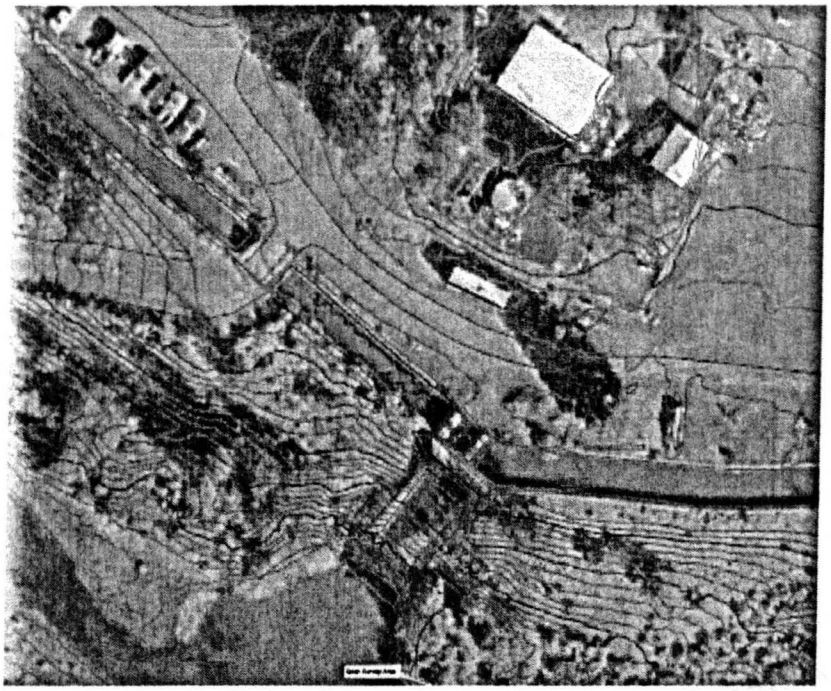

Ochoco Main Canal

Multi-Purpose Screen and Automation

Ochoco Irrigation District
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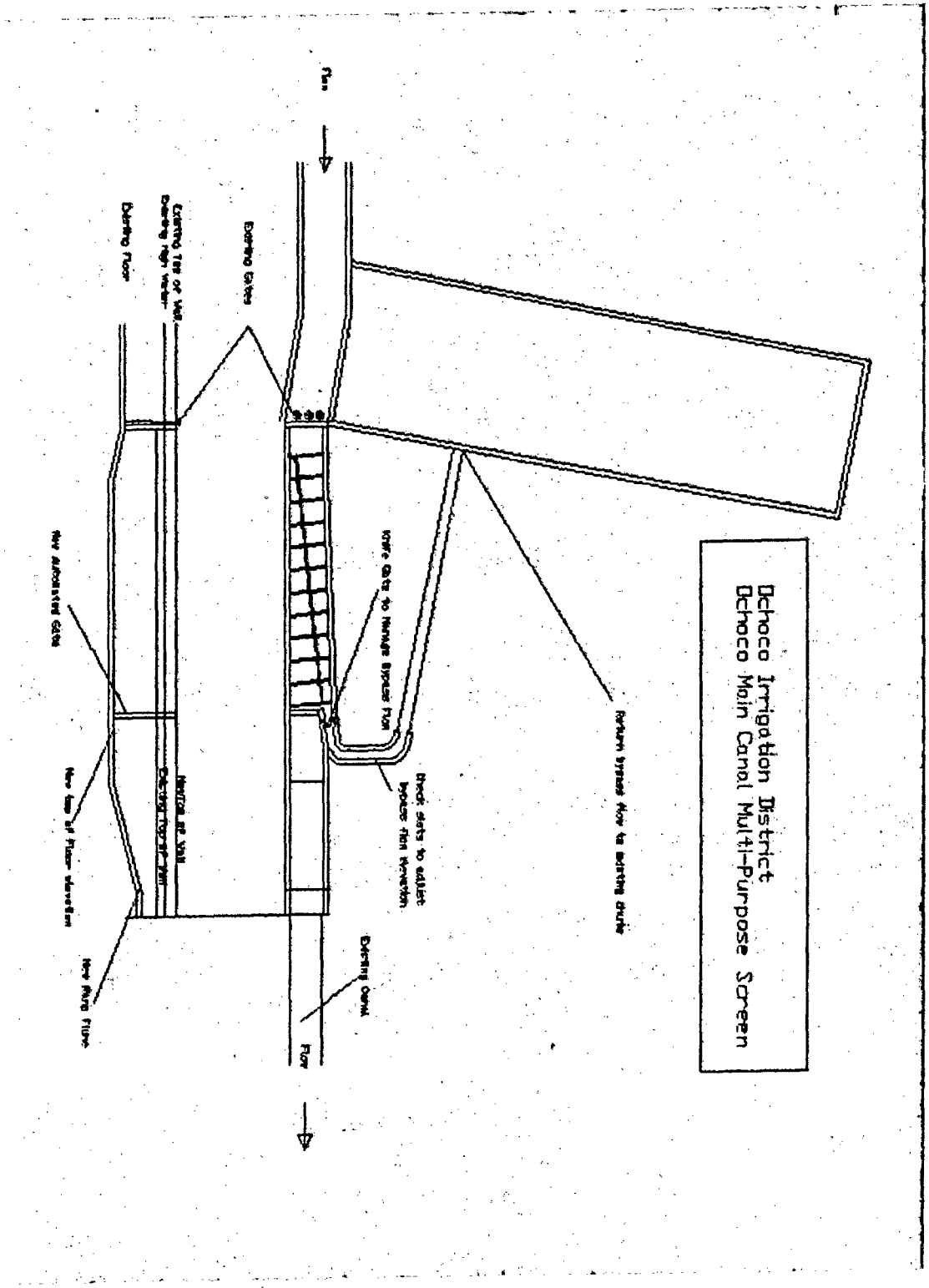
Executive Summary

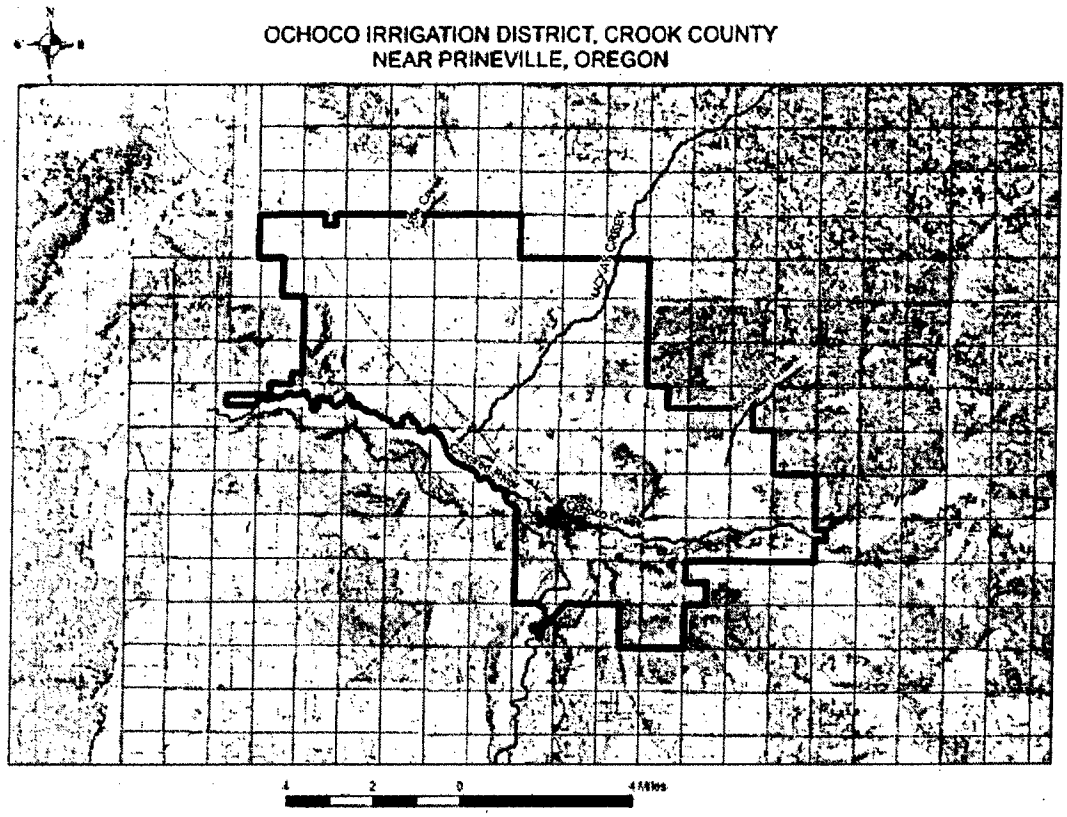
January 19, 2012 4:00 pm Mountain Standard Time (MST)

Ochoco Irrigation District, Prineville, Crook, Oregon

Ochoco Irrigation District provides irrigation water to over 20,000 acres of farmland in and around the Prineville Valley near Prineville, Oregon. The District diverts water from two reservoirs and several local streams. In total they have 13 major points of diversion. This project proposes to install a multi purpose screen on the Districts Ochoco Main Canal Diversion located near the Ochoco Dam outlet. It is the last of the 13 diversions to be screened. Along with the screen we propose to replace the rated section measuring device with a Replogle flume, allowing more accurate readings. In addition we will install a new gate with automated control. The goals of this Water Smart Grant are to optimize water and energy conservation and efficiency in the district, while benefiting the anadromous Steelhead reintroduction effort and ESA-listed fish, and reducing potential future conflict over community water supply. The project funds will be used to make upgrades that will provide tighter control on the water quantity and quality in the Ochoco main canal and attain our goals set out above.


Dehoco Irrigation District
Dehoco Main Canal Multi-Purpose Screen
Flow
Existing Gates
Existing Top of Wall
Existing High Water
Existing Floor
Return bypass flow to existing drain
Gate to manage bypass flow
Check gate to adjust bypass flow elevation
Existing Canal
Flow
New Automated Gate
New top of floor elevation
New floor elevation

Background Data



The main body of the Crooked River Project lies north and west of Prineville, Oregon. The water resources of Ochoco Creek and Crooked River are used to furnish irrigation water for approximately 20,000 acres.

The 1997 USBR and OWRD Upper Deschutes River Basin Water Conservation Study (page 93) estimates the following:

- Average district diversion: 75,560 AF
- Average distribution losses: 15,120 AF
- Average farm delivery: 60,440 AF
- On-farm losses 20,490 AF

Water supply is generally sufficient to meet water demand in the district. Water demand in the district is expected to stay constant in the future.

Project features include Arthur R. Bowman Dam on the Crooked River, Crooked River Headwork's and Diversion Canal located on the Crooked River, Crooked River Distribution Canal and associated laterals. Ochoco Dam located on Ochoco Creek, Ochoco Main Canal and laterals. Lytle Creek Diversion Dam and Wasteway, two major pumping plants, nine small pumping plants all totaling 27 lift pumps.

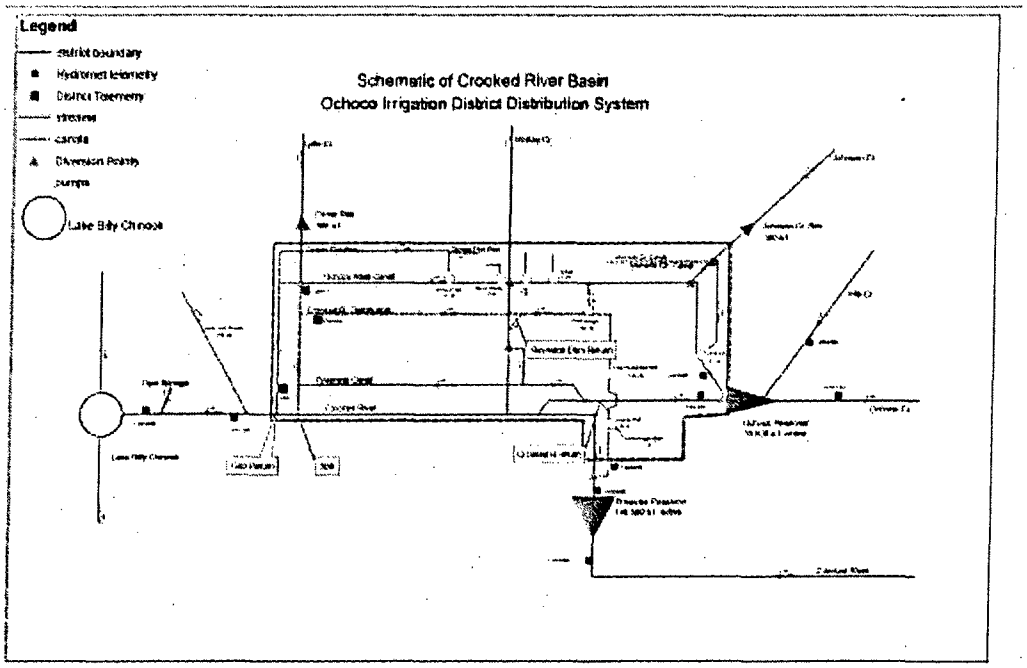
By congressional approval in 1964, the 3,450-acre Crooked River Extension was added to the project. This additional acreage was made possible by using the extra capacity included in the canal and pumping plants when the Crooked Project was constructed, constructing six small pumping plants, and using a portion of the unassigned space in Prineville Reservoir.

A 5-year rehabilitation and betterment program was completed in 1982 where some 20 miles of concrete pipe laterals and drains were installed to replace existing open and unlined channels.

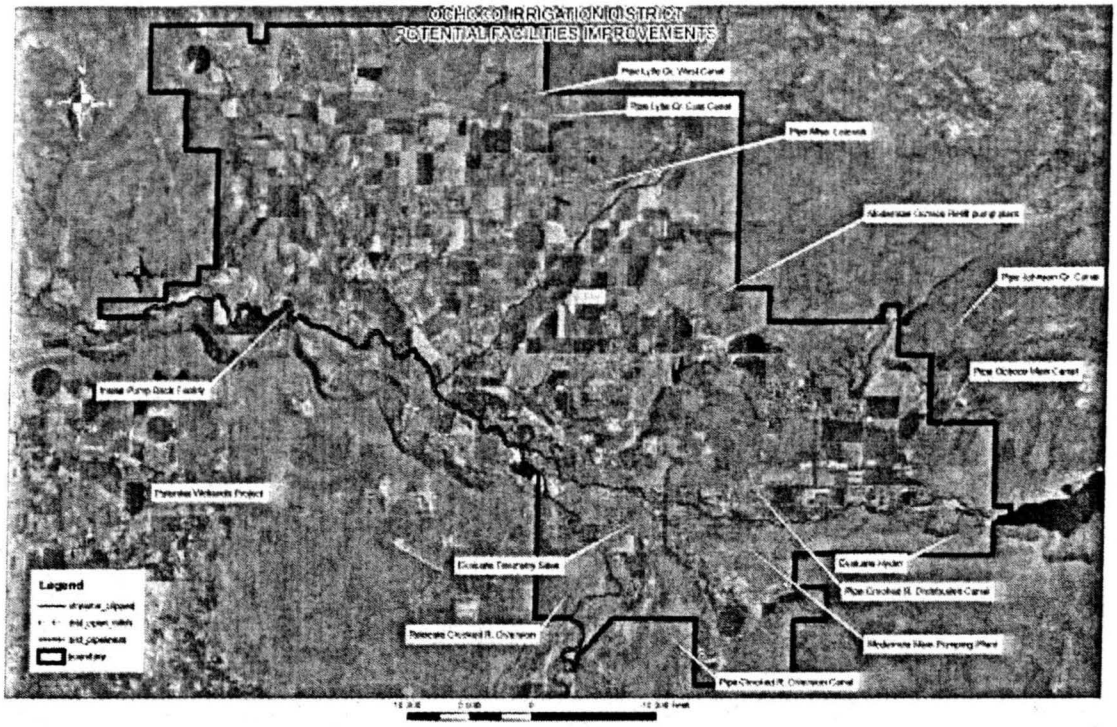
The project provides water for irrigation through the addition of works to the Ochoco Irrigation District. The rehabilitated Ochoco Dam, supplemented by assigned space in Prineville Reservoir, (currently 68,273acre-feet) furnishes an adequate water supply to both District and nonDistrict lands. Releases from Ochoco Reservoir flow into the Ochoco Main Canal, which serves high-elevation project lands east and north of Prineville. Storage from Prineville Reservoir is released into the Crooked River and diverted to project lands by a diversion canal 6 miles south of Prineville. From the headworks, the diversion canal runs north 8.3 miles across Ochoco Creek to the Barnes Butte Pumping Plant. The diversion canal serves irrigable lands along its course.

The Barnes Butte Pumping Plant lifts the water to the Crooked River Distribution Canal which runs through the center of the district lands. The Ochoco Relift Pumping Plant lifts water from the distribution canal to replenish flows in the Ochoco Main Canal that serves lands west of McKay Creek. Lytle Creek Diversion Dam and Wasteway capture return flows from project lands in the Lytle Creek area and divert them into the project-built Rye Grass Ditch.

District Schematic



Map of Potential Improvements



Facility Descriptions

Arthur R. Bowman Dam and Prineville Reservoir

Arthur R. Bowman Dam (formerly Prineville Dam) is an earthen fill structure on the Crooked River about 20 miles upstream from Prineville. The dam has a height of 245 feet, a crest length of 800 feet, and a volume of 1,424,000 cubic yards of material.

The spillway consists of an uncontrolled-crest inlet structure, chute, and stilling basin. Capacity of the spillway is 8,120 cubic feet per second at maximum water surface elevation of 3,257.9 ft. The outlet works has an intake structure with an 11-foot-diameter circular tunnel upstream from the gate chamber, an 11-foot modified horseshoe tunnel downstream from the gate chamber, and a stilling basin which is shared with the spillway. The capacity of the outlet works is 3,300 cubic feet per second at normal water surface elevation of 3,234.8 ft.

The total capacity of Prineville Reservoir at closure was 154,690 acre-feet (active 152,800 acre-feet). A reservoir sedimentation survey completed in 1998 estimates the total capacity at 150,200 acre-feet (active 148,633 acre-feet).

Ochoco Dam and Reservoir

Ochoco Dam, a hydraulic-fill structure on Ochoco Creek 6 miles east of Prineville, was constructed immediately after World War I as a part of the Veterans Farm Settlement Program undertaken by the State of Oregon. The left abutment is an alluvial fan, and the right abutment is a slide mass consisting of fine earth and rock. The original dam was about 126 feet high and

1,000 feet long, with an average crest width of 15 feet. The dam leaked badly through the main section, with heavy leakage at or through the right abutment. Since the dam was a constant hazard to life and property in the valley and the city of Prineville, some rehabilitation was required. The dam was rehabilitated by the Bureau of Reclamation in 1949 and the reservoir capacity was increased at that time. The dam provides flood control of Ochoco Creek in addition to storing water for irrigation. As repaired and reconstructed by the Bureau of Reclamation, the dam is 125 feet high with a crest length of 1,350 feet. The spillway is an open concrete chute at the south end of the dam.

Work under the Safety of Dams Program was initiated in 1994 and completed in 1998. This included, among other things, installation of an upstream interceptor trench and drainage system, replacement of riprap on the upstream face of the dam, a new outlet works, and spillway modifications. As part of this work, the intakes in the outlet tower were raised. This work, together with findings of a 1990 sedimentation survey, resulted in an active reservoir capacity of 39,600 acre-feet at spillway crest elevation 3130.7 feet.

Title to Ochoco Dam was retained by the Ochoco Irrigation District.

Barnes Butte Pumping Plant

Barnes Butte Pumping Plant lifts a maximum of 140 cubic feet per second from the end of the Crooker River Diversion Canal to the head of the Crooked River Distribution Canal. The plant consists of five pumping units that total 1,800 horsepower.

Distribution Canal

The Crooker River Distribution Canal serves all Ochoco District lands west of Barnes Butte below an elevation of 2,950 feet and above Rye Grass Ditch. In addition, the canal carries water to be lifted by Ochoco Relift Pumping Plant to Ochoco Main Canal near McKay Creek to serve lands below this main canal. The distribution canal carries water about 15.8 miles in a northerly direction.

Ochoco Relift Pumping Plant

The Ochoco Relift Pumping Plant pumps a maximum of 98 cubic feet per second from the distribution canal to the Ochoco Main Canal to irrigate lands west of McKay Creek. The plant contains four units, operates against a total dynamic head of 99 feet, and produces a total of 1,300 horsepower.

Extension Pumping Plants

The features completed to serve the additional acreage in the Crooked River Project Extension include six small pumping plants and associated canals, laterals, and drains. These features serve lands of six separate areas located generally east and north of the original project area. Combs Flat Pumping Plant lifts water from the Diversion Canal. The remaining five pumping plants, Johnson Creek, Tunnel, Hudspeth (aka Cox), McKay Creek, and Grimes Flat, pump from the

Ochoco Main Canal. Three much smaller pumping plants, Houston, and Stahancyk Nos. 1 and 2, were later installed on the Distribution Canal by the Ochoco Irrigation District.

Because of the increased water requirement for the additional acres in the extension area, it was necessary to install an additional pumping unit at both the Barnes Butte and Ochoco Relift Pumping Plants.

Rehabilitation and Betterment Program

A 5-year rehabilitation and betterment program was completed in 1982 during which concrete pipe was installed in laterals and drains to replace existing open and unlined channels. Some 18 miles of open laterals were enclosed with concrete pipe ranging from 10 to 24 inches in diameter. In addition, about 3 miles of open drain were enclosed with concrete pipe ranging from 6 to 18 inches in diameter. The program has increased the efficiency of system operation and has resulted in substantial water savings.

Authorization

The reconstruction of Ochoco Dam was authorized on June 28, 1948, in the Interior Department Appropriation, 1949. The Crooked River Project was authorized by the Congress on August 6, 1956 (70 Stat. 1058-9, Public Law 84-992) which incorporated Ochoco Dam. This Act was amended by the Congress on September 14, 1959 (73 Stat. 554, Public Law 86-271) to authorize the Secretary of the Interior to include extra capacity in the canal and pumping plants for future irrigation. The cost of this extra capacity was a deferred obligation until such time as additional lands were brought into the project.

The Crooked River Project Extension was authorized by the Act of September 18, 1964 (78 Stat. 954, Public Law 88-598). Rehabilitation and betterment of the lateral and drainage system was accomplished in 1982 under the provisions of the Rehabilitation and Betterment Act of October 7, 1949, as amended (63 Stat. 724 and 64 Stat. 11, Public Laws 81-335 and 81-451).

The 1956 Act authorized the Crooked River Project for irrigation and other beneficial purposes. Flood control is one of the project purposes. The preservation and propagation of fish and wildlife is provided for through the installation of a ladder and screen at the diversion headworks and a minimum release of 10 cubic feet per second for fish life during months when there is no other discharge from Prineville Reservoir. Minimum basic recreation facilities were also authorized.

Construction

Ochoco Dam was constructed by Ochoco Irrigation District in 1920. Ochoco Dam was rehabilitated in 1949-1950. Construction of Prineville Dam began in 1958, and was completed in 1961. Work on the Crooked River Extension began in 1966, and was completed in 1970.

Benefits

Irrigation

Irrigation in the project area has been successful over a period of many years. Principal crops are grain, hay, pasture, garlic and carrot seed, and mint. Size of operating units varies widely, ranging from small suburban residential tracts to large livestock ranches which own or lease considerable grazing land outside the project area.

Recreation, Fish & Wildlife

State and County parks located on both reservoirs are among the most heavily used in Oregon. Ochoco Reservoir has 8 miles of shoreline, but there are only 20 acres of publicly owned lands in the reservoir area. Camping, swimming, picnicking, and boat launching and mooring facilities are available. Ochoco Reservoir is stocked annually with rainbow trout.

The Prineville Reservoir area encompasses over 8,700 acres with a reservoir surface of 3,030 acres providing 43 miles of shoreline. Camping, picnicking, swimming, lodging, dining, and boat launching and mooring facilities are provided by Oregon State Parks, Crook County Parks , and by a private concessionaire. The reservoir offers excellent fishing for both warm- and cold- water species. A trout fishery has developed in Crooked River below the dam since the reservoir was created. The upper end of the reservoir has been designated a wildlife management area, and 3,800 acres of land and water provide habitat for a variety of wildlife including mule deer and numerous species of waterfowl.

A minimum release of 10 cubic feet per second is maintained from Prineville Reservoir for fishlife when there is no other discharge, but this release may be reduced for brief periods if it is determined that the release of the full 10 cubic feet per second is harmful to the primary purpose of the project and required maintenance activities.

Flood Control

In addition to the major purpose of furnishing an increased stable supply of irrigation water, the plan provides long-needed flood protection for Prineville and adjacent farm land areas. Flood control space is held in Ochoco Reservoir on a forecast basis to control Ochoco Creek, below the dam, to no more than 1100 cubic feet per second which, per the SOP, is the safe channel capacity. Similarly, space is held in Prineville Reservoir to control the Crooked River below Arthur R. Bowman Dam to no more than 3,000 cubic feet per second.

Energy Sources and Uses

Ochoco Irrigation District receives subsidized power through the Bureau of Reclamation's power contracts with BPA on the Crooked River project. The power is delivered by Pacific Power and Light (PP&L).

Ochoco Irrigation District relies on 27 pumps to move water around the District,with the largest being the Barnes Butte and Ochoco Relift pump plant.

A summary of the main pump plants is listed below:

Name	Number of Units	Capacity (cfs)	Dynamic Head (ft)	Total Horsepower
Barnes Butte (Main)	5	140	82	1,800
Ochoco Relift	6	98	99	1,300
Combs flat	2	8	140	135
Cox	1	2	59	20
Johnson Creek	2	14.2	125	250
Tunnel	1	7.8	92	120
Mckay Creek	1	3	49	25
Grimes Flat	3	21	78	260
Houston	2	4	4	3
Stahancyk No. 1	2	4	4	3
Stahancyk No. 2	2	4	4	3

ESA Issues

Federally listed threatened Mid-Columbia summer steelhead *(Onchorrychus mykiss)* were recently reintroduced to the lower Crooked River sub basin as part of a FERC relicensing obligation to provide fish passage for anadromous fish at the Pelton Round Butte Dam Complex located below the mouth of the Crooked River on Lake Billy Chinook. Smolts were first released in 2008 and planned releases are on-going. The reintroduction is a $200 million effort to provide fish passage and sufficient fish habitat to successfully re-establish historic populations of anadromous fish in the lower Crooked River, Whychus Creek and the Metolius River. Ochoco Irrigation District is invested in working collaboratively and proactively to reduce conflict around ESA issues and to support the reintroduction effort. The District is currently engaged in developing a Habitat Conservation Plan along with the Deschutes Basin Board of Control (7 Central Oregon Irrigation Districts) and the City of Prineville in an effort to minimize and mitigate its impacts on listed fish. The goals of this Water Smart Grant, including water and energy conservation and efficiency in the district, are designed to benefit the reintroduction effort.

Bureau of Reclamation Partnership

Ochoco Irrigation District has a long-standing relationship with the BOR. We have been partners since the 1940s when the Ochoco Dam was rehabilitated to the Construction of the Crooked River Project in 1958. During these many years of partnership the District has participated in many grants, a few of which are listed below:

BUREAU PROJECTS

2000 Johnson Creek Lift-Power & water savings by installation of a variable speed pump at the Johnson Creek Lift Station.

2001 Installation of automated gate at the Reynolds Dam.

2001 Thun gravity pressure pipeline.

2002 Installation of bituminous canal liners (two installations).

2002 Firestone Rubber Canal liner installation.

2002 Geosynthetic Clay liner installation.

2002 6 settlement ponds on Ochoco Main Canal for purpose of water quality (Sedimentation).

2003- 2010 Several grants covering GIS Mapping/Geo Spatial upgrades/Mapping of easements & facilities.

2004 Installation of 3 small pipelines to replace the Lanius ditch to conserve water by reducing seepage losses & increase water efficiency.

2006 Digital Water Records Management Enhancement-Financial assistance to enhance water management thru purchase and operation of a web based water right & facilities record keeping system.

2007 Conserve water by upgrading 600 feet of the Ochoco Main Canal with shotcrete to reduce seepage.

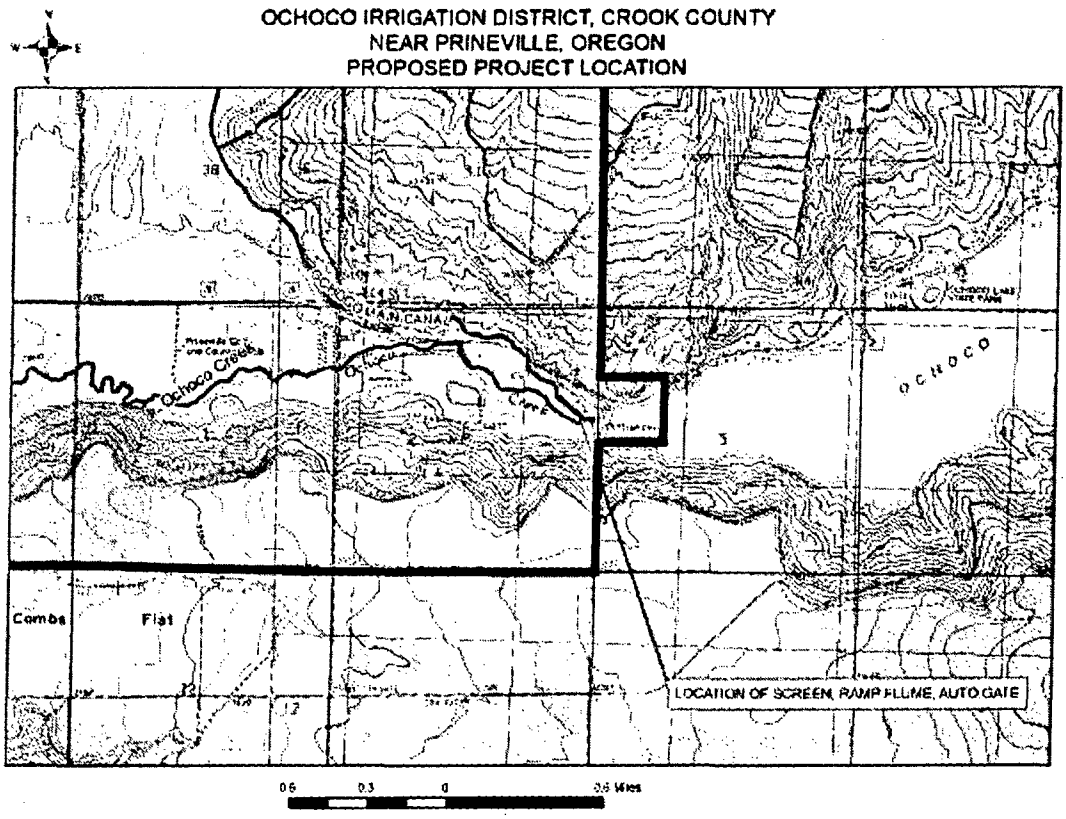
2007 2025 Action Plan & Telemetry Grant-Five irrigation districts joining together though the Water 2025 Challenge Cost Program on water conservation efforts within Deschutes Basin by installing flow measurement telemetry stations at 18 locations.

2009 Ochoco Johnson Creek Pipeline Project-Relocate delivery to 300 acres from Johnson Creek Lateral to the Ochoco Main Canal. Piping 2400 feet of delivery line, relocate an existing irrigation pump and provide power to a center pivot while conserving water.

2010 Lytle Creek West Canal Relocation-Relocate delivery to 198 acres from Lytle Creek West to the Ochoco Main Canal. Piping 1500 feet of delivery line, relocate an existing irrigation pump and provide power to a center pivot while conserving water.

Technical Proposal: Technical Project Description

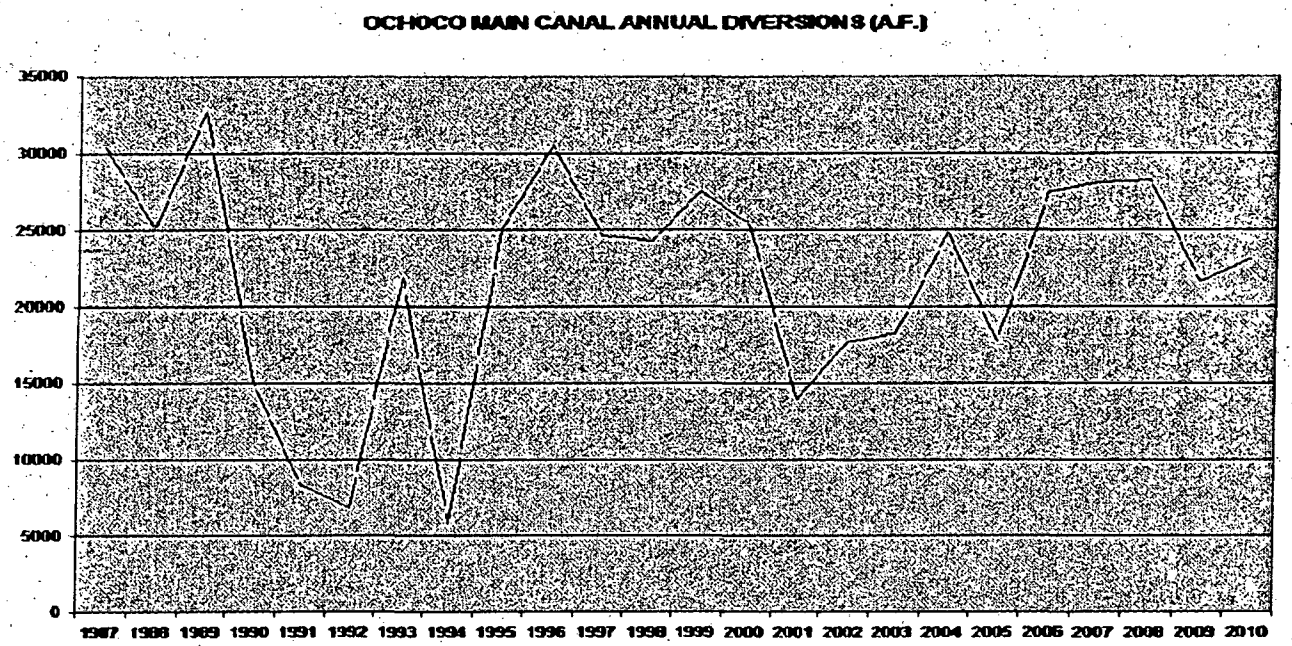
The technical project description should describe the work in detail, including specific activities that will be accomplished as a result of this project. This description shall have sufficient detail to permit a comprehensive evaluation of the proposal.

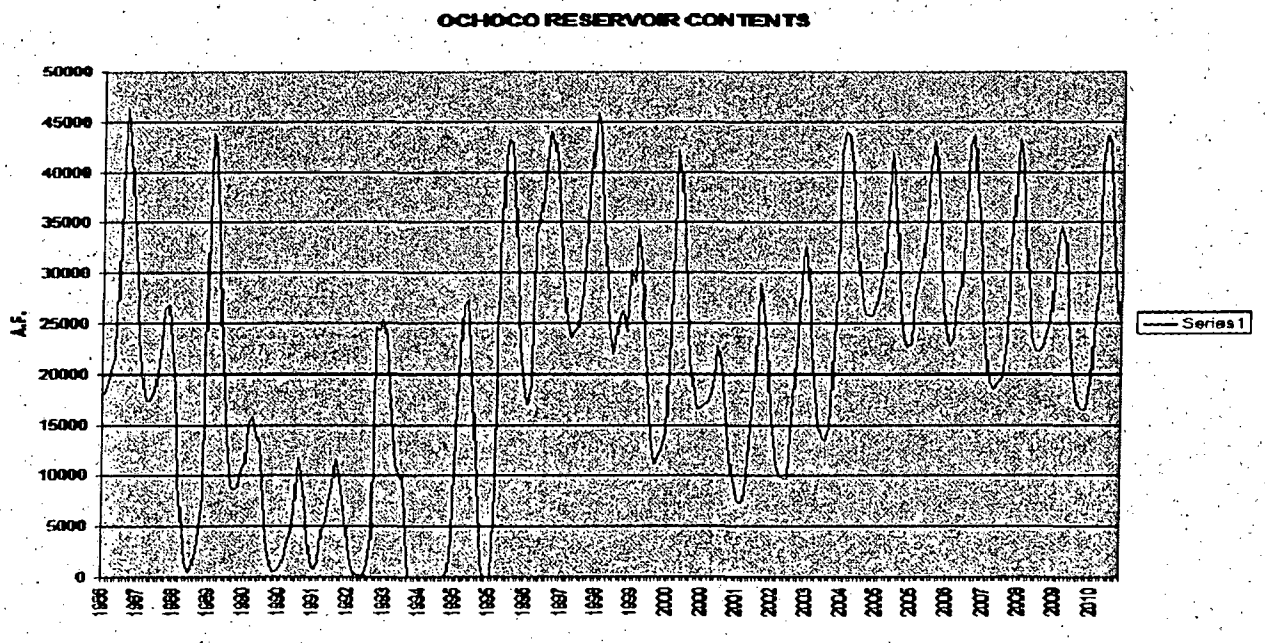


Ochoco Irrigation District diverts water from a total of 13 major points of diversion along the local streams and rivers. OID has successfully screened, with compliant screens, all but the Ochoco Main Canal. This Water Smart Grant if awarded will fund the installation of a vertical plate screen 44 feet in length at the head works of the Ochoco Main Canal where water is diverted into Ochoco Creek. In addition OID will demonstrate how, by installing this screen, they will conserve electricity and water and show other tangible benefits as well. Some of those benefits include tighter control on the water, using less aquatic herbicide, and fish screening all while providing a more reliable delivery of water to the end user.

Ochoco Main Canal diverts daily between 20 and 140 CFS during the months of April to October. In an average year the Ochoco Main Canal will divert 23,000 acre feet for irrigation purposes. Because the Ochoco Main Canal can reach almost the entire District by gravity, it is considered the most valuable water in the system. It is also the most variable of the District's

water supplies. As the following graph shows, the water supply to the Ochoco Main Canal, and the annual demand, is highly variable. Demand is affected by crop types and climate, while inflow to the reservoir is controlled by precipitation, both volume and timing.





During periods of high aquatic vegetation growth OID will experience demands of approximately 10-15 CFS higher than that required when the vegetation is not present. Part of this additional water is lost to seepage, but the bulk of it is lost to operational spills. Immediately following an aquatic vegetation treatment we can see reductions of the water surface elevation as much 0.5 feet. That extra wetted area induces additional seepage. Aquatic vegetation is typically a problem for 120 days of our 180 day irrigation season. By reducing this additional seepage OID expects to save 250 acre feet of water. The operational spill caused by this

additional water is expected to be 1550 acre feet. The water conserved will be left in the reservoirs for other uses consistent with project authorization and voluntary instream flows. Currently OID treats aquatic vegetation two to three times a year with aquatic herbicides. Since one can visually see the large masses of vegetation coming out of the outlet works, one can also tell that though we are treating the vegetation down the canal system, it is being replenished immediately. The proposed flat panel Multi Purpose Screen would intercept not only fish, but the masses of vegetation coming from the reservoir, returning them to Ochoco Creek below the dam. This would reduce our need for aquatic plant treatment to only the vegetation that actually grows in the canal. This would reduce the frequency of treatments and the total maintenance cost incurred.

Another benefit to screening off the aquatic vegetation from the reservoir is that many of the patron's pump intakes are plugging and during the night time hours shutting down. This results in excessive morning spills at the end of the delivery system and during the afternoons the end spills going dry as pumps are restarted. This often requires us to inflate the quantity of water diverted to create a buffer. If we were to keep this vegetation out of the canal we could realize a savings of that inflated quantity of water. We are at present, through our USBR System Optimization Grant, quantifying that amount of water. It is estimated that an additional 1070 acre feet could be saved on farm.

As part of this project the District will install an automated headgate to more accurately match the diversion to the demand of downstream deliveries. An automated headgate requires accurate flow measurement. Our current measuring device is a rated section maintained by Oregon Water Resources Department. While it is normally thought that the accuracy of the rated sections is in the vicinity of +-5%, our experience is that the accuracy of this rated section is much lower due to the constantly changing backwater effects of the vegetation masses. With this grant we will install a ramp flume with an estimated accuracy approaching +-2% (See USBR Water

Measurement Manual, Third Edition, page 8-19). With this increased accuracy we will be able to make our delivery tolerance much tighter. During periods of high aquatic vegetation growth OWRD has to make many shifts to the rated section, which makes the flow measurements accurate only in retrospect, while we need accuracy in real-time. This is especially critical during aquatic treatments. If the reading is too high we treat with too much chemical and if it is too low we end up with too little chemical (and the treatment ends up not killing the vegetation, rendering the treatment useless).

Perhaps one of the greatest benefits of this project is its potential to conserve energy. Our District is set up on three terraces. The water supply of the Ochoco Main Canal is supplemented by lifting water from the Crooked River through the Barnes Butte Main Pumping Plant and the Ochoco Relift Plant. The total lift is 181 feet. A savings of 2870 a.f. at the head of the Ochoco Main Canal implies that 2870 a.f. will not have to be lifted from Crooked River. The pumping plants are approximately 80% efficient. Therefore, the annual power savings in kilowatt hours is 656,640.

[Calculation of kilowatt hour savings (KWH):

KW=.735*HP=.735*(THP/efficiency)=.735*(12.08cfs*181feet/8.8)/.80=228 KW

Where HP=horsepower, THP=theoretical HP, 12.08cfs=2870a.f. over 120 days, 181 feet=head, .80=efficiency

228 KW for 120 days is 656,640 KWH.]

Evaluation Criterion A: Water Conservation (32 points)
*Up to **32 points** may be awarded for a proposal that will conserve water and improve efficiency. Points will be allocated to give consideration to projects that are expected to result in significant water savings.*
Subcriterion No. A.1—Water Conservation:
Subcriterion No. 1(a)—Quantifiable Water Savings

The average annual water savings estimates have been determined by using average daily hydromet data to calculate the savings. We used staff gage readings to determine the water surface readings for the water drop during the aquatic herbicide applications. And we have set up measurement locations for accurate readings for return flows to the McKay creek.

There are three causes of the waste of water that this proposal will curtail or eliminate:

1. seepage
2. spill of water used to "push" aquatic vegetation through the system
3. spill of water diverted to compensate for plugged pump intakes

Calculations:

1. Seepage: 23.1 miles of canal at an elevation .5 feet higher than necessary, using the canal seepage rates contained in the USBR Deschutes River Basin Water Conservation Study of .371 cubic feet/square foot/day for 120 days. Since the calculated seepage rate is an average over the entire canal wetted perimeter, it is assumed here that the seepage rate is double in the top .5 feet of the wetted perimeter. Thus .742 ft^3/ft^2*121968 ft=90500 ft^3/day=2.08 acre feet/day, which is 250 a.f. for 120 days.
2. "push spill": From experience, we know that 10-15 cfs must be added to the canal during periods of maximum vegetative growth, and zero before growth starts. A conservative estimate of the average "push" water added is 6.5 cfs. 6.5 cfs for 120 days is 1550 a.f.
3. "compensation spill": From experience, 3 cfs is typically added to the canal diversion to address the fluctuating pumps. Elimination of this need would save 4*1.98 a.f. *180 days=1070 a.f.

The sum of these savings is 2,870 a.f.

Subcriterion No. 1(b)—Improved Water Management
described in this subsection.

At present the diversion into the Ochoco Main Canal is controlled by hand-operated gates, and the volume is measured at a channel control gauging station operated by the Oregon Water Resources Department and is subject to severe backwatering from aquatic vegetation. The proposed project will install an automated gate and the gauging station will be altered to a long-throat ramp flume (Replogle), located immediately downstream of the flat panel screen. Water management will be improved because the data from the measuring device will be useful in real time and can be applied to the operation of the automated gate. The automated gate will allow needed adjustments to canal flow at the time they are needed, instead of when it is feasible and convenient to send district staff to operate the gate. Often the appropriate time for making a change under the present system is impractical for staff, so they make the change earlier than needed, just to ensure that the water will be available when called for.

What is the applicant's average annual acre-feet of water supply?

Ochoco Irrigation District diverts water from two reservoirs. Prineville Reservoir, 20 miles south of the city of Prineville is a Bureau facility with a capacity of 148,633 acre feet. Of that capacity the District has contract for 57,899 acre feet. The District also owns and operates Ochoco Reservoir, 7 miles east of the city of Prineville. The capacity for Ochoco is 44,248 acre feet. Of that capacity the District owns all of that water. The average annual diversion from all sources is 75,560 a.f. (USBR, Upper Deschutes Water Conservation Study, 1997).

Where is that water currently going (i.e., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?

The District's conveyance system is approximately 160 miles total. This includes all of the main canals and laterals to each delivery. The District delivers via a demand system (patron call in), and primarily deliver to patron's pumps. The predominant form of irrigation in the district is sprinkling. Approximately 95% of the deliveries are hand line, wheel line, or pivot, leaving only about 5% flood irrigation. These types of irrigation require that the canals be surcharged somewhat to provide positive pressure to the pumps (won't suck air and lose prime). That surcharge, or carry water, must go somewhere and typically it is returned either to another canal for re-delivery (when possible), to one of the many drains or creeks in the area, or to the Crooked River. The distribution system losses are estimated at 15,120 a.f. (USBR Upper Deschutes Water Conservation Study, page 93).

Where will the conserved water go?

The water conserved will be available for uses consistent with project authorizations. It is expected that the primary use will be to reduce the amount of water lifted from Crooked River to the highest terrace of the district, thereby resulting in a 656,640 k.w.h. reduction in power consumption and the savings of 2870 a.f. of water from Prineville Reservoir. No water associated with the savings for this project will be used to increase the total irrigated acreage for Ochoco Irrigation District.

Water savings will be confirmed by measurement at the Ochoco Main Canal gauge, the Crooked River Diversion Canal gauge, and the power meters at the pumping plants. These savings may not be reflected in gauge readings immediately (reservoir deficits may need to recover, climate variation may temporarily alter demand, etc.), but mass balance considerations imply that the savings will appear over an extended time.

(3) **Irrigation Flow Measurement**:

Are flows currently measured at proposed sites and if so what is the accuracy of existing devices? How has the existing measurement accuracy been established?

OID is currently recording measurements at the head of the Ochoco Main Canal. These measurements are made with a rated section maintained by Oregon Water Resources Department. They are being posted to the Hydromet site under the code OCHO. The measurement accuracy is reported to be +/- 5% by the Oregon Water Resources Department. While these records are deemed reasonably accurate once the rating curve shifts are calculated, the fact that growing or diverted aquatic vegetation is continually causing backwater at the gauge renders these gauge readings of little or no value for real-time decision making. The need for real-time data would be provided by the proposed long-throated ramp flume. OID also measures and records return flows from the Ochoco Main Canal through the use of a ramp flume and telemetry.

Provide detailed descriptions of all proposed flow measurement devices, including accuracy and the basis for the accuracy.

We are currently involved in a USBR funded System Optimization Review. Through that process we are setting up several measurement sites on our creek returns. The measurement at McKay Creek will be by Cipolletti weir and we expect the accuracy to be +- 5%. This location

is at 44 23'28.34" N and 120 49'17.98" W and is the first location we spill back to a creek. The measurement device at the head of the canal is by a rated section maintained by Oregon Water Resources Department. We expect that measurement accuracy on it is +-5% and will be replaced thru this grant with a long-throated ramp flume with an accuracy of +-2%. These accuracies have been quoted from the Water Measurement Manual, and from Water Measurement with Flumes and Weirs.

How will actual water savings be verified upon completion of the project?

Annual diversion volume will be reduced by virtue of this fact: if we are able to control the water put into the canal more closely then we will need less cushion, or excess water in the canal. If our total patron orders require an additional 10 cfs to be added to the canal for the next day's deliveries the norm has been to add it earlier than needed. When the best alternative would be to add at midnight or early am with automation. We are a demand system (patron call in) so releases are on an as-needed basis. It is hard to quantify the amount of savings due to the installation of automation. We have, in the past, installed measurement stations (Telemetry) at 5 locations throughout the district. Since we are able to remotely monitor the return flows we have experienced a reduction of those return flows of 50%. The district expects to verify savings by these existing telemetry stations as well as the proposed new measurement sites.

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Will canal seepage be reduced through improved system management? If so, what is the estimated amount and how was it calculated?

Canal seepage will be reduced by overall improvement and management to our system. If we can reduce the level of the water in the canal we can also reduce the wetted perimeter, which has shown in the past to reduce seepage and evaporation.
There are three causes of the waste of water that this proposal will eliminate:

1. Seepage
2. Spill of water used to "push" aquatic vegetation through the system
3. Spill of water diverted to compensate for plugged pump intakes

Calculations:

4. Seepage: 23.1 miles of canal at an elevation .5 feet higher than necessary, using the canal seepage rates contained in the USBR Deschutes River Basin Water Conservation Study of .371 cubic feet/square foot/day for 120 days. Since the calculated seepage rate is an average over the entire canal wetted perimeter, it is assumed here that the seepage rate is double in the top .5 feet of the wetted perimeter. Thus .742 ft^3/ft^2*121968 ft=90500 ft^3/day=2.08 acre feet/day, which is 250 a.f. for 120 days.
5. "push spill": From experience, we know that 10-15 cfs must be added to the canal during periods of maximum vegetative growth, and zero before growth starts. A conservative estimate of the average "push" water added is 6.5 cfs. 6.5 cfs for 120 days is 1550 a.f.

6. "On farm compensation spill": From experience, 3 cfs is typically added to the canal diversion to address the on farm fluctuating pumps. Elimination of this need would save 4*1.98 a.f. *180 days=1070 a.f.

The sum of these savings is 2,870 a.f.

How will actual water savings be verified upon completion of the project?

Since we are operating a demand system (patron call in) actual water savings will have to be made on an annual basis. Currently we are diverting an average of 23,000 acre feet annually into the Ochoco Main Canal and 52,560 a.f. from Crooked River. OID will verify that our annual usage will average 73,410 a.f.

Average Annual Water Supply

The total capacity of water in Ochoco Reservoir is 44,248 acre feet. The average annual inflow to Ochoco Reservoir is 35,000 acre feet and of that figure the average annual diversion for irrigation is 23,000 acre feet. Our estimates show that we will conserve 2870 acre feet of water. The real picture is shown if you look at the fact that on average we fill only 4 out of 10 years. Therefore the water in Ochoco Reservoir is very scarce and the 2870 acre feet of conservation is a valuable commodity. The water conserved through improved management is 3.8% of the District's total annual diversion.

Subcriterion No. A.2—Percentage of Total Supply:
Up to 8 ***additional points*** *may be allocated based on the percentage of the applicant's total average water supply that will be conserved directly as a result of the project.*

Based on our estimates we will annually conserve 2870 acre feet of water through improvements installed with this grant. Our total diversion, or use, averages 75,560 acre feet. Therefore the conservation represents 3.8% of our total diversion

Subcriterion No. A.3—Reasonableness of Costs:
Up to ***4 additional points*** *may be awarded based on the reasonableness of the cost for the benefits gained.*
Please include information related to the total project cost, annual acre-feet conserved (or better managed), and the expected life of the improvement. Use the following calculation:
Total Project Cost: $299,813.45
(Acre-Feet Conserved, or Better Managed x Improvement Life)

2870 acre feet x 50 years =
acre feet over the useful life of the project
Therefore, cost per acre foot saved over 50 years is $2.09

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For all projects involving physical improvements, specify the expected life of the improvement in number of years and provide support for the expectation (e.g., manufacturer's guarantee, industry accepted life-expectancy, description of corrosion mitigation for ferrous pipe and fittings, etc.). Failure to provide this information may result in a reduced score for this section.

The proposed improvements are to be shop built at the District. The concrete structure has a useful life of 75 years. The gates and operators we will purchase commercially and their useful life will be 50 years. They will have a manufacturer's warranty of 3 years. We will spec stainless shafts and heavy duty motors. The superstructure for the screen will be made of galvanized steel and the screen will be from stainless punch plate with a life expectancy of 50 years. The electronics for the telemetry will likely be outdated within 10 years and be in need of upgrade or replacement but that should not affect our ability to sustain the water conservation.

Evaluation Criterion B: Energy-Water Nexus (16 points)
*Up to **16 points** may be awarded based on the extent to which the project increases the use of renewable energy or otherwise results in increased energy efficiency.*

Any expected reduction in the use of energy currently supplied through a Reclamation project

As stated earlier, the need for supplemental water to be lifted from Crooked River to the Ochoco Main Canal will be reduced by 2870 a.f. annually. This results in a power savings of 656,640 KWH. Calculation is below. The District's power supply is through contracts with USBR and BPA.

Anticipated beneficiaries, other than the applicant, of the renewable energy system.

If the District conserves the water and does not pump it, the electricity would be available for other BPA customers for another beneficial use.

Subcriterion No. B.2—Increasing Energy Efficiency in Water Management
*If the project is not implementing a renewable energy component, as described in Subcriterion No. B.1 above, up to **4 points** may be awarded for projects that address energy demands by retrofitting equipment to increase energy efficiency and/or through water conservation improvements that result in reduced pumping or diversions.*
Describe any energy efficiencies that are expected to result from implementation of the water conservation or water management project (e.g., reduced pumping). Please provide sufficient detail supporting the calculation of any energy savings expected to result from water conservation improvements.

By conserving 2870 a.f. of Ochoco Reservoir water, the need to lift 2870 a.f. from the Crooked River Diversion Canal to the Ochoco Main Canal will be eliminated, thus saving 656,640 KWH annually.

[Calculation of kilowatt hour savings (KWH):
KW=.735*HP=.735*(THP/efficiency)=.735*(12.08cfs*181feet/8.8)/.80=228 KW
Where HP=horsepower, THP=theoretical HP, 12.08cfs=2870a.f. over 120 days, 181 feet=head, .80=efficiency

228 KW for 120 days is 656,640 KWH.]

Please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements?

Ochoco Irrigation District relies on 27 pumps to move water around the District; with the largest being the Barnes Butte and Ochoco Relift pump plant.

A summary of the main pump plants is listed below:

Name	Number of Units	Capacity (cfs)	Dynamic Head (ft)	Total Horsepower
Barnes Butte (Main)	5	140	82	1,800
Ochoco Relift	6	98	99	1,300
Combs flat	2	8	140	135
Cox	1	2	59	20
Johnson Creek	2	14.2	125	250
Tunnel	1	7.8	92	120
Mckay Creek	1	3	49	25
Grimes Flat	3	21	78	260
Houston	2	4	4	3
Stahancyk No. 1	2	4	4	3
Stahancyk No. 2	2	4	4	3

Please indicate whether you energy savings estimate originates from the point of diversion, or whether the estimate is based upon an alternate site of origin.

The savings occur at the Barnes Butte (Main) pumping plant and at the Ochoco Relift pumping plant.

Does the calculation include the energy required to treat the water? No

Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).

The SCADA installed will include solar power for operation.

Evaluation Criterion C: Benefits to Endangered Species (12 points)
*Up to **12 points** may be awarded for projects that will benefit federally recognized candidate species or up to **12 points** may be awarded for projects expected to accelerate the recovery of threatened or endangered species, or addressing designated critical habitat.*
For projects that will directly benefit *federally-recognized candidate species*, please include the following elements:
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(1) Relationship of the species to water supply

Federally listed threatened Mid-Columbia summer steelhead (*Onchorrychus mykiss)* were recently reintroduced to the lower Crooked River sub-basin as part of a FERC relicensing obligation to provide fish passage for anadromous fish at the Pelton Round Butte Dam Complex (Lake Billy Chinook). The Crooked River and its tributaries, such as Ochoco and McKay Creeks are part of that sub-basin.

(2) What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species?

The steelhead reintroduction is counting on successful reproduction in McKay Creek, Ochoco Creek, and the main stem of Crooked River below Bowman Dam. This project will reduce the risk of herbicide treatments reaching either of the creek environments, and increase the surplus of water in Prineville Reservoir by 2,870 a.f. that may be used in the future for flow enhancement.

For projects that will directly accelerate the recovery of *threatened or endangered species or address designated critical habitats*, please include the following elements:

Note: the steelhead habitats listed above are not critical habitats, since the reintroduced steelhead are proposed as an experimental population at this time. (NOAA)

(1) How is the species adversely affected by a Reclamation project?

Bowman and Ochoco Dams are viewed as fish barriers by Oregon Fish and Wildlife. Both Dams are part of the Crooked River Project. Sufficient instream flows for Steelhead spawning and migration are another concern.

(2) Is the species subject to a recovery plan or conservation plan under the

Endangered Species Act?

Yes. Ochoco Irrigation District is engaged in a Habitat Conservation Plan along with 6 other Central Oregon Irrigation Districts (Deschutes Basin Board of Control) and the City of Prineville.

(3) What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species?

Benefits to steelhead, as we understand them, are listed above. We cannot quantify these benefits, but are confident that they are a move in the right direction. More reliable refill capabilities of both Ochoco and Prineville Reservoir would result in strengthening of instream flows.

Evaluation Criterion E: Other Contributions to Water Supply Sustainability (14 points)

*Up to **14 points** may be awarded for projects that contribute to a more sustainable water supply in ways not covered by other criteria.*

This criterion is intended to provide an opportunity for the applicant to explain any additional benefits of the proposed project within the water basin, including benefits to downstream water users or to the environment. Please provide sufficient explanation of the expected benefits and their significance, including any information about water supply conditions within the basin (e.g., is the river, aquifer or other source of supply over-allocated? Is there frequently tension or litigation over water in the basin? Are there endangered species within the basin or other factors that may lead to heightened competition for available water supplies among multiple water uses? Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?) Additional project benefits may include, but are not limited to, the following:

(1) Will the project make water available to address a specific concern? For example:

Will the project address water supply shortages due to climate variability and/or heightened competition for finite water supplies (e.g. population growth or drought)?

All water resources in the Crooked River Basin have been fully allocated. As in many areas the best way to create more reliable storage or instream flow is through conservation. While challenging as it may be trying to capture on paper all the benefits to a particular project, OID believes this proposed Multi Purpose Screen does just that. Water and Power are believed to be such savings on this project, as well as water quality. Reduced chemical use is not only good from a maintenance and financial standpoint, but also good for the environment. Protecting and enhancing flow opportunities are valued as well. As stated earlier the district expects to conserve 2870 a.f. in Prineville Reservoir which will improve the reliability of Prineville Reservoir for irrigation, recreation, and flow enhancement. Also a reduction in pump power will be

recognized. Not only from a district standpoint but also from on farm water reliability. Pumps shutting down during the night time hours only increases the need for additional pumping and loss of water.

Will the project market water to other users?

No.

Will the project make additional water available for Indian tribes?

Not directly, though the Confederated Tribes of Warm Springs have an interest in steelhead recovery and are consider Basin partners.

Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved? (e.g., will the project benefit an endangered species by maintaining an adequate water supply)?

The project will benefit steelhead, a threatened specie.

Will the project generally make more water available in the water basin where the proposed work is located? Yes.

(2) Does the project promote and encourage collaboration among parties?

Yes, using less aquatic herbicide, keeping fish out of canals, conserving water and energy are concerns that many of our partners, agencies and other Basin interest have supported. This project is inline with the various interest of the ongoing HCP effort.

Is there widespread support for the project?

Yes, especially farmers in the District. Presumably, local and state agencies along with fishing interests would also support the project.

What is the significance of the collaboration/support?

OID has attached several letters of support. Conserving water, power, and addressing issues such as water reliability to our patrons, reduced maintenance cost, reduction in aquatic chemical use, water quality, water management, and direct fisheries benefits is something we can all agree on.

Will the project help to prevent a water-related crisis or conflict?

To the extent that steelhead benefit, the project will reduce the likelihood of conflict between agriculture and fisheries.

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(3) Will the proposed WaterSMART Grant project help to expedite future onfarm irrigation improvements, including future on farm improvements that may be eligible for Natural Resources Conservation Service (NRCS) funding?

Yes. By reducing the plugging of pump intakes, farmers will be better able to irrigate at night, thereby increasing the efficiency of the water delivered to the farms. Without night irrigation, farmers are forced to apply water at higher rates during the day time, adversely affecting infiltration and runoff.

If so, please address the following:
Note: *On-farm water conservation improvements that complement the water delivery improvement projects selected through this FOA may be considered for NRCS funding and technical assistance in FY 2012 to the extent such assistance is available. Complementing NRCS Farm Bill programs include the Environmental Quality Incentive Program (EQIP) and Agricultural Water Enhancement Program (AWEP), which are the primary programs that address water quantity and water quality conservation practices. For more information, including application deadlines and a description of available funding, please contact your local NRCS office or visit <http://www.nrcs.usda.gov>for further contact information in your area.*

Include a detailed listing of the fields and acreage that may be improved in the future.

The pump intake clogging problem would be reduced on approximately 11,000 acres lying between the Ochoco Main Canal and the Crooked River Distribution Canal.

Describe in detail the on-farm improvements that can be made as a result of this project. Include discussion of any planned or ongoing efforts by farmers/ranchers that receive water from the applicant.

See above.

(4) Will the project increase awareness of water and/or energy conservation and efficiency efforts? Yes
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Will the project serve as an example of water and/or energy conservation and efficiency within a community?

This Multi Purpose Screen would be a great example of a project having multiple benefits. Water and energy conservation, water quality, water management, reduced maintenance cost, fisheries, and on farm reliability.

Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?

By conserving the water and power as stated prior in the application, this will increase the potential for savings to be used by other interest.

Does the project integrate water and energy components?

Yes we have shown that by conserving water we are conserving energy.

Evaluation Criterion F: Implementation and Results (10 points)
*Up to **10 points** may be awarded for the following:*
Subcriterion No. F.1—Project Planning
Points may be awarded for proposals with planning efforts that provide support for the proposed project.
Does the project have a Water Conservation Plan, System Optimization Review (SOR), and/or district or geographic area drought contingency plans in place? Is the project part of a comprehensive water management plan (e.g., the Yakima River Basin Integrated Water Resource Management Plan)? Please self-certify, or provide copies of these plans where appropriate, to verify that such a plan is in place.
Provide the following information regarding project planning:
(1) Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, or other planning efforts done to determine the priority of this project in relation to other potential projects.

We are currently updating our District Water Conservation Plan which includes addressing this important issue.
We are currently conducting a System Optimization Review to analyze much of our district. Particular emphasis is being placed on the operational spill areas in an attempt to minimize or eliminate them (water management). We are also conducting efficiency testing on all of our pumps and pump stations. We are performing feasibility level engineering on many of the open ditches to determine how much water could be conserved by piping particular laterals. Also the district is fully engaged in the Deschutes HCP process. Looking at potential district projects that benefit ESA listed species is a priority.

(2) Identify and describe any engineering or design work performed specifically in support of the proposed project.

We are performing a survey grade GPS of our canal system to identify the head in each lateral so that we can properly size the pipes.
We have designed the screen size to meet fish screening criteria. We have designed the by-pass pipe to handle the return flow. We have designed the automated regulating gate that will deliver constant flows down the canal. We have also designed the ramp flume to handle the range of flows necessary to make the irrigation deliveries. In short we are shovel ready and just awaiting funding.

(3) Describe how the project conforms to and meets the goals of any applicable State or regional water plans, and identify any aspect of the project that implements a feature of an existing water plan(s).

This project meets the goals of State and Regional water plans first of all by screening off our main diversion. It also meets the goal of using less aquatic herbicide. It also meets the goal of tighter water management and thereby conserving water.

Subcriterion No. F.2—Readiness to Proceed
Points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement.
Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

The project is ready to commence after next irrigation season (October 2012). The plans have been drawn and the project schedule has been prepared. Upon securing funding the district is ready to commence construction..

before environmental compliance is complete and Reclamation explicitly authorizes work to proceed).
Please explain any permits that will be required, along with the process for obtaining such permits.
Subcriterion No. F.3—Performance Measures
Points may be awarded based on the description and development of performance measures to quantify actual project benefits upon completion of the project.
Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (i.e., water saved, marketed, or better managed, or energy saved). For more information calculating performance measure, see Section VIII.A.1. "FY2012 WaterSMART Water and Energy Efficiency Grants: Performance Measures". Note: All WaterSMART Grant applicants are required to propose a "performance measure" (a method of quantifying the actual benefits of their project once it is completed). A provision will be included in all assistance agreements with WaterSMART Grant recipients describing the performance measure, and requiring the recipient to quantify the actual project benefits in their final report to Reclamation upon completion of the project. If information regarding project benefits is not available immediately upon completion of the project, the financial assistance agreement may be modified to remain open until such information is available and until a Final Report is submitted. Quantification of project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of WaterSMART Grants.

PERFORMANCE MEASURES
The success of this project will be directly measured by the reduction in the District's average annual diversion total and the reduction of power consumed at the Barnes Butte and Ochoco

Relift pumping plants. The diversion reductions will be measured by the Oregon Water Resources Department at the canal gauging stations, and the power reduction will be measured by District and Pacific Power staff. We cannot propose how fishery benefits should be measured, since many other variables will affect the success of the reintroduction.

Evaluation Criterion G: Connection to Reclamation Project Activities (4 points)

Up to 4 points may be awarded if the proposed project is in a basin with connections to Reclamation project activities. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.

(1) How is the proposed project connected to Reclamation project activities?

Ochoco Irrigation District is the primary beneficiary of the USBR Crooked River Project. The facilities affected by the proposed project are Crooked River Project facilities. USBR has long sought fishery improvements from the Crooked River Project.

(2) Does the applicant receive Reclamation project water?
Yes.
(3) Is the project on Reclamation project lands or involving Reclamation facilities?
Yes.
(4) Is the project in the same basin as a Reclamation project or activity?
Yes.
(5) Will the proposed work contribute water to a basin where a Reclamation project is located?
Yes.

Environmental Compliance

To allow Reclamation to assess the probable environmental impacts and costs associated with each application, all applicants must respond to the following list of questions focusing on the NEPA, ESA, and NHPA requirements. Please answer the following questions to the best of your knowledge. If any question is not applicable to the project, please explain why. Additional information about environmental compliance is provided in Section IV.D.4 "Budget Proposal," under the discussion of "Environmental and Regulatory Compliance Costs," and in Section VIII.B., "Overview of Environmental Compliance Requirements."

(1) Will the project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earthdisturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

The proposed work will disturb the earth in the immediate vicinity of the concrete work. This work will occur within the prism of the existing Ochoco Main Canal. Therefore the disturbed

area will be kept to a minimum. The facility is to be installed adjacent to the Ochoco Canal Headwork's and again within the canal prism. The project is also located next to cattle pasture, therefore it will minimize any disturbance to wildlife habitat. The project involves excavating the old concrete liner, grading the area and constructing a multi-purpose screen in its place. Installation of gate automation and ramp flume will be within the canal prism as well.

(2) Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?
None
(3) Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "waters of the United States?" If so, please describe and estimate any impacts the project may have.
None

(4) When was the water delivery system constructed?
1916

(5) Will the project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

As stated above the Ochoco Main Canal was constructed in 1916. There have been several improvements and maintenance activities over the years. Such as modifying and upgrading headgates and concrete canal sections (shotcrete repairs). The project will attach to the existing headwork's and remove approximately 100 ft of shotcrete lined canal. This section of canal will be modified to incorporate a new concrete structure supporting the proposed Multi Purpose Screen.

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(6) Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

The existing facility was installed in 1916. There have been several upgrades and maintenance repairs to this section of canal over the years. Christine Horting-Jones the cultural resource specialist at the Bend Field Office is expected to help out with this work.

(7) Are there any known archeological sites in the proposed project area?
None Known.

The project is being constructed within the prism of the existing canal (which was excavated and shotcreted in the past).

(8) Will the project have a disproportionately high and adverse effect on low income or minority populations?

No. The project is being constructed on property owned by the Irrigation District.

(9) Will the project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands? No

(10) Will the project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area? Note, if mitigation is required to lessen environmental impacts, the applicant may, at Reclamation's discretion, be required to report on progress and completion of these commitments. Reclamation will coordinate with the applicant to establish reporting requirements and intervals accordingly.
This project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species. The District has a weed spray program to keep this kind of nuisance at bay. We will see to it that the disturbed areas are seeded and then sprayed to keep the weeds out.

Required Permits or Approvals

Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals. To complete a renewable energy project within the time frame required of this FOA, it is recommended that an applicant has commenced the necessary permitting process prior to applying.
Applicants proposing renewable energy components to Federal facilities should note that some power projects may require FERC permitting or a Reclamation Lease of Power Privilege. To discuss questions related to projects that propose renewable energy development, please contact Mr. Dean Marrone at 303-445-3577.
Note that improvements to Federal facilities that are implemented through any project awarded funding through this FOA must comply with additional
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OID has initiated conversations with Oregon Department of Fish and Wildlife (ODF&W) and have started the process of approvals from their organization. ODF&W will review the screen design. No Oregon Department of State Lands permit for Fill and Removal is required as the project is not within the bed or banks of any stream and less than 50 cubic yards of material will be disturbed. Construction is within the canal prism and there is no chance of contamination to local streams. Therefore no permit will be required from either DSL or from the Army Corps of Engineers.

Funding Plan and Letters of Commitment

Describe how the non-Reclamation share of project costs will be obtained.

Reclamation will use this information in making a determination of financial capability.

The District has included a resolution showing that the OID Board of Directors are committed to providing all non-federal cost-share for the project. It is anticipated that the total project cost will be $299,813.45 the grant requested amount is 49% of that amount, $146,908.59 and the remainder will comprise of OID in-kind match in the amount of 51%, $152,904.86. That in-kind will be made up primarily of labor and equipment, and will be assisted with cash.

The funding plan must include all project costs, as follows:
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(1) How you will make your contribution to the cost share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).

The District proposes to make their in-kind contribution as follows:

OID Manhours	$80,947.04
Outside Manhours	$23,520.00
OID Equipment hours	$18,400.00
Cash Outlay	$30,037.82

(2) Describe any in-kind costs incurred before the anticipated project start date that you seek to include as project costs. Include:

No in-kind costs will be incurred before the anticipated project start date.

(3) Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.
None
(4) Describe any funding requested or received from other Federal partners. Note: Other sources of Federal funding may not be counted towards your 50 percent cost share unless otherwise allowed by statute.
None
(5) Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.
NA

Official Resolution

Include an official resolution adopted by the applicant's board of directors or governing body, or for state government entities, an official authorized to commit the applicant to the financial and legal obligations associated with receipt of WaterSMART Grant financial assistance, verifying:

RESOLUTION 12.01.17.01

Now therefore, be it resolved that the Board of Directors of the Ochoco Irrigation District agrees and authorizes that:

1. The Board of Directors, of the Ochoco Irrigation District has reviewed and supports the proposal submitted;

2. The Ochoco Irrigation district hereby is capable of providing the amount of funding and/or in-kind contributions, specified in the funding plan; and

3. If selected for a Water Smart Grant, the Ochoco Irrigation District will work with Reclamation to meet established deadlines for entering into a cooperative agreement.

4. Michael P. Kasberger, Manager of Ochoco Irrigation District is legally authorized to enter into a Bureau of Reclamation Water Smart Grant.

Dated: Tuesday, January 17, 2012.

Wade Flegel, Board Chairman

Dean Davis, Board Director

Brian Barney, Board Director

Michael P. Kasberger, Secretary/Manager

Budget Proposal

General Requirements

Include a project budget that estimates all costs (not just costs to be borne by Reclamation). Include the value of in-kind contributions of goods and services and sources of funds provided to complete the project. The proposal must clearly delineate between Reclamation and applicant contributions.

Budget Proposal Format

The project budget shall include detailed information on the categories listed below and must clearly identify all project costs and the funding source(s) (i.e., Reclamation or other funding sources). Unit costs shall be provided for all budget items including the cost of work to be provided by contractors. **Lump sum costs are not acceptable.** Additionally, applicants shall include a narrative description of the items included in the project budget. It is strongly advised that applicants use the budget format shown on table 3 at the end of this section or a similar format that provides this information.

Budget Narrative

Ochoco Irrigation District (OID), is submitting this proposal for the USBR Water and Energy Efficiency grant. This project proposes to install a multi-purpose screen on the Ochoco Main Canal at the base of Ochoco Dam near Prineville Oregon. This screen will separate the fish from the diverted irrigation water and will also separate aquatic vegetation at the same time. Through the installation of an automated gate and more accurate measuring device OID will be able to keep tighter control of the diverted water and in the process will conserve 2870 acre feet. OID will also conserve energy making this a multi-purpose screen and project. Reducing maintenance cost (aquatic herbicides) and on farm efficiency are also project goals

The total project cost is $299,813.45 and the grant request is for 49% of that figure, or $146,908.59 and the remaining $152,904.86, or 51% will be picked up by OID in-kind. The in-kind match will consist of OID owned equipment and labor used to fabricate and install the multi-purpose screen. The District will provide the labor to excavate for and fine grade the site. OID will install the bypass line and connect it to the existing chute for the fish to return back to Ochoco Creek. District staff will install concrete forms including rebar and placement of concrete. District employees have the expertise to fabricate and install all of the iron work necessary for the screen, gate automation and measuring device. OID crews will install other associated equipment for the automated gate, new measurement device and telemetry. At project

completion the district will have the Oregon Water Resources Department rate the new measuring device for accuracy.

The NEPA process has been discussed with the Bureau's Bend Field office and we expect it to be a categorical exclusion. The cost for the CE is not expected to exceed $5,000.00. We anticipate the grant may be awarded by September 2012 which would allow us to begin the NEPA process in October and complete it by early November. The district will begin work immediately following all approvals.

We have included a project schedule showing the work to begin in early November and being completed prior to irrigation startup on April 1st, 2013.

Budget Proposal Format;

The project budget has been broken down in the following pages. We have provided it in the suggested table 3 format on the next page, and have broken it down even farther on the spreadsheet following table 3. That spread sheet breaks down each item into unit prices and all of the labor hours and how they are accounted for.

Salaries and Wages;

It is our intent to utilize our own workforce for the majority of the work. The project manager will be Mike Kasberger, manager of the District. The project supervisor will be OID foreman Mark Toney. The Laborers will consist of the work crew from the District and the wages are as follows:

	Base Wage	Fringe	Total Wage
Mike Kasberger	$36.56	$7.00	$43.56
Mark Toney	$23.92	$7.00	$30.92
Work Crew	$15.00	$7.00	$22.00

Fringe Benefits;

The fringe benefits included in the wages are insurance, vacation and sick leave.

Travel;

No travel is expected to be billed to this project.

Equipment;

John Deere 230 Excavator - $100.00 per hour (with out operator)
Case 580 Backhoe - $40.00 per hour (with out operator)
10 yard Dump Truck - $30.00 per hour (with out operator)

Materials and Supplies;

All of the costs of the major items of this project have been broken down and included in the spreadsheet following table 3.

Contractual;

It is expected that OID may contract for labor from one of the local concrete contractors. We have estimated that we will use no more than 840 hours of their time at a cost of $23,520 to the District. The only other portion of contracted labor is expected to be the electrical work. We will bid it out to the lowest bidder.

Environmental and Regulatory Compliance;

We have discussed the project with the local Bend Field office. It is thought that the level of NEPA compliance will be a Categorical Exclusion. The property at which the facility will be constructed is in the Districts ownership. There will be no need to acquire easements. Discussions have proven that the Categorical Exclusion will not likely cost more than $5,000. The work will be accomplished with local field office staff. We have included 2% of the project total for the work.

Reporting;

The District has worked with the Bend Field Office on grants numerous times in the past and is familiar with and prepared to report on the status of the project on a regular basis.

Indirect Costs;

Mike Kasberger will be performing the contract writing and be responsible for the reporting and project closeout. It is estimated that it will take 50 hours of indirect time to complete this project and we have included that in the estimate.

Table 3

Budget Item Description	Computation		Recipient	Reclamation	Total
	$/Unit	Quantity	Funding	Funding	Cost
Salaries and Wages					
Mike Kasberger	36.56				$0.00
Mark Toney	23.92	662.00	$15,835.04		$15,835.04
Laborers	15.00	2650.00	$39,750.00		$39,750.00
Fringe Benefits					
Full-Time	7.00	3312.00	$23,184.00		$23,184.00
Part-Time	0.00				
Travel					
Trip 1					
Trip 2					
Trip 3					

Equipment					
Excavator	100.00	128.00	$12,800.00		$12,800.00
10 yard dump truck	30.00	144.00	$4,320.00		$4,320.00
Back Hoe	40.00	32.00	$1,280.00		$1,280.00
Supplies / Materials					
Office Supplies					
Screen Pannels	12,084.82	1.00		$12,084.82	$12,084.82
Stansions	4,300.20	1.00		$4,300.20	$4,300.20
Hang Sweeper On	6,541.88	1.00		$6,541.88	$6,541.88
Railing	6,746.92	1.00		$6,746.92	$6,746.92
Fish Return Gates	6,368.68	1.00		$6,368.68	$6,368.68
Sweeper	907.80	1.00		$907.80	$907.80
Drive Assembly	7,743.32	1.00		$7,743.32	$7,743.32
Gate	7,203.80	1.00		$7,203.80	$7,203.80
Vent Pipe	75.00	1.00		$75.00	$75.00
Galvanize Parts	35,000.00	1.00		$35,000.00	$35,000.00
Sweeper Drive Unit	22,000.00	1.00		$22,000.00	$22,000.00
Saw Cut	400.00	1.00		$400.00	$400.00
Fish Return Line	2,300.00	1.00	2201.83	$98.17	$2,300.00
Crushed Rock	480.00	1.00		$480.00	$480.00
General Supplies	21,258.00	1.00		$21,258.00	$21,258.00
Concrete	15,700.00	1.00		$15,700.00	$15,700.00
Concrete Pump	2,000.00	1.00	$2,000.00		$2,000.00
Construction					
Contractual Construction					
Outside Labor	28.00	840.00	$23,520.00		$23,520.00
Electrical Setup	20000.00	1	$20,000.00		$20,000.00
Environmental and Regulatory					
Compliance	2.00%	291799.46	$5,835.99		$5,835.99
Other					
Reporting					
Total Direct Costs					
Indirect Costs	$ 43.56	50	$2,178.00		$2,178.00
Total Project Costs			$152,904.86	$146,908.59	$299,813.45

Ochoco Irrigation District
Ochoco Main Canal Multi-Purpose Screen
Budget Proposal

	Description	Dimension	Qty	Unit Price	Extended
Screen Pannel (Quantity is for one pannel... Multiply by 11 for Total)					
	Perforated Plate Screen Material (14 or 16 ga 3	48x120	1		$ 460.00
	Outside of pannel angle iron 1/4"	2x2x1/4 120"	2	$ 18.50	$ 37.00
	Cross members pannel angle iron 1/4"	2x2x1/4 48"	7	$ 7.40	$ 51.80
	Panel Spacers angle Iron	1 3/4 x 1 3/4 x 1/4	4	$ 16.77	$ 67.08
	UHMW	3/8 x 1 120"	2	$ 7.20	$ 14.40
	UHMW	3/8 x 2 1/2 120"	2	$ 18.00	$ 36.00
	UHMW	3/4 x 1 3/4 48"	7	$ 24.62	$ 172.34
	Strong Backs	3x3 tubing	2	$ 130.00	$ 260.00
	Supervision		12	$ 30.92	$ 371.04
	Labor to Build		48	$ 22.00	$ 1,056.00
Stansions					
	Main Leg I-Beam	W12 x 22 120"	12	$ 137.90	$ 1,654.80
	Stiffeners I-beam (cross members)	W4 x 13 92"	12	$ 65.20	$ 782.40
	Bottom Plates	7 x 18 x 1/2	12	$ 5.17	$ 62.04
	Wall Mounts Angle Iron	6 x6 x 3/8 12"	24	$ 10.04	$ 240.96
	Strong Backs	3x3	12	$ 130.00	$ 1,560.00
	Supervision		12	$ 30.92	$ 371.04
	Labor to Build		48	$ 22.00	$ 1,056.00
Hang Sweeper on					
	Track for Trolley channel	MC8 x 3 1/2 20'	6	$ 439.60	$ 2,637.60
	Plate to mount Sweeper on	3/8"x3'x6'	2	$ 311.00	$ 622.00
	Stiffeners	3 x 3 1/4 6'	6	$ 17.28	$ 103.68
	Angle Iron	3 x 3 1/4 36"	12	$ 8.64	$ 103.68
	Angle Iron for Hangers for the Shieves	W12 x 22 36'	4	$ 41.37	$ 165.48
	Plate to mount to wall	3/8" x 4' x2'	6	$ 138.24	$ 829.44
	Strong Backs	3x3	16	$ 130.00	$ 2,080.00
	Supervision		42	$ 30.92	$ 1,298.64
	Labor to Build		168	$ 22.00	$ 3,696.00
Railing					
	Posts square tubing	2 x 2 x 1/4 42"	60	$ 13.54	$ 812.40
	Bases for Posts	4 x 4 x 14 8"	60	$ 2.10	$ 126.00
	Longitudinal Railing	2 x 2 x 1/4 24'	24	$ 92.88	$ 2,229.12
	Walk Decking	36" Wide	60	$ 24.99	$ 1,499.40
	Strong Backs	3x3	16	$ 130.00	$ 2,080.00
	Supervision		42	$ 30.92	$ 1,298.64
	Labor to Build		168	$ 22.00	$ 3,696.00

	Description	Dimension	Qty	Unit Price	Extended
Fish Return Gates					
	2" solid round shaft	2" x 12'	4	$ 131.16	$ 524.64
	2 1/4" pipe	2 1/4" x 12'	4	$ 172.56	$ 690.24
	2" pipe	2" x 12'	4	$ 36.36	$ 145.44
	3/8" plate for paddles	3/8"x2x12	4	$ 1.64	$ 6.56
	2" strap material for paddles	2" x 3/8 x 20'	1	$ 32.80	$ 32.80
	1/2" x 8" plate for paddles	1/2" x 8" x 40'	1	$ 354.40	$ 354.40
	strap for hangers	3/8"x 4" x 20'	1	$ 63.00	$ 63.00
	round rod for hangers	3/4" x 20'	1	$ 31.60	$ 31.60
	Strong Backs	3x3	4	$ 130.00	$ 520.00
	Supervision		30	$ 30.92	$ 927.60
	Labor to build		120	$ 22.00	$ 2,640.00
	actuator for gates		4	$ 1,000.00	$ 4,000.00
Sweeper					
	2" square tubing (heaviest wall you have)	2" x 2"x 1/4" 20'	5	$ 37.00	$ 185.00
	2" x 3" square tubing	2" x 3" x 1/4" 20'	1	$ 101.80	$ 101.80
	3/8" pipe for grease tubes	3/8" x 20'	1	$ 14.60	$ 14.60
	1/4" Plate for Diflector	1/4x 18" 10	1	$ 86.40	$ 86.40
	Strong Backs	3x3	4	$ 130.00	$ 520.00
	Supervision		28	$ 30.92	$ 865.76
	Labor to build		112	$ 22.00	$ 2,464.00
Drive assembly					
	Platform on bottom	W 12 x 22 7'	4	$ 98.53	$ 386.12
	Motor Mount	W 12 x 22 2'	4	$ 27.58	$ 110.32
	Platform standing up	W 12 x 22 4'	4	$ 55.16	$ 220.64
	1 1.5" Drive shaft	1.5" x 24"	4	$ 28.76	$ 115.04
	ancilary parts	W 4 x 13 24'	2	$ 195.60	$ 391.20
	Strong Backs	3x3	4	$ 130.00	$ 520.00
	Supervision		60	$ 30.92	$ 1,855.20
	Labor to build		240	$ 22.00	$ 5,280.00
	Sheives and bearings		1	$ 5,000.00	$ 5,000.00
	Wire Rope		1	$ 1,000.00	$ 1,000.00
Gate					
	Plate for gate	3/8"x 5' x 6'	1	$ 518.00	$ 518.00
	Stiffiners	3" x 3" x 1/4" 5'	7	$ 172.80	$ 1,209.60
	Ends for Slides	W 12 x 22 7'	2	$ 96.53	$ 193.06
	Top Pieces	W 12 x 22 7'	2	$ 96.53	$ 193.06
	Plate for Motor	1/2" x 12" x 18"	1	$ 17.28	$ 17.28
	UHMW Slides	1" x 3" 10'	4	$ 18.20	$ 72.80
	Supervision		60	$ 30.92	$ 1,855.20
	Labor to build		240	$ 22.00	$ 5,280.00
	Gate actuator		1	$ 2,500.00	$ 2,500.00
	Telemetry		1	$ 2,500.00	$ 2,500.00
Vent Pipe					
	3" x 16' Vent Pipe	3" Pipe 15'	1	$ 75.00	$ 75.00
	Supervision		4	$ 30.92	$ 123.68
	Labor to build		16	$ 22.00	$ 352.00

	Description	Dimension	Qty	Unit Price	Extended
Galvanize Parts					
	Estimate from Northwest Galvanizing		1	$ 35,000.00	$ 35,000.00
Sweeper Drive unit					
	Used number from Kevin Crew Engineers Estimate (Black Rock Eng		1	$ 22,000.00	$ 22,000.00
Electrical setup					
	Used number from Kevin Crew Engineers Estimate (Black Rock Eng		1	$ 20,000.00	$ 20,000.00
Saw cut					
	OID to lay out		2	$ 22.00	$ 44.00
	We-Cut to cut (Just downstream of headgates	hours	4	$ 100.00	$ 400.00
	Supervision		12	$ 30.92	$ 371.04
OID two trucks and an excavator to remove old lining		hours	48	$ 22.00	$ 1,056.00
	Excavator		16	$ 100.00	$ 1,600.00
	Two trucks		32	$ 30.00	$ 960.00
Install the fish return line					
	We-Cut to cut notch into the existing Chute		4	$ 100.00	$ 400.00
	Purchase 100 lf of hancore pipe		100	$ 19.00	$ 1,900.00
	Supervision		40	$ 30.92	$ 1,236.80
	OID to install pipe 10 days		160	$ 22.00	$ 3,520.00
	Excavator		64	$ 100.00	$ 6,400.00
	Truck		64	$ 30.00	$ 1,920.00
	Backhoe		32	$ 40.00	$ 1,280.00
Excavate out for the main slab (300 cy)					
	Excavator		48	$ 100.00	$ 4,800.00
	truck		48	$ 30.00	$ 1,440.00
	Supervision		24	$ 30.92	$ 742.08
	OID labor		96	$ 22.00	$ 2,112.00
	3/4 Crushed for the fine grading		60	$ 8.00	$ 480.00
General Supplys for Project					
	Snap ties 26 boxes		30	$ 25.00	$ 750.00
	Cat heads 2500		3000	$ 1.30	$ 3,900.00
	6 units of plywood (48 sheets / unit)		288	$ 18.00	$ 5,184.00
	2x4 whalers		1400	$ 3.00	$ 4,200.00
	4 ton Rebar		6	$ 1,000.00	$ 6,000.00
	Tie Wire		1	$ 300.00	$ 300.00
	Nails		4	$ 40.00	$ 160.00
	Grade Stakes		20	$ 25.00	$ 500.00
	3/4 Crushed for the fine grading		33	$ 8.00	$ 264.00
Form for the Main Slab					
	Supervision		30	$ 30.92	$ 927.60
	OID 2 men for 8 days		120	$ 22.00	$ 2,640.00
	Outside 3 men for 5 days		120	$ 28.00	$ 3,360.00
	2x4 whalers		0	$ 3.00	$ -
	3/4 plywood		0	$ 20.00	$ -

	Description	Dimension	Qty	Unit Price	Extended
Pour the main Floor					
	Supervision		4	$ 30.92	$ 123.68
	OID 2 men for 1 day		16	$ 22.00	$ 352.00
	Outside 3 guys for 1 Day		48	$ 28.00	$ 1,344.00
	Concrete Pump		1	$ 500.00	$ 500.00
	Concrete		41	$ 100.00	$ 4,100.00
Form Main Walls					
	Supervision		90	$ 30.92	$ 2,782.80
	OID 2 men for 23 days		360	$ 22.00	$ 7,920.00
	Outside 3 guys for 15 days		360	$ 28.00	$ 10,080.00
Pour Main Walls					
	Supervision		4	$ 30.92	$ 123.68
	OID 2 Men for 1 Day		16	$ 22.00	$ 352.00
	Outside 3 Guys for 1 Day		24	$ 28.00	$ 672.00
	Concrete Pump		1	$ 500.00	$ 500.00
	Concrete		81	$ 100.00	$ 8,100.00
Form for Ramp Floor					
	Supervision		20	$ 30.92	$ 618.40
	OID 2 men for 5 days		80	$ 22.00	$ 1,760.00
	Outside 3 guys for 5 days		120	$ 28.00	$ 3,360.00
Pour Main Floor for Ramp					
	Supervision		4	$ 30.92	$ 123.68
	OID 2 Men for 1 Day		16	$ 22.00	$ 352.00
	Outside 3 Guys for 1 Day		24	$ 28.00	$ 672.00
	Concrete Pump		1	$ 500.00	$ 500.00
	Concrete		15	$ 100.00	$ 1,500.00
Form Walls for the Ramp Flume					
	Supervision		20	$ 30.92	$ 618.40
	OID 2 men for 5 days		80	$ 22.00	$ 1,760.00
	Outside 3 guys for 5 days		120	$ 28.00	$ 3,360.00
Pour Walls for the Ramp Flume					
	Supervision		4	$ 30.92	$ 123.68
	OID 2 Men for 1 Day		16	$ 22.00	$ 352.00
	Outside 3 Guys for 1 Day		24	$ 28.00	$ 672.00
	Concrete Pump		1	$ 500.00	$ 500.00
	Concrete		20	$ 100.00	$ 2,000.00

Totals

Project Direct Total ***$ 291,799.46***

Indirect	Nepa Compliance	2%	$ 291,799.46	$	5,835.99
	Indirect	50	$ 43.56	$	2,178.00

Project Grand Total ***$ 299,813.45***

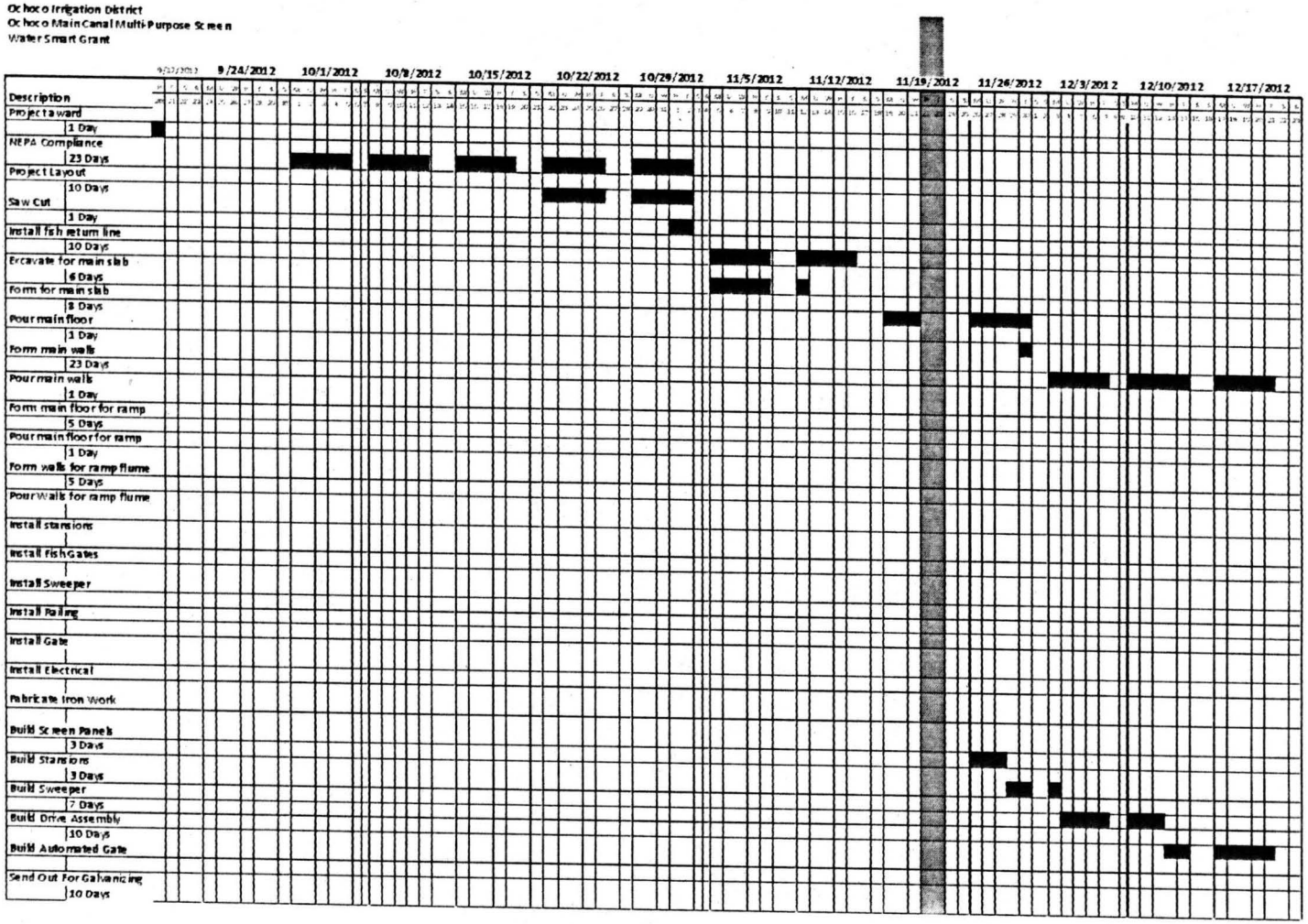
Description	Dimension	Qty	Unit Price	Extended
	Project Grand Total	100%	$	299,813.45
	OID In-Kind Match	51%	$	152,904.86
	Grant Requested Amount	49%	$	146,908.59

In-Kind Match consists of

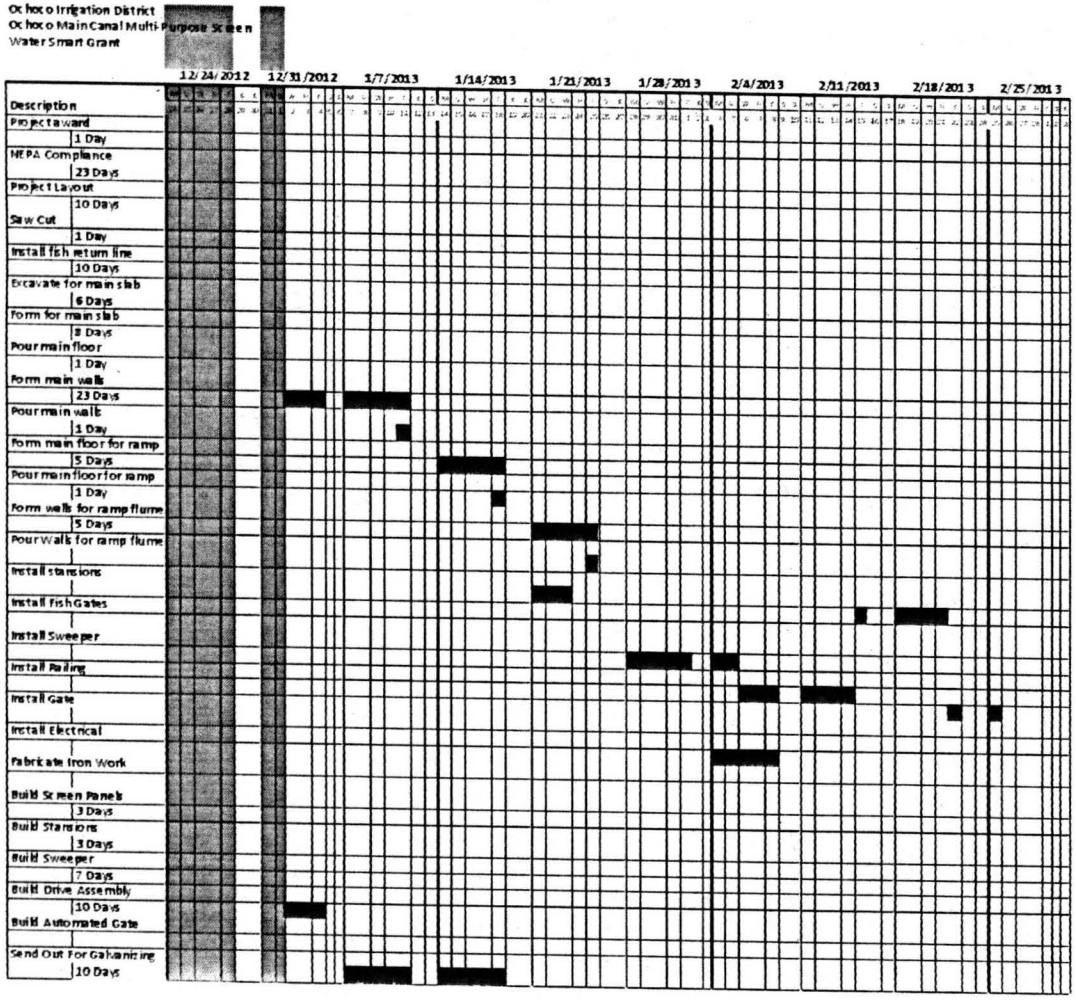
OID Manhours	$	78,769.04
Outside Manhours	$	23,520.00
OID Equipment Hours	$	18,400.00
Cash Outlay	$	32,215.82
	$	152,904.86

		Wage	Fringe	Total	
Project Manager	Mike Kasberger	$ 36.56	7	$	43.56
Field Supervisor	Mark Toney	$ 23.92	7	$	30.92
Laborers	Laborers	$ 15.00	7	$	22.00

Ochoco Irrigation District
Ochoco Main Canal Multi-Purpose Screen
Water Smart Grant



Ochoco Irrigation District
Ochoco Main Canal Multi-Purpose Screen
Water Smart Grant



Section VIII. Other Information

VIII.A. Performance Measures

VIII.A.1. FY2012 WaterSMART Water and Energy Efficiency Grants: Performance Measures

All WaterSMART Grant applicants are required to propose a method (or "performance measure") of quantifying the actual benefits of their project once it is completed. Actual benefits are defined as water actually conserved, marketed, or better managed, as a direct result of the project. A provision will be included in all assistance agreements with WaterSMART Grant recipients describing the performance measure and requiring the recipient to quantify the actual project benefits in their final report to Reclamation upon completion of the project. Quantifying project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of WaterSMART Grants.

The following information is intended to provide applicants with examples of some acceptable performance measures that may be used to estimate pre-project benefits and to verify post-project benefits upon completion. **However, the following is not intended to be an exclusive list of acceptable performance measures. Applicants are encouraged to propose alternatives to the measures listed below if another measure is more effective for the particular project.** Reclamation understands that, in some cases, baseline information may not be available, and that methods other than those suggested below may need to be employed. If an alternative performance measure is suggested, the applicant must provide information supporting the effectiveness of the proposed measure as applied to the proposed project.

Measuring Devices: b. Irrigation Metering

Installing measuring devices may include, but is not limited to, the following:

Flow meters (current or acoustic)

Weirs

Flumes

Meter gates

Submerged orifices

Pre-project estimations of baseline data:

Pre-project flows are difficult to estimate without a measuring device in place. However, the applicant may be able to use data from measurement devices located elsewhere in the delivery system (if available). Otherwise, the applicant may have to rely on other historical data and/or estimates based on soils/geology, flow data, and weather data.

The District has in the past attempted to verify the accuracy of the existing measuring device by a few methods. One would be to look at the reservoir level on a rolling 5 day average and the inflow and outflow to determine if the flows in the canal make sense. This has proven to be problematic. This new ramp flume will use a critical flow measurement that will not be subject to influences of aquatic vegetation. Another method we have used in the past is to use a submerged orifice equation. We do not believe that this method was highly accurate either. Regardless, the publications we have researched have determined that the ramp flume will be within +- 2% accurate. We will have the Oregon Water Resources Department verify these numbers.

Post-project methods for quantifying the benefits of projects to install measuring devices:

Compare post-project water measurement (deliveries or consumption) data to pre-project water uses

OID keeps daily use records on all of our deliveries and will compare the post-project water measurement with the pre-project water uses.

Compare pre-project and post-project consumptive use by crop via remote-sensing information—taking into account cropping patterns, irrigation methods, crop rotations, climatic variables, etc.

This brings up a good point. Since our deliveries are on a demand basis, they are highly variable. Not only are we a very flashy system, meaning our supply depends solely on the snow pack, and we do not know from one year to the next how much water the District will have to deliver, but we tend to be highly variable because of crop pattern as well. One year the valley may be mostly mint and alfalfa crops which will need between 3 and 4 acre feet per acre. The next year crops might be mostly wheat and garlic seed which will need closer to 2 acre feet per acre. So comparing the post-project water use to the pre-project water uses should definitely use the crop reports to help determine the demand.

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Post-project methods for quantifying benefits of SCADA or SCADA/GIS system projects:

Calculate amount of increased carryover storage in associated reservoirs. This is a long-term measure which will be more meaningful over a period of years.

OID will be able to track the amount of increased carryover storage in associated reservoirs. The district will need to track for a period of years because the immediate benefit might not be seen in the first or second year. Especially if we experience a dry cycle.

Establish baseline data by measuring existing spillage or document historical spillage. A rated measuring device should be positioned to measure spillage losses. To account for temporal variations, a minimum of a one-year history of pre-project measurements is

desirable for future comparison to post-project water usage. Spillage volumes can vary substantially between wet and dry years; therefore, some multiyear estimates of spillage may be necessary.

The District will establish a baseline for measuring at existing spill points. Through the System Optimization Review grant the District is currently conducting, the district will install 4 new points of measurement at existing operational spills to help in that effort.

Track pre-project water diversions using district or State diversion

OID will be able to track our water usage via our crop records over the last several years. Utilizing the many years of historical diversion records from Oregon Water Resources Department will also be helpful.

Post-project methods for quantifying benefits of spillage reduction projects:

Using rated devices, measure post-project flows. Gather enough data to account for seasonal and temporal variations. Using baseline and post-project data, calculate savings using the following calculation: Savings = (Spillage) without project – (Spillage) with project.

OID will use our new ramp flume, which will be rate by Oregon Water Resources Department, to gather enough data to account for seasonal and temporal variations. The district will then be able, using baseline and post-project data, calculate savings using the following calculation: Spillage without project – Spillage with project = Savings

Track post-project changes in the amount of water diverted and compare to pre-project diversion data.

OID will track post-project changes in the amount of water diverted and compare to the pre-project diversion data.

Compare estimated historical spills from district/project boundaries to post-project spills.

Document how the additional water resulting from the reduction in spillage was used (e.g., water retained in the river to support riparian habitat, transferred for another use, or used to meet normal water demands in times of drought).

Report specific volume changes to spills, diversions, or deliveries due to system automation.

For more information regarding canal seepage monitoring and verification, visit <http://www.agwatercouncil.org/images/stories/monitoring_and_verification_canal_seepage.pdf>

Performance Measure No. B.— Projects with Quantifiable Energy Savings

The performance measures included below are examples that may be helpful

in estimating pre-project benefits and post-project energy savings for projects that are expected to increase the use of renewable energy sources in the management and delivery of water and/or are upgrading existing water management facilities resulting in quantifiable and sustained energy savings. Energy efficiency projects are intended to increase the use of renewable energy and increase overall energy efficiency in the management and delivery of water. Applicants should address the following subsections as part of the performance measures they submit with their applications.

Performance Measure No. B.1. —Implementation of Renewable Energy Improvements Related to Water Management and Delivery

Explain the methodology for calculating the quantity of energy savings resulting from the activity

Simply put, OID has 27 district pumps within the irrigation system, water saved will not be pumped and therefore will save a corresponding amount of electricity.

Crook County

300 N.E. 3rd Street • Prineville, Oregon 97754
Phone (541) 447-6555 • FAX (541) 416-3891

January 16, 2012

Re: Letter of Support for Ochoco Irrigation District
Water Smart: Water and Energy Efficiency Grant.

To whom it may concern:

Crook County supports Ochoco Irrigation District's (OID's) efforts to obtain a Water Smart: Water and Energy Efficiency Grant. Crook County has a long standing relationship with OID and recognizes the importance and value of water and energy conservation. Many of OID's patrons are also constituents of Crook County and any efforts to conservation water and electricity are beneficial to the environment as well as the economic good of our community.

We understand that OID requests funds to construct a multi-purpose screen at the beginning of the Ochoco Main Canal. This project is expected to conserve a sizable amount of water which will benefit the threatened steelhead fry. It will also conserve electricity since the water that is being conserved will not have to be pumped. This conserved water will directly affect the amount of aquatic herbicide used since the flows will be reduced. Operation and Maintenance will be reduced along with neighborhood conflict since the aquatic vegetation will be reduced. And finally the fish being released from Ochoco Dam will be screened out of the canal and into Ochoco Creek. This project is a big winner for multi-purposes.

Thank you for your consideration.

Sincerely,

Mike McCabe
Crook County Judge

Mike McCabe, Judge • Ken Fahlgren, County Commissioner • Seth Crawford, County Commissioner

City of Prineville

387 NE THIRD STREET • PRINEVILLE, OREGON 97754

DEPARTMENT OF PUBLIC WORKS

ENGINEERING DEPARTMENT

Phone: (541)447-2337 FAX: (541) 447-5628

EMAIL: eldaw@cityofprineville.com Website: www.cityofprineville.com

January 10, 2012

Re: Letter of Support for Ochoco Irrigation District Water Smart Grant.

To Whom It May Concern:

The City of Prineville supports Ochoco Irrigation District's application for a WaterSMART: Water and Energy Efficiency Grant.

As the only incorporated town in rural Crook County, the City of Prineville has recently become very conscious of the importance of water conservation activities within the Crooked River basin. In the spring of 2008, 242,000 threatened Steelhead fry were released into the Crooked River and Ochoco Creek within the City of Prineville's limits. Additional fry were released in these same areas again in the spring of 2009, 2010 and 2011. The City of Prineville (City) and Ochoco Irrigation District (OID) have become very close partners working to identify and mitigate risks associated with our close proximity to this species.

Both groups are currently participating in the development of a Habitat Conservation Plan which will ensure the survival of this species in our basin. This plan recognizes our good efforts to support the Steelhead. The combined activities of both groups have led to a potential 10j rulemaking by the National Oceanic and Atmospheric Administration (NOAA). When appropriate conditions exist, the reintroduced population can be classified as "Experimental and Non-Essential". This monumental rulemaking will be done in response to our proactive efforts to support the species and develop the HCP.

As the City and OID have worked hand-in-hand on the above activities, the importance of water and energy conservation in our basin has become evident. It is our understanding that OID requests funds to construct a multipurpose screen at the head of the Ochoco Main Canal. It is estimated that this project will conserve up to 2,150 acre feet of water and save 490,000 kilowatt hours of power per year while protecting the threatened Steelhead fry. This is a fantastic project that the City fully supports.

Thank you for your consideration,

Betty Roppe, Mayor

Betty Roppe, Mayor
City of Prineville
541-447-5627

CRWC
CROOKED RIVER WATERSHED COUNCIL

498 SE Lynn Blvd.
Prineville, Oregon 97754

Phone: (541) 447-8567 Fax: (541) 233-0744

contact@crwc.info
www.crookedriver.deschutesriver.org

January 12, 2012

Re: WaterSmart: Water and Energy Efficiency Grant- Ochoco Irrigation District

USBR Representative,

We are writing to support the grant application submitted by Ochoco Irrigation District under your WaterSmart program. This proposed project will deliver multiple benefits to Ochoco Creek directly and the lower Crooked River watershed indirectly.

Direct benefits include reduction of chemical agents to control weeds, improved accuracy in water measurements, energy and water conservation, and of course, keeping fish out of the main canal. These benefits add significant value to the investment and project a positive, proactive image of the District. By implementing this project with your support through this grant, you are also exhibiting good water resource stewardship and protecting fish. This project has much more upside than some others as it addresses several improvements that will return dividends to the District and its patrons over time.

Indirectly, this project will aid in improving conditions in the lower watershed by conserving water, and promoting less chemical use. Both of these practices have the effect of increasing water quantity and quality in the lower watershed. Conserved water is important in this area as competing interests for water supplies continue to grow.

We recognize that we all share in the responsibility to contribute solutions that effectively address these issues if we are to make sustained improvements. We very much appreciate the effort the District is taking by developing and submitting this application to the WaterSmart program. We recommend approving the application so that this important work can be supported.

If you have any questions about our work, our relationship and past work with Ochoco Irrigation District, or any other related matter, please contact me directly at 541-447-8567; email is chris@crwc.info. Thank you for considering our letter.

Sincerely,

Chris M. Gannon, Director
Crooked River Watershed Council

498 SE Lynn Blvd.
Prineville, Oregon 97754

Phone: (541) 447-9545 Fax: (541) 416-2119

Libby.stahancyk@crooksnrcs.edu

January 6, 2012

Dear Water SMART Grant Committee:

I am writing you today in regards to Ochoco Irrigation District's (OID) Water and Energy Efficiency grant application for the Ochoco Main Canal Project. The Crook County Soil and Water Conservation District (CCSWCD) is a large supporter of helping implement both water and energy efficiency projects within Crook County. This project will include the construction of a multipurpose screen at the head of the Ochoco Main Canal diverted from Ochoco Creek.

Installing this multipurpose screen will most importantly, eliminate fish access into the main canal, which has been and still is a major concern for OID and CCSWCD. There are two additional benefits to installing this screen one being the water conservation of an estimated 2,150 acre feet and secondly the realized energy savings of 490,000 kilowatt hours. The new system will be automated providing a new measuring device to allow for efficiency and improved control of the water that enters the canal. Not only will this screen provide all of the previously stated benefits, it will separate the aquatic vegetation out of the canal water and thus require less aquatic herbicide application and require less maintenance.

This project definitely emphasizes on several environmental and conservation concerns that all partners involved have had regarding the Ochoco Main Canal for some time. The CCSWCD will provide any technical assistance that may be necessary for this worthwhile project.

The CCSWCD strongly recommends that you consider OID's application for funding and realize the multitude of benefits and improvements that this project will offer to several fish species and agricultural producers serviced by Ochoco Irrigation District.

Sincerely,

Libby Stahancyk
Project Manager

CRWC
CROOKED RIVER WATERSHED COUNCIL

498 SE Lynn Blvd.
Prineville, Oregon 97754

Phone: (541) 447-8567 Fax: (541) 233-0744

contact@crwc.info
www.crookedriver.deschutesriver.org

January 12, 2012
Re: WaterSmart: Water and Energy Efficiency Grant- Ochoco Irrigation District

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We recognize that we all share in the responsibility to contribute solutions that effectively address these issues if we are to make sustained improvements. We very much appreciate the effort the District is taking by developing and submitting this application to the WaterSmart program. We recommend approving the application so that this important work can be supported.

If you have any questions about our work, our relationship and past work with Ochoco Irrigation District, or any other related matter, please contact me directly at 541-447-8567; email is chris@crwc.info. Thank you for considering our letter.

Sincerely,

Chris M. Gannon, Director
Crooked River Watershed Council

DESCHUTES RIVER CONSERVANCY

Mike Kasberger, Manager
Ochoco Irrigation District
1001 N W Deer St.
Prineville, OR 97754-1134

January 16, 2012

Dear Mike:

The Deschutes River Conservancy (DRC) submits this letter in support of Ochoco Irrigation District's (OID) Bureau of Reclamation WaterSmart Water and Energy Efficiency Grant proposal to construct a multipurpose screen at the head of its Ochoco Main Canal. The DRC is a 501(c)3 organization dedicated to restoring stream flow and improving water quality in the Deschutes Basin. The DRC supports any efforts of the district to conserve water; the fish screen has the potential to reduce the amount of water needed to convey irrigation water to the end users.

While the primary purpose of the screen is to keep fish out OID canals, providing critical benefits for native redband trout and reintroduced anadromous fish, it also has the capacity to provide other important water quality, quantity and energy conservation benefits. By reducing the amount of aquatic growth entering the canal, OID will be able to use less water to convey water to its deliveries, resulting in less water and energy use. Reducing aquatic vegetation will result in less herbicide application helping to limit any potential impacts to water quality. OID has been actively pursuing and implementing ways to better manage water and energy resources in the district, and this project is consistent with those goals. This project aligns with the DRC's mission and we support NUID's efforts to screen fish, improve water quality and conserve water and energy.

Sincerely,

Tod Heisler, Executive Director
Deschutes River Conservancy