurred with the determination of no effect to archeological sites in a letter dated February 28, 2007 (Appendix C).

Imported fill would be obtained from an active source or by excavation from the Tumalo Reservoir during the off-season when the reservoir bed is mostly dry. Only material deposited by the reservoir waters would be used for fill. No fill material would be taken from the undisturbed edges of the reservoir (Appendix C). The District will require that their contractor will complete all required actions of Section 106 of the National Historic Preservation Act prior to obtaining gravel or fill material from any other location where materials are not procured from existing stockpiles, and there is the potential the procurement of the materials could effect historic properties. The contractor will hire professional archeologists to complete investigations. If sites are found, the District will seek to avoid the sites. If they cannot be avoided, the contractor or the District will complete all actions required to assess eligibility of the sites to the National Register, assess

effect of the action, and to treat unavoidable adverse effects. The District will conduct all required consultations with the SHPO, and with interested Indian tribes if appropriated, as needed to comply with processes defined in 36 CFR 800.3 through 800.6.

5.8.3 Mitigation Measures

The HAER documentation of the Tumalo Irrigation District and its distribution was deemed full mitigation for the piping of the Tumalo Feed Canal (Memorandum of Agreement for the Piping of the Tumalo Feed Canal and Highline/Couch Lateral, October 30, 2006). The HAER provides photos and a written history of the District. The HAER document serves as a record of the facilities for those interested in understanding the history of the District. The HAER has been provided by the District to Reclamation, SHPO, the Seattle office of the National Park Service (for provision to the Library of Congress), the Bend Public Library, and the Deschutes County Historical Society. Correspondence with SHPO about the proposed project is included as Appendix C.

5.9 CUMULATIVE IMPACTS

Other irrigation canals in Central Oregon have been piped in the past years, and the District's key water conservation goal is to have its entire system piped. This will result in improved public safety, more in-stream water flows, and eventually, more water available to irrigators.

Tumalo Creek and Deschutes River

Population growth is expected to change the mix of landowners and land use in Central Oregon. The trend is anticipated to result in less use of irrigation water throughout Central Oregon, and create the potential for temporary or permanent reallocation of water through in-stream leasing of water rights (Aylward 2006). This scenario could result in enhanced aquatic habitat.

Wells

Some shallow wells that have not been drilled deep enough to tap the aquifer in the Bend area may dry up once more of the canal system is piped. Most wells have been drilled deep enough to avoid being effected by piping of canals in Central Oregon.

Historic Properties

Historic properties will be affected by piping projects. The Bend Feed Canal has been piped, and the piping of the Tumalo Feed Canal will result in both of the District's principal diversion canals to be altered from their historical design. Together, these actions have an adverse effect on the historic integrity of the entire historic Tumalo irrigation system; the TID HAER document provides mitigation for the loss of these features. Other irrigation districts in the Bend vicinity and elsewhere in the State are participating in Federal programs, and also proceeding on their own, in piping their systems to conserve water and increase efficiency. Over time, it is likely that most of the original features of the State's

irrigation systems will be significantly altered, ultimately reducing evidence of the irrigation engineering designs and practices used in the late 19th and early 20th Centuries.

Reclamation is pursuing a Programmatic Agreement (PA) that ultimately may include many, if not all, of the irrigation districts in the Bend vicinity. Under that PA, Reclamation anticipates that mitigation measures will be defined that synthesize information about each district to address broader research questions about irrigation development in Deschutes, Crook, and Jefferson Counties.

6 ENVIRONMENTAL COMMITMENTS

6.1 FISHERIES AND AQUATIC RESOURCES

No work will be performed in Tumalo Creek. The project will dedicate 20 cfs of conserved water to in-stream flows of the Upper Deschutes River and Tumalo Creek as described in Section 4.1.2, thus providing an improvement to aquatic habitat.

6.2 VEGETATION AND WILDLIFE RESOURCES

The project alignment will be re-contoured and planted with a seed mix of native shrubs, grasses, and herbs. Appendix A includes a photograph of the Bend Feed Canal alignment about four months after a similar pipe installation project. During the three years following construction, the contractor would be required to ensure that native plants become established in the first year (including by irrigation, if necessary) and to weed, fertilize, or otherwise maintain the minimum plant density in the subsequent two years.

Although no trees can be planted along the buried pipe because they may interfere with future maintenance, the contractor would be required to ensure that existing trees greater than three inches in diameter at breast height be protected in place wherever feasible. To minimize the impacts associated with removing vegetation and excavating, tree pruning would be limited to trees within the existing Carey Act right-of-way, and all pruning would be performed or supervised by a licensed arborist. Pruning would only be allowed when necessary for equipment passage, and must not exceed what is required for approximately 12 inches of equipment clearance.

The Migratory Bird Treaty Act prohibits disturbance of active nests of migratory birds. Most of the birds found in the project area are considered migratory. Tree and shrub clearing will occur between August 1 and March 15. This makes the chance of physically impacting an active nest very low.

6.3 HISTORIC PROPERTIES

The HAER document has been made available for review by interested parties at Reclamation, SHPO, the District, the Seattle office of the National Park Service, the Bend Public Library and the Deschutes County Historical Society.

Imported fill will be obtained from the Tumalo Reservoir during the off-season when the reservoir bed is mostly dry. No fill material will be taken from the undisturbed edges of the reservoir, and only depositional material from the reservoir bed will be used for fill. (Appendix C). The District will require that their contractor will complete all required actions of Section 106 of the Historic Preservation Act prior to obtaining gravel or fill material from any other location where materials are not procured from existing stockpiles, and there is the potential the procurement of the materials could effect historic properties. The contractor will hire professional archeologists to complete investigations. If sites are found, the District will seek to avoid the sites. If they cannot be avoided, the contractor or the District will complete all actions required to assess eligibility of the sites to the National Register, assess effect of the action, and to treat unavoidable adverse effects. The District will conduct all required consultations with the SHPO, and with interested Indian tribes if appropriated, as needed to comply with processes defined in 36 CFR 800.3 through 800.6.

Preparers

John Macklin, DEA Senior Scientist, contributed the fisheries and aquatic resources, vegetation and wildlife resources, and endangered species sections, and edited the overall document. Gillian Zacharias, DEA Planner, contributed the public safety, recreation, aesthetics, and water supply sections. Karen Swirsky, DEA Planner, contributed to the Historic Properties section and assisted in Quality Management review. Jenny Severson, DEA Environmental Planner, prepared the Historic Properties section and edited the overall document. Dana Siegfried, DEA Permit Specialist, provided Total Quality Management review. Kelly Winter, DEA Administrative Assistant, performed word processing, and Melissa Foltz, DEA Project Assistant, produced report graphics.

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APPENDIX A: SITE PHOTOGRAPHS

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Tumalo Creek near south end of project

Southern terminus of project, at siphon discharge

Tumalo Feed Canal; typical channel in south end of project

Typical hydrophytic vegetation fringe along canal margin

Tumalo Feed Canal; typical channel in middle section of project

Tumalo Feed Canal; inlet to Weber Flume

Tumalo Feed Canal; typical channel in northern section of project

Diversion settling pond on Tumalo Feed Canal

Tumalo Feed Canal northern terminus: outlet to Tumalo Reservoir

Tumalo Reservoir

Couch Lateral at northern project terminus

Typical canal view during irrigation season

Typical pipe installation in irrigation canal – from Bend Feed Canal piping project

Typical Post-Construction View of buried pipe alignment, from Bend Feed Canal piping project

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APPENDIX B: USFWS SPECIES LIST

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FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES AND SPECIES OF CONCERN UNDER THE JURISDICTION OF THE FISH AND WILDLIFE SERVICE WHICH MAY OCCUR WITHIN DESCHUTES COUNTY, OREGON

LISTED SPECIES

Birds

Northern spotted owl	*Strix occidentalis caurina*	CH T

Fish

Inland:

Bull trout	*Salvelinus confluentus*	CH T

PROPOSED SPECIES

None

No Proposed Endangered Species	PE
No Proposed Threatened Species	PT

CANDIDATE SPECIES

Birds

Yellow-billed cuckoo	*Coccyzus americanus*

Reptiles and Amphibians

Inland:

Oregon spotted frog	*Rana pretiosa*

SPECIES OF CONCERN

Mammals

Terrestrial:

Pygmy rabbit	*Brachylagus idahoensis*
Townsend's western big-eared bat	*Corynorhinus townsendii townsendii*
Spotted bat	*Euderma maculatum*
California wolverine	*Gulo gulo luteus*
Silver-haired bat	*Lasionycteris noctivagans*
Small-footed myotis bat	*Myotis ciliolabrum*
Long-eared myotis bat	*Myotis evotis*
Long-legged myotis bat	*Myotis volans*
Yuma myotis bat	*Myotis yumanensis*
Preble's shrew	*Sorex preblei*

Birds

Northern goshawk	*Accipiter gentilis*
Western burrowing owl	*Athene cunicularia hypugaea*
Ferruginous hawk	*Buteo regalis*
Greater sage-grouse	*Centrocercus urophasianus*
Black tern	*Chlidonias niger*
Olive-sided flycatcher	*Contopus cooperi*

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FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES AND SPECIES OF CONCERN UNDER THE JURISDICTION OF THE FISH AND WILDLIFE SERVICE WHICH MAY OCCUR WITHIN DESCHUTES COUNTY, OREGON

Willow flycatcher	*Empidonax traillii adastus*
Yellow-breasted chat	*Icteria virens*
Lewis' woodpecker	*Melanerpes lewis*
Mountain quail	*Oreortyx pictus*
White-headed woodpecker	*Picoides albolarvatus*

Reptiles and Amphibians

Coastal tailed frog	*Ascaphus truei*
Oregon slender salamander	*Batrachoseps wrighti*
Cascades frog	*Rana cascadae*
Northern sagebrush lizard	*Sceloporus graciosus graciosus*

Invertebrates

Clams:

California floater mussel	*Anodonta californiensis*

Plants

Estes' artemisia	*Artemisia ludoviciana ssp. estesii*
Cliff paintbrush	*Castilleja rupicola*
Cusick's buckwheat	*Eriogonum cusickii*
Peck's penstemon	*Penstemon peckii*
Howell's thelypody	*Thelypodium howellii ssp. howellii*

DELISTED SPECIES

Birds

American Peregrine falcon	*Falco peregrinus anatum*
Bald eagle	*Haliaeetus leucocephalus*

Definitions:

Listed Species: An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future.

Proposed Species: Taxa for which the Fish and Wildlife Service or National Marine Fisheries Service has published a proposal to list as endangered or threatened in the Federal Register.

Candidate Species: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.

Species of Concern: Taxa whose conservation status is of concern to the U.S. Fish and Wildlife Service (many previously known as Category 2 candidates), but for which further information is still needed. Such species receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing.

Delisted Species: A species that has been removed from the Federal list of endangered and threatened wildlife and plants.

Key:

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FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES AND SPECIES OF CONCERN UNDER THE JURISDICTION OF THE FISH AND WILDLIFE SERVICE WHICH MAY OCCUR WITHIN DESCHUTES COUNTY, OREGON

E	Endangered
T	Threatened
CH	Critical Habitat has been designated for this species
PE	Proposed Endangered
PT	Proposed Threatened
PCH	Critical Habitat has been proposed for this species

Notes:

Marine & Anadromous Species: Please consult the National Marine Fisheries Service (NMFS) (http://www.nmfs.noaa.gov/pr/species/) for marine and anadromous species. The National Marine Fisheries Service (NMFS) manages mostly marine and anadromous species, while the U.S. Fish and Wildlife Service manages the remainder of the listed species, mostly terrestrial and freshwater species.

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APPENDIX C: STATE HISTORIC PRESERVATION OFFICE CORRESPONDENCE

- April 16, 1997: Tumalo Irrigation District as potentially eligible for National Register of Historic Places
- October 20, 2004: Delegation of SHPO consultation responsibilities to Tumalo Irrigation District
- July 25, 2006: Section 106 Level of Effect cover letter to SHPO (determination of adverse effect to Tumalo Feed Canal)
- September 1, 2006: Concurrence from SHPO regarding adverse effect to Tumalo Feed Canal
- October 30, 2006: Memorandum of Agreement regarding mitigation for adverse effect to Tumalo Feed Canal
- December 15, 2006: Determination of no effect to historic properties (other than Tumalo Feed Canal itself)
- August 13, 2007: Electronic mail from SHPO verifying that an archeological survey of the Tumalo Reservoir borrow site is not required (with stipulations)

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Oregon

PARKS AND
RECREATION
DEPARTMENT

STATE HISTORIC
PRESERVATION OFFICE

April 16, 1997

Christine Pfaff, Historian
Bureau of Reclamation
P.O. Box 25007
Building 67, Denver Federal Center
Denver, CO 80225

RE: Tumalo Irrigation Project
Deschutes County, Oregon

Dear Ms. Pfaff:

Thank you for your submission of project documentation for the property(s) referenced above. This information was submitted in compliance with the National Historic Preservation Act of 1966 (16 U.S.C. 470f), Section 106, and reviewed under criteria and procedures outlined in 36 CFR Part 800. Further consultation and comment was also solicited from appropriate SHPO program staff.

The Tumalo Irrigation Project is located in Deschutes County, and has origins dating to 1893. The Project provided much needed water to the region, helping to promote settlement and agricultural development, and lands irrigated under the Project were the first approved by the Department of the Interior in Oregon under the 1894 Carey Act.

We **"Concur"** with the overall evaluation that the Tumalo Irrigation Project is **"Considered Eligible"** for listing in the National Register of Historic Places under Criterion A as one of the earliest irrigation projects in the Upper Deschutes Basin. It is also significant for its association with the Carey Act. The Project may also meet National Register Criterion C for engineering significance, though further research will be necessary to support this criterion.

The Project was researched and evaluated for National Register significance as a system with contributing and non-contributing features. Eight features were evaluated, with the following recommendations:

1. Columbia Southern Diversion Structure and Canal - Potentially contributing; survey of the canal necessary for final evaluation of integrity and significance
2. Tumalo Feed Diversion Dam - Contributing
3. Tumalo Feed Canal - Contributing
4. Tumalo Reservoir - Contributing
5. Tumalo Dam and Control House - Potentially contributing; more research necessary for final evaluation of integrity and significance
6. Bull Creek Dam and Bridge - Contributing
7. Bend Diversion Dam - Contributing
8. Bend Feed Canal - Contributing

1115 Commercial St. NE
Salem, OR 97310-1001
(503) 378-5001
FAX (503) 378-6447

C. Pfaff, Tumalo Irrigation Project
April 16, 1997
page 2

Final concurrence on the contributing status of individual features will depend on the result of further research for the Columbia Souther Diversion Structure and Canal and the Tumalo Dam and Control House.

On preliminary review of Project Alternatives, we would prefer implementation of an alternative that has the least impact on the resource. Piping of the network would obliterate the canals, and could result in an Adverse Effect to resources eligible for listing in the National Register. It appears that other alternative such as lining the canals would have significantly less impact.

Thank you for the work put into research and evaluation of this large and interesting resource. If you should have any further questions, or need additional assistance, please feel free to contact Liz Carter at the SHPO, extension 229.

Sincerely,

Liz Carter for

Henry C. Kunowski
Project Manager

Oregon
Theodore R. Kulongoski, Governor

Parks and Recreation Department
Heritage Conservation Division
725 Summer St. NE, Suite C
Salem, OR 97301-1271
(503) 986-0707
FAX (503) 986-0793
www.hcd.state.or.us

20 October 2004

Mr. Ronald J. Eggers
Bureau of Reclamation
Lower Columbia Area Office
825 NE Multnomah Street, Suite 1110
Portland, Oregon 97232-2135

RE: Delegation of Section 106 Responsibility for Incremental Modification to the Tumalo Irrigation District Project System

Dear Mr. Eggers:

The State Historic Preservation Office concurs with the appropriateness of The Bureau of Reclamation delegating Section 106 responsibilities directly to the Tumalo Irrigation District (TID), including selecting and implementing future water conservation actions and the consideration of long-term effects from those actions. Our office looks forward to continued coordination with the TID, and future consultation on the implementation of a Programmatic Agreement to address incremental modifications to the historic resources on TID facilities.

Sincerely,

James Hamrick

James M. Hamrick, Jr.
Assistant Director for Heritage Conservation
Deputy State Historic Preservation Officer

cc: Mr. Elmer McDaniels, Tumalo Irrigation District

TUMALO IRRIGATION DISTRICT
64697 Cook Ave.
Bend, OREGON 97701
Phone (541) 382-3053
FAX (541) 383-3287
Email: tid@tumalo.org
Web Page: www.tumalo.org

July 25, 2006

Oregon Parks and Recreation Dept
State Historic Preservation Office
Heritage Conservation Division
Attn: Sarah Jalving
725 Summer St NE, Suite C
Salem, OR 97301

Dear Ms. Jalving:

To begin the consultation process for the Tumalo Feed Canal, I have enclosed two copies of the Section 106 Level of Effect Form for the Tumalo Feed Canal Pipeline Replacement Project. The Tumalo Irrigation District has approximately 75 miles of canal, with about seven miles of the system currently piped. This proposed project would pipe six miles of open canal. The Level of Effect Form concludes that there is an adverse affect to historic properties, and that HAER NO. OR-151 can provide mitigation for the piping of the Tumalo Feed Canal. The HAER contains a description of the historic context of the Tumalo Feed Canal, along with photographs of its features.

The Section 106 Level of Effect Form has continuation sheets with additional text, photographs, and a map depicting the project area. The form was completed by Steve Emerson, program director of Archaeological & Historical Services at Eastern Washington University.

If you have any questions you can contact Jenny Severson at David Evans and Associates, Inc. who is helping facilitate this process. She can be reached via email at jsse@deainc.com. Her phone number is (541) 389-7614.

Cordially,

Elmer G. McDaniels
Manager
Tumalo Irrigation District

Enc: Two copies of the Section 106 Level of Effect Form for the Tumalo Feed Canal

OREGON INVENTORY OF HISTORIC PROPERTIES

SECTION 106 LEVEL OF EFFECT FORM

Agency and Project:: Tumalo Irrigation District, Tumalo Feed Canal Pipeline Replacement Project	
Property Name: Tumalo Feed Canal	
Street Address: NW of Bend between UTMs 10-630714-4882889 & 10-626662-4887984	City, County: Bend, Deschutes

Preliminary Finding of Effect:

☐No Historic Properties Affected ☐No Historic Properties Adversely Affected ☒Historic Properties Adversely Affected

State Historic Preservation Office Comments:

☒Concur ☐Do Not Concur: ☐No Historic Properties Affected
☐No Historic Properties Adversely Affected
☐Historic Properties Adversely Affected

Signed Sarah Jahing Date 8/1/2006

Comments:

Provide written description of the project, and its potential effects on the subject property per 36 CFR 800. Include maps, drawings, and photographs as necessary to effectively describe and discuss the project. Use continuation sheets as needed.

TUMALO FEED CANAL PIPELINE REPLACEMENT PROJECT
TUMALO IRRIGATION DISTRICT, OREGON

Historic Context: The Tumalo Feed Canal and its associated features are part of the Tumalo Irrigation District (TID). The district's earliest features date to 1900, with substantial building phases in 1903, 1913-1914, and 1922-1923. Initially begun as a private enterprise, the system came under the jurisdiction of the State of Oregon as a failed Carey Act project before reformation as the self-governing TID. Construction of the irrigation system historically known as the Tumalo Project has encouraged and accompanied settlement and agricultural development in the Upper Deschutes River Basin to the present day.

The Tumalo Feed Canal, and its associated historic features, was constructed during 1913-1914, following the 1913 construction of the Tumalo Diversion Dam, which diverts water from Tumalo Creek into the canal. Both the diversion dam and the canal were designed by Olaf Laurgaard. Mr. Laurgaard was a civil engineer who had formerly worked with the U.S. Bureau of Reclamation. He was hired in 1911 by the Oregon, Washington, and Idaho Finance Company and charged with the task of redesigning several irrigation networks that had previously been constructed by various private interests. Part of Mr. Laurgaard's scheme was to divert water from Tumalo Creek, and several lesser streams, into a 7.2-mile-long canal that would transport water to a new reservoir to be constructed northwest of the diversion point. At several points along the Tumalo Feed Canal, including at the Columbia Southern Canal, water was diverted into laterals that distributed it to fields lying northeast of the canal. Water was also routed from the reservoir itself, in generally the same direction. In this fashion, irrigation sustenance was delivered to a large area along the west side of the Deschutes River. When the redesigned system failed to produce an adequate supply, a new diversion dam was built on the Deschutes River, in 1922, allowing the Tumalo Feed Canal to be supplemented by water from the Bend Feed Canal.

The TID was created by area farmers in 1919, but problems with adequate water supply led them

Surveyor/Agency: Archaeological and Historical Services, EWU Date Recorded: February 2002 Pg 1
106 Level of Effect Rev. 08/03

MEMORANDUM OF AGREEMENT

**BETWEEN THE TUMALO IRRIGATION DISTRICT &
THE OREGON STATE HISTORIC PRESERVATION OFFICE**

**FOR THE PIPING OF
THE TUMALO FEED CANAL & HIGHLINE/COUCH LATERAL,
TUMALO IRRIGATION DISTRICT,
BEND VICINITY, DESCHUTES COUNTY, OREGON**

WHEREAS, the Bureau of Reclamation (Reclamation) delegated Section 106 responsibility to the Tumalo Irrigation District (TID) in 2004;

WHEREAS, Reclamation, in consultation with the Oregon State Historic Preservation Office (SHPO), has determined that the Tumalo Feed Canal is a contributing feature to the Tumalo Irrigation District, a National Register-eligible historic property;

WHEREAS, TID has determined that the Tumalo Feed Canal and Highline/Couch Lateral Piping Project will have an adverse effect upon the Tumalo Feed Canal and the headgate to the Highline/Couch Lateral, and that Historic American Engineering Record (HAER) number OR-151 will mitigate that adverse effect;

WHEREAS, SHPO has concurred with TID's determination of adverse effect and sufficiency of mitigation;

WHEREAS, TID has notified the Advisory Council on Historic Preservation (Council) of the adverse effect on the Tumalo Feed Canal and Highline/Couch Lateral pursuant to 36 CFR Section 800.6(a)(1) of the Council's regulations, and the Council declined on October 4, 2006 to participate in the consultation regarding the resolution of adverse effects;

NOW, THEREFORE, TID and the Oregon SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

Stipulations

TID, in consultation with the Oregon SHPO, will ensure that the following measures are carried out:

1. Prior to project construction, a survey for historic properties will be conducted in the area of potential impact of the Highline/Couch Lateral piping effort, which has received federal funding. The survey will be 50 feet to each side of the center of the lateral, although the actual area of potential impact is much smaller. The survey will be for historic properties other than the canal

system itself, which is mitigated by HAER OR-151. TID will consult with the Oregon SHPO regarding the results of the survey.

2. HAER number OR-151, completed in September 2006, shall be distributed to the following entities: the Seattle office of the National Park Service, the Oregon SHPO, TID, Reclamation, the Deschutes County Historical Society and the Bend Public Library.

3. It was originally believed that there would be Reclamation funds contributing to the piping of the Tumalo Feed Canal, but currently there is no federal involvement on that segment of the irrigation system. It is unclear when the Tumalo Feed Canal will be piped, but if future federal involvement triggers Section 106 consultation requirements, a survey for historic properties will be conducted in the area of potential impact prior to construction (the survey will be for historic properties other than the canal system itself). In the event that any historic properties are located, TID will consult with the Oregon SHPO regarding means to avoid, minimize, or mitigate any adverse effects that may occur.

Execution of this Memorandum of Agreement by TID and the Oregon SHPO, its subsequent filing by the Council, and implementation of its terms by TID evidence that TID has afforded the Council an opportunity to comment on the Tumalo Feed Canal and Highline/Couch Lateral Piping Project and its effects on historic properties, and that TID has taken into account the effects of the undertaking on historic properties.

Signatories

TUMALO IRRIGATION DISTRICT

by: Edward A. McCamish 10-10-06
Manager, Tumalo Irrigation District Date

OREGON STATE HISTORIC PRESERVATION OFFICE

by: 10-30-06
Deputy Oregon State Historic Preservation Officer Date

Concurring Party

BUREAU OF RECLAMATION

by: 10-23-06
Area Manager, Pacific Northwest Region, Bureau of Reclamation Date
for

TUMALO IRRIGATION DISTRICT
64697 Cook Ave.
Bend, OREGON 97701
Phone (541) 382-3053
FAX (541) 383-3287
Email: tid@tumalo.org
Web Page: www.tumalo.org

December 15, 2006

Dr. Dennis Griffin, Senior Archaeologist
Oregon State Historic Preservation Office
725 Summer Street NE, Suite C
Salem, OR 97301

Subject: Tumalo Irrigation District Tumalo Feed Canal: Phase I Field Survey and Section 106 Evaluation, Deschutes County, Oregon

Dear Mr. Griffin:

Enclosed is a Phase I field survey and Section 106 evaluation report (Stuemke 2006) documenting the cultural resource inventory along the Tumalo Feed Canal and right-of-way in Deschutes County, Oregon. Mr. Stuemke has made a determination of no historic properties to be affected by the proposed undertaking.

The historic component of the Tumalo Feed Canal itself has already been addressed in a Section 106 Level of Effect form submitted to Sarah Jalving, with concurrence from SHPO on September 1, 2006. The Historic American Engineering Record (HAER) Number OR-151 and its distribution to the Oregon SHPO, National Park Service, Bureau of Reclamation, Deschutes County Historical society, and the Bend Public Library serve as mitigation for the adverse effect to the historic component of the Tumalo Feed Canal itself (Memorandum of Agreement between TID and SHPO for the Piping of the Tumalo Feed Canal and Highline-Couch Lateral, October 30, 2006).

The TID has approximately 75 miles of canal; seven miles of the system are currently piped. This proposed project would pipe approximately six miles of open canal.

The Section 106 documentation for the Tumalo Feed Canal and its associated right-of-way is being provided in the event that federal funding is acquired for the proposed project. Federal funding for the project is uncertain at this time, but we request your concurrence with Mr. Stuemke's findings.

If you have any questions you can contact Jenny Severson at David Evans and Associates, Inc. who is helping facilitate this process. She can be reached via email at jsse@deainc.com. Her phone number is (541) 389-7614.

Cordially,

Elmer G. McDaniels
Manager
Tumalo Irrigation District

Enclosure: Scott E. Stuemke, Report No. SES 2006-004, Tumalo Irrigation District Tumalo Feed Canal: Phase I Field Survey and Section 106 Evaluation, Deschutes County, Oregon.

Oregon
Theodore R. Kulongoski, Governor

Parks and Recreation Department
State Historic Preservation Office
725 Summer St. NE, Suite C
Salem, OR 97301-1266
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www.hcd.state.or.us

2/28/2007

Mr. Elmer McDaniels
Tumalo Irrigation District
64697 Cook Ave
Bend, OR 97701

RE: SHPO Case No. 06-2972
Tumalo Irrigation Dist Feed Canal Pahse I
17S 11E 3, 4, 10, 11, 13, 14, 24, Bend, Deschutes County

Dear Mr. McDaniels:

Our office recently received the archaeological report about the project referenced above. I have reviewed the report and agree that the project will have no effect on any known archaeological resources. No further archaeological research is needed with this project.

I understand that the historic component of the Tumalo Feed Canal has been addressed with documentation and mitigative measures have been agreed upon in a Memorandum of Agreement created in conjunction with Sarah Jalving, OSHPO Above-Ground Resources Specialist.

It should be noted that the archaeological report does not include a "Background Research" section that includes a summary of the previous archaeological sites and surveys in the vicinity of your project area. I have contacted the report's author, Scott Stuemke, to rectify the omission.

If you have any questions regarding any future discovery or my letter, feel free to contact our office at your convenience.

Susan Lynn White

Susan Lynn White, RPA
Assistant State Archaeologist
503- 986-0675
Susan.White@state.or.us

63400 0807

From: Dennis Griffin [Dennis.Griffin@state.or.us]
Sent: Monday, August 13, 2007 12:00 PM
To: Jenny Severson
Subject: Re: FW: Piping of Tumalo Feed Canal - additional archy survey?

Jenny,

In discussing with you the scope of the proposed borrowing activities you have stated that all of the material is to be taken from the bottom of the existing reservoir during periods of low water; hence you are removing sediments that have collected during the period of water being in the reservoir. If this is the correct scenario, I see no reason for a cultural survey being conducted since the area has already been impacted and anything that you would find has been placed there due to sediments settling during the operation of the reservoir.

However, if the proposed project includes any enlargement of the existing reservoir, including expansion due to sloping of the current shoreline or removal of material along the edge of the reservoir, this would entail that previous undisturbed soils would be impacted by the proposed project. As such, this area should be surveyed as part of the project.

Let me know if any further clarification is needed.

\ Dennis /

Dennis Griffin, Ph.D., RPA
SHPO State Archaeologist
(503) 986-0674
(503) 986-0793, fax
dennis.griffin@state.or.us

APPENDIX D: FINAL ORDER APPROVING ALLOCATION OF CONSERVED WATER

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BEFORE THE WATER RESOURCES DEPARTMENT
OF THE
STATE OF OREGON

In the Matter of the Proposed Allocation of Conserved Water by Tumalo Irrigation District, for certificates 74146 and 74148, Deschutes County, Oregon	))))	FINAL ORDER APPROVING ALLOCATION OF CONSERVED WATER

ORS 537.455 to 537.500 as amended by 2003 HB 2456, and OAR Chapter 690, Division 018, authorize and establish the process and criteria for allocations of conserved water.

Findings of Fact

1. On May 20, 2005, Tumalo Irrigation District (TID) filed an application for an allocation of conserved water. The Department assigned the application number C-37.

2. The application requests an allocation of conserved water under certificates 74146 and 74148 in the name of TID. However, TID indicated a willingness to have the allocation of conserved water apply to other TID rights.

3. The Oregon Water Resources Department consulted with the Oregon Department of Fish and Wildlife (ODFW), Department of Environmental Quality, Oregon State Parks and Recreation Department, and TID to determine how the conserved water could best meet instream needs. Based on this consultation, the State of Oregon determined that the allocation of conserved water would be most beneficial if applied to the water rights TID proposed, certificates 74146 and 74148.

4. The rights involved in the allocation of conserved water are generally described below, and, reflect a previously approved allocation of conserved water, C-9, as evidenced by Special Order Volume 64, Page 157. However, these rights of record may be further modified by any cancellations, transfers, and other allocation of conserved water projects, completed pursuant to ORS 537 and ORS 540.

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

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Certificate 74146

Source: Tumalo Creek

Priority Date	Acres (equivalent)	Maximum Rate (cfs)	Maximum Duty (AF)
August 5, 1900	407.60	5.823	733.68
September, 1900	3,265.85	40.835	5,878.63
April 28, 1905	301.60	4.309	542.88
May 27, 1907	43.20	0.603	77.76
June 1, 1907	992.65	14.181	1,786.77
Total	***5,010.90***	***65.751***	***9,019.62***

Total Duty: 1.8 AF/ac, being 9,019.62 AF measured at or within one-half mile of the place of use

On-Farm Rate: 1/70 cfs per acre

Type of Use: Irrigation, pond maintenance, industrial, domestic including livestock

Total Acres-Equivalent: 5,010.9

Points of Diversion:

Twp	Rng	Mer	Sec	Q-Q	Survey Coordinates
17 S	11 E	WM	23	SW NE	NORTH 70 DEGREES 21 MINUTES WEST, 1550 FEET FROM E1/4 CORNER, SECTION 23
18 S	10 E	WM	2	NW SW	NORTH 14 DEGREES 2 MINUTES EAST 1713 FEET FROM S1/4 CORNER, SECTION 2

Certificate 74148

Source: Crescent Lake Reservoir

Priority: April 7, 1911

Duty: 35,000 AF

Type of Use: Supplemental irrigation, pond maintenance, industrial use

Total Acres-Equivalent: 6,590.6

Point of Diversion:

Twp	Rng	Mer	Sec	Q-Q
24 S	6 E	WM	11	SE SW and SW SE

5. The conservation project involves piping the un-piped portion of the Tumalo Feed Canal above the junction with the Bend Feed Canal, and piping the two joined canals from the junction to Upper Tumalo Reservoir, a distance of approximately 6 miles. The replacement of open, unlined ditches with pipelines is a proven technology for conserving water.

6. The water conserved by this pipelining project is seepage losses from the ditches operated by TID. To the extent that the seepage losses eliminated by pipelines are in excess of the quantities of conserved water to be allocated, the project also will provide for more reliable delivery of water for the beneficial purposes under the water right.

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7. Public notice was published as required under OAR 690-018-0050. No comments were received.

8. The application includes land use information forms completed and signed by Deschutes County demonstrating that the required land use approvals have been obtained by the applicant.

9. Pursuant to OAR 690-018-0012(1), the applicant's propose that 100 percent of the conserved water be allocated to the State for an instream water right.

10. Pursuant ORS 537.485, the applicant's request that the priority dates of the conserved water be the same as the originating rights.

11. The applicant has proposed to conserve 11.8 cubic feet per second (cfs) from Tumalo Creek under certificate 74146, with the rate proportionately distributed between all priority dates, and 2,732 acre-feet (AF) as measured at Crescent Creek Gauging Station No. 14060000, from Crescent Lake Reservoir under certificate 74148, with a priority date of April 7, 1911. After the allocation of conserved water, the water right held by the district and the State's instream water right will allow use of the following quantities of water:

Certificate	Priority Date	Before Project District Maximum Rate/Duty	After Project District Maximum Rate/Duty	Conserved Water Rate/Duty	Instream Water Right Rate/Duty
74146*	Aug. 5, 1900	5.823 cfs	4.778 cfs	1.045 cfs	1.045 cfs
	Sept. 1900	40.835 cfs	33.506 cfs	7.329 cfs	7.329 cfs
	April 28, 1905	4.309 cfs	3.536 cfs	0.773 cfs	0.773 cfs
	May 27, 1907	0.603 cfs	0.495 cfs	0.108 cfs	0.108 cfs
	June 1, 1907	14.181 cfs	11.636 cfs	2.545 cfs	2.545 cfs
	Subtotal	***65.751 cfs***	***53.951 cfs***	***11.8 cfs***	***11.8 cfs***
74148	April 7, 1911	35,000 AF	32,268 AF	2,732 AF	2,732 AF

* Certificate 74146 has a maximum rate at the point of diversion, but no duty associated with the point of diversion. The duty of 1.8 AF/ac is measured at or within one-half mile of the lands to be irrigated. Since this piping project is not affecting the amount of water to be delivered within ½ mile of the place of use, only the rate at the point of diversion is involved in this allocation of conserved water.

12. Project construction is proposed to begin in October 2006, and is scheduled for completion between April 2007 and April 2010.

13. The applicant has proposed to create two instream reaches. One from the point of diversion on Tumalo Creek to Lake Billy Chinook and the other from Crescent Lake Reservoir to Lake Billy Chinook.

14. TID is located in an area that is underlain by highly permeable, fractured basalts. The canal seepage that is conserved by the project likely would have entered the regional ground water system that discharges near or into Lake Billy Chinook. The ground water flows in the area are generally parallel to Tumalo Creek. As a result, the canal seepage did not return to Tumalo Creek and did not become available to other water users in Tumalo Creek.

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Channel loss is known to occur in the Little Deschutes River and in some segments of the Deschutes River. From Crescent Creek Gauging Station No. 14060000 to Benham Falls Gauging Station No. 14064500 on the Deschutes River there is an 18 percent channel loss. From Benham Falls to the City of Bend on the Deschutes River there is a 7 percent channel loss.

15. Instream water rights have been established in Tumalo Creek, Crescent Creek, the Little Deschutes River and the Deschutes River. However, these rights are frequently not met.

16. For many years an informal agreement has allowed for the release of approximately 5.0 cfs from Crescent Lake Reservoir, as measured at Crescent Creek Gauging Station Number 14060000. As part of this conserved water application, TID has requested that this gentleman's agreement be formalized.

17. The ODFW, Department of Environmental Quality, and Oregon Parks and Recreation Department were consulted and indicated that additional streamflows are needed in Tumalo Creek, Crescent Creek, the Little Deschutes River and the Deschutes River to provide for the conservation, maintenance and enhancement of aquatic and fish life and fish habitat.

18. Pursuant to OAR 690-018-0025, the applicant has an adopted allocation of conserved water policy, which was approved on March 8, 2005.

Ultimate Findings of Fact

Pursuant to OAR 690-018-0050, in reviewing the application for allocation of conserved water the Department has determined the following:

A. The proposed allocation of conserved water will result in a reduced diversion for the uses allowed under the original rights of 11.8 cfs for certificate 74146 and 2,732 AF for certificate 74148 as established in Finding of Fact 11. Additionally, a flow of 5.0 cfs shall be required at Crescent Creek Gauging Station Number 14060000. Any flow restoration activities, including, but not limited to, instream transfers, allocations of conserved water, and instream leases, shall be additive to the 5.0 cfs flow release.

B. The proposed allocation will not harm other water rights as long as the channel loss factors are applied as described in Finding of Fact 14.

C. The application is compatible with the local comprehensive land use plan as established in Finding of Fact 8.

D. Since no harm will occur to other water rights, no reduction in the quantity of conserved water to be allocated is required to mitigate for effects on other water rights.

E. Consistent with Finding of Fact 4 and 11, the maximum on-farm rate and duty associated with certificate 74146 remains unchanged at 1/70 cfs/ac and 1.8 AF/ac. The maximum rate at the point of diversion shall be:

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Certificate	Priority Date	After Project District Maximum Rate (cfs)
74146	August 5, 1900	4.778
	September, 1900	33.506
	April 28, 1905	3.536
	May 27, 1907	0.495
	June 1, 1907	11.636
	Total	***53.951***

For certificate 74148 the maximum total diversion shall not exceed 32,268 AF for water used for supplemental irrigation, pond maintenance, and industrial use.

F. The State's portion of the conserved water is needed to improve aquatic resources and their habitat in Tumalo Creek, Crescent Creek, the Little Deschutes River and the Deschutes River.

G. The applicant is requesting that 100 percent of the conserved water be allocated to an instream water right to be held in trust by the Water Resources Department for the people of Oregon and that the priority dates of the conserved water rights are the same as the originating rights.

H. The State's portion of the conserved water shall be allocated to instream water rights for conservation, maintenance and enhancement of aquatic and fish life, wildlife, fish and wildlife habitat and other ecological values. The instream water rights that are being created shall provide for the protection of flows:

- From the authorized point of diversion for TID in Tumalo Creek at

Twp	Rng	Mer	Sec	Q-Q	Survey Coordinates
17 S	11 E	WM	23	SW NE	NORTH 70 DEGREES 21 MINUTES WEST, 1550 FEET FROM E1/4 CORNER, SECTION 23

to the mouth of Tumalo Creek and then into the Deschutes River from the mouth of Tumalo Creek to Lake Billy Chinook, and

- From the authorized point of diversion for TID in Crescent Lake Reservoir at

Twp	Rng	Mer	Sec	Q-Q
24 S	6 E	WM	11	SE SW & SW SE

to the mouth of Crescent Creek and then into the Little Deschutes River from the mouth of Crescent Creek to the mouth of the Little Deschutes River and then into the Deschutes River to Lake Billy Chinook.

The right originating in Tumalo Creek shall be for a total of 11.8 cfs, with the following priority dates and rates:

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Priority Date	Rate (cfs)
August 5, 1900	1.045
September, 1900	7.329
April 28, 1905	0.773
May 27, 1907	0.108
June 1, 1907	2.545

and shall allow the use and protection of flows from April 15 through October 15.

The right originating in Crescent Creek shall be limited to a maximum of 2,732 AF, with an April 7, 1911 priority date, as measured at the Crescent Creek at Gauging Station No. 14060000. To account for channel losses, an 18 percent loss factor shall be used between the Crescent Creek Gauging Station and the Benham Falls Gauging Station No. 14064500 on the Deschutes River. A 7 percent loss factor shall be used on the Deschutes River between Benham Falls and the City of Bend. The right shall allow the use and protection of flows from January 1 through December 31, and shall be in addition to the 5.0 cfs flow required year-around at Crescent Creek Gauging Station.

I. The applicant has not requested additional time to finalize the project after the project has been completed.

J. No other conditions or limitations are needed to prevent or mitigate for harm to existing water rights.

Conclusion of Law

The project described in the application C-37 for allocation of conserved water is consistent with the criteria in ORS 537.455 to 537.500, as amended by 2003 HB 2456, and OAR Chapter 690, Division 018. Water will be conserved that can be allocated without harming other water rights.

Now, therefore, it is ORDERED:

1. The applicant has until October 31, 2015, to file a notice of completion of the conservation measures, unless the Director grants an extension of time.

2. When the applicant files the notice of completion, the project will be finalized, unless the applicant requests additional time to finalize the project and the Director grants an extension of time for the purposes of finalization.

On submittal of notice of completion of the conservation project described in the application for allocation of conserved water, the Department shall:

3. Cancel certificate 74146. A new superseding certificate shall be issued to TID for irrigating approximately 5,010.90 acres, pond maintenance, industrial use, and domestic use including livestock. The acreage, rate, duty, and priority dates are subject to modification by any previously approved transfers, cancellations, corrections, allocation of conserved water, or

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other prior modification to Certificate 74146. The associated priority date and rate shall be approximately:

Priority Date	Acres (equivalent)	Maximum Rate (cfs)
August 5, 1900	407.60	4.778
September, 1900	3,265.85	33.506
April 28, 1905	301.60	3.536
May 27, 1907	43.20	0.495
June 1, 1907	992.65	11.636
Total	***5,010.90***	***53.951***

The maximum per acre rate associated with these rights is 1/70 cfs/ac. The duty remains at 1.8 AF/ac, measured at within one-half mile of the land to be irrigated. The place of use shall be those lands described under certificate 74146, as modified by any transfers completed pursuant to ORS 540.580 or other prior modifications. All other conditions and limitations of the existing water right shall be included in the superseding certificate.

4. Cancel certificate 74148. A new superseding certificate shall be issued to TID for the use of up to 32,268 AF of stored water. The use of the water shall be limited to total diversion of not to exceed 32,268 AF during any one irrigation season. Additionally, the water along with that described in #4 below shall be shared as follows: 3.175 % of Crescent Lake Reservoir's contents as of April 1 to the State for instream flow purposes, and 96.825 % to TID. Each party will share the storable inflow, from April 1 until maximum storage is reached, in this same proportion. Each party's usage of stored water during the year between April 1 and March 31 will be deducted from their respective accounts. On April 1 the contents of the reservoir shall again be divided between the parties as described above.

   The acreage, rate, duty, and priority dates are subject to modification by any transfers, cancellations, corrections, allocation of conserved water, or other prior modification to Certificate 74148. The place of use shall be those lands described under certificate 74148, as modified by any transfers completed pursuant to ORS 540.580 or other prior modifications. All other conditions and limitations of the existing water right shall be included in the superseding certificate.

5. Issue a new instream certificate for conservation, maintenance and enhancement of aquatic and fish life, wildlife, fish and wildlife habitat and other ecological values in Tumalo Creek from the authorized point of diversion for TID at the Tumalo Feed Canal:

Twp	Rng	Mer	Sec	Q-Q	Survey Coordinates
17 S	11 E	WM	23	SW NE	NORTH 70 DEGREES 21 MINUTES WEST, 1550 FEET FROM E1/4 CORNER, SECTION 23

   to the mouth of Tumalo Creek and then into the Deschutes River from the mouth of Tumalo Creek to Lake Billy Chinook at River Mile 120. The instream water right shall allow the use of the water to provide fish screen bypass and cleaning flows at the Tumalo Feed Canal diversion provided such use does not interfere with use of instream flow to operate fish passage facilities at the same site.

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The instream water right shall be for a total of 11.8 cfs, with the following priority dates and rates

Priority Date	Rate (cfs)
August 5, 1900	1.045
September, 1900	7.329
April 28, 1905	0.773
May 27, 1907	0.108
June 1, 1907	2.545

and shall replace a portion of instream water rights established pursuant to ORS 537.341 or 537.346 and shall be in addition to any instream water rights established pursuant to ORS 537.348 or 537.470, unless otherwise specified by a subsequent order establishing a new instream water right. The rights shall allow for the use and protection of flows from April 15 to October 15.

6. Issue a new instream certificate for conservation, maintenance and enhancement of aquatic and fish life, wildlife, fish and wildlife habitat and other ecological values in Crescent Creek from the authorized point of diversion for TID at the Crescent Lake Reservoir:

Twp	Rng	Mer	Sec	Q-Q
24 S	6 E	WM	11	SE SW & SW SE

to the mouth of Crescent Creek and then into the Little Deschutes River from the mouth of Crescent Creek to the mouth of the Little Deschutes River and then into the Deschutes River to Lake Billy Chinook at River Mile 120.

The instream water right shall be for a maximum of 2,732 AF, to be drawn from the State's share of Crescent Lake Reservoir, with an April 7, 1911 priority date, and shall replace a portion of instream water rights established pursuant to ORS 537.341 or 537.346 and shall be in addition to any instream water rights established pursuant to ORS 537.348 or 537.470, unless otherwise specified by a subsequent order establishing a new instream water right. The right shall be limited to an annual maximum of 2,732 AF. No fee, annual or otherwise, will be assessed by TID or other parties to the State of Oregon for the 2,732 AF of stored water.

To account for channel losses, an 18 percent loss factor shall be applied between the mouth of Crescent Creek on the Little Deschutes River to Benham Falls on the Deschutes River. A 7 percent loss factor shall be applied on the Deschutes River between Benham Falls and the City of Bend. For example, if 9.18 cfs was protectable under this right at Crescent Creek Gauging Station No. 14060000, then the 7.53 cfs would be protectable at Benham Falls and 7.00 cfs would be protectable at Bend.

The State of Oregon may call for water to be released from storage during any month of the year, but the State is limited to a maximum of two changes in the amount of water being released in any month, unless the Water Resource Director and TID concur that additional changes may be made.

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7. An operational flow release of not less than 5.0 cfs shall be required year-around at Crescent Creek Gauging Station Number 14060000. The instream water right described in #4 above shall be additive to the 5.0 cfs flow. However, the 5.0 cfs flow shall not be additive to TID irrigation releases. Any additional flow restoration activities, including but not limited to, instream transfers, allocations of conserved water, and instream leases, shall also be additive to the 5.0 cfs flow requirement, unless otherwise specified by a subsequent order. Water users above Crescent Lake Reservoir shall not be regulated to satisfy the 5.0 cfs requirement.

Dated at Salem, Oregon this 9th day of December 2005.

For Phillip C. Ward
Director

Date of Mailing: DEC 14 2005

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BEFORE THE WATER RESOURCES DEPARTMENT
OF THE
STATE OF OREGON

In the Matter of the Proposed Allocation of Conserved Water by Tumalo Irrigation District, for certificates 74146 and 74148, Deschutes County, Oregon	) FINAL ORDER APPROVING) ALLOCATION OF CONSERVED) WATER)

ORS 537.455 to 537.500 as amended by 2003 H13 2456, and OAR Chapter 690, Division 018, authorize and establish the process and criteria for allocations of conserved water.
Findings of Fact
1. On May 20, 2005, Tumalo Irrigation District (TID) filed an application for an allocation of conserved water. The Department assigned the application number C-37.

2. The application requests an allocation of conserved water under certificates 74146 and 74148 in the name of TID. However, TID indicated a willingness to have the allocation of conserved water apply to other TID rights.

3. The Oregon Water Resources Department consulted with the Oregon Department of Fish and Wildlife (ODFW), Department of Environmental Quality, Oregon State Parks and Recreation Department, and TID to determine how the conserved water could best meet instream needs. Based on this consultation, the State of Oregon determined that the allocation of conserved water would be most beneficial if applied to the water rights TID proposed, certificates 74146 and 74148.

4. The rights involved in the allocation of conserved water are generally described below, and, reflect a previously approved allocation of conserved water, C-9, as evidenced by Special Order Volume 64, Page 157. However, these rights of record may be further modified by any cancellations, transfers, and other allocation of conserved water projects, completed pursuant to ORS 537 and ORS 540.

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

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Certificate 74146
Source: Tumalo Creek
Priority Date, Acres(equivalent), Maximum Rate (cfs), Maximum Duty (AF)
August 5, 1900; 407.60; 5.823; 733.68
September, 1900; 3,265.85; 40.835; 5,878.63
April 28, 1905; 301.60; 4.309; 542.88
May 27, 1907; 43.20; 0.603; 77.76
June 1, 1907; 992.65; 14.181; 1,786.77
Total; 5,010.90; 65.751; 9,019.62

Total Duty: 1.8 AF/ac, being 9,019.62 AF measured at or
within one-half mile of the place of use
On Farm Rate: 1/70 cfs per acre
Type of Use: Irrigation, pond maintenance, industrial, domestic
including livestock
Total Acres-Equivalent: 5,010.9
Points of Diversion:
Twp, Rng, Mer, Sec Q-Q Survey Coordinates
17S, 11E, WM, 23, SW NE, NORTH 70 DEGREES 21 MINUTES WEST, 1550 FEET
FROM E1/4 CORNER, SECTION 23
18S, 10 E, WM, 2, NW SW, NORTH 14 DEGREES 2 MINUTES EAST 1713 FEET
FROM SI/4 CORNER, SECTION 2

Certificate 74148
Source: Crescent Lake Reservoir
Priority: April 7, 1911
Duty: 35,000AF
Type of Use: Supplemental irrigation, pond maintenance, industrial use
Total Acres-Equivalent: 6,590.6
Point of Diversion:
24S, 6E, WM, 11, SE SW and SW SE

5. The conservation project involves piping the un-piped portion of the Tumalo Feed Canal above the junction with the Bend Feed Canal, and piping the two joined canals from the junction to Upper Tumalo Reservoir, a distance of approximately 6 miles. The replacement of open, unlined ditches with pipelines is a proven technology for conserving water.

6. The water conserved by this pipelining project is seepage losses from the ditches operated by TID. To the extent that the seepage losses eliminated by pipelines are in excess of the quantities of conserved water to be allocated, the project also will provide for more reliable delivery of water for the beneficial purposes under the water right.

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7. Public notice was published as required under OAR 690-018-0050. No comments were received.
8. The application includes land use information fonns completed and signed by Deschutes County demonstrating that the required land use approvals have been obtained by the applicant.
9. Pursuant to OAR 690-018-0012(1), the applicant's propose that 100 percent of the conserved water be allocated to the State for an instream water right.
10. Pursuant ORS 537.485, the applicant's request that the priority dates of the conserved water be the same as the originating rights.
11. The applicant has proposed to conserve 11.8 cubic feet per second (cfs) from Tumalo Creek under certificate 74146, with the rate proportionately distributed between all priority dates, and 2732 acre-feet (AF) as measured at Crescent Creek Gauging Station No. 14060000, from Crescent Lake Reservoir under certificate 74148, with a priority date of April 7, 1911. After the allocation of conserved water, the water right held by the district and the State's instream water right will allow use of the following quantities of water:
Certificate, Priority Date, Before Project District Maximum Rate/Duty, After Project District Maximum Rate/Duty, Conserved Water Rate/Duty, Instream Water Right
Rate/Duty
Certificate 74146*
Aug.5, 1900, 5.823cfs, 4.778cfs, 1.045cfs, 1.04Scfs
Sept. 1900, 40.835 cfs, 33.506 cfs, 7.329 cfs, 7.329 cfs
April 28, 1905, 4.309 cfs, 3.536 cfs, 0.773 cfs, 0.773 cfs
May 27, 1907, 0.603 cfs, 0.495 cfs, 0.l08cfs, 0.l08cfs
June 1, 1907, 14.l8lcfs, l1.636cfs, 2.S4Scfs, 2.545cfs
Subtotal, 65.751 cfs, 53.951 cfs, 11.8 cfs, 11.8 cfs, 74 148
Certificate 74148
April 7, 1911, 35,000 AF, 32,268 AF, 2,732 AF, 2,732 AF
* Certificate 74146 has a maximum rate at the point of diversion, but no duty associated with the point of diversion. The duty of 1.8 AF/ac is measured at or within one-half mile of the lands to be irrigated. Since this piping project is not affecting the amount of water to be delivered within V2 mile of the place of use, only the rate at the point of diversion is involved in this allocation of conserved water.
12. Project construction is proposed to begin in October 2006, and is scheduled for completion between April 2007 and April 2010.
13. The applicant has proposed to create two instream reaches. One from the point of diversion on Tumalo Creek to Lake Billy Chinook and the other from Crescent Lake Reservoir to Lake Billy Chinook.
14. TID is located in an area that is underlain by highly permeable, fractured basalts. The canal seepage that is conserved by the project likely would have entered the regional ground water system that discharges near or into Lake Billy Chinook. The ground water flows in the area are generally parallel to Tumalo Creek. As a result, the canal seepage did not return to Tumalo Creek and did not become available to other water users in Tumalo Creek.

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Channel loss is known to occur in the Little Deschutes River and in some segments of the Deschutes River. From Crescent Creek Gauging Station No. 14060000 to Benham Falls Gauging Station No. 14064500 on the Deschutes River there is an 18 percent channel loss. From Benham Falls to the City of Bend on the Deschutes River there is a 7 percent channel loss.

15. Instream water rights have been established in Tumalo Creek, Crescent Creek, the Little Deschutes River and the Deschutes River. However, these rights are frequently not met.

16. For many years an informal agreement has allowed for the release of approximately 5.0 cfs from Crescent Lake Reservoir, as measured at Crescent Creek Gauging Station Number 14060000. As part of this conserved water application, TID has requested that this gentleman's agreement be formalized.

17. The ODFW, Department of Environmental Quality, and Oregon Parks and Recreation Department were consulted and indicated that additional streamflows are needed in Tumalo Creek, Crescent Creek, the Little Deschutes River and the Deschutes River to provide for the conservation, maintenance and enhancement of aquatic and fish life and fish habitat.

18. Pursuant to OAR 690-018-0025, the applicant has an adopted allocation of conserved water policy, which was approved on March 8, 2005.

Ultimate Findings of Fact
Pursuant to OAR 690-018-0050, in reviewing the application for allocation of conserved water the Department has determined the following:

A. The proposed allocation of conserved water will result in a reduced diversion for the uses allowed under the original rights of 11.8 cfs for certificate 74146 and 2,732 AF for certificate 74148 as established in Finding of Fact 11. Additionally, a flow of 5.0 cfs shall be required at Crescent Creek Gauging Station Number 14060000. Any flow restoration activities, including, but not limited to, instream transfers, allocations of conserved water, and instream leases, shall be additive to the 5.0 cfs flow release.
B. The proposed allocation will not harm other water rights as long as the channel loss factors are applied as described in Finding of Fact 14.
C. The application is compatible with the local comprehensive land use plan as established in Finding of Fact 8.
D. Since no harm will occur to other water rights, no reduction in the quantity of conserved water to be allocated is required to mitigate for effects on other water rights.
E. Consistent with Finding of Fact 4 and 11, the maximum on-farm rate and duty associated with certificate 74146 remains unchanged at 1/70 efs/ac and 1.8 AF/ac. The maximum rate at the point of diversion shall be:

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Certificate, Priority Date, After Project District Maximum Rate (cfs)
74146, August 5, 1900, 4.778
September, 1900, 33.506
April 28, 1905, 3.536
May 27, 1907, 0.495
June 1,1907, 11.636
Total, 53.951
For certificate 74148 the maximum total diversion shall not exceed 32,268 AF for water used for supplemental irrigation, pond maintenance, and industrial use.

F. The State's portion of the conserved water is needed to improve aquatic resources and their habitat in Tumalo Creek, Crescent Creek, the Little Deschutes River and the Deschutes River.
G. The applicant is requesting that 100 percent of the conserved water be allocated to an instream water right to be held in trust by the Water Resources Department for the people of Oregon and that the priority dates of the conserved water rights are the same as the originating rights.
H. The State's portion of the conserved water shall be allocated to instream water rights for conservation, maintenance and enhancement of aquatic and fish life, wildlife, fish and wildlife habitat and other ecological values. The instream water rights that are being created shall provide for the protection of flows:

• From the authorized point of diversion for TID in Tumalo Creek at
Twp, Rng, Mer Sec Q-Q Survey Coordinates
117 S 11 E WM 23 SW NE NORTH 70 DEGREES 21 MINUTES WEST, 1550 FEET FROM E114 CORNER, SECTION 23
to the mouth of Tumalo Creek and then into the Deschutes River from the mouth of Tumalo Creek to Lake Billy Chinook, and

• From the authorized point of diversion for TJD in Crescent Lake Reservoir at
Twp, Rng, Mer Sec Q-Q,
24S 6E WM 11 SE SW&SW SE
to the mouth of Crescent Creek and then into the Little Deschutes River from the mouth of Crescent Creek to the mouth of the Little Deschutes River and then into the Deschutes River to Lake Billy Chinook.

The right originating in Tumalo Creek shall be for a total of 11.8 cfs, with the following priority dates and rates:

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Priority Date, Rate (cfs)
August 5, 1900, 1.045
September, 1900, 7.329
April 28, 1905, 0.773
May 27, 1907, 0.108
June 1, 1907, 2.545
and shall allow the use and protection of flows from April 15 through October 15.

The right originating in Crescent Creek shall be limited to a maximum of 2,732 AF, with an April 7, 1911 priority date, as measured at the Crescent Creek at Gauging Station No. 14060000. To account for channel losses, an 18 percent loss factor shall be used between the Crescent Creek Gauging Station and the Benham Falls Gauging Station No. 14064500 on the Deschutes River. A 7 percent loss factor shall be used on the Deschutes River between Benham Falls and the City of Bend. The right shall allow the use and protection of flows from January 1 through December 31, and shall be in addition to the 5.0 cfs flow required year-around at Crescent Creek Gauging Station.

I. The applicant has not requested additional time to finalize the project after the project has been completed.

J. No other conditions or limitations are needed to prevent or mitigate for harm to existing water rights.

Conclusion of Law
The project described in the application C-37 for allocation of conserved water is consistent with the criteria in ORS 537.455 to 537.500, as amended by 2003 RB 2456, and OAR Chapter 690, Division 018. Water will be conserved that can be allocated without harming other water rights.

Now, therefore, it is ORDERED:
1. The applicant has until October 31, 2015, to file a notice of completion of the conservation measures, unless the Director grants an extension of time.
2. When the applicant files the notice of completion, the project will be finalized, unless the applicant requests additional time to finalize the project and the Director grants an extension of time for the purposes of finalization.
On submittal of notice of completion of the conservation project described in the application for allocation of conserved water, the Department shall:
3. Cancel certificate 74146. A new superseding certificate shall be issued to TID for irrigating approximately 5,010.90 acres, pond maintenance, industrial use, and domestic use including livestock. The acreage, rate, duty, and priority dates are subject to modification by any previously approved transfers, cancellations, corrections, allocation of conserved water, or

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other prior modification to Certificate 74146. The associated priority date and rate shall be approximately:
Priority Date, Acres (equivalent), Maximum Rate (cfs)
August 5, 1900, 407.60, 4.778
September, 1900, 3,265.85, 33.506
April28, 1905, 301.60, 3.536
May 27, 1907, 43.20, 0.495
June 1, 1907, 992.65, 11.636
Total, 5,010.90, 53.951
The maximum per acre rate associated with these rights is 1/70 cfs/ac. The duty remains at 1.8 AF/ac, measured at within one-half mile of the land to be irrigated. The place of use shall be those lands described under certificate 74146, as modified by any transfers completed pursuant to ORS 540.5 80 or other prior modifications. All other conditions and limitations of the existing water right shall be included in the superseding certificate.
4. Cancel certificate 74148. A new superseding certificate shall be issued to TID for the use of up to 32,268 AF of stored water. The use of the water shall be limited to total diversion of not to exceed 32,268 AF during any one irrigation season. Additionally, the water along with that described in #4 below shall be shared as follows: 3.175 % of Crescent Lake Reservoir's contents as of April 1 to the State for instream flow purposes, and 96.825 % to TID. Each party will share the storable inflow, from April 1 until maximum storage is reached, in this same proportion. Each party's usage of stored water during the year between April 1 and March 31 will be deducted from their respective accounts. On April 1 the contents of the reservoir shall again be divided between the parties as described above
The acreage, rate, duty, and priority dates are subject to modification by any transfers, cancellations, corrections, allocation of conserved water, or other prior modification to Certificate 74148. The place of use shall be those lands described under certificate 74148, as modified by any transfers completed pursuant to ORS 540.580 or other prior modifications. All other conditions and limitations of the existing water right shall be
included in the superseding certificate.
5. Issue a new instream certificate for conservation, maintenance and enhancement of aquatic and fish life, wildlife, fish and wildlife habitat and other ecological values in Tumalo Creek from the authorized diversion for TID at the Tumalo Feed Canal:
17S, 11E, WM, 23, SW NE, NORTH 70 DEGREES 21 MINUTES WEST, 1550 FEET FROM E1/4 CORNER, SECTION 23
to the mouth of Tumalo Creek and then into the Deschutes River from the mouth of Tumalo Creek to Lake Billy Chinook at River Mile 120. The instream water right shall allow the use of the water to provide fish screen bypass and cleaning flows at the Tumalo Feed Canal diversion provided such use does not interfere with use of instream flow to operate fish passage facilities at the same site.

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The instream water right shall be for a total of 11.8 cfs, with the following priority dates and rates
Priority Date, Rate (cfs)
August 5, 1900, 1.045
September, 1900, 7.329
April 28, 1905, 0.773
May27, 1907, 0.108
June 1, 1907, 2.545
and shall replace a portion of instream water rights established pursuant to ORS 537.341 or 537.346 and shall be in addition to any instream water rights established pursuant to ORS 537.348 or 537.470, unless otherwise specified by a subsequent order establishing a new instream water right. The rights shall allow for the use and protection of flows from April 15 to October 15.

6. Issue a new instream certificate for conservation, maintenance and enhancement of aquatic and fish life, wildlife, fish and wildlife habitat and other ecological values in Crescent Creek from the authorized point of diversion for TID at the Crescent Lake Reservoir:
Twp Rng Mer Sec Q-Q
24S 6E WM 11 SE SW & SW SE
to the mouth of Crescent Creek and then into the Little Desehutes River from the mouth of Crescent Creek to the mouth of the Little Deschutes River and then into the Deschutes River to Lake Billy Chinook at River Mile 120.

The instream water right shall be for a maximum of 2,732 AF, to be drawn from the State's share of Crescent Lake Reservoir, with an April 7, 1911 priority date, and shall replace a portion of instream water rights established pursuant to ORS 537.341 or 537.346 and shall be in addition to any instream water rights established pursuant to ORS 537.348 or 537.470, unless otherwise specified by a subsequent order establishing a new instream water right. The right shall be limited to an annual maximum of 2,732 AF. No fee, annual or otherwise, will be assessed by TID or other parties to the State of Oregon for the 2,732 AF of stored water.

To account for channel losses, an 18 percent loss factor shall be applied between the mouth of Crescent Creek on the Little Deschutes River to Benham Falls on the Deschutes River. A 7 percent loss factor shall be applied on the Deschutes River between Benham Falls and the City of Bend. For example, if 9.18 cfs was protectable under this right at Crescent Creek Gauging Station No. 14060000, then the 7.53 cfs would be protectable at Benham Falls and 7.00 cfs would be protectable at Bend.

The State of Oregon may call for water to be released from storage during any month of the year, but the State is limited to a maximum of two changes in the amount of water being released in any month, unless the Water Resource Director and TID concur that additional changes may be made.

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7. An operational flow release of not less than 5.0 cfs shall be required year-around at Crescent Creek Gauging Station Number 14060000. The instream water right described in #4 above shall be additive to the 5.0 cfs flow. However, the 5.0 cfs flow shall not be additive to TID irrigation releases. Any additional flow restoration activities, including but not limited to, instream transfers, allocations of conserved water, and instream leases, shall also be additive to the 5.0 cfs flow requirement, unless otherwise specified by a subsequent order. Water users above Crescent Lake Reservoir shall not be regulated to satisfy the 5.0 cfs requirement.

Dated at Salem, Oregon this 9th day of December 2005.
Phi1lip C. Ward
Director
Date of Mailing: DEC 14 2005

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APPENDIX E: TUMALO FEED CANAL PROJECT COST ESTIMATE

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TUMALO FEED CANAL PIPING PROJECT PRELIMINARY COST ESTIMATE

Description	Breakdown	Unit	Quantity	Unit Price	Total
Mobilization, Bonds & Insurance	--	LS	5	$50,000	**$250,000**
Temporary Facilities & Controls	--	L.F.	32,617	$4	**$130,468**
Clearing and Grubbing	--	LS	1	$237,000	**$237,000**
Demolition	--	LS	5	$40,000	**$200,000**
BFC/TFC Connect	--	LS	1	$70,000	**$70,000**
Steel / Weholite Connection	--	LS	4	$30,000	**$120,000**
Pipe/Welding/Earthwork					**$14,091,300**
	Earthwork	L.F.	32,617	$130	$4,240,210
	48-Inch Weholite	L.F.	6,317	$210	$1,326,570
	90-Inch Weholite	L.F.	26,300	$300	$7,890,000
	Fittings (0-30 degree)	Each	58	$4,830	$280,140
	Fittings (31-61 degree)	Each	47	$7,540	$354,380
Turn Outs	--	Each	25	$10,000	**$250,000**
Division Structure	--	LS	1	$80,000	**$80,000**
Laterals	--	Each	5	$10,000	**$50,000**
Outlet Structure	--	LS	4	$70,000	**$280,000**
Restoration	--	L.F.	32,617	$10	**$326,170**
Landscape Manitenance (1)	--	L.F.	32,617	$2	**$65,234**
Landscape Manitenance (2)	--	L.F.	32,617	$2	**$65,234**
			Sub Total		$16,215,406
	Engineering, Construction Management, and Legal Fees			5%	$810,770
			Contingency	5%	$810,770
		Total Phase 5			**$17,836,947**

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APPENDIX F: MAILING LIST

- Draft EA Distribution List
- Distribution List for the Notice of Draft EA Availability: Land Owners & Water Users
- Distribution List for the Notice of Draft EA Availability: Potentially Interested Parties

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Draft EA Distribution List

Phil Ward
Oregon Water Resources Dept
725 Summer Street NE, Ste A
Salem, OR 97301

Honorable Ron Wyden
131 NW Hawthorne Ave, Ste 107
Bend, OR 97701

Jon Burgi
David Evans and Associates
320 Upper Terrace Dr, St 200
Bend, OR 97701

Jerry Cordova
US Fish & Wildlife Service
20310 Empire Ave, St A 100
Bend, OR 97701-5713

Chris Horting-Jones
Bureau of Reclamation
1375 SE Wilson Ave, Ste. 100
Bend, OR 97702

Brett Hodgson
OR Dept of Fish and Wildlife
61374 Parrell Road
Bend, OR 97702

Honorable Jeff Merkley
131 NW Hawthorne Ave, Ste 208
Bend, OR 977701

Dave Kaumheimer
Bureau of Reclamation
1917 Marsh Road
Yakima, WA 98907

Molly Brown
Bureau of Land Management
3050 NE Third
Prineville, OR 97754

Elmer McDaniels
Tumalo Irrigation District
64697 Cook Avenue
Bend, OR 97701

Carl William Hopp, Jr.
168 NW Greenwood Ave
Bend, OR 97701

Eric Nigg
OR Dept. of Environmental Quality
2146 NE Fourth St. #104

Robert Brunoe
Natural Resources
Confederated Tribes of Warm Springs
P.O. Box C
Warm Springs, OR 97761

Distribution List for Notice of Draft EA Availability:
Land Owners & Water Users

171104 A0 00100
LARSON,KEVIN L
GILL,LESLIE E
18395 TUMALO RESERVOIR RD
BEND OR 97701

171104 A0 00300
KOCHAN,PHILLIP F
KOCHAN,PAIGE M
18349 TUMALO RESERVOIR RD
BEND OR 97701

171104 A0 00400
SHORES,DORIS J
SHORES,DON L
18255 TUMALO RESERVOIR RD
BEND OR 97701

171104 A0 00500
WRIGHT,ANN MAPLES
C/O COBB, ANN M (A)
18295 TUMALO RESERVOIR RD
BEND OR 97701

171103 BB 00100
BRIZEE,HARRY A ETUX
18449 TUMALO RES MKT RD
BEND OR 97701

171103 BB 00200
ROTONDI,RICHARD J ETUX
60245 WOODSIDE RD
BEND OR 97702

171103 BB 00401, 500, 501
SWITZER, AARON J
SWITZER, ANGELA D
18473 TUMALO RESERVOIR RD
BEND OR 97701

171103 A0 00600
STATE OF OREGON
ROCK SPRINGS GUEST RANCH LLC
64201 TYLER RD
BEND OR 97701

171103 00 01300
BLM: sent a hard copy
to Thomas Mottl

171103 00 01500
BLM: sent a hard copy
to Thomas Mottl

171111 00 00302
MILLER, WESLEY JOSEPH
JILES, VONDA
61149 S. Highway 97, #161
BEND OR 97702

171111 00 00500
JOYCE E COATS REVOCABLE TRUST
COATS, JOYCE E COTRUSTEE
COATS, ERIC W COTRUSTEE
63285 SKYLINE RANCH RD

171111 00 00901
PARKER, DAVID G
63810 TYLER RD
BEND OR 97701

171111 00 01000
JUDITH ADAMS FAMILY TRUST
ADAMS, JUDITH K
717 W CALIFORNIA WAY
REDWOOD CITY CA 94062

171111 00 01001, 1002
CRAIG, HILARY
CRAIG, MICHAEL O
63727 Johnson Road
BEND OR 97701

171111 00 01100
ROSENBERG, DAVID B
ROSENBERG, OKSANA
63719 JOHNSON RD
BEND OR 97701

171111 00 01400
COOPER, ROBERT L
JANSEN-COOPER, BEVERLY A
63735 JOHNSON RD
BEND OR 97701

171111 00 01401
CROCKER, MARCUS
CROCKER, LISA
3462 NW COTTAGE PL
BEND OR 97701

171111 00 01500, 1600, 1603
LYSTER, THEODORE C
LYSTER, ELOISE A
PO BOX 28
BEND OR 97709

171111 00 01601
MCCOOK, PETER NEVINS
HENSLOP-MCCOOK, JACQUELINE
10305 SW 64th AV
MIAMI FL 33156

171111 00 01602
BREUER, GEORGE H
19470 SUNSHINE WAY
BEND OR 97702

171111 00 01700
BOWLES, SCOTT C
BOWLES, ROBERTA JOYCE
63635 JOHNSON RD
BEND OR 97701

171111 00 01800
REVOCABLE TRUST of
HORSMAN, CHRISTOPHER J
HORSMAN, JENNIFER M
63685 JOHNSON MKT RD
BEND OR 97701

171111 00 01900
REVOCABLE TRUST of
OBILL, TRENA S
OBILL, RICHARD J
18900 MARTINGALE CIR
BEND OR 97701

Distribution List for Notice of Draft EA Availability:
Land Owners & Water Users Continued....

171110 A0 00200
STEINLICHT, L DIANE
63945 TYLER RD
BEND OR 97701

171114 00 11000
STOLLER, ELMER L ETUX
505 MORROW RD
INDEPENDENCE OR 97351

171110 A0 00100
WITHERS, RENEE
18700 KUHLMAN RD
BEND OR 97701

171114 00 11500
SCOTT, REGAN L
SCOTT, LYNN O
64435 BAILEY RD
BEND OR 97701

171114 00 11800
ELKINS, CRAIG J
FORREST-ELKINS, CINDY L
12820 HUFFMAN CIR
ANCHORAGE AK 99516

171114 00 11900
LUCAS, CLAIRE JOLIE
19155 KLIPPEL RD
BEND OR 97701

171114 00 12000
HOMAN, JOHN
2181 NW MONTEREY PINES DR
BEND OR 97701

171113 00 00800
KLIPPEL WATER INC
%CORDONI JULIUS(A)
19185 BUCK DR
BEND OR 97701

171113 00 00817
CLR INC
703 NW STONEPINE DR
BEND OR 97701

171113 00 00823
KIMBLE, HARRIS C
19625 CLEAR NIGHT DR
BEND OR 97702

171113 00 01600
KORISH, BRYCE W
KORISH, JULIE L
19225 KLIPPEL RD
BEND OR 97701

171113 00 02300
KRAHN, GREGORY A
KRAHN, SELMA JEAN
63410 FAWN LN
BEND OR 97701

171113 00 02400
BILL AND MILLIE MOORE JOINT TRUST
63394 FAWN LN
BEND OR 97701

171113 00 02500
RAVERA, MARK J
RAVERA, SUSAN J
63382 FAWN LN
BEND OR 97701

171113 00 02600
VAN DER ZWIEP, TODD
LINDQUIST, ERIKA
63360 FAWN LN
BEND OR 97701

171113 00 02700
HAMMOCK, WILLIAM T
19214 BUCK DR
BEND OR 97701

171113 00 04100
ENGELHARD, TERESA
19570 E. CAMPBELL ROAD
BEND, OREGON 97701

171113 00 04101
JOHNSON, CYNTHIA A
63240 STAG DR
BEND OR 97701

171113 00 04200
RUDIN, MARK L
20756 HIGH DESERT CT. #4
BEND OR 97701

171113 00 04300
SHICK, FREDERIC A
SHICK, LESLIE J H
1774 SW KNOLL AVE
BEND OR 97702

171113 00 04301
STONE, DAVID L
STONE, RENEE L
19269 BUCK DR
BEND OR 97701

171123 00 01600
BEND METROPOLITAN PARK AND RECREATION DISTRICT
799 SW COLUMBIA
BEND OR 97702

171123 00 02200
GRACE, LENORE
PO BOX 772857
STEAMBOAT SPRINGS,CO 80477

171123 00 02300
MEHR, KENNETH A
MEHR, RYNA E
2000 N OCEAN BLVD
BOCA RATON FL 33431

Distribution List for Notice of Draft EA Availability:
Land Owners & Water Users Continued…

Thomas & Karen Anderson
1400 NW Putnam Rd.
BEND, OR 97701

Jerry A. & Judi Booth
18405 Tumalo Reservoir Rd.
BEND, OR 97701

Briles/Parisi/Loomis
c/o James C. Briles
PO Box 497
MONROE, OR 97456

Timothy H. & Amy E. Cecil
20680 Sierra Dr.
BEND, OR 97701

Douglas & Brenda Hansen-Coats
18781 Kuhlman Rd.
BEND, OR 97701

Alan H. & Janet W. Larson
1605 NW Putnam Road
BEND, OR 97701-5911

Richard & Judy Rotondi
P.O. Box 6794
BEND, OR 97708

Schneider Trust
Roger A. & Joyce E. Schneider
1851 NW Putnam Rd.
BEND, OR 97701

Baden Living Trust
28079 Spencer Creek
EUGENE, OR 97405

Robert E. Baxter
63555 Johnson Rd.
Bend, OR 97701

Distribution List for Notice of Draft EA Availability:
Potentially Interested Parties

Natural Resources
Conservation Service
625 SE Salmon Ave, Suite 4
Redmond, OR 97756-9580

Natural Resources
Conservation Service
2701 NW VAUGHN ST, STE 450
PORTLAND, OR 97210-5398

Zach Willey
Environmental Defense Fund
60440 Woodside Road
Bend, OR 97702

Steve Johnson
Central OR Irrigation Dist
1055 SW Lake Ct
Redmond, OR 97756

Suzanne Butterfield
Swalley Irrigation Dist
64672 Cook Ave., Suite #1
Bend, OR 97701

Mike Britton
North Unit Irrigation Dist
2024 NW Beech St
Madras, OR 97741

John DeVoe
Water Watch of Oregon
213 S.W. Ash, Suite 208
Portland, OR 97204

Kelly Cannon-Miller
Deschutes County Historical
Society
129 NW Idaho
Bend, Oregon 97701

Kyle Gorman
Oregon Water Resources Dept
1128 NW Harriman St
Bend, OR 97701

Honorable Ron Wyden
131 NW Hawthorne Ave, Ste 107
Bend, OR 97701

Ryan Houston
Upper Deschutes Watershed
Council
PO Box 1812
Bend, OR 97709

Tod Heisler
Deschutes River Conservancy
700 NW Hill Street
Bend, Oregon 97701

Andrew Purkey
National Fish & Wildlife
Foundation
806 SW Broadway, Suite 750
Portland, OR 97205

U.S. Geological Survey
Oregon Water Science Center
10615 SE Cherry Blossom Dr.
Portland, OR 97216

Anita Winkler
Oregon Water Resources
Congress
1201 Court St NE
Salem, OR 97301