

**Three Sisters Irrigation District  
Collaborative Restoration Project  
which includes  
Fish Screen/Passage  
Channel Restoration Project  
and the  
Main Canal Piping/Penstock Project  
Phase 3**

**DESCHUTES COUNTY  
OREGON**

**THREE SISTERS IRRIGATION DISTRICT  
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**May 4, 2010**

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## Executive Summary

April.30<sup>th</sup>, 2010

Three Sisters Irrigation District  
Sisters, Deschutes County, Oregon

The project includes components that accomplish goals set out in tasks A, B, C, and D.

**Task A Water Conservation** of the project includes the replacement of an existing canal (identified as the Three Sisters Irrigation District Main Canal) with a buried pipeline. It provides irrigation water for 175 rural landowners across approximately 8,000 acres. The project will pipe 5,200 feet of open canal with 10,400 ft of two 54” high density polyethylene (HDPE) pipes. Phase 3 of the Main Canal Pipeline/Penstock project will conserve approximately 1500 acre feet in canal seepage loss.

**Task A Improved Water Management** will involve the installation of 4 new weir gates (which are part of the fishscreen) automated using a telemetry and SCADA system that will allow TSID to better manage 100% of their 160 cfs flow, (35,000 acre feet avg. annual diversion) as well as maintain the protected instream flows in Whychus Creek for listed Steelhead, Chinook Salmon, listed Bull Trout and resident fish.

**Task B Energy Efficiency** of the project includes the completion of the 3<sup>rd</sup> and final phase of replacement of an existing canal (identified as the Three Sisters Irrigation District Main Canal) with a buried pipeline. Upon completion of the pipeline pressurized water will now be available to the Fryrear pipeline which serves 502.7 acres, the Patterson pipeline which serves 61 acres and the Halousek group ditch which serves 127.1 acres for a total of 690.80 acres. These 19 farms will be able to eliminate their irrigation pumps.

**Task C Addressing Endangered Species Concerns** The Deschutes River Conservancy, the Deschutes Land Trust, and the Upper Deschutes Watershed Council developed a comprehensive restoration strategy to guide habitat restoration in support of steelhead reintroduction in 2006. This strategy sets the broad goal of restoring the habitat conditions necessary to support self-sustaining populations of summer steelhead and spring Chinook in Whychus Creek. The actions proposed under the Whychus Creek – Three Sisters Irrigation District Main Canal Piping Project will move us towards this goal.

This project is one component of a larger effort, the Whychus Creek – Three Sisters Irrigation District Collaborative Restoration Project. The Whychus Creek – Three Sisters Irrigation District Collaborative Restoration Project will address limiting factors related to the Three Sisters Irrigation District diversion on Whychus Creek. The larger project contains four interconnected components. It will pipe a leaky irrigation canal and legally restore stream flow at the Three Sisters Irrigation District diversion, screen the diversion,

restore fish passage at the diversion, and improve habitat just downstream from the diversion. All 3 components will be under construction September 2010-March 2011.

**Task D Water Markets** will involve TSID working with DRC to market and certificate the final 2 cfs from phase 3 (approximately 833 acre feet annually) of water into a water right held by the State of Oregon that will protect flows for fish and water quality in Whychus Creek.

Phase 3 of the Main Canal Pipeline Project will begin in September 2011 and be completed in September 2012. This distance will include sections traveling through high seepage reaches of canal. In addition to improving irrigation management, the project will also generate renewable energy through the natural pressure created in the pipeline. Two 750 Kilowatt turbines will be installed at the terminus of the pipeline located at Watson Reservoir once Phase 3 and the hydro plant are completed.

The primary purpose of the project is to improve stream flow and water quality conditions in Whychus Creek for fish, wildlife and aquatic habitat. The three phase project (Phase I & II are currently under construction) will return a minimum combined flow rate of 6.0 cubic feet per second to Whychus Creek and annually conserve an estimated total of 3000 to 4500 acre-feet of water. The instream reach will be from the existing TSID point of diversion at river mile (RM) 23.5 (approx.) to the mouth of Whychus Creek.

The project will strengthen a working relationship between Deschutes Soil & Water Conversation District (SWCD), Natural Resources Conservation Service (NRCS), Upper Deschutes Watershed Council (UDWC), Deschutes National Forest, Sisters Ranger District (USFS), Three Sisters Irrigation District (TSID) and interested funding organizations such as Deschutes River Conservancy (DRC), Oregon Watershed Enhancement Board (OWEB), the Pelton General Electric Water Fund (PGE), Deschutes National Forest, Sisters Ranger District (USFS) and the Bureau of Reclamation (BOR) through their Water and Energy Efficiency Grants program (WaterSMART).

**The average annual acre-feet of water supply:** Historically TSID diverts between 30,000 to 35,000 acre feet. 20,000 – 22,000 in drought years like 1977, 2001 & 2005. The Oregon Water Resources Department maintains a gauging station near TSID's diversion on TSID's main canal. The recorder takes a reading every 15 minutes. Diversion records date back to 1960. Conversion from flood irrigation to sprinkler occurred in the late 1960's into 1970's. Those conservation measures reduced TSID diversion from 50,000 acre feet to 35,000 acre feet.

**Estimated water saved after the project is completed:** An irrigation loss analysis for all 3 phases in 2009 was conducted by Newton Consultants. The Main Canal between TSID diversion and Watson Reservoir in 2009 had an estimated canal loss of 10.85 cfs. Over a 210 day irrigation season (April- Oct.), that translates into 4500 acre feet per season. Phase 3 of the Main Canal piping project would conserve about 1/3 of the loss.

**Estimated amount of water better managed:**

160 cfs (35,000 acre feet avg. annual diversion). Delivery efficiency will improve in a number of ways. First, the additional conserved water will help shore up deliveries to the whole district. Second, it now takes 5-12 hours for the water to reach Watson Reservoir while wetting down the ditch. The piping of all three phases will eliminate this lag time. The new TSID Diversion Headgates that were installed in Phase I will be coordinated with the 4 new fishscreen weir gates through SCADA and telemetry. This system will allow TSID to capture fluctuating flows during the summer as well as protect and maintain instream flows for fish and water quality.

**Estimated and current water marketed:** Phase 3 will conserve approximately 3 cfs. TSID will market 2 cfs to DRC for Phase 3 of the Main Canal pipeline. The remaining conserved water will help shore up on farm deliveries in the District.

As in the past project like the Cloverdale pipeline, Fryrear pipeline, and the 5 phases of the McKenzie pipeline project TSID has contracted with DRC to apply for a new in stream water right.

Under Oregon's water laws, water right holders who implement a water conservation project can apply for a new water right equivalent to the amount of water that the project conserved. This project will create a new instream water right under Oregon law. It will legally protect over 2 cfs from river mile 26.5 to the mouth of Whychus Creek during the summer irrigation season.

The Deschutes River Conservancy will complete Oregon's Conserved Water application process with the Oregon Department of Water Resources on behalf of TSID. This process will create a new instream water right of at least 2 cfs with an 1895 priority date. The instream right will protect flows from April 1 to October 31 and at other times when TSID is diverting water.

**Length of time and estimated completion date for the project: Phase 3 Pipeline Schedule:**

- Main Canal Pipeline Penstock Project Feasibility Study & Preliminary design completed September 2008 by NRCS engineer Bill Cronin under authority of Bridging the Headgate Agreement.
- Culture Resource Survey & Report completed March & April 2009 by Archeologist, Scott Stuemke. Report submitted to SHPO May, 2009.
- Survey of Main canal completed March/April 2009 by Fred Ast, CWRE and canal profile sent to Bill Cronin for final design. Final design was completed August 2009.
- All NEPA requirements for all three phases were completed September 28<sup>th</sup>, 2009 Categorical exclusions were completed by both BOR and USFS in 2009
- Advertise for pipe & materials bids November 1, 2010.
- Open bids December 2, 2010. Award materials contract December 10, 2010. Order pipe & materials.
- All BOR funds can be expended in 2011,

- Take delivery of pipe Spring 2011
- Weld up pipe Summer 2011.
- Prep main canal with D-8 October/November/December 2011.
- Sand Bottom of canal, install pipe in canal, backfilling November 2011 to August 31, 2012.
- Project completion September 2012

**Length of time and estimated completion date for the project: Channel & Habitat Restoration, Fish Passage and Fishscreen Schedule:**

- Farmers Conservation Alliance TSID Fish Screen Design completed in 2009 by Anderson Perry & Associates. Roughened Channel and Fish Passage Design completed in 2009 by River Design Group in 2009. Whychus Creek Channel & Habitat Restoration Design completed by the USFS in 2009. USF&W, NOAA and ODF&W participated in the 12 month design process.
- Culture Resource Survey & Report completed 2009 by USFS. Report submitted to SHPO and concurrence was reached.
- All NEPA requirements for all three components were completed in 2009. ARBO Programmatic general permit was completed by USFS and NOAA,
- USFS is in the process of getting permits from ACOE and DSL for instream work
- UDWC, USFS and TSID will start the channel restoration and passage in September 2010.
- TSID will start the Fish Screen in October 2010
- All BOR funds can be expended in 2010 & 2011.
- Channel restoration and passage will be completed by October 15<sup>th</sup> 2010
- FCA TSID Fishscreen will be completed by March 2011.
- Habitat and re-vegetation will occur in October 2010, March 2011 and any supplemental needs in fall of 2011 and spring of 2012.
- Project completion September 2012

**Applicant is in Reclamation District (Yes/No):** No

## **BACKGROUND DATA**

**Geographic location (state, county, and direction from nearest town). Attach a map of the area:**

Three Sisters Irrigation District is generally described as running in a northeasterly direction from Whychus Creek (a tributary of the Deschutes River), through the Cloverdale area, and down McKenzie Canyon to the Lower Bridge area. The office is located 4 miles east of the city of Sisters on Highway 20. TSID serves farm land in both Deschutes County and Jefferson County, 20 miles northwest of Redmond in the Upper Deschutes River Basin.

**Describe the source of water supply, the water rights involved, current water uses (agricultural, municipal, domestic or industrial), the number of water users served, and the current and projected water demand and identify potential shortfalls in water supply:**

The source of water comes from Whychus Creek a tributary of the Deschutes River. TSID carries the water right certificates on over 8,000 acres of water rights. The Main Canal Pipeline Project serves 8000 acres and 175 farmers that use the water for agricultural applications.

Due to the nature of the climate in Central Oregon we are continuously looking for ways to stretch the water that is available. Piping will not only conserve a considerable amount for fish reintroduction, but also serve the farmers by giving them more water.

**If water is primarily used for irrigation, describe major crops, total acres served:**

On 53% of the cropland, alfalfa or grass hay is grown. 25% is pasture and 22% is used to produce specialty crops such as carrots and radish for seed. The total irrigated acreage served in the project area is 8,000.

**If the application includes renewable energy or energy efficiency elements, describe existing energy sources and current energy uses.**

Once all 3 phases are completed on the Main Canal pipeline, TSID water users on the Fryrear and Patterson pipelines will receive pressurized water, thus conserving energy. The Halousek Group will work with NRCS through AWEP & EQIP farm bill programs to pipe their ditch so that they can take advantage of the pressurized water. These 19 farms irrigate a total of 690.8 acres. Annual conserved energy once these 19 farms are pressurized will range from 500, 000 to 800,000 KWH. In turn when the Hydro plant is built in 2012 and goes on line in 2013, TSID will produce between 3,700,000 KWH to 5,000,000 KWH, enough green power to serve 400-500 homes during the irrigation season, March-October.

**Describe the applicant's water delivery system. For agricultural systems, please include the miles of canals, miles of laterals and existing irrigation improvements (i.e. type, miles, acres). For municipal systems, please include the number of connections and/or number of water users served, and any other relevant information describing the system.**

The system consists of a series of District owned and operated canals, privately owned and operated ditches, and two principal water storage facilities. Water diverted from Whychus Creek flows to the Watson Reservoir, from which it runs through the Main Canal and Cloverdale Canal to the McKenzie Reservoir. Along the way, a series of private ditches is fed, each with its own head gates and measuring devices. From the McKenzie Reservoir water runs down the Association and Black Butte Pipelines where it serves the needs of McKenzie Canyon and Lower Bridge members. Of the 60 miles of canals and ditches over 30 miles are piped. Over 4000 of the 8000 irrigated acres are served by pipelines.

## CONSERVATION PROJECTS

**Vermilyea:** The project involved piping approximately 3000ft of the 7000ft ditch. The project conserves between 50 to 75 acre-feet per irrigation season.

**Brown:** The Brown project involved the elimination of approximately an 8000ft ditch. The 5 farms that the ditch served were all converted from on farm flood irrigation to pressurized sprinklers. The project conserves over 500-acre feet per irrigation season.

**Bartlemay Pipeline:** The Bartlemay Pipeline was a model conservation project, 7200 feet of open ditch with a 50% loss factor has been put in pipe and buried. Three of the five ponds have been lined. The project conserves from 300 to 500 acre-feet per season

**Thompson:** The project eliminated the Thompson Ditch, which was approximately 7000ft. Subsequently returning 1 cfs of 1885 senior water right and 1 cfs junior 1900 water right to the stretch of Whychus Creek between TSID's diversion and the proposed diversion point on the Deggendorfer property 15-10-2 tax lot 100. The project also eliminated existing ditch losses. The project changed the flood irrigation to a sprinkler system. Directly resulting in conservation of water applied to existing crops.

**Cloverdale:** The Cloverdale canal serves 1000 acres of farmland in Three Sisters Irrigation District. Traditionally the transmission loss of the canal has been between 45% and 55%. As a result when running the maximum flow of 20 cfs only, approximately, 10 cfs was being delivered to the farmers. By piping 14880 feet of the canal TSID hoped to save 4 cfs in transmission losses. TSID dedicated 2 cfs to instream and 2 cfs will be available to all the farmers in the district.

**Schaad:** This project replaced approximately 8000ft of open ditch with HDPE ADS pipe. The project conserves from 200 to 300 acre feet per season.

**B-Ditch:** This project replaced approximately 6000 of 7000ft of open ditch with culvert and PVC. This project was unique because 3 of the landowners paid for the whole project without the help of any grant monies. The project conserves from 200 to 300 acre-feet per season.

**Fryrear:** The project included the replacement of an existing open lateral (identified as the Fryrear Ditch) with a buried pipeline. It provides irrigation water for approximately 475acres. This project consisted of piping approximately the first 19,000 of ditch. This distance included sections traveling through Forest Service lands and very high seepage reaches of canal. Benefits have accrued due to water savings, electrical energy conservation and reduction of operation and management costs. The water savings in this project are of special consideration because the reduction of diversion flows from Whychus Creek has increased in-stream flows on a year round basis. Whychus Creek has traditionally been completely dewatered during the irrigation season and only recently has a year round flow been established. The conservation efforts of the Three Sisters Irrigation District and local conservation organizations are responsible for the augmented flows. The project has returned a flow rate of 1.5 cubic foot per second to Whychus Creek and annually conserves an estimated total of 600 acre-feet of water.

**Z-Ditch:** This project replaced approximately 6000 ft of open ditch with HDPE. This project was a huge improvement for the 5 landowners. Prior to the piping each landowner

received water just 1 day a week. The project conserves from 200 to 300 acre feet per season.

**McKenzie Canyon/Black Butte Canal:** The project will include the replacement of TSID's Black Butte and Association canals with a buried pipeline, resulting in the permanent transfer of 6 cfs of water to Whychus Creek.

**Arnold Ditch:** This project has replaced approximately 9240 of open ditch with PVC pipe. This project serves 6 landowners that farm 155 acres. The project will conserve from 300 to 400 acre feet per season.

**Vetterlein:** This project replaced an open lateral with a buried pipeline. It provides irrigation water for approximately 160 acres. This project consisted of piping 15,000 feet of ditch with HDPE pipe. Benefits have accrued due to water savings, electrical energy conservation and reduction of operation and management costs.

#### Canal and Ditch Lengths

<b>Main Canal</b> from Diversion to Watson Reservoir	Approx. 4 miles
<b>Main Canal</b> from Watson to McKenzie Reservoir	Approx. 5 miles
<b>Cloverdale Canal</b> (piped)	Approx. 10 miles (3 miles)

<b>Black Butte Canal</b>	Approx. 10.5 miles
<b>Association Canal</b>	Approx. 4 miles

**Hurtley:** This pipeline consists of approximately 10,000 to 13,000ft of buried PVC and above ground aluminum pipe. The system serves approximately 30 parcels.

**Desert Sands:** These 2 pipelines consist of approximately 5000 to 6000 feet of buried PVC.

**Billings/Halousek Group:** Approximately 4600ft of open ditch.

**Cement:** Approximately 6000ft of open concrete ditch.

**Hermens:** Approximately 2800ft of open concrete ditch and 1500ft of PVC pipe.

**Uncle John:** Approximately 3 miles of open ditch.

#### **Describe any other relevant background information:**

The Three Sisters Irrigation District is a quasi-governmental corporation, a political subdivision of the State of Oregon, duly organized and operated under Oregon law governing irrigation and other special districts. Special districts are governed by a variety of Oregon statutes and administrative rules; more specifically, Chapter 545 of the Oregon Revised statutes addresses the operation of irrigation districts. In addition, an entire body of law and custom has developed around the question of access to water in Oregon's streams and the water rights attendant to that access.

The Three Sisters Irrigation District was founded in 1917 from the Squaw Creek Irrigation Company and the Cloverdale Irrigation Company, which were founded in 1895 and 1903 respectively, making Three Sisters Irrigation District one of the oldest such districts in Oregon. Its purpose is to react to a communal need to provide irrigation water to the farming and ranching interests located in an area generally described as running in a northeasterly direction from Whychus Creek (a tributary of the Deschutes River), through the Cloverdale area, and down McKenzie Canyon to the Lower Bridge area. The system consists of a series of District owned and operated canals, privately owned and operated ditches, and two principal water storage facilities. Water diverted from Whychus Creek flows to the Watson Reservoir, from which it runs through the Main Canal and Cloverdale Canal to the McKenzie Reservoir. Along the way, a series of private ditches is fed, each with its own head gates and measuring devices. From the McKenzie Reservoir water runs down the Association and Black Butte Canals where it serves the needs of McKenzie Canyon and Lower Bridge members.

**If applicable, describe any Endangered Species Act (ESA) issues that exist in the geographic area.**

Summer steelhead (Mid-Columbia ESU) in the Deschutes Basin are listed as threatened under the Endangered Species Act. Whychus Creek was historically one of the most important summer steelhead spawning areas in the upper Deschutes Basin, with an estimated 1,000 adults returning in 1953. Water withdrawals, irrigation diversion structures, and channel alteration progressively degraded habitat in all but the lowest 3 miles of Whychus Creek. The completion of the Pelton Round Butte dam complex in the 1960s effectively eliminated anadromous fish runs in the upper Deschutes Basin. Restored passage at the dam complex has brought Whychus Creek forward as the center of the summer steelhead reintroduction effort.

Environmental baseline conditions for Deschutes River MCR steelhead are described in Reclamation's Biological Assessment (Reclamation, 2003). Whychus Creek currently has instream flow, water quality, and habitat features that may be limiting factors to successful steelhead trout reintroduction. Historical reports indicated that Whychus Creek once served as the primary spawning and rearing habitat for steelhead trout in the upper Deschutes Basin (Nehlsen 1995). Since 1895, the flows of Whychus Creek have been diverted for irrigation uses and have limited the rearing habitat of steelhead trout populations (Nehlsen 1995). The steelhead trout populations were extirpated in 1968 five years after the completion of the Pelton-Round Butte (PRB) complex. Federal re-licensing of the PRB complex resulted in steelhead trout reintroduction to Whychus Creek beginning in 2007.

**Bull Trout (Salvelinus confluentus)**

The USFWS issued a final rule listing the Columbia River and Klamath River populations of bull trout as a threatened species under the Endangered Species Act (ESA)

Bull trout occur within the lower 1-2 miles of Whychus Creek which is part of the project area. In this ruling, the USFWS identified three subpopulations of bull trout in the Deschutes River basin: 1) Odell Lake, 2) Metolius River-Lake Billy Chinook complex,

and 3) Lower Deschutes River (USFWS 1998). The bull trout within the project area are within the Lower Deschutes River subpopulation. Lower Whychus Creek is also proposed as designated critical habitat for bull trout within the Lower Deschutes Subunit 1 (USFWS 2002). Bull trout use in Whychus Creek is mainly sub adult rearing, and potentially spawning (USFWS 1998).

## **PAST WORKING RELATIONSHIPS WITH THE BUREAU OF RECLAMATION**

**Identify any past working relationships with the Reclamation. This should include the date(s), description of relationship with Reclamation, and a brief description of the project(s):**

- 2009 Phase I Main Canal Water Marketing and Efficiency ARRA Challenge Grant \$1,150,000 R09AP1CR06 Purchased 16,500 feet of 54” HDPE Pipe & Material( Including 4 stainless steel headgates along with installing a SCADA and telemetry system
- 2009 Phase I & II Main Canal TSID is a sub recipient of BOR ARRA funding awarded R09AP1CR03 to Deschutes River Conservancy \$1,500,000 Purchased 13,500 feet of 54” HDPE Pipe & Materials for Phase I & II
- 2008 Water Conservation Field Services Program 1425-08-FG-1L-1354, 10/23/2008. BOR WCFSP grant for \$3,100. Purchased a mobile GPS unit with GIS software.
- 2008 System Optimization Review 1425-08-FG-1L-1395, 10/23/2008. The grant is being used to develop an Agricultural Water Management and Conservation Plan (AWM&CP)
- 2008 Phase I of McKenzie Canyon Irrigation Pipeline Project BOR 2025 Challenge grant for \$300,000. 1425-08-FG-1L-1397, 9/15/2008.
- 2006 Phase IV of McKenzie Canyon Irrigation Pipeline Project BOR 2025 Challenge grant for \$300,000. 1425-06-FC-1L-1250, 9/21/2006.
- 2005 Phase V of McKenzie Canyon Irrigation Pipeline Project BOR 2025 Challenge grant for \$300,000. 1425-05-FC-1L-1168, 9/23/2005.
- 2000 and 2002 we had cooperative grant agreements for gauging station in the Watson and McKenzie reservoirs in the Water Conservation Field Services Program.
- The Cloverdale and Fryrear Pipeline Project grants from the DRC.

## **Technical Project Description**

### ***(a) Water Conservation***

#### **Subcriteria No. 1—Quantifiable Water Savings:**

##### **Describe the amount of water saved.**

An irrigation loss analysis for all 3 phases in 2009 was conducted by Newton Consultants. The Main Canal between TSID diversion and Watson Reservoir in 2009 had

an estimated canal loss of 10.85 cfs. Over a 210 day irrigation season (April- Oct.), that translates into 4500 acre feet per season. Phase 3 of the Main Canal piping project would conserve about 1/3 of the loss approximately 1500 acre feet.

**Subcriteria No. 2—Percentage of Total Supply:**

**Describe the improvement to the applicant’s overall delivery efficiency, including the following: State the applicant’s total average annual water supply in acre-feet. (This is the amount actually diverted, pumped, or released from storage, on average, each year. This does not refer to the applicant’s total water right or potential water supply.) Explain how this calculation was made. State the existing transport losses and delivery efficiency.**

Historically TSID diverts between 30,000 to 35,000 acre feet. 20,000 – 22,000 in drought years like 1977, 2001 & 2005. The Oregon Water Resources Department maintains a gauging station near TSID’s diversion on TSID’s main canal. The recorder takes a reading every 15 minutes. Diversion records date back to 1960. Conversion from flood irrigation to sprinkler occurred in the late 1960’s into 1970’s. Those conservation measures reduced TSID diversion from 50,000 acre feet to 35,000 acre feet.

Currently the Main Canal between TSID diversion and Watson Reservoir has an estimated canal loss of 6 to 11 cfs. Over a 210 day irrigation season (April- Oct.), that translates into 2500 to 4500 acre feet per season. Phase 3 of the Main Canal piping project would conserve about 1/3 of the loss (1500 acre feet in an average year). Prior to 1997 TSID would divert on average 35,000 acre feet and deliver 17,000 acre feet on farm. Historically TSID had an overall system loss of 50 to 55 percent. In 2009 TSID diverted 27,313 acre feet. We delivered 16,480 acre feet on farm (40 percent system loss) and leased 1583 acre feet instream. TSID’s delivery efficiency has improved from 45-50% prior to 1997 to 60% today. Phase 3 will conserve approximately 1500 acre feet. 833 acre feet will be dedicated to instream flows for fish and approximately 667 acre feet will help shore up deliveries to the whole district. 667 additional acre feet available for on farm deliveries using 2009 delivery numbers would be a 4% increase in on farm water. The additional 2 cfs instream will increase the protected flow in 2012 from 19.6 to 21.6 cfs, a 10% increase in flow for fish. It now takes 5-12 hours for the water to reach Watson Reservoir while wetting down the ditch. The piping of all three phases will eliminate this lag time.

**Subcriteria No. 3—Improved Water Management:**

160 cfs (35,000 acre feet avg. annual diversion 100%). Delivery efficiency will improve in a number of ways. First, the additional conserved water will help shore up deliveries to the whole district. Second, it now takes 5-12 hours for the water to reach Watson Reservoir while wetting down the ditch. The piping of all three phases will eliminate this lag time. The new TSID Diversion Headgates that were installed in Phase I will be coordinated with the 4 new fishscreen weir gates through SCADA and telemetry. This system will allow TSID to capture fluctuating flows during the summer as well as protect and maintain instream flows for fish and water quality.

**Subcriteria No. 4—Reasonableness of Costs:**

For all projects involving physical improvements, specify the expected life of the improvement in number of years.

**Total Project Cost**

**Acre-Feet Conserved x Improvement Life**

$$\frac{\$3,400,000}{1500 \text{ acre ft} \times 100 \text{ years (HDPE Pipe)}} = 22.67$$

**Total Project Cost**

**Acre ft better managed x Improvement life**

$$\frac{\$2,070,686}{35,000 \text{ ac ft} \times 30 \text{ years (New weir gates, SCADA, Telemetry \& fishscreen, passage and channel restoration)}} = 1.97$$

The first calculation is for the pipeline & conserved water. HDPE has the potential to last 1000 years. The HDPE pipe manufacturers are hesitant to put that in writing. They refer to HDPE pipe as a 100 year pipe.

The second calculation is for the Weir gates, SCADA, Telemetry & fishscreen, passage and channel restoration for the better managed water

***(b) Energy Efficiency Subcriteria No. 1—Implementation of Renewable Energy Projects***

Once all 3 phases are completed on the Main Canal pipeline, TSID will be able to proceed with the construction of the Hydro plant in 2012 and goes on line in 2013. TSID will produce between 3,700,000 KWH to 5,000,000 KWH, enough green power to serve 400-500 homes during the irrigation season, March-October. The Hydro portion of this project will be considered Phase 4 and is not part of this application. However it is part of the overall project. The completion of the fishscreen will allow TSID to start implementing the time table listed below:

TSID Main Canal Pipeline/Penstock Project Time Table

Time Line	Task
April 2013	Generate Power
Oct 2012	Build Hydro Plant & install turbines
February 2013	Install connection equipment
Oct 2011- Sept 2012	Phase III Pipeline
Oct 2010- Sept 2011	Phase II Pipeline
Oct 2009- Sept 2010	Phase I Pipeline
Summer 2011	Power Sales Contract
Spring 2011	Inter connection Contract with Utility

Winter 2010	& Maintenance Agreement OWRD Expedited Water Right for Hydro using existing water rights
Winter 2010	FERC application
Fall - Winter 2010	Install Fishscreen
Sept 2009	BETC Application
Summer-Fall 2010	Inter connection Study Feasibility Study System Impact Study Facilities Study Small Generator Inter connection Study (including wheeling by CEC)
Summer 2010	Inter connection Study grant application

**Subcriteria No. 2—Increasing Energy Efficiency from Enhanced Water Management or Water Conservation**

**Please describe any energy efficiency improvements that are expected to result from implementation of the project. Include support for the calculation of any energy savings expected to result from water conservation improvements.**

Once all 3 phases are completed on the Main Canal pipeline, TSID water users on the Fryrear and Patterson pipelines will receive pressurized water, thus conserving energy. The Halousek Group will work with NRCS through AWEP & EQIP farm bill programs to pipe their ditch so that they can take advantage of the pressurized water. These 19 farms irrigate a total of 690.8 acres. Annual conserved energy once these 19 farms are pressurized will range from 500,000 to 800,000 KWH. Average electric bills for farmers can range from \$40 to \$80 per acre. 500,000 KWH divided by 690 acres is 724 KWH per acre times 6 cent per KWH = \$43.48 per acre. 800,000 KWH run through the same formula is approximately \$70 per acre.

**Projects that benefit both federally-listed endangered species and federally-recognized candidate species will receive additional consideration under this criterion.**

***(c) Addressing Endangered Species Concerns***

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

**(1) Relationship of the species to a Reclamation project water supply**

**For projects that will benefit federally-recognized candidate species, please include the following elements:**

**(1) Relationship of the species to a Reclamation project water supply**

Summer Steelhead & Chinook

Summer steelhead (Mid-Columbia ESU) in the Deschutes Basin are listed as threatened under the Endangered Species Act. Whychus Creek was historically one of the most important summer steelhead spawning areas in the upper Deschutes Basin, with an

estimated 1,000 adults returning in 1953. Water withdrawals, irrigation diversion structures, and channel alteration progressively degraded habitat in all but the lowest 3 miles of Whychus Creek. The completion of the Pelton Round Butte dam complex in the 1960s effectively eliminated anadromous fish runs in the upper Deschutes Basin. Restored passage at the dam complex has brought Whychus Creek forward as the center of the summer steelhead reintroduction effort.

Restored fish passage at the dams is the centerpiece of a new hydropower operating license issued in 2005. In anticipation of restored passage, fisheries managers chose three streams for steelhead and Chinook reintroduction: Whychus Creek, Lake Creek, and the lower Crooked River. Reintroduction started in Whychus Creek in 2007. In 2009, fisheries managers released an additional one million steelhead trout and spring Chinook salmon into the creeks. Portland General Electric and the Confederated Tribes of the Warm Springs Reservation, who co-manage the hydropower project, completed passage facilities in 2010. Similar numbers of these fish will be released in 2010.

### Bull Trout

The USFWS issued a final rule listing the Columbia River and Klamath River populations of bull trout as a threatened species under the Endangered Species Act (ESA)

Bull trout occur within the lower 1-2 miles of Whychus Creek which is part of the project area. In this ruling, the USFWS identified three subpopulations of bull trout in the Deschutes River basin: 1) Odell Lake, 2) Metolius River-Lake Billy Chinook complex, and 3) Lower Deschutes River (USFWS 1998). The bull trout within the project area are within the Lower Deschutes River subpopulation. Whychus Creek is also proposed as designated critical habitat for bull trout within the Lower Deschutes Subunit 1 (USFWS 2002). Bull trout use in Whychus Creek is mainly sub adult rearing, and potentially spawning (USFWS 1998).

Channel stability, substrate composition, cover, temperature and migratory corridors seem to influence bull trout distribution and abundance (Rieman and McIntyre 1993). In a study by Dambacher and Jones (1997) it was found that stream shading, undercut banks, large woody debris (volume and number), low sedimentation and low bank erosion were significantly related to presence of juvenile bull trout. Bull trout require cold water temperatures of less than 15°Celsius (C). High water temperatures can cause bull trout to move into smaller tributaries with cooler water temperatures where they can continue to forage and overwinter (USFWS 1998). The stability of stream channels and stream flows are important habitat characteristics for bull trout populations (Rieman and McIntyre 1993). Bull trout are sensitive to activities that directly or indirectly affect stream channel stability and alter natural flow patterns (USFWS 1998).

### Red Band Trout

The biological status (life history diversity, trends in population abundance and productivity) of red band trout populations is mixed. Red band trout are moderately abundant in the limited amount of headwater tributaries with good habitat and cool water. Red band trout populations are depressed, however, in main stem rivers and tributaries with degraded riparian zones, poor fish habitat, and warm water. Overall, wild red band

trout populations are depressed compared to historical numbers. As a result, red band trout are listed as a state sensitive species and as a Category 2 sensitive species by the USFS.

The principal red band trout production areas existing within the Upper Deschutes Basin include the main stem Deschutes River up to Big Falls, Whychus Creek, the Deschutes River above Crane Prairie Reservoir, the Crooked River below Bowman Dam, and the North Fork Crooked River and tributaries (NPCC 2004). These populations are considered strong and viable.

#### Other Species

Whychus Creek currently supports native redband trout, mountain whitefish, dace, bridgelip suckers, chiselmouth, northern squawfish and sculpins. Although these resident species play important roles in Whychus Creek, restoration partners and restoration funders have coalesced around re-introducing anadromous fish to Whychus Creek while simultaneously improving conditions for native resident trout.

#### *(c) Addressing Endangered Species Concerns*

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

**(2) Likely impacts that would result from an interruption in the water supply**

**For projects that will benefit federally-recognized candidate species, please include the following elements:**

**(2) Likely impacts that would result from an interruption in the water supply**

If flow in Whychus Creek were interrupted, the following historic factors would be exacerbated. Prior to 1997, the creek would go dry in August and September making fish passage.

A suite of factors related to agriculture and urbanization have altered Whychus Creek from its historic conditions. Channel straightening that occurred in the 1960s led to increased erosion head cutting near the City of Sisters, and continued incision which eventually disconnected Whychus Creek from its floodplain. Channelization, riparian vegetation removal and stream flow modification have reduced the availability of pools, shade, in-stream structure and other important habitat components.

Currently, six fish passage barriers seasonally block fish passage in Whychus Creek. They limit connectivity from approximately river mile 15 through river mile 26.5. These barriers have varying levels of passability depending on stream flow in the creek. Project partners recognize the need to fully restore fish passage, and are actively working with landowners to improve passage at individual barriers. Restoration partners expect to retrofit the Three Sisters Irrigation District (TSID) diversion with fish passage and screening within the next two years as part of the holistic *Whychus Creek – Three Sisters Irrigation District Collaborative Restoration Project*.

Although physical channel alterations have limited habitat conditions, stream flow has been consistently identified as the greatest factor limiting stream function. Irrigation diversions have altered when, where, and how much water flows through Whychus Creek. Flow alterations due to irrigation diversions have occurred since the late 1800s in Whychus Creek. The stream is severely over allocated as rights have been issued authorizing diversion of more water than typically flows in the creek.

Presently, the creek enjoys natural flows from its headwaters until it reaches river mile 26.5, where a series of major irrigation diversions remove up to 90% of the flow for a five mile reach. The Three Sisters Irrigation District (TSID), the primary water user on Whychus Creek, diverts up to 160 cfs at a dam at river mile 26.5. Below the City of Sisters, springs and return flow gradually re-water the creek around river mile 18, though flows remain insignificant as compared to the natural hydrograph. A large spring complex discharges into the creek near its confluence with the Deschutes River at river mile 3, improving in-stream conditions. Inadequate stream flow limits salmonid spawning and rearing in Whychus Creek from river mile 26.5 to river mile 3. These conditions persist from April through October each year.

Low stream flow affects many aspects of ecological function in Whychus Creek, including physical and biological parameters. Insufficient stream flow has led to elevated water temperatures throughout much of the creek. Temperatures in the creek have been recorded as high as 24°C / 75°F, which is well above the 18°C / 64°F maximum temperature standard established by the State of Oregon to protect native fish. As a result, Whychus Creek has been listed on Oregon's 303(d) list since 1998 for temperature. In addition to poor water quality, fish habitat has suffered as a result of irrigation withdrawals. Impacts include increases in the channel width to depth ratio, reduced pool habitat, loss of oxbows and sloughs, loss of riparian habitat, and diminished channel/floodplain connectivity.

Projects completed through 2009 have protected 15.6 cfs of minimum flow in the creek. Each phase of the planned 3 phase project will put 2 cfs minimum stream flow in Whychus Creek. However, without completion of the Three Sisters Irrigation District Collaborative Restoration Project which includes the Fish Screen/Passage Channel Restoration Project and Main Canal Piping/Penstock Project Phase 3, a hypothetical interruption of the water supply could seriously impact all fish species.

**For projects that will accelerate the recovery of threatened species or endangered species or address designated critical habitats, please include the following elements:**  
**(3) Extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species**

**For projects that will benefit federally-recognized candidate species, please include the following elements:**  
**(3) Extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species**

TSID does not serve Reclamation project lands and does not receive any Reclamation project water. But additional instream flows in Whychus Creek which flow into the Deschutes River will help with BOR's minimum stream flow requirements from NOAA and US Fish as per the ongoing Section 7 consultation for the Pelton and Round Butte Dam FERC re-licensing agreement. Those flows will also benefit Wild and Scenic reaches on the Deschutes River. Whychus Creek also was historically an important spawning and rearing stream for steelhead and Chinook salmon until passage was curtailed around Pelton and Round Butte Dams on the Deschutes River. FERC re-licensing is requiring passage of anadromous fish at these two dams which makes the restoration of Whychus Creek a priority of fishery agencies, tribes, and others. The focus of this project is to conserve water by improving irrigation delivery efficiencies so that adequate flows can be maintained in Whychus Creek. Whychus Creek historically (prior to the dams) has provided 1/3 of the steelhead runs in the Deschutes River. If the anadromous fish runs are restored through spawning in Whychus Creek then pressure to restore the Crooked River runs by additional flow requirements in the Crooked River from North Unit ID and Ochoco ID will be lessened. NOAA fisheries have viewed past conservation projects that TSID and BOR have partnered on as benefiting the whole basin. TSID continued efforts will be beneficial to all members of the Deschutes Basin Board of Control (DBBC) as well as BOR during the ongoing Deschutes Basin Habitat Conservation Plan process.

The additional in stream flow from this project will benefit all listed and non-listed fish species. Because of the inter-connection among Whychus Creek, the Deschutes River and the Crooked River with Lake Billy Chinook

***(d) Other Contributions to Water Supply Sustainability***

**(1) Will the project make water available to address a specific concern, e.g. water supply shortages due to climate variability and/or heightened competition for finite water supplies; will it market water to other users, or generally make more water available in the water basin where the proposed work is located?**

Historically TSID has always had to deal with short water supplies and drought. Pressure for finite water supplies in Whychus Creek will only increase as time goes on. This project helps shore up supplies for farming as well as restoring stream flow for fish and water quality. This project will restore a more natural hydrograph to the creek, improve anadromous fish spawning and rearing habitat, improve longitudinal connectivity, and eliminate anadromous fish population sinks. One could say that by marketing the 2cfs instream to the DRC the whole community benefits. The farmers appreciate the additional available water especially in drought years and low flows.

**(2) Where will the conserved water go? 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 2 cfs marketed to the DRC for a protected instream right will benefit listed summer Steelhead and Bull Trout. The water will also benefit spring Chinook, Red Band Trout and a number of other native fish species. The additional flow will benefit the City of

Sisters and the State of Oregon with reducing the temperature, thus helping the community comply with the 303 D listing for Whychus Creek for temperature. The additional flow benefits PGE and the Tribes (CTWS) with their FERC relicensing requirements for the anadromous reintroduction of Steelhead and Chinook salmon above Round Butte and Pelton Dams. The additional flow into the Deschutes River from the Whychus Creek confluence will benefit wild & scenic stretches of the Deschutes River as well as generate additional power through the turbines in the dams. The additional flows will also help with BOR Sec 7 ESA minimum flow requirements running into Lake Billy Chinook. The additional 1 cfs conserved going to the farmers will help shore up on farm deliveries. Currently the water is seeping into the ground.

**(3) Does the project promote and encourage collaboration among parties? Is there widespread support for the project? Will the project help to prevent a water-related crisis or conflict?**

Whychus Creek has become a rallying point for stream restoration in the upper Deschutes Basin. Local, state, federal, and tribal agencies and organizations have coalesced around anadromous fish reintroduction, and restoration efforts have received enormous support from local communities and funding partners. Local and regional media, including the Bend Bulletin, the Oregonian, the Sisters Nugget, High Country News, and Oregon Public Broadcasting, have highlighted the reintroduction of salmon and steelhead to the upper Deschutes Basin as an historic event. The Deschutes River Conservancy and its partners have built on this public support to develop strong relationships with local communities and state, federal, and tribal agencies. These relationships are instrumental to our success in restoring Whychus Creek.

**Demonstrated Support for this Project**

Local, state, federal, and tribal agencies and organizations have consistently identified Whychus Creek as a priority for restoration, and they have consistently listed stream flow as the primary factor limiting fish production in the creek. The following plans and assessments identify the limiting factors that this project addresses, highlight the efficacy of the stream flow restoration, or prioritize the ecological importance of restoration in Whychus Creek.

- Proposed Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan (National Marine Fisheries Service 2008)
  - The Deschutes River Westside summer steelhead population, which includes Whychus Creek, is considered “High Risk” for viability (Appendix B, p. B-47)
  
- Reintroduction and Conservation Plan for Anadromous Fish in the Upper Deschutes River Sub-basin, Oregon. Edition 1: Spring Chinook Salmon and Summer Steelhead (Oregon Department of Fish and Wildlife and Confederated Tribes of the Warm Springs Reservation 2008)
  - Whychus Creek steelhead smolt production potential estimated to be up to 1/3 of total steelhead smolt production potential in upper Deschutes Basin (p. 18)

- Whychus Creek was historically the strongest producer of steelhead in the Upper Deschutes Subbasin and is a priority for restoration (p. 48)
- Deschutes Basin Restoration Priorities, Oregon Watershed Enhancement Board, 2007
  - The alteration of the hydrologic regime is identified as having a “High Impact” on ecosystem health.
- Upper Deschutes Agricultural Water Quality Management Area Plan, Oregon Department of Agriculture, 2007
  - Identifies low streamflow in Whychus Creek as a contributing factor to poor water quality (p. 35)
  - Under “Recommended Actions” for irrigation management, the plan suggests improving irrigation efficiency and instream flows through canal piping (p. 14)
- Deschutes Subbasin Plan, Northwest Power and Conservation Council, 2004
  - The Deschutes Subbasin Plan provides almost 80 pages of site specific findings, objectives and management strategies (p. 11 to 87) many of which involve increasing stream flow in reaches adversely affected by irrigation diversions. Key habitat objectives for Whychus Creek include increasing minimum instream flow to meet the instream water right of 33 cfs below Indian Ford Creek (p. 73)
- Squaw Creek Watershed Action Plan, Upper Deschutes Watershed Council, 2002
  - Goal 1 of the Action Plan recommends improving instream flows (p. 2)
  - Goal 2 recommends improving water quality (p. 2)
- Sisters/Why-Chus Watershed Analysis, US Forest Service, 1998
  - Identifies low streamflow as a key limiting factor affecting stream temperatures and riparian habitat health (p. 202)
  - Directs agencies and partners to restores streamflow while reducing conflicts between irrigators and stream dependent fish and wildlife (p. 215)
- Upper Deschutes River Basin Water Conservation Study, Bureau of Reclamation, 1997
  - Identifies Main Canal lining/piping as a major water conservation opportunity (p. 103)
- Upper Deschutes River Fish Management Plan, Oregon Department of Fish and Wildlife 1996
  - Habitat limitations include low streamflow and poor water quality in dewatered sections (p. 56)

- Whychus Creek Watershed Assessment, Deschutes County Soil and Water Conservation District, 1994
  - Recommends improvements to the efficiency of the irrigation canal system (p. 38)
  - Identifies the McKenzie Canyon project as a priority action (Abstract, p. 1)

Representatives of many of the agencies and organizations listed above have written letters of support for this project. Letters of support from the following entities are attached in Appendix B.

- Deschutes River Conservancy
- Deschutes National Forest, Sisters Ranger District
- Deschutes County
- Upper Deschutes Watershed Council
- Oregon Department of Fish and Wildlife
- 

NOAA Fisheries, US Fish & Wildlife, US Forest Service and ODF&W have been actively involved in the fish passage, fish screening, and habitat restoration components of the over-arching *Whychus Creek – Three Sisters Irrigation District Collaborative Restoration*

The *Whychus Creek – Three Sisters Irrigation District Main Canal Piping Project* is inextricably linked to the overall success of other restoration projects being implemented in the watershed. The Deschutes Land Trust and the Upper Deschutes Watershed Council are implementing the land conservation and habitat restoration components of the joint Whychus Creek restoration strategy, discussed earlier. To the extent that stream channel, floodplain, and riparian functions are dependent on sufficient stream flows, this stream flow restoration project complements numerous other watershed activities including:

- **Reintroduction of spring Chinook and ESA listed summer steelhead.** The Oregon Department of Fish and Wildlife, Confederated Tribes of the Warm Springs Indian Reservation, and Portland General Electric began releasing steelhead fry in Whychus Creek during the spring of 2007 and Chinook fry during the spring of 2009. Efforts to reestablish anadromous fish in Whychus Creek will rely heavily on the availability of instream flows during key time periods, particularly during the spring and summer.
- **Oregon Department of Fish and Wildlife Minimum Instream Flows.** The Oregon Department of Fish and Wildlife (ODFW) has established minimum instream flows for Whychus Creek. Because these water rights carry a very junior priority date (1990) they are not met during the irrigation season except during extremely high flow events. The *Whychus Creek – Three Sisters Irrigation District Main Canal Piping Project* utilizes the Oregon Conserved Water Statute and therefore protects water instream that is co-equal to the

irrigation district's 1895 water right, helping meet state requested minimum instream flows during the irrigation season each year.

- **Deschutes Land Trust Preserve Restoration.** The Deschutes Land Trust is actively working to restore the Camp Polk and Rimrock Ranch preserves adjacent to Whychus Creek. These preserves will eventually provide high quality habitat for fish and wildlife once restoration is complete. Restoration is largely focused on riparian areas, stream channel function, and flood-plain connectivity. Without adequate instream flows in Whychus Creek, restoration of riparian areas, stream channels, and flood-plains would be difficult to achieve.
- **Upper Deschutes Watershed Council Habitat Restoration.** In addition to working closely with the Deschutes Land Trust on their preserve restoration activities, the Upper Deschutes Watershed Council is engaged in numerous riparian habitat projects along Whychus Creek that depend on streamflow restoration projects to be successful. They plan to screen and restore both low and high flow passage at diversion dams on lower Whychus Creek. The Upper Deschutes Watershed Council has partnered with the Deschutes National Forest to develop and implement a comprehensive fish passage, fish screening, and habitat restoration design at the TSID dam site.
- **Deschutes County Soil and Water Conservation District On-Farm Irrigation Efficiency.** The Deschutes Soil and Water Conservation District has been aggressively pursuing on-farm conservation opportunities in the Whychus Creek watershed for several years. In partnership with local farmers, the Soil and Water Conservation District has been providing technical and financial assistance to improve water application efficacy, reduce power consumption, and eliminate operational losses.
- **US Forest Service Restoration Program.** The Crooked River National Grasslands and the Deschutes National Forest have both implemented numerous restoration projects in recent years for the purpose of improving water quality and riparian habitat along Whychus Creek. These projects include road obliteration near the creek, riparian plantings, dispersed camping set-backs, and educational programs to improve public awareness of the importance of Whychus Creek. The Deschutes National Forest recently partnered with the Upper Deschutes Watershed Council to develop and implement a comprehensive fish passage, fish screening, and habitat restoration design at the TSID dam site.
- **Three Sisters Irrigation District.** TSID has committed to working with local partners to improve conditions in Whychus Creek, particularly at its diversion dam. TSID is pro-actively working to providing fish passage and screening at its diversion dam. They have fostered close relationships with the Upper

Deschutes Watershed Council and the Deschutes National Forest to achieve their goals.

Yes, this project will help to prevent future conflict and litigation by helping make the anadromous re- introduction a success.

***(e) Water Marketing and Banking***

**Briefly describe any water marketing or banking elements included in the proposed project. Include the following elements:**

**(1) Estimated amount of water to be marketed/banked**

Phase 3 will conserve approximately 3.5 cfs. TSID will market 2 cfs to DRC for Phase 3 of the Main Canal pipeline. The remaining conserved water will help shore up on farm deliveries in the District

**(2) A detailed description of the mechanism through which water will be marketed (e.g., individual sale, contribution to an existing market/bank, the creation of a new water market/bank, or construction of a recharge facility)**

As in the past project like the Cloverdale pipeline, Fryrear pipeline, and the 5 phases of the McKenzie pipeline project TSID has contracted with DRC to apply for a new in stream water right.

Under Oregon's water laws, water right holders who implement a water conservation project can apply for a new water right equivalent to the amount of water that the project conserved. This project will create a new instream water right under Oregon law. It will legally protect over 2 cfs from river mile 26.5 to the mouth of Whychus Creek during the summer irrigation season.

Newton Consultants, a consulting engineering firm with extensive experience working on water conveyance projects, completed a final irrigation conveyance loss analysis in 2009 that showed an average loss factor of 10.85 cfs in TSID's Main Canal between diversion and Watson Reservoir. The Deschutes River Conservancy will complete Oregon's Conserved Water application process with the Oregon Department of Water Resources on behalf of TSID. This process will create a new instream water right of at least 2 cfs with an 1895 priority date. The instream right will protect flows from April 1 to October 31 and at other times when TSID is diverting water.

**(3) Number of users, types of water use, etc. in the water market/bank**

Marketed Conserved water will be used for environmental uses. The 2 cfs dedicated instream will benefit fish and water quality. Whychus is listed on the 303 d list for temperature. The City of Sisters, its residents and visitors will benefit from increased flow that helps enhance recreational experiences on Whychus Creek for everyone. The remainder of the conserved water will be used for irrigation. The 1 cfs that will be used to shore up deliveries will benefit the 175 farms in TSID.

**(4) A description of any legal issues pertaining to water marketing or banking (e.g., restrictions under reclamation law or contracts, individual project authorities, or State water laws)**

TSID has not had any legal issues or problems regarding recent water marketing transactions. All 5 conserved water applications for the McKenzie project moved through the process and proposed final orders were issued. Final water right certificates were issued on Phases 5, 4, 3, 2 and 1 as they were completed.

**(5) Estimated duration of the water transfer or market**

The Conserved Water application process with the Oregon Department of Water Resources will create a transferred instream water right that is held in perpetuity by the State of Oregon.

***(f) Demonstrated Results***

**Does the project have a Water Conservation Plan, System Optimization Review (SOR), and/or district or geographic area drought contingency plans in place? Please self-certify, or provide copies, where appropriate to verify there is a water conservation plan, SOR, and/or district or geographic area drought contingency plans 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.**

Fish passage restoration at the Pelton Round Butte dams presents an unprecedented opportunity to restore fish habitat on a regional scale. Whychus Creek was historically one of the most productive steelhead streams in the upper Deschutes Basin. The Deschutes River Conservancy and its partners recognized early in this process that anadromous fish reintroduction would not succeed without our restoring conditions in Whychus Creek.

The Deschutes River Conservancy, the Deschutes Land Trust, and the Upper Deschutes Watershed Council developed a comprehensive restoration strategy to guide habitat restoration in support of steelhead reintroduction in 2006. This strategy sets the broad goal of restoring the habitat conditions necessary to support self-sustaining populations of summer steelhead and spring Chinook in Whychus Creek. The actions proposed under the *Whychus Creek – Three Sisters Irrigation District Main Canal Piping Project* will move us towards this goal.

This project is one component of a larger effort, the *Whychus Creek – Three Sisters Irrigation District Collaborative Restoration Project*. The *Whychus Creek – Three Sisters Irrigation District Collaborative Restoration Project* will address limiting factors related to the Three Sisters Irrigation District diversion on Whychus Creek. The larger project contains four interconnected components. It will pipe a leaky irrigation canal and

legally restore stream flow at the Three Sisters Irrigation District diversion, screen the diversion, restore fish passage at the diversion, and improve habitat just downstream from the diversion.

TSID water conservation plan is embedded in its Rules and regulations. TSID has always dealt with shortfalls in supply through a water delivery rotation and percentage schedule. Every delivery has a weir or a meter. TSID has no return flows or operational spills. TSID only diverts what it is delivering except for 500 ac ft of storage. (Approximately a 5 to 7 day supply). Over the last 15 years TSID has piped over 30 of the 60 miles of TSID canals and private laterals.

Currently TSID is working on a System Optimization Review of TSID whole system. This effort involves over 35 TSID member volunteers who will help with the end product which will be an Agricultural Water Management & Conservation Plan (AWMCP). In addition to the AWMCP outline TSID will focus on these additional items:

The TSID SOR will consist of these items

- (1) Piping & conserved water assessment.
- (2) Measurement & telemetry plans for TSID.
- (3) Fish screen and passage upgrade design.
- (4) Completed and updated GIS database
- (5) Expansion of current IWM (Irrigation Water Management) Program.
- (6) Plan for a Whychus Branch of DWA Water Bank.

The number one project on the piping and conserved water assessment as well as the measurement and telemetry plan is the Main Canal Pipeline Project.

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

Main Canal Pipeline/Penstock Feasibility Study conducted by NRCS engineer Bill Cronin under Bridging the Headgates MOU with BOR. (13 pages)

Main Canal Pipeline/Penstock Pipeline Project engineering designed by NRCS engineer Bill Cronin. (23 pages)

Three Sisters Irrigation District Diversion Fish Screen Feasibility Analysis and Passage Design by River Design Group, Inc. and Anderson Perry & Associates, Inc.

Farmers Conservation Alliance Whychus Creek Fish Screen Improvements by Anderson Perry & Associates, Inc.. (43 pages)

Whychus Creek Irrigation Diversion Project Fish Passage Design & Report by River Design Group, Inc. (44 pages)

Whychus Creek Channel Design Downstream of the TSID Irrigation Dam prepared by USFS (56 pages)

Revegetation Plan for the Three Sisters Irrigation District Channel Restoration Project, prepared by the US Forest Service (22 pages)

**Due to the page length of all the engineering plans and the application restriction of only a 100 pages only a select number of pages are attached in appendix C.**

**(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).**

The following plans and assessments identify the limiting factors that this project addresses, highlight the efficacy of the stream flow restoration, or prioritize the ecological importance of restoration in Whychus Creek.

- Proposed Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan (National Marine Fisheries Service 2008)
  - The Deschutes River Westside summer steelhead population, which includes Whychus Creek, is considered “High Risk” for viability (Appendix B, p. B-47)
- Reintroduction and Conservation Plan for Anadromous Fish in the Upper Deschutes River Sub-basin, Oregon. Edition 1: Spring Chinook Salmon and Summer Steelhead (Oregon Department of Fish and Wildlife and Confederated Tribes of the Warm Springs Reservation 2008)
  - Whychus Creek steelhead smolt production potential estimated to be up to 1/3 of total steelhead smolt production potential in upper Deschutes Basin (p. 18)
  - Whychus Creek was historically the strongest producer of steelhead in the Upper Deschutes Subbasin and is a priority for restoration (p. 48)
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  - The alteration of the hydrologic regime is identified as having a “High Impact” on ecosystem health.
- Upper Deschutes Agricultural Water Quality Management Area Plan, Oregon Department of Agriculture, 2007
  - Identifies low stream flow in Whychus Creek as a contributing factor to poor water quality (p. 35)
  - Under “Recommended Actions” for irrigation management, the plan suggests improving irrigation efficiency and instream flows through canal piping (p. 14)
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  - The Deschutes Subbasin Plan provides almost 80 pages of site specific findings, objectives and management strategies (p. 11 to 87) many of which involve increasing stream flow in reaches adversely affected by irrigation diversions. Key habitat objectives for Whychus Creek include increasing minimum instream flow to meet the instream water right of 33 cfs below Indian Ford Creek (p. 73)
- Squaw Creek Watershed Action Plan, Upper Deschutes Watershed Council, 2002
  - Goal 1 of the Action Plan recommends improving instream flows (p. 2)

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- Sisters/Why-Chus Watershed Analysis, US Forest Service, 1998
  - Identifies low stream flow as a key limiting factor affecting stream temperatures and riparian habitat health (p. 202)
  - Directs agencies and partners to restore stream flow while reducing conflicts between irrigators and stream dependent fish and wildlife (p. 215)
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  - Recommends improvements to the efficiency of the irrigation canal system (p. 38)
  - Identifies the McKenzie Canyon project as a priority action (Abstract, p. 1)

**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, —Other Information.**

An irrigation loss analysis for all 3 phases in 2009 was conducted by Newton Consultants. The Main Canal between TSID diversion and Watson Reservoir in 2009 had an estimated canal loss of 10.85 cfs. Over a 210 day irrigation season (April- Oct.), that translates into 4500 acre feet per season. Phase 3 of the Main Canal piping project would conserve about 1/3 of the loss.

The Deschutes River Conservancy will complete Oregon's Conserved Water application process with the Oregon Department of Water Resources on behalf of TSID. This process will create a new instream water right of at least 2 cfs with an 1895 priority date. The instream right will protect flows from April 1 to October 31 and at other times when TSID is diverting water.

The District intends to use the Oregon Conserved Water Statute to allow the saved water to be allocated instream (OAR 690-018-0010 to 690-018-0090 and ORS 537.455 to 537.500). The District will not divert the saved water at its diversion point, but instead leave the conserved water in the river where it will be protected by the Oregon Water

Resources Department from other withdrawals and measured at the gauging stations located at Camp Polk and the City of Sisters. Preliminary saved water was determined to be a minimum of 6 cfs for the period of April 15<sup>th</sup> through October 15<sup>th</sup> of each year. Increased stream flow in Whychus Creek will help reconnect the creek with the floodplain, create more backwater and pool habitat for fish and improve the health of the riparian habitat community.

The Deschutes River Conservancy will focus on monitoring both the water outputs and economic outputs from this project. The Oregon Water Resources Department maintains a near-real-time, web accessible stream gauge downstream from the TSID diversion at Sisters (river mile 21). The Deschutes River Conservancy will use this gauge to determine whether stream flows are meeting targets on a daily basis, and will use this gauge to determine overall implementation

It is anticipated that the project will enhance water quality in Whychus Creek by increasing the rate of flow and thus reducing the impacts of solar heating and low dissolved oxygen levels. Increased stream flow may also increase riparian vegetation, leading to more canopy cover and reduced stream flow temperatures. Whychus Creek is currently listed under the Oregon DEQ 303(d) criteria for temperature (DEQ, 2002). Improved stream flow conditions will benefit fish and wildlife communities that inhabit the Whychus Creek ecosystem.

ODF&W as well as fish biologists from (NOAA, USFW, USFS, TRIBES/PGE) who are involved with the anadromous reintroduction will continue to monitor the benefits of additional flow for fish.

DEQ and the Upper Deschutes Watershed Council, who have 15 water quality monitoring stations on Whychus Creek as well as the Tribes, will continue to monitor temperature and other water quality benefits from increased flow.

TSID will have completed their SOR and AWMCP by the September of 2010. That plan will include a Piping & conserved water assessment as well as a Measurement & telemetry plan which will be reviewed annually.

TSID's staff day to day use of telemetry, SCADA and automated head gates to better manage TSIDs whole water supply will be monitored by the new OWRD gauging station on the main canal pipeline that will replace the old one on the canal. TSID and OWRD have Diversion records dating back to 1924. Comparing old data against new as well as noting delivery improvements will be part of the Final report process.

**Summarize the information regarding how direct and indirect project benefits were calculated, and reference any supporting documents.**

TSID, DRC and its partners have focused on restoring the habitat necessary to support self-sustaining anadromous fish populations in Whychus Creek. Given this goal, our restoration actions need to be self-sustaining to the greatest extent possible. Our work addresses the root causes of habitat degradation while improving current conditions.

Stream flow drives all aspects of stream ecosystems. Fisheries managers have consistently identified low summer stream flow as the greatest factor limiting fish populations in Whychus Creek. Increasing stream flow in Whychus Creek will reduce the magnitude of this limiting factor and permanently improve habitat conditions.

TSID and DRC have worked to restore streamflow in Whychus Creek since 1998. We have used temporary leases, permanent water transfers, and large-scale water conservation projects like the McKenzie Pipeline project to restore over 20 cfs of stream flow to Whychus Creek. Each water transaction permanently improves stream flow in Whychus Creek and reduces the impacts of low stream flow on ecological conditions.

Large-scale water conservation projects, such as the *Whychus Creek – Three Sisters Irrigation District Main Canal Piping Project*, permanently improve conditions in Whychus Creek while enhancing irrigation water management. These projects and associated instream water rights are firmly grounded in Oregon’s water law framework (Oregon Revised Statutes 537.455 - 537.500). Large-scale water conservation projects, when coupled with stream flow restoration, are socially sustainable, legally protectable, and provide both economic and environmental benefits to local communities. The plans and assessments listed on pages 8-11 of the technical project description identify the limiting factors that this project addresses, highlight the efficacy of the stream flow restoration, or prioritize the ecological importance of restoration in Whychus Creek.

***(g) Project Financing and Cost Sharing***

<b>FUNDING SOURCE</b>	<b>FUNDING AMOUNT</b>
<b>Non-Federal Entities:</b>	
Three Sisters Irrigation District	\$2,240,409
Oregon Watershed Enhancement Board	\$1,930,845
<b>Non-Federal Subtotal:</b>	<b>\$4,171,254</b>
National Fish & Wildlife Foundation	\$5,000
Deschutes/Ochoco Resource Advisory Committee	\$50,000
National Forest Foundation	\$100,000
United States Forest Service	\$300,470
Reclamation Funding:	\$1,000,000
<b>Federal Subtotal:</b>	<b>\$1,505,000</b>
<b>TOTAL PROJECT FUNDING:</b>	<b>\$5,629,724</b>

**Subcriteria No. 1—Allocation of Costs:**

**Does the budget identify direct, indirect, environmental, and contingency costs? If not, explain.**

Yes

**Subcriteria No. 2—Additional non-Federal Funding:**

**State the percentage of non-Federal funding provided.**

72%

***(h) Connection to Reclamation Project Activities***

**How is the proposed project connected to Reclamation project activities?**

TSID does not serve Reclamation project lands and does not receive any Reclamation project water. But additional instream flows in Whychus Creek which flow into the Deschutes River will help with BOR's minimum stream flow requirements from NOAA and US Fish as per the ongoing Section 7 consultation for the Pelton and Round Butte Dam FERC re-licensing agreement. Those flows will also benefit Wild and Scenic reaches on the Deschutes River. Whychus Creek also was historically an important spawning and rearing stream for steelhead and Chinook salmon until passage was curtailed around Pelton and Round Butte Dams on the Deschutes River. FERC re-licensing is requiring passage of anadromous fish at these two dams which makes the restoration of Whychus Creek a priority of fishery agencies, tribes, and others. The focus of this project is to conserve water by improving irrigation delivery efficiencies so that adequate flows can be maintained in Whychus Creek. Whychus Creek historically (prior to the dams) has provided 1/3 of the steelhead runs in the Deschutes River. If the anadromous fish runs are restored through spawning in Whychus Creek then pressure to restore the Crooked River runs by additional flow requirements in the Crooked River from North Unit ID and Ochoco ID will be lessened. NOAA fisheries have viewed past conservation projects that TSID and BOR have partnered on as benefiting the whole basin. TSID continued efforts will be beneficial to all members of the Deschutes Basin Board of Control (DBBC) as well as BOR during the ongoing Deschutes Basin Habitat Conservation Plan process.

**Does the applicant receive Reclamation project water?**

No.

**Is the project on Reclamation project lands or involving Reclamation facilities?**

No

**Is the project in the same basin as a Reclamation project or activity?**

Yes

**Will the proposed work contribute water to a basin where a Reclamation project is located?**

Yes

***f. Performance Measure for Quantifying Actual Post project Benefits***

**All proposals must describe how you will quantify actual project benefits (water saved, marketed or better managed) upon completion of the project (also known as a —performance measure□). You should identify a performance measure for their project and explain how the measure will be applied to their project.**

An irrigation loss analysis for all 3 phases in 2009 was conducted by Newton Consultants. The Main Canal between TSID diversion and Watson Reservoir in 2009 had

an estimated canal loss of 10.85 cfs. Over a 210 day irrigation season (April- Oct.), that translates into 4500 acre feet per season. Phase 3 of the Main Canal piping project would conserve about 1/3 of the loss approximately 1500 acre feet.

The Deschutes River Conservancy will complete Oregon's Conserved Water application process with the Oregon Department of Water Resources on behalf of TSID. This process will create a new instream water right of at least 2 cfs with an 1895 priority date. The instream right will protect flows from April 1 to October 31 and at other times when TSID is diverting water.

The District intends to use the Oregon Conserved Water Statute to allow the saved water to be allocated instream (OAR 690-018-0010 to 690-018-0090 and ORS 537.455 to 537.500). The District will not divert the saved water at its diversion point, but instead leave the conserved water in the river where it will be protected by the Oregon Water Resources Department from other withdrawals and measured at the gauging stations located at Camp Polk and the City of Sisters. Preliminary saved water was determined to be a minimum of 6 cfs for the period of April 15<sup>th</sup> through October 15<sup>th</sup> of each year. Increased stream flow in Whychus Creek will help reconnect the creek with the floodplain, create more backwater and pool habitat for fish and improve the health of the riparian habitat community.

The Deschutes River Conservancy will focus on monitoring both the water outputs and economic outputs from this project. The Oregon Water Resources Department maintains a near-real-time, web accessible stream gauge downstream from the TSID diversion at Sisters (river mile 21). The Deschutes River Conservancy will use this gauge to determine whether stream flows are meeting targets on a daily basis, and will use this gauge to determine overall implementation

It is anticipated that the project will enhance water quality in Whychus Creek by increasing the rate of flow and thus reducing the impacts of solar heating and low dissolved oxygen levels. Increased stream flow may also increase riparian vegetation, leading to more canopy cover and reduced stream flow temperatures. Whychus Creek is currently listed under the Oregon DEQ 303(d) criteria for temperature (DEQ, 2002). Improved stream flow conditions will benefit fish and wildlife communities that inhabit the Whychus Creek ecosystem.

ODF&W as well as fish biologists from (NOAA, USFW, USFS, TRIBES/PGE) who are involved with the anadromous reintroduction will continue to monitor the benefits of additional flow for fish. They will also be monitoring the fish screen the new passage as well as the channel and habitat restoration.

DEQ and the Upper Deschutes Watershed Council, who have 15 water quality monitoring stations on Whychus Creek as well as the Tribes, will continue to monitor temperature and other water quality benefits from increased flow. TSID will have completed their SOR and AWMCP by the end of 2010. That plan will include a Piping & conserved water assessment as well as a Measurement & telemetry plan which will be reviewed annually.

TSID's staff day to day use of telemetry, SCADA and automated weir and head gates to better manage TSIDs whole water supply will be monitored by the new OWRD gauging station on the main canal pipeline that will replace the old one on the canal. TSID and OWRD have Diversion records dating back to 1924. Comparing old data against new as well as noting delivery improvements will be part of the Final report process.

***g. Description of Potential Environmental Impacts***

**In order 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 requirements of the National Environmental Policy Act (NEPA), the ESA, and the National Historic Preservation Act (NHPA). 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 this section at paragraph k(3)(g), —Environmental and Regulatory Compliance Cost□ and in Section VIII B., —Environmental Compliance Requirements.□ If you have any questions, please contact your regional or area Reclamation office (see <<http://www.usbr.gov/main/regions.html>>) with questions regarding ESA compliance issues or you may contact Dean Marrone, WaterSMART Program Coordinator, at 303-445-3577 for further information.**

**(1) Will the project impact the surrounding environment (i.e., soil [dust], air, water [quality and quantity], animal habitat, etc.)? Please briefly describe all earth-disturbing 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.**

**Wildlife:**

Bald eagles are known to inhabit the lower portion of the Whychus Creek Watershed with incidental use in the Lower Division of the TSID project area. Two bald eagle nesting sites (currently not in use) have been observed at Watson Reservoir in the project area. The following wildlife species are found in the project area: mule deer, elk, coyotes, ground squirrels, mountain lions, common ravens, turkey vultures, golden eagles, and red-tailed hawks. Irrigated agriculture has provided forage for numerous wildlife species. Also, irrigation ponds provide water for many wildlife species. Watson Reservoir and Whychus creek and nearby farm ponds will provide adequate water for wildlife.

Construction:

Pipeline and Fish screen

All construction of the pipeline and the fish screen will occur in the Main Canal. TSID has an 1891 right of way width of 50 feet on both sides of the canal. From October 2011 until the water comes on in April 2012 trucking of bedding and backfill will occur in the canal. Once the water is on existing roads will be used. A water truck will be used to control dust. Winter months tend to be snowy and wet around Sisters which helps with dust control. Working in the canal will minimize all impacts.

Beneficial impacts from additional in stream flow for fish and water quality will be realized immediately upon completion of Phase 3.

Fish Passage, Channel and Habitat Restoration

This work will occur in September and October of 2010. The UDWC and the USFS will be overseeing all work during the passage and channel restoration. NOAA, USFW and ODFW are all being consulted. USFS is working with ACOE and DSL for in stream work permits. USFS has designed a revegetation plan that will be implemented by USFS, UDWC and various sub contractors that will be hired by USFS and UDWC. Any heavy equipment sub contractors will be hired by the USFS. TSID will be donating in-kind labor and equipment for hauling material as well as donating boulders from our farmers.

**(2) Are you aware of any endangered or threatened species in the project area? If so, would they be affected by any activities associated with the proposed project?**

ESA species present in Whychus Creek include MCR steelhead and Bull Trout. Bull trout were consulted on by the Natural Resources Conservation Service (NRCS) for all phases of the McKenzie Canyon project. The NRCS received a concurrence from the Fish and Wildlife Service for a not likely to adversely affect determination. The ESA status, distribution, life history, and habitat requirements for MCR steelhead are described in Reclamation's Final Biological Assessment on Continued Operation and Maintenance of the Deschutes River Basin Projects and Effects on Essential Fish Habitat under the Magnuson-Stevens Act (2003).

In May 2007, the Oregon Department of Fish and Wildlife, in cooperation with the Confederated Tribes of the Warm Springs Reservation, began the process of reintroducing hatchery-raised fingerling steelhead into Whychus Creek, a tributary of the Deschutes River above the Pelton Round Butte Hydroelectric (PRB) Project. The reintroduction is part of a commitment made in the recent Federal Energy Regulatory Commission (FERC) relicensing of the PRB Project. Also in May 2007, NOAA Fisheries sent a letter to the Deschutes Basin Board of Control stating that the juvenile steelhead used for this out planting are considered ESA listed (threatened) fish.

Environmental baseline conditions for Deschutes River MCR steelhead are described in Reclamation's Biological Assessment (Reclamation, 2003). Whychus Creek currently has instream flow, water quality, and habitat features that may be limiting factors to successful steelhead trout reintroduction. Historical reports indicated that Whychus Creek once served as the primary spawning and rearing habitat for steelhead trout in the upper Deschutes Basin (Nehlsen 1995). Since 1895, the flows of Whychus Creek have been diverted for irrigation uses and have limited the rearing habitat of steelhead trout populations (Nehlsen 1995). The

steelhead trout populations were extirpated in 1968 five years after the completion of the Pelton-Round Butte (PRB) complex. Federal re-licensing of the PRB complex resulted in steelhead trout reintroduction to Whychus Creek beginning in 2007.

Whychus Creek is Section 303(d) listed for temperature impairment because it does not meet state temperature standards set to protect salmon and trout rearing and migration.

The proposed action will increase streamflow in Whychus Creek by an average of 2 cfs during the irrigation season (April – October) from TSID’s diversion at RM 27 on Whychus Creek to Lake Billy Chinook. Historically, Whychus Creek would run dry during most summers from the town of Sisters downstream to Alder Springs as a result of irrigation withdrawals. Through water conservation efforts, protected flows of almost 15-20 cfs now flow through the town of Sisters during irrigation season, and are protected to Lake Billy Chinook. TSID Main Canal Pipeline Project will improve water quality and quantity conditions in Whychus Creek that will subsequently benefit the reintroduction of MCR steelhead into this basin.

It was Reclamation’s determination that Reclamation’s proposed action of funding the TSID’s McKenzie Pipeline Phase I 2025 Project, may affect, but is not likely to adversely affect, listed MCR steelhead in Whychus Creek. Effects from the proposed action will be beneficial to MCR steelhead. The Main Canal pipeline is the same type of project as McKenzie.

**(3) Are there wetlands inside the project boundaries? If so, please estimate how many acres of wetlands there are and describe any impact the project will have on the wetlands.**

There are no jurisdictional wetlands along the Main Canal. There are areas of seepage along the canal. Cottonwood, willows, and other vegetation grows sporadically along portions of the open canal.

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

The diversion headwork’s were constructed in 1970. The canal was built in 1891 and enlarged in 1919-1924.

**(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.**

Yes. The Fish Screen design will add a second set of control gates at TSID’s diversion. These 4 gates will open in a downward direction operating as weir gates. As part of the main Canal pipeline project phase 1 TSID replaced the 4 wooden manual headgates at the creek with new steel gates. TSID plans to install a SCADA & telemetry system to run both sets of gates. (Total of 8) Also as part of the Main Canal pipeline, TSID will replace OWRD’s old wooden gauging station with 2 measuring devices concrete weir structures and a telemetry gauging station.

The canal will be replaced with 2 54” HDPE pipes set side by side and backfilled with a minimum of 3 feet of cover over the top.

**(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.**

Yes, all canals in Central Oregon irrigation projects are eligible to the NRHP

**(7) Are there any known archeological sites in the proposed project area?**

See attached Appendix E Cultural Resources report for the Project and USFS/BOR/TSID/SHPO concurrence MOU.

***h. 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.**

Pipeline

TSID had submitted a cultural resource survey and report to SHPO. USFS, BOR, TSID and SHPO signed a MOU completing the required concurrence. USFS completed and issued a categorical exclusion on the pipeline that complies with NEPA requirements. NOAA in recent e-mail felt that it would not be necessary for Reclamation to consult on piping projects in the Deschutes Basin that will leave a portion of the conserved water in stream as long as the project is off channel and will have no negative impacts to streams and or rivers. A No effect determination will need to be placed in the file. USF&W has been informally consulted on Bull trout by reclamation.

TSID has an 1891 federally recognized right of way and a recent court decision recognized that Irrigation Districts can pipe their canals under this right of way.

Fish Screen, Passage, Channel and Habitat Restoration.

Final Design for all 3 components has been approved by NOAA, USFW, ODF&W and USFS. USFS has completed all required NEPA. Currently USFS is working with ACOE and DSL for in channel permits.

***i. 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.**

**Project funding provided by a source other than the applicant shall be supported with letters of commitment from these additional sources. This is a mandatory requirement.**

**Letters of commitment shall identify the following elements:**

- (1) The amount of funding commitment**
- (2) The date the funds will be available to the applicant**
- (3) Any time constraints on the availability of funds**
- (4) Any other contingencies associated with the funding commitment**

**Commitment letters should be included with your project application. If a final funding commitment has not been received by the date of application, commitment letters are to be submitted by no later than September 1, 2010, to the address shown in Section IV.C, above. The funding plan must include all project costs, as follows:**

- (1) How you will make your contribution to the cost-share requirement, e.g., monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).**

TSID currently owns a 100,000 lb excavator, D-8 Cat, off road dump truck, front end loader, 4 dump trucks and backhoe. TSID will use this equipment to complete Phases I, II, III of the Main Canal pipeline and future Main Canal pipeline projects between Watson and McKenzie reservoirs.

TSID will also borrow money to pay for fuel and labor for the project. Once all phases and the Hydro is built TSID will sell the Oregon Business Energy Tax Credit and pay back the loan. The Hydro will also generate around \$300,000 annually which can cover long term debt.

**(2) Describe any in-kind costs incurred before the anticipated project start date that you seek to include as project costs. The description of these costs shall include**

**(a) What project expenses have been incurred**

Engineering costs for dam and passage modifications.

**(b) How they benefitted the project**

Since the fish passage and channel restoration will raise the stream bed to the height of the dam it is prudent to reinforce the corner structures on the existing diversion dam.

**(c) The amount of the expense**

\$2,222.50

**(d) The date of cost incurrence**

March 25, 2010

**(1) Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.**

See Appendix D

<b>FUNDING SOURCE</b>	<b>FUNDING AMOUNT</b>
<b>Non-Federal Entities:</b>	
Three Sisters Irrigation District	\$2,240,409
Oregon Watershed Enhancement Board	\$1,930,845
<b>Non-Federal Subtotal:</b>	<b>\$4,171,254</b>
National Fish & Wildlife Foundation	\$5,000
Deschutes/Ochoco Resource Advisory Committee	\$50,000
National Forest Foundation	\$100,000
United States Forest Service	\$303,470
Reclamation Funding:	\$1,000,000
<b>Federal Subtotal:</b>	<b>\$1,508,470</b>
<b>TOTAL PROJECT FUNDING:</b>	<b>\$5,629,724</b>

**(2) Describe any funding requested or received from other Federal partners. Note: Other sources of Federal funding may not be counted towards the applicant's 50 percent cost share unless otherwise allowed by statute.**

Funding from the USFS will consist of \$200,000 in cash and approximately \$100,000 in in-kind for the channel restoration.

Funding from the National Fish & Wildlife Foundation is for \$5000 for the Fish screen.

\$100,000 has been requested from the National Forest Foundation for the Fish screen.

\$50,000 has been requested from the Deschutes/Ochoco Resource Advisory Committee for the Fish screen.

**(3) Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.**

OWEB funds in the amount of \$930,000 will come through their Deschutes Special Investment Program (SIP). Those monies will be obligated and contracted to DRC in September, 2009.

Based on past history with both DRC & OWEB, TSID is confident that this project will be funded by OWEB. If funding for pipe and materials was not obtained, obviously the project would be put on hold or a smaller portion of the project would be completed with less funding.

***j. 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:**

**The identity of the official with legal authority to enter into agreement**

**The board of directors, governing body, or appropriate official who has reviewed and supports the application submitted**

**The capability of the applicant to provide the amount of funding and/or in-kind contributions specified in the funding plan**

**That the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement**

**An official resolution meeting the requirements set forth above is mandatory. If the applicant is unable to submit the official resolution by the application deadline because of the timing of board meetings or other justifiable reasons, the official resolution may be submitted up to 30 days after the application deadline.**

See Official Resolution attached – Appendix F

***k. Budget Proposal***

**(1) General Requirements. Include a project budget with the annual estimated project costs and an estimate of any increase or decrease in operation and maintenance (O&M) costs resulting from the project. 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.**

**(2) 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 1 at the end of this section or a similar format that provides this information.

**(3) Budget Narrative Format.** Submission of a budget narrative is mandatory. An award will not be made to any applicant who fails to fully disclose this information. The Budget Narrative provides a discussion of, or explanation for, items included in the budget proposal. Listed below are examples of the types of information to include in the narrative.

**(a) Salaries and Wages.** Indicate program manager and other key personnel by name and title. Other personnel may be indicated by title alone. For all positions, indicate salaries and wages, estimated hours or percent of time, and rate of compensation proposed. All labor estimates, including any proposed subcontractors, shall be allocated to specific tasks as outlined in the recipient's technical project description. Labor rates and proposed hours shall be displayed for each task.

**Clearly identify any proposed salary increases and the effective date.**

The manager has a contract and his salary will increase to \$70,000.00 December 15, 2010.

Marc Thalacker, TSID Manager      Salary \$65,000.00.

Hourly is \$34.57 and fringe is \$11.67 per hour.

Bill McKinney Construction Foreman

Hourly is \$20.00 and fringe is \$8.03 per hour.

Mathias Pearle UDWC Project Manager

\$55.00 Hour

Currently TSID has 6 heavy equipment operators on staff. For budgeting purposes we used \$17 per hour, which works out to a wage cost of \$17.00 and fringe benefit cost of \$2.23. The UDWC and the USFS will manage and hire any needed sub contractors for the channel, passage and habitat projects. TSID will build the Fish screen with TSID employees.

Generally, salaries of administrative and/or clerical personnel should be included as a portion of the stated indirect costs. If these salaries can be adequately documented as direct costs, they may be included in this section; however, a justification should be included in the budget narrative.

Clerical and Administrative hours are tracked daily and assigned as a direct cost to the project.

**(b) Fringe Benefits.** Indicate rates/amounts, what costs are included in this category, and the basis of the rate computations. Indicate whether these rates are used for application purposes only or whether they are fixed or provisional rates for billing purposes. Federally approved rate agreements are acceptable for compliance with this item.

Fringe benefits average 20% of salary costs and include basic health insurance and vacation and sick time allowance costs.

**(c) Travel.** Include purpose of trip, destination, number of persons traveling, length of stay, and all travel costs including airfare (basis for rate used), per diem, lodging, and miscellaneous travel expenses. For local travel, include mileage and rate of compensation.

There is no travel by District anticipated for this project. Any travel costs from UDWC will be in paid for with OWEB funds. These would include per diem charged by the engineers and surveyors as well as mileage as listed in the budget spreadsheet.

**(d) Equipment.** Itemize costs of all equipment having a value of over \$500 and include information as to the need for this equipment. If equipment is being rented, specify the number of hours and the hourly rate.

See Appendix H

**(e) Materials and Supplies.** Itemize supplies by major category, unit price, quantity, and purpose, such as whether the items are needed for office use, research, or construction.

See Appendix H

**(f) Contractual.** Identify all work that will be accomplished by subrecipients, consultants, or contractors, including a breakdown of all tasks to be completed, and a detailed budget estimate of time, rates, supplies, and materials that will be required for each task. If a subrecipient, consultant, or contractor is proposed and approved at time of award, no other approvals will be required. Any changes or additions will require a request for approval.

TSID is not planning to hire any contractors. We will do the work ourselves on the pipeline. The UDWC and the Forest Service will hire some subcontractors for engineering, project oversight, heavy equipment and channel and habitat restoration. They will use USFS and OWEB funds. No Reclamation funds will be spent on sub contractors.

**(g) Environmental and Regulatory Compliance Costs.** Applicants must include a line item in their budget to cover environmental compliance costs. —Environmental compliance costs  refer to costs incurred by Reclamation or the recipient in complying with environmental

regulations applicable to a WaterSMART Grant, including costs associated with any required documentation of environmental compliance, analyses, permits, or approvals. Applicable Federal environmental laws could include NEPA, ESA, NHPA, and the Clean Water Act, and other regulations depending on the project. Such costs may include, but are not limited to:

The cost incurred by Reclamation to determine the level of environmental compliance required for the project

The cost incurred by Reclamation, the recipient, or a consultant to prepare any necessary environmental compliance documents or reports

The cost incurred by Reclamation to review any environmental compliance documents prepared by a consultant

The cost incurred by the recipient in acquiring any required approvals or permits, or in implementing any required mitigation measures

The amount of the line item should be based on the actual expected environmental compliance costs for the project. However, the minimum amount budgeted for environmental compliance should be equal to at least 1-2 percent of the total project costs. If the amount budgeted is less than 1-2 percent of the total project costs, you must include a compelling explanation of why less than 1-2 percent was budgeted. Any environmental compliance costs that exceed the amount you budgeted for must generally be paid for solely by you.

How environmental compliance activities will be performed (e.g., by Reclamation, the applicant, or a consultant), and how the environmental compliance funds will be spent, will be determined pursuant to subsequent agreement between Reclamation and the applicant. If any portion of the funds budgeted for environmental compliance is not required for compliance activities, such funds may be reallocated to the project, if appropriate.

Currently all of the costs for environmental compliance have been spent prior to this application. TSID has budgeted \$20,000 for any additional unforeseen environmental costs.

**(h) Reporting.** Recipients are required to report on the status of their project on a regular basis. Include a line item for reporting costs (including final project and evaluation costs). Please see Section VI.C for information on types and frequency of reports required.

The line item for the Manager includes time for reporting compliance requirements

**(i) Other.** Any other expenses not included in the above categories shall be listed in this category, along with a description of the item and what it will be used for. No profit or fee will be allowed.

**(j) Indirect Costs.** Show the proposed rate, cost base, and proposed amount for allowable indirect costs based on the applicable OMB circular cost principles (see Section III E., —Cost Sharing Requirement□) for the recipient's organization. It is not acceptable to simply incorporate indirect rates within other direct cost line items.

If the recipient has separate rates for recovery of labor overhead and general and administrative costs, each rate shall be shown. The applicant should propose rates for

**evaluation purposes, which will be used as fixed or ceiling rates in any resulting award.**

**Include a copy of any federally approved indirect cost rate agreement.**

**If you do not have a federally approved indirect cost rate agreement, or if unapproved rates are used, explain why, and include the computational basis for the indirect expense pool and corresponding allocation base for each rate.**

The District has a federally approved indirect cost agreement rate of 35%.

For this project the District should not have any indirect costs. All costs associated with the project are direct and can be documented as such.

available from Interior, the National Business Center, and Indirect Cost Section, at <http://www.aqd.nbc.gov/services/ICS.aspx>.

(k) *Total Cost*. Indicate total amount of project costs, including the Federal and non-Federal cost-share amounts.

**(4) Budget Form.** In addition to the above-described budget information, the applicant must complete an SF-424A, Budget Information – Nonconstruction Programs, or an SF-424C, Budget Information – Construction Programs. These forms are available at [http://www.grants.gov/agencies/aapproved\\_standard\\_forms.jsp#1](http://www.grants.gov/agencies/aapproved_standard_forms.jsp#1).

## **E. Funding Restrictions**

See Section III.E.3 for restrictions on incurrence and allow ability of pre-award costs.

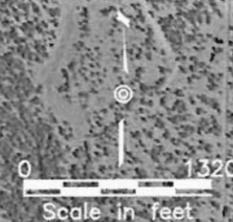
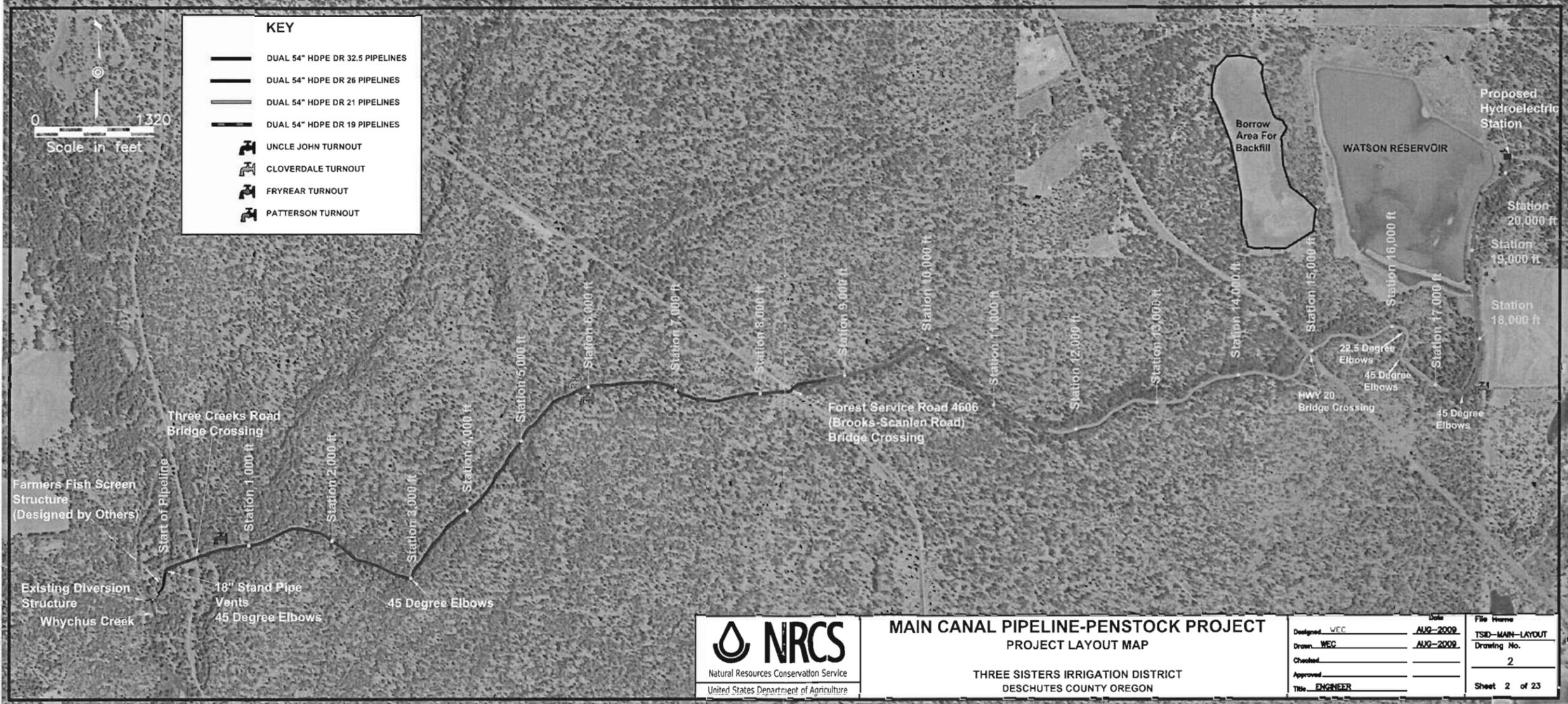
**BUDGET INFORMATION - Construction Programs**

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	\$ 19,072.00	\$	\$ 19,072.00
2. Land, structures, rights-of-way, appraisals, etc.	\$	\$	\$ 0.00
3. Relocation expenses and payments	\$	\$	\$ 0.00
4. Architectural and engineering fees	\$	\$	\$ 0.00
5. Other architectural and engineering fees	\$	\$	\$ 0.00
6. Project inspection fees	\$	\$	\$ 0.00
7. Site work	\$	\$	\$ 0.00
8. Demolition and removal	\$	\$	\$ 0.00
9. Construction	\$ 5,510,652.00	\$	\$ 5,510,652.00
10. Equipment	\$	\$	\$ 0.00
11. Miscellaneous	\$	\$	\$ 0.00
12. SUBTOTAL (sum of lines 1-11)	\$ 5,529,724.00	\$ 0.00	\$ 5,529,724.00
13. Contingencies	\$ 100,000.00	\$	\$ 100,000.00
14. SUBTOTAL	\$ 0.00	\$ 0.00	\$ 0.00
15. Project (program) income	\$	\$	\$ 0.00
16. TOTAL PROJECT COSTS (subtract #15 from #14)	\$ 5,629,724.00	\$ 0.00	\$ 5,629,724.00
<b>FEDERAL FUNDING</b>			
17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter eligible costs from line 16c Multiply X <input type="text"/> % Enter the resulting Federal share.			\$ 1,000,000.00

# Appendix A

## MAP



KEY	
	DUAL 54" HDPE DR 32.5 PIPELINES
	DUAL 54" HDPE DR 26 PIPELINES
	DUAL 54" HDPE DR 21 PIPELINES
	DUAL 54" HDPE DR 19 PIPELINES
	UNCLE JOHN TURNOUT
	CLOVERDALE TURNOUT
	FRYREAR TURNOUT
	PATTERSON TURNOUT



**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**PROJECT LAYOUT MAP**  
 THREE SISTERS IRRIGATION DISTRICT  
 DESCHUTES COUNTY OREGON

Date	File Name
Designed: WEC	AUG-2009
Drawn: WEC	AUG-2009
Checked:	
Approved:	
Title: ENGINEER	

TSID-MAIN-LAYOUT
Drawing No. 2
Sheet 2 of 23

# **Appendix B**

## **LETTERS OF SUPPORT**



# Oregon

Theodore R. Kulmgoski, Governor

Department of Fish and Wildlife  
Deschutes Watershed District  
61374 Parrell Road  
Bend, OR 97702  
(541) 388-6363  
FAX (541) 388-6281

April 6, 2009

Deschutes River Conservancy  
700 NW Hill St  
Bend, OR 97701

Attn: Brett Golden

RE: Whychus Creek - Three Sisters Irrigation District Collaborative Restoration Project

Oregon Department of Fish and Wildlife is writing to express its support for the Whychus Creek - Three Sisters Irrigation District Collaborative Restoration Project. There are numerous benefits resulting from the screening/passage phase of the project including:

- Fish screening at the biggest irrigation diversion on Whychus Creek that diverts up to 90% of summer stream flow
- Provision of both upstream and downstream fish passage at an existing complete passage barrier
- Restored stream function including erosion control, floodplain connection and habitat improvements in the 1/4 mile reach downstream of the dam
- The project will support the reintroduction of Chinook salmon and summer Steelhead into their historic habitats and compliment existing efforts and plans for restoration and fish passage improvements along other reaches of Whychus Creek

The benefits of the piping phase of the project including restoring over 6 cfs of stream flow to historically degraded reaches of Whychus Creek, permanently improving habitat conditions along 23 miles of creek. This increased streamflow will improve riparian conditions, reduce maximum summer water temperatures, and increase available spawning and rearing habitat.

Oregon Department of Fish and Wildlife appreciates the opportunity to provide support for this particular project.

Regards

Ted Wize

Oregon Department Fish and Wildlife  
Asst. District Fisheries Biologist



**DESCHUTES RIVER  
CONSERVANCY**

May 13, 2009

Marc Thalacker  
District Manager  
Three Sisters Irrigation District  
PO Box 2230  
Sisters, OR 97759

RE: TSID Main Canal Conservation Project – Letter of Support

Dear Marc:

The purpose of this letter is to express the Deschutes River Conservancy's (DRC) support for Three Sisters Irrigation District's Main Canal Conservation Project. As you are well aware, the District's commitment to return at least six cubic feet per second of conserved water to Whychus Creek is a critical component to the overall effort to restore flows and water quality in Whychus Creek. The DRC has long supported the water conservation efforts of the District and its farmers and believes that only through cooperative efforts such as this, can instream flow targets in Whychus Creek be achieved.

The DRC has agreed to work with the District to draft and submit a conserved water application to the Oregon Water Resources Department on behalf of this project. If you have any questions, please do not hesitate to contact me at 541.382.4077, extension 17.

Thank you again for your leadership in the area of water conservation and instream flow restoration.

Sincerely,

Scott McCaulou  
Program Director  
Deschutes River Conservancy



File Code: 1910-6

Date: April 1, 2009

Craig Wolcott, Melanie Gange  
Dept of Commerce, NOAA Fisheries

RE: Deschutes NF Support for NOAA Coastal and Marine Restoration Project Grant,  
Deschutes River Conservancy, Whychus Creek – Three Sisters Irrigation District Collaborative  
Restoration Project

Dear Mr. Woolcott and Ms. Gange,

I am writing to express support for the Deschutes Resource Conservancy's (DRC) project on  
Whychus Creek that will re-establish fish passage over the Three Sisters Irrigation District  
(TSID) diversion dam and provide restored channel habitat as well.

The Deschutes National Forest is a partner in this project as it occurs on our lands. We have  
been deeply involved in the design and environmental analysis phases of the project over the last  
year.

Whychus Creek is at the top of the priority list in the Deschutes Subbasin for stream habitat  
restoration and enhancement. Whychus Creek was historically used by Chinook salmon and  
summer Steelhead as prime spawning and rearing habitat before the construction of the Pelton  
Round Butte Dam complex in the 1960s.

However, several significant diversions remain unscreened and are complete barriers to upstream  
and downstream fish passage. The TSID diversion, located upstream of Sisters, is the largest and  
oldest diversion in the watershed, responsible for diverting up to 90% of summer flow.

Because of these diversions, insufficient instream flow has led to a decrease in water quality  
including elevated water temperatures throughout much of the watershed. As a result, Whychus  
Creek has been listed on Oregon's 303(d) list since 1998 for temperature. In addition to poor  
water quality, fish habitat has suffered as a result of irrigation withdrawals. Impacts include  
increases in the channel width to depth ratio, reduced pool habitat, loss of oxbows and sloughs,  
loss of riparian habitat, and diminished channel/floodplain connectivity.

The benefits of the screening/passage phase of the project include restored stream function and  
erosion control, floodplain connection, and habitat improvements in the ¼ mile reach  
downstream of the dam. Also, the project will support the reintroduction of Chinook salmon and  
summer Steelhead into their historic habitats and compliment existing efforts and plans for  
restoration and fish passage improvements along other reaches of Whychus Creek.

The benefits of the piping phase of the project include the restoration of over 6 cfs of stream flow  
to historically degraded reaches of Whychus Creek, permanently improving habitat conditions

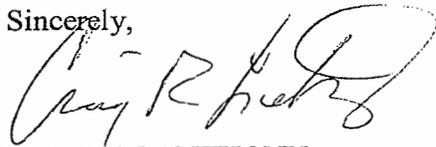


along 23 miles of creek by reducing maximum summer water temperatures, and increasing available spawning and rearing habitat.

The Deschutes National Forest looks forward to continuing this important project. The NOAA grant is an integral part of its success. We hope that NOAA looks favorably on the application submitted by DRC.

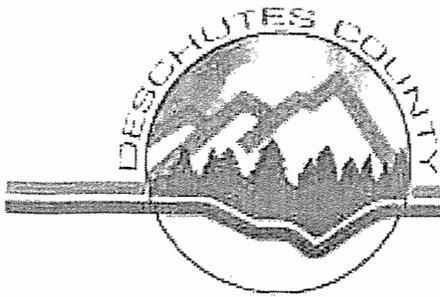
If you have any questions please contact Project Leader Rod Bonacker at 541-549-7729, or District Fish Biologist Mike Riehle at 541-549-7702.

Sincerely,

A handwritten signature in cursive script, appearing to read "William Anthony".

For

WILLIAM ANTHONY



## Board of County Commissioners

1300 NW Wall St, Suite 200 • Bend, OR 97701-1960

(541) 388-6570 • Fax (541) 385-3202

[www.co.deschutes.or.us](http://www.co.deschutes.or.us)

[board@co.deschutes.or.us](mailto:board@co.deschutes.or.us)

Tammy Baney

Dennis R. Luke

Alan Unger

April 1, 2009

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

### **Re: Whychus Creek - Three Sisters Irrigation District Collaborative Restoration Project**

Dear Mr. Houston:

On behalf of Deschutes County, the Board of Commissioners would like to extend support for the request to fund the Whychus Creek - Three Sisters Irrigation District Collaborative Restoration Project. Whychus Creek is at the top of the priority list in the Deschutes Subbasin for stream habitat restoration and enhancement. Whychus Creek was historically used by Chinook salmon and summer Steelhead as prime spawning and rearing habitat before the construction of the Pelton Round Butte Dam complex in the 1960s.

This project is needed to support and help ensure the successful reintroduction of steelhead and salmon in Whychus Creek. Some of key highlights include:

- Restoring over 6 cfs of stream flow to historically degraded reaches of Whychus Creek through canal piping.
- Limiting fish losses by providing fish screening at the largest irrigation diversion on the creek.
- Providing both upstream and downstream fish passage which will allow habitat connectivity and access to more spawning habitat

This project will provide access to existing good habitat upstream of the diversion dam and will also restore impaired habitat. These benefits combined with restoring stream flows below the diversion will complement the other restoration projects currently under way or planned for Whychus Creek

We support this project and urge you to approve this grant application. All of the partners that address water issues in the Deschutes Basin are working together to improve fish habitat, water quality and quantity and overall watershed health in the Deschutes river and its tributaries. This is an exciting project for us. Thank you for the opportunity to comment on this important project.

Sincerely,

DESCHUTES COUNTY BOARD OF COMMISSIONERS

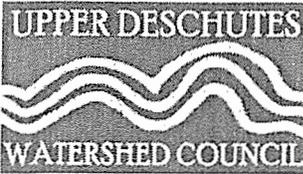
Tammy Bancy, Chair



Dennis R. Luke, Commissioner



Alan Unger, Commissioner



April 30, 2009

Marc Thalacker  
Three Sisters Irrigation District  
P.O. Box 2230  
Sisters, OR 97759

Re: Support for Main Canal Piping Project

Dear Marc:

I am writing to express my support for the Three Sisters Irrigation District's proposed piping of the Main Canal. The project will conserve approximately six cubic feet per second of streamflow, greatly improving aquatic conditions in Whychus Creek.

The Watershed Council is supportive of streamflow restoration efforts in Whychus Creek because Whychus Creek is currently listed on the state's 303(d) list for impaired water quality and streamflow is directly linked to water quality. Specifically:

- More than 10 years of data collected by the Watershed Council, Oregon Department of Environmental Quality and other partners have identified a direct relationship between streamflow and summer water temperature. Increased flow leads to decreased water temperature.
- Data collected by the Watershed Council in 2007 and 2008 indicate that Whychus Creek also suffers from low dissolved oxygen during the summer months when streamflows are low. Analyses indicate that improved streamflows would result in improved dissolved oxygen concentrations.
- Sufficient streamflow is critical for maintaining physical habitat in Whychus Creek, including the transport of spawning gravels, maintenance of deep pools, and support of wetlands and riparian areas.
- Low streamflow has been identified by Oregon Department of Fish and Wildlife, U.S. Fish and Wildlife Service and others as a limiting factor in the development of robust native fish populations.

Over the long term, streamflow restoration is the most critical part of restoring a healthy aquatic ecosystem in Whychus Creek because many other restoration efforts (e.g., fish passage, fish habitat restoration, etc.) can be successful only if there are the flows necessary to support a healthy stream corridor.

Please let me know how I can help make the Main Canal piping project successful.

Sincerely,

A handwritten signature in black ink, appearing to read "Ryan Houston", is written over a horizontal line.

Ryan Houston  
Executive Director  
Upper Deschutes Watershed Council

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## **Appendix C**

**MAIN CANAL PIPELINE  
/PASSAGE/FISHSCREEN  
/CHANNEL RESTORATION**

# MAIN CANAL PIPELINE-PENSTOCK PROJECT

## THREE SISTERS IRRIGATION DISTRICT

BY:  
U.S. DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE 430-DD

JOB CLASS VI

### INDEX OF DRAWINGS

- 1) COVER SHEET-INDEX OF DRAWINGS
- 2) PROJECT LAYOUT
- 3) PIPELINE GRADE SPECIFICATIONS
- 4) STATION 0-2,000 FT SPECIFICATIONS
- 5) STATION 2,000-4,000 FT SPECIFICATIONS
- 6) STATION 4,000-6,000 FT SPECIFICATIONS
- 7) STATION 6,000-8,000 FT SPECIFICATIONS
- 8) STATION 8,000-10,000 FT SPECIFICATIONS
- 9) STATION 10,000-12,000 FT SPECIFICATIONS
- 10) STATION 12,000-14,000 FT SPECIFICATIONS
- 11) STATION 14,000-16,000 FT SPECIFICATIONS
- 12) STATION 16,000-18,000 FT SPECIFICATIONS
- 13) STATION 18,000-20,000 FT SPECIFICATIONS
- 14) STATION 20,000-22,000 FT SPECIFICATIONS
- 15) PIPE-VALVE SPECIFICATIONS
- 16) PIPE INSTALLATION-BACKFILL SPECIFICATION
- 17) THREE CREEKS ROAD BRIDGE CROSSING
- 18) BROOKS SCANLEN ROAD BRIDGE CROSSING
- 19) HIGHWAY 20 BRIDGE CROSSING
- 20) AIR-VACUUM VALVE VAULT HOUSING
- 21) AIR-VACUUM, PRESSURE RELEASE VALVES VAULT HOUSING
- 22) TYPICAL VAULT INSTALLATION CROSS SECTION
- 23) THRUST BLOCK DETAILS

### UTILITY STATEMENT

No representation is made to the existence or non-existence of any utilities, public or private. Absence of utilities on these drawings is not assurance that no utilities are present. The exact location and depth of any utility must be determined by the utility company prior to any excavation. The land owner/contractor is responsible for contacting the utilities prior to excavation.

### EXISTING PIPELINES-STRUCTURES STATEMENT

This design does not validate the condition of any existing or used part of the pipeline system. Failure of any existing part of the pipeline system will be repaired at the irrigation districts expense.

### WATER SUPPLY STATEMENT

This design in no way guarantees the amount or timing of water deliveries to the planned pipeline. Water inflows less than irrigation demand may require the irrigation district to alter operation of the diversion headworks accordingly.

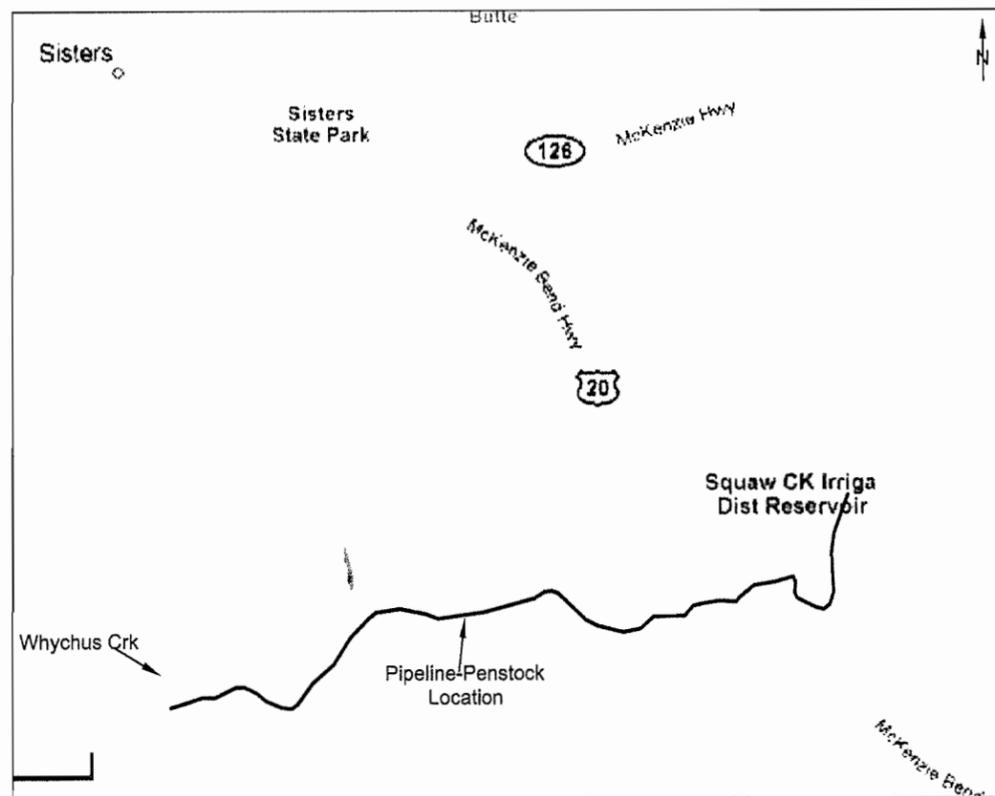
### PROJECT INSTALLATION/CONSTRUCTION STATEMENT

The irrigation district will be responsible for quality control of construction work for this project. All parties involved with construction will meet with an NRCS representative to discuss the construction requirements before any excavation begins. All work shall be done in accordance with NRCS specifications, Federal, State, and County laws.

Construction must be in conformance with these NRCS-approved drawings and specifications. Any material deviation from these drawings and specifications will constitute a breach of contract and will discharge NRCS from its obligation to provide cost-share under terms of the NRCS contract.



VICINITY MAP



Date AUG-2009  
Designed WEC  
Drawn WEC  
Checked  
Approved  
Title ENGINEER

MAIN CANAL PIPELINE-PENSTOCK PROJECT  
COVER SHEET INDEX OF DRAWINGS  
THREE SISTERS IRRIGATION DISTRICT  
DESCHUTES COUNTY OREGON



File Name  
TSID-MAIN-COVER  
Drawing No.  
1  
Sheet 1 of 23

58



KEY	
	DUAL 54" HDPE DR 32.5 PIPELINES
	DUAL 54" HDPE DR 26 PIPELINES
	DUAL 54" HDPE DR 21 PIPELINES
	DUAL 54" HDPE DR 19 PIPELINES
	UNCLE JOHN TURNOUT
	CLOVERDALE TURNOUT
	FRYREAR TURNOUT
	PATTERSON TURNOUT

Farmers Fish Screen Structure (Designed by Others)

Existing Diversion Structure

Whychus Creek

Start of Pipeline

Station 1,000 ft

Station 2,000 ft

Station 3,000 ft

Station 4,000 ft

Station 5,000 ft

Station 6,000 ft

Station 7,000 ft

Station 8,000 ft

Station 9,000 ft

Station 10,000 ft

Station 11,000 ft

Station 12,000 ft

Station 13,000 ft

Station 14,000 ft

Station 15,000 ft

Station 16,000 ft

Station 17,000 ft

Station 18,000 ft

Station 19,000 ft

Station 20,000 ft

18" Stand Pipe Vents

45 Degree Elbows

45 Degree Elbows

Forest Service Road 4606 (Brooks-Scanlan Road) Bridge Crossing

Borrow Area For Backfill

WATSON RESERVOIR

Proposed Hydroelectric Station

22.5 Degree Elbows

45 Degree Elbows

HWY 20 Bridge Crossing

45 Degree Elbows

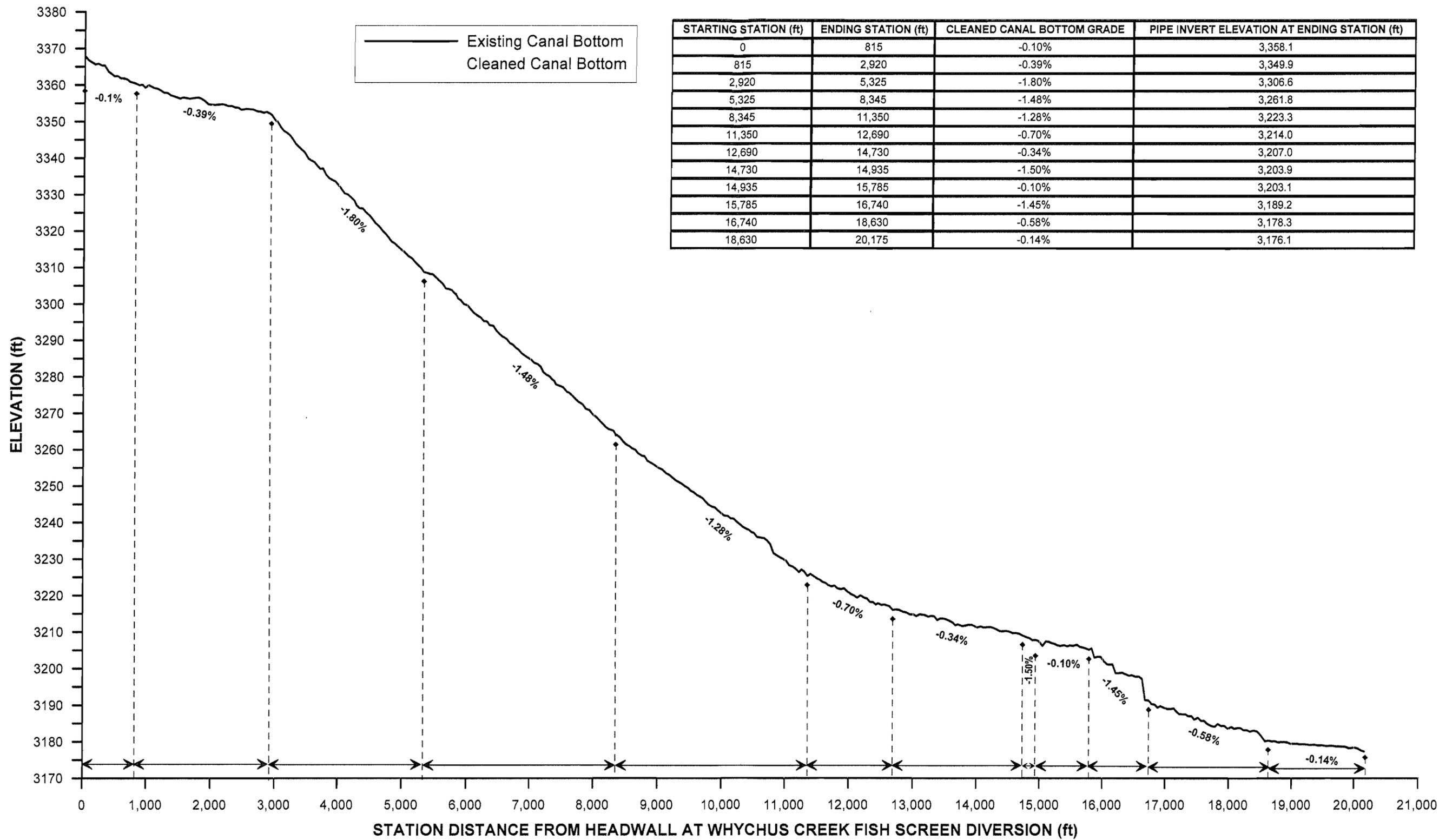


**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
PROJECT LAYOUT MAP

THREE SISTERS IRRIGATION DISTRICT  
DESCHUTES COUNTY OREGON

	Date	File Name
Designed: WEC	AUG-2009	TSID-MAIN-LAYOUT
Drawn: WEC	AUG-2009	Drawing No.
Checked:		2
Approved:		
Title: ENGINEER		Sheet 2 of 23

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STARTING STATION (ft)	ENDING STATION (ft)	CLEANED CANAL BOTTOM GRADE	PIPE INVERT ELEVATION AT ENDING STATION (ft)
0	815	-0.10%	3,358.1
815	2,920	-0.39%	3,349.9
2,920	5,325	-1.80%	3,306.6
5,325	8,345	-1.48%	3,261.8
8,345	11,350	-1.28%	3,223.3
11,350	12,690	-0.70%	3,214.0
12,690	14,730	-0.34%	3,207.0
14,730	14,935	-1.50%	3,203.9
14,935	15,785	-0.10%	3,203.1
15,785	16,740	-1.45%	3,189.2
16,740	18,630	-0.58%	3,178.3
18,630	20,175	-0.14%	3,176.1

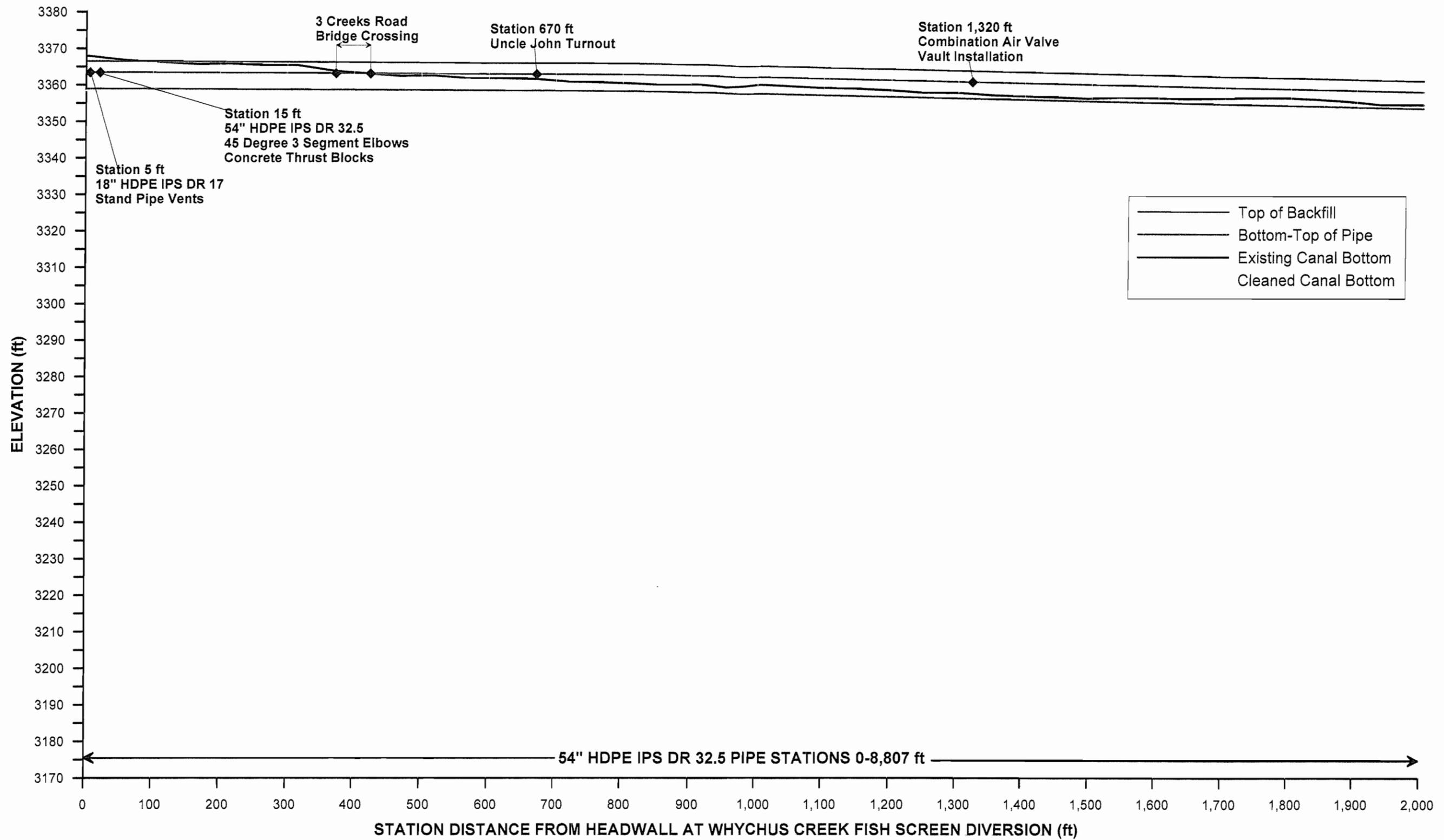
Date: JUL, 2009  
 Designed: WEC  
 Drawn: WEC  
 Checked: WEC  
 Approved: WEC  
 Title: Engineer

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**CLEANED CANAL BOTTOM GRADE SPECIFICATIONS**  
 THREE SISTERS IRRIGATION DISTRICT  
 DESCHUTES COUNTY, OREGON



File Name: TSID-MAIN-GRADE  
 Drawing No.: 3  
 Sheet 3 of 23

60



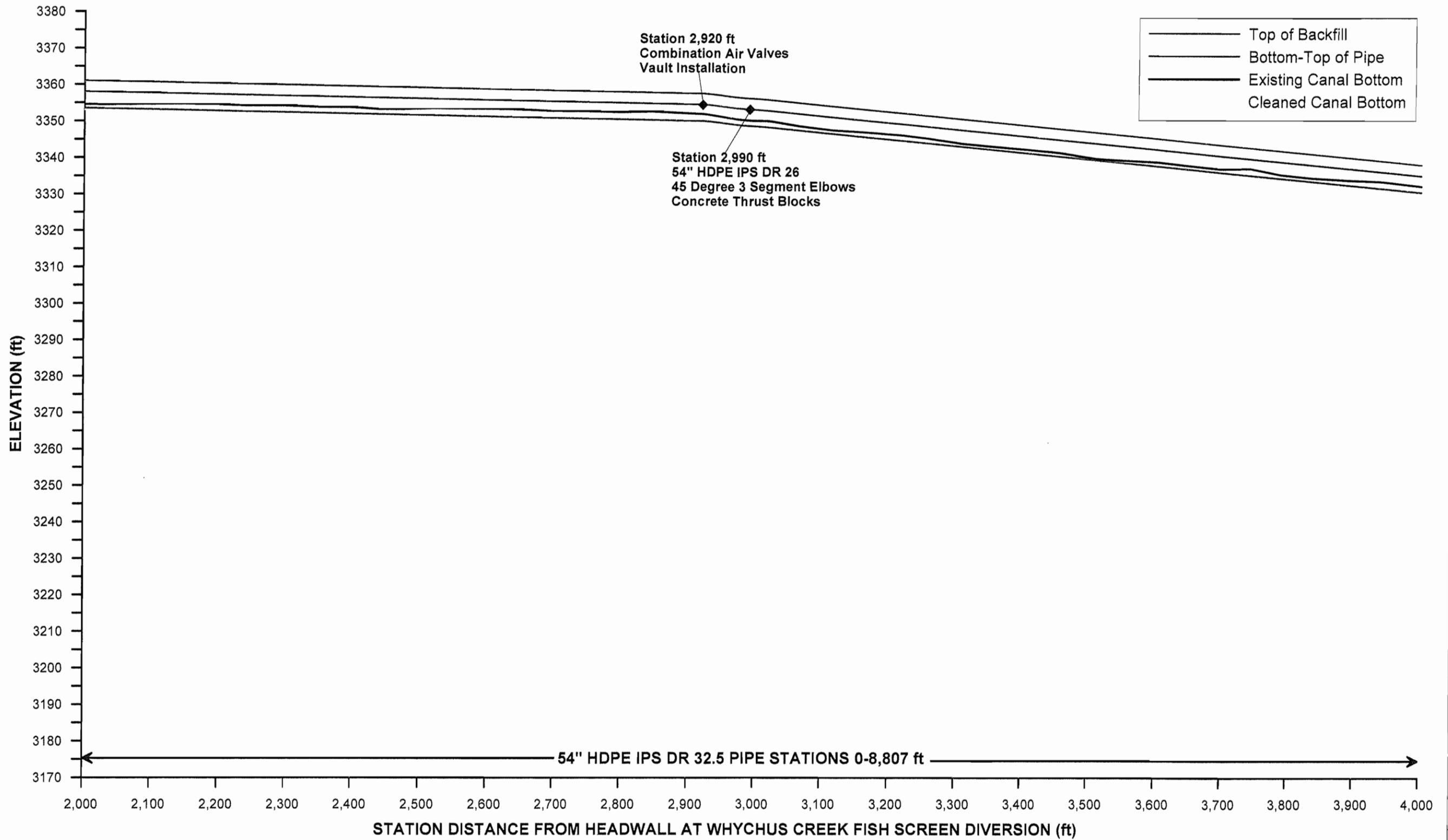
Designed	WEC	Date	JUL, 2009
Drawn	WEC		JUL, 2009
Checked			
Approved	WEC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**STATIONS 0-2000 FT SPECIFICATIONS**  
**THREE SISTERS IRRIGATION DISTRICT**  
 DESCHUTES COUNTY, OREGON



File Name	PIPE-SPECS-0-2000
Drawing No.	0-2000
Sheet 4 of 23	

61



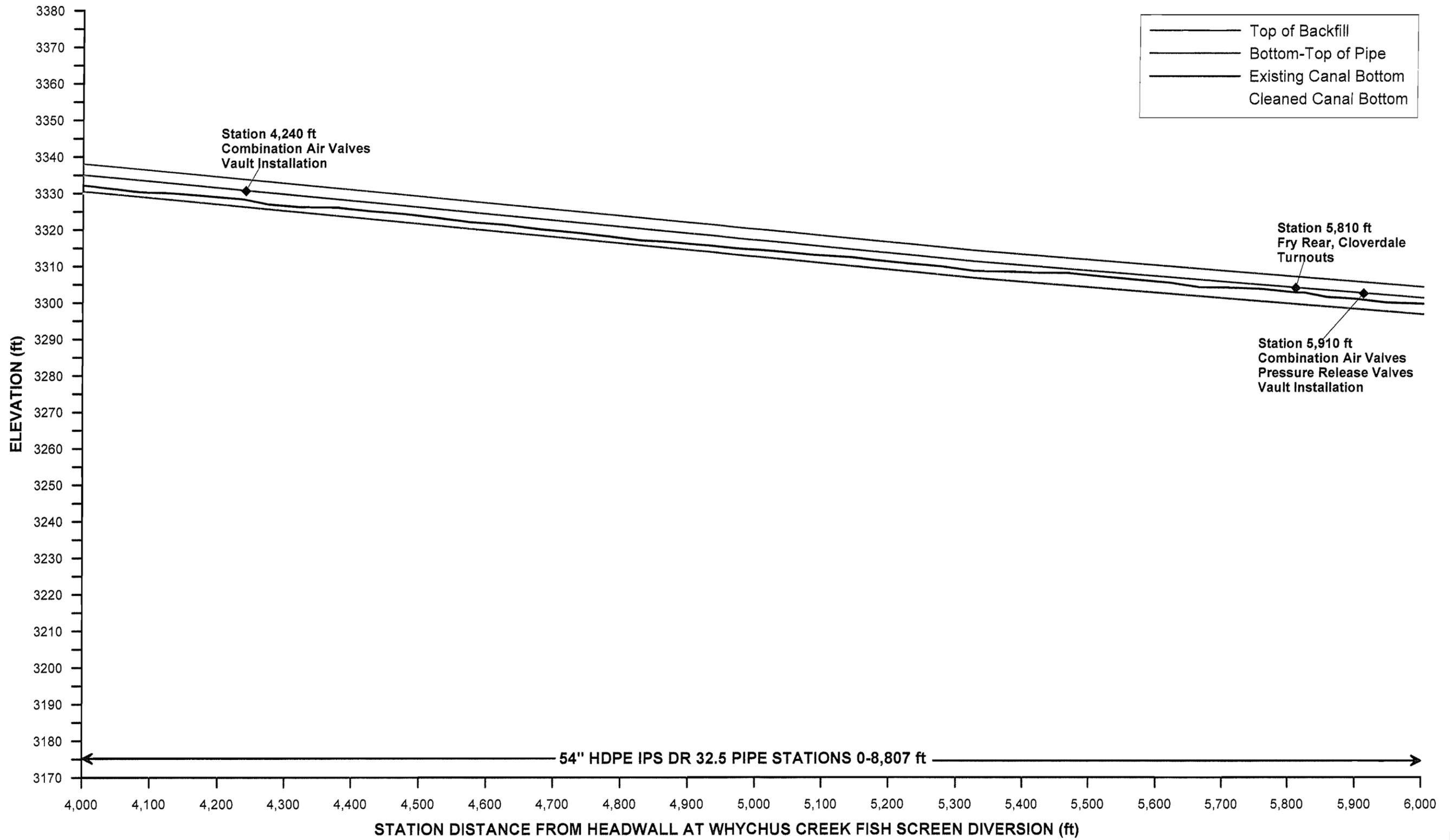
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Drawn	WEC		JUL, 2009
Checked			
Approved	WEC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**STATIONS 2,000-4,000 FT SPECIFICATIONS**  
**THREE SISTERS IRRIGATION DISTRICT**  
**DESCHUTES COUNTY, OREGON**



File Name	PIPE-SPECS-2000-4000
Drawing No.	2000-4000
Sheet	5 of 23

62



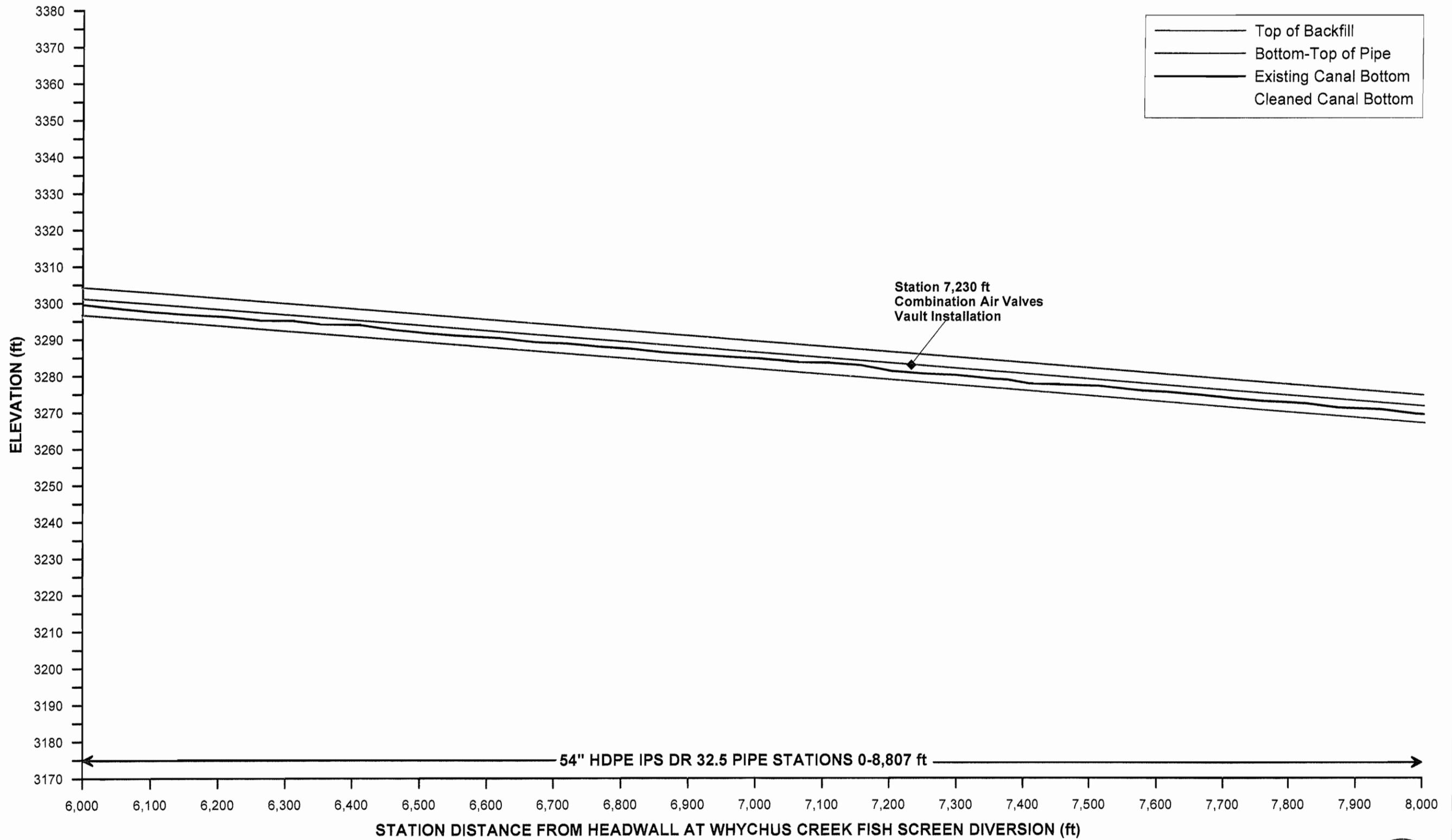
Designed	WEC	Date	JUL, 2009
Drawn	WEC		JUL, 2009
Checked	WEC		JUL, 2009
Approved	WEC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**STATIONS 4,000-6,000 FT SPECIFICATIONS**  
**THREE SISTERS IRRIGATION DISTRICT**  
**DESCHUTES COUNTY, OREGON**



File Name	PIPE-SPECS-4000-6000
Drawing No.	4000-6000
Sheet	6 of 23

63



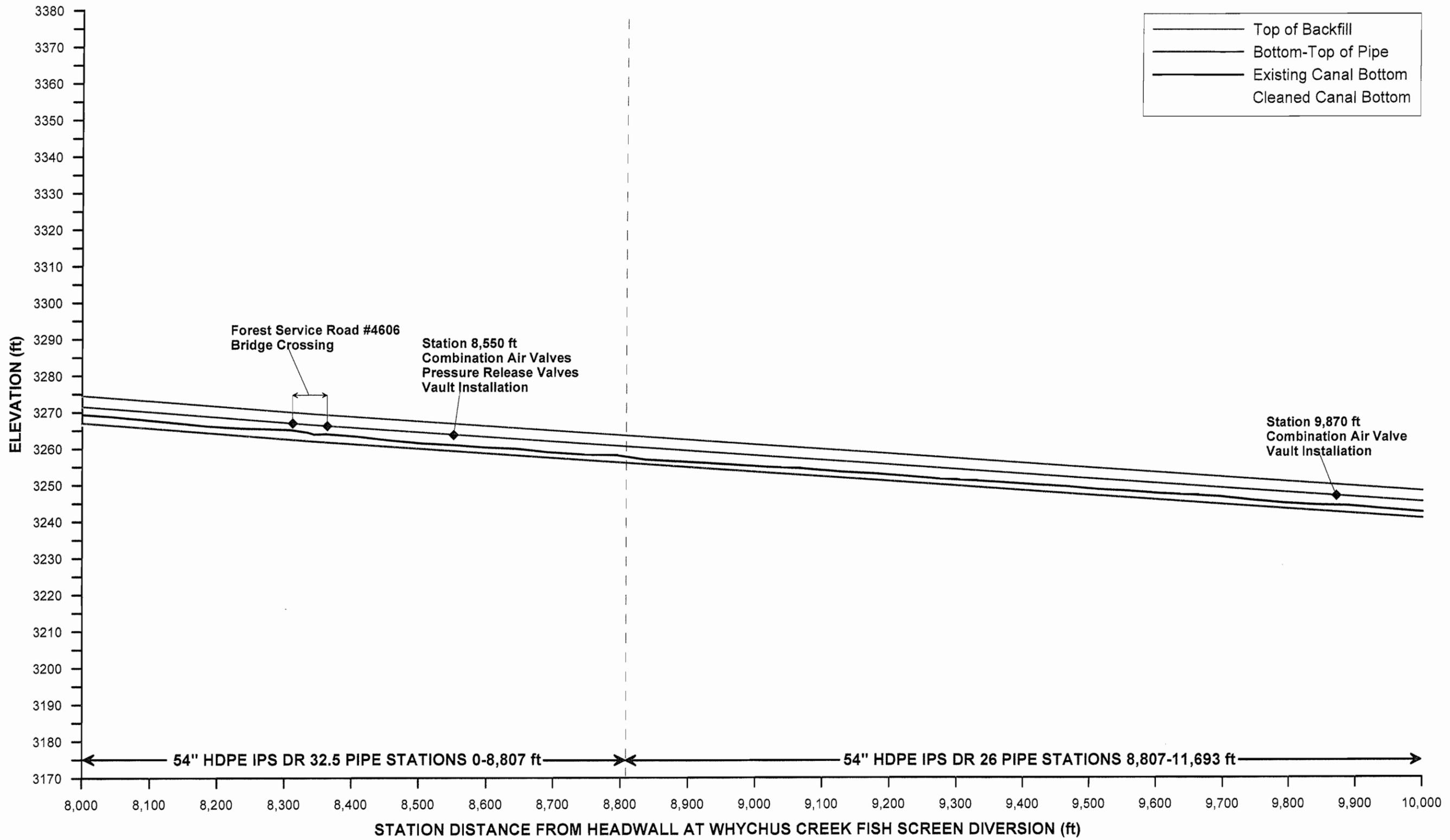
Designed	MEC	Date	JUL, 2009
Drawn	MEC		JUL, 2009
Checked			
Approved	MEC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**STATIONS 6,000-8,000 FT SPECIFICATIONS**  
**THREE SISTERS IRRIGATION DISTRICT**  
**DESCHUTES COUNTY, OREGON**



File Name	PIPE-SPECS-6000-8000
Drawing No.	6000-8000
Sheet	7 of 23

64



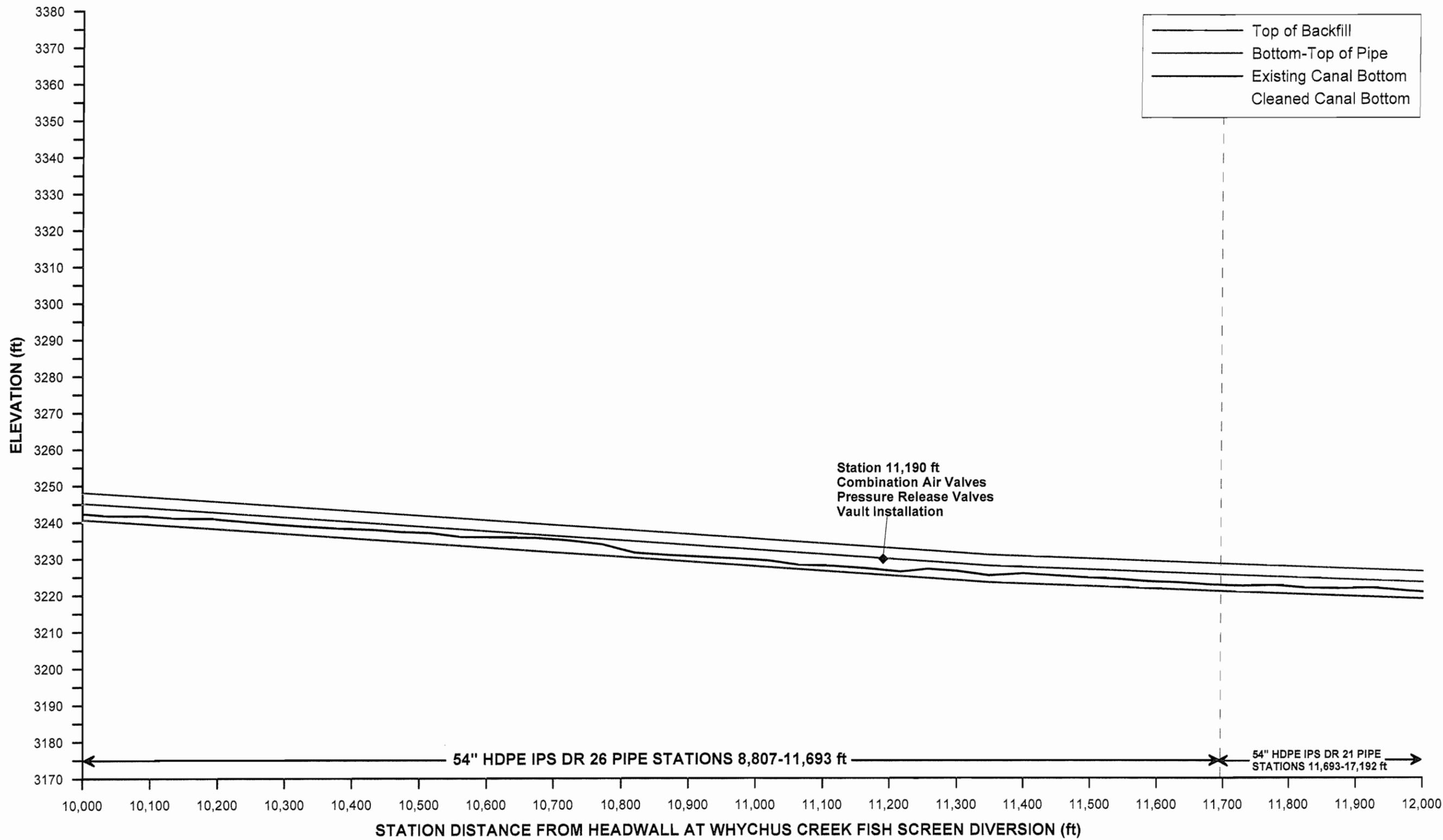
Designed	WEC	Date	JUL, 2009
Drawn	WEC		JUL, 2009
Checked			
Approved	WEC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**STATIONS 8,000-10,000 FT SPECIFICATIONS**  
**THREE SISTERS IRRIGATION DISTRICT**  
**DESCHUTES COUNTY, OREGON**



File Name	PIPE-SPECS-8000-10000
Drawing No.	8000-10000
Sheet	8 of 23

65



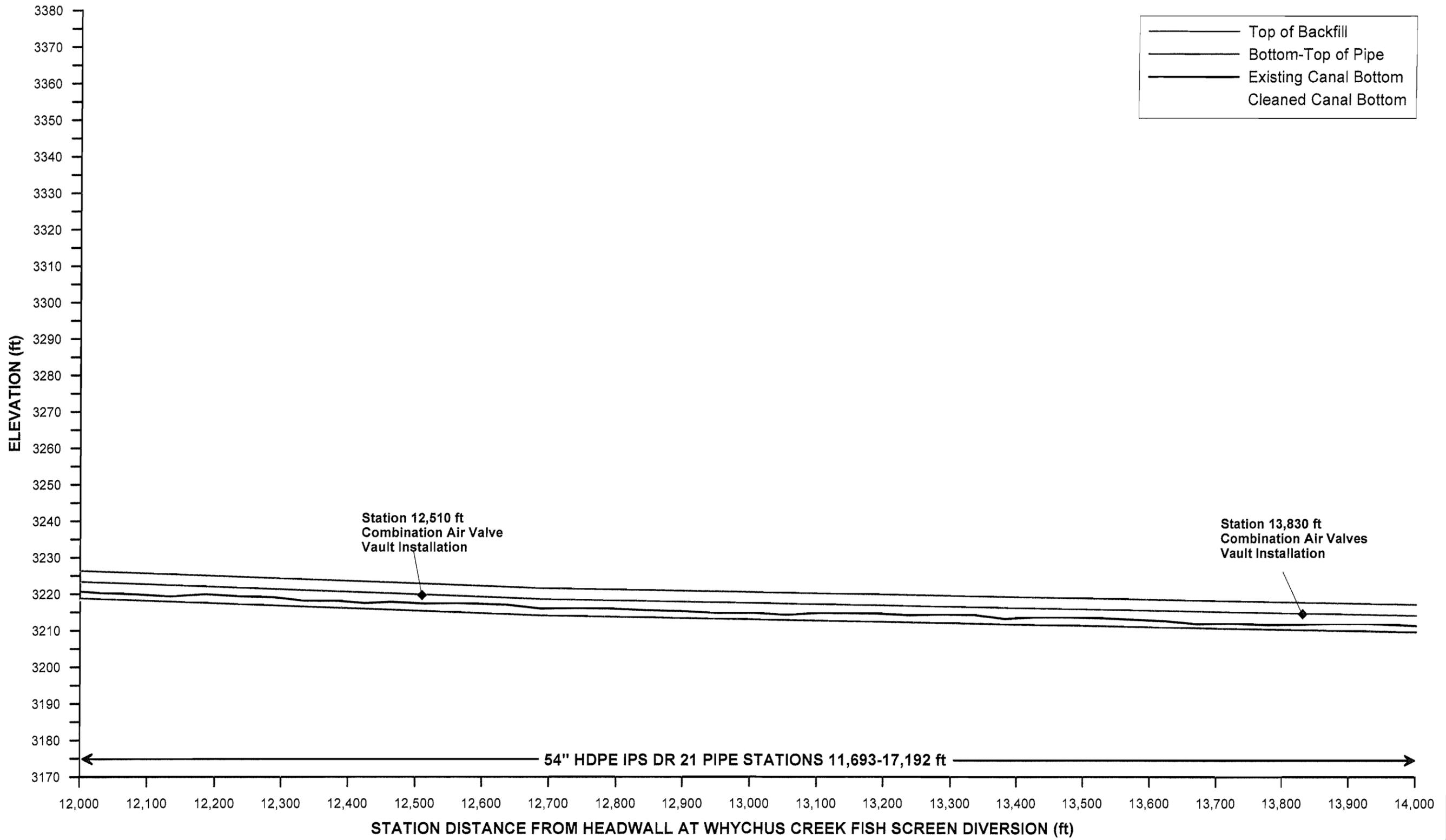
Designed	WEC	Date	JUL, 2009
Drawn	WEC		JUL, 2009
Checked			
Approved	WEC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**STATIONS 10,000-12,000 FT SPECIFICATIONS**  
**THREE SISTERS IRRIGATION DISTRICT**  
**DESCHUTES COUNTY, OREGON**



File Name	PIPE-SPECS-10000-12000
Drawing No.	10000-12000
Sheet	9 of 23

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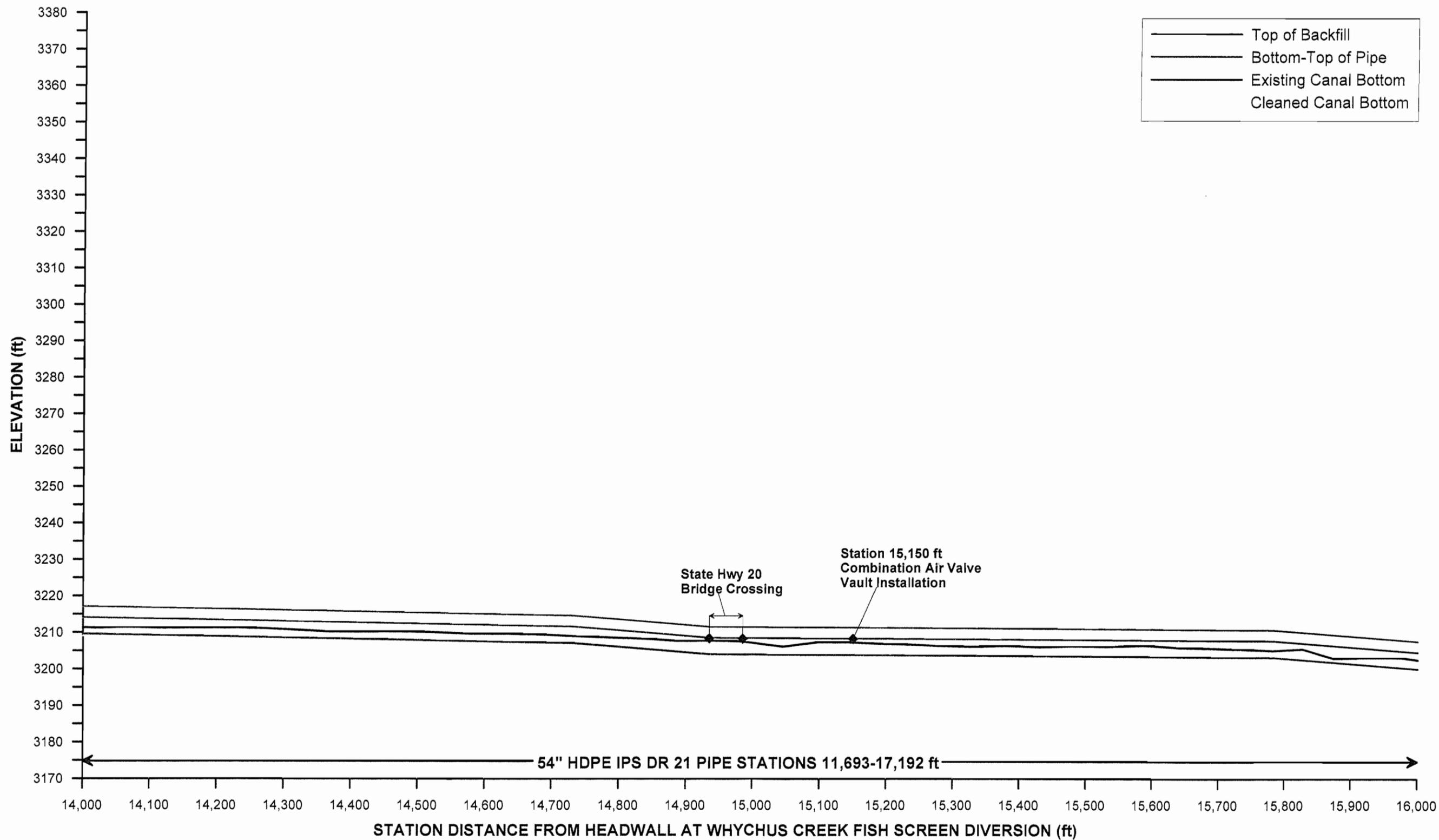
Designed	WEC	Date	JUL, 2009
Drawn	WEC		JUL, 2009
Checked			
Approved	WEC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**STATIONS 12,000-14,000 FT SPECIFICATIONS**  
**THREE SISTERS IRRIGATION DISTRICT**  
**DESCHUTES COUNTY, OREGON**



File Name	PIPE-SPECS-12000-14000
Drawing No.	12000-14000
Sheet	10 of 23





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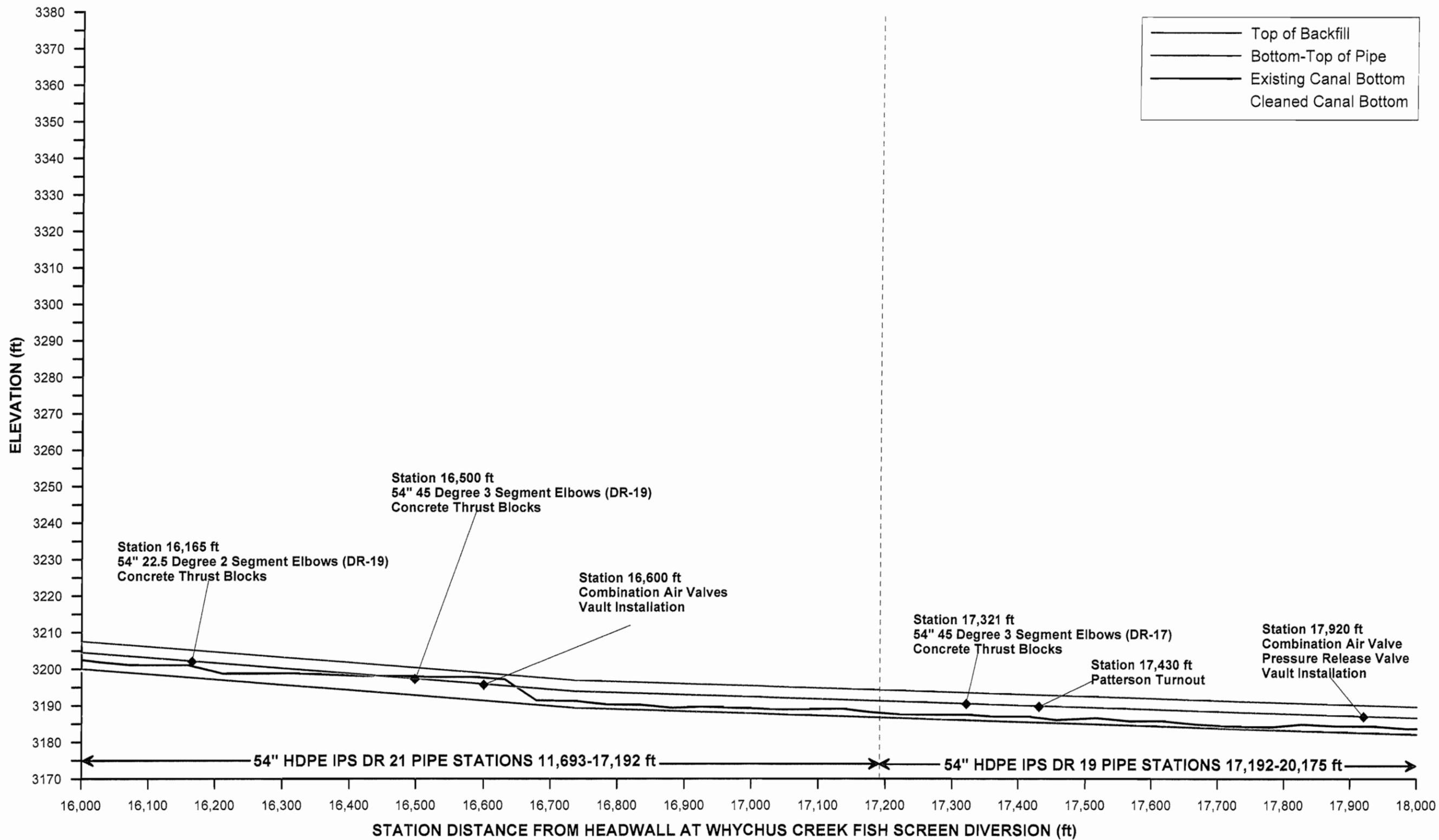
Designed	MEC	Date	JUL, 2009
Drawn	MEC		JUL, 2009
Checked	MEC		JUL, 2009
Approved	MEC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**STATIONS 14,000-16,000 FT SPECIFICATIONS**

**THREE SISTERS IRRIGATION DISTRICT**  
 DESCHUTES COUNTY, OREGON



File Name	PIPE-SPECS-14000-16000
Drawing No.	14000-16000
Sheet	11 of 23



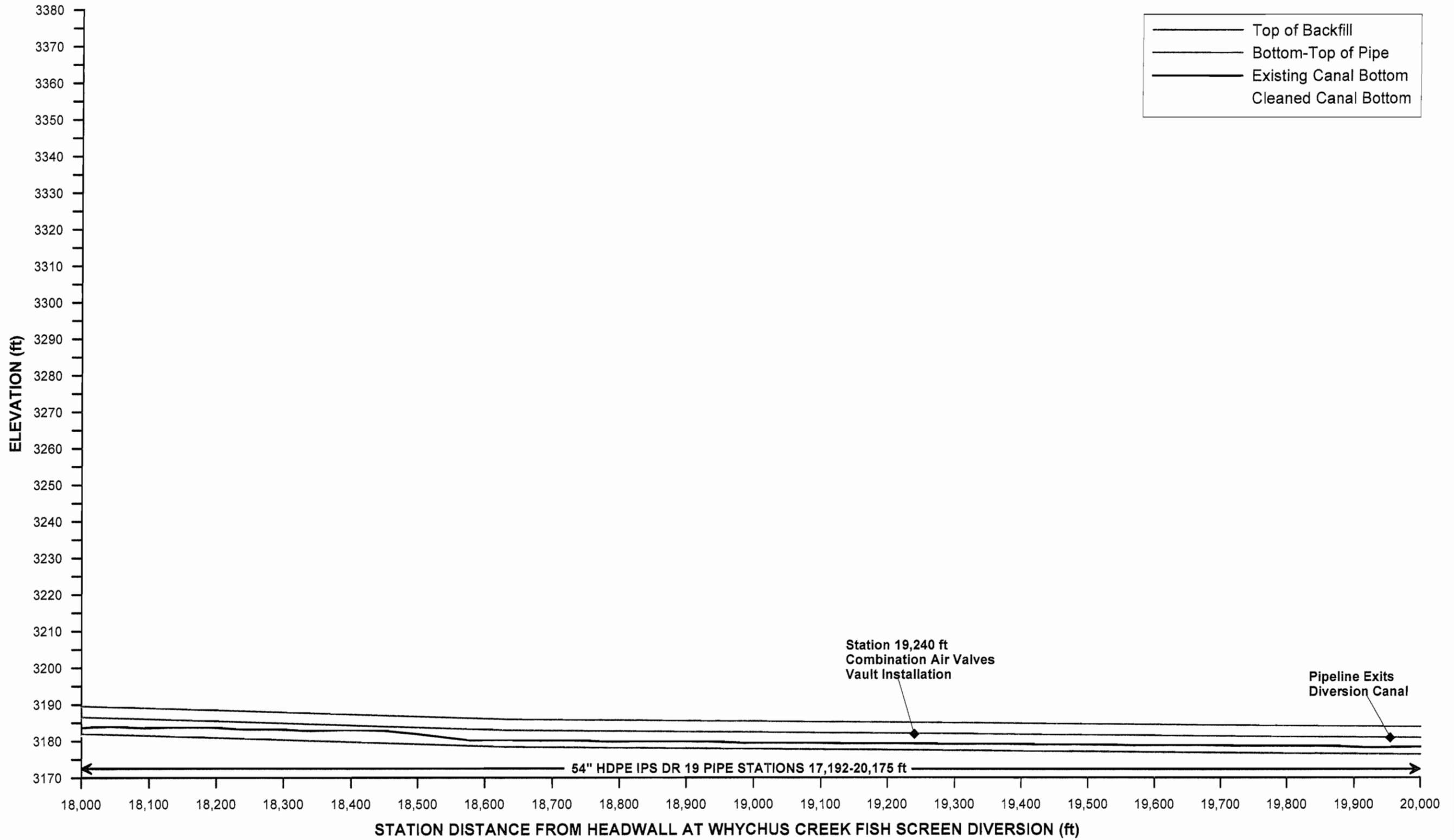
Designed	WEC	Date	JUL, 2009
Drawn	WEC		
Checked			
Approved	WEC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**STATIONS 16,000-18,000 FT SPECIFICATIONS**  
**THREE SISTERS IRRIGATION DISTRICT**  
 DESCHUTES COUNTY, OREGON



File Name	PIPE-SPECS-16000-18000
Drawing No.	16000-18000
Sheet	12 of 23

69



Designed	WEC	Date	JUL, 2009
Drawn	WEC		JUL, 2009
Checked	WEC		JUL, 2009
Approved	WEC		JUL, 2009
Title	Engineer		

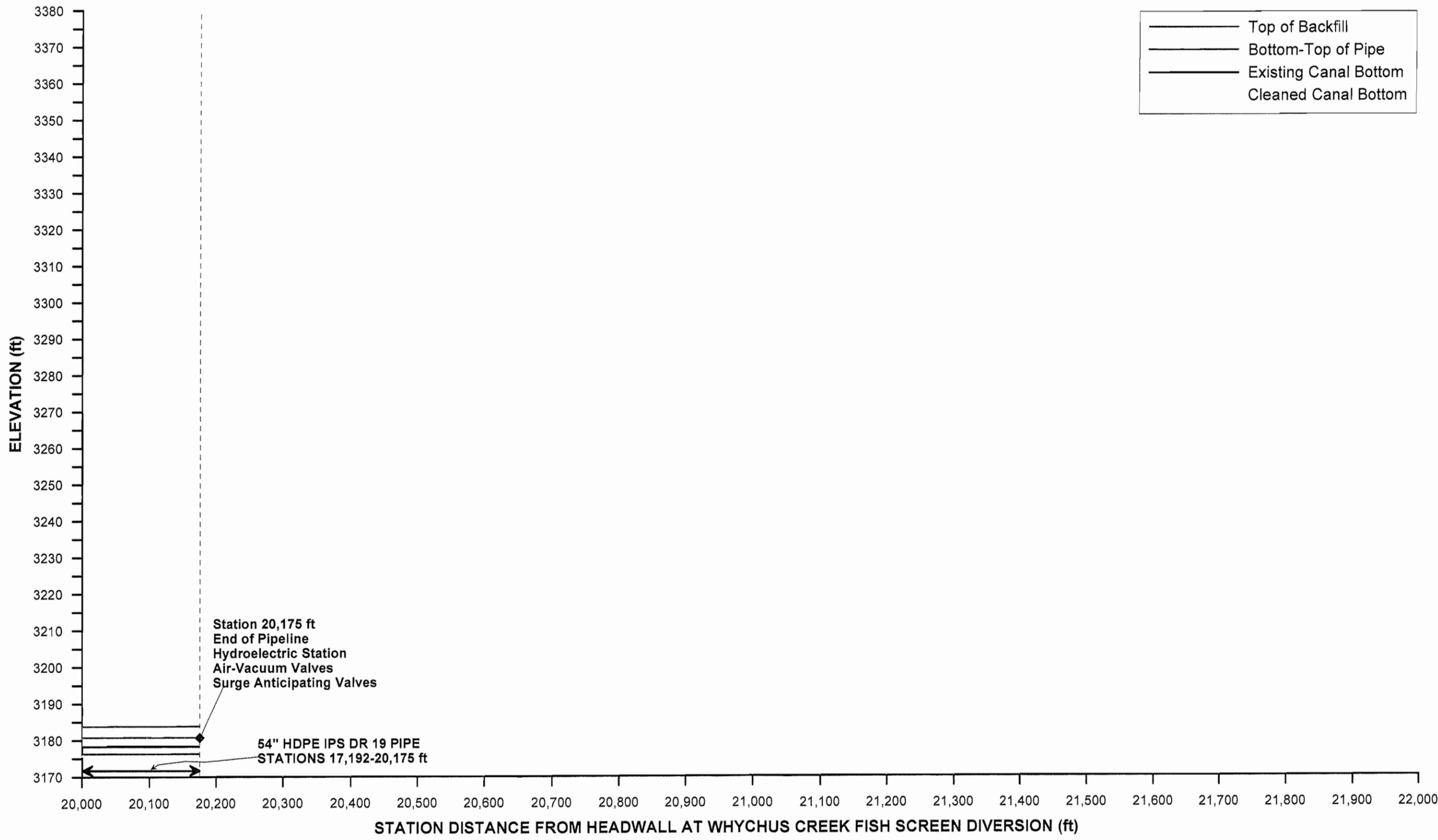
**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**STATIONS 18,000-20,000 FT SPECIFICATIONS**

**THREE SISTERS IRRIGATION DISTRICT**  
 DESCHUTES COUNTY, OREGON



File Name	PIPE-SPECS-18000-20000
Drawing No.	18000-20000
Sheet	13 of 23

70



Designed	REC	Date	JUL, 2009
Drawn	REC		JUL, 2009
Checked			
Approved	REC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**STATIONS 20,000-22,000 FT SPECIFICATIONS**

THREE SISTERS IRRIGATION DISTRICT  
 DESCHUTES COUNTY, OREGON



File Name	PIPE-SPECS-20000-22000
Drawing No.	20000-22000
Sheet 14 of 23	

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## PIPE SPECIFICATIONS

PIPE SPECIFICATION	STARTING STATION (ft)	ENDING STATION (ft)	NORTH PIPE LENGTH (ft)	SOUTH PIPE LENGTH (ft)	TOTAL PIPE LENGTH (ft)
54" HDPE IPS DR 32.5 (50 psi)	0	8,807	8,807	8,807	17,614
54" HDPE IPS DR 26 (65 psi)	8,807	11,693	2,886	2,886	5,772
54" HDPE IPS DR 21 (80 psi)	11,693	17,192	5,499	5,499	10,998
54" HDPE IPS DR 19 (89 psi)	17,192	20,175	2,983	2,983	5,966

## CONTINUOUS ACTING COMBINATION AIR AND VACUUM VALVE SPECIFICATIONS

VALVE-VAULT STATION (ft)	NORTH PIPE VALVE SPECIFICATION	SOUTH PIPE VALVE SPECIFICATION	OPERATING PRESSURE RANGE (psi)	COMMENT
1,320	8" APCO MODEL #1808, 154/200A	8" APCO MODEL #1808, 154/200A	5--7	AIR VALVE VAULT
2,920	8" APCO MODEL #1808, 154/200A	8" APCO MODEL #1808, 154/200A	7--9	AIR VALVE VAULT
4,240	12" APCO MODEL #1812, 156/200A	12" APCO MODEL #1812, 156/200A	17--19	AIR VALVE VAULT
5,910	12" APCO MODEL #1812, 156/200A	12" APCO MODEL #1812, 156/200A	28--32	AIR VALVE\PRESSURE RELEASE VALVE VAULT
7,230	12" APCO MODEL #1812, 156/200A	12" APCO MODEL #1812, 156/200A	36--40	AIR VALVE VAULT
8,550	12" APCO MODEL #1812, 156/200A	12" APCO MODEL #1812, 156/200A	44--49	AIR VALVE\PRESSURE RELEASE VALVE VAULT
9,870	10" APCO MODEL #1810, 155/200A	10" APCO MODEL #1810, 155/200A	50--56	AIR VALVE VAULT
11,190	10" APCO MODEL #1810, 155/200A	10" APCO MODEL #1810, 155/200A	56--66	AIR VALVE\PRESSURE RELEASE VALVE VAULT
12,510	10" APCO MODEL #1810, 155/200A	10" APCO MODEL #1810, 155/200A	60--67	AIR VALVE VAULT
13,830	8" APCO MODEL #1808, 154/200A	8" APCO MODEL #1808, 154/200A	61--70	AIR VALVE VAULT
15,150	6" APCO MODEL #1806, 153/200A	6" APCO MODEL #1806, 153/200A	63--72	AIR VALVE VAULT
16,600	10" APCO MODEL #1810, 155/200A	10" APCO MODEL #1810, 155/200A	66--76	AIR VALVE VAULT
17,920	8" APCO MODEL #1808, 154/200A	8" APCO MODEL #1808, 154/200A	70--82	AIR VALVE\PRESSURE RELEASE VALVE VAULT
19,240	6" APCO MODEL #1806, 153/200A	6" APCO MODEL #1806, 153/200A	72--84	AIR VALVE VAULT
20,175 (Hydroelectric Station)	6" APCO MODEL #1806, 153/200A	6" APCO MODEL #1806, 153/200A	72--85	AIR VALVE IN HYDROELECTRIC STATION

## PRESSURE RELIEF VALVE SPECIFICATIONS

VALVE-VAULT STATION (ft)	NORTH PIPE VALVE SPECIFICATION	SOUTH PIPE VALVE SPECIFICATION	PRESSURE RELIEF SETTING (psi)
5,910	12" CLA-VAL MODEL 50-01 ANGLE (150 psi)	12" CLA-VAL MODEL 50-01 ANGLE (150 psi)	60
8,550	12" CLA-VAL MODEL 50-01 ANGLE (150 psi)	12" CLA-VAL MODEL 50-01 ANGLE (150 psi)	60
11,190	12" CLA-VAL MODEL 50-01 ANGLE (150 psi)	12" CLA-VAL MODEL 50-01 ANGLE (150 psi)	75
17,920	12" CLA-VAL MODEL 50-01 ANGLE (150 psi)	12" CLA-VAL MODEL 50-01 ANGLE (150 psi)	100
20,175 (Hydroelectric Station)	16" CLA-VAL MODEL 52-03 ANGLE (150 psi) (Surge Anticipating)	16" CLA-VAL MODEL 52-03 ANGLE (150 psi) (Surge Anticipating)	100

## FITTING SPECIFICATIONS

PIPELINE STATION (ft)	NORTH PIPE FITTING SPECIFICATION	SOUTH PIPE FITTING SPECIFICATION
15	54" 45 DEGREE 3 SEGMENT ELBOW, HDPE IPS DR 32.5	54" 45 DEGREE 3 SEGMENT ELBOW, HDPE IPS DR 32.5
2,990	54" 45 DEGREE 3 SEGMENT ELBOW, HDPE IPS DR 26	54" 45 DEGREE 3 SEGMENT ELBOW, HDPE IPS DR 26
16,165	54" 22.5 DEGREE 2 SEGMENT ELBOW, HDPE IPS DR 19	54" 22.5 DEGREE 2 SEGMENT ELBOW, HDPE IPS DR 19
16,500	54" 45 DEGREE 3 SEGMENT ELBOW, HDPE IPS DR 19	54" 45 DEGREE 3 SEGMENT ELBOW, HDPE IPS DR 19
17,321	54" 45 DEGREE 3 SEGMENT ELBOW, HDPE IPS DR 17	54" 45 DEGREE 3 SEGMENT ELBOW, HDPE IPS DR 17

## STAND PIPE AIR VENT PIPE SPECIFICATIONS

AIR VENT STATION (ft)	NORTH PIPE STAND PIPE AIR VENT SPECIFICATION	SOUTH PIPE STAND PIPE AIR VENT SPECIFICATION
5	18" HDPE IPS DR 21**	18" HDPE IPS DR 21**

\*\*STAND PIPE OPEN END NEEDS TO BE A MINIMUM OF 2 FT ABOVE THE MAXIMUM WATER LEVEL IN THE DIVERSION STRUCTURE

Note: Equivalent valves from other manufacturers may be used.

Date  
 Designed: WEC AUG-2009  
 Drawn: WEC AUG-2009  
 Checked: \_\_\_\_\_  
 Approved: \_\_\_\_\_  
 Title: ENGINEER

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**PIPE AND VALVE SPECIFICATIONS**

**THREE SISTERS IRRIGATION DISTRICT**  
**DESCHUTES COUNTY OREGON**

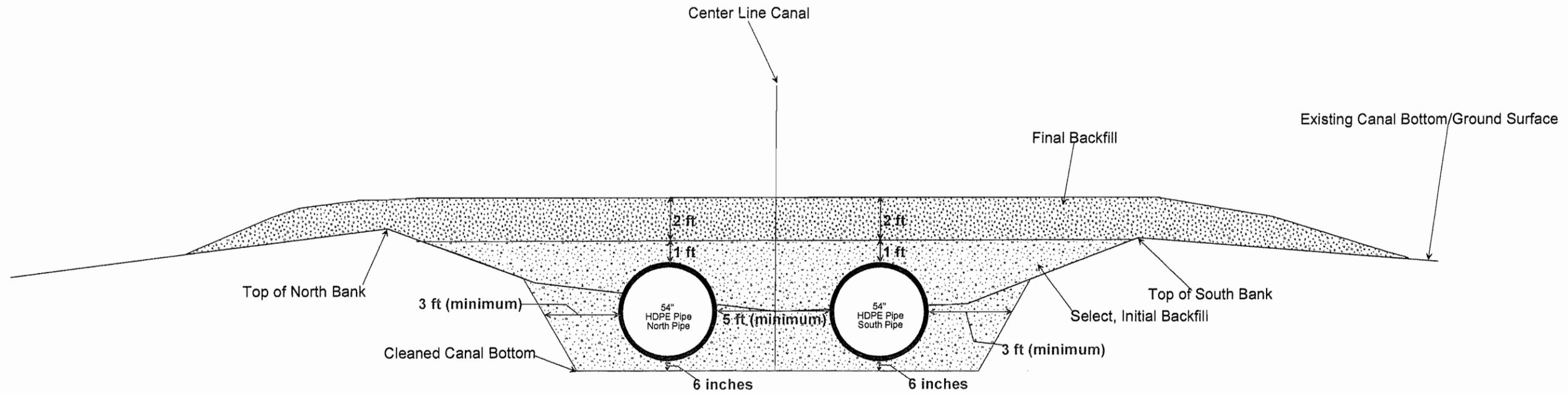
  
**NRCS**  
 Natural Resources Conservation Service  
 United States Department of Agriculture

File Name  
 TSID-MAIN-PIPE  
 Drawing No.  
 15  
 Sheet 15 of 23

72

## TYPICAL PIPE INSTALLATION CROSS SECTION

not to scale



**Construction Notes:**

- 1) Select, initial backfill is defined as:  
 "Sands and gravels with a maximum particle size of 1 inch containing a maximum of 12 percent non-cohesive fines. Sands shall have a maximum of 45 percent passing the #40 sieve. Unified soil classification of GW, GP, SW, and SP are included in this class."
- 2) All select, initial backfill shall be installed in 4-6 inch lifts and compacted to a minimum 95% standard proctor density.
- 3) Final backfill is defined as:  
 "Native soil or excavation material free of clods and debris with a maximum rock diameter of 3 inches."
- 4) Upon completion of backfill, All disturbed areas shall be graded without surface depressions to blend with the surrounding areas, and reseeded if necessary.
- 5) A minimum of 3 ft of pipe backfill cover is required.
- 6) Install tracer wire to local county standards.
- 7) If unstable trench bottom conditions are encountered (large voids, clay layers, springs, etc.), consultation with NRCS Engineering staff is required before pipe installation continues.

73

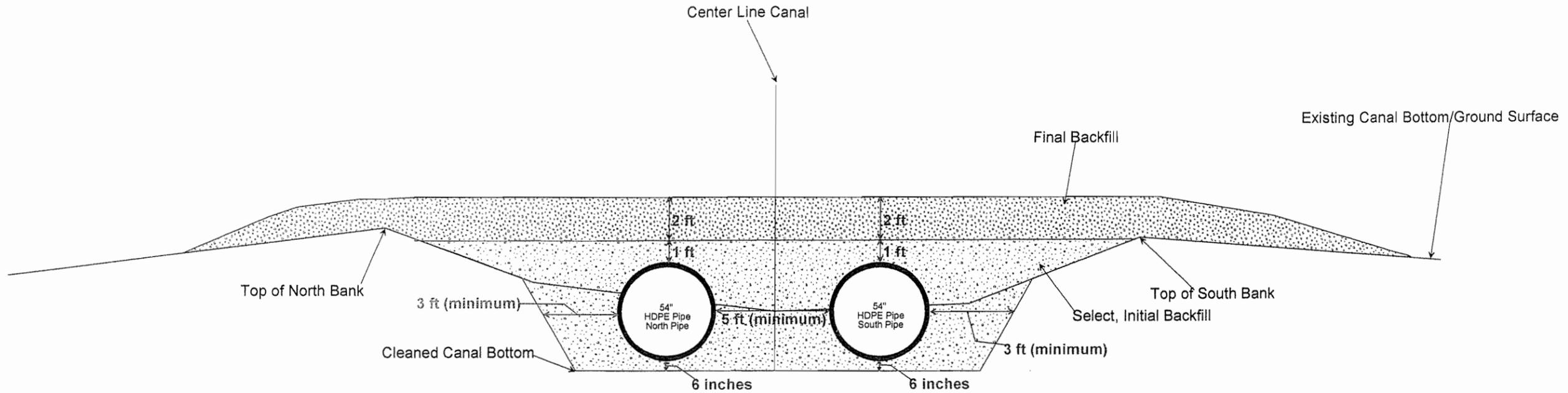
Designed	WEC	Date	JUL, 2009
Drawn	WEC		JUL, 2009
Checked			
Approved	WEC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**TYPICAL INSTALLATION CROSS SECTION**  
  
**THREE SISTERS IRRIGATION DISTRICT**  
 DESCHUTES COUNTY, OREGON



File Name	TSID-MAIN-CANAL-BACKFILL
Drawing No.	16
Sheet	16 of 23

**TYPICAL PIPE INSTALLATION CROSS SECTION**  
not to scale



**Construction Notes:**

1) Select, initial backfill is defined as:

"Sands and gravels with a maximum particle size of 1 inch containing a maximum of 12 percent non-cohesive fines. Sands shall have a maximum of 45 percent passing the #40 sieve. Unified soil classification of GW, GP, SW, and SP are included in this class."

2) All select, initial backfill shall be installed in 4-6 inch lifts and compacted to a minimum 95% standard proctor density.

3) Final backfill is defined as:

"Native soil or excavation material free of clods and debris with a maximum rock diameter of 3 inches."

4) Upon completion of backfill, All disturbed areas shall be graded without surface depressions to blend with the surrounding areas, and reseeded if necessary.

5) A minimum of 3 ft of pipe backfill cover is required.

6) Install tracer wire to local county standards.

7) If unstable trench bottom conditions are encountered (large voids, clay layers, springs, etc.), consultation with NRCS Engineering staff is required before pipe installation continues.

Designed	WEC	Date	JUL, 2009
Drawn	WEC		
Checked			
Approved	WEC		
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**TYPICAL INSTALLATION CROSS SECTION**

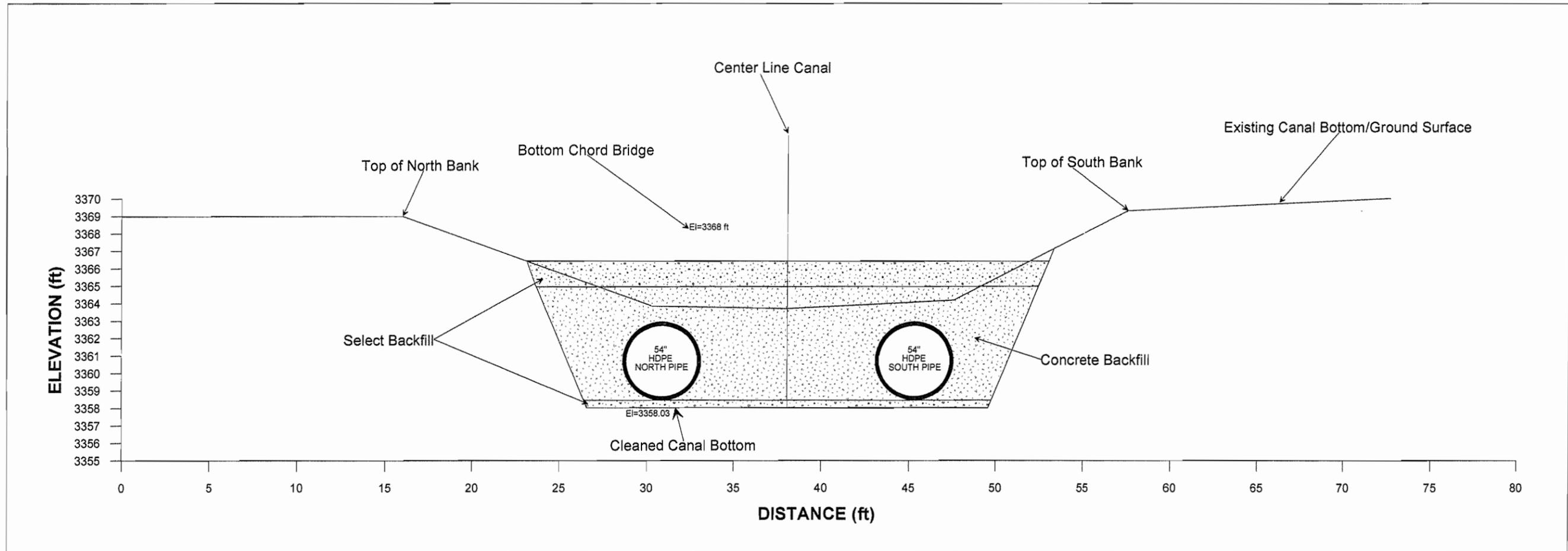
**THREE SISTERS IRRIGATION DISTRICT**  
DESCHUTES COUNTY, OREGON



File Name	TS1D-MAIN-CANAL-BACKFILL
Drawing No.	16
Sheet	16 of 23

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**PIPELINE INSTALLATION CROSS SECTION  
STATION= 372 ft  
THREE CREEKS ROAD BRIDGE CROSSING**



**Construction-Installation Notes:**

- 1) Clean canal bottom to elevation on drawing.
- 2) If cleaned canal bottom does not consist of stable bedrock, line canal bottom with geotextile fabric before placing backfill, building forms and pouring concrete..
- 3) The concrete forms should extend a minimum of 5 ft from the edge of upstream and downstream edges of the bridge structure.
- 4) Use structural quality concrete as backfill (28 day compressive strength = 4,000 psi).
- 5) Use a woven type 2W geotextile fabric.

75

Date	JUL, 2009
Designed	WEC
Drawn	WEC
Checked	WEC
Approved	WEC
Title	Engineer

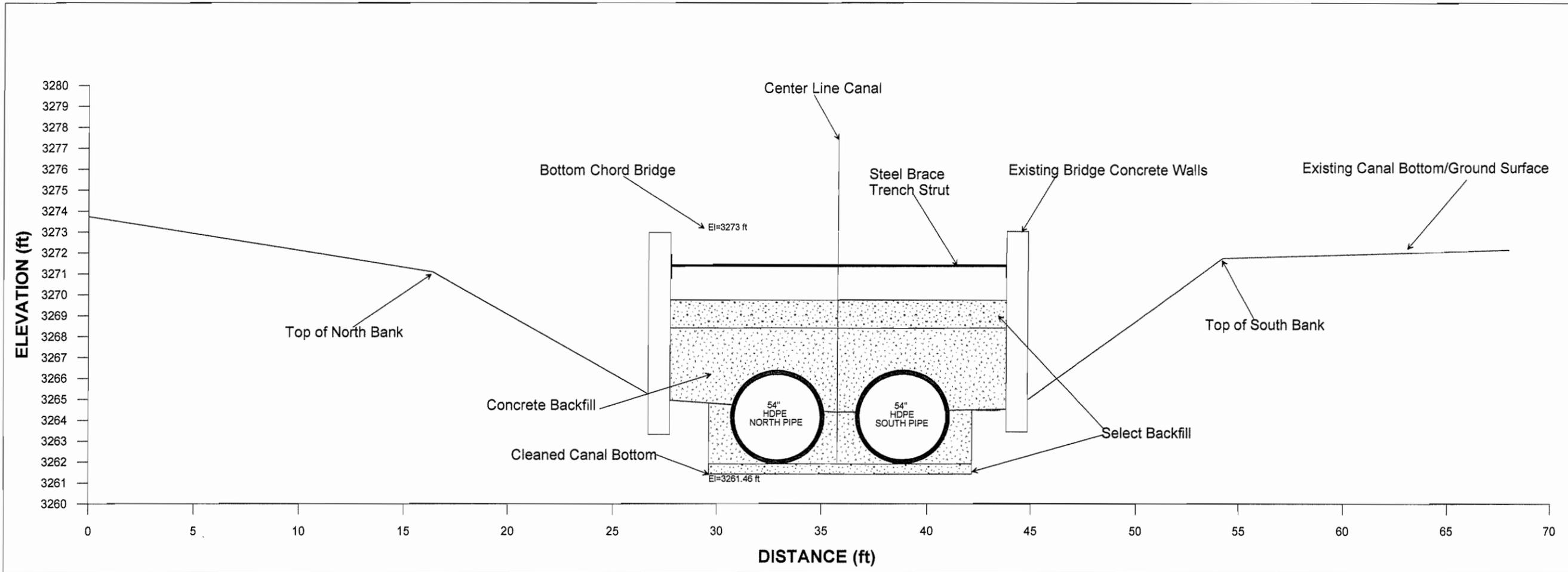
**MAIN CANAL PIPELINE-PENSTOCK PROJECT  
THREE CREEKS ROAD BRIDGE CROSSING**



File Name	3-CREEKS-CROSSING
Drawing No.	17
Sheet	17 of 23

**THREE SISTERS IRRIGATION DISTRICT  
DESCHUTES COUNTY, OREGON**

**PIPELINE INSTALLATION CROSS SECTION  
STATION= 8,335 ft  
FOREST SERVICE ROAD #4606 (BROOKS SCANLEN ROAD) BRIDGE CROSSING**



- Construction-Installation Notes:**
- 1) Place Steel stabilization struts every 10 ft before any heavy equipment enters the construction area. Trench struts shall be capable of supporting a minimum of 100 kips.
  - 2) If the cleaned canal bottom does not consist of stable bedrock, line canal bottom with geotextile fabric before placing backfill, building forms and pouring concrete. Use a woven type 2W geotextile fabric.
  - 3) The concrete forms should extend a minimum of 5 ft from the upstream and downstream edges of the bridge structure.
  - 4) Use structural quality concrete as backfill (28 day compressive strength = 4,000 psi).
  - 5) Remove struts only after concrete backfill has cured to full strength.
  - 6) Location and depth of existing buried concrete bridge footings have not been located with precision. If an existing bridge footing is encountered, make sure any trench walls are a minimum of 2 ft away from the footing.

76

Designed	WEC	Date	JUL, 2009
Drawn	WEC		
Checked			
Approved	WEC		
Title	Engineer		

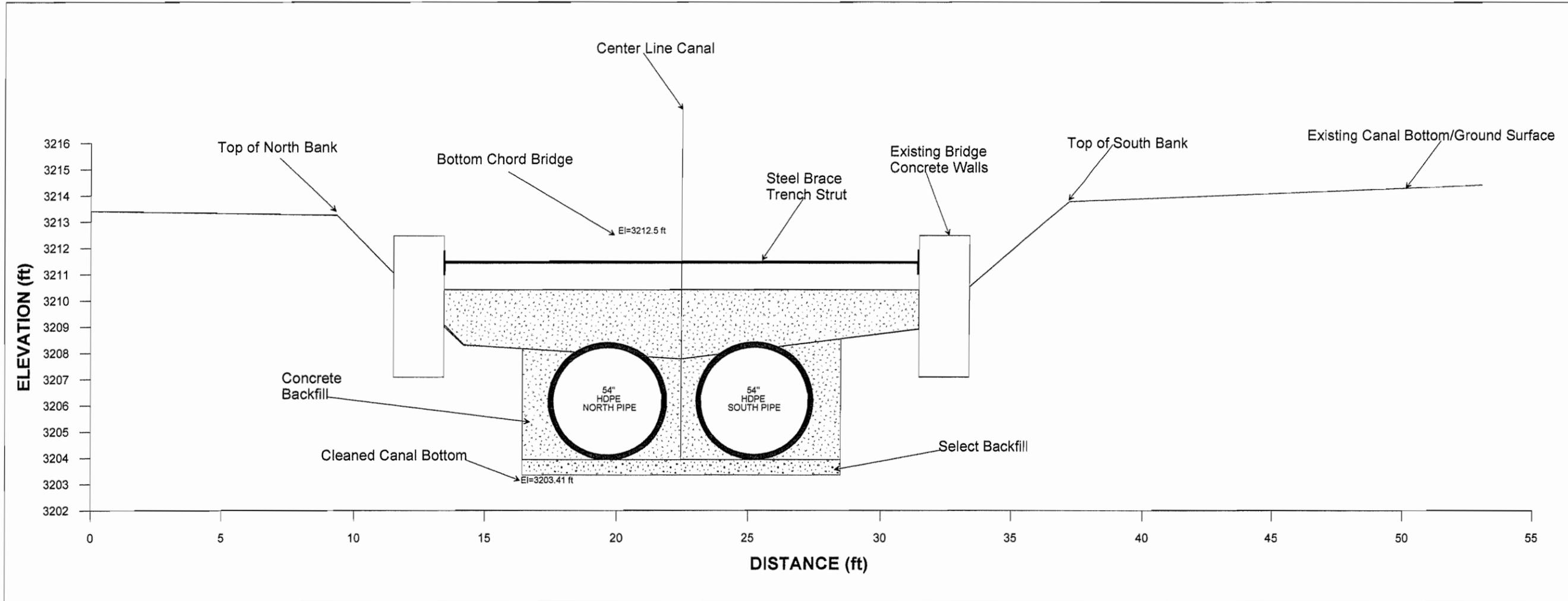
**MAIN CANAL PIPELINE-PENSTOCK PROJECT  
BROOKS-SCANLEN ROAD BRIDGE CROSSING**

**THREE SISTERS IRRIGATION DISTRICT  
DESCHUTES COUNTY, OREGON**



File Name	FS-4606-CROSSING
Drawing No.	18
Sheet	18 of 23

**PIPELINE INSTALLATION CROSS SECTION  
STATION= 14,936 ft  
STATE HWY 20 BRIDGE CROSSING**



- Construction-Installation Notes:**
- 1) Place Steel stabilization struts every 10 ft before any heavy equipment enters the construction area. Trench struts shall be capable of supporting a minimum of 100 kips.
  - 2) If the cleaned canal bottom does not consist of stable bedrock, line canal bottom with geotextile fabric before placing backfill, building forms and pouring concrete. Use a woven type 2W geotextile fabric.
  - 3) The concrete forms should extend a minimum of 5 ft from the upstream and downstream edges of the bridge structure.
  - 4) Use structural quality concrete as backfill (28 day compressive strength = 4,000 psi).
  - 5) Remove struts only after concrete backfill has cured to full strength.
  - 6) Location and depth of existing buried concrete bridge footings have not been located with precision. If an existing bridge footing is encountered, make sure any trench walls are a minimum of 2 ft away from the footing.



Date	JUL, 2009
REC	REC
Drawn	REC
Checked	REC
Approved	REC
Title	Engineer

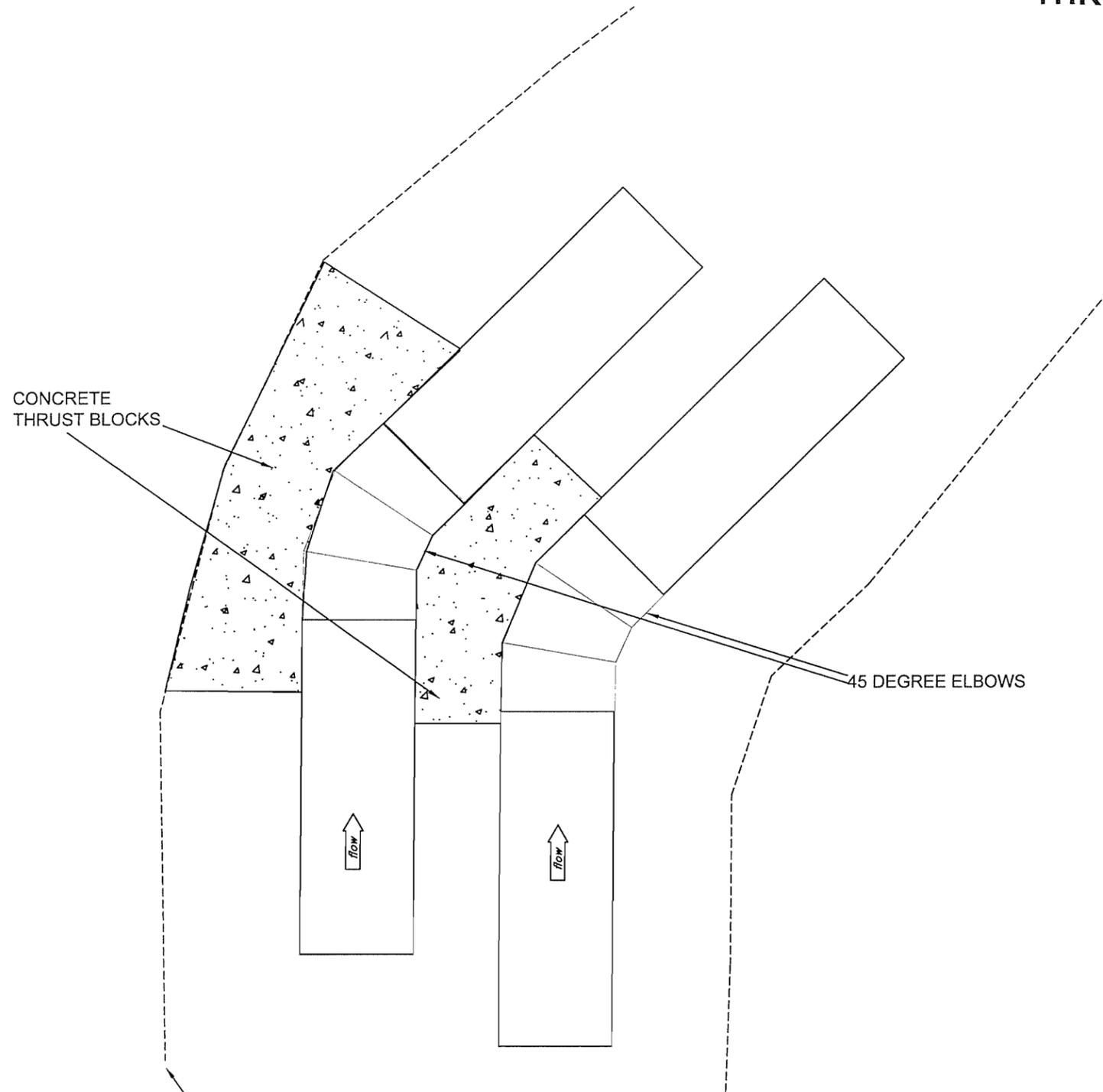
**MAIN CANAL PIPELINE-PENSTOCK PROJECT  
STATE HWY 20 BRIDGE CROSSING**  
THREE SISTERS IRRIGATION DISTRICT  
DESCHUTES COUNTY, OREGON



File Name	HWY-20-CROSSING
Drawing No.	19
Sheet	19 of 23

# THRUST BLOCK SPECIFICATIONS

not to scale



### INSTALLATION NOTES:

- 1) Stable foundation conditions must exist before pouring concrete thrust blocks. If bedrock conditions are not present, lay geotextile fabric and compacted select backfill before building forms and pouring blocks.
- 2) Maximum height of concrete is to within a few inches of the top of pipes. Do not pour concrete on top of the pipes.
- 3) Build forms to insure the minimum below thrust block area requirements are met.

STATION (ft)	FITTING	MINIMUM THRUST BLOCK AREA (square ft)	CONCRETE VOLUME FOR A 2 ft THICK BLOCK (cubic yards)
15	45 DEGREE ELBOW	35	2.6
2,990	45 DEGREE ELBOW	45	3.3
16,165	22.5 DEGREE ELBOW	50	3.7
16,500	45 DEGREE ELBOW	95	7.0
17,321	45 DEGREE ELBOW	95	7.0

Date: AUG-2009  
 Designed: WEC  
 Drawn: WEC  
 Checked: \_\_\_\_\_  
 Approved: \_\_\_\_\_  
 Title: ENGINEER

**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
**THRUST BLOCK SPECIFICATIONS**  
 THREE SISTERS IRRIGATION DISTRICT  
 DESCHUTES COUNTY OREGON



File Name: TSID-THRUST-BLOCK  
 Drawing No.: 23  
 Sheet 23 of 23

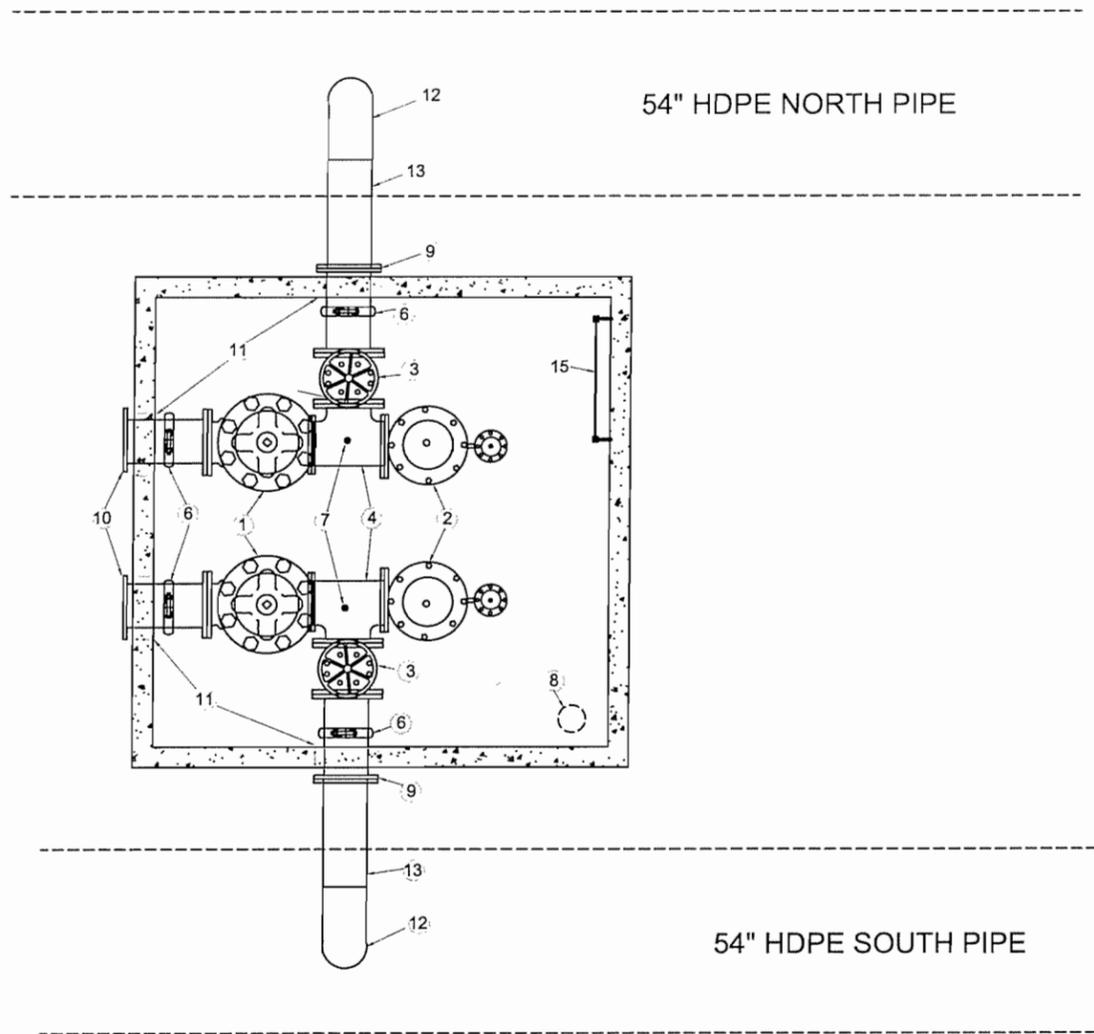
78

# GENERAL MAIN CANAL PIPELINE VAULT DRAWING COMBINATION AIR/VACUUM AND PRESSURE RELIEF VALVES VAULT

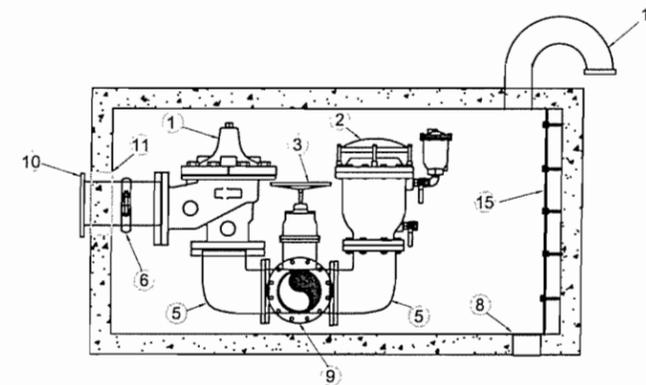
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Date  
 Designed - WEC AUG-2009  
 Drawn - WEC AUG-2009  
 Checked \_\_\_\_\_  
 Approved \_\_\_\_\_  
 Title - ENGINEER \_\_\_\_\_

PLAN VIEW



CROSS SECTION



**MAIN CANAL PIPELINE-PENSTOCK PROJECT  
COMBINATION AIR/VACUUM-PRESSURE RELIEF VALVE VAULT**

THREE SISTERS IRRIGATION DISTRICT  
DESCHUTES COUNTY OREGON

ITEM #	DESCRIPTION	QUANTITY
1	12" CLA-VAL 90-01 BCSY PRESSURE RELEASE VALVE	2
2	12" APCO MODEL #1812 COMBINATION AIR AND VACUUM VALVE	2
3	12" GATE VALVE	2
4	12" SCH 40 TEE (EPOXY COATED STEEL)	2
5	12" SCH 40 90 DEGREE ELBOW (EPOXY COATED STEEL)	4
6	12" VICTAULIC COUPLING	4
7	PRESSURE GAGE (GLYCERIN FILLED)	2
8	8" FLOOR DRAIN WITH SCREEN COVER	1
9	12" STEEL TO HDPE FLANGE CONNECTION	2
10	12" PRESSURE RELEASE FLANGE LOCATION	2
11	12" PIPE SEAL ASSEMBLY	4
12	12" HDPE DR 26 90 DEGREE ELBOW	2
13	12" HDPE DR 26 PIPE	2
14	8" VAULT AIR VENT	1
15	OSHA APPROVED ACCESS LADDER	1

**Design/Installation Notes:**

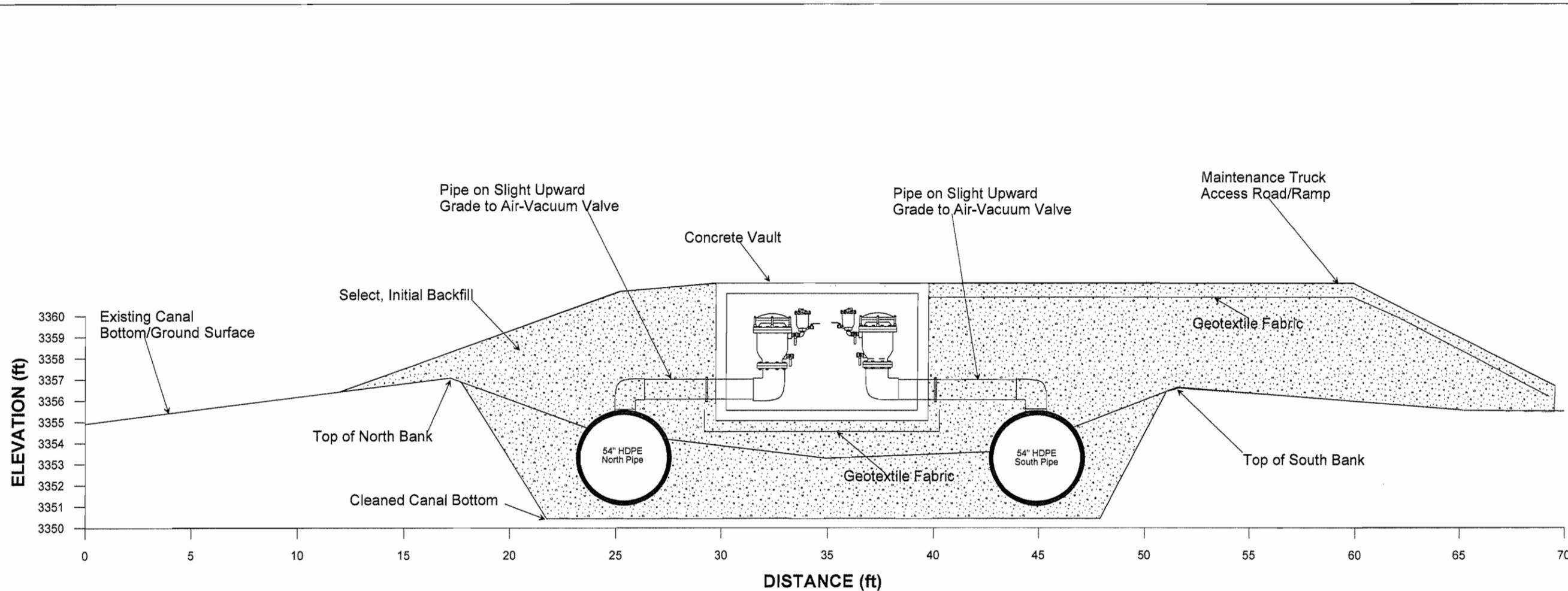
- 1) After Excavation, line the excavated vault area with geotextile road fabric. lay a 6" layer of select backfill on top of the geotextile fabric. Level and compact select backfill with a vibrator compactor. Place prefabricated vault on top of compacted fill. Use a woven type 2W geotextile fabric as defined in the USDA-NRCS specification MS-20 (see sheet #22).
- 2) All prefabricated vaults must meet the minimum requirements of **ASTM C 857-07 (Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures)**, and **ASTM C 858-09 (Standard Specification for Underground Precast Concrete Utility Structures)**.
- 3) All piping and fittings within the vault = Sch 40 epoxy coated steel (inner and outer pipe coating required).
- 4) All applicable Occupational Safety and Health Division (OSHA) safety requirements for confined space entry and exit must be followed.
- 5) All vaults including pressure relief and air valves will require 12" pressure release valves. Air/Vacuum valve sizes will vary. See sheet #15 for air/vacuum valve specifications for each vault location.
- 6) Minimum pressure rating for all valves = 150 psi.
- 7) All piping and valves within the vault will require steel pipe supports or concrete saddles.
- 8) Equivalent valves from other manufacturers may be used.
- 9) Vault providers chosen by Three Sisters Irrigation District must submit vault design drawings and computations to the NRCS Engineer for approval.

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File Name  
 TSID-PRV-CAV-VAULT  
 Drawing No.  
 21  
 Sheet 21 of 23

**PIPELINE INSTALLATION CROSS SECTION  
TYPICAL VALVE VAULT INSTALLATION  
(Vault-Valves Not To Scale)**



**Installation Notes:**

- 1) All air-vacuum valve piping from the top of 54" mainline pipes must be on a slight upward grade to the bottom of the air-vacuum valve.
- 2) Use geotextile fabric underneath all vaults, and at the base of any locations where vehicular traffic is likely.
- 3) Use a woven type 2W geotextile fabric as defined in the USDA-NRCS specification MS-209.

80

Designed	WEC	Date	JUL, 2009
Drawn	WEC		JUL, 2009
Checked	WEC		
Approved	WEC		JUL, 2009
Title	Engineer		

**MAIN CANAL PIPELINE-PENSTOCK PROJECT  
TYPICAL VALVE VAULT INSTALLATION**

**THREE SISTERS IRRIGATION DISTRICT  
DESCHUTES COUNTY, OREGON**



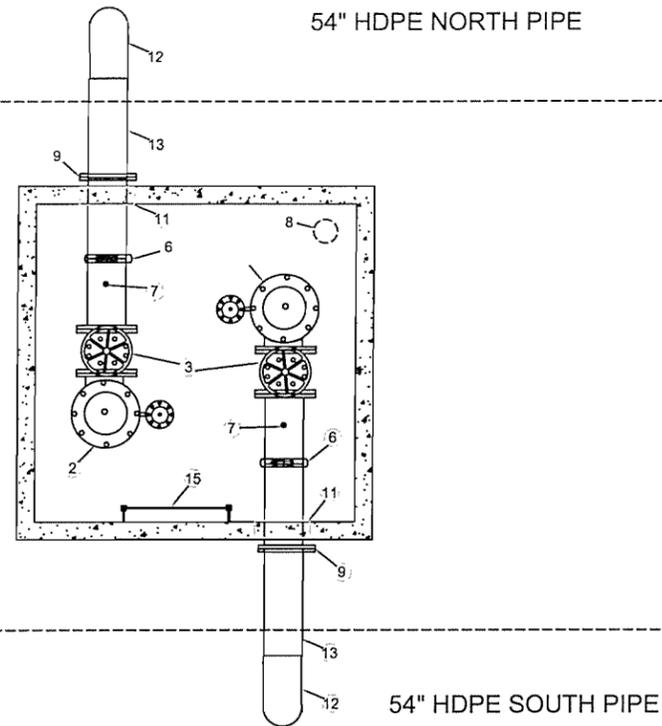
File Name	VAULT-INSTALLATION
Drawing No.	22
Sheet	22 of 23

# GENERAL MAIN CANAL PIPELINE VAULT DRAWING COMBINATION AIR/VACUUM VALVE VAULT

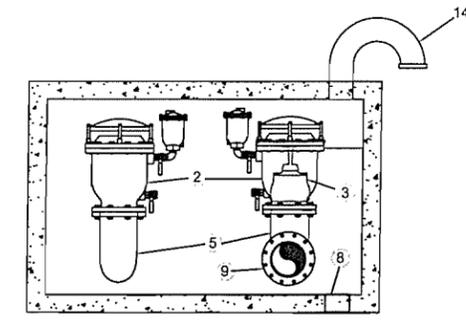
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Date \_\_\_\_\_  
 Designed \_\_\_\_\_ WEC \_\_\_\_\_ AUG-2009  
 Drawn \_\_\_\_\_ WEC \_\_\_\_\_ AUG-2009  
 Checked \_\_\_\_\_  
 Approved \_\_\_\_\_  
 Title \_\_\_\_\_ ENGINEER

PLAN VIEW



CROSS SECTION



**MAIN CANAL PIPELINE-PENSTOCK PROJECT**  
COMBINATION AIR/VACUUM VALVE VAULT

THREE SISTERS IRRIGATION DISTRICT  
DESCHUTES COUNTY OREGON



ITEM #	DESCRIPTION	QUANTITY
2	12" APCO MODEL #1812 COMBINATION AIR AND VACUUM VALVE	2
3	12" GATE VALVE	2
5	12" SCH 40 90 DEGREE ELBOW (EPOXY COATED STEEL)	2
6	12" VICTAULIC COUPLING	2
7	PRESSURE GAGE (GLYCERIN FILLED)	2
8	8" FLOOR DRAIN WITH SCREEN COVER	1
9	12" STEEL TO HDPE FLANGE CONNECTION	2
11	12" PIPE SEAL ASSEMBLY	2
12	12" HDPE DR 26, 90 DEGREE ELBOW	2
13	12" HDPE DR 26 PIPE	2
14	8" VAULT AIR VENT	1
15	OSHA APPROVED ACCESS LADDER	1

**Design/Installation Notes:**

- 1) After Excavation, line the excavated vault area with geotextile road fabric. lay a 6" layer of select backfill on top of the geotextile fabric. Level and compact select backfill with a vibrator compactor. Place prefabricated vault on top of compacted fill. Use a woven type 2W geotextile fabric as defined in the USDA-NRCS specification MS-209 (see sheet #22).
- 2) All prefabricated vaults must meet the minimum requirements of **ASTM C 857-07 (Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures)**, and **ASTM C 858-09 (Standard Specification for Underground Precast Concrete Utility Structures)**.
- 3) All piping and fittings within the vault = Sch 40 epoxy coated steel (inner and outer pipe coating required).
- 4) All applicable Occupational Safety and Health Division (OSHA) safety requirements for confined space entry and exit must be followed.
- 5) Air/Vacuum valve sizes will vary with the vault location. See sheet #15 for air/vacuum valve specifications for each vault location.
- 6) Minimum pressure rating for all valves = 150 psi.
- 7) All piping and valves within the vault will require steel pipe supports or concrete saddles.
- 8) Equivalent valves from other manufacturers may be used.
- 9) Vault providers chosen by Three Sisters Irrigation District must submit vault design drawings and computations to the NRCS Engineer for approval.

81

File Name  
TSID-CAV-VAULT  
 Drawing No.  
20  
 Sheet 20 of 23

# Appendix D

## **FUNDING LETTERS**



# Oregon

Theodore R. Kulongoski, Governor

## Oregon Watershed Enhancement Board

775 Summer St NE, Suite 360

Salem, OR 97301-1290

(503) 986-0178

FAX (503) 986-0199

[www.oregon.gov/OWEB](http://www.oregon.gov/OWEB)

April 26, 2010



Marc Thalacker, District Manager  
Three Sisters Irrigation District  
P. O. Box 2230  
Sisters, OR 97759

Dear Mr. Thalacker:

The Oregon Watershed Enhancement Board's (OWEB) mission is to help protect and restore healthy watersheds and natural habitats that support thriving communities and strong economies. To carry out this mission, OWEB grants funds every six months to projects that protect and/or restore watershed functions throughout the state. OWEB has also developed longer-term commitments with partners to achieve specific ecological outcomes on a large scale.

In the Deschutes basin OWEB has committed more than \$8 million to the Deschutes Special Investment Partnership (SIP). The Deschutes SIP was established to provide funds for activities that will ensure the capacity of the upper basin to produce salmon and steelhead following removal of the passage barrier at Round Butte Dam. OWEB has committed \$1,000,000 (grant agreement 210-4023-7706) funds to the Upper Deschutes Watershed Council (UDWC) for The Three Sisters Irrigation District (TSID) Fish Passage and Screening – Phase II project. The UDWC is serving as the grant administrator for the comprehensive project and is working in partnership with TSID and the Deschutes National Forest to 1) restore the stream channel for 1,400 ft below the TSID dam, 2) provide upstream and downstream fish passage at the TSID Dam and 3) provide fish screening at the TSID dam. This OWEB funding will be used to complete project construction in 2010 and 2011. Funding is available to the UDWC between November 4, 2009, and December 31, 2011.

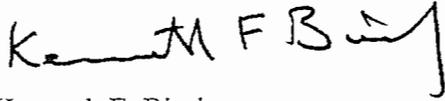
Additionally, OWEB has committed a \$999,978 grant to the Deschutes River Conservancy (DRC) to assist in the piping of the main canal of the TSID to assist in Phases I and II of the TSID main canal. The piping project will result in the legal protection of conserved water and avoid transportation losses through the cracked basalts through which the canals pass. Both DRC and UDWC are important partners in implementing water conservation projects in the Deschutes basin. Water conservation is a part of the project list that has been approved for the Deschutes SIP which means that OWEB will likely be participating in additional efforts (Phase III) with TSID and their partners.



OWEB is a committed partner in this restoration work and looks forward to seeing the project completed. Our experience with the UDWC and DRC has shown that they are effective, efficient and responsive.

Please let me know if you have any questions,

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth F. Bierly". The signature is written in a cursive style with some capital letters.

Kenneth F. Bierly  
Deputy Director



United States  
Department of  
Agriculture

Forest  
Service

Deschutes National Forest  
Sisters Ranger District

PO Box 249  
Sisters, OR 97759  
(541) 549-7700

File Code: 2510

Date: April 28, 2010

Marc Thalacker  
District Manager  
Three Sisters Irrigation District  
PO Box 2230  
Sisters, , OR 97759

Dear Mr. Thalacker,

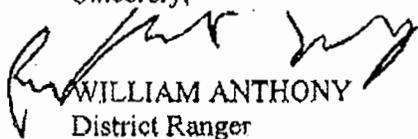
The Deschutes National Forest has a history of successful collaborations with the Upper Deschutes Watershed Council (UDWC) and its partners on restoration projects throughout the Upper Deschutes Basin. The Deschutes National Forest has partnered with the UDWC and the Three Sisters Irrigation District (TSID) to implement a comprehensive restoration project at and near the TSID diversion dam that will 1) provide fish screening, 2) provide up and downstream fish passage and 3) restore the Whychus Creek channel for 1,400 feet downstream of the dam to limit erosion, create habitat for anadromous and resident fish species, re-connect Whychus Creek to its floodplain, provide improved riparian vegetative cover and restore overall stream function.

The need for this restoration work at the TSID dam has been identified in the US Forest Service Sisters/Whychus Watershed Analysis, ODFW Fish Management Plan, Deschutes Sub-basin Plan and the Draft Bull Trout Recovery Plan. To help achieve these goals, the Deschutes National Forest has committed \$200,000 in funds and over \$100,000 of in-kind materials to be used for the channel restoration component of the project. These funds are available to the UDWC between August 8<sup>th</sup>, 2009 and September 30<sup>th</sup>, 2012. The Deschutes National Forest and the UDWC intend to spend a majority of these funds in 2010.

The Deschutes National Forest is a committed partner in this restoration work and looks forward to seeing the project completed.

Please let me know if you have any questions,

Sincerely,

  
WILLIAM ANTHONY  
District Ranger

cc: Mathias Perle, Upper Deschutes Watershed Council



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Printed on Recycled Paper



EW

# **Appendix E**

## **CULTURAL RESOURCES REPORT**



# Oregon

Theodore R. Kulongoski, Governor

## Parks and Recreation Department

State Historic Preservation Office

725 Summer St NE, Ste C

Salem, OR 97301-1266

(503) 986-0671

Fax (503) 986-0793

www.oregonheritage.org

June 01, 2009

Mr. Scott Stuemke  
1785 NW Harriman St  
Bend, OR 97701

RE: SHPO Case No. 09-0935

Three Sisters Irrigation Dist Main Canal Pipeline/Watson Reservoir  
Hydro Proj  
15S 10E 13, 14, 16, 21, 22, 23, 24, Deschutes County.

Dear Mr. Stuemke:

We have reviewed the materials submitted on the project referenced above, and we concur with the determination that the property is eligible for the National Register of Historic Places in accordance with 36 CFR Part 60.4. Additionally, our office concurs that piping the Main Canal from the headworks to the Watson Reservoir and the installation of two 750-kilowatt turbines is an adverse affect on the National Register-eligible resource.

As is true for any undertaking that adversely affects a National Register-eligible property, the project will need to be mitigated. Often additional documentation is provided as mitigation; however, we believe that little can be gained from such a project. Instead, we suggest that the Three Sisters Irrigation District consider a more creative approach, such as the creation of a website, museum display, brochure, or interpretive signage that would document the history of the resource and make it readily available to the public. We ask that your agency create a mitigation proposal and discuss it with our office. Once mitigation has been agreed to by both parties, a Memorandum of Agreement will be completed and signed. Please note that it is the responsibility of the Three Sisters Irrigation District to inform the federal Advisory Council on Historic Preservation of this adverse affect and to invite the Council's comment.

Our response here is to assist you with your responsibilities under Section 106 of the National Historic Preservation Act (per 36 CFR Part 800). We look forward to working with the Three Sisters Irrigation District to create a mitigation plan that satisfies all parties and the requirements of Section 106 of the National Historic Preservation Act of 1966.

Sincerely,

Ian P. Johnson, Historian  
(503) 986-0678 or [ian.johnson@state.or.us](mailto:ian.johnson@state.or.us)





# Oregon

Theodore R. Kulongoski, Governor

## Parks and Recreation Department

State Historic Preservation Office

725 Summer St NE, Ste C

Salem, OR 97301-1266

(503) 986-0671

Fax (503) 986-0793

[www.oregonheritage.org](http://www.oregonheritage.org)



5/26/2009

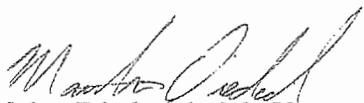
Mr. Scott Stuemke  
1785 NW Harriman St  
Bend, OR 97701

RE: SHPO Case No. 09-0935  
Three Sisters Irrigation Dist Main Canal Pipeline/Watson Reservoir Hyd  
15S 10E 13, 14, 16, 21, 22, 23, 24, Deschutes County

Dear Scott:

Our office recently received your report about the project referenced above. I have reviewed your report and agree that the project will have no effect on any known cultural resources. Site TSID 001-09 does not meet the 50 year criteria for age of an archaeological site and was not assigned a Smithsonian number. The site is also considered not eligible for inclusion to the National Register. No further archaeological research is needed with this project.

Please be aware, however, that if during development activities you or your staff encounters any cultural material (i.e., historic or prehistoric), all activities should cease immediately and an archaeologist should be contacted to evaluate the discovery. This letter only addresses the archaeological portion of this project. For concurrence regarding the Sec 106 documentation for the canal please refer to Ian Johnson (503- 98600678), who will be reviewing the project for the built environment portion of the project. If you have any questions regarding any future discovery or my letter, feel free to contact our office at your convenience.

  
Matt Diederich, MAIS  
SHPO Archaeologist  
(503) 986-0577  
[Matthew.Diederich@state.or.us](mailto:Matthew.Diederich@state.or.us)

MEMORANDUM OF AGREEMENT  
No. 09MA1U7176  
BETWEEN THE THREE SISTERS IRRIGATION DISTRICT,  
BUREAU OF RECLAMATION,  
SISTERS RANGER DISTRICT, DESCHUTES NATIONAL FOREST,  
And  
THE OREGON STATE HISTORIC PRESERVATION OFFICE  
For  
Piping of The Main Canal and  
Watson Reservoir Hydro Project

**SISTERS VICINITY, DESCHUTES COUNTY, OREGON**

This Memorandum of Agreement, hereinafter referred to as “MOA”, is made and entered into by and between the United States Of America, acting through Columbia-Cascades Area Office, Bureau of Reclamation, Department of the Interior, hereinafter referred to as “**Reclamation**”, the Three Sisters Irrigation District, hereinafter referred to as “**District**”, the Deschutes National Forest, hereinafter referred to as “**Forest**” and the Oregon State Historic Preservation Office, hereinafter referred to as “**SHPO**”, pursuant to the Reclamation Act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto and other applicable State laws and regulations, and Section 106 of the National Historic Preservation Act (36 CRF 800).

**I. Background**

WHEREAS, the District, Reclamation, and the Forest, in consultation with the Oregon SHPO, has determined that the District’s Main Canal is eligible to the National Register of Historic Places;

WHEREAS, the District is installing within the prism of the Main Canal two 54-inch pipelines approximately 4 miles in length, from the headworks at Wychus Creek to Watson Reservoir for water conservation aimed at restoring anadromous fish habitat. In addition, two 750 KW turbines will be installed at the terminus below Watson Reservoir to generate hydropower.

WHEREAS, it has been determined that replacement of the open canal with the two pipelines and installation of turbines will have an adverse effect upon the Main Canal;

WHEREAS, the Oregon SHPO has concurred with the determination of adverse effect and sufficiency of mitigation defined in email correspondence dated May 23, 2008;

WHEREAS, Reclamation has notified the Advisory Council on Historic Preservation (Council) of the adverse effect on the Main Canal pursuant to 36 CFR Section 800.6(a)(1), and in a letter dated July 15, 2009, the Council indicated they have concluded that their participation is not needed in the consultation for resolution of adverse effects from this undertaking;

NOW THEREFORE, the parties agree as follows:

## **II. Implementing Actions**

The District, Reclamation, the Forest, and the Oregon SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on historic properties, and adherence to the terms of this agreement satisfy the Section 106 responsibilities for addressing the effects of the undertaking on historic properties.

### **Stipulations**

The District will ensure that the following actions will occur:

A. Historic documentation of the District's Main Canal that will be affected by this undertaking (from the diversion at Wychus Creek to Watson Reservoir). Such documentation will be completed by a company/individual listed on the Oregon Preservation Contractor Directory, and include a history of the district, an historic site form (to include detailed description and dimensions of the canal and associated features), site location map (1:24000 scale), site map, photos of the canal and any appurtenances (i.e., headworks, gates, drop structures, diversion dam), recorded to standards and detail as required by the Oregon SHPO. Draft documentation will be submitted to the Forest and Reclamation for review by October 31, 2009. A final version of the documentation will be submitted the Forest, Reclamation, and Oregon SHPO by December 31, 2009.

B. Compilation of a history of the District, including a selection of historic photos, maps, and other documentation to be made accessible to the general public through a District-sponsored website. Links from the Deschutes County Historical Society, Three Sisters Historical Society, and the Forest websites to the District's website may be made to facilitate searches on the history of the District. The website will be completed by April 15, 2010.

Execution of this Agreement by the District, Reclamation, the Forest and the Oregon SHPO, its subsequent filing by the Council, and implementation of its terms by Reclamation evidence that Reclamation has afforded the Council an opportunity to comment on the District's Main Canal piping and Watson Reservoir Hydro Project and its effects on historic properties, and that Reclamation has taken into account the effects of the undertaking on historic properties.

## **III. Period of Performance**

This agreement shall become effective on the date of last signature hereto and extend through May 30, 2010. Any party may terminate this MOA by providing 30 days written notice to the other party. Any party may formally request modification of the agreement.

## **IV. Designated Contacts**

**For Reclamation:**

Christine Horting-Jones  
Archeologist  
1375 SE Wilson Ave. #100  
Bend, OR 97701  
Phone (541) 389-6541  
Fax (541)-389-6394  
Email: [chrotingjones@usbr.gov](mailto:chrotingjones@usbr.gov)

**For the District:**

Marc Thalaker  
Manager  
P.O. Box 2230  
Sisters, OR 97759  
Phone (541) 549-8815  
Fax (541) 549-8070  
Email: [tsid@uci.net](mailto:tsid@uci.net)

**For the Forest:**

Paul Claeysens  
Forest Archaeologist  
Deschutes National Forest  
1001 SW Emkay Dr.  
Bend, OR 97702  
Phone (541) 383-5500  
Fax (541) 383-5748  
Email: [pclaeysens@fs.fed.us](mailto:pclaeysens@fs.fed.us)

**For SHPO**

Ian Johnson, Historian  
State Historic Preservation Office  
Oregon Parks and Recreation Department  
725 Summer St. NE, Suite C  
Salem, OR 97301-1266  
Phone (503) 986-0671  
Fax (503) 986-0793  
Email: [ian.johnson@state.or.us](mailto:ian.johnson@state.or.us)

**VI. General Provisions**

A. Nothing herein shall or shall be construed to obligate any party to expend funds or involve their respective agencies in any contract or other obligation for the future payment of

money in excess of appropriations authorized by law and administratively allocated for the purposes and projects contemplated hereunder.

B. No Member of or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this MOA or to any benefit that may arise out of it.

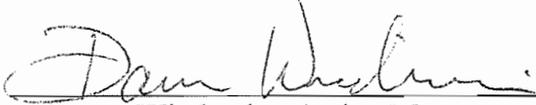
C. The parties agree to comply with all Federal statutes relating to nondiscrimination, including but not limited to: Title VII of the Civil Rights Act of 1964, as amended, which prohibits discrimination on the basis of race, color, religion, sex, or national origin; Title IX of the Education amendments of 1972, as amended, which prohibits discrimination on the basis of sex; the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act of 1990, as amended, which prohibit discrimination on the basis of disability; the Age Discrimination in Employment Act of 1967, as amended, which prohibits discrimination based on age against those who are at least 40 years of age; and the Equal Pay Act of 1963.

## VI. SIGNATURES

### THREE SISTERS IRRIGATION DISTRICT

by:  8/5/09  
Marc Thalaker, Manager Date

### BUREAU OF RECLAMATION

by:  7/31/09  
Dawn Wiedmeier, Acting Manager, Date  
Columbia-Cascades Area Office

### SISTERS RANGER DISTRICT, DESCHUTES NATIONAL FOREST

by:  8-4-09  
John Allen, Forest Supervisor Date

OREGON STATE HISTORIC PRESERVATION OFFICE

by: 

Deputy Oregon State Historic Preservation Officer, *Asst.*

Date *8-11-2009*

~~End of Document~~

# **Appendix F**

## **Official Resolution**

**Three Sisters Irrigation District**

P. O. Box 2230  
541-549-8815 (tel)

Sisters, Oregon 97759  
541-549-8070 (fax)

**Three Sisters Irrigation District**

**RESOLUTION NO. 2010 - 04**

**Three Sisters Irrigation District**

**WHEREAS, The Board of Directors of the Three Sisters Irrigation District has reviewed and is in support of the Three Sisters Irrigation District Collaborative Restoration Project which includes Fishscreen/Passage/Channel Restoration Project and the Main Canal Piping/Penstock Project Phase 3.**

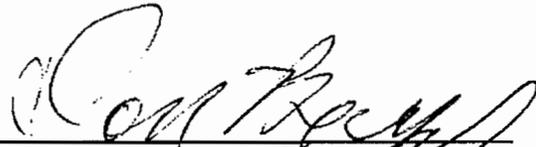
**WHEREAS, Three Sisters Irrigation District is capable of providing the amount of funding with in-kind contributions, specified in the funding plan; and**

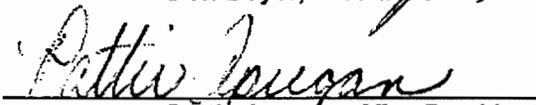
**WHEREAS, Three Sisters Irrigation District will work with the Bureau of Reclamation to meet all established deadlines for entering in to a cooperative agreement.**

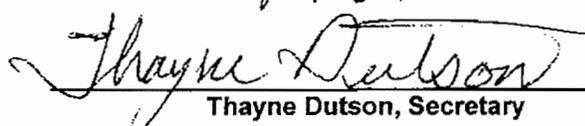
**NOW THEREFORE, BE IT RESOLVED that the Board of Directors agrees and authorizes this resolution to approve and support this grant application and project:**

**NOW THEREFORE the Manager Marc Thalacker, is authorized, empowered and directed to execute and deliver, in the name and on behalf of district, the Grant Agreement if so awarded by Bureau of Reclamation.**

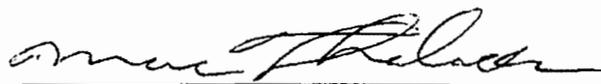
**DATED: May 4<sup>th</sup>, 2010**

  
\_\_\_\_\_  
Don Boyer, President

  
\_\_\_\_\_  
Pattie Apregan, Vice President

  
\_\_\_\_\_  
Thayne Dutson, Secretary

**ATTEST:**

  
\_\_\_\_\_

**Three Sisters Irrigation District**

P. O. Box 2230  
541-549-8815 (tel)

Sisters, Oregon 97759  
541-549-8070 (fax)

**Three Sisters Irrigation District**

**RESOLUTION NO. 2010 - 04**

**Three Sisters Irrigation District**

WHEREAS, The Board of Directors of the Three Sisters Irrigation District has reviewed and is in support of the Three Sisters Irrigation District Collaborative Restoration Project which includes Fishscreen/Passage/Channel Restoration Project and the Main Canal Piping/Penstock Project Phase 3.

WHEREAS, Three Sisters Irrigation District is capable of providing the amount of funding with in-kind contributions, specified in the funding plan; and

WHEREAS, Three Sisters Irrigation District will work with the Bureau of Reclamation to meet all established deadlines for entering in to a cooperative agreement.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors agrees and authorizes this resolution to approve and support this grant application and project:

DATED: May \_\_\_\_\_, 2010

\_\_\_\_\_  
Don Boyer, President

\_\_\_\_\_  
Pattie Apregan, Vice President

\_\_\_\_\_  
Thayne Dutson, Secretary

ATTEST:

\_\_\_\_\_

TSID Board of Directors will meet Tuesday May 4, 2010  
The resolution will be sent after that meeting.

## **Appendix H**

# **BUDGET/EQUIPMENT INKIND HOURLY PIPE & MATERIALS SPREADSHEET**

**TSID FISH SCREEN/PASSAGE CHANNEL RESTORATION AND MAIN CANAL PIPELINE PROJECT PHASE III**

BUDGET ITEM DESCRIPTION	COMPUTATION			Total Cost	USFS	BOR WaterSmart	OWEB	TSID	NFF	RAC	NFWF	USFS & Other In-Kind
	\$/Unit	Unit	Quantity									
<b>SALARIES AND WAGES</b>												
Manager/Adminstration	\$34.57	hr	300	\$10,371.00				\$10,371.00				
Office Administration	\$12.00	hr	400	\$4,800				\$4,800				
Construction Foreman	\$20.00	hr	1960	\$39,200				\$39,200				
Equipment Operator	\$17.00	hr	1675	\$28,475.00				\$28,475.00				
Equipment Operator	\$17.00	hr	1675	\$28,475.00				\$28,475.00				
Equipment Operator	\$17.00	hr	1675	\$28,475.00				\$28,475.00				
Equipment Operator	\$17.00	hr	1675	\$28,475.00				\$28,475.00				
Equipment Operator	\$17.00	hr	1500	\$25,500.00				\$25,500.00				
Equipment Operator	\$17.00	hr	1500	\$25,500.00				\$25,500.00				
			11660									
			Sub-	\$219,271.00				\$219,271.00				
<b>FRINGE BENEFITS</b>												
Manager/Adminstration	\$11.67	hr	300	\$3,501.00				\$3,501.00				
Office Administration	\$1.00	hr	400	\$400				\$400				
Construction Foreman	\$8.03	hr	1960	\$15,739				\$15,739				
Equipment Operator	\$2.23	hr	1675	\$3,735.25				\$3,735.25				
Equipment Operator	\$2.23	hr	1675	\$3,735.25				\$3,735.25				
Equipment Operator	\$2.23	hr	1675	\$3,735.25				\$3,735.25				
Equipment Operator	\$2.23	hr	1675	\$3,735.25				\$3,735.25				
Equipment Operator	\$2.23	hr	1500	\$3,345.00				\$3,345.00				
Equipment Operator	\$2.23	hr	1500	\$3,345.00				\$3,345.00				
			Sub-	\$41,270.80				\$41,270.80				
<b>Backfill/Fuel/Supplies/Legal/Insurance</b>												
Backfill Material	\$ 8	Cu Ft	50,000	\$400,000				\$400,000				
Fuel	\$2.50	gallon	99,000	\$247,500				\$247,500				
Supplies				\$50,000				\$50,000				
Insurance/Legal				\$20,000				\$20,000				
<b>TSID OWNED EQUIPMENT</b>												
Excavator 450	\$ 100	Per Hour	1600	\$160,000				\$160,000				
D-8 Cat	\$ 125	Per Hour	1295	\$161,875				\$161,875				
Front End Loader JD 844J	\$ 90	Per Hour	1600	\$144,000				\$144,000				
On Road Dump Truck	\$ 35	Per Hour	1600	\$56,000				\$56,000				
On Road Dump Truck	\$ 35	Per Hour	1600	\$56,000				\$56,000				
On Road Dump Truck	\$ 35	Per Hour	1600	\$56,000				\$56,000				
Backhoe	\$ 22	Per Hour	1100	\$24,200				\$24,200				
Off Road Dump Truck (Cat 735)	\$ 100	Per Hour	600	\$60,000				\$60,000				
<b>RENTAL EQUIPMENT</b>												
Pipe Welding-Small Diameters	\$ 300	Per day	13.75	\$4,125				\$4,125				
HDPE Welding Machine	\$ 1,100	Per day	81.25	\$89,375			\$89,375.00					
Water Truck	\$ 38	Per day	220	\$8,360			\$8,360.00					
Hitachi 350 Excavator	\$6,618	Per Month	4	\$26,472				\$26,472				
Tractor & Scraper (TSID owns the Scraper)	\$3,000	Per Month	3	\$9,000				\$9,000				
			Sub-	\$1,572,907.00			\$97,735.00	\$1,475,172.00				

**TSID FISH SCREEN/PASSAGE CHANNEL RESTORATION AND MAIN CANAL PIPELINE PROJECT PHASE III**

BUDGET ITEM DESCRIPTION	COMPUTATION			Total Cost	USFS	BOR WaterSmart	OWEB	TSID	NFF	RAC	NFWF	USFS & Other In-Kind
	\$/Unit	Unit	Quantity									
<b>SUPPLIES/MATERIALS</b>												
54" SDR21 HDPE pipe 80psi	\$137.00	feet	4400	\$602,800.00		\$450,000		\$152,800.00				
54" SDR 19 HDPE pipe 89 psi	\$150.00	feet	5989	\$898,350.00		\$65,240	\$833,110					
Concrete vaults for ARV & PRV 10"	\$6,000	each	10	\$60,000.00		\$60,000						
Combination Air/Vac Valves Cla-Val	\$4,500	each	10	\$45,000.00		\$45,000						
Pressure Relief Valves Cla-Val 12"	\$12,000	each	4	\$48,000.00		\$48,000						
Riser & Saddle Assemblies	\$3,000	each	14	\$42,000.00		\$42,000						
Valve(s) By pass into Reservoir	\$50,000	each	1	\$50,000.00				\$50,000				
			Sub-	\$1,746,150		\$710,240	\$833,110	\$202,800				
<b>TOTAL DIRECT COSTS</b>												
Contingency/				\$100,000.00				\$100,000.00				
Environmental Compliance				\$20,000.00				\$20,000.00				
<b>TOTAL PIPELINE PROJECT COSTS</b>				<b>\$3,699,598.80</b>		<b>\$710,240.00</b>	<b>\$930,845.00</b>	<b>\$2,058,513.80</b>				

FISH SCREEN	COMPUTATION			Total Cost	USFS	BOR WaterSmart	OWEB	TSID	NFF	RAC	NFWF	USFS & Other In-Kind
	\$/Unit	Unit	Quantity									
Mob/demob	5000	each	1	\$5,000.00				\$5,000.00				
Clearing and grubbing	\$19,800.00	each	1	\$19,800.00				\$19,800.00				
Earthwork	\$30,195.00	each	1	\$30,195.00				\$30,195.00				
Access Road	\$9,900.00	each	1	\$9,900.00				\$9,900.00				
Concrete Structure	\$457.38	cubic yard	650	\$297,297.00		\$139,710.00	\$111,026.00			\$50,000	\$5,000	
30 " Return Pipe	\$94.13	feet	230	\$21,650.00		\$21,650.00						
24 " Sediment Pipe	\$56.00	feet	400	\$22,400.00		\$22,400.00						
Under-drain piping	\$12.50	feet	2000	\$25,000.00		\$25,000.00						
Plug Valves	\$1,000.00	each	28	\$28,000.00					\$28,000.00			
Manhole	\$3,000.00	each	3	\$9,000.00		\$9,000.00						
Weir Gates	\$36,000.00	each	2	\$72,000.00					\$72,000.00			
Fish Screen Assembly	\$300,000.00	each	1	\$300,000.00			\$300,000.00					
Debris Rack & Walkway Assembly	\$72,000.00	each	1	\$72,000.00		\$72,000.00						
				<b>\$912,242.00</b>		<b>\$289,760.00</b>	<b>\$411,026.00</b>	<b>\$64,895.00</b>	<b>\$100,000.00</b>	<b>\$50,000</b>	<b>\$5,000</b>	<b>\$0</b>
<b>FISH PASSAGE</b>												
Finalize Design Plans												
Project Engineer	\$103.33	Per hour	60	\$6,200.00			\$6,200.00					
Engineering Technician	\$85.00	Per hour	28	\$2,380.00			\$2,380.00					
Fish Biologist	\$100.00	Per hour	28	\$2,800.00			\$2,800.00					
Site Access, Dewatering, and Fish Salvage Plan												
Project Engineer	\$99.00	Per hour	30	\$2,970.00			\$2,970.00					
Engineering Technician	\$85.00	Per hour	12	\$1,020.00			\$1,020.00					
Fish Biologist	\$100.00	Per hour	16	\$1,600.00			\$1,600.00					
Construction Stakeout												
Surveyor	\$103.89	Per hour	90	\$9,350.00			\$9,350.00					
Engineering Technician	\$89.11	Per hour	90	\$8,020.00			\$8,020.00					
Fish Biologist	\$100.00	Per hour	40	\$4,000.00			\$4,000.00					
Construction Management												
Project Engineer	\$104.17	Per hour	120	\$12,500.00			\$12,500.00					
Fish Biologist	\$100.00	Per hour	80	\$8,000.00			\$8,000.00					
Travel	\$0.50	miles	2950	\$1,475.00			\$1,475.00					
Lodging and Per Diem	\$105.00	each	29	\$3,045.00			\$3,045.00					
RTK GPS Survey Station	\$2,100.00	each	1	\$2,100.00			\$2,100.00					
Survey Material	500	each	1	\$500.00			\$500.00					
				<b>\$65,960.00</b>			<b>\$65,960.00</b>	<b>\$0.00</b>				

**TSID FISH SCREEN/PASSAGE CHANNEL RESTORATION AND MAIN CANAL PIPELINE PROJECT PHASE III**

BUDGET ITEM DESCRIPTION	COMPUTATION			Total Cost	USFS	BOR WaterSmart	OWEB	TSID	NFF	RAC	NFWF	USFS & Other In-Kind
	\$/Unit	Unit	Quantity									
<b>CHANNEL RESTORATION</b>												
Personnel												
Fish Biologist	\$335.00	Per day	159	\$53,265.00			\$53,265.00					
Hydrologist	\$335.00	Per day	66	\$22,110.00			\$22,110.00					
Ecologist/Weed Management	\$340.00	Per day	13	\$4,420.00			\$4,420.00					
Technician	\$220.00	Per day	62	\$13,640.00			\$13,640.00					
Off site plant propagation	\$298.18	Per day	66	\$19,680.00			\$11,280.00					\$8,400.00
Supplies and Materials	\$95,426.00	each	1	\$95,426.00			\$3,926.00					\$91,500.00
Contracted Heavy Equipment	\$241,710.00	each	1	\$241,710.00			\$139,210.00	\$102,500.00				
Travel	\$0.50	miles	12000	\$6,000.00			\$6,000.00					
				\$456,251.00			\$253,851.00	\$102,500.00				\$99,900.00
<b>Contracted Services Channel Restoration</b>												
Planting Labor	\$1.50	Per plant	43796	\$65,694.00	\$51,144.00		\$13,050.00					\$1,500.00
				\$65,694.00	\$51,144.00		\$13,050.00					\$1,500.00
<b>Contracted Services Wood Hauling</b>												
Post Implementation Survey Map	\$145.00	Per hour	190	\$27,550.00			\$27,550.00					
GIS & Outreach	\$120.00	Per hour	32	\$3,840.00			\$3,840.00					
	\$13,151.00	each	1	\$13,151.00	\$13,151.00							
				\$44,541.00	\$13,151.00		\$31,390.00					
<b>SUPPLIES AND MATERIALS</b>												
Planting and Fencing Materials	\$124,510.00	each	1	\$124,510.00	\$77,816.00		\$46,693.00					
Roughened Channel Materials	\$31,779.00	each	1	\$31,779.00	\$369.00		\$14,840.00	\$14,500.00				\$2,070.00
				\$156,289.00	\$78,185.00		\$61,533.00	\$14,500.00				\$2,070.00
<b>UDWC PROJECT Management/Payroll</b>												
Project Management	\$55.00	Per hour	91	\$5,000.00	\$5,000.00							
Fish Passage Coordination	\$45.00	Per hour	422	\$19,000.00	\$8,000.00		\$11,000.00					
Channel Restoration Coordination	\$45.00	Per hour	556	\$25,000.00	\$18,720.00		\$6,280.00					
Fish Screen Coordination	\$45.00	Per hour	89	\$4,000.00			\$4,000.00					
Re-vegetation Coordination	\$45.00	Per hour	89	\$4,000.00	\$1,600.00		\$2,400.00					
Permitting	\$45.00	Per hour	133	\$6,000.00	\$6,000.00							
Monitoring Coordination	\$45.00	Per hour	165	\$7,420.00			\$7,420.00					
				\$70,419.99	\$39,320.00		\$31,100.00					
<b>UDWC Administration, Contingency &amp; Travel</b>												
Administration	\$86,565.00	Each	1	\$86,565.00	\$18,200.00		\$68,365.00					
Contingency	\$62,600.00	Each	1	\$62,600.00			\$62,600.00					
Travel	\$0.50	miles	2250	\$1,125.00			\$1,125.00					
				\$150,290.00	\$18,200.00		\$132,090.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>TOTAL SCREEN/PASSAGE/CHANNEL COSTS</b>				<b>\$1,921,686.99</b>	<b>\$200,000</b>	<b>\$289,760</b>	<b>\$1,000,000</b>	<b>\$181,895</b>	<b>\$100,000</b>	<b>\$50,000</b>	<b>\$5,000</b>	<b>\$103,470</b>

Federal	\$1,458,470.00	\$200,000	\$1,000,000	\$1,930,845	\$2,240,409	\$100,000	\$50,000	\$5,000	\$103,470
Non Federal	\$4,171,253.80	\$200,000.00	\$1,000,000.00	\$1,930,845.00	\$2,240,408.80	\$100,000.00	\$50,000.00	\$5,000.00	\$103,470.00
<b>PROJECT TOTAL</b>	<b>\$5,629,723.80</b>								

<b>USFS</b>	<b>BOR WaterSmart</b>	<b>OWEB</b>	<b>TSID</b>	<b>NFF</b>	<b>RAC</b>	<b>NFWF</b>
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