Title Page

Klamath Drainage District

West Side Water Recycling Improvement Project

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Technical Proposal

(1) Executive Summary

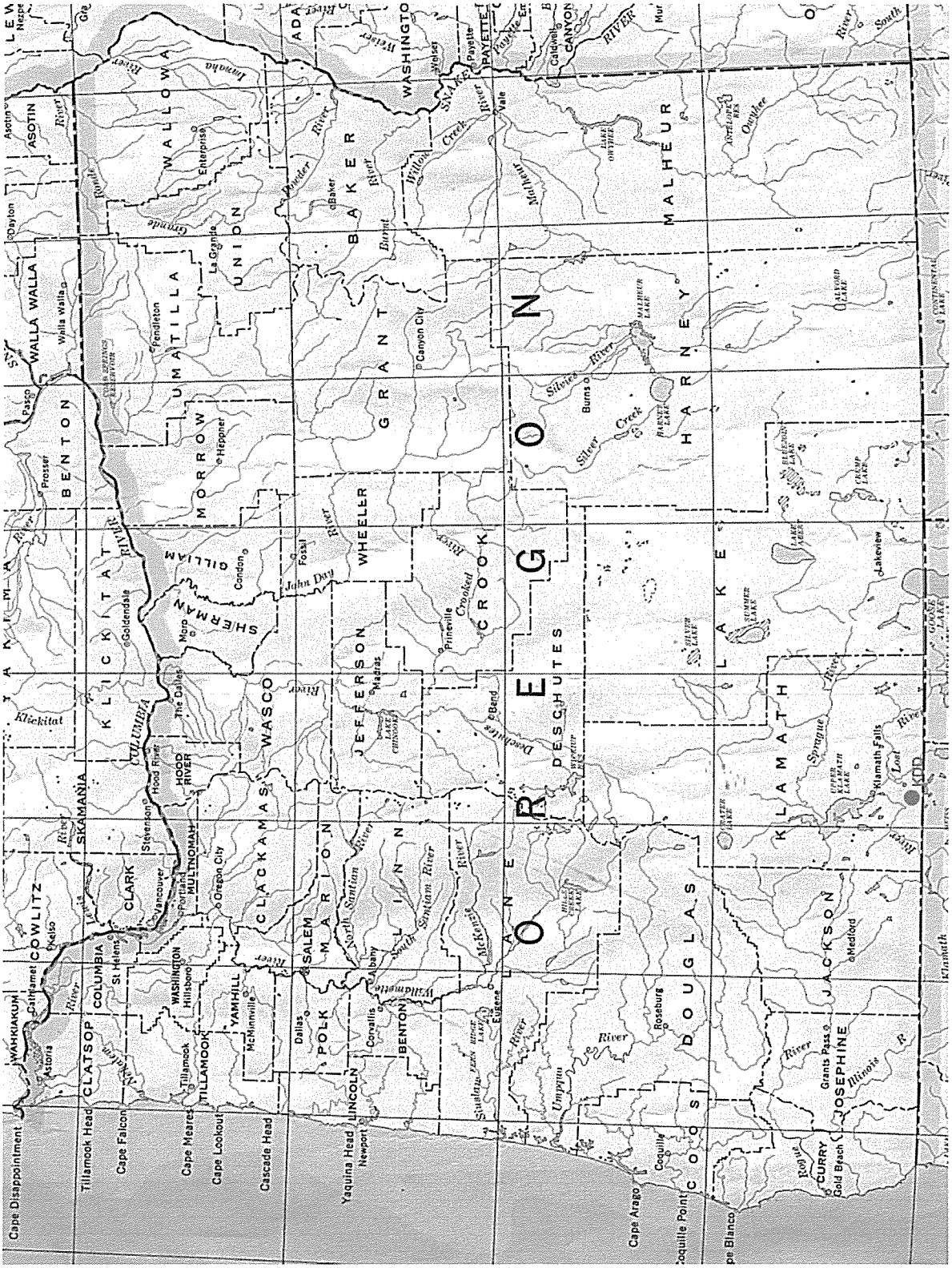
Date: 01/17/2013
Applicant Name: Klamath Drainage District (KDD)
City, County, State: Klamath Falls, Klamath County, Oregon

Project Summary: The Klamath Drainage District, situated in Oregon along the California-Oregon state line and comprised of 27,000+ acres of agricultural lands, diverts irrigation water directly from the Klamath River at two points of diversion. Drainage water is returned directly to the Klamath River through the Straits Drain. In the late 1990's, KDD constructed a tail water recovery system on the west side of the District known as the Westside Pumping Facility. A Table showing the volume of water recycled through this facility can be found elsewhere in this proposal. The project under proposal will recycle an average of 7,953 ac-ft of additional drainage water through the Westside Pumping Facility by making small-scale improvements at five District-owned drain crossings within the system. In addition to environmental benefits addressed elsewhere in this proposal, and particularly during water shortages, recycling 7,953 ac-ft of water may result in an increase in water supply for downstream Klamath River water users. When most of the Districts within the Klamath Project save water, it results in more water for Districts lying downstream within the Project. However, when KDD achieves greater water efficiency, it results in more water in the Klamath River. This project may help to mitigate competition for water resources and reduce water use conflicts in the Klamath Basin and downstream in California. In any water year type, recycling additional water through the existing Westside Pumping Facility will increase the on-farm water use efficiency on lands service by that canal. At a cost of $16.30 per acre-ft to the Federal Government, we request that this small-scale improvement to KDD's existing water recycling system be found eligible for funding.

Length of time and estimated completion date for the project Due to the harsh winters in the Klamath Basin, construction must occur during the late spring, summer and early fall months. It is estimated that this project will be completed by September 30, 2014.

(2) Background Data

Map of State and County in relation to KDD: nearest major town is Klamath Falls, OR approximately 15 miles to the north.



History of KDD

The agricultural history of the Klamath Drainage District began in the late 1800's when natural grasslands of the District were utilized for the grazing of cattle. However, formal development of what was to later become the Klamath Drainage District began in 1907 when the Northeastern Railway Company and the Southern Pacific Company constructed a railway embankment on the line of the California Northeastern Railway across the marshes near the north end of the Lower Klamath Lake. This embankment crossed the channel connecting the Lower Klamath Lake with the Klamath River. During high flow conditions, and prior to the construction of the railroad embankment, the Klamath River flowed uncontrolled into the Lower Klamath Lake making farming impractical. On October 24, 1907, the United States and the two railroad companies entered into agreement acting under the provisions of the Reclamation Act of 1902; the Act of Congress of 2/9/1905; and the Oregon and California Acts of Legislation of 1905. The railroad companies agreed to construct the embankment in such a manner that it would serve as a levee. The railroad companies were also responsible for constructing a structure within the embankment that would allow for the controlled passage of water from the Klamath River on the west side into the Lower Klamath Lake on the east side. This structure currently consists of five openings, each measuring five feet wide by seven feet six inches high. This headgate structure at the Klamath Straits is known today as the Ady Head-works.

In 1911, Congress expanded the Secretary of the Interior's authority to develop reclamation projects by passing the Warren Act, which authorized the Secretary to enter into contracts with individuals, associations, and irrigation districts for the irrigation and drainage of lands not included in the scope of the 1902 legislation. Based upon the provisions of the Warren Act, the Klamath Drainage District was formed under the laws of the State of Oregon on March 6, 1915. The District was created for the purpose of providing adequate drainage at all times for its landowners as well as for providing a cost effective water supply to those same landowners.

The Klamath Drainage District entered into its first contract with Secretary of the Interior on November 30, 1917. This contract authorized the closing of the gates at the Klamath Straits in order to drain the land, making it possible to farm.

Shortly after the gates were closed, construction of facilities such as the North Canal, Ady Canal, drains, dikes and pumping stations began. In years to follow, KDD modified its facilities to increase deliveries to lands within its boundaries and worked with the United States Bureau of Reclamation (USBR) to enlarge the Ady Canal to increase water deliveries to the wildlife refuges lying to the south.

In 1921, KDD signed its first contract with the Secretary of the Interior to provide water to 27,500 acres of land. This acreage amount was amended to 27,000 acres in subsequent contracts with the United States. In subsequent years, KDD constructed additional facilities or modified existing structures to improve water delivery and efficiency on District lands. In 1940, KDD signed a contract with the United States Fish and Wildlife Service (USFW) to modify the South Canal in order to increase deliveries by KDD to wildlife refuge lands lying in California. The services rendered by KDD keep the wildlife refuge lands viable, and help its landowners thrive and remain productive. This in turn contributes to the overall economic stability of communities within the Klamath Basin.

Of the approximately 27,000 acres of land situated within the boundaries of KDD, the United States government never allowed 6,253 acres to be homesteaded. The parcels of land making up these 6,253 acres are collectively known as Area K and leased by the

United States for farming. KDD supplies irrigation water and drainage to Area K upon request by the U.S. The landowners of the Klamath Drainage District privately own the majority of the remaining acres. KDD also owns approximately 1,000 acres within the District.

Terrain

Owing to the fact that the District overlies a historic shallow lakebed, the topography of the District is extremely flat with the exception of some portions of the District's boundary, which are higher than the lakebed itself. The lowest lands are near the center of the District however, the slope from the boundaries to the center is gradual.

The flat topography of KDD has proven to be both beneficial and challenging. Beneficial, because the two major water supply canals lie along the west and east boundaries which are the high areas in the District, causing diversions from these supply canals and laterals to flow toward the center. Therefore, water from the upper fields help to irrigate the lower fields. Several landowners have terraced their fields to utilize the benefit of this natural design feature. The gradual sloping of land toward the center of the District provides a central area for the lands within its boundary to drain toward. This adds to the efficiency of KDD by reducing the level of effort required to manage the drain and return flows.

The District's flat topography also presents its challenges. The flatness of the historic lakebed imposes limitations on the design of the supply canals. Consequently, the North Canal (east side supply canal) and Ady Canal (west side supply canal) are relatively flat. At times this has resulted in water supply insufficiencies for some lands supplied by these canals. Solutions to this problem are few and costly. This proposed project seeks to help alleviate the water supply insufficiencies in the Ady Canal through the introduction of recycled drainage water from the northern portion of the District.

Soil Type

The predominate soil type within KDD is Tulana Silt Loam. The Tulana series is a very deep, peat type soil that formed in lacustrine sediments high in diatoms and amorphous material. Tulana soils are on lake bottoms and have slopes of 0 to 1 percent. As identified by the NRCS, the Tulana soils are typically sixty inches in depth. The first eleven inches is generally a black mucky silty clay loam followed by approximately twenty-seven inches of light gray silt loam. From thirty eight to forty four inches down the soil is typically light brownish gray fine sandy loam with the bottom sixteen inches a light brownish gray silt loam.

Tulana soils tend to wick moisture better than other soil types bringing the subsurface water to the root zone of the plants. The NRCS estimates the available water capacity for Tulana soils is approximately 23 to 33 inches. This reduces the applied water demand during the normal irrigation season. This allows KDD to operate more efficiently during the April to October period.

A problem associated with this soil type is its corrosive nature. The upper part of the soil is slightly acid to mildly alkaline and the lower part is mildly alkaline to extremely acid making Tulana soils highly corrosive, requiring special consideration for protective coatings on concrete and steel facilities. The use of non-corrosive material such as galvanized steel has been the choice of KDD management for coping with the corrosive nature of the soil.

KDD has experienced problems when the soil moisture content becomes too low. As the soil surface begins to dry out, it cracks and becomes unworkable. This creates air quality problems from wind erosion and can result in dangerous driving conditions on Highway 97 which borders KDD on the west, and the Stateline Highway which borders KDD on the south. If the soils continue to dry out they become a fire hazard. Burning soil created severe air quality problems for the local area when the soils were initially dried out in 1922. To prevent these soils from burning again and to prevent wind erosion, KDD must maintain moist soil conditions year round.

Water Supply

All irrigation water for the Klamath Drainage District comes from the Klamath River in the form of both natural flow and stored water. KDD generally relies on the natural flow of the Klamath River, but when these flows are not available, the District draws on releases of the stored water in Upper Klamath Lake.

Unlike other Districts in the Klamath Project, groundwater is not a water resource option for KDD. In 2002, KDD contracted with three geophysicists to perform geophysical surveys within District boundaries using three different methods (gravity, magnetic, seismic) in an effort to determine the potential for locating groundwater. Based upon the results of these studies, a geologist identified six sites with the greatest potential for finding groundwater. Funding was obtained and six test wells were drilled. The findings based upon the test wells were that no significant amount of groundwater exists under KDD proving that groundwater is not water resource option for the District.

Klamath River allocations, water recycling and landowner conservation efforts together meet KDD water supply needs.

Water Rights

The water rights for the Klamath Reclamation Project were granted for the benefit of all lands in the Project area including those lands situated within the boundaries of the Klamath Drainage District. +KDD initially entered into contract with the United States Department of the Interior in 1917. This 1917 contract was superceded by the District's 1921, 1929, 1940, 1943 and 1947 contracts with the Federal government. KDD's 1921 contract with the United States Department of the Interior entitles the District to water made available by the Klamath Project including water stored in the Upper Klamath Lake. The 1921 contract and subsequent contracts make water available to KDD for agricultural use to the extent that water is available. The contracts do not specify an annual entitlement to the water; the only limitation is the amount that can be beneficially used to irrigate 27,500 acres of land during the irrigation season which runs from the middle of April to September 30th. This includes reasonable allowances for losses due to evaporation, seepage and other causes.

In addition to KDD's Federal contracts, the District also holds an Oregon State appropriated water right, Permit 43334 (Application 55748), which entitles the District to 480.46 cubic feet per second (cfs) to be used on 19,234.5 acres of land lying within the boundaries of the District. This Permit excludes the Area K lands. Permit 43334 limits KDD to 1 cfs per +40 acres or the equivalent of 2 acre-feet per acre from March 1 through September 30. Permit 43334 also authorizes KDD to divert 1 acre-foot per acre from October 1 to March 1 for winter irrigation.

Current Water Uses and Number of Water Users Served

There are two major classification of water users in KDD: government managed lands known as Area K comprised of 6,252.70 acres which are maintained for both wildlife habitat and agricultural purposes; and privately managed land comprised of 19,371.17 acres representing eleven full time farms. All lands within KDD's boundaries are irrigated for agricultural purposes with the obvious exception of roadways, canal and drain banks. Water is beneficially applied to KDD lands for the purpose of irrigation of agricultural crops, winter soil preparation, livestock watering, quack grass abatement and minimal frost production.

Current and Projected Water Demand

Water demand is dependent upon the crops grown. Cropping patterns on KDD have not changed significantly in the past 15 years and because of the types of crops suitable for the District, significant changes are not likely to occur in the next 20 years. KDD does not anticipate an increased demand on water in the next 20 years. Therefore KDD's long-range plans are to use the allotment granted under the contractual agreement with the USBR and the Oregon State appropriate right as needed.

Potential Shortfalls in Water Supply

Water supply for the Klamath Project is largely dependent upon yearly precipitation amounts. Potential shortfalls in water supply may result in years of low precipitation or as the result of compliance with biological opinions.

In recent years, the Project water supply has been augmented by ground water pumping. As the USBR continues to implement creative measures to insure water supply, shut-offs to Project irrigators becomes less of a threat although reduction in deliveries remains a potential in drought years. The Klamath Basin Restoration Agreement (KBRA) seeks to provide a reliable water supply to Project Irrigators.

Major Crops and Total Acres Served

The primary crops produced within KDD have been cereal grains, alfalfa and grass hay, limited row crops, and irrigated pasture. Table 2 below gives the crop acreages grown for the fifteen-year period of 1995 through 2010 and excludes Area K.

Crop and Total Acres Served
(1995-2010)

Year	Barley	Oats	Wheat	Alfalfa Hay	Other Hay	Irrigated Pasture	Sugar Beets	Potatoes	Onions	Mint	Canola	Total Irrigated Acreage
1995	9,469	225	107	125	2,414	6,332	523	0	0	0	0	19,195
1996	9,589	100	152	125	2,105	5,773	150	0	0	0	0	17,994
1997	8,821	625	0	250	2,470	5,613	0	60	500	0	0	18,339
1998	5,657	1,614	65	250	2,442	6,226	470	713	746	0	0	18,183
1999	7,906	160	150	305	170	7,045	628	753	392	0	0	17,509
2000	8,365	190	160	230	2,322	5,630	120	355	135	20	0	17,527
2001	7,906	582	338	1,258	1,258	6,827	0	0	0	0	0	18,169
2002	7,520	1,338	393	290	2,019	5,390	0	375	0	0	0	17,325
2003	7,317	1,354	514	350	2,021	5,558	0	388	0	51	0	17,553
2004	4,698	0	4,791	285	2,116	5,585	0	164	0	110	0	17,749
2005	1,576	60	7,737	165	2,066	5,518	0	227	5	207	0	17,561
2006	4,323	752	1,974	865	1,966	5,506	0	198	148	201	0	15,933
2007	3,703	0	2,282	2,105	1,966	5,506	0	0	0	205	303	16,070
2008	2,988	0	3,981	2,274	2,148	5,506	0	200	0	40	0	17,137
2009	1,883	0	3,566	2,220	2,205	5,571	0	388	0	40	0	15,873
2010	5,266	605	696	2,120	1,601	5,928	0	240	0	40	0	16,496
Avg.	6,466	507	1,794	881	2,086	6,234	126	271	128	61	20	18,574

All privately owned KDD lands are under production except for roads, canals, drains, other structures.

KDD's Water Delivery System

Points of Diversion

KDD has two points of diversion along the west side of the District: the North Canal and the Klamath Straits. These points of diversion are on the main stem of the Klamath River about 10 miles downstream of Upper Klamath Lake. Project releases occur primarily between April 15th and October 15th. Diversions for winter flooding, under the District's supplemental State water right, occur between the middle of October through the middle of April, with January, February and March being the heaviest months.

North Canal

The North Canal is supplied by a one-mile long channel that connects the Klamath River with the District at the North Canal head-works. This channel has been cut through the

marsh on the left bank of the Klamath River and is maintained by clearing vegetation to allow water to flow.

Ady Canal

Further downstream on the Klamath River, the Ady Canal obtains its water through the one-mile long Klamath Straits channel. Water enters the District through the Ady Canal headworks, which has been installed in the railroad embankment. Historically, high winter flows spilled from the Klamath River into Lower Klamath Lake (which is now KDD and Federal refuge lands lying in California) through the Klamath Straits. Sections of the Klamath Straits channel have been modified and improved over the years. Vegetation is cleared from the channel to maintain flow capacity.

Regulation Facilities

North Canal

Water is diverted into the North Canal by opening the gates on three, 54-inch culverts in the railroad embankment. Water flows under the embankment into a small stilling pool, then through three, 48-inch culverts beneath Highway 97. The gates, which regulate the flow, are owned and operated by KDD however the USBR determines the availability of water.

The North Canal is approximately twelve and a half miles long and flows in a southeasterly direction along the eastern boundary of the District. From this main supply canal, water is delivered to water users through a number of turnouts with headgates. There are approximately forty turnouts to farm laterals directly off the North Canal and thirty-six lift pumps. The majority of these pumps lift water for members of Klamath Hills District Improvement Company (KHDIC), to which KDD has agreed to provide water. KDD management does not regulate these private turnouts or the lift pumps. KDD personnel regulate the flow in the supply canal, keeping it full, while the water users divert the amount of water that can be beneficially applied to their crops.

Ady Canal

Water is diverted from the Klamath Straits channel by opening five, 5 x 7-foot gates, which allow water to flow beneath the railway and Highway 97 into a small stilling pool. The gates controlling the flow are operated by KDD under the direction of the USBR as part of the Klamath Project. At the stilling pool, just east of Highway 97, are the headworks for the Ady Canal. The majority of the flow into the stilling pool is diverted through a siphon into the Ady Canal. The remainder is diverted north into the Highway 97 Drain.

The Ady Canal is approximately five and a half miles long and flows south through KDD, ending at the California-Oregon state line. This is the southern boundary of KDD and the final delivery point on the Ady Canal. At the state line, KDD delivers water to the Lower Klamath National Wildlife Refuge from the end of the Ady Canal.

In addition to the headworks for the Ady Canal at the stilling pool, there are other, smaller diversions. These smaller diversions deliver water to adjacent fields through

small culverts controlled by headgates. Also, an inverted siphon diverts water from the Ady stilling pool through three, 4' x 5' openings under the old Klamath Straits Drain, which are operated by the USBR.

KDD personnel regulate and maintain the water level in the Ady Canal while the District's water users divert water through twenty-nine gated turnouts in an amount that can be beneficially applied to the crops grown. The exception to this is the water delivered to the Lower Klamath National Wildlife Refuge lying in California, which is also supplied through the Ady Canal. Water diverted into the Refuge is initiated by a request from the United States Fish and Wildlife Service and regulated by KDD personnel.

The Ady Canal also provides water to three major laterals, the Center Canal, the Lease Land Canal and the West Canal. The recycled water from this project can be applied to any lands supplied by the aforementioned canals.

Center Canal

The Center Canal is a lateral off the Ady Canal and provides water to the middle of KDD, flowing across the Klamath Straits Drain via a flume. The canal itself terminates in the center of KDD at the Township Road where water is further diverted through two, 48" headgates that provide water to private and government lands. Diversions to Area K lands are regulated at this gate structure on the Township Road.

The Center Canal is approximately five miles long and diversions are "water user regulated" at the head of the canal through a concrete headwork consisting of three, 4.5' x 7' openings, a hand crank gate and flash boards. KDD personnel monitor and adjust water levels in the Center Canal daily. The canal has thirteen gated turnouts and three pumps to adjacent fields, all of which are regulated by the water user, with water being diverted as can be beneficially applied to the crops.

Lease Land Canal

The three mile long Lease Land Canal is a lateral off of the Ady Canal. Its main function is to supply water to the west half of the Area K lands. Water enters the canal through an open concrete structure with 3 openings that are 4.5 by 7 feet. Water flow is regulated by use of flashboards. KDD personnel monitor and regulate the canal to keep it full.

West Canal

The West Canal is approximately four and a half miles long and provides water to the most southwestern portion of KDD through its headworks consisting of two, 60" gates located at what is known as the old Oregon State University Experiment Station. The gates are kept open continuously with water users regulating diversions to adjacent fields through the seventeen gated turnouts.

Return Flows

The Klamath Straits Drain is the structure by which Klamath Reclamation Project tail-water as well as water returns from Federal refuge lands is returned to the Klamath River. Tail-water from upstream irrigation districts within the Klamath Reclamation

Project (the largest being the Klamath Irrigation District [KID] and the Tulelake Irrigation District [TID]) flows into the Wildlife Refuges lying in California and is then returned to the Klamath River through the Klamath Drainage District via the Stateline head-works and the Straits Drain. Drainage from KDD lands joins the returns from the rest of the Klamath Reclamation Project and Federal refuge lands.

Water Reuse

In the late 1990's, KDD constructed a tail water recovery system on the west side of the District at the Ady Canal and Township Road, known as the Westside Pumping Plant. This system was developed to benefit a portion of the landowners receiving water from the Ady Canal. Often times, lands lying south of the Straits Drain do not receive sufficient water through the three 4' x 5' siphons under the drain. KDD built the Westside Pumping Plant to help alleviate this problem by re-circulating tailwater in the drain in order to increase the head in the Ady Canal. The table below shows the amount of water KDD currently re-circulates yearly through the Westside Pumping Facility. The drainage water captured as a result of this project will also be recycled through this pumping facility, increasing the head even more.

KDD is aware that individual water users within KDD have developed similar smaller water re-use systems at the farm level. The District has no records to quantify the amount of reuse of these systems, but believes the benefit to be significant.

Table 2 – Water Reuse
Amount of water re-circulated at the Westside Pumping Plant from 1997 to 2010

Water Year	Amount re-circulated in acre-feet
1997	10,428
1998	5,808
1999	6,534
2000	7,860
2001	7,662
2002	4,620
2003	6,930
2004	6,105
2005	6,934
2006	5,610
2007	8,844
2008	8,028
2009	10,950
2010	9,702

Measurement Stations

To better manage and ensure a reliable water supply to its landowners, KDD monitors the water supply entering and leaving its borders by taking water measurement readings daily. Measurements of surface water inflow and outflow are conducted at the western and southern boundaries of the KDD, as identified further below.

Inflow Measurement Stations

KDD personnel measure diversions from the Klamath River through the gates at the North Canal and the Ady Canal manually on a once-per-day basis.

The flows entering KDD through the Klamath Straits Drain at the Oregon-California state line are from storm runoff events, subsurface flow, and tailwater from the Klamath Project. Tailwater from upstream irrigation districts such as KID and TID are pumped into the Lower Klamath National Wildlife Refuge. Spills from the Lower Klamath National Wildlife Refuge, which are significant during large storm events, drain into the Klamath Straits Drain. Water is conveyed within the Klamath Straits Drain through KDD and is pumped into the Klamath River at F & FF Pumping Plants. USBR manually measures the quantity of water flowing within the Klamath Straits Drain at the Stateline based on a theoretical rating.

Outflow Measurement Stations

KDD has an extensive drainage system in order to keep the water table below the root zone of the crops. When and where it is feasible, water is discharged from the drains into the laterals for reuse. All drains within KDD terminate at the Klamath Straits Drain, which is operated by USBR to keep the historical Lower Klamath lakebed sustainable for agricultural production. Water in the Klamath Straits Drain is pumped into the Klamath River at the F&FF Pumping Plants. The quantity of water pumped by the USBR at the F &FF Pumping Plants is measured based on a theoretical rating. This is the total return flow to the Klamath River for the entire Klamath Reclamation Project. KDD subtracts the return flows at the Stateline from the return flows at pumps F & FF to determine the return flows generated by KDD alone.

KDD also measures the flows delivered to the Lower Klamath National Wildlife Refuge from the Ady Canal based on a theoretical rating and periodic manual measurements.

Drainage System

Due to KDD's proximity to the Klamath River and the fact that it was historically a marsh and lake, ground water levels are high. An extensive drainage system throughout the District exists to lower the water table sufficiently to grow crops in the summer months. The proposed project will utilize existing District Drains (Rangeline Drain, Loop Drain, Township Drain) to convey drainage water from lands lying north of the Center Canal, to the existing Westside Pumping Facility.

Losses of Water From the System

Primary losses of water on KDD can be attributed to spillage, seepage and evaporation. Operational spills occur only at the spillways and only in emergency situations. Water spilled at these spillways flows into District drains for transport to the Straits Drain by which it is returned to the Klamath River.

Seepage and subsurface flow is captured by toe drains and also returned to the Klamath River via District drains and the Straits Drain.

Reducing the area of exposed water surface can reduce evaporation; however piping of canals and drains is not feasible for this District.

Because KDD is a drainage district and not an irrigation district, lining canals and drains with concrete or geomembranes, or piping canals is not practical. Throughout KDD, the water table is actually higher than the bottom of the canals. If geomembrane is used to line canals that are not kept at capacity, ground water pressure will push the lining out away from the sides and bottom causing it to float. The weight of the water in the ditches is what holds the lining in place so lowering or de-watering a lined canal for maintenance or inspection, although necessary at times, is not practical. The same scenario applies to concrete lining. If canals are not constantly held at capacity, water pressure exerted by ground water presses against the sides and bottom causing the concrete to heave or break.

Shallow, earth covered pipe would become buoyant and rise to the surface if not held at full capacity, much the same way old underground fuel tanks have been known to pop up out of the ground when ground water rises.

Piping or lining KDD's canals is also not feasible due to the fact that the lake bottom is constantly shifting, making the soil unstable. Movement would cause differential settlement, lifting and buckling of pipe and concrete linings

System Monitoring

KDD personnel monitor the delivery and drainage systems on a daily basis looking for leaking structures. Necessary repairs are made quickly to eliminate water loss.

Water Delivery Insufficiencies and Potential Solutions

West Side Delivery System Insufficiencies
Located at the Ady Canal is a stilling pool from which an inverted siphon diverts water through three, 4' x 5' siphons under the old Klamath Straits Drain. These siphons are owned by the USBR. The lack of volume at this point of diversion often results in water insufficiencies for the land irrigated with this water. In particular, a major landowner on the west side of the District receives insufficient water from the Ady Canal for his crops because the existing siphons are undersized to adequately deliver the necessary water for the crop needs. This is an on-going problem and it is one of the reasons why KDD installed the Westside Pumping Facility (a water recirculation plant) to supply additional water.

To boost the flows delivered via the Ady Canal to the west side of the District, KDD sees a couple of solutions:

- The UBSR could install additional piping under the Straits Drain, which would be very costly.

- KDD can construct this proposed project which will reuse drainage water from KDD lands lying to the north; recycling it to increase the head and water supply into the Ady Canal for lands supplied by that Canal.

Past Working Relationships With Reclamation

The Klamath Drainage District is part of the Klamath Reclamation Project, lying within the Mid-Pacific region of the U.S.B.R. Beginning shortly after the District's creation in 1915 and in the years ensuing, KDD has entered into a number of contracts and agreements with the U.S.B.R. for water supply, etc. Federal Area K lands lie within the boundaries of KDD, making the U.S. government a KDD landowner. In its efforts to manage Federal lands within the District, the Klamath Basin Office has a close working relationship with KDD.

Federal Water Conservation Grants Awarded

In the past five years, KDD has entered into two grant agreements with the B.O.R. under its Water Conservation Field Services Program. The first grant in 2008 funded the repair of two leaky spillways (North Canal spillway and the Lease Land Canal spillway) and a leaky culvert and headgate. It is estimated that these repairs conserve an estimated 2,825 ac-ft annually.

In 2010, KDD secured grant funds through Reclamation to rehabilitate the abandoned South Straits Canal in order to create what is known today as the South Straits Canal Water Delivery System. All work was performed by District personal with the exception of initial survey and design work, which was carried out by a professional engineer. Personnel from the Klamath Basin Office have performed their final inspection of the project and have found the completed project to meet their satisfaction.

This system serves 824 acres lying immediately south of the Klamath Straits Drain and north of the Center Canal.

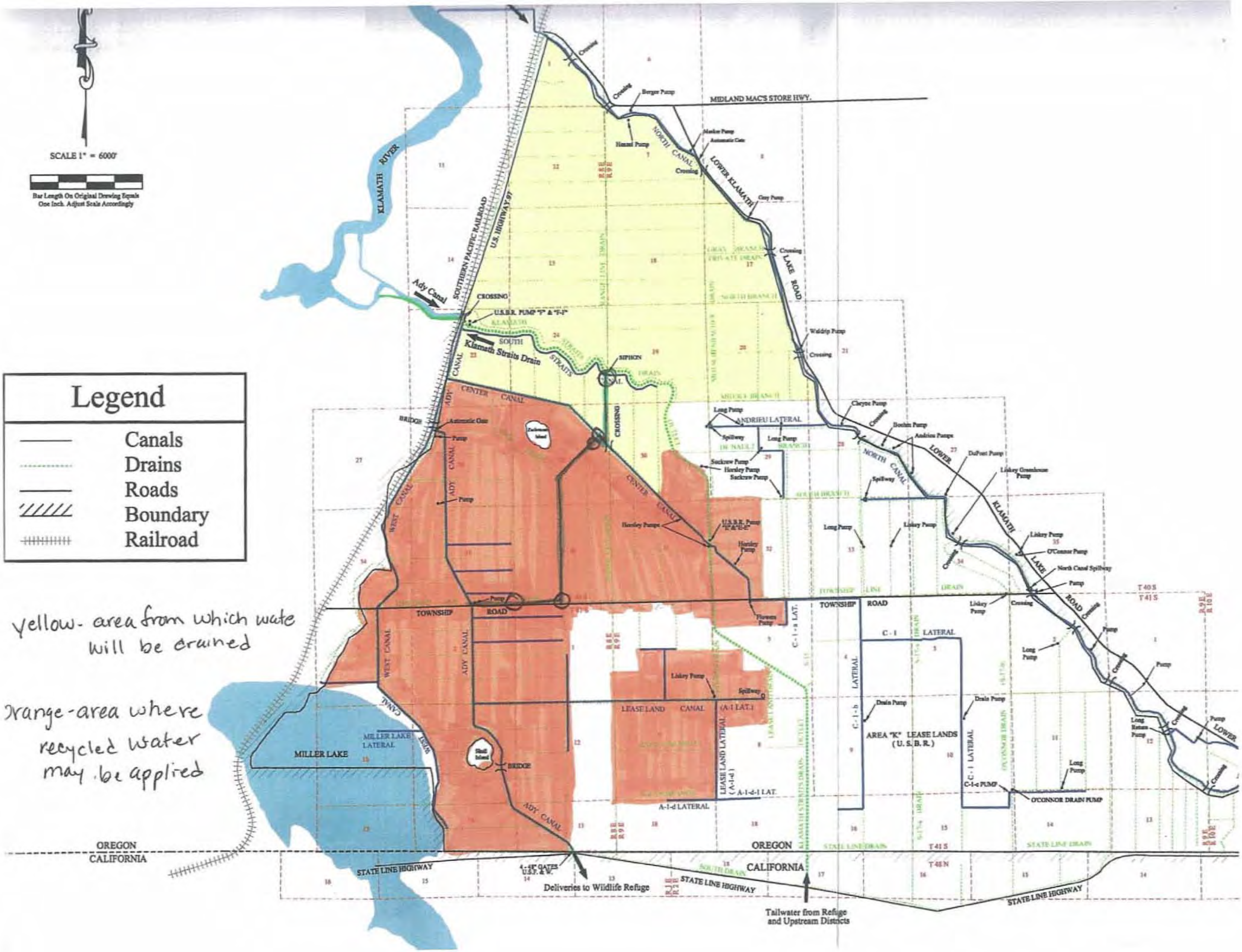
This project successfully eliminated inefficient irrigation practices that called for the application of excess Project water to 824 acres. Historically, field owners were required to flood irrigate uphill: from the lower elevations within the fields to the upper elevations, with water delivered through the Center Canal. This method of irrigation required the application of enormous amounts of water because the lower elevations had to become fully saturated before the water began to rise in elevation to cover the upper end of the fields. Some fields in the project area are nearly a mile in length and water stood approximately five to six feet deep at the lower elevations of the fields in order to get water to the upper end of the fields. In addition to the amount of water required to saturate the soils, water was lost to evaporation during this prolonged application period.

The new delivery canal system has been constructed along the upper elevation of the fields, immediately adjacent to and south of the Klamath Straits Drain. Flood irrigation is being accomplished by flooding down slope from the higher elevations to the lower elevation.

This new system has led to greater conservation and management of Project water and quicker irrigating cycles. It may also result in energy savings, USBR O & M cost savings and may result in an increase in water supply for Klamath River water users lying in California. The new water delivery system has also granted greater flexibility in the kinds of crops that can be grown on the parcels benefited by the system. This project was completed in November of 2011 and is expected to conserve in excess of 3,180 acre-feet of water annually.

(3) Technical Project Description

The grantor is referred to the maps on the following pages for this discussion.



SCALE 1" = 6000'
Bar Length On Original Drawing Equals One Inch. Adjust Scale Accordingly
Legend
Canals
Drains
Roads
Boundary
Railroad
yellow- area from which wate will be drained
Orange-area where recycled water may be applied
KLAMATH RIVER
SOUTHERN PACIFIC RAILROAD
U.S. HIGHWAY 97
Ady Canal
CROSSING
U.S.B.R. PUMP "F" & "F-1"
Klamath Straits Drain
SOUTH STRAITS
MIDLAND MAC'S STORE HWY.
Berger Pump
Hamel Pump
Crossing
NORTH CANAL
LOWER KLAMATH LAKE ROAD
Gray Pump
Waldrip Pump
SIPHON
CENTER CANAL
ADY CANAL
WEST CANAL
BRIDGE
Automatic Gate
Pump
ANDRIEU LATERAL
Long Pump
Spillway
Sackrow Pump
Horsley Pump
Cheyne Pump
Bochin Pump
Andrieu Pumps
DuPont Pump
Liskey Greenhouse Pump
U.S.B.R. Pump "E" & "E-1"
Horsley Pumps
Liskey Pump
O'Connor Pump
North Canal Spillway
TOWNSHIP ROAD
TOWNSHIP LINE DRAIN
Flowers Pump
C-1-a LAT.
C-1 LATERAL
C-1-b LATERAL
AREA "K" LEASE LANDS (U.S.B.R.)
Drain Pump
C-1-c PUMP
O'CONNOR DRAIN PUMP
O'CONNOR DRAIN
Long Return Pump
LEASE LAND CANAL
(A-1 LAT.)
LEASE LAND LATERAL (A-1-d)
(A-1-d-1 LAT.)
A-1-d LATERAL
MILLER LAKE
MILLER LAKE LATERAL
Shell Island
ADY CANAL
4-48" GATES U.S.F. & W.
Deliveries to Wildlife Refuge
KLAMATH STRAITS DRAIN
STATE LINE DRAIN
SOUTH DRAIN
STATE LINE HIGHWAY
OREGON
CALIFORNIA
Tailwater from Refuge and Upstream Districts
T 40 S
T 41 S
T 48 N
R 8 E
R 9 E
R 10 E

This map shows the location of the proposed culverts and headgates, which would enable drainage water from lands lying north of the District's Center Canal to be conveyed to the existing Westside Pumping Facility for redistribution to lands lying generally south of the Center Canal (see map for exceptions).

KDD proposes to capture drainage water from 5,302 acres lying north of the District's Center Canal (highlighted in yellow on the map), recycle it through the District's existing Westside Pumping Facility located at the intersection of the Township Drain and the Ady Canal, making approximately 7,953 ac-ft available to lands serviced by the Ady Canal, the Center Canal, the Lease Land Canal and the West Canal (highlighted in orange on the map).

This will be accomplished by installing a total of ten, 48" culverts with headgates, at five locations on existing District drains through which drainage water will be conveyed from the northern portion of the District to the existing Pumping Facility for distribution in the southern portion of the District.

Before discussing the proposed project, it is important to first describe the current management of the drainage water that the District plans to capture and recycle through this project.

Currently, drainage from lands lying north of the Straits Drain is conveyed through a network of small private drains into the Rangeline Drain. The Rangeline Drain conveys the drainage south where it empties into the Straits Drain and is returned to the Klamath River.

Land lying between the Straits Drain and the Center Canal (also highlighted in yellow), is also returned to the Straits Drain, but in one of two manners. Drainage from some of these lands is returned directly into to the Straits Drain, and the remainder is captured in the Center Canal toe drain and conveyed southeasterly to pumping plant E & EE where it is returned to the Straits Drain

Under the proposed project, drainage water from land lying north of the Straits Drain will be captured in the Rangeline Drain as usual, but rather than emptying into the Straits Drain, the gates will be closed at their intersection and the drainage water will pass under the Straits Drain through the existing siphons (known locally as "the diagonals"). It is at this point that new construction begins. All construction will be on District-owned structures.

Drainage will flow southerly in the Rangeline Drain, under the Straits Drain and under the recently rehabilitated South Straits Canal to the Center Canal toe drain lying along the north side of the Center Canal. This will be joined with drainage from lands lying between the Straits Drain and the Center Canal, which can already be captured in the Center Canal toe drain. Depending on irrigation needs, one of two headgates in the toe drain will be closed, backing water up in a northwesterly direction to the location of the Loop Drain (situated on the south side of Center Canal). New culverts with headgates will be installed under the Center Canal allowing the drainage to flow south to the Township Drain and then west to the Westside Pumping Facility. Below is a breakdown of the sub-projects within this proposal.

Crossing # 1: Installation of one new 48" culvert with headgate under the South Straits Canal.

Rational: Drainage water passing under the Straits Drain must also be conveyed under the recently rehabilitated South Straits Canal, which lies immediately south of the Straits Drain. To accomplish this, workers will remove the existing top two culverts that convey water in the recently rehabilitated South Straits Canal to expose the bottom culvert which will be moved over to make room for a second 48" culvert with headgate. Workers will install the seconded 48" culvert with headgate in the bottom of the canal; then reinstall the existing two culverts that set on top. The materials for this crossing include 200' of 48" culvert, a 48" headgate, one stub, five bands and rock. It also calls for 235 hours of machine work, 15 hours of dump truck use, and 20 hours of manual labor.

Crossing # 2: Installation of two new 48" culverts with headgates on each end under the Center Canal. (See Crossing # 5 for relocation of the crossing in the Center Canal north toe drain, which is part of this sub-project.)

Rational: On its journey south through the Rangeline Drain to the Westside Pumping Facility, the drainage must pass under the Center Canal and into the Loop Drain. To accomplish this, either one of two gates will be close causing the water to back up in a northwesterly direction in the toe drain until it is in line with the Loop Drain, which is situated on the south side of the Center Canal. A new crossing consisting of two 48" culverts with headgates on each end will be installed under the Center Canal at the location of the Loop Drain. (This requires the relocation of a crossing in the Center Canal north toe drain - Crossing # 5 below). Crossing # 2 involves site preparation and installation of the two culverts with headgates on each end. The materials for this crossing include 400' of 48" culvert, four headgates, 16 bands, four stubs and rock. It also calls for 373 hours of machine work, 30 hours of dump truck use, and 20 hours of manual labor. Two temporary earth-filled dams will be constructed in the Center Canal, one the upstream side and one on the downstream side to allow for construction.

Crossing # 3: Enlargement of the crossing at the intersection of the Loop Drain and Township Drain by removing the existing 36" crossing and installing two 48" culverts with headgates.

Rational: Passing under the Center Canal, the drainage water enters the existing Loop Drain through the two new headgates discussed in Crossing # 2 above. Water is conveyed in a southerly direction through the Loop Drain to the Township Drain, then westerly to the Pumping Facility. The existing culvert at the intersection of the Loop Drain and the Township Drain is 36" and would constrict the flow of water. Therefore two 48" culverts with headgates will be installed at this intersection. This calls for removing the existing smaller culvert and installing the two new culverts with headgates. The materials needed or this crossing include 180' of 48" culvert, two 48" headgates, six bands, two stubs and rock. It also includes 145 hours of machine work, 15 hours of dump truck use, and 10 hours of manual labor.

Crossing # 4: Install two new 48" culverts with headgates in a private crossing on the Township Drain.

Rational: On its journey west through the Township Drain toward the Westside Pumping Facility, the drainage water must pass under a private crossing. The size of the existing culvert would constrict the flow of water in the Township Drain. This calls for digging out the old, 48" culvert with headgate and replacing it with two 48" culverts. The materials needed for this crossing are 160' of 48" culvert, one 48" headgate (as the old headgate will be reused), two stubs, four bands and rock. This also calls for 145 hours of machine work, 15 hours of dump truck use and 10 hours of manual labor.

Crossing # 5: The grantor is referred back to Crossing #2 for this discussion of Crossing # 5. Crossing # 5 is the relocation of the crossing in the Center Canal toe drain at the Rangeline Drain. The proposal for Crossing # 5 is to remove the old existing 48" culvert and install a new 48" culvert with headgate 900' northwest where the Center Canal meets the Loop Drain. Construction in this stretch requires the removal of the old culvert, site work such as building up the north bank on the Center Canal toe drain to a width of 20 feet and height of six feet for a distance of 900 feet, and installing the new culvert with headgate. The materials for this crossing include 60' of 48" culvert, two 48" headgates, two stubs, four bands and rock. It also involves 208 hours of machine work, 110 hours of dump truck use and 8 hours of manual labor.

Catwalks: KDD employees will construct seven catwalks at a total cost of $2,518.94 to give access to the newly installed headgates. A catwalk diagram can be found in the Appendix. Klamath Falls has only one supplier for the materials necessary for the construction of the catwalks, therefore competitive bidding was not engaged in.

Pumping facilities will not be installed as part of this project. Water will be pushed through this system solely by the head created by the drainage water.

Feasibility Study: KDD hired a professional engineer to compare the elevation of the Rangeline Drain near the Straits Drain (point A) with the elevation at the Westside Pumping Facility (point B). The engineer determined that even thought the District is very flat (due to the fact that it overlays the historic Lower Klamath Lake) there is a fall of 1.8 feet between the two points. The engineer determined that this project would be feasible if the drain ditches between the points were uniformly graded. KDD personnel plan to clean the drains in the project area, grading, widening and improving drain banks as needed. KDD considers this part of its routine maintenance and has not included this work in its in-kind contribution. The engineer's letter can be found in the Appendix.

KDD personnel possess the experience and skill necessary to successfully complete this project and therefore will carry out all construction aspects of the project. Employee wages and fringe benefits for equipment operation, iron work, and manual labor, constitute a portion of KDD's in-kind contribution. Wages and fringe benefits amounts are calculated using January 1, 2011 Davis Bacon Wage Rates for Klamath County, Oregon.

Equipment necessary to carry out this project will be supplied by KDD. Equipment expenses were calculated based upon rates charged by construction equipment rental

companies located on the west coast. Equipment costs constitute the balance of KDD's in-kind contribution.

(4) Evaluation Categories

Water Conservation

KDD has a state and federally approved Water Conservation and Management Plan. At this time it is in the process of being updated and revised. This project was not foreseen at the time the Plan was written and therefore was not included in the Plan.

Subcriterion No. A.1(a)—Quantifiable Water Savings

As stated in the Executive Summary, KDD differs from other Districts in the Klamath Project in that KDD diverts its water directly from the Klamath River. Therefore, water savings under this proposal amounts to Klamath River water that is saved for downstream uses. It is assumed that if KDD can reuse 7,953 ac-ft of water diverted for its needs, then that same amount may be saved in the Klamath River for downstream uses. This is the water savings component of this project. Other water saving measures are either not applicable or not feasible for KDD under this proposal.

Improved Water Management

Recycling 7,953 ac-ft of Klamath River water through its drainage system improves water management on lands served by the Ady Canal. Due of poor facility design, the west side of the District supplied by the Ady Canal often experiences insufficient water deliveries for the crop needs. This project would increase the head and water supply in the Ady Canal which would help resolve this issue.

Also, during years when water is in shortage. Recycling drainage water will allow irrigators to continue producing agricultural commodities when they might otherwise be shut-off.

How water conservation amount was quantified:

KDD's State water right allows for the application of 3 ac-ft per acre per year. For the 5,302 acres from which drainage will be recycled as a result of this project, that amounts to 15,906 acre-ft of water applied.

It has been determined through water measurement (using USBR measurements) that the average ratio of tailwater pumped at the Government pumps to the amount of irrigation water diverted is 66%. This includes not only tailwater from agriculture diversions, but also storm run-off. For the purposes of the this proposal however, a more conservative percentage was assumed: an average of 50% of the water applied to lands lying north of the District's Center Canal will be drained and made available for reuse. This amounts to 7,953 ac-ft on 5,302 acres. This is intended to be a minimum figure as it does not include water from storm run-off which can be significant in years with high precipitation.

The amount of water expected to be better managed, in acre-feet per year and as a percentage of the average annual water supply

7,953 ac-ft will be better managed or 16.1% ((7,953 / 49,500)*100 = 16.1%) of the District's annual water supply

Percentage of Total Supply

At an average of 49,500 ac-ft per year, 7,953 ac-ft per year amounts to 16.1% of KDD's annual water supply. (7,953 / 49,500)*100 = 16.1%

Reasonableness of Costs

$311,753.00/(7953*30) = $1.31

(Culvert and headgate life is estimated at 30 years)

Energy-Water Nexus

Increasing Energy Efficiency in Water Management

This project should result in a reduction in pumping cost through the government's pumping plants E & EE, and F & FF. Compared to the cost of lifting KDD's initial amount of drainage water through the government pumping plants, this should result in greater energy efficiency because the tail water captured as a result of this project does not have to be "lifted" through the District's Westside Pumping Plant. The net returns to the government pumps will be lower after the water has been recycled. This should ultimately result in lower USBR O&M costs.

Benefits to Endangered Species

This project will benefit the bald eagle which is on the federal threatened species list. The irrigation and farming practices within the District promote and create thousands of acres of wildlife habitat providing the optimum use of land and water resources. KDD accomplishes this by simulating how the area operated prior to the construction of the railroad levee that severed the natural flooding of the Lower Klamath Lake from the Klamath River. Historically, the lakebed would fill during the winter months in high flow events and then drain as flows receded in the spring. KDD's winter flooding practices is intended to restore soil moisture in preparation for seed germination and may also reduce the need for summer diversions. Winter flooding reduces soil erosion and has proven to provide immeasurable benefits to wildlife. Winter flooding of fields provides foraging and diurnal resting habitat for waterfowl. It also creates a forage base for eagles, earning KDD lands the designation of ***"Oregon Feeding Area"*** for eagles. (Keister, etal 1987). Eagles depend on the rodents flushed out through field flooding in the winter months for part of their food base. KDD's winter flooding practices have enabled the eagle population in the Bear Valley National Wildlife Refuge to recover and thrive.

Wildlife from the adjacent refuges and habitat areas use lands throughout KDD. In 1998, KDD paid for an independent investigation to document the wildlife and habitat within KDD. A report from the firm *SRI/SHAPIRO/AGCO,* Inc. who performed the assessment

found an abundance of species within KDD and concluded that the agricultural practices, primarily winter flooding, provide important seasonal forage habitat for migrating waterfowl and bald eagles. Edward O'Neill, biologist, who documented additional species and activity throughout the year, updated this report in 2000.

Because the proposed project is most concerned with supplying winter water by recycling drainage from northern fields, this project becomes extremely important to waterfowl and bald eagles in those years when water is short.

Water Marketing
This proposal does not have any water marketing elements.

Other Contributions to Water Supply Sustainability
This proposed project contributes to a more sustainable water supply during years of drought, not just for landowners in KDD's target area (highlighted in orange) but also for stakeholders in that portion of the Klamath River lying in California.

The conserved water will initially be applied to agricultural lands in KDD with the drainage being returned to the Klamath River.

It is undetermined to what extent the proposed project may promote or encourage collaboration among stakeholders. The project has not been advertised so it is uncertain whether or not this project would enjoy wide support. It seems reasonable to assume that reusing Klamath River water would be welcomed whenever it can be accomplished.

The Board of Supervisors for KDD believes that the District's past water conservation efforts are good examples to other district's of the possibility of accomplishing significant water management projects at a reasonable cost to both the district and the government.

Upon completion of its first BOR grant, KDD's projects were publicized in the local newspaper. It is uncertain whether or not this current project, if funded, will be publicized in such a way to increase awareness of the District's water conservation and efficiency efforts. However, the District's efforts will be made known publicly through it's monthly and annual meetings as well as public documents published by the District. It is unknown whether or not KDD's project will increase the capability of future water conservation or energy efficiency efforts for use by other users.

Implementation and Results

Project Planning
KDD hired a professional engineer to compare the elevation of the Rangeline Drain near the Straits Drain (point A) with the elevation at the Westside Pumping Facility (point B). The engineer determined that even thought the District is very flat (due to the fact that it overlays the historic Lower Klamath Lake) there is a fall of 1.8 feet between the two points. The engineer determined that this project would be feasible if the drain ditches between the points were uniformly graded.

The project description above details how the project will be implemented. It is difficult to produce a schedule or timeline for construction work because of weather conditions which exist in the Klamath Basin and because some of the construction will have to done around irrigation schedules, for instance when installing the culverts and gates under the Center Canal. Actual time to construct the project is expected to take four months, but one year and four months is being allowed to compensate for irrigation schedules and harsh winter weather when work cannot be performed. Most work will be performed over the course of two summer seasons. Major tasks have been outlined in the project description. Construction can begin as soon as the grant agreement has been signed.

This project, while not specifically identified in KDD's Water Management and Conservation Plan it is the result of KDD's **Monitoring** practices noted on page 1 (Water Conservation Goals) of the plan. KDD monitors its system constantly to identify areas of water waste and system inefficiency. This project implements cost effective solutions that will conserve Project water and keep it in KDD's system for agricultural use during years of water shortage.

Innovation

The innovative nature of this project was demonstrated in the Project Description: existing facilities (drains and pumps) will be utilized to move approximately 8,000 ac-ft of drainage water from the northern portion to the middle portion of the District, from which point KDD has the option to apply this water to any number of fields lying within a 7,000+ acre section in the southern portion of the District - simply by installing 10 culverts with headgates.

KDD will assist landowners in the project area in recycling water on a smaller scale by making available to the landowners the District's Crisifuli Pumps.

KDD Board of Supervisors is contemplating a future replacement of the 60 hp pumps at the Westside Pumping Facility with 75 hp pump to more efficiently recycle water.

Readiness to Proceed

KDD personnel are capable of carrying out the work of this project. Because weather in the Klamath Basin gives the District a relatively small window of time to accomplish it projects, District employees will begin this project as soon as an agreement is signed. It is estimated that this project will require two seasons to complete, The District has funds on hand to cover its in-kind share therefore, it is also financially ready to proceed.

Non-Federal Funding

$182,197.00 (KDD's in-kind) / $311,753.00 = 58.4%

Connection to Reclamation Project Activities

KDD is an "on-Project" water user. Although KDD benefits from having its own unique points of diversion and therefore does not rely on tail-water from upstream users as does much of the rest of the Klamath Project, it still sees the need to work cooperatively with the rest of the Project irrigation districts to ensure the viability of the Project for generations to come. Because KDD is inherently tied to the same water source as the other districts in the Klamath Project, it is mindful of its practices that might affect the

water supply and the efficiency of the entire Project and acts accordingly.

IV.D. Performance Measures

Water Captured: Performance of this project will be measured using existing water measuring devices at the Westside Pumping Facility. Water that is captured from the lands lying north of the District's Center Canal as a result of the new culverts installed under this proposal, will be pumped through the Districts Westside Pumping Facility and therefore be subject to daily water readings as applicable. The District expects to see and record measurable increases in flows through this facility. The amount of water discharged at Pumping Plant F & FF should be lower by the amount recycled through this project.

Water Applied: In measuring the performance of the water applied as a result of this project, it is more reasonable to consider empirical data when validating conservation measures. The fact that water users are able to irrigated faster and more efficiently, and have better crop yields, is the best indicator that conservation measures are being effective.

The performance and outcome of this project will be reported at KDD's monthly business meetings, which are open to the public. It will also be reported at the District's annual meeting which is publicized in the local newspaper and likewise open to the public. Performance and outcome will be published in the District's Management Discussion and Analysis document and the District's Updated Water Management and Conservation Plan, both of which are public documents. Project benefits may not be known for perhaps some time following the completion of the project because the benefits will only be realized during the winter months in those years where water is in shortage.

IV.D.1. Environmental and Cultural Resources Compliance

KDD has budgeted 1.5% of the total project cost for Cultural and Environmental studies which will be performed by the Klamath Area BOR Office.

Earth disturbing work was outlined in the Project Description. Replacing and installing culverts in the banks will have minor impact on the water and air quality. Any potential impact will be short-lived. No animal habitat will be disturbed other than perhaps muskrat habitat. Muskrats cause many dollars worth of damage on the District each year and KDD already works at controlling the population.

Bald eagles, (Federal Threatened Species List) utilize KDD lands for foraging in the winter months. They feed on rodents forced out of the ground by winter flooding practices. This project will not interrupt the bald eagles use of KDD lands for foraging. The proposed project will serve to insure that the Bald eagles continue to have a forage base even in years of water shortage. There are no other endangered species on KDD.

There are currently no wetlands in KDD.

The water delivery system was constructed primarily between 1917 and 1950. Modifications to existing canals and headgates were described in the Project description above.

There are no structures or features within the boundaries of KDD that are listed or are eligible for listing on the National Register of Historic Places.

There are no known archeological sites within the boundaries of KDD.

This project will not have a disproportionately high and adverse effect on low income or minority populations?

There are no Indian sacred site or tribal lands within the project boundaries.

The project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area.

IV.D.2. Required Permits or Approvals

No permits or prior approval is required for this project.

4 (h) Funding Plan and Letters of Commitment

KDD is the sole contributor of non-federal funding for this project. KDD maintains a reserve fund equal to one years operating expense on deposit with the State of Oregon in a Local Government Investment Pool Account. The amount is in excess of $400,000. KDD is committed to fund its in-kind contribution of $182,196.91 from funds on deposit with the State of Oregon. There are no time constraints on the funds. The funds are currently available and KDD will begin drawing on them as soon as the agreement is signed and construction begins.

KDD has paid a professional engineer to look at the feasibility of this project (see engineer's letter in the Appendix). KDD has absorbed the engineering fees on this project.

There are no funding partners for this project and no funding requests that have not been approved.

Resolution to Commit the Klamath Drainage District to Financial and Legal Obligations Associated with the Receipt of WaterSMART Grant Financial Assistance

Whereas, the Klamath Drainage District is governed by a Board of Supervisors, and

Whereas, I, Luther Horsley am a Supervisor on the Board of Supervisors for the Klamath Drainage District and as such have the legal authority to enter into agreement on behalf of the District, and

Whereas, I have reviewed and support the application being submitted, and

Whereas, KDD is capable of providing the amount of in-kind contributions specified in the funding plan, and

Whereas, KDD will work with Reclamation to meet established deadlines for entering into a grant agreement,

Therefore, be it resolved this day that the Klamath Drainage District commits to the financial and legal obligations associated with the receipt of WaterSMART grant financial assistance.

Dated this 14th day of January, 2013

Luther Horsley, Supervisor on the KDD Board of Supervisors

IV.D.4. Project Budget

Funding Plan and Letters of Commitment
Non Federal share of project costs will be provided by KDD as in-kind expenses: primarily wages, fringe benefits and equipment expense. KDD is committed to provide $182,197.00 in fund to cover its in-kind costs. KDD maintains an investment fund with the Oregon State Treasurer upon which project in-kind expenses will be drawn. There are no time constraints on these funds: funds are immediately available for use on this project.

There are no other contingencies associated with KDD's funding commitment

Summary of Funding Plan: non-Federal and Federal funding sources.

Funding Sources	Funding Amount
Non-Federal Entities	
1. (In-Kind Contributions – Klamath Drainage District	$182,197.00
2.	
3.	
4.	
Non-Federal Subtotal:	
Other Federal Entities	
1.	
2.	
3.	
Other Federal Subtotal:	
Requested WaterSMART Funding:	$129,556.00
Total Project Funding:	$311,753.00

Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		TOTAL COST
	$/Unit and Unit	Quantity	
1. SALARIES AND WAGES –Davis Bacon wages for Klamath County, Oregon			
Excavator Operator	$34.65/hr.	438 hours	$15,176.70
Excavator Operator	$33.71/hr	220 hours	$7,416.20
Dozer Operator	$34.65/hr	308 hours	$10,672.20
Tractor Operator	$32.60/hr	140 hours	$4,564.00
Dump Truck Driver	$32.60/hr	185 hours	$4,976.50
Iron Worker	$33.62/hr	168 hours	$14,725.56
Manual Labor	$26.15/hr	68 hours	$1,778.20
2. FRINGE BENEFITS – Davis Bacon fringe rates for Klamath County, Oregon			
Equipment Operators	$11.50/hr	1106 hours	$12,719.00
Dump Truck Drivers	$12.75/hr	185 hours	$2,358.75
Iron Workers	$19.60/hr	168 hours	$8,584.80
Manual Labor	$11.25/hr	68 hours	$765.00
3. EQUIPMENT—Based upon rental prices charged for construction equipment on the west coast.			
John Deer 790 Excavator	$80/hr	438 hours	$35,040.00
Hitachi Long-Reach Excavator	$80/hr	220 hours	$17,600.00
D-5 Dozer	$90/hr	308 hours	$27,720.00
John Deere Tractor and Scraper	$50/hr	140 hours	$7,000.00
Dump Trucks	$60/hr	185 hours	$11,100.00
4. SUPPLIES/MATERIALS—Competitive bidding utilized where applicable			
48" Culvert	$54.35/ft	950 feet	$51,632.50
48" Bands	$64.00/ea	37	$2,368.00
48" Stubs	$136.00/ea	10	$1,360.00
48" Headgate	$4,300.00/ea	10	$43,000.00
Square tubing (40' pieces)	$27.29/piece	44 pieces	$1,200.57
¼" x 1 ½" Flat Steel	$21.97/ft	12 feet	$263.65
48" wide expanded metal grating	$131.84	8	$1,054.72
Diesel Fuel	$5.00/gal	4460 gallons	$22,450.00
Pit run rock	$1.50/cu. yd.	1080 cu. yds.	$1,620.00
6. ENVIRONMENTAL and REGULATORY COMPLIANCE COSTS [2] – Reference cost incurred by Reclamation or the applicant in complying with environmental regulations applicable to this Program, which include NEPA, ESA, NHPA etc.			
1.5% of total budget			$4,607.00
8. OTHER –List any other cost elements necessary for your project; such as extra reporting, or contingencies in a construction contract.			
			$0.00
TOTAL DIRECT COSTS--			$311,753.35
9. INDIRECT COSTS - What is the percentage rate % . If you do not have a Federally-approved Indirect Cost Rate Agreement or if unapproved rates are used - Explain Why.			
			$0.00
TOTAL PROJECT/ACTIVITY COSTS			$311,753.35

Refer to budget narrative for additional information.

Budget Narrative to Budget Proposal

1. Salaries and Wages:

Response: Job titles for positions on the project are: Equipment Operator, Dump Truck Driver, Iron Worker and Laborer. The hours associated with Equipment Operator are for excavator, dozer and tractor/scraper operation related to demolition, site work and construction; dump truck driver is for hauling rock from the gravel pit to the crossings and for hauling dirt to build up the 900' bank on the north side of the Center Canal toe drain; for iron workers to construct the catwalks; and for some manual labor. Hours for equipment operators and dump truck drivers are based upon the number of hours estimated for equipment and dump truck use. Davis Bacon wage rates for Klamath County have be used to arrive at the per hour rate for the labor component of the project. See Table A for hours, rates and total costs. KDD has budgeted $59, 309.36 for wages. This is part of KDD's in-kind contribution.

2. Fringe Benefits:

Response: Fringe benefit amounts are those amounts listed for each job title in the Davis Bacon wage rate document for Klamath County. Please see Table A for rates and total costs. KDD has budgeted $24,427.55 for fringe benefits. This is part of KDD's in-kind contribution.

3. Travel:

Response: There is no travel associated with this project.

4. Equipment:

Response: The equipment rates listed in Table A were derived from rates charged by construction equipment rental companies on the west coast. The cost includes wear and tear on the equipment, tires, etc. Please see Table A for a breakdown of rates, hours of operation and total costs per piece of equipment. KDD has budgeted $98,460.00 for equipment expense. This is part of KDD's in-kind contribution.

5. Supplies:

Response: The supplies include all materials necessary for the successful completion of this project. It includes materials to construct five crossings using 48" culverts and headgates, rock, and seven catwalks. Also included is diesel fuel for the equipment and dump trucks while used on this project. See Table A for a more detailed list and breakdown on these charges. KDD is requesting $124,949.44 from Reclamation to cover supplies. This would be part of Reclamation's cost share for the project.

6. Contractual/Construction –

Response: There will be no sub-recipients, consultants, or contractors associated with this project. All work will be done by KDD employees, using KDD equipment.

7. Environmental and Regulatory Compliance Costs –
Reference cost incurred by Reclamation or the applicant in complying with environmental regulations applicable to this Program, which include NEPA, ESA, NHPA and the Clean Water Act, and other regulations depending on the project, including costs associated with any required permits or approvals.

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.

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.

8. Other Costs:

Response: There are no other costs associated with this project.

9. Indirect Cost:

Response: There are no indirect costs associated with this project.

BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. WaterSMART	15.507	$	$	$ 129,556.00	$ 182,197.00	$ 311,753.00
2.						0.00
3.						0.00
4.						0.00
5. Totals		$ 0.00	$ 0.00	$ 129,556.00	$ 182,197.00	$ 311,753.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1)	(2)	(3)	(4)	Total (5)
a. Personnel	$ 59,309.36	$	$	$	$ 59,309.36
b. Fringe Benefits	24,427.55				24,427.55
c. Travel					0.00
d. Equipment	98,460.00				98,460.00
e. Supplies	124,949.44				124,949.44
f. Contractual					0.00
g. Construction					0.00
h. Other	4,607.00				4,607.00
i. Total Direct Charges *(sum of 6a-6h)*	311,753.35	0.00	0.00	0.00	311,753.35
j. Indirect Charges					0.00
k. TOTALS *(sum of 6i and 6j)*	$ 311,753.35	$ 0.00	$ 0.00	$ 0.00	$ 311,753.35
7. Program Income	$ 0.00	$	$	$	$ 0.00

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SECTION C - NON-FEDERAL RESOURCES				
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8. WaterSMART	$ 182,196.91	$	$	$ 182,196.91
9.				0.00
10.				0.00
11.				0.00
12. TOTAL *(sum of lines 8-11)*	$ 182,196.91	$ 0.00	$ 0.00	$ 182,196.91

SECTION D - FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 129,556.00	$	$ 129,556.00	$	$
14. Non-Federal	91,098.45		91,098.45		
15. TOTAL *(sum of lines 13 and 14)*	$ 220,654.45	$ 0.00	$ 220,654.45	$ 0.00	$ 0.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT				
(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16. WaterSMART	$ 129,566.00	$ 0.00	$ 0.00	$ 0.00
17.				
18.				
19.				
20. TOTAL *(sum of lines 16-19)*	$ 129,566.00	$ 0.00	$ 0.00	$ 0.00

SECTION F - OTHER BUDGET INFORMATION	
21. Direct Charges: $311,753.36	22. Indirect Charges: $0.00
23. Remarks:	

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Appendix

Catwalk Design

MARK MILLER & ASSOCIATES
CIVIL ENGINEERING

January 20, 2012

Mr. Joe Frost
Klamath Drainage District
250 Main Street
Klamath Falls, Oregon 97601

Re: Range Line Drain Elevations

Dear Joe,

Pursuant to your request, we have surveyed the difference in elevations from the northerly end of the Range Line Drain (near the Straights Drain) to the West end of the Township Line Drain to determine the feasibility of getting water from one end to the other. Based upon our survey results there is approximately 1.8 feet of fall from Point A to Point B. Therefore, if the drain ditch were uniformly graded from Point A to Point B, you would be able to intercept, convey and reuse the drainage waters from the adjacent lands.

If you have any questions, please call.

Sincerely,

Mark A. Miller

Mark A. Miller, P.E.
Principal

250-C Main Street, Klamath Falls, Oregon 97601
Phone: 541-281-2128 Fax: 541-885-3920 Email: mmiller.pe@charter.net

Engineer's Report

Declaration of KDD's Effort to Use Competition on the Purchase of Materials

This document is a disclosure of KDD's effort to compete on the purchase of large line item supplies and materials for the District's Water Recycling Improvement Project.

A cost breakdown for culverts, stubs, headgates, bands, and steel for catwalk construction were supplied to the grantor in the Budget Proposal Table. The figures submitted represent the lowest estimate when local suppliers were solicited.

Steel: The only supplier locally who could supply the steel for the project was Heaton's Steel. Therefore KDD will be purchasing the material for catwalks from this supplier.

Culverts, headgates, bands, stubs: In soliciting prices for the culvert, headgates, bands and stubs, KDD solicited estimates from the only two local suppliers: Heaton's Steel and J.W. Kerns. The two estimates differed by $4,500.00 The bid was awarded to J.W. Kerns, because they had the lowest estimate.

Rock: KDD has an agreement with O'Connor Livestock to purchase pit run rock from their pit at a cost of $1.50 per cubic yard. Cal-Ore Land Development LLC is operating O'Connor's pit and honors the agreement between KDD and O'Connor Livestock. This is the most cost effective place to purchase rock.