



**OREGON WATER RESOURCES DEPARTMENT
WATER SUPPLY DEVELOPMENT ACCOUNT
LOAN AND GRANT APPLICATION**

I. Project Information

Project Name: Tumalo Feed Canal Phase 5

Type of Project: Conservation Check box if project type includes storage

Funding Request Type: Loan Grant

Funding Amount Requested: \$ \$1,299,968 Total cost of project: \$ \$3,407,155

Note: Grant funding requests must demonstrate cost match of at least 25% of total project cost. This may include in-kind.

II. Applicant Information

Principal Contact: <i>Kenneth Rieck, Tumalo Irrigation District</i>	Fiscal Officer: <i>Fran DeRock, Tumalo Irrigation District</i>
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Involved Landowner 1:	Involved Landowner 2:
Address:	Address:
Phone: Fax:	Phone: Fax:
Email:	Email:

**Please include a supplementary document that lists all additional involved landowners if applicable.*

Certification:

I certify that this application is a true and accurate representation of the proposed project work and that I am authorized to sign as the Applicant or Co-Applicant. By the following signature, the Applicant certifies that they are aware of the requirements of an Oregon Water Resources Department funding award and are prepared to implement the project if awarded.

Applicant Signature: *Kenneth B Rieck* Date: 1/19/2016

Print Name: Kenneth B Rieck Title/Organization: District Manager

III. Project Summary

Please provide a description of the need, purpose and nature of the project. Include what the applicant intends to complete and how the applicant intends to proceed.

The Tumalo Feed Canal Conservation Project is a multi-phased effort to pipe approximately six miles of open irrigation basalt canal. This application is requesting funding for the fifth phase of this project. Phase V is the longest stretch to be completed to date, and will pipe over one mile (5500 ft.) of canal. The project was initiated in 2005; and when complete will conserve an estimated 20cfs (5,554 acre-feet) of flow by eliminating 50% seepage and evaporation losses that occur in the open canals. Phase V alone will conserve 3.22 cfs of water (1,149.76 acre-feet). This includes 1.83 to Tumalo

Creek (654.99 acre-feet) and 1.39 cfs to the little Deschutes River (494.77 acre feet). 100% of the conserved water will be protected instream through a new senior water right held by the State of Oregon.

Tumalo Irrigation District (TID) has completed three successful phases of this project; Phase IV is currently in construction and is expected to be operational by the irrigation season in 2016. Each successful phase of the project incrementally eliminates the approximately 50% seepage loss caused by the open basalt canals and creates a new senior instream water right, held by the State of Oregon, in Tumalo Creek and the Deschutes River during the summer and Crescent Creek, the Little Deschutes River, and the Upper Deschutes River during the winter. With the completion of Phase IV 2.5 of 6 miles of the canal will be piped (12,968ft). Completion of Phase V would result in over half of the canal being piped (additional 5500 ft).

As with previous piping phases, Phase V will be constructed of leak-proof 84 inch diameter HDPE pipe. The total project commenced approximately 3/4 of a mile downstream of the existing Tumalo Creek diversion where two existing concrete pipes previously discharged water to the open Tumalo Feed Canal. (Please refer to Attachment A - Project Map.) Phase I of the total project started at that point and approximately 1/4 mile downstream of the initial connection the project confluences with the Bend Feed Canal. From that point, combined flows from the Bend Feed Canal and Tumalo Feed Canal have been completed through Phase III of the project; Phase IV is currently in progress. The Tumalo Feed Canal, when complete, will constitute about 6 miles of installed piping to its outlet at the Tumalo Reservoir.

One hundred percent of the water conserved will be returned and protected instream; providing substantial water quality and quantity benefits to the Deschutes Basin; with a majority being returned to Tumalo Creek. Tumalo Creek and the Deschutes River originate in the Cascade Mountains in Central Oregon. Both suffer from extremely low summer streamflows that have been identified as a major factor limiting fish habitat and water quality in the Deschutes River and its tributaries. Water temperature reaches dangerously high levels in the summer. Tumalo Creek, originates in springs and snowmelt west of Bend. According to a study by the Upper Deschutes Watershed Council for the Deschutes River Conservancy, Tumalo Creek flows entering the Deschutes are substantially cooler than flows in the Deschutes above the confluence. Thus, "... increasing flows in Tumalo Creek may therefore represent an opportunity to achieve the greatest cooling effect in the Middle Deschutes...by contributing a greater volume of colder water at the confluence." (UDWC 2013- Attachment B). At the completion of the Tumalo Feed Canal, dry season flows will be increased in Tumalo Creek from 5.8 cfs to approximately 17.6 cfs (303% increase). It will also increase fall, winter and spring stream flows in Crescent Creek, the Little Deschutes River and the Deschutes River by approximately 8.2 cfs and will result in improved habitat conditions for federally listed Oregon Spotted Frog by improvement of winter flows on Crescent Creek.

The Final Order for these instream water rights has already been established with the Oregon Water Resources Department. The water rights will be held and monitored by OWRD. As individual phases are completed, proportionate amounts of the water right will be applied to instream use (incremental conserved water right orders have already been finalized for Phases 1 - 3).

The following attachments are referred to throughout this document to aid in the review and evaluation of the application:

Attachment A: Project Map and Conceptual Design Drawings

Attachment B: Instream Flow Restoration and Temperature Responses Technical Report, Upper Deschutes Watershed Council, 2013

Attachment C: Irrigation District Water Efficiency Cost Analysis and Prioritization, Deschutes Water Alliance by Newton Consultants, 2006

Attachment D: Middle Deschutes Fisheries Monitoring Report, Oregon Department of Fish and Wildlife, 2012

Attachment E: Detailed Budget

Attachment F: Water Conservation Plan Update (2005)

Attachment G: Letters of Support

IV. Project Specifics

Instructions: Answer all questions in this section by typing the answer below the question, using additional space as needed.

- 1. Describe how the project will provide public benefits in each of the three public benefit categories.** Project applications will be scored and ranked based on the economic, environmental and social/cultural public benefits identified below. Describe the conditions prior to and after project implementation to demonstrate changes resulting from the project. Descriptions should be quantitative when possible. Information provided must be sufficient to allow evaluation of the public benefits of the project. **Please see the Public Benefit and Evaluation Guidance document for a description of how public benefits will be evaluated.** Applications that do not demonstrate public benefit in each of the three categories (economic, environmental, social/cultural) will be deemed incomplete. Leave blank any categories that are not applicable to project.

Economic Benefits ORS 541.673(2)

(a) Job creation or retention:

The Tumalo Feed Canal is a significant investment in the infrastructure for TID as well as the economy of Deschutes County; with improvements in higher agricultural yields, methods, and efficiencies leading to job security and retention as well as the creation of temporary jobs from design and construction activities.

The completion of the Tumalo Feed Canal will result in a pressurized irrigation system for TID; a direct benefit for job retention for TID patrons. A pressurized system will eliminate the need for pumping water from a diversion point to a sprinkler system, and allows for a direct hook-up to the TID system. Eliminating the use of pumps will save patrons at least \$60/acre per year in energy costs. The pressurized system will also allow for improved coverage of irrigated lands, leading to higher agricultural yields for the same land. This conversion will increase cost margins for TID's patrons, directly benefiting job retention for farmers and farm workers.

Tumalo Irrigation District serves approximately 8,110 acres owned by 675 patrons. Most of the water use is agricultural (7,400 acres). Agriculture in Deschutes County accounts for nearly 50,000 direct jobs with an average wage of \$30,721, with over half of those jobs directly related to crop production. For TID patrons, operational efficiencies made possible through the pressurization of the system and improvements in on-farm irrigation equipment will further secure permanent jobs.

In addition to decreased costs for landowners aiding job retention, continuing efforts to conserve water and return instream flows to contribute to the vitality of streams, thus solidifying the TID's commitment to meet multiple purposes with their operations, and continuation of water deliveries for agricultural producers in Deschutes County.

The Tumalo Feed Canal will also provide temporary jobs related to design, construction and implementation of the project. Since 2005, TID has reliably employed Oregonians every winter through the piping of the Tumalo Feed Canal. The project also utilizes local gravel, reinforcing steel, concrete, equipment supply and rental, fencing companies and seed suppliers in addition to local engineers and construction crews to build the project. As of 2016, \$18 million has been invested in design and construction of this project; an additional \$3.4 million will be invested in Phase V. Using calculation criteria from the American Recovery and Reinvestment Act, 37 temporary jobs will be created by Phase V; in addition to the approximately 200 jobs over the past ten years [ARRA estimates one job year is created per \$92,000 in spending].

(b) Increases in economic activity:

For ten years, TID has consistently invested in this project totaling to over \$21 million through Phase V in design, construction and implementation. This spending is beyond the normal operating budget of TID; and allows for

new contracts to engineering firms, construction firms, and other consultants to ensure safe design and completion of the feed canal. This investment will continue for several more years to the completion of the Feed Canal. The phased approach to completing this project has created sustainable and dependable work for well over ten years (and continuing for an additional 5+ years) in Central Oregon.

In addition to construction work, the pressurization of the system at the culmination of the feed canal will allow for sustainable economic activity as district members have incentive to update on-farm irrigation systems, to eliminate pumping and pump storage. While this is an upfront cost for upgrade, it presents a significant cost savings for patrons into the future that can be spent on other economic improvements to their land and business. These impacts are anticipated to sustain gradual economic activity for more than a decade.

(c) Increases in efficiency or innovation:

Irrigation canals in Central Oregon were constructed over 100 years ago by the first settlers of the area. The canals were dug into open earth and lined with fractured basalt. Due to the design of the canals, about half of the water withdrawn from rivers and streams is lost through seepage. Thus, irrigation districts using the open basalt canals must withdraw double their district's need to adequately serve their members. Construction of conservation and piping projects, like the Tumalo Feed Canal, more than double the efficiency of TID operations. The canals are piped with no-leak systems allowing for withdrawal of only the needs of TID; leaving more water in-stream and none lost to seepage or evaporation in the canals.

The pressurization of the system due to the construction of the Tumalo Feed Canal piping project will provide exceptional time, energy and operational savings to TID and its patrons. With the current system, water is diverted into retention ponds or pumped from a diversion; then that water transported via pumping system to sprinklers or another distribution method. With a pressurized system, patrons can hook up sprinklers directly to a diversion eliminating the need for retention ponds and pumping. This results in better coverage of irrigable land, increased efficiency of water, and more control of withdrawals because water is no longer lost through seepage or pumping efficiency losses. TID will also be able to automate the headgates to only divert the water that is required to serve the users; allowing TID to better operate and manage water in real-time (approximately 45,000 acre-feet per year.) This is a significant upgrade to the TID system.

(d) Enhancement of infrastructure, farmland, public resource lands, industrial lands, commercial lands or lands having other key uses:

Construction of the Tumalo Feed Canal Project will increase property values through the improvements caused through the pressurized system as well as freeing up land previously used for canals and pump storage for landowner use. The current irrigation canals offer no value to the property they cross.

Currently, patrons divert water from the canals and typically store that water in retention ponds. The water is then pumped into sprinklers and distributed throughout their land. Piping the Tumalo Feed Canal replaces this antiquated delivery system constructed a century ago into a modernized pressurized delivery system. Through this improvement, pressurized water will be delivered to farms and on-farm systems directly with enough pressure to directly hook up to sprinkler systems. This eliminates the need for retention ponds, freeing up usable space on farms for agriculture products or other use. It also eliminates the needs for pumping, decreasing operation costs from energy needing to run pumps; that savings can directly be applied to improvements to the land or job retention. The pressurized system also allows for a more consistent application of the water resource through efficient sprinkler systems and better regulation of the water - eliminating the need to withdrawal more water than necessary due to seepage, pump loss, or other inefficiencies.

The piped Tumalo Feed Canal will be buried. Currently, the canal traverses through several patron lands. Burying the pipe and eliminating the canal will free up approximately 6 miles of previously unusable land. This will increase property values for the area affected.

In addition to gain usable land, the piping further secures a sustainable and reliable water source; a vital importance to the value of agricultural land in Deschutes County. This major infrastructure improvement for TID allows for TID to withdrawal only what is needed to fulfill its patrons needs; eliminating the need to withdraw

additional water to account for 50% seepage loss. Once the canal is piped, there will be no loss in the piped section. The pipe being used has water-tight joints. The water that was traditionally diverted and lost due to inefficiencies will remain instream. The Tumalo Feed Canal is a significant enhancement of TID's infrastructure and increases the efficiency of water use through the construction and implementation of piping infrastructure that will serve TID well into the future.

- (e) Enhanced economic value associated with tourism or recreational or commercial fishing, with fisheries involving native fish of cultural significance to Indian tribes or with other economic values resulting from restoring or protecting water instream:

Recreation is a \$200+ million industry in Deschutes County and in the Deschutes River Basin Corridor. Increasing instream water during summer months is a direct benefit to in-water recreation. The Tumalo Feed Canal Project will return all conserved water instream, boosting Tumalo Creek flows 303% from 5.8 cfs to approximately 17.6 cfs when complete; Phase V will return 1.83 cfs to Tumalo Creek (15% of the total). Tumalo Creek runs through Tumalo State Park and is approximately 7 miles outside of Bend, Oregon. Due to its proximity to Bend as well as Tumalo Creek, the park is extremely popular for camping, wading, swimming and in-water recreation. Recreational fishing for redband trout and brown trout is very popular in the park, along Tumalo Creek and through to the Deschutes River. This is especially important and helpful during the summer months when water is low and historically too warm for fish. The increased instream availability of flow will result in increased water recreation; resulting in increased daily park fees at Tumalo State Park, increased fishing licenses, and improve the scenic quality of Tumalo Creek and the Deschutes River.

In addition to benefits to recreational fishing, the protected instream flow provides a substantial benefit for the Deschutes River System to Lake Billy Chinook; including enhanced flow for endangered Bull Trout and Steelhead, as well as popular recreational fish species like rainbow trout, brown trout, kokanee, and smallmouth bass. Lake Billy Chinook is a popular recreational fishing lake, and an important cultural landmark to the Confederated Tribes of the Warm Springs. Adding instream flow to the system will enhance the tribe's efforts for recovery of culturally important species, such as kokanee and steelhead, in the lake.

- (f) Increases in irrigated land for agriculture:

The intent of the project is not to expand TID's system-wide irrigated agriculture. However, the project is expected to provide a reliable pressure enhanced delivery to the TID patrons and to enhance the ability of patrons to more effectively cover irrigated lands. Reduction in pumping costs will allow patrons to move to more efficient sprinkling practices and the finances to enhance on-farm systems and associated efficient coverage on lands that may have not been as effectively farmed in the past.

Environmental Benefits ORS 541.673(3)

- (a) A measurable improvement in protected streamflows that accomplishes one or more of the following:

- (A) Supports the natural hydrograph;
- (B) Improves floodplain function;
- (C) Supports state- or federally-listed sensitive, threatened or endangered fish species;
- (D) Supports native fish species of cultural importance to Indian tribes; or
- (E) Supports riparian habitat important for wildlife:

All (100%) conserved water resulting from piping the Tumalo Feed Canal will be returned instream and protected through a senior instream water right. Thus, this project will directly impact and improve conditions for federally listed endangered species, native fish species of cultural importance to Indian tribes, and support the natural hydrograph through instream flow restoration to Tumalo Creek and the Deschutes River. The State of Oregon would secure the water rights for the conserved water to be permanently allocated to instream use in Tumalo Creek, Crescent Creek and the Little Deschutes River. The Final Order for these water rights have already been established with the Oregon Water Resources Department. The water rights will be held and monitored by OWRD. As individual phases are completed, proportionate amounts of the water right will be applied to instream use (incremental conserved water right orders have already been finalized for Phases 1 - 3).

Phase V will restore 1.83 cfs and 654.99 acre-feet to Tumalo Creek. Tumalo Creek is fast-moving, short and glacier fed; contributing to water approximately 10 degrees cooler than the Deschutes at the confluence. Both the Deschutes River and Tumalo Creek are over-appropriated, authorizing more water to be diverted than what is available. Prior to the implementation of the Tumalo and Bend feed canal piping projects, flow in the middle Deschutes sunk from a natural flow of 1300 cfs to as little as 30 cfs. Similarly in Tumalo Creek, a natural flow of 60 cfs averaged as little as 8 cfs. As recently as the 1990s, Tumalo Creek frequently ran dry; it is only since the implementation of conservation projects that flows have been added to Tumalo Creek. TID's conservation efforts will result in increased dry season stream flows in Tumalo Creek from 5.8 cfs to approximately 17.6 cfs. It will also increase fall, winter and spring stream flows in Crescent Creek, the Little Deschutes River and the Deschutes River by approximately 8.2 cfs. The increased flows from Tumalo Creek will also provide cool water to the Deschutes in the summer months when temperature is important to fish survival.

Several documents support the prioritization of this flow restoration effort including:

- The Deschutes Subbasin Plan, Northwest Power and Conservation Council, 2005*
- Upper Deschutes River Fish Management Plan, Oregon Department of Fish and Wildlife, 1996*
- Upper Deschutes Agricultural Water Quality Management Area Plan, Oregon Department of Agriculture, 3rd rev. 2013*
- Integrated Water Quality Report, Oregon Department of Environmental Quality, 2004/2006*
- Deschutes Basin Restoration Priorities, Oregon Watershed Enhancement Board, 2006*
- Middle Deschutes Monitoring Project, Oregon Department of Fish and Wildlife, 2012*
- Instream Flow Restoration and Temperature Responses Technical Report, Upper Deschutes Watershed Council, 2013*

Studies in the basin have shown that additional water left instream is a critical factor in supporting riverine and riparian habitat and water quality on the mainstem Deschutes River and Tumalo Creek. The reach of the Deschutes River running through the city of Bend currently is already at or near the upper limit of Oregon's water quality standards. The Upper Deschutes Watershed Council (UDWC) performed a recent water quality analysis that found restoring flow to Tumalo Creek contributes to reducing stream temperatures thus improving water quality on the mainstem Deschutes River. Furthermore, the same analysis found that leaving more water in the Deschutes River at the City of Bend, where most irrigation water is diverted, does not reduce downstream water temperatures, but rather it only reduces the rate of downstream warming. Alternatively, monitoring results suggest that allowing more cold Tumalo Creek water to remain instream could reduce stream temperatures on the Deschutes River below Bend. Thus, increasing Tumalo Creek flows is the best tool available to reduce water temperatures in the Deschutes River. The Tumalo Feed Canal will return and protect cool Tumalo Creek water to the Deschutes River thereby improving endangered and native species in the Basin.

*This project will benefit Oregon Spotted Frog in Crescent Creek and the Little Deschutes River. The Fish and Wildlife Service listed the Oregon Spotted Frog (*Rana pretiosa*) as threatened under the Endangered Species Act in 2014. Federal agencies have declared Crescent Creek, the Little Deschutes River, and the Deschutes River down to the City of Bend as critical habitat for the frog (see <https://www.fws.gov/oregonfwo/Species/Data/OregonSpottedFrog/>). They have documented the presence of the frog in Crescent Creek downstream from Crescent Lake. Phase V will return 1.39 cfs to Crescent Lake (494.77 acre-feet).*

The Fish and Wildlife Service has identified Crescent Creek as a priority for the recovery of the Oregon Spotted Frog. The agency has suggested that increasing winter and spring stream flows in Crescent Creek will benefit the Oregon Spotted Frog. This project will conserve stored water from Crescent Lake and allow for its release during the storage season, contributing to improved conditions for frog overwintering and mating.

The additional instream flows resulting from this project will also benefit federally threatened, sensitive, and State of Oregon sensitive-vulnerable species downstream of TID diversions. A documented supporting letter from Oregon Department of Fish and Wildlife is included in Attachment G. Throughout the Deschutes Basin projects are being completed that increase stream flow. While increases in stream flow are clearly beneficial, such flow

increases do not necessarily equate to an increase in water quality. The Tumalo Feed Canal Piping project increases stream flow and improves water quality. Tumalo Creek is one of the only sources of cold water in the middle Deschutes and is also a critical gravel-bearing stream that enhances fish habitat within the Tumalo Creek and Deschutes River systems.

With the presence of endangered steelhead and threatened Bull Trout in the Deschutes Basin, the quantity and quality of water in the Deschutes River becomes increasingly important. Tumalo Creek is one of the only cold water sources for the middle Deschutes. The Deschutes River Conservancy (DRC) engaged Newton Consultants to undertake an in-depth evaluation of conservation projects in Central Oregon and rank the projects based on several parameters for the 2006 Deschutes Water Summit (Attachment C). The report confirmed that the Tumalo Feed Piping project was the best available conservation opportunity to secure Tumalo Creek and Crescent Creek instream flows. Piping of the Tumalo Feed Canal is one of the only ways to increase the flow of this cold water into the Deschutes River that improves habitat for the endangered species.

- (b) A measurable improvement in groundwater levels that enhances environmental conditions in groundwater restricted areas or other areas:

Returning conserved water to protected instream use will allow for a more natural hydrograph in the Basin. This may provide more normal conditions for fill and refill of groundwater sources, thus improving groundwater levels.

- (c) A measurable improvement in the quality of surface water or groundwater:

The Middle Deschutes River is 303(d) listed for temperature during the summer months. According to the ODFW Upper Deschutes River Fish Management Plan (1996), low stream flows are a leading cause of poor water quality in the middle Deschutes River. If a sufficient volume of water can be secured in Tumalo Creek, there will be a decrease in the summer water temperatures for the Middle Deschutes in the reach below the confluence of the two streams.

This project will provide substantial improvement to water temperature in Tumalo Creek and the Deschutes River during the vital summer months. Temperatures upstream from the Tumalo Feed Canal diversion generally meet state water quality standards. However, rapid warming associated with historically low stream flows has caused temperatures in the 2.8 mile reach immediately below the Tumalo Feed Canal diversion to exceed state standards. Monitoring and evaluation by the Upper Deschutes Watershed Council (Attachment B) suggests that the completion of the whole Tumalo Feed Canal Piping Project will provide the stream flows necessary to meet state water temperature standards in this reach. Monitoring by the Oregon Department of Fish and Wildlife (Attachment D) suggests that native redband trout concentrate in and around cold water inputs to the Deschutes River, including Tumalo Creek, and further emphasize the importance of these stream flows.

According to the Upper Deschutes Watershed Council 2012 Water Quality monitoring program, the restoration of Tumalo Creek flows should be prioritized to achieve greater temperature benefits and provide the best return on investment for improved water quality in the basin.

In a letter of support to TID in 2010, ODFW reiterated the water quality improvement potential of the piping project. "The contribution to reduced temperatures in the Deschutes River between Big Falls and Lake Billy Chinook will provide benefits to migrating Chinook salmon, summer steelhead, and bull trout."

In addition to summer water quality improvement, there will also be improvement in winter flows on the Upper Deschutes River. Extreme flow fluctuations have exacerbated bank erosion and sedimentation associated with increased exposure of fine-grained sediments to freeze-thaw processes. This increases loss of habitat and contributes to poor water quality. Reaches of the Upper Deschutes exceed state water quality criteria for dissolved oxygen, turbidity, and sedimentation. In addition, the flow regime makes it difficult for riparian vegetation to establish, creating highly challenging conditions for on-going bank and channel restoration efforts by the USDA Forest Service, Oregon Department of Fish and Wildlife and other partners. Because low stream

flow is directly linked to depressed fish populations, excessive stream bank erosion, loss of riparian vegetation and instream sedimentation, winter stream flow restoration in the Upper Deschutes River has been identified as a high priority in the following reports:

- Upper Deschutes River Wild and Scenic Management Plan (USFS)
- Upper Deschutes River Subbasin Assessment and Action Plan (Upper Deschutes Watershed Council)
- Upper Deschutes River Restoration Strategy (ODFW)

(d) Water conservation:

Water conservation is the main priority of the Tumalo Feed Canal Project. Completion of the entire Tumalo Feed Canal will result in a 20 cfs total reduction in water withdrawals, with the savings being protected instream. Phase V of this project will eliminate 3.22 cfs; this represents 16% of the total conservation at the completion of the Tumalo Feed Canal Project and a substantial amount conserved for the 5500 ft of piped canal.

As demonstrated in Question 1(c), the original design of the irrigation canals result in 50% total system seepage loss, requiring TID to withdraw twice the amount of water used for irrigation. The following table was created through a test of the Tumalo Feed Canal prior to piping. This test demonstrated the seepage loss before the piping of the Tumalo Feed Canal Project:

Date	Time	Tumalo Canal Diversion(cfs)	Canal Diversions(cfs)	Delivery to Reservoir(cfs)	Loss (cfs)
4/6/05	800	52.8	0.1	33.6	19.1
4/6/05	900	52.1	0.1	33.6	18.4
4/6/05	1000	52.1	0.1	33.6	18.4
4/6/05	1100	52.2	0.1	33.6	18.5
4/6/05	1200	60.6	0.1	33.7	26.8
4/6/05	1300	55.6	0.1	33.7	21.8
4/6/05	1400	55.6	0.1	33.7	21.4

Phase V alone will conserve 3.22 cfs of water (1,149.76 acre-feet). This includes 1.83 cfs to Tumalo Creek (654.99 acre-feet) and 1.39 cfs to Crescent Creek (494.77 acre feet). The State of Oregon would receive the water rights to the conserved water associated with public funding will be permanently allocated to instream use in Tumalo Creek, Crescent Creek and the Little Deschutes River.

The Final Order for the water rights have already been established with the Oregon Water Resources Department. The water rights will be held and monitored by OWRD. As individual phases are completed, proportionate amounts of the water right will be applied to instream use (incremental conserved water right orders have already been finalized for Phases 1 - 3).

(e) Increased ecosystem resiliency to climate change impacts:

Phase V of the Tumalo Feed Canal will protect 3.22 cfs instream; an important resource in increasing ecosystem resiliency to climate change impacts. Qualitatively, this project will improve resiliency through increased instream flow and improved temperature conditions. Currently, Tumalo Creek provides one of the only sources of cold water to the middle Deschutes River. As mentioned in question 2(c), restoration of instream flow to Tumalo Creek is prioritized to improve summer stream temperatures in the Deschutes River. This will improve cool water habitat for both endangered species as well as native fisheries. Water conserved through the entire piping project is critical to meeting instream needs (both quantity and quality) now and in the future.

The completion of the Tumalo Feed Canal Piping Project will facilitate and allow for improved water management. TID has a dual source system, drawing water from either the Deschutes River or Tumalo Creek. With the completion of the Tumalo Feed Canal, TID will be able to work in collaboration with other irrigators and water users in the basin to better manage water in both the Deschutes River and Tumalo Creek for multiple uses. This will help reduce the supply and demand imbalance by continuing to meet irrigation demand, while

making water available for instream and municipal mitigation needs. The project will reduce the potential for conflicts and crisis in the future.

TID is a part of the Deschutes Basin Study Work Group (BSWG) that is actively managing a Deschutes Basin Study that will look at climate change impacts. TID is a voting member of the study group and an active member of the Deschutes Basin Board of Control. That study will be able to quantify benefits of conservation efforts to ecosystem resiliency.

(f) Improvements that address one or more limiting ecological factors in the project watershed:

Several reports and regional efforts prioritize improvements in irrigation management as priority actions for addressing ecological factors in the Deschutes Basin. The primary limiting ecological factors of the basin include low summer flows, temperature and water quality that is inhospitable to native and endangered species, and habitat degradation. The following reports confirm and prioritize the need to return natural flow to Tumalo Creek (reports not attached are available upon request):

- *Upper Deschutes Subbasin Assessment, Upper Deschutes Watershed Council, 2003- A key recommendation in the Water Quantity chapter directs agencies to “Support current and future methods to improve the efficiency of water delivery systems. Support canal piping projects that comply with Oregon’s conserved water statute” (page 121).*

- *Upper Deschutes Subbasin Fish Management Plan, Oregon Department of Fish and Wildlife, 1996- ‘Recommended Action 5.1’ states: “Develop strong partnerships with irrigation districts, irrigators...to improve water distribution and application techniques in an effort to use less water more efficiently in order to establish increased minimum flows necessary to maintain aquatic life and retrofit facilities to reduce fish mortality and provide passage.”(pg 63).*

- *Deschutes River Subbasin Plan, Northwest Power and Conservation Council, 2005- The Deschutes Subbasin Plan provides almost 80 pages of site specific findings, objectives and management strategies many of which involve increasing stream flow in reaches adversely affected by irrigation diversions. Key habitat objectives or strategies that are relevant to this project include:*

- o *Deschutes River (Big Falls to Bend) – “improve the river’s flow regime by increasing the minimum summer flow to meet instream water rights” and “The reach of the Deschutes River near the mouth of Tumalo Creek is a priority area for habitat restoration” (MP-77)*

- o *Tumalo Creek – “increase the minimum summer flow and develop a coordinated water policy to protect and secure instream flow enhancements from conservation, leases, transfers and acquisitions.” (MP-78)*

- o *Little Deschutes River including Crescent Creek – “Work with water users to increase the efficiency of water delivery and management practices to increase minimum summer streamflow.” (MP-88)*

- o *Upper Deschutes River— “Improve the river’s flow regime by increasing the minimum winter flow and reducing the summer peak flow.” (MP-75)*

- *Deschutes Basin Board of Control Habitat Conservation Plan (2013) Spotted Frog - the increased flows returned to Crescent Lake and run through Crescent Creek by conservation provide an exceptional management asset to TID to better protect habitat for the Spotted Frog.*

Social/Cultural Benefits ORS 541.673(4)

(a) The promotion of public health and safety and of local food systems:

The Tumalo Feed Canal project will improve TID’s water delivery infrastructure, further securing its ability to deliver water to its patrons that contribute to the local food systems. The TID serves about 8,110 acres and has about 675 patrons. Most of the water use is agricultural (7,400 acres) for food and livestock products. Approximately 35% of the land served by TID is planted in alfalfa, 40% in hay/pasture, 15% in grains, and 10% in lawn and garden.

TID must deliver approximately 29,600 acre-feet of irrigation to meet the peak annual demand of its patrons. With the inclusion of on-farm efficiencies with pressurization through the Tumalo Feed Canal Piping project, TID is able to withdraw only the water needed for its patrons use. Thus, through this project TID is able to meet the needs of their patrons while also leaving more water in-stream to promote better in-water conditions for the ecosystem.

Piping of the Tumalo Feed Canal also prevents contaminants, such as herbicides and pesticides, from entering the water supply for TID's patrons. This is extremely important to the safety of the local food system; especially for a patron dairy producer and several farms that sell food products to the local farmers markets.

The Tumalo Feed Canal will also contribute to improved water quality in Tumalo Creek and the Deschutes River, improving fisheries including recreational fisheries and in-water recreation.

(b) A measurable improvement in conditions for members of minority or low-income communities, economically distressed rural communities, tribal communities or other communities traditionally underrepresented in public processes:

TID recognizes the importance of improving conditions for those in our communities that are underrepresented in public processes. The conserved water achieved through the project will provide measureable improvement to tribal fisheries. The protected instream flow provides a substantial benefit for the Deschutes River System to Lake Billy Chinook; including enhanced flow for endangered Bull Trout and Steelhead, as well as popular recreational fish species like rainbow trout, brown trout, kokanee, and smallmouth bass. Lake Billy Chinook is a popular recreational fishing lake, and an important cultural landmark to the Confederated Tribes of the Warm Springs. Adding instream flow to the system will enhance the tribe's efforts for recovery of culturally important species, such as kokanee and steelhead, in the lake.

(c) The promotion of recreation and scenic values:

The Deschutes River is designated as both a National Scenic River as well as a National Recreation River. Both Tumalo Creek and the Deschutes River are extremely popular locations for summer in-water recreation including rafting, floating, fishing and swimming. Economic value of recreation in the Deschutes Corridor is estimated to be above \$200 million per year. By returning cold Tumalo Creek water to the Deschutes River system and promoting a more natural hydrograph, TID is promoting to enhanced fisheries, more flow for summer recreation including boating, and enhancing the scenic value to Central Oregon.

(d) Contribution to the body of scientific data publicly available in this state:

Oregon Water Resources Department and other state and federal agencies maintain stream gauges along Tumalo Creek and the Deschutes River. The conservation effects of the piping will be able to be tracked and measured through the stream gauges, further improving the ability to track usage and manage the Deschutes Basin for multiple purposes.

Several other irrigation districts and regional partners are also engaged in piping conservation projects in Central Oregon. In the near future, the Deschutes Basin will have more water protected instream than in the past 100 years. Effects to the ecosystem function of the protected instream water will be observed and quantified for the next several decades. TID looks forward to continuing to participate in conservation and habitat improvement efforts with its regional partners that contribute to the body of knowledge of both water management and ecosystem function in the region.

(e) The promotion of state or local priorities, including but not limited to the restoration and protection of native fish species of cultural significance to Indian tribes:

TID supports and participates in several regional collaborative bodies including the Deschutes Basin Board of Control (DBBC), the Deschutes Water Alliance (DWA), and a key stakeholder in the Deschutes River Conservancy. The DBBC is a collaboration between eight irrigation districts in the region. The main priority of

these groups is to facilitate long-term water resource management in the basin and identify how to meet diverse needs. TID works in collaboration with these groups to achieve restoration of instream flows leading to healthy populations of fish and wildlife in the Basin.

Also through the DBBC, TID works with eight other irrigation districts to coordinate and share resources and management assets to conserve water, improve services to farm and ranch families, and enhance river conditions for wildlife species and recreational opportunities. Through this collaboration, the DBBC has developed the Deschutes Basin Habitat Conservation Plan (2006), furthered piping projects for water conservation, improved fish and wildlife habitat restoration, and produce renewable energy through hydropower generation projects.

(f) The promotion of collaborative basin planning efforts, including but not limited to efforts under Oregon's Integrated Water Resources Strategy:

As mentioned in question (e) above, TID is a member of the Deschutes Basin Board of Control (DBBC), an unprecedented collaboration between eight irrigation districts (Arnold, Central Oregon, Lone Pine, North Unit, Ochoco, Swalley, Three Sisters and TID). TID also participates in the Deschutes Basin Study Work Group (BSWG) through an agreement with Bureau of Reclamation and the Deschutes Basin Board of Control to complete the Deschutes River Basin Study. The BSWG is an incredibly diverse group with members from the eight irrigations in addition to Avion Water Company, Bend Paddle Trail Alliance, Ventral Oregon Flyfishers, Cities of Bend, Madras, Prineville, and Redmond, Crooked River Watershed Council, Deschutes County, Deschutes River Conservancy, Native Reintroduction Network, Natural Resources Conservation Service, Oregon DEQ, OWRD, Portland General Electric, Trout Unlimited, U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, U.S. Forest Service, Upper Deschutes River Coalition, Upper Deschutes Watershed Council, Water for Life, and Water Watch. Both of these diverse collaborative groups produce studies contributing to the body of knowledge of the basin, develop habitat conservation plans, identify immediate and long-term needs of the basin's water resource management, and provide a venue to communicate and coordinate all basin efforts. These efforts are an excellent example of collaborative place-based planning for the Deschutes Basin.

The Tumalo Feed Canal also directly correlates to the efforts suggested through the Integrated Water Resources Strategy. The following Recommended Actions in the IWRS directly relate to this project:

- Recommended Action 3.a: Regional efforts identified the needs for instream; thus encouraging conservation projects such as the Tumalo Feed Canal.*
- Recommended Action 4.c: Piping the canal contributes to energy savings through the elimination of pumps in addition to the significant water savings by eliminating 50% seepage through the canals.*
- Recommended Action 7.a: This project is a significant investment in sustainable infrastructure that will be low maintenance and serve the district for decades.*
- Recommended Actions 9.a - 9.c: Irrigation districts in the Deschutes Basin coordinate and collaborate in several venues that contribute to collaborative place-based planning efforts including the Deschutes Basin Board of Control, the Deschutes Basin Study Work Group, Deschutes River Conservancy and other efforts. Canal piping is a direct result from this successful place-based planning effort.*
- Recommended Action 10.a: Completion of the Tumalo Feed Canal will eliminate a 50% seepage loss in the irrigation canals, a substantial benefit to water use efficiency and water conservation.*
- Recommended Action 10.D: Tumalo Irrigation District is committed to transferring the water right for all conserved water over to the State of Oregon for protection instream. This is a large environmental benefit that occurred without regulatory intervention*
- Recommended Actions 11.A, 11.B, 11.D: Returning water instream improves watershed health, resiliency and capacity, provides instream flow protections, as well as protecting and restoring instream habitat for fish and wildlife.*

TID and its partners in the DBBC and BSWG have held numerous public meetings and outreach throughout their history to both inform and include the public on its activities. In addition, all BSWG meeting notes are publically available on the Bureau of Reclamation's website.

TID's board meetings are also open to the public with sufficient time for public comments and communication with the public. All meeting agendas and minutes are available at TID's website.

2. Identify Project Location.

(a) Attach map of project implementation area if appropriate. List map(s) in this space and attach to application.
Please see Attachment A

(b) Township Range Section Quarter-Quarter Section
T17S 11E S16-19

(c) Tax Lot Number(s)
171111 1602; 171111 1901; 171111 1600; 171111 1500

(d) Latitude/Longitude
Start:44°06'54.21 N / 121°22'19.17 W / End: 44°07'13.03N / 121°22'57.96W

(e) County
Deschutes

(f) Watershed
Upper Deschutes Basin

(g) River/Stream Mile (where applicable)
n/a

3. (a) Will the project result in a physical change on private land? Yes No

If yes, attach evidence that landowners are aware of and agree to the proposal. List attachments below.
TID operates its canal system on land that was granted under the Carey Act of the federal government. Evidence of the State Engineers Certification of this federal right-of-way is on file with TID in its offices. The Carey Act authorizes TID to operate, patrol, maintain, and pipe its irrigation system within the right-of-ways. Landowner outreach and communication is currently occurring and will continue through construction of Phase V.

(b) Will the project result in monitoring on private land? Yes No

If yes, attach evidence that landowners agree to the proposal and are aware that monitoring information is public record. List attachments below.

4. Provide a project schedule, including beginning and completion dates. Use the following table as a guide. Attach a separate sheet to application if needed.

Estimated Project Duration: October 1, 2016 to August 1, 2017

Place an "X" in the appropriate column to indicate when each Key Task of the project will take place.

Project Key Tasks	2016				2017				20 & Beyond
	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	
<i>Permit Applications (done)</i>									
<i>Materials Acquisition</i>			X	X	X				
<i>Bid Solicitation</i>			X	X					
<i>Contracting</i>			X	X					
<i>Construction</i>				X	X	X			
<i>Project Inspection</i>						X	X	X	
<i>Post Project Implementation Review</i>						X	X	X	X
<i>Project Maintenance (to occur through 4/2019)</i>						X	X		
<i>Project Water Rights</i>									

5. Describe any conditions that may affect the completion of the project.

Tumalo Irrigation District has an exceptional track record of delivering Phases I-IV of the Tumalo Feed Canal. The major condition that may affect the completion of the project is receiving adequate funding. Four different funding sources (including in-kind funds from TID) are being sought for this project.

6. Attach a completed feasibility analysis if one has been completed.

Please refer to Attachment F for TID's 2005 Water Conservation Plan, also on file with Oregon Water Resources Department.

7. Provide suggestions for interim and long-term project performance benchmarks.

Tumalo Irrigation District will use the key tasks identified in Section 4 as interim benchmarks for completion of the project. After the project is complete, regular maintenance and testing will be performed to ensure performance is as expected.

The conserved water returned through the instream water right transfer amount is required and tracked by the Oregon Water Resources Department at their gage on the Tumalo Creek and Crescent Creek. As each phase completes and certificates are completed, the results of the conserved water is confirmed through instream flows.

8. Provide letters of support for the proposed project (list in this space and attach to application).

Please see Attachment G

9. Describe partnerships and collaborative efforts associated with the project.

See Social section question (f) for collaborative efforts associated with this project.

10. Consultations/communications with affected Indian tribes and with the Legislative Commission on Indian Services regarding the project.

Has the Legislative Commission on Indian Services been contacted to identify tribes affected by the project?

Yes No

Please provide correspondence as an attachment to this application.

Has there been consultation/communications with affected Indian tribes?

Yes No

Please provide a description of consultation/communication that occurred and attach documents to this application if applicable.

11. Provide a description of:

(a) Required local, state and/or federal [permits](#) and/or authorizations for project implementation that have been secured to date. Please attach secured permits/authorizations to the application.

The TID irrigation system does not drain into any water bodies of the U.S. and therefore is not under the jurisdiction of the US Army Corps of Engineers or Division of State Lands. No wetlands were found in the project area. No removal/fill permits are anticipated to be required to implement the project. Consultation with SHPO regarding historic properties (of both a historic and an archeological nature) has been completed. If Federal funding is received, TID will complete a final archaeological project walk as required by the National Environmental Policy Act. An environmental assessment has been completed and submitted to Reclamation's regional office. A Finding of Non-Significant Impact has been issued on the project (PN-FONSI-10-06). No other permits or approvals are required.

(b) Required local, state and/or federal permits and/or authorizations that will be secured in the future to implement the project. Describe efforts to date in securing these permits and/or authorizations.

N/a

12. Provide any additional supplemental materials to demonstrate ability to implement the project. Examples include project plans and specifications, engineering details and [water availability analysis](#). List documents in this space and attach to application.

Attachment A: Project Map and Conceptual Design Drawings

Attachment B: Instream Flow Restoration and Temperature Responses Technical Report, Upper Deschutes Watershed Council, 2013

Attachment C: Irrigation District Water Efficiency Cost Analysis and Prioritization, Deschutes Water Alliance by Newton Consultants, 2006

Attachment D: Middle Deschutes Fisheries Monitoring Report, Oregon Department of Fish and Wildlife, 2012

Attachment E: Detailed Budget

Attachment F: Water Conservation Plan Update (2005)

Attachment G: Letters of Support

V. Storage Project Requirements (if not a storage project continue to Section VI)

For any storage project please contact Water Resources Grant Administrator, Jon Unger, at (503) 986-0869 prior to completing the application.

13. Storage Project Type: Above Ground Below Ground

14. If above-ground storage, would the proposed storage project be located in-channel?

Yes No N/A

15. Identify the capacity in acre-feet of the proposed storage project.

16. Has a water right application been filed for the proposed storage project?

Application not yet made.

Water right application made; permit not yet issued Application #

Permit issued. Application # Permit #

For Questions 17 & 18 answer the following:

(a) Does the proposed storage project impound surface water on a perennial stream?

Yes No Uncertain

(b) Does the proposed storage project divert water from a stream that supports state- or federally-listed sensitive, threatened or endangered fish species?

Yes No Uncertain

(c) Does the proposed storage project divert more than 500 acre-feet of water annually?

Yes No

17. Water Dedicated Instream N/A

For above ground storage projects seeking grant funding: If you answered “yes” to any of the questions posed in a-c above a minimum volume of water equal to at least 25% of the stored water must be dedicated to instream use.

Identify percentage of stored water to be dedicated to instream use.

%

Note: Any storage project dedicating 25% of stored water to instream use will automatically receive a median score in the environmental public benefit category with the opportunity to demonstrate additional environmental benefit to increase the score.

18. Seasonally Varying Flow Prescription

For all storage projects: If you answered “yes” to any of the questions posed in a-c above the project will need a **Seasonally Varying Flow (SVF) Prescription**, determining the duration, timing, frequency and volume of flows (including ecological baseflow), necessary for protection and maintenance of biological, ecological, and physical functions outside of the official irrigation season. The initial step in defining the SVF for the project is to schedule an SVF meeting with OWRD. For assistance and more information please contact Water Resources Grant Administrator Jon Unger at (503) 986-0869.

Identify whether the storage project will need a Seasonally Varying Flow Prescription.

Yes No Uncertain

VI. Environmental Public Benefit for Conservation Projects Dedicating Water Instream (if not a conservation project continue to Section VII)

19. Identify percentage of conserved water to be dedicated to instream use. N/A

100 %

Note: Any project that conserves water and dedicates at least 25% of the conserved water quantity to instream use will automatically receive a median score in the environmental public benefit category with the opportunity to demonstrate additional environmental benefit to increase the score. Water dedicated to instream use must be permanently placed instream and protected by the Oregon Water Resources Department.

VII. Financial Information

For Loan Applicants – Since loan applications do not require cost match, loan applicants who do not offer a cost match need not complete Section A and can disregard the match funding columns in Sections B and C. Budget and costs of key tasks must be identified in sections B & C. Loan applicants will be required to provide additional financial information related to their ability to repay the loan. This request for information will take place after the scoring and ranking process for those projects that are recommended for funding.

For Grant Applicants – Complete Sections A, B and C.

Section A – Cost Match Information

Applicants must demonstrate a minimum 25% funding match based on the total project cost. The match may include: a) applicant funds or secured funding commitment from other sources; b) pending funding commitment from other sources; and/or c) the value of in-kind labor, equipment rental, and materials essential to the project. For secured funding, the applicant must attach a funding award letter from the match funding source that specifically mentions the dollar amount shown in the “Amount/Dollar Value” column. For pending resources, documentation showing a request for the matching funds must accompany the application. Funds expended prior to grant agreement are not reimbursable nor do they qualify for cost match without prior authorization by the Department.

In the Type column below matching funds may include:	In the Status column below matching funds may have the following status:
<ul style="list-style-type: none"> • Cash - Cash is direct expenditures made in support of the feasibility study by the applicant or partner*. 	<ul style="list-style-type: none"> • Secured - Funding commitments already secured from other sources.
<ul style="list-style-type: none"> • In-Kind - The value of in-kind labor, equipment rental and materials essential to the feasibility study provided by the applicant or partner. 	<ul style="list-style-type: none"> • Pending - Pending commitments of funding from other sources. In such instances, Department funding will not be released prior to securing a commitment of the funds from other sources. Pending commitments of the funding must be secured within 12 months from the date of the award.

* “Partner” means a non-governmental or governmental person or entity that has committed funding, expertise, materials, labor, or other assistance to a proposed project planning study. OAR 690-600-0010.

Match Funding Source (if in-kind, briefly describe the nature of the contribution)	Type (✓ One)	Status (✓ One)	Amount/ Dollar Value	Date Match Funds Available (Month/Year)
<i>OWEB</i>	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input checked="" type="checkbox"/> pending	<i>\$1,000,000</i>	<i>October 16</i>
<i>USBR WaterSmart</i>	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input checked="" type="checkbox"/> pending	<i>\$1,000,000</i>	<i>October 16</i>
<i>Tumalo Irrigation District</i>	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	<i>\$107,167</i>	<i>October 16</i>
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		

