

WATER SMART GRANT APPLICATION SMALL SCALE WATER EFFICIENCY FY2017

MAY 15, 2017

WALKER RIVER IRRIGATION DISTRICT
PLYMOUTH DITCH COMPANY

FOAN: BOR-DO-17-FO11

CFDA: 15.507

FEDERAL FUNDING REQUEST: \$150,000

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EXECUTIVE SUMMARY

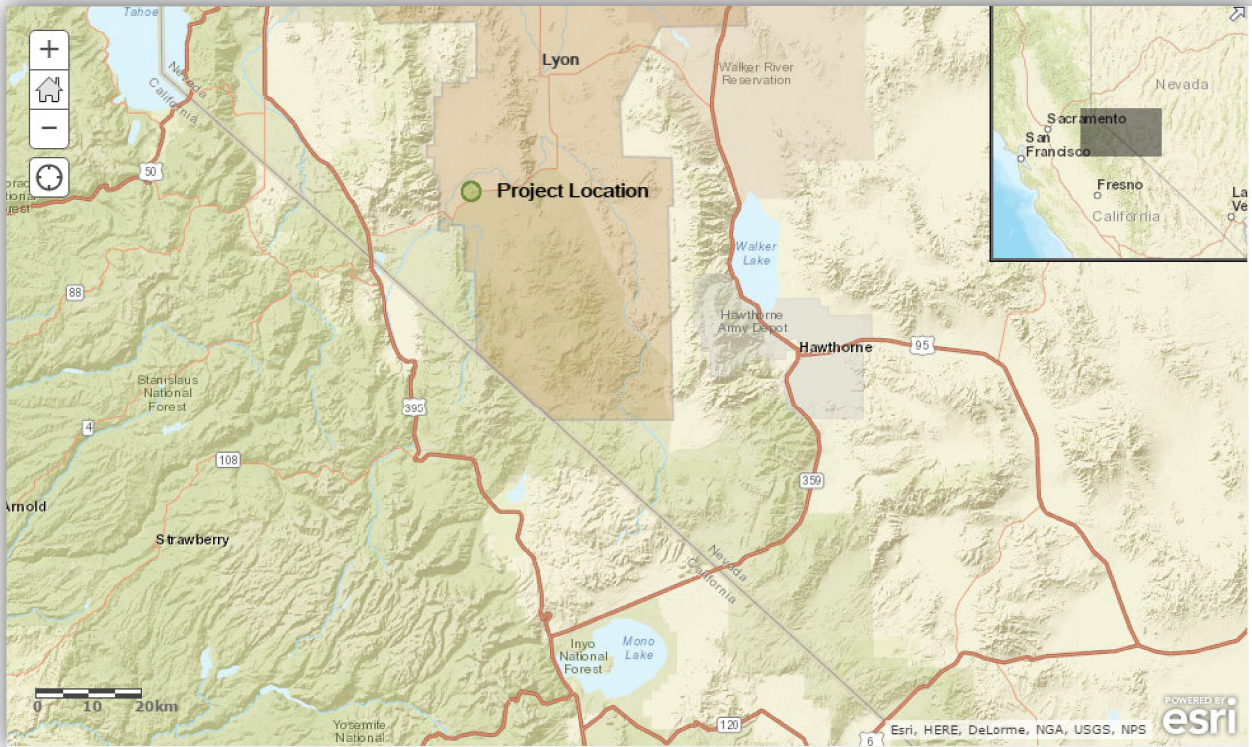
The Walker River Irrigation District (WRID), in coordination with the Plymouth Ditch Company (PDC), is submitting for federal funds under the Water SMART Small Scale Water Efficiency Grant for FY2017. A request of \$73,500 in federal funding is being made, which will allow the full project cost of \$150,000 to be met when added to the 51% match funds. This project has been titled as the “Lower Plymouth Pipeline Implementation Project Phase I.A.” (the Project). This independent utility project is expected to provide its own benefits by significantly decreasing the amount of water loss along the Plymouth Canal system, thus providing more efficient and appropriate delivery of water to agricultural users, reducing energy requirements, increasing the longevity of the system functionality and potentially improving ultimate in-stream conditions for endangered species.

BACKGROUND DATA

WRID was created in April 1919 under the Authority of the Nevada Irrigation District Act and functions primarily under Nevada Revised Statute 539. WRID has oversight of approximately 235,000 acres, which includes two (2) reservoirs and 80,000 irrigated acres along the east and west forks of the Walker River. The PDC is one of many independent corporations within the boundaries of the WRID and is comprised of approximately 22 users / shareholders and 31 gates obtaining water from the Plymouth Canal. These users include a variety of agricultural and livestock businesses, many of whom are continuing the legacy of working the land that their fore-fathers began generations before. Success in such a livelihood is dependent upon appropriate amounts of water to sustain the operations with the ominous challenge that this region continues to experience of unpredictable and unreliable supply of water. Regular monitoring of the Plymouth Canal water flows and delivery by WRID has shown water losses of up to 60% within the system. This shortfall in water delivery makes it nearly impossible for all users to obtain their allocated amounts. The need for system improvement is obvious. In November of 2016 the Irrigation Training & Research Center (ITRC) of California Polytechnic State University completed a Draft Technical Memorandum for the Lower Plymouth Pipeline Revised Design (Design). The Design includes technical information and recommendations for infrastructure improvements along the lower section of the Plymouth Canal, as provided by Dr. Stuart Styles, Director of ITRC. In 2016 an estimated 5,688.7 acre/ft of water travelled through the Plymouth Canal. Flows of this extent were required in order to deliver appropriate amounts of water through user gates; although, much of this water returned at the lower end of the system. Due to ongoing litigation, with regard to water rights along the Walker River influencing the total number of users and water requirements, it is expected that demand will increase. Of course, meeting this demand is subject to annual climate.

Major agricultural uses along the Plymouth Canal include alfalfa, grass, grain, as well as cattle and sheep. The Plymouth Canal is comprised of approximately 9.15 miles of primary ditch, not including laterals. Existing improvements include solar powered head gates and a modernization project with an installation of a Supervisory Control and Data Acquisition (SCADA) system. The recent SCADA Modernization Project is an example of a successful cooperative project between the Bureau of Reclamation (BOR) and WRID; this project highlights the capability of both WRID and the PDC to appropriately utilize federal funds.

Figure 1



PROJECT DESCRIPTION

The Project is located in Smith Valley, NV. Particularly, modifications are proposed between STN 392+30 to STN 422+00 along the Plymouth Canal as very few improvements have been made to this section of Canal since it was created in 1867; it's in dire need of attention. This is addressed as Phase I in the ITRC Technical Memorandum (see Attachment A). The design was drafted from field survey data gathered in 2014. It has been decided to address this section due to its overall cost-benefit in conserving water. Inefficiencies in water delivery along this section are caused in part by improper elevations, canal cuts, wash-outs, pooling, evaporation and seepage. Approximately 2,358 Linear Feet of pipeline (The Lower Plymouth Pipeline) will replace and bypass deep, wide, overgrown, open flood section of the Plymouth Canal which is currently exposed to ambient factors and incurring considerable water loss. The design includes piping as corrugated 36" High Density Polyethylene with gasket joints buried at a depth of ~14' along a specified hydraulic grade line. Special consideration is given to elevation so that gravity will drive the system. Periodic air vents will be installed to improve flow and reduce pressure. The capacity of the pipeline is designed for 35 CFS.

The proposed pipeline path runs through land owned by R.N. Fulstone Company; the Project is supported by Steven Fulstone, President of R.N. Fulstone Company. A letter of intent to approve an easement has been drafted and can be referenced as Attachment B.

EVALUATION CRITERIA

Planning Efforts Supporting the Project

1. Listed below are two adaptation strategies which have been developed with a focus on water savings and return in-stream flows. Because both of the studies are being conducted along the Walker River, WRID will be a critical cooperating agency in their pursuit of success. The PDC will not specifically be involved with assessments; however, as upstream water users they will certainly play a role in strategic successes.
 - a. **Conservation assessment for Walker Lake in Mineral County, Nevada – The Nature Conservancy**
This assessment has a primary restoration strategy to increase the quantity and quality of freshwater inflows to Walker Lake.
 - b. **Walker Basin Restoration Program- A Business Plan for the Conservation of the Lahontan Cutthroat Trout: A Ten Year Plan for Conservation Throughout Its Range – National Fish and Wildlife Foundation**
The Walker Basin Restoration Program was established in accordance with Public Law 111-85 in October 2009 for the primary purpose of restoring and maintaining Walker Lake, a natural desert lake in Nevada at the terminus of the Walker River stream system of Nevada-California.

Project Benefits

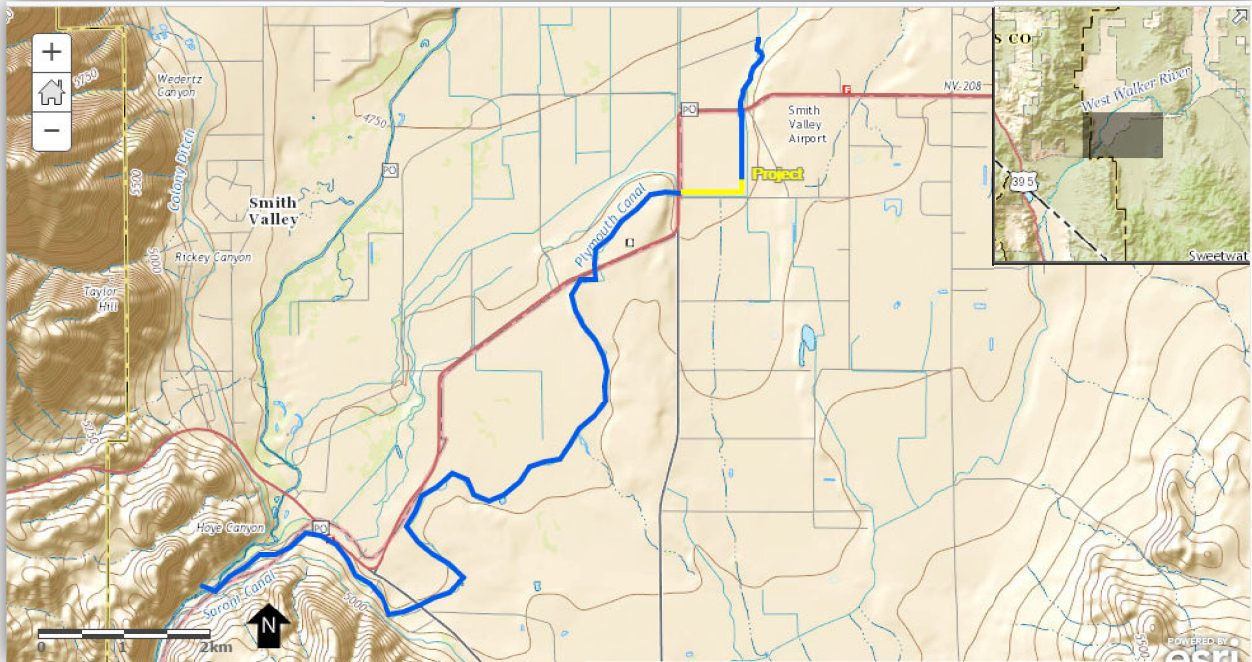
1. The Project is expected to both conserve water as well as improve water transport and delivery efficiency through installation of piping. Measured losses in the past year ranged up to 60% daily water loss along the Plymouth Canal system with an annual daily average of 35% water loss. Total annual system loss in 2016 is calculated at 1,398.7 acre-ft/yr. A decrease to system water loss is estimated to drop below a daily average loss of 29% which equates to savings of at least 231.6 acre-ft/yr. This was calculated utilizing the CFS measurements in Figure 9 and percentage measurements in Figure 10. There were 112 days of flowing water for which the CFS totals could be made for acre-ft/yr metrics. The water savings is expected to increase return flows into the Walker River, which is the primary water source for Walker Lake.
2. With a 17% decrease in system loss, calculated at 231.6 acre-ft/yr, it would be fair to assume that water will either remain in-stream as not needed for irrigation demand or will return to in-stream flow at the end of the system.
3. Resulted benefits from increased in-stream flows include improved stability and diversity to riparian and lacustrine habitat, as well as improved physical water quality composition for both fish and wildlife. Most notably the Lahontan Cutthroat Trout, a federally threatened species, and the Bi-State Distinct Population Segment of the Greater Sage Grouse, a species of particular ecological interest. Additionally, increased in stream flows would increase ecosystem capacities for all biological life along the lower Walker River. Recreational species such as large game, upland game, waterfowl and rare seasonal birds of the Pacific flyway, would likely increase. Increased fresh water flows into Walker Lake, an imperiled desert terminal lake, could potentially improve water composition for native species. The lake has seen total dissolved solids at a concentration reaching 26 g/L as of the spring 2016, which is well above the lethal limit for most native fish species. The Tui Chub may also be saved from disappearing from Walker Lake should fresh water levels returning to in-stream flow increase and reach the Lake.
4. The BOR Desert Terminal Lakes Program has funded several projects which would positively influence fish and wildlife populations. Projects implemented include, a

Walker River Basin Restoration / Acquisition Program which works to restore water to Walker Lake and support efforts to preserve Walker Lake while protecting agricultural, environmental, and habitat interests in the Walker River Basin. The BOR is involved with the Walker River Basin Cloud Seeding Project intended to enhance precipitation, primarily in the form of snowfall, while developing hydrologic models.

5. Increased in-stream flows will not specifically benefit federally designated critical habitat.
 6. Economic benefits from increased in-stream flows would apply to many businesses along Walker River who rely on tourism, such as fish, photography and bird guides as well as resorts. Social and recreational benefits include fishing, birding and tubing all of which happen annually during special events.
 7. Considering public benefits of water conservation for agricultural businesses, it surely lends itself to improved local economy and access to healthy local foods. As farmers and ranchers find themselves in a more secure spot financially, their children are more likely to carry on the family business and desire to stay in the area raising families of their own. Individuals invested in an area have far more concern to see that ecosystems as a whole are conserved.
 8. The primary water supply sustainability concern in the region is upholding historic water rights for agricultural users while preserving the Walker Lake ecosystem. Efforts and support to such projects, in addition to the BOR, can be tied to the US Fish and Wildlife Service, National Fish and Wildlife Foundation, Trout Unlimited, Nevada Department of Wildlife, California Department of Wildlife, Cal Trout, Desert Research Institute, University of Nevada, Walker Basin Restoration Foundation, Walker River Paiute Tribe, Natural Resource Conservation Service, Lyon County and the State of Nevada.
 9. This Project will help to address the water supply sustainability concern by increasing water use efficiency upstream ensuring more users get their allotted amounts while increasing return flows. The number of diversions and users is slated to remain the same. Yet, minimizing system losses will help alleviate water supply shortages which recently can be contributed to drought and climate variation. A greater amount of water coming through the head-gate will find its way to the bottom of the system making the Ditch Rider's job easier.
 10. The Project is expected to increase in-stream return flows, which by way of the Walker River may provide additional water leading through the Walker River Paiute Tribe Reservation. As a disadvantaged community in pursuit of additional water, it is likely that they will pursue the use of any additional water. This may or may not affect how much returns to Walker Lake.
 11. The outcome of this Project will guide planning for future improvements as a template, such as Phase II of the Lower Plymouth Pipeline Revised Design. It may also guide improvements along other irrigation systems that are within the Walker River Basin which would essentially provide similar benefits.
2. Post project metrics which will be utilized to quantify actual benefits of the project are as follows:
- a. Linear Feet of canal replaced with piping.
 - b. Water transit loss through project section.
 - c. Annual water loss along Plymouth Canal from head gate to lower end.
 - d. Annual water returned to in-stream flow at lower end of Plymouth Canal.
 - e. Annual daily flow ordered.
 - f. Water savings calculated from baseline and post-project data.

Project Implementation

Figure 2



The ITRC Design specifies a Phase I and a Phase II. Only half of Phase I is being addressed at this point (Phase I.A.) respecting technical and financial feasibility. In accordance with [Section 9504\(a\)\(3\)\(B\) of P.L. 111-11](#), WRID and PDC agree: 1) not to use any associated water savings to increase the total irrigated acreage of the applicant; and, 2) not to otherwise increase the consumptive use of water in the operation of the applicant, as determined pursuant to the law of the State in which the operation of the applicant is located.

Table 1: Project Milestones

MILESTONE	January 2018	March 2019	September 2019	October 2019
Environmental /Cultural Review	X			
Project Construction		X		
Post Project Performance Measures			X	
Closeout Report				X

CHARACTERISTICS OF PIPE

Diameter (inches)	36	
Length (ft)	3,000	
Roughness Coefficient	0.0135	(Corrugated PE Smooth Inner=.0135)
Number of bends	1	(90 degree bend with curve radius approx equal to pipe diameter)
Head (ft)	11.4	(Vertical distance from water to discharge)

DISCHARGE RATE =

37.70	CFS
16,921	GPM
74.78	Acre-Ft/Day

Figure 3



Figure 4



~20'

Figure 5



Figure 6

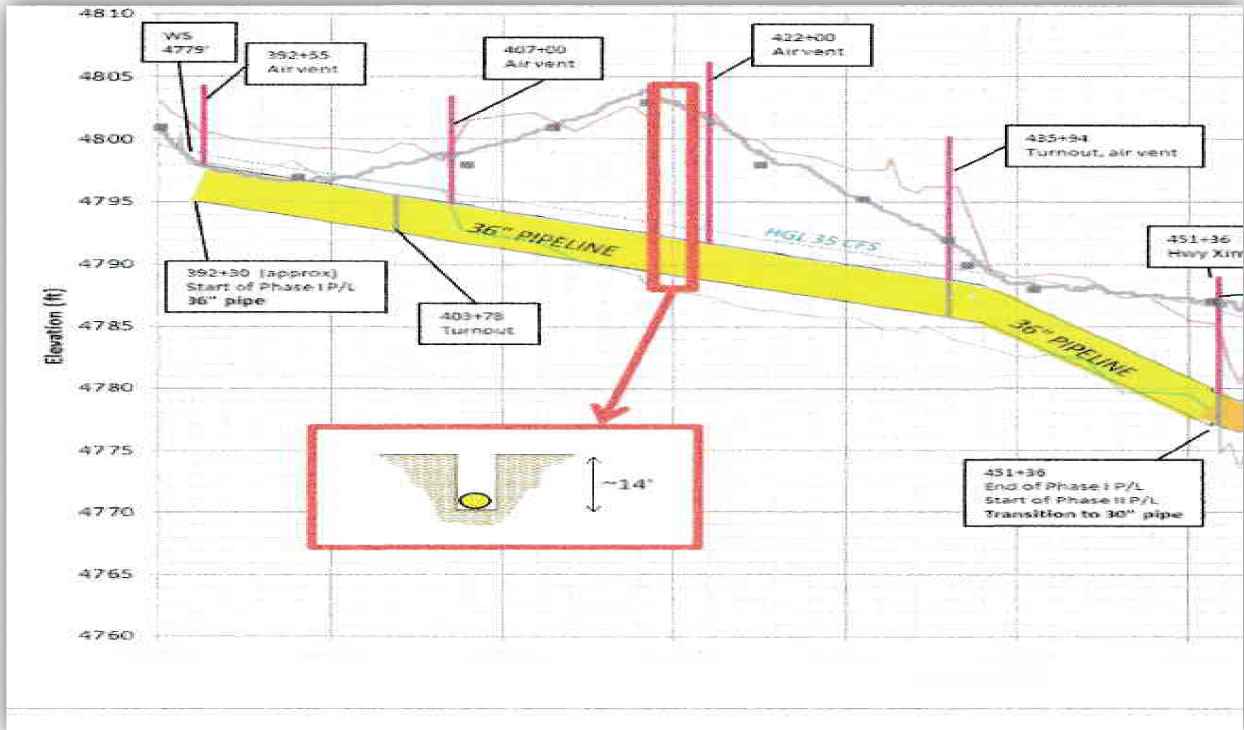
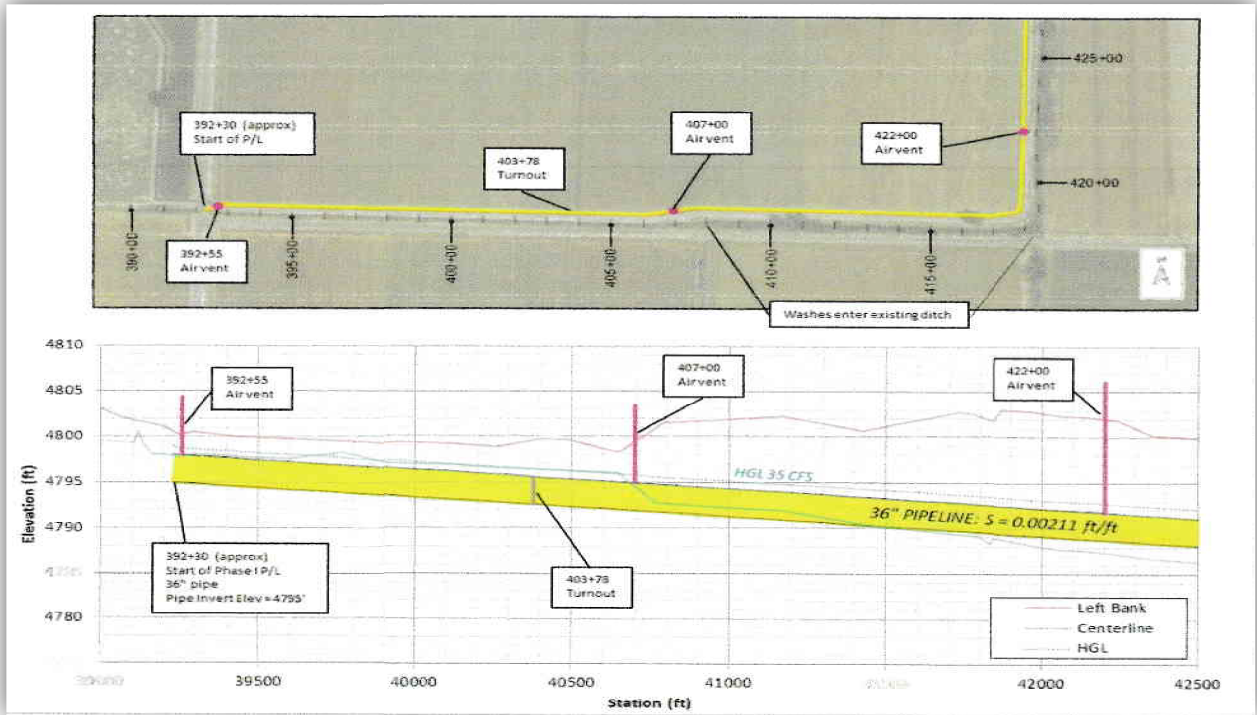
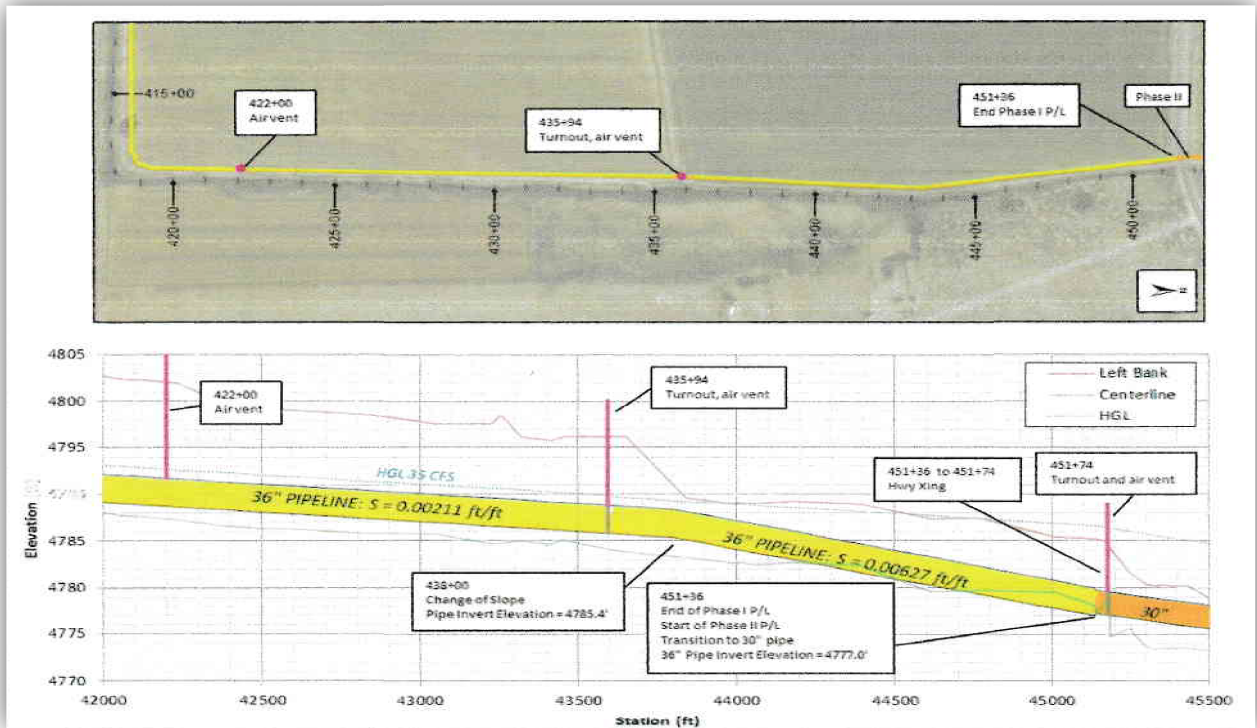


Figure 7



ITRC Draft Technical Memorandum pg6

Figure 8



ITRC Draft Technical Memorandum pg7

Figure 9

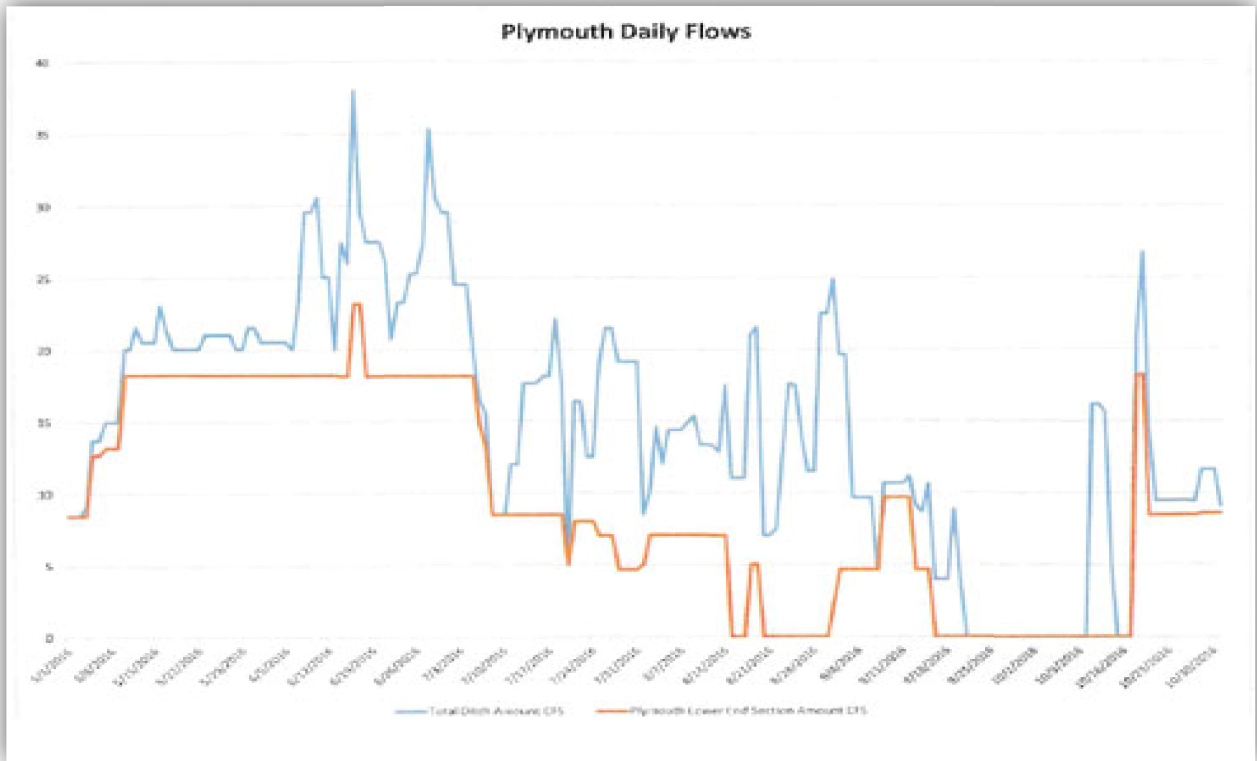


Figure 10

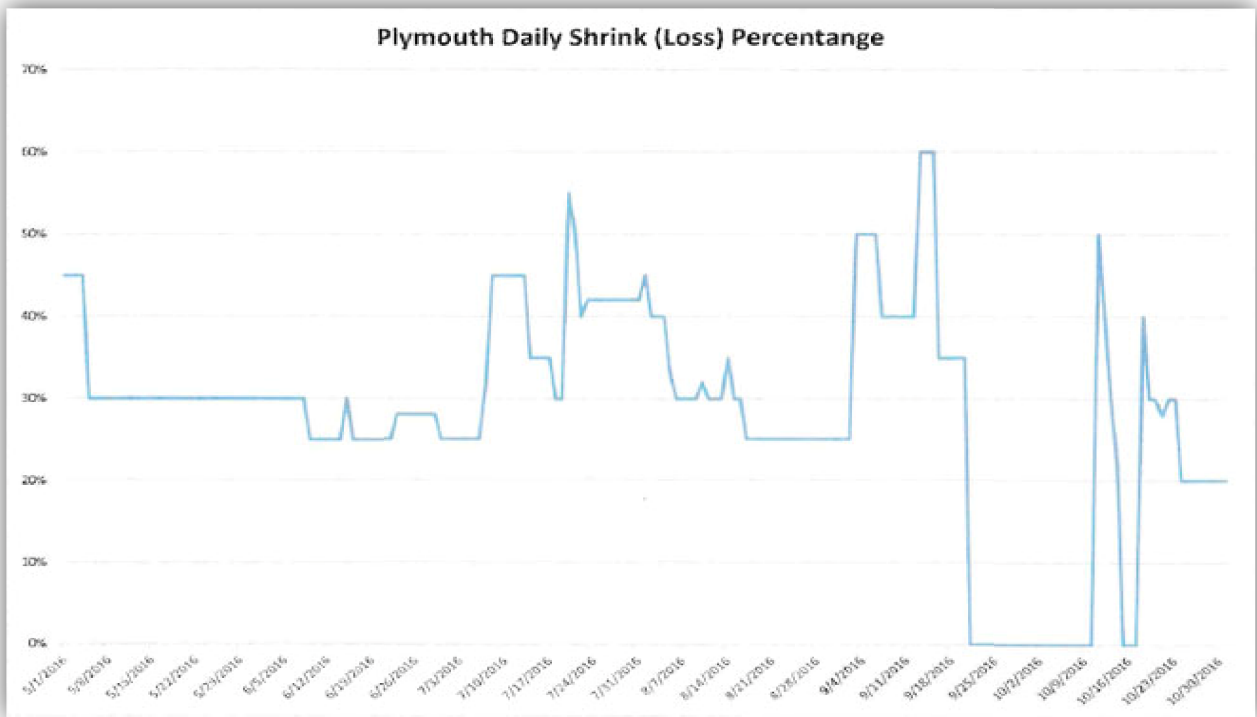


Figure 11

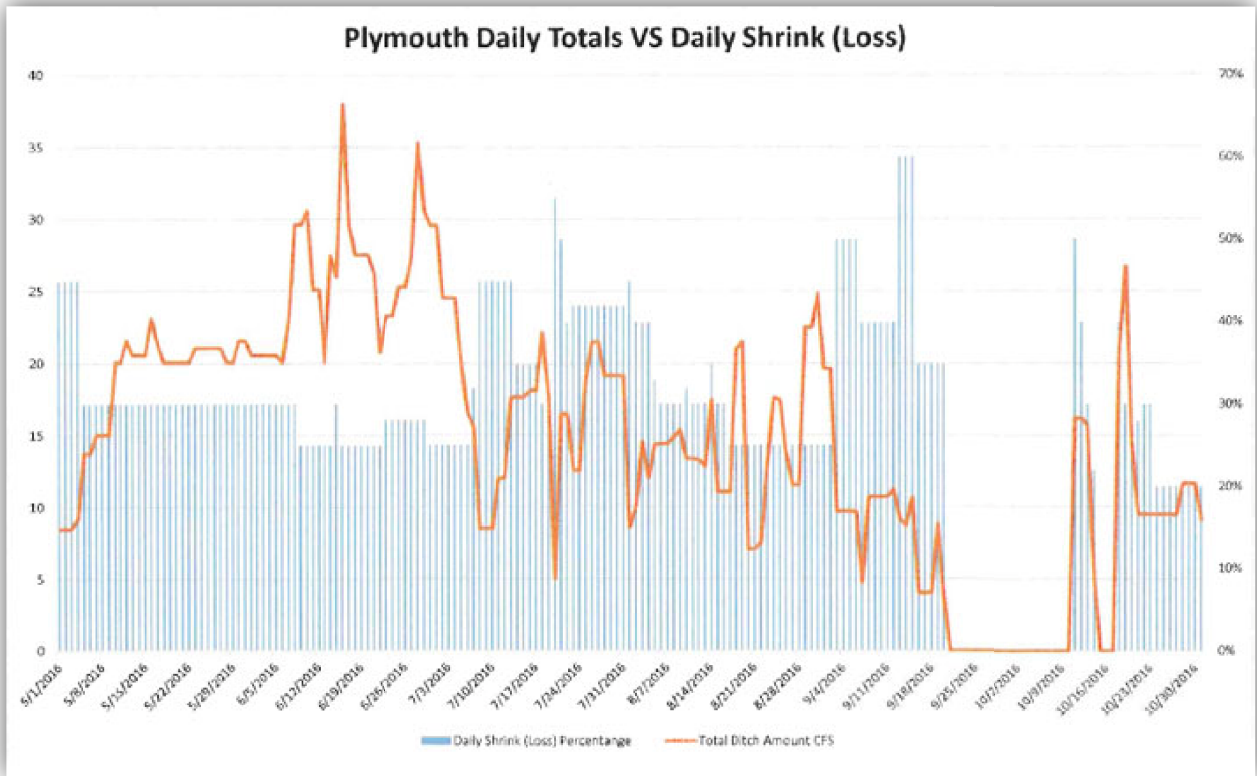
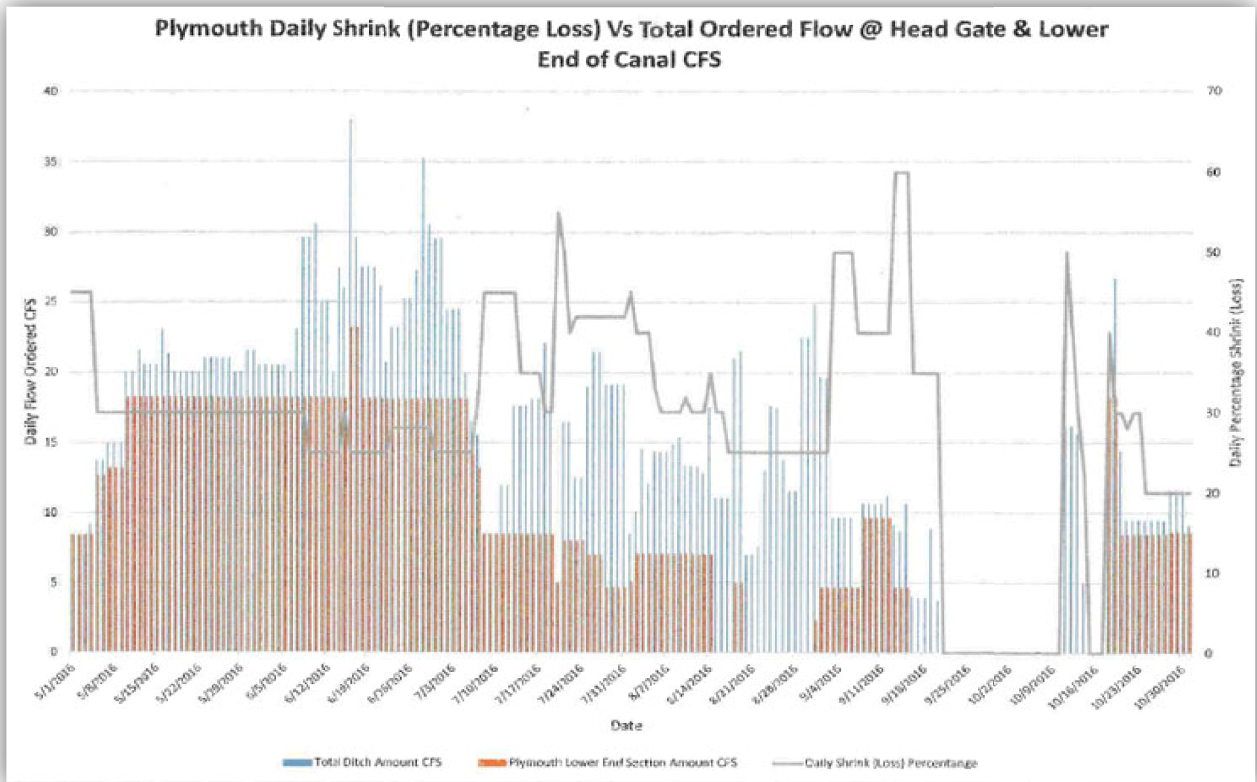


Figure 12



Nexus to Reclamation

1. The proposed project is connected to Reclamation project activities by contributing to common goals such as, conserving water, protecting agriculture, environmental and habitat interests.
2. The applicant does not receive Reclamation project water.
3. The Project is not on Reclamation project lands and does not involve any Reclamation facilities.
4. The project is in the same basin as other Reclamation projects such as the Walker Basin Restoration Program with the National Fish and Wildlife Foundation and the Walker Basin Project with the University of Nevada Reno & Desert Research Institute.
5. Project results will include an increase of return flows down-stream due a more efficient use of water along the Plymouth Canal. This increase of water, which may potentially reach Walker Lake is a contribution in alignment with the goals of the of the Reclamation projects listed.
6. The waters of the Walker Basin have been a integral part of life fore many tribes including the Bridgeport Indian Colony, the Washoe Tribe, the Yerington Paiute Tribe and the Walker River Paiute Tribe. In addition many other tribe's in the region both federally and non-federally recognized make use of this resource. Since the project does not adversely affect the current flows but potentially works to restore flows it is a mutual benefit to other users such as the Tribes. The federal Indian trust responsibility as a legally enforceable fiduciary obligation on the the part of the United States, Reclamation included, to protect, among other things, tribal resources. The Walker Rive Paiute Tribe has water rights along the Walker River and would benefit from increased flow, thus fulfilling a portion of trust responsibility. Additionally, federal projects, under Executive Order 13175, provide the opportunity for Tribal consultation which further helps Reclamation meet trust responsibilities to Tribes.

ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

1. All applicable environmental and cultural requirements for Federal funding, including the National Environmental Policy Act, the Endangered Species Act and the National Historic Preservation Act, will be followed and documented. Preliminary review of the project area has not identified adverse affects to environmental or cultural resources.
2. As the proposal is planned for installation of piping off of the Plymouth Canal, an irrigation ditch, it is exempt from dredging permits from both the Environmental Protection Agency and the Army Corps of Engineers under the Clean Water Act. The canal, which is man-made, does occasionally transport surface water acquired from the West Walker River as permitted by the users for irrigation. Classification by the Fish and Wildlife Service along the canal is wetlands.
3. The pipe pathway is planned entirely within private property belonging to R.N. Fulstone Company; an easement is being drafted. Trenching will occur in order to install pipe which may result in minimal airborne particulate matter. Surface material is existing agricultural vegetation, alfalfa. Soil content is primarily East Fork loam, clay loam and clay substratum.
4. No known occurrences of federally listed species have been documented in the project area. The project area does not contain any critical habitat.
5. The beginnings of the Plymouth Canal may have been around 1876 with modifications being integrated since then. There are no head gates which will be affected or altered.

Project construction will be conducted during the non-irrigating season, likely in the fall when the soil is dry. The project is not expected to contribute to any significant water transported sediments. The section of the canal which will be diverted into pipe will no longer have heavy flows and may fully grow in with vegetation creating wildlife habitat.

6. No historical or culturally sensitive properties lay within the project boundaries.
7. No known archaeological sites are present.
8. The Project will not have a high or adverse effect on low income or minority populations.
9. Access will not be limited to any ceremonial grounds or sacred sites of Native Americans.
10. It is not anticipated that the Project will introduce or contribute to the spread of noxious weeds or non-native invasive species known to occur in the area. Likely the existing agricultural vegetation will re-fill the disturbed soils.

FUNDING PLAN AND LETTERS OF COMMITMENT

1. A total of \$76,500.00 is planned as the applicant contribution towards this project. By March 1, 2019 it is expected that the PDC will have the full \$76,500.00 dedicated as monetary match cost. A PDC cash estimate sheet can be referenced as Attachment C.
2. Assessment fees are collected from individuals belonging to the PDC on an annual basis. These funds are readily available upon approval from two signatories from the Board of Directors. Out of the assessment fees is a nominal operations cost which has been factored in to the cash estimates.
3. One contingency that may or may not change is the Easement value through R.N.Fulstone property. An estimated assessment value may be waived pending mutual approval from the PDC and the land owner.
4. Expenditures that have been incurred before the start of the grant are associated with grant preparation and submittal by the Grant Writer in the amount of \$3,600.00.
5. An Official Resolution to accompany this grant proposal was signed at the February 7, 2017 WRID Board Meeting. The PDC has signed a Resolution for the Project and the grant application (See Attachment E).
6. No other funding or project partner contributions, besides verbal support of the project, have been received.

Table 2: Summary of Non-Federal and Federal Funding Sources

Funding Sources	Amount
Non-Federal Entities	
1. Plymouth Ditch Company	\$76,500.00
Non-Federal Subtotal	\$76,500.00
Other Federal Entities	
1. N/A	\$0
Other Federal Subtotal	\$0
Requested Reclamation Funding	\$76,500.00

Plymouth Ditch Company

Resolution 17-2

Application for BOR WaterSMART: Small Scale Water Efficiency Grant

WHEREAS: The Plymouth Ditch Company (PDC), is a non-profit corporation established to deliver irrigation water through the Plymouth Canal, and operates within the boundaries of the Walker River Irrigation District (WRID) which has delegated authority under the Nevada Irrigation District Act by Nevada Revised Statute 539; and,


WHEREAS: the PDC has water delivery authority for water users along the Plymouth Canal; and,

WHEREAS: the PDC has a common goal of improving water delivery efficiency; and,


WHEREAS: it is in the best interest of the of the PDC and WRID to cooperatively submit a proposal in the amount of \$150,000.00 to the Bureau of Reclamation (BOR) for the WaterSMART: Small Scale Water Efficiency Grant in order to fund the Lower Plymouth Pipeline Project Phase I-A; and,

WHEREAS: the PDC is committed to contributing \$80,000.00 towards the project as monetary match-cost.

THEREFORE LET IT BE RESOLVED: that the PDC is in agreement by majority vote of the Board on this 12th day of May, 2017 to pursue BOR WaterSMART- Small Scale Water Efficiency Grant funding.



Steven A. Fulstone
Board Member



Alton Anker
Board Member

Page 1 of 2
REVISION 1
 Bid Date: 5/15/2017
 Time: 12:00PM

Proposal for:
Modified (Reduc W. R. I. D. - Lwr Plymouth Pipeline, Phase 1
 From
 Mountain West Construction, Inc.
 1170 Zerolene Rd. P. O. Box 995, Minden, NV 89423
 LN: 99999 Type: A - General Engineering
 Phone: (775) 782-5957 Fax: (775) 782-0322

Quote Number: 2200.5
 Plymouth Ditch

Item	Description	Quantity	Unit	Unit Price	Total Price
CONBASE	Construction Base Bid				
01A	36" HDPE Poly Pipe	2,358.00	LF	31.4900	74,253.42
01B	Gravel Bedding For Pipe	2,358.00	LF	5.1900	12,238.02
01C	36" Fittings (As Needed)	2.00	EA	1,103.0000	2,206.00
01D	Labor And Equipment To Install Pipe	2,358.00	LF	16.7900	39,590.82
02	Irrigation Box Structures	1.00	EA	3,500.0000	3,500.00
03	ARVs	1.00	EA	733.0000	733.00
04	Inlet Structure Budget	1.00	EA	10,000.0000	10,000.00
05	(Temporary) Outlet Diversion Structure Budget	1.00	EA	2,479.0000	2,479.00
				Total:	<u>145,000.26</u>
CNTIN	Construction Contingency 0%				
! 01	Construction Contingency	1.00	LS	0.0000	0.00 !
				Total:	<u>0.00</u>
				Total:	<u>145,000.26</u>

√ = Locked Bid-Item

! = Zero Total Price

5/15/2017 11:05 am

Attachment Enclosed

Estimator: JOHN CARLSON



Generated by a SharpeSoft Product

Modified (Reduc W. R. I. D. - Lwr Plymouth Pipeline, Phase 1

- 01 BID INCLUDES ONLY THOSE ITEMS INCLUDED ON THE PROPOSAL.
- 02 COST OF A BOND IS EXCLUDED.
- 03 SCHEDULE IS SUBJECT TO WEATHER CONDITIONS, AVAILABILITY OF MANPOWER, EQUIPMENT AND MATERIAL.
- 04 ALL RIGHT OF WAY IS TO BE PROVIDED AT NO COST OR DELAY TO MOUNTAIN WEST CONSTRUCTION, INC.
- 05 ALL COSTS FOR PERMITS; FEES; STAKING; TESTING; INSPECTION; SURVEYING AND ENGINEERING ARE EXCLUDED.
- 06 PRICES ARE BASED ON THE FOLLOWING: 1) AWARD OF ALL ITEMS OF WORK LISTED ON THE PROPOSAL; 2) THE SCOPE OF WORK; AND OR 3) THESE CONDITIONS.
- 07 MOUNTAIN WEST CONSTRUCTION, INC. WILL PERFORM THEIR WORK IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS AND INDUSTRY PRACTICE. MOUNTAIN WEST CONSTRUCTION, INC. ASSUMES NO RESPONSIBILITY FOR: ACTS OF GOD; SOIL CONDITIONS; OR SUITABILITY OF DESIGN.
- 08 DELAYS DUE TO INTERFERENCE BY OTHERS BEYOND THE CONTROL OF MOUNTAIN WEST CONSTRUCTION, INC. SHALL BE SUBJECT TO CHARGES AND PAID FOR AS A CHANGE ORDER TO THE CONTRACT.
- 09 PAYMENT AND ULTIMATELY THE FINAL PAYMENT SHALL BE BASED ON TOTAL QUANTITIES INSTALLED EXTENDED BY THE UNIT PRICE BID.
- 10 BID DOES NOT INCLUDE PREVAILING (DAVIS - BACON) WAGES.
- 11 WE EXCLUDE REMOVAL, REPLACEMENT, RELOCATION OR RE-ROUTING OF EXISTING UTILITIES THAT ARE NOT SPECIFICALLY SHOWN ON THE PLANS TO BE REMOVED, REPLACED, RELOCATED OR REROUTED.
- 12 WE EXCLUDE THE FOLLOWING: DEWATERING; WORKING IN ADVERSE CONDITIONS; FENCE REMOVAL OR REPLACEMENT; TEMPORARY FENCING; SOIL STABILIZATION, SCREENING OR MIXING; IMPORT OR EXPORT FILL; SEEDING; EROSION CONTROL; STORM WATER POLLUTION PREVENTION PLAN; WINTERIZATION, INCLUDING CONCRETE FREEZE PROTECTION, ETC.; SEWER CLEANOUTS; WATER WELL ABANDONMENT; CESSPOOL AND SEPTIC TANK ABANDONMENT; THE HANDLING OR DISPOSAL OF HAZARDOUS MATERIALS FOUND EXISTING ON SITE OR GENERATED BY OTHERS.
- 13 MOUNTAIN WEST CONSTRUCTION, INC., ITS BANK AND BONDING COMPANY SHALL BE SATISFIED AS TO THE MEANS AND METHODS OF PAYMENT PRIOR TO SIGNING AN AGREEMENT.
- 14 CONSTRUCTION WATER SOURCE TO BE PROVIDED AT NO COST TO MOUNTAIN WEST CONSTRUCTION, INC..
- 15 BID IS BASED ON MATERIAL PRICES AT THE TIME OF BIDDING. ANY INCREASES IN MATERIAL PRICES SHALL BE PASSED ON TO OWNER AND SHALL BE PAID FOR AS AN EXTRA TO THE CONTRACT.
- 16 CONTINGENCY BUDGET IS NOT INCLUDED. IF NEEDED, CONTINGENCY AMOUNT SHALL BE NEGOTIATED.