

Decision Notice and Finding of No Significant Impact
Special Use Permit: City of Bend Bridge Creek Water Supply System
U.S. Forest Service
Bend/Ft. Rock Ranger District, Deschutes National Forest
Deschutes County, Oregon

Background

When the City of Bend was founded in the early 1900s, its primary source of drinking water was the Deschutes River. However, water quality problems in the river developed in the 1920s and forced the City to purchase the original private water company and investigate alternative water supply sources. That investigation led to the identification of Bridge Creek as a high-quality and reliable source of drinking water. In 1926, the Bridge Creek intake facility and the first pipeline from Bridge Creek into town were constructed. In the 1950s, a second pipeline was constructed. Water storage and treatment facilities were added at the City's Outback site (approximately 3 miles west of town) starting in the 1980s. The original two water supply pipelines now terminate at the Outback site.

The City relies on a dual-source water supply that is comprised of groundwater from the Deschutes Regional Aquifer, and surface water from Tumalo and Bridge Creeks. Each of these water sources provides about one-half of the City's annual water supply. The surface water is the primary source providing year-round water for the City, and is usually the single source of water used by the City in the winter. Increased demands in the summer require that the surface water be supplemented by groundwater during the irrigation system. The City holds secured, senior water rights for both. The City has determined that this dual-source water supply enables it to best satisfy its' obligation to provide a safe and reliable water supply that meets its' citizens' needs for water, while also maximizing the long-term energy efficiency, safety, cost-effectiveness, and operational flexibility of the City's water supply system.

The Bridge Creek surface water is the primary source of the City's dual-source supply, and the planned upgrades respond to the City's additional needs to:

- Address the deteriorating condition of the water supply pipelines that carry approximately 50% of the City's annual municipal water supply from Bridge Creek to a storage and disinfection facility at the City Outback site.
- Comply with Forest Service Manual Guidance to locate utilities within developed corridors or easements and reduce the vulnerability of the City's surface water supply pipelines to substantial damage by wildfire or windstorms.
- Address regulatory and structural deficiencies identified at the City's Bridge Creek intake building.
- Improve environmental conditions and water quality by withdrawing less water from the creek when there is less demand by the City.
- Provide benefits to aquatic habitats and fish through a mitigation plan, as well as providing

for more water to remain in-stream for much of the year throughout over 10 miles of upper Tumalo Creek.

The City proposes to maintain the Bridge Creek intake facility at its existing location in order to:

- Maintain cost-effective gravity-fed conveyance of its surface water supply.
- Minimize risk to water quality from contamination by keeping the intake immediately adjacent to a protected watershed.
- Operate the surface water system under existing, secured water rights.
- Avoid environmental impacts associated with development of a new point of diversion.

The democratically elected representatives of the citizens of Bend have long supported maintaining the dual water supply, and investing in system upgrade and improvements. In November 2010, the Bend City Council passed a resolution (Resolution No. 2814) committing to proceeding with the surface water pipeline replacement project and thereby preserving the dual-source water supply system for the City of Bend. A similar resolution was adopted in March, 2012 (Resolution No. 2867). The City Council reaffirmed this with a vote on a revised version of the 2867 resolution on February 20, 2013 (Resolution No. 2900).

Over the last 30 years, the City has studied the possibility of developing new systems to enhance Bend's public water supply. Most recently, the City completed a Water Supply Alternatives Study (WSAS) in 2009 that analyzed alternatives for water delivery to Bend residents, and also completed a Water System Master Plan Optimization Study in 2011. These studies are available on the City of Bend's website www.bendoregon.gov/surfacewater, under Master Plans and Analyses; and on the Deschutes NF website. The alternatives studied in the WSAS included reinvesting in the existing Bridge creek/Tumalo Creek surface water system, replacing the Bridge Creek/Tumalo Creek supply with groundwater, and replacing the Bridge Creek/Tumalo Creek supply with water from the Deschutes River.

After analyzing multiple variables—including water rights, existing water delivery infrastructure, and long-term energy, construction, and operational costs—the City identified reinvestment in the Bridge Creek/Tumalo Creek water supply and preservation of the dual-source water supply as the lowest-risk, and most economical, sustainable, and reliable long-term water supply option.

The City's existing Bridge Creek intake facility is in very poor condition and does not comply with current state and county standards for building codes, or meet new operational requirements for fish screening or fish passage. The City's existing surface water supply pipelines are also in poor condition and are at risk of failure.

The project is located west of Bend, Oregon, between the City's Bridge Creek Water Intake and Outback Reservoir Site. The proposed new pipeline route primarily follows Forest Service Roads 4601 (Skyliners Road) and FS Road 4603. The proposed pipeline would originate at the City's intake facility located on Bridge Creek approximately 13 miles west of

the city near the Tumalo Falls Overlook parking area and would terminate at the City's Outback Reservoir Site located approximately 1.5 miles west of Bend off of Skyliners Road.

A majority of the proposed project is within existing developed areas (City of Bend's water supply Intake Facility, gravel FS Road 4603, Skyliners Road, a Deschutes County road, and FS Road 4606-100, access to the City's Outback Reservoir Site). Only one short section (approximately 700 feet) of the new pipeline would run through a forested area previously disturbed by the existing pipeline from the intake facility to the western terminus of Forest Service Road 4603.

Purpose and Need for Action

Providing safe and high quality drinking water to communities is one of the original purposes that led to the establishment of the National Forest System. My task is to balance the needs of people that rely on the National Forests for consumptive, recreational, and spiritual purposes, while protecting the natural environment in accordance with the Forest Service's important conservation responsibilities. The **purpose** of the Special Use Permit is to authorize use of National Forest System lands for planned upgrades to the City's existing Bridge Creek intake facility, to replace the City's aging Bridge Creek water supply pipelines, and to authorize operation of the new system while limiting the City to conveying no more water than it uses under the current permit. The Deschutes National Forest Service, in accordance with 36 CFR Part 251, Subpart B, has identified a **need** for action on an application from the City of Bend for issuance of a Forest Service Special Use Permit. Under these regulations, I am to decide whether to approve the proposed uses, approve the proposed uses with modifications, or deny the proposed uses.

Additionally, I believe that the Forest Service has a responsibility to help fulfill Bend's intent to protect the quality, security and efficiency of their dual-source water system insofar as we can do so consistent with our statutory and regulatory conservation duties. In the Resolution No. 2867 cited above, the City included many letters of support for a dual water supply from local irrigation districts, businesses, Economic Development for Central Oregon (EDCO, the tri-county's lead economic development organization for the past 30 years), and several other Oregon water districts. The Tualatin Valley Water District, serving over 200,000 customers, recommended that the City of Bend follow "a strategy involving the use of multiple sources of water" (November 2, 2010). The Eugene Water and Electric Board (EWEB), the largest water provider in the Pacific Northwest relying on a single source of water, urged the City Council to consider the "unquantifiable cost of not being able to provide water reliably in the future" (October 28, 2010).

I also believe that improving the City's water supply system is the right thing to do for Tumalo Creek at this time. The current system relies on out-dated technology that does not use water as efficiently as it would when re-constructed under this action. My decision results in more water remaining in Tumalo Creek above the Tumalo Irrigation District diversion, and it eliminates the potential for water quality effects from sediment-carrying return flow into Tumalo Creek of unused water from the City's Outback facility. Additionally, my decision will benefit fish,

especially sensitive and valuable redband trout by providing mitigation for the fish passage barrier caused by the Bridge Creek diversion.

Some concerned stakeholders believe that the choice that I have is between permitting the re-construction of the City's water system or completely removing the system from NFS lands and Tumalo Creek. This is not true. The No Action Alternative would result in the City continuing to operate as they do today, relying on an aging system that unnecessarily displaces valuable surface water from Tumalo Creek, places the forest and private landowners at increasing risk for damage from a pipe failure, and leaves the City at risk of losing half of their water supply from pipeline or system failure. Indeed, the City has some five years remaining under its existing Special Use Permit to continue operating the current, antiquated system in the same manner as it is doing at present. In addition, pursuant to applicable direction in Forest Service regulations, my task is simply to decide whether or not to grant the permit the City seeks and, if so, whether to modify its terms as may be necessary to protect federal resources, not to assume the municipal government's responsibilities or try to displace the lengthy public processes in which the City has already engaged. I do not believe that doing nothing provides any benefits to Tumalo Creek or the citizens of Bend, and it would be irresponsible of me not to take this opportunity under the illusion that a better outcome is on the table.

While the benefits of the project are small in the scale of the problems of the entire Deschutes Basin, they do improve conditions in Tumalo Creek. And they come at a extremely low environmental cost – installing the pipe under the existing roads causes no lasting impacts to any public or National Forest resource.

Additionally, permitting the re-construction of the water system will allow for enhanced monitoring of flows and water quality that will improve and refine our understanding, which is already quite substantial given the considerable work we have already undertaken in this regard, of the creek and how it is being affected by ongoing and future uses and the land management activities of the Forest Service. It will also provide data that will be useful to the Forest Service as it continues to adaptively manage this important resource well into the future.

Ultimately, the fact remains that the City is currently using an 87 year-old and 59-year old pipe to supply half of the water used by the citizens of Bend. These pipes are showing signs of deterioration and are losing their integrity, as evidenced by pipe lining and tree roots that show up at the Outback Facility (Brown and Caldwell, 2009). Continued reliance on these pipes is a risk to both the City and the National Forest and I believe the responsible course of action is to replace these aging pipes with a single pipeline that allows for better control of water intake and is located in an area that will have less impact to forest resources.

The Deschutes National Forest has long been a leader in the protection and restoration of Tumalo Creek. From instream habitat improvements, to watershed land exchanges, to reducing the risk of wildfire, we have worked with the City, recreationists, conservation groups, residents, and large landowners and water consumers to reverse the impacts on the watershed caused by earlier decades of hard use and inattention. I would direct the attention of all these stakeholders to the north and the example provided by Whychus Creek. Twenty years ago, Whychus Creek had lost its name, its water and its iconic salmon and steelhead. For reasons similar to the situation at

Tumalo Creek, the creek was a dry bed of stones in the summertime where it ran through the town of Sisters. Through the efforts of local citizens, water users, property owners, and local, state, and federal government agencies, the creek has regained its name, streamflows through Sisters approach native norms in the summertime, and the fish are returning from the sea as I write this. These dedicated stakeholders did not spend their energy on litigation or protracted court battles; instead they committed their time to listening to each other, building relationships and working together to achieve their common interest. It is time, and past time to apply this model to Tumalo Creek. The operations permit that I will approve lasts for no more than 20 years. By the time it expires, the City of Bend and its citizens should be able to replicate in Tumalo Creek the success we see to our north and many places elsewhere in the west.

Summary of Decision

Based upon my review of the July, 2013 Special Use Permit - City of Bend - Bridge Creek Water Supply System Revised Environmental Assessment (EA), the administrative record, and many discussions with stakeholders, commenters, and objectors, it is my decision to select the Proposed Action, with modifications, which approves issuance of a Special Use Permit (SUP) to the City of Bend for occupancy and use of National Forest System (NFS) lands for the City's improvements to their Bridge Creek Water Supply System. Actions identified in the EA would not be implemented until the Special Use Permit is signed by both the City and FS consistent with the Special Use permitting regulations. In addition the City is required to notify the public, and obtain Federal, State or local county permits before construction could occur.

This decision addresses the proposal, design criteria, and monitoring. Specifics of the decision are as follows:

- Two Special Use Permits will be issued to the City of Bend (City), with one authorizing use of NFS lands for the construction of a replacement water supply pipeline, and upgrades to the City's Bridge Creek intake facility, and the other authorizing the City to operate the new system. As described in the EA, the City's project consists of the following actions:
 - Water supply pipeline replacement: An approximately 10-mile long, 30-inch diameter pipeline will be installed primarily within the existing roadway corridors.
 - Pipeline will include a flow-control system, including flow measuring devices at both the intake and outflow, allowing the City to adjust diversion rates according to municipal demand and available stream flow/water rights.
 - Pipeline will be comprised of different sections of materials including high-density polyethylene, ductile iron, and steel.
 - Installation will be approximately 3 to 5 feet beneath the surface and deeper in areas where the pipeline is installed under Tumalo Creek or adjacent tributaries.
 - At two locations the pipeline will cross Tumalo Creek; at the upper crossing it will be installed aerially and at the lower crossing it will be installed under the creek at a previously disturbed bridge site.
 - Bridge Creek intake facility upgrades:

- Above-grade portions of the intake building will be replaced to address accessibility, safety, fire protection, thermal performance, energy efficiency, seismic risk, and obsolete mechanical and electrical systems.
- Building will be designed in a manner consistent with the Forest Service's Built Environment Image Guide for the Pacific Northwest.
- Facility will allow the City to monitor diversions and remotely control and shutdown flow at the intake.
- The City will provide, in-lieu of fish passage at the dam, fish habitat improvement mitigation that will meet or exceed the cost/benefit ratio of providing passage at the intake dam.
- The City will install flow meters to provide additional data beyond that which already exists regarding intake flows in the existing pipes, until the new pipes are installed and operational so that I may consider, in the context of adaptive management, whether any minor changes within the scope of the effects analysis in the Bridge Creek EA are warranted in issuing the Operations SUP.
- Upgraded system operations:
 - The City shall be limited by municipal demand, up to a maximum rate of conveyance of 18.2 cfs measured as instantaneously as available technology allows.
 - Flow control will limit diverted flows to match demand, and eliminate return flows from the Outback Site to Tumalo Creek, leaving more water in the creek downstream of the diversion when the City's demand is less than 18.2 cfs.
- Project Design Criteria and Monitoring are included as Appendix A.

Decision Rationale and My Conclusions

In response to an application from the City of Bend for issuance of a Special Use Permit, the Forest Service initiated a review of the proposal consistent with the Special Use permitting regulations found in 36 CFR 251. The new Special Use Permit requested by the City would authorize the replacement of two existing pipelines with a new pipeline. The new pipeline would be built within an existing right-of-way (Skyliners Road and FS Road 4603) for most of its length and therefore would avoid any significant impacts to the environment, and cause far fewer environmental impacts than other alternatives. The City will also reconstruct the existing intake structure, which does not meet current standards, with a new intake facility.

The development of the environmental assessment and this decision address the Forest Service's need for action to respond to the City's application. As described in the EA and in the responses to comments on the EA, the Special Use Permit will allow the City to continue to operate its dual source water supply system in a more efficient and secure manner.

The underlying needs of the City in relation to the Bridge Creek surface water supply are outlined in the EA at section 1-2.

The City relies on a dual-source water supply that is comprised of surface water from Tumalo and Bridge Creeks and groundwater from the Deschutes Regional Aquifer. Each of these water sources provides about one-half of the City's annual water supply. The surface water is the primary source for year-round water for the City, and is the single source of water used by the City in the winter. Increased demands in the summer require that the surface water be supplemented by groundwater during the irrigation season. The City holds water rights for both sources, including a number of senior "certificated" water rights for surface water. After considerable public process and debate, the City, acting through its Council, has determined that its dual-source water supply is best able to satisfy its obligation to provide a safe and reliable water supply that meets its citizens' needs for water while also maximizing the long-term energy efficiency, cost-effectiveness, and operational flexibility of the City's water supply system.

The City has established that it has sufficient proven water rights on Bridge and Tumalo Creeks to make surface water a viable source for Bend into the future. The City's surface water rights are complex, and many of these rights have season of use and annual water use limitations because they were obtained in the early 1900s from irrigation rights that are limited traditionally to the growing season. In addition, several of the surface water rights are subject to regulation at some time during the irrigation season under the Oregon Watermaster's distribution schedule. The City holds surface water rights from Bridge Creek and Tumalo Creeks as shown in Table 2 of the EA.

The City's ability to use these water rights for municipal supply is limited by the water rights' seasons of use and dates of priority, available streamflows, and demands of other Tumalo Creek water users. For example, the City's Certificates 31411 and 31665 and Transfer B-112 allow the use of water only during the irrigation season (generally April 15 to October 15). Further, Tumalo Irrigation District (TID) holds water rights that authorize the use of up to 210 cfs during irrigation season, which can be a large portion of Tumalo Creek flows. To put the current proposal in context, this is more than 10 times the amount of water at issue in the Special Use Permit the City is seeking.

During periods of low flow, usually in the summer and early fall, when there is not sufficient water in Tumalo Creek to satisfy all of the existing water rights, the State of Oregon Watermaster distributes the flow in Tumalo Creek between TID, the City, and in-stream water rights according to a predetermined proportional-share formula based on the rights' priority dates and flow rates. During these periods, the City does not receive water under its 1983 water right, due to its junior priority date, and generally receives less than the maximum authorized rate for its other water rights (except Certificate 85526). See Table 3 of the EA.

As a result, even though the City's surface water rights have a total combined maximum authorized rate of 36.1 cfs, this rate of diversion is typically not available to the City during periods of high water demand, usually in the summer. The water right available to the City varies with creek flow as discussed above. Actual operation authorized by this decision would not exceed 18.2 cfs and can reasonably be expected to be less than that for at least the foreseeable future during substantial parts of the year when the City does not need that much water or its rights are being constrained by water rights distribution. The difference between the creek flow and the City's actual use is the amount of water available to meet TID and in-

stream water needs. Currently in winter, the City uses much less than 18.2 cfs. See Table 4 of the EA.

Though total City water demand during the summer irrigation season exceeds 18.2 cfs, limitations within the new Special Use Permit for the project will limit the maximum diversion to 18.2 cfs, the amount the Oregon Water Resources Department (OWRD) has certified that the City has been diverting and putting to beneficial use on essentially a continual basis under the current system.

Other factors limiting the City's ability to divert their full water rights include:

- Stream flow varies in the creek by time of day, daily, monthly, and seasonally.
- Water rights are managed by OWRD using the system of "prior appropriation". City water rights include a mix of seniority which, at times, limits availability.
- The City's diversion is limited by actual demand up to 18.2 cfs. Currently, during portions of the year, City demand is less than 18.2 cfs.

The Bridge Creek surface water supply is the primary component of the City's dual-source supply, and the planned upgrades to the pipeline that conveys that supply are subject to a Forest Service Special Use Permit respond to the City's need to:

- Address the deteriorating condition of the 1920's and 1950's water supply pipelines that carry approximately 50% of the City's annual municipal water supply from the Bridge Creek intake to a storage and disinfection facility at the City Outback site.
- Comply with Forest Plan direction (LRMP SU-2, SU-7) to locate utilities within developed corridors or easements and reduce the vulnerability of the City's surface water supply pipelines to substantial damage by wildfire or windstorms.
- Address regulatory and structural deficiencies identified at the City's Bridge Creek intake building.

The City proposes to maintain the Bridge Creek intake facility at its existing location in order to:

- Maintain cost-effective gravity-fed conveyance of its surface water supply,
- Minimize risk to water quality from contamination by keeping the intake immediately adjacent to a protected watershed,
- Operate the surface water system under existing, secured water rights, and,
- Avoid environmental impacts associated with development of a new point of diversion.

Of the alternatives considered, the selected alternative best ensures the continuity of a dual-source water supply system for the City, and will produce environmental benefits, ranging from the ability to control the rate of withdrawal based on demand, leaving more water in Tumalo Creek during much of the year, to avoiding the adverse water quality impacts associated with use of the return channel for water the City does not need, as occurs under the current system.

Impacts associated with the selected alternative include:

- Short-term construction impacts to wetlands and waterways.

- Permanent conversion (defined by the Department of State Lands as longer than 24 months) of .071 acres (approximately 3100 square feet) of forested wetland to fully functional emergent wetland because of the removal of nine trees.
- Short-term restrictions to recreation access.
- Short-term disturbance to residents and visitors.
- Loss of portions of the historical character of a building eligible for the National Register of Historic Places.

The selected alternative provides benefits to public health, safety, and natural resources as follows:

- Reliable surface water supply infrastructure with a design life of at least 100 years.
- Substantial reduction of risk of pipeline failure and subsequent interruption of water service, as well as potentially substantial environmental impacts associated with necessary repairs to restore the current system.
- Addition of flow control resulting in more water in the upper reaches of Tumalo Creek.
- Placement of the pipeline in an existing right-of-way (ROW), avoiding construction, maintenance and repair activities in otherwise undisturbed forested lands.
- Provision of fish screens meeting ODFW standards.
- In-lieu mitigation for fish passage at the intake.
- Elimination of the water quality impacts caused by the current sediment-carrying return flow back to Tumalo Creek.
- Addition of water hydrants for fire protection in the Skyliners community.
- Flow, temperature, and trout population monitoring to better understand creek hydrology and biology.

The No Action Alternative carries long-term risk of pipeline failure and resulting disruption to service, and the potential environmental impacts that would occur as a result of the failure and subsequent repair activities.

I have weighed the long- and short-term impacts, risks, and benefits of the selected alternative against the No Action Alternative and have determined that, over the long term, the decision to approve occupancy and use of NFS lands for this project is the prudent choice that best protects the environment and the public interest.

Public Involvement

This action was originally listed as a proposal on the Deschutes National Forest Schedule of Proposed Actions in May 2010, and updated periodically during the analysis. The Forest Service originally issued a decision on this project on July 10, 2012. The project was appealed, the Decision was upheld by the Appeal Deciding Officer, and subsequently a complaint and request for a Temporary Restraining Order was filed in the Federal District Court of Oregon. A Preliminary Injunction was granted, which stopped implementation of the project on October 11, 2012. The decision was subsequently withdrawn on December 17, 2012.

The Forest Service and the City revised the proposal in response to the concerns the Court articulated in its preliminary injunction ruling, as well as others expressed by members of the public. The revised proposal to issue a Special Use Permit allowing the City's revised planned upgrades to its' surface water supply system was provided to the public and other agencies for comment during the NEPA scoping period held between December 18, 2012, and January 22, 2013.

Public and agency outreach was undertaken by the City and Forest Service. These efforts are described in the EA at section 1.8.1. The EA lists agencies and people consulted in the EA at section 4.1 to 4.4.

Pursuant to 36 CFR Part 218, the Forest offered a 30-day public comment period on the project, which began following publication of a legal notice in *The Bulletin* on April 10, 2013. The completed environmental assessment was provided to those who responded to scoping and was made available to the public for download from the Deschutes National Forest's project web page. A notification of the opportunity to comment was mailed to 750 individuals, agencies, and organizations. A total of 39 responses were received from 37 individuals or organizations.

This project is subject to the pre-decisional review and objection process described in 36 CFR 218, Parts A and B. The draft Decision Notice was made available, with the Environmental Assessment and all supporting documents, pursuant to 36 CFR 218.7(6) on July 25, 2013.

Four sets of objections were received on the project. An objection resolution meeting was held on September 24, 2013 where the Objection Reviewing Officer and I met with the objectors to discuss with them their objections and determine if any resolution was possible. Although no objection points were withdrawn by the objectors, we did come to agreement on several points.

First, we agreed to require the City to ensure that the new pipeline would have a device to measure the amount of water it will be diverting. The original design included measuring at the Outback facility only, but the review team, the objectors, and the Forest agreed that measuring at the intake was a reasonable and cost-effective course of action that would provide data to the City and the Forest to give further assurance that the project is functioning within the parameters of the SUP.

Second, we agreed that I would work with the City to determine if it was cost-effective and otherwise feasible to install a meter that could provide additional data regarding the amount of water the City is diverting at the intake of the current pipes. As noted in my decision, the City has agreed to install such a measuring device and the Forest is currently working with the City to get that device operational. This will provide the City and the Forest with data that will bolster the already substantial amount of existing documentation and information already in the record concerning how much water is currently being taken in at Bridge Creek.

More specifically in this context, I would note my determination that the Certificate of Beneficial Use and recent flow measurements and other relevant data in the record are more than ample to support the EA's findings as to the amount of water that the City currently diverts at Bridge Creek. Nevertheless, the new flow meters will provide data to enhance the record, which a few objectors have questioned. In addition, if for some reason the flow meters should indicate that

there is a significant difference from 18.2 cfs in the amount of water the City is diverting under the current system, I may take that into account in issuing the Operations SUP or even amending this decision insofar as it may be necessary or warranted. I should add that I do not reasonably expect this to occur given the substantial reliable and credible documentation and data that already exist in the record concerning this point, in particular the OWRD's Certificate of Beneficial Use. Moreover in this regard, I specifically find that the data to be generated by the new flow meters, while it would undoubtedly be helpful, is not essential to my ability to make a reasoned choice among alternatives such that my final decision needs to await its compilation, consistent with the policy reflected in 40 C.F.R. § 1502.22. But the timeframe between the issuance of the construction permit and the final operations permit provides ample time to collect and assess that data in any event.

Third, we agreed to take out language regarding exceptions for operational limits for exceeding 18.2 cfs.

Fourth, I also agreed to discuss mitigation about fish passage, both with the City and with the objectors. As noted by my decision, the City will provide, in-lieu of fish passage at Bridge Creek, fish habitat improvement mitigation that will meet or exceed the cost/benefit ratio of providing passage at the intake.

Fifth, the Forest also agreed to clarify the difference between the project area and analysis area in the EA. As documented in the response to the objection statements, the project area includes areas where actual ground disturbance will occur, while the analysis area is much larger and includes the Tumalo Creek watershed. Effects are discussed at an even greater scale, and include effects to the Middle Deschutes River, where appropriate.

Sixth, I also agreed to look into compliance with measuring requirements at the point of diversion, in terms of what the Oregon Water Resource Department requires for holders of water rights. No timeline was set for this, but I am committed to looking into this.

Seventh, as part of the objection process, the Reviewing Officer has given me instructions to make minor changes to the EA and response to comments. Her instructions included listing several laws, regulations, and Oregon State statutes in the final EA. In addition, her instructions included minor corrections to the response to comments. These changes have been made in accordance with her instructions, which are detailed in the response to the objector statements.

In sum, I am pleased we were able to work cooperatively to reach agreement on the foregoing points and at least ameliorate some of the objections raised to this decision. While I realize that the objectors' concerns were not all fully resolved, I believe that this decision is necessary to protect the National Forest System lands and is a far more responsible course of action to take than continuing to use deteriorating pipes that risk damaging the natural resources in Tumalo Creek and surrounding public and private lands, and is further supported by the other rationales and environmental analysis in this Decision Notice, the EA, and the administrative record.

Response to Issues

There were two general categories of issues raised during scoping and throughout this analysis. The first group related to the effects of the selected alternative on environmental conditions and resources. This group includes concerns about the presence of bull trout in Tumalo Creek, short and long term construction impacts to wildlife and habitat, and adverse impacts to flows and water quality. These issues defined the analysis in the EA, were used to compare the choice of alternatives, and defined the design criteria and mitigation prescribed in this decision in Appendix A of this DN.

The second group of issues was related to the City of Bend's decision to continue using surface water versus an increased or sole reliance on ground water, questions about the City's actions to determine the probability of pipe failure and the City's response to loss of the pipes, questions about the City's water rights and the actual amounts historically diverted compared to the selected alternative, the City's choices of pipe size, concerns about the costs of the project and the effects on water user rates, the future of the hydropower component, operations of the water treatment facility, and concerns about the City's design and public involvement processes. These issues, while very important for discussion, are outside the scope of actions considered under this NEPA analysis. The City analyzed options prior to submitting a proposal to the Forest Service, including the ground water only alternative, which was dismissed for reasons presented in the Introduction of the EA (Section 1.3 *City Decision to Reinvest in Surface Water*). Our analysis of environmental impacts is focused on the proposal submitted for consideration.

Consideration of Public Comment

Approximately 188 separate comments were grouped into the following categories and the Forest's response is summarized. All responses to comments are included in Appendix C of the Revised EA (October 30, 2013). As noted above, many of these comments were about issues, concerns or recommendations that were outside the scope of the Forest Service analysis and/or decision authority. Even so, responses were made to add to the record and clarify information, assumptions, or conclusions used by either the City or the Forest Service in this analysis.

EIS vs EA

Comment: Commenters said that the Forest Service should have prepared an EIS rather than and EA because of the level of public controversy, and the complexity of the project

Response: Neither public controversy nor complexity create a requirement to do an EIS. An EIS is necessary when the effects to the environment are determined to be significant, as defined by 40 CFR 1508.27, or when the effects are uncertain or difficult to determine or predict. This analysis found no significant effects that would result to resources from the selected alternative, and that the effects are not uncertain or difficult to determine. See the Findings section on page 29 of this document.

Actual amount of current diversions is much less than 18.2 cfs.

Comment: Commenters noted that past City documents have raised questions about the actual amount the existing pipes could divert from Bridge Creek at the point of diversion and assert that past City documents identify a diversion rate of less than 17 cfs. Commenters stated that the FS should verify the amount that the City is currently diverting from the existing pipes by taking measurements at the point of diversion and limit the proposed maximum diversion under this action to that amount. Commenters questioned that the proposed 18.2 cfs operating level of the proposed system is the same as the existing system, stating that there is no credible evidence in the record, however, that the current or historical rate of diversion or "operating capacity" is or was 18.2 cfs.

Response: Past master planning documents were based on theoretical calculations which used the best available pipeline information and best city demand information at the time. Recent studies are based on more current actual measurements, such as the measurements done for the Certificate of Beneficial Use (COBU) for City of Bend Permit # S-49823 and the recent flow measurement by OWRD. These documented measurements performed by licensed professionals are based on actual measured flow rather than theoretical calculated flow.

The City's demand data (water use records) is the City's daily volume of water demand measured in units of million gallons per day. This is the total volume (gallons) of water demand over a 24 hour period. Converting this volume to cfs, which is an instantaneous rate unit, assumes a constant "rate" over the 24-hour day. This simplification does not take into account that the City's municipal demand for water (like other cities) varies over the course of a day, typically spiking in the morning and early evening. The City's instantaneous rate data documents this phenomenon, and documents beneficial use of 18.2 cfs. This data and the data described above are more than sufficient to support the diversion rate baseline of 18.2 cfs incorporated into the EA analysis. In this context, as noted above, I find that the additional data concerning this issue that that will be generated by the new flow meters to be installed in the current system, while useful, clearly is not essential to allowing me to make a reasoned choice among the alternatives and adopt the decision reflected in this notice at this time.

Purpose and Need/ Dual Water Source

Comments: Commenters said that the Forest Service had inaccurately or unclearly stated the risks of a single source water supply system, and the Purpose and Need was unjustified.

Response: The EA, section 1.3.1 describes risks associated with a single-source system. The decision to reinvest in a dual-source system is a City decision. The single-source system was not proposed to the Forest Service under the Special Use permitting process. Not granting approval for this application is described as the No Action Alternative in the EA in section 2.2.1. If I were to decide to take the No Action alternative, the City would continue to withdraw water from the Bridge Creek intake as they do today until the pipes fail or some other action was taken.

The EA provides a discussion of risk of a single-source supply in section 1.3.1. Maintenance of a dual-source system results in lower risk than a single-source system for the City because it provides reliable water service in the face of power failures, system failures, and natural disasters. A dual-source system allows the City to manage two sources in a manner that

considers season, surface flow, and groundwater recharge and minimizes environmental impacts to either source. The City relied on the economic analysis in the record which showed that based on long-term energy trends, an energy dependent system has potential for higher economic impacts to the community. From a sustainability perspective, relying on gravity supply has a smaller carbon footprint than an energy dependent system.

In the context of NEPA and this environmental assessment, “purpose and need” is not defined by the need or avoidance of need of surface water by the City of Bend. The decision to retain and improve the surface water delivery system has been made by the democratically elected representatives of the citizens of Bend. The need for the Forest Service decision here is to review an application for use of National Forest System lands, and to ensure that the proposed activity is consistent with the laws, regulations, and standards and guidelines designed to protect resources for which the Forest Service is responsible, to inform the public of the action and its’ consequences, solicit public comment, and protect the interests of the citizens of the US.

An Environmental Assessment under NEPA is intended to assess, compare, document and present the environmental impacts of federal actions. It is not intended to be a source of comparison of various public opinions about a federal action, or in this case, the actions of a local governing body. The Forest Service is aware of, and has considered the opposition to the City’s proposal. The proposal has been presented to the Forest Service by the democratically elected representatives of the citizens of Bend following their careful consideration and public deliberation.

Because the City Council has affirmed in several votes over the last several years to maintain the dual source water supply system, no alternatives were considered that would abandon the City’s surface water supply.

Condition of existing pipes and need for replacement

Comment: Commenters stated that the EA’s statements on deterioration of the current pipes are not substantiated. Commenters question the EA’s assertion that if one or more of the pipelines fails, that the City will suffer a loss of water service.

Response: In late summer of 2009 City engineers and staff walked the route of the pipelines from the Intake down to the Outback, inspecting the pipe alignment for exposed pipe, evidence of leaks and any other unknown or unusual indications reflecting the existing pipe conditions (WSAS, Chapter 13, 2009). Numerous locations were found where there was evidence of potential leaks and an excessive portion of the pipeline route had trees, some fairly large, growing on top of the pipes. In one area, one pipe was exposed and located at the base of a road fill slope containing large rocks with little to no cover.

As evidenced by the pipe breaks from October of 2012 cited in the EA, it is very probable that these types of failures will occur again and could be larger and more damaging depending on the location of the failures along the pipeline corridor and how long they go undetected. It is possible that with a significant windstorm some large trees could blow over and damage the pipeline(s) in the process of falling where those trees sit right on top of the pipeline, especially if their roots are wrapped around a pipeline.

In addition, in the upper portion of one of the existing pipes the pipe alignment goes through private easements. In some areas, private structures, landscaping and other private property encroach on or near the pipe. To maintain the easement, significant private property clearing of trees and structures would be required. These easements have not been maintained by the City, nor does the Forest Service have any authority or responsibility for these private land easements.

Following the pipeline assessment, Brown and Caldwell included in their report (WSAS, 2009) several additional alternatives of pipeline repair to the alternative of total pipeline replacement. However, due to the state of the pipelines as assessed from the site walk, the opportunity to replace the pipelines with a new pipeline within Skyliners Road before the reconstruction of that road by Deschutes County, combined with the infrastructure value of the main water supply source pipelines to the City of Bend and the risk associated with keeping the old pipes, the decision was made by the City to replace the older pipelines with a new single pipe in the Skyliners roadway corridor.

The City of Bend has repeatedly expressed commitment to the dual source water system, most recently in February, 2013 with their Resolution 2900. The City utilizes surface water from Bridge Creek as its base supply for meeting demand and uses wells to meet peak demands. The assumption that the City can satisfy all of its needs from groundwater wells only is not supported in the studies that have been done. The City did an extensive and comprehensive analysis of the entirety of its water system in the Optimatics Master Plan Update Report (February 2011). The study found that under emergency operating conditions, which the City is required to be in a position to serve, there is inadequate groundwater to meet the projected emergency needs. This is due to the City's use of the aquifer as emergency storage for fire flow. Under fire flow conditions the City lacks adequate above ground storage and requires both the existing above ground storage and the reliable groundwater available of 9 million gallons per day (MGD). Furthermore, this is complicated by the fact that not all pressure zones within the city have the ability to be served by all wells. It is the combination of storage, surface water, and groundwater that allows the City to meet the demands in all zones. The report also found that the City saves substantial amounts of money annually by not being completely dependent on wells. This reduction in well usage reduces the energy consumed by the City and substantially reduces the City's carbon footprint by not being completely dependent on power to pump deep water wells.

Range of Alternatives - Alternatives Not Considered in Detail

Single Pipe Alternative

Comments: Commenters said that the Forest Service should have analyzed in detail an alternative where the City could avoid the new pipeline project by relying on just the existing 1950's pipe.

Response: The Forest Service rejected the single pipe alternative during the initial screening process based on previous analysis done by the City. See Response to Comments for further detail.

Short Pipe/ Downstream diversion

Comments: Commenters said that a short pipe alternative with a diversion farther downstream should have been fully considered because it meets the Purpose and Need, and because it leaves water in the creek for a longer distance. Alternatives were suggested for general locations from 10 miles to 1 mile upstream of the Outback Site, and one particular location at the Rd 4606 crossing of Tumalo Creek.

Response: The Forest took a hard look at the short pipe alternative during the initial screening process but rejected it for several reasons. The Short Pipe alternative is discussed in the EA in section 2.1.2, Alternatives Considered and Dismissed from Detailed Study. The primary reasons for rejection were to remain consistent with Forest Service policy to locate utilities within existing utility or road corridors whenever possible, and the complications associated with locating the diversion point on private land, or crossing private land to deliver water and power between the new diversion site and the Outback site.

In the Brown and Caldwell Water System Alternative Study (WSAS, 2009) the City considered moving its point of diversion to a river intake pump station near the Outback site (*pump station alternative*). The location was not specified, but for the purposes of this analysis the potential sites to be considered on NFS lands are limited to the area in T18S, R11E, southeast corner of section 33, where FS Road 4606 crosses Tumalo Creek just upstream of the west end of Shevlin Park. There is no other NFS land along the creek within about 2 miles of this site, except that upstream of this site the north side is NFS lands and the south side is private. From the pumping station, pipe could be run under the road for approximately one mile to the Outback facility.

During public review and comment, a number of commenters suggested that the diversion and intake be moved from Bridge Creek east to a downstream location on Tumalo Creek, again to an unspecified location (*short pipe alternative*). Any diversion site must be at a high enough elevation on the creek to allow for gravity flow of water down to the Outback Site. A pipe running from this conceptual new diversion must traverse the canyon slope at slightly less downhill grade than the creek, until it can exit the canyon at a point with sufficient elevation to provide downstream drop to the Outback site. This limits the potential diversion location to approximately T18S, R11E, east quarter of section 6 and west half of section 5.

These alternatives have been suggested because they would reduce the length of the pipeline, reduce pipe material costs, allow water to remain in a longer reach of Tumalo Creek, and present higher opportunity for the City to approach their full water rights due to higher flows that would be available at a lower point of diversion.

The benefit of a short pipe alternative would be retention of up to a maximum of 18.2 cfs during some portions of the year in somewhere between approximately 5 and 9 miles of Tumalo Creek, depending on the location of a new diversion and the time of year. Flows to Reach B and the Middle Deschutes would not be increased by this alternative as flows would continue to be diverted as they are now by Tumalo Irrigation District (TID).

Groundwater only Alternative

Comments: Commenters took issue with virtually all aspects of the City's decision to maintain a dual source system. Commenters thought the EA should have considered a groundwater-only alternative.

Response: The Forest Service did not analyze the groundwater alternative in detail because it did not meet the Purpose and Need to maintain a dual-source water system. Also, a groundwater alternative is outside the scope of any decision the Forest Service can make here because all infrastructure for wells is off NFS lands. There is no decision that the Forest Service can make in this proceeding that would force or compel the City to go to a groundwater only system. Providing water and other infrastructure are solely decisions of the citizens of the City as made by the democratically elected representatives of the citizens of Bend on the City Council. Not granting a permit for upgrading the surface water system would not force the City to turn to groundwater only because the City could continue to use the existing pipelines until they ultimately fail, continue to repair the pipelines in place, or continue to use the pipelines until they are beyond repair. The environmental impacts and the response of the City if a permit is not granted are addressed by the No Action alternative.

No Action Alternative

Comments: Commenters said that the No Action Alternative was not adequately assessed because it did not use “natural” conditions as the baseline from which to measure change; commenters said that the No Action Alternative was the same as a Groundwater only alternative, and should be assessed as such; commenters said that the No Action alternative was deficient because it only partially analyzed some foreseeable events.

Response: The no action alternative is best represented by current conditions, including the City’s current system that has been in place now for decades and the diversion of water occurring under that system pursuant to an existing permit not due to expire for five more years - not the environmental conditions that may have been in existence prior to the beginning of diversions in the 1920’s. If the no action alternative used the pre-1920s’ as a baseline, then the analysis would then need to assume what other factors existed in the 1920s’ - such as population levels, land uses, water demand, water rights prevalent at that time, etc. However, those conditions no longer exist, and using 1920s’ as a baseline condition does not provide any useful information to the decision maker. The Forest Service did in fact consider pre-diversion native flows in the creek to establish a basis for measurement of impacts, but the effects analysis is appropriately based on the change between the current existing condition and the outcomes of the alternatives analyzed in detail.

The No Action Alternative is not the same as a groundwater only alternative because the City could and would continue to use the existing diversion and pipeline. A ground water only alternative would stop the water diversion from Tumalo Creek entirely, and require development of a replacement supply of municipal water. This alternative was considered and rejected by the City before they proposed the present upgrades. This alternative is outside the scope of the EA because it is not a course of action that could be authorized by the Forest Service because all of the infrastructure would be off NFS lands and would not meet the Purpose and Need.

Water Quantity and Flows

Comments: Commenters said the EA inadequately evaluated flows and the effects on water temperatures in Tumalo Creek and the Middle Deschutes River.

Response: In the EA section 3.7.4, the effects of the selected alternative were compared to both the existing condition as well as calculated native flow conditions. Although quantitative temperature modeling of native flow conditions was performed, a qualitative discussion of the inverse relationship of flow and temperature in the Tumalo system indicates that increased stream flow (that would occur if the City ceased to withdraw water from the Tumalo Creek watershed) would likely result in cooler stream temperatures.

EA section 3.7.5.2 Summary of Effects to Water Quality

- **Sub-reach A1:** With the Proposed Action, stream temperatures will decrease for all flow regimes associated with municipal diversion rates of less than the existing 18.2 cfs. Any effects to sedimentation and turbidity through the implementation of the Proposed Action would be very small to non-existent in magnitude and duration during system installation.
- **Sub-reach A2:** Effects to stream temperature are expected to be very small (if measurable) with the implementation of the Proposed Action. Effects to sedimentation and turbidity will improve with the abandonment of return flows through the channel from the Outback facility.
- **Reach B:** Effects to stream temperature are expected to be very small (nearly immeasurable) with the implementation of the Proposed Action. There are no expected effects to sedimentation and turbidity.
- **Reach C (Middle Deschutes River):** There will be no effects to temperature, sediment, or turbidity with implementation of the Proposed Action.

Water Rights

Comments: Commenters disagreed with the EA's assessment of risk to the City from shifting water rights from surface to groundwater. Commenters suggested that the City's water rights at the source springs were being managed illegally.

Response: The commenter's dismissal of the regulatory risks of a groundwater only system in the Deschutes Basin is not shared by the City or other water rights experts. No water right application is guaranteed to succeed. On its face, obtaining new groundwater rights holds more risk than the continued development of an existing water right. Citizens may disagree with City Council about the magnitude of the risk. Several City Councils over the years have weighed this risk and discussed this with experts and have made the same policy decision on this issue. The City ultimately assumes this risk (not the Forest Service) and the City has evaluated the risk with assistance from expert water rights consultants and legal counsel.

The source springs and diversion are covered by a Forest Service SUP that expires in 2019. The City is not proposing any modifications to its source spring complex diversion structures and this area is outside the boundaries of the area affected by the project for the purposes of this EA. Management of the source springs is outside the scope of this analysis because the decision to be made is limited to issuing an SUP for the improvements to the intake and pipeline. In addition,

regulation of the City's water use is under the jurisdiction of the Oregon Water Resources Department (OWRD), (see Oregon Revised Statutes (ORS) chapters 536, 537 and 540) and the agency is fully aware of how the City operates its surface water system.

Fish and Hydrology analysis is inadequate

Comments: Commenters stated that there is an inadequate baseline of information where the EA relies on flow data from 1923 to 1987. The use of the 1923-1987 data as a baseline is inappropriate where it misses the past 25 years of information on stream flows and temperatures. There are at least two drought cycles in the 1990s and 2000s which were not utilized in the EA's assessment of historical patterns. Commenters claimed that the Forest Service applied the Heat Source model only to the period of July 19 to August 7, and did not try to apply it to analyze impacts at other times of the year. Commenters claimed that EA's analysis using the Heat Source data reveals that there is still a violation of state water quality standards (no degradation in excess of .3° C). Commenters claim that the projection of increased consumption of water will have a particular impact below where the City currently returns water from the Outback Facility to Tumalo Creek, and the EA includes no analysis of the impacts on fisheries habitat from increased demand and the resulting decreased flows in Tumalo Creek. Commenters claim that the EA repeatedly fails to address impacts specifically associated with "fall/winter low flow periods" when the project is likely to have significant impacts on Tumalo Creek. Commenters state that the EA only assesses impacts of low flows during warm periods, and it does not do so for low flow scenarios or at low temperatures where trout may be killed or macro invertebrate food cycles could be disrupted.

Response: The hydrologic data set referred to that spans 1923-1987 represents the longest, most complete, and accurate data set available for Tumalo Creek, and therefore the best baseline information available for flows in Tumalo Creek. As explained in the EA (EA, Fish and Hydrology Report, Appendix D), the data for Tumalo Creek after 1987 is intermittent and does not accurately capture the flow of Tumalo Creek until the new gauge was installed in 2011. Within the 1923-1987 dataset, there exist several drought cycles that match or exceed the drought cycles of the 1990s and 2000s. These include drought cycles in the 1970s, 1960s, and the 1930s. The 1930s drought cycle is the most sustained drought cycle in Central Oregon since 1455 and corresponds to the drought cycle that gave rise to the Dust Bowl (Pohl et al, 2002). Through the use of that dataset, and the flow exceedance analysis, we were able to analyze the environmental effects through a range of flow scenarios including serious drought conditions that exceed the conditions referred to in the last 25 years.

Temperature data for Tumalo Creek was for the years from 1995 through 2009 and included more recent monitoring data from the City taken in 2010-2012. The EA, Fish and Hydrology Report, Appendix R, portrays temperature data from 2012 that includes the efforts for flow restoration by TID and the in-stream leasing program.

The 2013 use of the Heat Source model for analyzing the potential effects to stream temperature between the proposed and existing water system was properly executed as substantiated by resource and modeling experts within the USFS and Oregon DEQ, including Sherri Johnson, Ph.D,

a senior research scientist in hydrology and ecology for the Forest Service's Pacific Northwest Research Laboratory, and Dan Turner, Senior Water Quality Analyst for the Oregon DEQ. The model was properly calibrated, and the range of scenarios chosen to model the potential effects to temperature were adequate to capture a range of conditions from wet years to drought years that would occur outside the period of July 19 to August 7, and also included the exact conditions that occurred during the calibration period.

While previous model runs included the manipulation of multiple variables and increased the run time to cover a longer period of analysis, the 2013 modeling effort contained the modeling manipulations to changes in stream flow. Both are reasonable approaches to modeling stream temperature. The latter retains more of the observed conditions for the period of calibration. By manipulating the flow variable we were able to effectively simulate a range of in-stream flow and diversion scenarios for the existing and proposed water systems that mimic the water distribution/management scenarios (based on water rights) that are governed by OWRD and include municipal use, irrigation, and minimum in-stream flows. The assumptions and limitations that went into the model are discussed in the EA (pp. 96, 119-124), in the letter of direction to HDR modelers, and in the HDR Technical Memorandum (2013).

The temperature limits for changes from anthropogenic sources (0.3°C) referred to here and in OAR 340-041-0028 do not apply to Tumalo Creek because it (A) does not have threatened or endangered salmonids currently inhabiting the creek; (B) has not been designated as critical habitat; and (C) colder water is not necessary to ensure that downstream temperatures achieve and maintain compliance with the applicable temperature criteria (OAR 340-41-0028 (11)(c)). This rule applies to waters that currently remain colder than the biologically based numeric criteria throughout the summer; where salmon, steelhead or bull trout are present; and waters not designated for salmon and steelhead spawning use (ODEQ, 2008).

Operation of the return flow from Outback is explained in the EA at section 3.7.4. Water in excess of demand is returned to the stream at this point (start of Sub-reach A2). As demand increases, less water will be returned to the stream. The ability of the new system would allow the diversion rate to match demand, resulting in more instream flow throughout Sub-reach A1 (EA at section 3.7.4.2, page 106.) In-stream flow rates in Sub-reach A2 (below Outback Facility return flow) will not change as a result of operations of the proposed water system, but instead are a reflection of increased demand (EA, section 3.7.4.2, pp 109, 151), which would occur under either alternative. Identical to No Action, any changes to redband trout habitat based on stream flow in Sub-reach A2 would be a function of increasing municipal water demand (EA, page 151).

Assessment of redband trout habitat utilized the Physical Habitat Simulation model (PHABSIM), the most widely accepted and applied fish habitat model in Oregon and the USA (EA, section 3.7.6, page 128). In addition, the assessment included a Channel Response analysis, which compares differences for wetted perimeter, change in water depth, mean depths, and mean velocities between the two alternatives. Also, an assessment of trout habitat using base flows was completed for both alternatives (EA, section 3.7.6.2).

Results of the PHABSIM modeling are given on a monthly basis, including the fall and winter

months. The selected alternative would result in at least as much, and at times more, instream flow throughout Sub-reach A1 than what occurs under the No Action alternative, including the fall and winter months (EA, page 140). This means stream flow, whether considered on an instantaneous, daily, monthly, or annual basis, would not decrease, but would remain the same or increase under the selected alternative.

Stream flow would be the same for both alternatives in Sub-reach A2 and B for all months (EA, page 109), therefore available redband habitat would not differ between the two alternatives, other than benefits to habitat under the Proposed Action with elimination of the return flow and largely reducing the likelihood of adverse effects from a pipeline failure scenario (EA, page 156, 162).

Within Sub-reach A1, the Proposed Action would have neutral or beneficial effects to redband trout habitat to all 3 life stages, including the fall and winter months (EA, tables 30-36, 39-41, and 44-46). The greatest benefit would be to adult habitat in the winter months when demand is less than the maximum amount of conveyance. During the winter, the largest benefit to instream flow would occur when existing use patterns would return flows to approximately 90% of native flow (EA, page 107 and Table 21). With increased stream flow in Sub-reach A1 under the Proposed Action, some habitat decreases were modeled for the spawning and juvenile life stages due to increased velocities, mostly within Sub-reach A1-RR Lower (EA, Tables 34-36).

Impacts to Fish and Wildlife

Comments: Commenters said that the EA failed to adequately address impacts to the Middle Deschutes River; commenters challenged the findings of the EA regarding the potential impacts on the future possibility of reintroducing bull trout; commenters said the EA failed to address the importance of, and the impacts to, native redband trout in Tumalo Creek.

Response: The study area for the Tumalo Creek Instream Flow Study (HDR Tech Memo, 2013), extended below Tumalo Irrigation Districts' (TID) diversion, down to the confluence of the Deschutes River. Empirical and modeled findings from the Instream Flow Study indicated that there would be no changes to flows, fish habitat or channel process within Reach B of Tumalo Creek resulting from the selected alternative, as discussed above. Therefore, there are no downstream effects on fish habitat or channel processes on the Deschutes River due to the selected alternative.

Tumalo Creek provides a median value of 15-percent and average of 28-percent of the flow of the middle Deschutes River. Modeled maximum water temperatures impacts in Tumalo Creek would not be measureable in the middle Deschutes River and were not assessed further.

ODFW has no current plans to manage for bull trout in Tumalo Creek, and would only manage for bull trout in the event that USFWS decided to reintroduce bull trout into the Upper Deschutes as part of a recovery action for the species and Tumalo Creek was within the reintroduction area.

In an April 27, 2012 letter to the Forest Service, the US Fish and Wildlife Service (USFWS) confirmed that a 2011 bull trout survey performed by the Forest Service on Tumalo Creek using 2002 American Fisheries Society (AFS) protocol did not find any bull trout in Tumalo Creek.

USFWS has concurred that the selected alternative would have no effect on bull trout critical habitat (CH), since the closest CH is 28 miles downstream, and starts below Big Falls on the Deschutes River. The USFWS did not indicate in their April 27 letter that they had current or foreseeable plans to manage Tumalo Creek for bull trout. The current Draft Bull Trout Recovery Plan (2002) states that a feasibility study would need to be done on the Deschutes Core Habitat, which includes Tumalo Creek, before any plans would be made to reintroduce bull trout into Tumalo Creek. The draft recovery plan does not list Tumalo Creek as suitable habitat, nor does it specifically identify Tumalo Creek as suitable for reintroduction.

The EA at section 3.7.7.1 notes that the redband trout is a sensitive species in the Pacific Northwest Region of the Forest Service and a sensitive species (vulnerable) in the State of Oregon.

The impacts to redband trout habitat for the selected alternative are discussed in detail by sub-reach in the Aquatic Habitat and Channel Morphology sections of the EA at section 3.7.6.2. Modeling of habitat found that the changes vary by sub-reach, life stage, and stream flow. During operations of the system, the selected alternative would have predominantly neutral effects or improved redband trout habitat conditions compared to the No Action alternative. When diversion rates are less than 18.2 cfs, the additional stream flow would benefit habitat for redband trout, with the adult life stage having the greatest benefit. During operations, no measurable effects are expected in channel morphology with the selected alternative.

In Sub-reach A2, Reaches B and C, the selected alternative would largely reduce the likelihood of pipe failure and the potential adverse impacts to redband trout habitat and channel morphology. During operations, there would be no difference between the selected alternative and the No Action as stream flow would be identical.

Effects to redband trout populations for the selected alternative are discussed in the EA at section 3.7.7.2. The Biological Evaluation concluded that the selected alternative “May Impact Individuals or Habitat, but will not likely contribute to a trend toward federal listing” (EA page 159). The “May Impact” finding is because pipeline installation at the creek crossing would have short term impacts to redband trout and their habitat.

Impacts to redband trout in Tumalo Creek from non-native fish are discussed within the Fisheries Section of the EA at section 3.7.7.2.

The EA addresses the effects to northern spotted owls at section 3.8.3. The Biological Evaluation (EA at section 3.8.2) concluded that the selected alternative “may affect, and is not likely to adversely affect” spotted owls and their habitat. The “may effect” finding is because approximately 0.3 acres of dispersal habitat would be disturbed. The USFWS concurred with this finding.

Impacts to Recreation and Tumalo Falls

Comments: Commenters said that the EA should consider how the project would affect Tumalo Falls and recreation opportunities downstream through Shevlin and Tumalo State Parks.

Response: Impacts to recreation are addressed in the EA at section 3.5.3. There is no evidence that any recreational activities that now occur – fishing, floating playing in the water, viewing birds and wildlife, or scenic quality would be changed or adversely affected. The City’s water rights primarily originate in springs on Tumalo Creek, which is diverted and conveyed to Bridge Creek before it reaches Tumalo Falls. No changes are proposed to the diversion at the springs. This project (the issuance of a SUP for pipe and intake improvements) does not affect Tumalo Falls. Flows at Tumalo Falls will remain as they are today, and have been since approximately 1957.

Risk and Impacts of Fire

Comments: Commenters said the EA fails to adequately address issues associated with wildfire; commenters said the EA does not address the risk of relying on surface water which will eventually be impacted by a wildfire.

Response: The risk of fire and the likely impacts to vegetation and water quality are well documented in the record (Tumalo Creek Watershed Analysis, 2008). Risks of wildfire occurring in the watershed exists the same for any alternative available for consideration in this EA. The risk of adverse effects to the water system increase incrementally as the size of the area above any diversion point is increased; the area of potential effect is increased as the potential diversion point is moved downstream. The existence of risk does not alter the Purpose and Need for the project, nor does it inform the decision.

The results of a wildfire in the watershed would impact water quality particularly during snow melt runoff period. During these periods, it may be possible to run at a reduced rate or shut the surface water system down completely since it would occur at a time outside the peak City water demand. Outside of the snow melt runoff period, water quality would be less impacted since most of the water discharges from a spring and is transported through a channel.

Climate Change

Comments: Commenters said the EA did not provide an adequate assessment of the effects of climate change on water availability and stream flows.

Response: The analysis presented is consistent with Forest Service direction for addressing climate change as provided in *Climate Change Considerations in Project Level NEPA Analysis* (USFS, 2009). The Forest Service takes the issue of climate change very seriously as it has the potential to affect nearly every resource area and every geographic area for which we have responsibility. There is consensus that there will be change, but there is no consensus in the scientific community regarding what that change will look like, how local weather will respond to global changes, nor how local vegetation and waters will react to local weather and seasonal changes. Effects of climate change on steam flow and water quality are discussed at section 3.10.3.4.

The use of stream flow predictions as a result of climate change modeled for Tumalo Creek by

Wegner et al. (2010) was considered in the analysis. However, Tumalo Creek is located within a zone of high base flow index (BFI). These are areas of high groundwater influence on runoff. As is stated repeatedly in Wegner's document, the predicted and measured flows in these areas are heavily skewed and result in poor predictions for stream flow. Because positive quantitative predictions are not attainable in this area, we discussed the potential effects of climate change on stream flow in qualitative terms.

Also, the suggested changes in mean stream flow offered by Wenger are for the 2040s and 2080s. The life of this special use permit is no more than 20 years. During this time, stream flow and climatological monitoring will give us a better idea of the true effects of climate change on stream flow in Tumalo Creek. The additional monitoring as described in the EA with the selected alternative is intended to provide information on flow, temperature, and fisheries so that if a trend toward adverse effects to any of the those components are detected (whether from the City's use, or climate change), management adjustments can be made to avoid detrimental impacts. The current water allocation to the City is already being managed by OWRD through a proportional distribution of water to water right holders based on current in-stream flow. This accounts for stream flow variations as a result of individual runoff events, annual variability, as well as long term climate change.

Cumulative Effects

Comments: Commenters said that the EA failed to assess all past actions, particularly water use and the original diversion and the original flows and habitat in Tumalo Creek

Response: The rationale for the cumulative effects analysis used in this EA is found in section 3.1. Cumulative effects to streamflow are discussed at section 3.7.6. This analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

The cumulative effects analysis in this EA does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the selected alternative or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignores the important residual effects of past natural events, which may contribute to cumulative effects as much as human actions.

By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. Finally, the Council on Environmental Quality issued an interpretive memorandum on

June 24, 2005 regarding analysis of past actions, which states, “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.”

The cumulative effects analysis in this EA is also consistent with Forest Service National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f)) (July 24, 2008), which state, in part:

“CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision making (40 CFR 1508.7).

Ability of the Forest Service to regulate the City’s diversion, and use of pipe size to regulate the amount of diversions.

Comment: Commenters said that the EA cites no legal authority to restrict use of new 30” pipe to 18.2 cfs. Commenters stated that if Bend does elect to increase diversions of water from the Creek, it can potentially do so without the future involvement of the Forest Service. Commenters stated that unless the FS revises the SUP conditions to mandate a pipe size that allows no more than 18.2 cfs to be diverted at the Bridge Creek intake structure, the FS should analyze the effect of withdrawing the full amount of surface water allowed under the City’s existing permits and certificates. Commenters believed that it is very likely that the City will divert water in excess of 18.2 cfs to perfect their currently unperfected rights.

Response: The Forest Service can and will condition the Operations Special Use Permit restricting use of the new pipeline to 18.2 cfs. The regulations governing the use of National Forest lands are found in 36 CFR, Section 251, Subpart B. Here, in its Special Use Permit application, the City has voluntarily limited its ability to divert water through the water supply pipeline to a flow of 18.2 cfs, even though the City possesses water rights in excess of that amount. If the City eventually chose to seek to divert more than the 18.2 cfs this present permit will authorize (which it has given no indication at this time that it intends to do), it would have to apply for a new, or amended, permit that would be subject to additional NEPA analysis and opportunities for public involvement. In addition, the Forest Service is well within its legal rights to limit the City’s use of the pipeline to a flow of 18.2 cfs. The City acknowledges the Forest Service’s ability both to limit the use of the pipeline and enforce the terms of its SUP limiting the flow of water in the pipeline to 18.2 cfs. The Forest Service cannot assume that a municipality would do something to violate its permit conditions, and the City has certainly

given no indication that it intends to do so here.

It is important to note in this context the distinction between the City's water rights, which the Forest Service lacks any legal authority to establish or impair, and the City's exercise of those rights through use of the upgraded pipeline system it seeks to construct and operate by its permit application across National Forest System lands. Regarding the latter, the Forest Service acknowledges that it can condition such uses in the course of permitting them, at least where it finds that doing so is necessary to comply with federal law or protect against the degradation of federal resources. As my findings establish, the limitation to 18.2 cfs in the Operations SUP I approve in this Decision Notice is clearly consistent with these objectives.

The current proposed design of 30-inch nominal size (28.25-inches internal diameter) is the correct size for this project based on projected flow velocities of between 4 and 6 feet per second. Pipe size was determined by engineering experts in the industry of municipal transmission pipeline design and was also supported in the finding of the VE Study (VE, 2011). It is not recognized or recommended by pipeline professionals to use pipe diameter to restrict flow. Rather, common practice in pipe design is to use valves to restrict flow since this provides much better control of flow, and extends the life of the pipe with lower velocities.

Velocities are only one factor when determining pipe sizing in design. Another related factor is the risk of hydraulic surge due to sudden valve closure or failure. In pipe line design typically the higher the velocity, the higher the risk for surge. The potential for surge is reduced with lower velocity of water flow. Higher velocity conditions associated with a smaller diameter would require slower valve closure and longer closure times. This would create water management and operations issues and increase containment costs at the Outback site. Due to the remote nature of the Bend pipeline and challenging access during severe winter weather, a lower risk of surge is a benefit to the project.

The 30" nominal size (28.25" internal diameter) is at the lower limit for safety of workers entering the pipe. This includes workers welding and lining during pipe initial construction, as well as pipe inspectors and repair workers needing to enter the pipe following initial construction. With smaller diameter pipe, it may not be possible or safe for workers to enter and patch the lining, potentially requiring the use of special equipment for this purpose.

Monitoring of diversions will be through gages at and below the City's intake facility at Bridge Creek. The gaging data will be available to the public, and the City will be required to file diversion records with the Forest Service. If the City is unable to meet the terms of the permit, the Forest Service can suspend or terminate the permit.

The issue raised regarding possible future diversions above the 18.2 cfs requested in the City's SUP application is based on speculation; an increase in the amount of water conveyed through the pipeline is not reasonably foreseeable. Before the City could ask for or would seek an increase in the rate of conveyance of water through the pipeline, three conditions would need to be in place.

First, the City's overall demand for water will need to justify the additional diversion of surface water. At this time it is not possible to determine with any degree of certainty when overall demand would increase to such an extent that additional surface water would be needed to meet the City's needs. As the EA establishes, the City's needs are met for the next twenty years by the diversion of 18.2 cfs, which will occur only as demand increases and surface water is used operationally to meet that municipal need during the twenty-year period. In future years, assuming population grows as projected, the 18.2 cfs would be reached when the water is available under the water rights, but even then potentially not in peak demand summer months if water use is curtailed, as a result of limitations imposed by OWRD ('distribution due to low flows).

Second, as described in the EA at section 1.4, the City's ability to withdraw surface water up to 36 cfs (the maximum combined authorized rate of diversion in the City's existing water rights) is severely limited by restrictions within the water right, streamflow conditions and use by senior water right holders. Withdrawal beyond 18.2 cfs is limited by the fact that much of the additional water use is authorized by "junior" rights. These rights are subject to regulation by the State of Oregon watermaster according to their relative priority within the system and an established distribution schedule created by the watermaster. Thus, the City can only withdraw that additional water if the City's water use is not regulated to meet the demands of the more "senior" water rights. Also, several of the City's rights are limited by the season of use. Three of the City's water rights were originally irrigation rights and limit water use to the irrigation season (generally April 15 to October 15). The City has water rights authorizing the diversion of up to only 21.0 cfs year-round. Further, the City's water use is subject to annual volume limits. Therefore, any environmental effects of future diversions beyond the scope of the SUP are not reasonably foreseeable and do not constitute direct, indirect or cumulative effects that must be analyzed in the EA for the current project.

Finally, and most importantly, before the City could convey more than 18.2 cfs through the pipeline, it must first apply for and be granted a new Special Use Permit from the Forest Service. This request for a new SUP would trigger a new NEPA analysis, including new temperature and habitat modeling, an assessment of the anticipated restoration of flows on the river by other users such as irrigation districts, temperature and flow requirements, etc. For this new SUP, the Forest Service must also take into account any changes or new listings under the Endangered Species Act, Forest Service policy such as INFISH, as well as any issues arising under the Clean Water Act. It is simply not possible that any future request by the City to amend or replace the current requested SUP in order to increase the amount of water conveyed through the pipeline will escape a new round of environmental review by the Forest Service.

Commentators premise their allegations that the EA is deficient, and that the Forest Service should require a smaller pipe on an incorrect assumption that the Forest Service cannot impose a flow restriction on the City's use of the pipe. This assumption is incorrect as a matter of law and fact. It is undisputed that the City's application itself limits the use of the pipe to a flow of 18.2 cfs. This limitation is designed to reduce and mitigate any environmental impacts resulting from the use of the new pipeline. The Forest Service has ample authority under FLPMA to impose and enforce an 18.2 cfs limitation on the City's use of the pipe.

Impacts to wetlands

Comment: Commenters stated that the EA's assessment of riparian and wetlands impacts from construction is not adequate. Commenters believe that there will be a significant impact on the riparian area from diversions, not only at a consumption level of 18.2 cfs but at what the commenters believe is the foreseeable consumption rates of 21 cfs and above.

Response: The new pipeline will travel through wetlands between the existing Intake structure and the Tumalo Falls parking lot. In this area special construction techniques are required by the USFS Revegetation Plan, which has been reviewed and approved by Oregon Department of State Lands. The excavation and pipe installation through these wetland areas are required to follow rigid protocols for excavating soil layers, placing the pipe, and replacing the excavated materials above the pipe zone in the layered order it was removed. Additionally, within the pipe trench there will be concrete 'trench plugs'. These three foot long, full trench depth, blocks of concrete are located on either side of, and through wetland areas, and have the purpose of preventing water from moving out of the wetland via the pipe trench, essentially isolating the pipe trench from the existing wetlands and their associated flows.

At the Lower Tumalo Creek Bridge site, the pipe will be located under the creek bed of Tumalo Creek on the downstream side of the bridge. The pipe will be placed deep enough to allow for a 12 inch thick concrete cap to be placed over the pipe through the entire stream width extending through the entire associated wetland and stream embankment area so as to totally isolate the pipe and pipe trench from the river flows and associated wetlands. Preconstruction surveys of the stream cross sections will be done through the pipe trench area before and after construction to confirm that the replacement of stream bed materials matches the original stream bed grades.

Two wetland areas to be affected by the construction of the new pipeline were identified by Department of State Lands (DSL) as falling under the DSL definition of permanently impacted wetland. DSL considers tree removal in a wetland to be a permanent conversion from a forested to an emergent wetland because the canopy cover provided by the mature trees cannot be replaced within two years (new trees will be planted and other riparian vegetation restored, see the Revegetation Plan). The project would remove a total of nine trees over 6" dbh in the two wetlands. One area just south of the Tumalo Falls parking lot area is 0.031 acres. The second area near the lower Tumalo Creek crossing on the north side of Tumalo Creek is 0.04 acres. The total area of these two wetland areas, from DSL permit dated September 20, 2013, Permit #50575-RF is 0.071 acres.

Because these areas would still function hydrologically and ecologically as wetlands, albeit emergent rather than forested wetlands, the Forest Service considers these to be temporary impacts, (EA at section 3.7.17.2). Installation of the new pipeline as described under the Proposed Action would have short term (<2 years) impacts to riparian areas associated with Tumalo Creek. Less than 0.3 acres of wetlands would be disturbed out of approximately 865 acres in the project area (EA, Table 47). The operation of the system under the Proposed Action would have neutral or minimal beneficial effects to riparian areas compared to the No Action alternative (EA at section 3.7.8.2).

Finding of No Significant Impact

After considering the effects of the actions analyzed, in terms of context and intensity, I find that these actions will not have a significant impact on the quality of the human environment. Therefore, an environmental impact statement will not be prepared. Sufficient information has been disclosed in the analysis to make a reasoned choice among alternatives.

In terms of context, the proposed project disturbs approximately 121 acres of land, which constitutes 0.012% of the 1 million acre Bend/Ft. Rock Ranger District, and 0.007% of the 1.8 million acre Deschutes National Forest. Thus, in terms of context, the effects are limited in scope and scale to the local area and are not significant.

An analysis of the direct, indirect, and cumulative effects of the planned resource activities indicated that the combined effects do not result in a significant impact on soil, water or any renewable forest resources. Based on the analysis, I expect only short duration adverse impacts and long-term favorable impacts from implementation of Alternative 2. All adverse impacts are limited in scope and intensity and can be considered minor. This determination is based on the mitigation measures (Appendix A) designed into the selected alternative and the following factors:

1. Impacts may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that, on balance, the effect will be beneficial. Consideration of the intensity of environmental effects is not biased by beneficial effects of the action. Beneficial and adverse direct, indirect and cumulative environmental impacts discussed in the EA have been disclosed within the appropriate context and intensity. No significant effects on the human environment have been identified. There will be no significant direct, indirect, or cumulative effects to soil, water, fish, wildlife resources, inventoried roadless areas, wilderness areas, sensitive plant areas, stands of trees that display late or old characteristics, or other components of the environment (EA Chapter 3.0).
2. The degree to which the selected alternative affects public health or safety. There will be no significant effects on public health and safety because public health and safety will only be minimally affected over a short term by the proposed project. Short term safety hazards such as heavy equipment operations and falling trees near roads will be mitigated through contract safety provisions (EA section 2.2.2.1).
3. Unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas. There will be no significant effects on unique characteristics of the area, because, other than the wetlands, there are no other unique characteristics present within the project area. Impacts to wetlands are considered to be temporary by the Forest Service because they will be less than 2 years in duration or only conversions of forested wetland to emergent wetland. While I recognize that the Division of State Lands considers these to be 'permanent' impacts because the lost canopy cover will not be recovered within two years, the areas will still function as wetlands. The amount of wetland "permanently" converted is less than .071 acres, or approximately 0.008% of the 865 acres of wetland in the project area.

4. The effects of implementation of this decision do not rise to the level of scientific controversy as defined by the Council on Environmental Quality (EA Chapter 3.0). The effects on the quality of the human environment are not likely to be highly controversial. I have reviewed the information provided by the objectors regarding our use of the Heat Source model. The model has undergone scientific review and was found to be the best available model for predicting potential impacts to stream temperature. As such, there is no known credible scientific controversy over the impacts of the selected alternative.
5. The Agency has considerable experience with actions like the one proposed. The analysis shows the effects are not uncertain, and do not involve unique or unknown risk (EA Chapter 3.0). The City of Bend has operated the existing pipeline and intake facility for decades. Pipes have been repaired and replaced across the forest. Installation of pipelines or other infrastructures has occurred previously on the Forest and I am confident that our experience in implementing these other infrastructure projects will help us ensure that this project is successfully implemented.
6. This action does not establish a precedent for future actions with significant effects, or represents a decision in principle about a future consideration. Any future management action within the project area or related to the permitted action would be evaluated to determine significance. Future projects would require site-specific analysis and decisions. Specifically, if the City of Bend desired to divert more than 18.2 cfs of water through the pipe, a new analysis under NEPA would need to be initiated, and a new decision would need to be made.
7. This decision is made with consideration of past, present, and reasonably foreseeable future actions on National Forest and other ownerships within potentially affected areas which could have a cumulatively significant effect on the quality of the human or natural environment. After examining other past, present and future projects, I find there to be no such cumulative significance from implementing this project. (EA section 3.1.2.).
8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed, or eligible for listing, in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources. Even though substantial modifications are proposed, the action will have no significant adverse effect on the historic intake structure which is eligible for inclusion on the National Register of Historic Places, because via the Memorandum of Agreement between the Forest Service and the SHPO, the historic value of the intake structure would be maintained through documentation of the structure using the Historic American Building Survey/Historic American Engineering Record (HABS/HAER) forms. The cultural report prepared for the intake building is available on the City's project website and has been provided to the University of Oregon Libraries, the State Historical Society, and the Deschutes County Historic Society, where it is available to the public. (EA, section 3.6.4.2).
9. The biological evaluations for the area indicates that the proposed project will have no significant adverse impacts on any proposed, endangered, sensitive or threatened plant or animal species (EA: Botany section 3.3.1, Fish section 3.7.7.2, Wildlife section 3.8.2). Should any endangered or threatened species be found during the implementation of the

project, the environmental analysis and ESA consultation will be reviewed and revised. No bull trout exist in the project area. Affects to redband trout have been assessed and found not to be significant. As documented below, the Oregon spotted frog does not occur in the area and as such, will not be impacted.

10. This decision is in compliance with relevant federal, state and local laws, regulations and requirements designed for the protection of the environment (EA Chapter 3.0). Effects from this action meet or exceed state air quality and water standards. Prior to construction, as required in the Special Use Permit, the City of Bend is required to obtain all necessary federal, state and local permits.

Findings Required by Other Laws and Regulations

National Forest Management Act

This decision is consistent with the Deschutes National Forest Land and Resource Management Plan, as amended. The project was designed in conformance with specific direction for the Scenic Views Management Area. Project design criteria incorporated into the selected alternative ensure the modified intake facilities are consistent with the Built Environment Image Guide. The buried pipeline would have no long-term adverse effects to scenic resources (EA section 3.2.4.2.).

Northwest Forest Plan (NWFP): The selected alternative complies with standards and guidelines for actions within Administratively Withdrawn and Matrix land allocations. The selected alternative was also assessed for compliance with the Aquatic Conservation Strategy (ACS), and is found to maintain the nine Aquatic Conservation Strategy Objectives (EA section 3.7.9.).

Aquatic Conservation Strategy Objectives Compliance (USDA, Forest Service, Northwest Forest Plan, 1994)

The Aquatic Conservation Strategy is a component of the Northwest Forest Plan and was developed to restore and maintain the ecological health of watersheds and aquatic systems contained within them on public lands. The Aquatic Conservation Strategy Objectives were developed to manage land use activities to approach a goal of maintaining the natural disturbance regime. The approach seeks to prevent further degradation and restore habitat over broad landscapes. Each of the nine objectives is addressed in detail below.

Bridge Creek from the intake to the junction with Tumalo Creek (0.2 miles distance) and Tumalo Creek from the junction with Bridge Creek at river mile 16.0 downstream to river mile 10 are within lands managed under the NWFP. Drainages upstream of the project area within the Tumalo Creek watershed are also within lands managed under the NWFP.

ACS Objective 1: Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Within the Tumalo Creek watershed, the potential effects of the selected alternative are limited to the location of pipeline alignment and instream flows of Tumalo Creek within a 16.0 mile area, and 0.2 miles within Bridge Creek. Approximately 6.0 miles of Tumalo Creek within the project area is on lands managed under the NWFP. Nearly 10 miles of pipeline would be buried having only short-term impacts (<2 years) to soils, upland vegetation, riparian vegetation, and streams. Approximately half of the pipeline route is located on lands managed under the NWFP. There would be no impact to the distribution, diversity, and complexity of landscape-scale features such as timber stands, landslide-prone areas, sensitive soils, stream networks, or wildlife habitats from installing the pipeline. The Proposed Action will either result in the same stream flow or increased stream flow in Tumalo Creek compared to the existing condition throughout the project area because of flow control, therefore not impacting watershed and landscape-scale features. Minimal effects in the watershed are limited to the stream environment and immediately adjacent stream margins, such as an increase in wetted perimeter and stream depth with increased stream flow in Sub-reach A1. The Proposed Action meets this objective at the local and watershed scales as watershed and landscape-scale features are maintained, and aquatic systems are protected.

ACS Objective 2: Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands, upsweep areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Drainage network connections are not impacted by the Proposed Action. Installation of the pipeline would have only short term (<2 years) impacts to small areas (0.273 acres) of floodplains and wetlands. The increase in stream flow in Sub-reach A1 resulting from implementing the Proposed Action results in minimal but likely immeasurable benefits to wetlands and the ability of Tumalo Creek to access its floodplain (EA sections 3.7.6 and 3.7.8). Routes critical for fulfilling life history requirements of aquatic and riparian-dependent species are not affected. The Proposed Action meets this objective at the local and watershed scales as network connections for species are provided.

ACS Objective 3: Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

The pipeline installation would have only short term impacts (< 2 years) to approximately 50 lineal feet of stream bank of Tumalo Creek. Re-vegetation of the banks would ensure long-term integrity of the disturbed area. The stream crossing near Skyliners Bridge would disturb approximately 220 lineal feet across wetlands and the stream bed, of which approximately 40 feet is stream bed. Approximately 500 ft² of the streambed would be impacted during the pipeline installation, but would be restored to pre-project conditions after installation. Impacts such as water re-routing, gravel displacement, downstream sedimentation, and turbidity would be short term (< 1 month). The streambed features of Tumalo Creek would not be impacted by the small increase in stream flow in Sub-reach A1 as the ability of the stream to carry bedload would not be measurably affected as described in the EA section 3.7.6. The Proposed Action meets this objective at the local and watershed scales by maintaining the physical integrity of the aquatic system.

ACS Objective 4: Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

During pipeline installation at the Tumalo Creek crossing, there would be occasional short term (<1 day) increases in turbidity and sedimentation over the course of approximately 1 month, but would be within the range frequently experienced during high flow events. There would be no long term impacts (> 1 month) to water quality from pipeline installation.

As discussed under the Water Quality section of the EA, the ODEQ's Heat Source model was used to analyze potential thermal regimes along Tumalo Creek for Operations under the Proposed Action. Projected diversion rates for the City of Bend during average flow years would be held to approximately 15 cfs during the hottest part of the year when in water rights distribution. Operation of the new water system was shown in the ODEQ Heat Source modeling to slightly cool water temperatures in Sub-reach A1, which includes federal lands managed under the NWFP, based on the 7 day maximum temperature. Within Sub-reach A2 and Reach B downstream of lands managed under the NWFP and not located on federal lands, the modeling for both the Proposed Action and the No Action Alternative showed a slight increase in the 7 day maximum at low flows, even though stream flow would be increased through Sub-reach A1 in the Proposed Action. The relative differences in effects to temperature related to return flows versus cooler upstream flows are too small to be measurable with available technology.

Notwithstanding the potential for a very small increase in water temperature within the micro-scale of a particular sub-reach reflected in modeling results, the increase at issue is so small as to be effectively immeasurable and within the margin of error. Moreover, the experts within the Forest Service question the reliability of these results for purposes of projecting actual expected effects, particularly because the model is not designed principally for that purpose, but rather to allow for a relative comparison of effects among alternatives. Nevertheless, and more important for purposes of this analysis, at the much more relevant and meaningful site-specific scale to consider in analyzing these effects of the entire length of the affected stream, our analysis shows that there will be overall improvement to stream temperatures and a reduction in water quality impacts caused by turbidity from the Proposed Action, even accounting for the modeling results in the particular subreach in question. Finally, it needs to be remembered that the most appropriate scale for evaluating compliance with ACS objectives is the watershed, and it is beyond dispute that the Proposed Action will not retard or prevent attainment of this objective at this scale, either.

The Proposed Action maintains this objective as water quality remains within a range that maintains the biological, physical, and chemical integrity of the system. The Proposed Action takes restorative action on water temperatures within Sub-reach A1 by increasing instream flow through Sub-reach A1 during the hottest months of the year when demand is less than maximum capacity or when in water rights distribution.

ACS Objective 5: Maintain and restore the sediment regime under which aquatic

ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

The single site of pipeline installation under Tumalo Creek would result in short-term (intermittent over approximately 1 month) sediment inputs to Tumalo Creek, primarily when the stream is re-watered after the stream crossing construction is completed. The volume of sediment entrained would likely be less than 1-2 cubic yards and the character, rate, and volume would not be outside the range seen during high flow events. Operation of the new water system would often result in more stream flow in Sub-reach A1. This was shown in the Channel Morphology section (3.7.6) to not adversely impact the ability of the stream to transport and store sediment. Bankfull stage water elevations in Sub-reach A1 are increased minimally under the Proposed Action. This objective is met at the local and watershed scales as the input, storage, and transport of sediment is maintained.

ACS Objective 6: Maintain and restore in-stream flows sufficient to create and restore riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration and spatial distribution of peak, high, and low flows must be protected.

The pipeline installation affects instream flows only during the fall-winter construction periods that would last for several weeks. At this time, instream flows would be at times increased over existing conditions as the diversion at Bridge Creek would temporarily cease. Operation of the new system would often result in more stream flow than existing conditions. The increase in flows was shown to have negligible effects to sediment routing, wetted perimeter, wetland inundation, and bankfull discharge. The increase in flows is not expected to have measurable impacts to nutrient and wood routing. There would be minimal increases in the magnitude, duration, and spatial distribution of peak, high, and low flows, as more water is returned instream. The Proposed Action, by restoring some stream flow to 0.2 miles of Bridge Creek and over 10 miles of Tumalo Creek, meets this objective at the local and watershed scales. Riparian, aquatic, and wetland habitats are maintained or enhanced and the potential for newly created habitats is increased. There are no adverse effects to riparian, wetland, or aquatic habitats.

ACS Objective 7: Maintain and restore timing, variability, and duration of flood plain inundation and water table elevation in meadows and wetlands.

The pipeline installation would temporarily affect this objective during the fall-winter construction period lasting several weeks when instream flow would be increased, potentially slightly increasing water table elevations in meadows and wetlands late in the year. No adverse effects are expected during this time. Operation of the new system would minimally increase bankfull stage elevations, therefore minimally increasing water table elevations in meadows and wetlands as described in section 3.7.8. The ability of Tumalo Creek to access floodplains would be minimally increased, as bankfull and higher flows would be slightly higher. This objective is met at the local and watershed scales by the Proposed Action as floodplain inundation and water table elevations are maintained.

ACS Objective 8: Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distribution of coarse woody

debris sufficient to sustain physical complexity and stability.

The pipeline installation would temporarily impact (< 2 years) riparian vegetation at the 6 small wetlands impacted by pipeline installation, including the single under-stream crossing of Tumalo Creek. Within the six small wetlands, a total of less than 0.3 acres would be impacted. Within two years, the riparian vegetation is expected to be re-established. Operation of the new water system, which at times results in higher flows in Sub-reach A1 than the existing system, will have minimal effects to riparian vegetation. This objective is met by the Proposed Action at the local and watershed scales as the species composition and structural diversity of riparian and wetland vegetation would be maintained.

ACS Objective 9: Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

Pipeline installation would temporarily (< 2 years) impact less than 0.3 acres of wetland which supports habitat for riparian plants, invertebrates, and vertebrates. In addition, the Division of State Lands determined there would be a permanent conversion of a total of 0.071 acres of palustrine forested wetland to palustrine emergent wetland, as 9 trees over 6" in diameter would be removed. These 0.071 acres would retain wetland characteristics of having saturated soils and supporting native wetland plant, invertebrate, and vertebrate riparian-dependent species. The only change is in the amount of canopy cover, as replacement trees will not provide the same amount of canopy cover within two years. There is no loss of wetlands or waters of the United States. There would be no long-term impacts (> 2 years) to habitat for native plants, invertebrates, and vertebrate riparian-dependent species. Operation of the new system, with increased stream flow, would have minimal effects to native riparian vegetation. This objective is met by the Proposed Action at the local and watershed scales as habitat supporting invertebrates, native plants, and riparian-dependent species is maintained.

ACS Summary

The Proposed Action of the Bridge Creek Water Supply Project would maintain the 9 objectives of the Aquatic Conservation Strategy. Installation of the pipeline would have minimal short term effects (range of 1 day to < 2 years) to aquatic systems and riparian areas. Impacted soils and riparian areas would be restored. Operation of the new water system would provide some benefits to the aquatic system under the Proposed Action compared to the existing system due to the ability to match demand with flow through control at the intake structure. The Proposed Action restores some stream flow to 0.2 miles of Bridge Creek and over 10 miles of Tumalo Creek, including 6.0 miles managed under the NWFP. The overall ecological health of the aquatic system within the project area would be maintained.

Survey and Manage

I have reviewed the NEPA document for the Bridge Creek Water Supply System Project and have determined it is consistent with the Deschutes National Forest Land and Resource Management Plan as amended by the 2001 *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (2001 ROD) because it appropriately applied the species list and direction from the 2001 ROD (Table 1-1, Standards and Guidelines, pages 41-51).

INFISH:

The project was evaluated for consistency with Riparian Management Objectives (pool frequency, water temperature, large woody debris, and width/depth ratio). The selected alternative is consistent with direction in INFISH because it will not retard or prevent the attainment of the RMOs (EA section 3.7.9.).

National Historic Preservation Act:

Archaeological field investigations have been completed for the project area of effect. Per the Memorandum of Agreement between the Forest Service and SHPO, effects to the historic Bridge Creek Intake Facility have been mitigated through documentation of the structure. No other NRHP-eligible prehistoric sites are located with the area of potential effect. The project is compliant with Section 106 of the NHPA.

National Environmental Policy Act:

NEPA establishes the format and content requirements of environmental analysis and documentation as well as requirements for public involvement and disclosure. The entire process of preparing this environmental assessment was undertaken to comply with NEPA.

Clean Water Act:

The City's project would result in short-term (temporary) impacts to federally protected wetlands and waters of the state and is subject to regulations under Section 404 and Section 401 of the Clean Water Act, which is promulgated by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency (EPA), respectively. EPA has delegated Section 401 authority to the Oregon Department of Environmental Quality. Water quality, storm water discharge, and temporary fill and removal permits will be by obtained by the City prior to issuance of the special use permit. The following permits are applicable to this project:

- U.S. Army Corps of Engineers Section 404 Permit
- Oregon Department of State Lands Removal Fill Permit
- Oregon Department of Environmental Quality Section 401 Water Quality Certification
- Oregon Department of Environmental Quality NPDES 1200-C Permit
- Oregon Department of Environmental Quality Water Pollution Control Facility (WPCF) Permit

Monitoring and evaluation of the implementation and effectiveness of Forest Plan standards and guidelines and Best Management Practices (BMP) will occur as described in Section 3.7, Fisheries and Watershed. The selected alternative is expected to meet all applicable State of Oregon water quality standards.

Endangered Species Act:

Biological assessments and evaluations were prepared for plants, wildlife, and fish to document potential effects to species listed or proposed for listing as threatened or endangered under the Endangered Species Act (EA Botany section 3.3.1, Fish section 3.7.7.2, Wildlife section 3.8.2). The project meets Project Design Criteria of the 2010-2013 Joint Aquatic and Terrestrial Programmatic Biological Assessment. Appropriate consultation with the U.S. Fish and Wildlife Service has been completed. The selected alternative is determined to "may affect, and is not likely to adversely affect" the northern spotted owl and their habitat. The USFWS has concurred with this finding. The Biological Evaluation for bull trout concluded that the selected alternative

would have “NO Effect” to bull trout or its critical habitat. The USFWS concurred with this finding. The Biological Evaluation concluded there would be “No Effect” to Middle Columbia River steelhead or its critical habitat. There would be no effect to any other listed species.

Oregon Spotted Frog:

In the Biological Evaluation for the “Improving the City of Bend’s Bridge Creek Water Supply System” Project (dated June 6, 2013), the Oregon spotted frog was listed as a Candidate Species. This frog species has never been observed within Tumalo Creek, but, potential habitat occurs within the Tumalo Creek system between the upper and lower bridges, but not at the specific areas where the pipes would cross the creek.

On August 29, 2013, the United States Fish and wildlife Service (USFWS) listed the Oregon spotted frog as “Proposed” for listing as a threatened species under the Endangered Species Act. Along with this, 68,192 acres of critical habitat was proposed to be designated throughout Washington and Oregon. The listing of this species as “Proposed” does not change the effects to this species from the project. Critical habitat does not occur within or adjacent to the project area. The closest critical habitat unit is the Upper Deschutes River Unit, which begins below Wickiup Dam on the Deschutes River and ends in Bend, Oregon. Tumalo Creek enters the Deschutes River below Bend, over 5 miles from the project area. Potential habitat would not be affected by construction of the pipeline.

The Oregon spotted frog is the most aquatic native frog in the Pacific Northwest. It is almost always found in or near a perennial body of water that includes zones of shallow water and abundant emergent or floating aquatic plants, which the frogs use for basking and escape cover (Leonard et al. 1993, Corkran and Thoms 1996, McAllister and Leonard 1997, Pearl 1997, Pearl 1999). Oregon spotted frogs seem to prefer fairly large, warm marshes (approximate minimum size of 4 hectares (9 acres)) that can support a large enough population to persist despite high predation rates (Hayes 1994) and sporadic reproductive failures. Large concentrations of Oregon spotted frogs have been found in areas with the following characteristics: (1) the presence of good breeding and overwintering sites connected by year-round water; (2) reliable water levels that maintain depth throughout the period between oviposition and metamorphosis; and (3) the absence of introduced predators, especially warm-water game fish and bullfrogs (United States Fish and Wildlife Service [USFWS] 2013). Within the project area, potential habitat for this species would be in side channels that occur along Tumalo Creek or within the many spring channels that flow into Tumalo Creek between the upper and lower bridge crossings.


Implementation Date

In accordance with the regulation at 36 CFR 218.12(b), my decision, the final EA and the response to comments address and respond to the written instructions of the Objection Reviewing Officer. Implementation of this project is expected to begin in fall, 2013 and be completed in the late fall of 2014. The Special Use Permit for construction of the waterline is being issued to the City concurrent with this Decision Notice. Prior to beginning

implementation, the City is required to provide at least one month notice to the public about potential traffic impacts on Skyliners Road. The permit consists of three phases over time, each of which will require written authorization by the Forest Service prior to implementation. Consistent with the description of the activities set forth and authorized by this Decision Notice, a final operations and maintenance permit will be issued at a later date once construction is completed or within a matter of weeks of being completed.

Contact

The Responsible Official is John Allen, Forest Supervisor, Deschutes National Forest. A copy of the Environmental Assessment and Decision Notice and/or additional information can be obtained by contacting Rod Bonacker at the Bend/Fort Rock Ranger District, 63095 Deschutes Market Rd, Bend, OR 97701, 541-480-3915, or by emailing him at rbonacker@fs.fed.us.


JOHN ALLEN
Forest Supervisor

11-4-13

Date

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Appendix A. Design Criteria for the Selected Alternative

Discipline	Design Criteria/Resource Protection Measure
<p>Scenic Resources</p>	<ul style="list-style-type: none"> • The proposed upgrades to the City's Bridge Creek intake building will reflect a rustic-style Cascadian design as presented in the Forest Service Built Environment Image Guide. This is a traditional and crafted form of architecture that uses native materials such as timber posts, a lava rock or stone base, and a steeper roof pitch, especially in areas with heavy snow. The City's intake building modifications will incorporate the following elements: <ul style="list-style-type: none"> ➤ Exterior veneer shall be comprised of (or very closely resemble) Montana Black Diamond natural stone ➤ Exterior light over main entrance door to intake building must be placed symmetrically over the door ➤ Windows are to be aluminum-clad with a rustic exterior finish, with a style that responds to direction in the Forest Service Built Environment Guide (Cascadian Style) ➤ Roof girders and outrigger will be wood or steel that is painted in a wood-toned color ➤ All exterior wall panels will be cementations fiber panel, and they will be painted brown • The City will minimize tree removal and incorporate large vegetation into the final site design to the extent possible. Where stumps must remain, they will be flush-cut to be removed from view. • Slash generated from construction activities will be removed from the site as soon as possible given chosen method (chip, burn or removal) or burning if conditions are safe.
<p>Noxious Weeds and Unwanted Vegetation</p>	<ul style="list-style-type: none"> • All project-related equipment will be cleaned before entering National Forest System lands to remove mud, dirt, and plant parts before entering National Forest System lands. • Weeds located within or immediately adjacent to the project will be treated prior to project initiation. • All fill material brought into the project area will be examined by the District Botanist or her designee for the presence of invasive plants. • The City of Bend will be responsible for monitoring and treatment of weeds within the project area for a period of 3 years after project construction is completed. The monitoring and treatment period will commence the first growing season after completion of work. The City will consult with the Bend-Fort Rock Ranger District Weed Coordinator as to where the known weed sites are, what treatment method is appropriate for each site, what herbicides are approved for use, and proper reporting of herbicide use. • The City will send monitoring/treatment reports to the District Weed Coordinator by August 31 of each year that the City is responsible for weed monitoring and treatment.

Discipline	Design Criteria/Resource Protection Measure
Historic Structures	<ul style="list-style-type: none"> Under the selected alternative, there would be substantial alterations to the above-grade portions of the Bridge Creek Intake building, which is eligible for nomination to the National Register of Historic Places (NRHP). Resolution of adverse effects under Section 106 will be advanced under the selected alternative. Resolution of these effects is included in a Memorandum of Agreement (MOA) with the SHPO and includes Historic American Building Survey/Historic American Engineering Record (HABS/HAER) surveys and documentation and the Cultural Report prepared for the intake building to be submitted to the University of Oregon Libraries, the State Historical Society, and the Deschutes County Historical Society. This documentation must also be made accessible to the public on the City's project website throughout project construction.

Discipline	Design Criteria/Resource Protection Measure
Recreation Resources, Access, and Public Safety	<ul style="list-style-type: none"> • The City will sign the area 1 month prior to project implementation to alert the public of construction start dates. Warning signs and public notices will be posted during project activities to alert the public in advance about expected road delays and closures and trail access changes. • The City will schedule construction activities to provide access to the Tumalo Falls Recreation Area and all major trailheads along Skyliners Road and Forest Service Road 4603 during the peak visitor period. The peak visitor period for the project area starts on Memorial Day and ends on Labor Day. • The City will maintain proper trailhead directional and approach signage along Skyliners Road and Forest Road 4603 throughout pipeline installation work. • Pipeline installation along Forest Road 4603 will require full road closure. This segment of the project will be completed in the shortest timeframe possible and will be conducted outside the peak visitor period. During the peak visitor period, parking will be maintained at the Tumalo Falls Trailhead, and access along the full length of Forest Service Road 4603 will be maintained. • The City will reconstruct and restore the Farewell Trailhead to pre-construction condition at a minimum in a manner agreed upon in advance with the Forest Service. • As pipeline and intake building construction is completed, the City will restore pre-construction contours and grades wherever possible and will stabilize soils in a manner and on a schedule that is agreed upon in advance with the Forest Service. The Forest Service will revegetate disturbed areas. • The City will coordinate construction activities to maintain access to Skyliners Lodge, Skyliners Trailhead, and all other trailheads accessed from Skyliners Lodge. Trailhead parking that is displaced from Skyliners Trailhead may be relocated between the trailhead and Road 430, but parking near Skyliners Trailhead will be made available during construction. • The City will install signage during Forest Road 4603 closures to make it clear to the public that the road is temporarily closed to all access and uses. • Access to Skyliners Subdivision will be maintained throughout all phases of construction. The City will set up a communication protocol with Skyliners residents so that they are effectively kept apprised of anticipated delays and are aware of when construction might affect driveway access. The communication protocol will include a contact at the city to report speeding or other safety issues related to construction. • If Western Federal Land's Skyliners Road Improvement project construction occurs during pipeline installation along Skyliners Road, the City will work closely with Western Federal Lands and the County to minimize delays and lane closures along Skyliners Road.

Discipline	Design Criteria/Resource Protection Measure
Wildlife	<ul style="list-style-type: none"> • To assure that suitable NRF habitat is remaining vacant, or becomes occupied by a pair of northern spotted owls, yearly monitoring for northern spotted owls will occur in NRF habitat every year within ¼ mile of Skyliners Road (starting in 2013) until construction in this area is complete. If spotted owls are discovered nesting within any of these particular stands, pipeline construction and road construction would be seasonally restricted beginning from March 1 to September 30. • Any sizeable downed log that must be removed during construction will be placed back as close as possible to its original position. • Historic nest sites for goshawk, Cooper's and Sharp-shinned hawks will be surveyed during the breeding season prior to construction to determine if nests are active. • Disturbing activities (such as tree removal, grubbing, rock crushing, blasting, etc.) shall not be conducted within ¼ mile and/or line of sight from any active nest of the following species during the listed periods. Distance increases to 1 mile for blasting. <ul style="list-style-type: none"> ➤ Northern goshawk March 1 – August 31 ➤ Cooper's hawk April 15 – August 31 ➤ Sharp-shinned hawk April 15 – August 31. • The City will immediately coordinate with the District Wildlife Biologist if any of these accipiter species are detected during project activities. • If, for presently unanticipated constraints or construction delays, restriction periods specified above must be compromised, conduct project activity at the end of the period (the last month) as least likely to cause nest abandonment. • Construction of the pipeline between the water intake building and the lower bridge crossing should not begin until after September 1 to reduce impacts to potential nesting birds and potentially after September 15 for roosting bats. • Conduct summer surveys for roosting bats to determine the potential use of the upper and lower Tumalo Creek bridges and the water intake building. If necessary, restrict project activities to occur at these sites after September 15 when bats may be proceeding to winter hibernacula sites. Also if necessary, utilize appropriate exclusion techniques at the water intake building to be assured that no bats are still roosting at the site. If bats are discovered during dismantling of the building, work must stop immediately. • Conduct pre-activity surveys during the spring and summer to determine if western bumblebees are present within the project area. If it is found that this species does occur, potential loss of individual western bumblebees would be reduced if project activities associated with pipe construction between the water intake facility and the first bridge crossing occurred in late September to mid-October when the bumblebees may be dying off and the queens have not found a place to hibernate yet. • While working in the pipeline corridor adjacent to the Tumalo Falls Trailhead parking area, limit tree-clearing activities to within construction clearing limits as agreed upon by the Forest Service. The City will, to the extent possible, work around trees >20 inches dbh to minimize impacts to Williamson's sapsucker, brown creeper, and hermit thrush nesting and foraging habitat.

Discipline	Design Criteria/Resource Protection Measure
	<ul style="list-style-type: none"> • The City will minimize clearing limits for pipeline installation along Skyliners Road to reduce the number of trees and shrubs removed and retain these habitat constituents for chipping sparrows and other birds. • The City will implement Best Management Practices for all ground-disturbing activities. • To the extent possible, the City will maintain riparian vegetation excavated for pipeline placement on site and will place it back on disturbed areas post-construction. • The City will restore original grade and contours to disturbed areas wherever possible. The City will stabilize disturbed areas as work is completed in a manner agreed upon by the Forest Service. • The Forest Service will re-vegetate disturbed areas with native vegetation sourced from on site. • The Forest Service will monitor re-vegetated areas for survival of wetland vegetation for 2 years and continue re-vegetation if needed. • The Forest Service will re-vegetate disturbed areas with native vegetation sourced from onsite. • To avoid potential nest abandonment, nest destruction, and loss of broods for focal bird species, within or immediately adjacent to the project area, limit felling of trees and removing brush during the period April 15 – July 15. Implement activities where possible during the late summer, fall, winter, and early spring (August through March). <i>If the specified restriction period must be compromised, project activity at the beginning of the period (within the first month) or the end of the period (within the last month) is preferred.</i> If these activities could be done during these time periods, impacts such as disturbance and abandonment of nests or even nest destruction would be reduced.

Discipline	Design Criteria/Resource Protection Measure
Soil Resources	<ul style="list-style-type: none"> • The City will implement appropriate design elements for avoiding or reducing the disturbance footprint to only that which is needed. • The City will minimize the extent of new soil disturbance from mechanical treatment. • The City will prepare an erosion-control plan prior to construction and will apply appropriate erosion-control measures to all ground-disturbing activities associated with the construction and development of new facilities. • The City will, to the extent possible, refrain from excavation work during major rain events, periods of high surface runoff, or rain-on-snow events. Exceptions would be made to accommodate completing work in sensitive areas as expeditiously as possible. The City will use appropriate Best Management Practices when working in sensitive areas (slopes, wetlands, and riparian areas) to minimize soil erosion and disturbance. • The City will, where appropriate, use swales and vegetated filtering structures placed at key drainage pathways to dissipate runoff from project construction areas. • The City will maintain road and parking surfaces and drainage structures so that they remain functional at dispersing runoff adequately. • For non-paved road and parking areas, the City will treat surfaces during construction to minimize the generation of dust, particularly during the dry season. • The City will restore areas to their original elevation and contours wherever possible and will stabilize soils immediately after construction in a manner agreed upon by the Forest Service. The Forest Service will revegetate disturbed areas with native vegetation. • The City will use mulch, top soil, or another type of top cover that will help retain soil moisture and support the re-establishment of vegetation. • If using off-site mulch or topsoil, the City will use weed-free/seed-free products. • The City will design new facilities and place natural materials from within the project area in a manner that discourages the creation of new trails by users.

Discipline	Design Criteria/Resource Protection Measure
<p>Tumalo Creek Monitoring</p>	<ul style="list-style-type: none"> • Additional Tumalo Creek monitoring will be implemented as part of the Proposed Action to improve the understanding of its hydrology and fisheries. The monitoring program will focus on flow, temperature, and fisheries. • Within 6 months of the issuance of the SUP, the City will establish flow and temperature monitoring at two new gauging sites on Tumalo Creek. One of these gauges would be located on Tumalo Creek between Bridge Creek and South Fork Tumalo Creek at approximately river mile 16. Another would be located on Tumalo Creek approximately ¼ mile downstream of Skyliners Bridge in a location that can be readily accessed. An additional continuous temperature monitoring station will be established between the FS Road 4606 crossing and the TID diversion at approximately rm 3.0. This station would fill a data gap in the temperature monitoring. These gauges are to be run concurrently to collect data at the three locations. • In addition, redband trout populations are to be monitored in Tumalo Creek to determine trends in population size and age class structure. The methodology will be night snorkeling in late summer in Sub-reach A1 and an area above Tumalo Falls using stations that were established during a 2011 fisheries survey conducted by the Forest Service. This data will supplement the fisheries data collected during the 2011 survey. The snorkeling frequency will be annual for the first 3 years, then every other year for the next 6 years. • For the duration of the Special Use Permit, the City and the Forest Service will hold a meeting at the end of each monitoring season to review results, identify trends and concerns, and possibly refine the monitoring program. If temperature values are found that exceed ODEQ standards for Tumalo Creek, and can be determined to be the result of the City's activities authorized by the SUP, the Forest Service, after consultation with ODEQ and OWRD, may amend the SUP to ensure flows that maintain the cold water temperature standards. After 9 years of monitoring, a committee comprised of City and Forest Service representatives will determine if monitoring should continue, or what changes, if any, need to occur within the monitoring program.

Discipline	Design Criteria/Resource Protection Measure
<p>Flow Control and ramping rates</p>	<ul style="list-style-type: none"> • The City will monitor water diversion rates continuously using either an ultrasonic or magnetic type flow meter located at the Outback site and the Intake. Under normal operations, the Outback system will be designed to check flow at least every 15 minutes and adjust the diversion gate to maintain the desired flow. Reporting will include the peak hour flow rate and the daily volume of water diverted. This will allow the City to control water diversions as to not exceed the instantaneous diversion rate of 18.2 cubic feet per second. The flow rate diverted from Bridge Creek is the same as the flow rate at the Outback site since there will be no gain or loss of flow along the proposed pipeline. • The City shall be limited by municipal demand, up to a maximum rate of diversion of 18.2 cfs measured as instantaneously as available technology allows. • The City will work with the USFS to develop a seasonal ramping rate that is operationally sound and protective of fish. • Flow control will limit diverted flows to match demand, and eliminate return flows from the Outback Site to Tumalo Creek, leaving more water in the creek downstream of the diversion when the City's demand is less than 18.2 cfs.

Discipline	Design Criteria/Resource Protection Measure
<p>Water Quality, Aquatic Species, and Riparian Areas</p>	<ul style="list-style-type: none"> • To the extent possible, the City will service and refuel equipment on developed roads in areas that are at least 200 feet from streams. When equipment must be serviced in off-road areas or near surface waters, the City will exercise Best Management Practices to prevent pollutants from entering natural bodies of water. • Prior to construction, the City will develop a general Erosion-Control Plan that sets erosion-control measures to be used and identifies all mitigation measures to be employed to limit erosion and sedimentation. • The City will plan construction to ensure that pipeline placement under Tumalo Creek occurs in the fall when streamflows are low and shall conduct this work within periods allowed by the Oregon Department of Fish and Wildlife. • The City will store or stockpile excavated materials from pipeline placement activities away from streams and outside of wetlands. • The City will use silt fences or other erosion-control structures near streams during construction to limit sedimentation of streams. • During pipeline placement under Tumalo Creek, the City will minimize downstream sedimentation and restore the channel to natural grade, condition, and alignment as soon as possible post-construction. • The City will minimize impacts to wetlands from pipeline placement. To the extent possible, wetland vegetation that is excavated for pipeline placement shall be maintained on site and placed back on disturbed areas post-construction. The Forest Service will revegetate disturbed areas as needed with native vegetation sourced from on-site. The Forest Service will monitor re-vegetated areas for survival of wetland vegetation for 2 years and will continue revegetation if needed. • To prevent contamination of waters in the event of accidental spills, a predetermined organization and action plan will be prepared by the City. A Spill Prevention, Control, and Countermeasure (SPCC) Plan will be prepared if the total oil products on-site exceed 1,320 gallons or if a single container exceeds 660 gallons capacity. The plans will identify coordination responsibilities and names and phone numbers of agencies for spill reporting and cleanup.