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Technical Memorandum

To: **Tom Skjelstad**, General Manager

From: Catherine Hansford **Date:** September 6, 2018

Subject: **Big Bend Cabins Water Charges Study**

Background and Purpose

The Donner Summit Public Utility District (DSPUD or District) provides water services to the customers of Big Bend in Placer County. Big Bend was historically served by a mutual water company; however, in 2007 the District started providing contract service, and in 2013 the water system was annexed into the District. The Big Bend water system is separate from the water system that serves all the other District water customers; because the cost structure to serve the 29 cabins on the Big Bend system is very different, the Big Bend customers have different water charges from the other District water customers.

The purpose of this memorandum is to calculate updated water charges for Big Bend customers; this fee study is necessary because new water treatment infrastructure is required for the system to comply with State of California (State) drinking water standards, specifically, the Total Coliform Rule. The District has worked with Sauers Engineering to determine a project (hereafter "Project") that will meet the State's requirements. The Project described in this memorandum has been determined the least-cost alternative of three alternatives studied. A workshop was held with Big Bend customers August 25, 2018 to present the least-cost alternative option and potential cost impacts to customers. Customer feedback is incorporated into this study.

Big Bend Water System

The Big Bend water system is very old. Two springs feed a water tank; from the tank water is distributed via a network of pipes. The water is not currently treated and is out of compliance with the State for drinking water standards. Since annexing to the District, various solutions to resolve this problem have been considered. Many of the solutions have proven too costly for the cabin owners; in 2017 the District and Sauers Engineers worked to identify a project that uses existing resources and cooperation with the Forest Service to keep the spring water sources. Three project options were identified. Diagrams and cost information for each option are provided in Attachment A. The least-cost alternative identified is 'Option 3'. The fee analysis is based on Option 3.

An accompanying document to this memorandum, which describes the Big Bend water system in greater detail, as well as the Project, has been prepared by Sauers Engineering titled "Big Bend Water System Improvement Project Preliminary Engineering Report".

Table 1 summarizes the total estimated Project cost. The total project cost estimate is $512,000. The District has already secured a planning loan/grant combination with the State to pay for approximately $165,000 of the total cost. Of the $165,000, 80%, or $132,000 will be forgiven. The total estimated net Project cost is $380,000.

Table 1
Estimated Project Cost

Cost Item	Estimated Cost September 2018
Construction	
Mobilization, Clearing & Grubbing	$41,000
Treatment Building	$109,000
Treatment System	$66,500
Pipelines (incl. rental heavy equipment)	$47,850
Rock Excavation	$20,000
Subtotal Construction	**$284,350**
15% Contingency	$42,650
Total Construction	**$327,000**
Inspection/Construction Management	$20,000
Planning/Design/Environmental/Financing	$165,000
Total Project Cost Estimate	**$512,000**
less SWRCB Grant	($132,000)
Net Project Cost Estimate	**$380,000**

Source: Sauers Engineering, July 12, 2018.

cost

The District made an application to the United States Department of Agriculture (USDA) Rural Development Water and Wastewater Program to finance the costs of the Project. **Table 2** shows the net cost of the Project divided equally among the 29 cabins (prepayment amount per cabin), as well as the estimated annual debt service due if the Project is funded by USDA.

All numbers shown in **Table 2** are estimated; the actual Project cost will not be known until bids are received.

The USDA has a requirement that one year of debt service be accumulated over the first ten years of repayment; therefore, the debt service for the first ten years is ten percent higher than in the remaining thirty years. The annual debt service per cabin is estimated at $741.86, or $185.46 per quarter for the first ten years of repayment.

Table 2
Project Cost and Financing Assumptions

Costs		**USDA**
Net Cost of Project (excludes grant - see Table 1)	**rounded**	**$380,000**
Prepayment Amount per Cabin		**$13,105**
Financing Assumptions		
Interest Rate		4.125%
Repayment Period (years)		40
Principal		$380,000
Interest		$402,320
Total Cost with Financing		**$782,320**
Annual Debt Service	**a**	**$19,558**
First Ten Years Annual Debt Service	**b = a*1.1**	**$21,514**
Number of Connections paying Debt Service	*c*	*29*
Annual Debt Service per Connection	d = b/c	$741.86
Quarterly Debt Service per Connection	**e = d/4**	**$185.46**

Source: Sauers Engineering and HEC.

funds

Big Bend Water Charges Update

Current water charges are summarized in **Table 3**. Quarterly charges per cabin are $296.37. Charges comprise a water service fee, which pays for operations and maintenance, and an assessment, which pays for additional 'project' costs. Specifically, since 2009, the assessment has paid for hydrological studies, the costs of annexation, a major pipeline repair at the United States Forest Service bridge, planning/engineering studies for compliance with the State drinking water requirements, and District General Manager time.

Table 3
Summary of Existing Big Bend Water Charges

Fee	Annual	Quarterly
	per Cabin	
Water Service Fee	$639.96	$159.99
Assessment	$545.52	$136.38
Total Water Charges	**$1,185.48**	**$296.37**

exist

The costs of the Project (option 3 in Appendix A) will replace the water assessment. Operations and maintenance costs of the water system have not been fully recovered historically, nor has there been any collection for system rehabilitation in the water service fees.

Table 4 on the following page estimates the annual cost of running the Big Bend water system, including system rehabilitation. System rehabilitation includes replacement of antiquated and leaking pipeline by District staff and improvements to the water tank. The new project assets are also included in system rehabilitation costs since these assets will also need improving over time.

The total estimated annual cost to operate and maintain the Big Bend water system is $28,600. The annual cost per cabin is $986.21, or $246.55 per quarter.

Table 4
Calculation of Operations and Maintenance Annual Costs

Estimated Annual Expenses	Estimated Annual Cost	Notes
Operations and Maintenance		
Service Calls / Crew	$11,900	3 Crew members, 81 hrs @ $147.12 / hour
Materials and Supplies	$3,500	Annual allowance based on historical cost
Laboratory Testing	$3,000	Annual allowance based on historical cost
Administration	$3,300	Office personnel average $54.97 / hour, 60 hours
General Manager Time	$2,000	20 hours @ $98.69 / hour
Subtotal Operations and Maintenance Costs	**$23,700**	
System Rehabilitation		
Pipeline Replacement and Tank Maintenance	$3,000	Replace 150 ft pipe / year @ $20 per l.f.
Short-Lived Assets	$1,000	Required for USDA; described in Engineering Report
New Assets Depreciation	$900	30% of depreciation. See [1]
Subtotal System Rehabilitation	**$4,900**	
Total Annual Expenses	**$28,600**	
Total Number Cabins	29	
Annual Expense per Cabin	**$986.21**	
Quarterly O&M Fee per Cabin	**$246.55**	

req

[1] New Assets Depreciation:	Cost	Years	Annual Depreciation
Treatment Building	$109,000	80	$1,363
Treatment System	$66,500	60	$1,108
Pipelines	$37,000	100	$370
Total New Assets Depreciation	**$212,500**		**$2,841**

Calculated Updated Water Charges

The updated Big Bend water charges, effective January 1, 2019, will collect for (1) operations and maintenance, and (2) USDA debt service. The current assessments (see **Table 3**) will be eliminated.

Project Prepaid Option

Once a bid has been awarded, all cabin owners will be given an opportunity to prepay their share of the Project cost. Currently, the prepayment amount is estimated at $13,105 per cabin. While some cabin owners may be able to and choose to make this payment upfront, it is unlikely that all cabin owners will.

For cabins choosing to pay their portion of the Project cost upfront (labeled "Project Prepaid Cabins"), quarterly bills will exclude portion (2) USDA debt service. "Debt Service Cabins" will pay both water charge components. **Table 5** below shows the updated water charges schedule.

Table 5
Updated Big Bend Water Charges Schedule Effective January 1, 2019

	Quarterly Charges *		
	Operations *	Debt Service	**Total**
	a	*b*	***c = a+b***
Project Prepaid Cabins	$246.55	$0.00	**$246.55**
Debt Service Cabins	$246.55	$185.46	**$432.02**

sum

* Quarterly fee for Operations automatically increases 3.0% per year every January 1 unless action is taken by the DSPUD Board of Directors to either decrease fees or increase fees by a lesser amount than the maximum 3.0% increase. The last automatic increase is January 1, 2024. Debt service does not increase over time.

Water service fees need to increase over time to keep up with inflation. The calculated rate schedule for the next five years includes an automatic increase of 3.0% per year. The automatic escalator is only applied to the operations cost portion of water charges. The water charges schedule for the next five years, accounting for automatic increases, is shown here:

	1/1/2019	1/1/2020	1/1/2021	1/1/2022	1/1/2023	1/1/2024
Quarterly Water Charges						
Project Prepaid Cabin	$246.55	$253.95	$261.57	$269.41	$277.50	$285.82
Debt Service Cabin	$432.02	$439.41	$447.03	$454.88	$462.96	$471.28

Table 6 compares current water bills with updated water bills. Quarterly water bills will be reduced for customers who prepay the Project cost. Quarterly water bills will be increased for customers paying for the Project over the next 40 years.

Table 6
Comparison of Existing and Updated Water Bills

Cabin Type	Current	1-Jan-19	*Change*
Debt Service Cabins	*Quarterly*		
Water Service Fees	$159.99	$246.55	*$86.56*
Water Assessment	$136.38	$0.00	*($136.38)*
USDA Debt Service	$0.00	$185.46	*$185.46*
Total Quarterly Payment	**$296.37**	**$432.02**	***$135.65***
Project Prepaid Cabins			
Total Quarterly Payment if Prepaid Project Cost	**$296.37**	**$246.55**	***($49.82)***

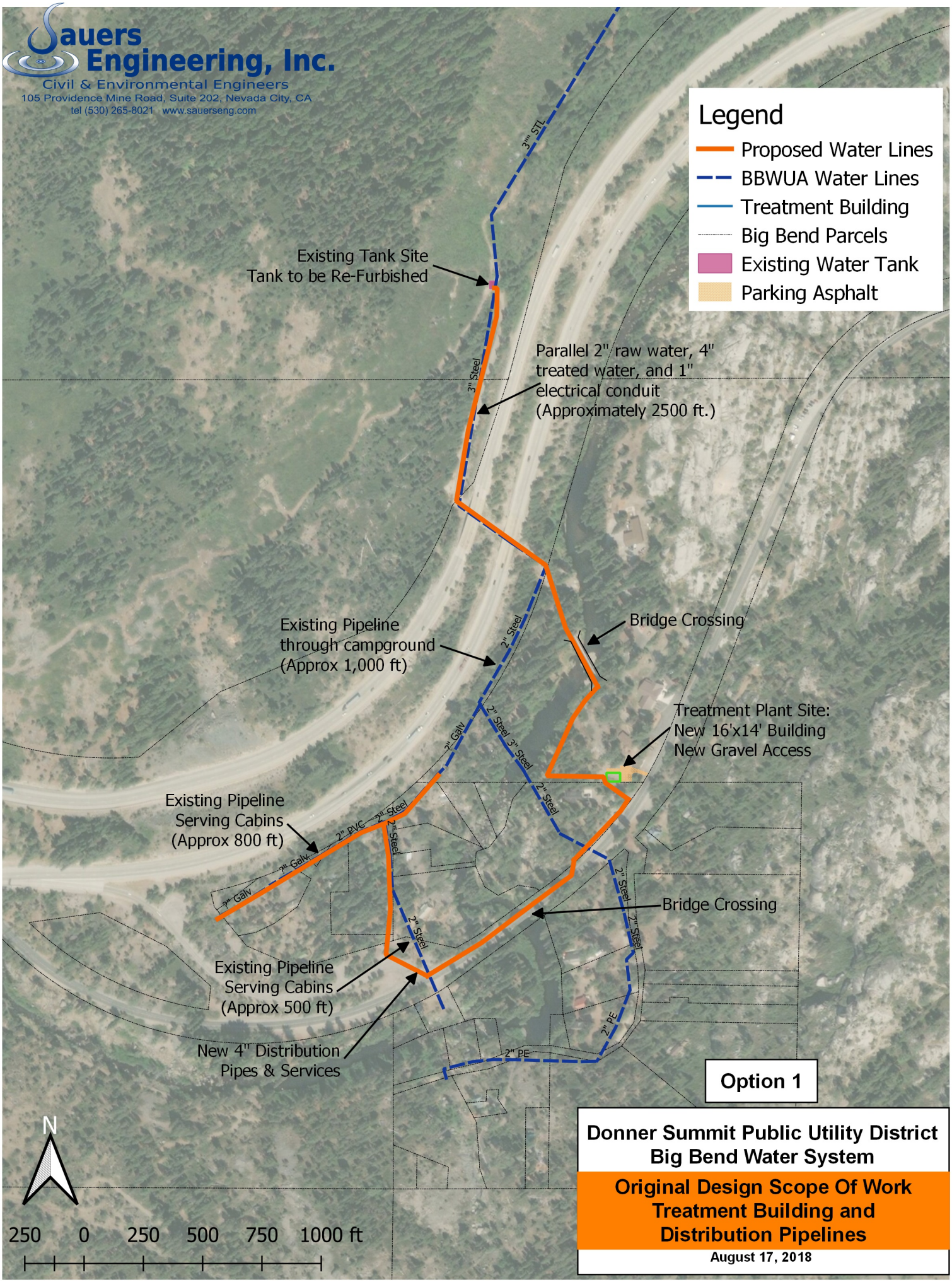
comp

ATTACHMENT A

SAUERS ENGINEERING

BIG BEND WATER SYSTEM OPTIONS

AUGUST 17, 2018


Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA
tel (530) 265-8021 www.sauerseng.com
Legend
Proposed Water Lines
BBWUA Water Lines
Treatment Building
Big Bend Parcels
Existing Water Tank
Parking Asphalt
Existing Tank Site
Tank to be Re-Furbished
3"" STL
3" Steel
Parallel 2" raw water, 4" treated water, and 1" electrical conduit (Approximately 2500 ft.)
Existing Pipeline through campground (Approx 1,000 ft)
2" Steel
Bridge Crossing
Treatment Plant Site: New 16'x14' Building New Gravel Access
2" Galv
2" Steel
3" Steel
Existing Pipeline Serving Cabins (Approx 800 ft)
2" PVC
2" Steel
3" Galv
2" Galv
2" Steel
Bridge Crossing
2" Steel
2" Steel
Existing Pipeline Serving Cabins (Approx 500 ft)
2" Steel
New 4" Distribution Pipes & Services
2" PE
2" PE
Option 1
Donner Summit Public Utility District
Big Bend Water System
Original Design Scope Of Work
Treatment Building and Distribution Pipelines
August 17, 2018
N
250 0 250 500 750 1000 ft

Option 1
Surface Water Treatment &
Replacement of Distribution System

DSPUD Big Bend Water System Improvements
Preliminary Construction Estimate

August 17, 2018

Item	Quantity	Units	Materials	Labor	Extension	Category
Mobilization	1	l.s.	$120,000		$120,000	
SWPPP Implementation	1	ea	$10,000	$10,000	$20,000	
Clearing & Grubbing	1	l.s.	$0	$10,000	$10,000	
					→	$150,000.00
Treatment Building and Site Work						
Site Grading	1	l.s.	$0	$10,000	$10,000	
Slab/Foundation	250	sq ft	$20	$20	$10,000	
Wood frame building	250	sq ft	$80	$80	$40,000	
Gravel Parking and Access	3000	sq ft	$1	$2	$9,000	
Electrical Service	1	l.s.	$12,000		$12,000	
Building Electrical	1	l.s.	$15,000	$15,000	$30,000	
						$111,000.00
Treatment System (with filtration)						
Filter Vessels and Cartriges	2	ea.	$4,000	$2,000	$12,000	
Chemical Feed System	1	ea.	$2,500	$1,000	$3,500	
Contact Pipeline	200	l.f.	$30	$50	$16,000	
Booster Pump System	1	l.s.	$4,000	$5,000	$9,000	
Break Tank	1	ea.	$1,000	$2,000	$3,000	
					→	$43,500.00
Monitoring & Control						
Plant Flow Meter	1	ea	$1,500	$1,000	$2,500	
Turbidimeters	2	ea	$6,000	$1,000	$14,000	
Chlorine Residual Analyzer	1	ea	$6,000	$3,000	$9,000	
Plant PLC	1	ea	$10,000	$10,000	$20,000	
Modulating Valve	1	ea	$1,500	$1,500	$3,000	
Pump Control Panel	1	ea	$2,500	$2,500	$5,000	
Tank Level Transmitters	3	ea	$1,500	$1,500	$9,000	
Communication Conduit/Conductor	2500	l.f.	$5	$30	$87,500	
SCADA	1	l.s.	$10,000	$10,000	$20,000	
					→	$170,000.00
Pipelines						
2" Raw Water Transmission	2500	l.f.	$10	$50	$150,000	
4" Treated Water Transmission	2500	l.f.	$20	$50	$175,000	
4" Distribution	3400	l.f.	$20	$75	$323,000	
Water Meters	29	ea	$1,000	$1,300	$66,700	
Hwy 40 Bridge Crossing	1	l.s.	$15,000	$25,000	$40,000	
USFS Bridge Crossing	1	l.s.	$10,000	$15,000	$25,000	
					→	$779,700.00
Raw Water Tank						
5000 Gallon Concrete Tank	1	l.s.	$4,500	$5,000	$9,500.00	
Gravel Pad/UnderDrain	1	l.s.	$1,500	$2,500	$4,000.00	
Overflow	1	l.s.	$1,000	$1,000	$2,000.00	
Valves & Appurtenances	1	l.s.	$600	$1,000	$1,600.00	
					→	$17,100.00
Miscellaneous						
Remove vault under I-80	1	l.s.	$1,500	$3,500	$5,000.00	
AC Surface Restoration- Pipe	25000	sq ft	$3	$4	$175,000.00	
Rock Excavation	1	l.s.	$0	$100,000	$100,000.00	
					→	$280,000.00
Treated Water Tank Rehab						
Grading & Site Development	1	l.s.		$5,000	$5,000.00	
Subsurface Drainage	1	l.s.	$1,500	$2,500	$4,000.00	
Interior Coating System	1	l.s.	$5,000	$15,000	$20,000.00	
Exterior Coating System	1	l.s.	$2,000	$5,000	$7,000.00	
Valves Piping & Accessories	1	l.s.	$1,000	$1,500	$2,500.00	
					→	$38,500.00

Construction Subtotal=	$1,589,800.00
15% Contingency=	$238,470.00
Construction Total=	$1,828,270.00

Planning/Design/Environmental Permitting to Date (80% funded by grant)=	$111,223.00
Inspection/Construction Management=	$40,000.00
HEC Loan/Grant Coordination=	$10,000.00
Total Project Cost Estimate=	$1,989,493.00


Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA
tel (530) 265-8021 www.sauerseng.com
Legend
New 2" and 4" Pipeline
New Treatment Building
Big Bend Parcels
Gravel Access
Connect to Existing 2" & 4" Pipelines
Bridge Crossing
New 2" and 4" Pipeline
New Treatment Plant Bldg
Option 2
N
250 0 250 500 750 1000 ft
Donner Summit Public Utility District
Big Bend Water System
Revised Scope of Work
Pipeline & Treatment Bldg.
Constructed by Contractor
August 17, 2018

Option 2
Disinfection Only, New Building & Minimal Pipeline
(No District Participation)

DSPUD Big Bend Water System Improvements
Preliminary Construction Estimate

August 17, 2018

Item	Quantity	Units	Materials	Labor	Extension	Category
Mobilization	1	l.s.	$40,000		$40,000	
Clearing & Grubbing	1	l.s.	$0	$5,000	$5,000	
					→	$45,000.00
Treatment Building and Site Work						
Site Grading	1	l.s.	$0	$8,000	$8,000	
Slab/Foundation	250	sq ft	$20	$20	$10,000	
Wood frame building	250	sq ft	$80	$80	$40,000	
Gravel Parking and Access	3000	sq ft	$1	$2	$9,000	
Electrical Service	1	l.s.	$12,000		$12,000	
Building Electrical	1	l.s.	$15,000	$15,000	$30,000	
					→	$109,000.00
Treatment System (No Filtration)						
Chemical Feed System	1	ea.	$2,500	$1,000	$3,500	
Flow Meter/Misc. Plumbing	1	ea	$2,500	$1,000	$3,500	
Contact Pipeline	200	l.f.	$30	$50	$16,000	
Chlorine Residual Analyzer	1	ea	$6,000	$3,000	$9,000	
Data Logger/Controller	1	ea	$4,000	$4,000	$8,000	
Autodialer	1	ea	$4,000	$2,500	$6,500	
Misc. Instrumentation/Control Wiring	1	ea	$10,000	$10,000	$20,000	
					→	$66,500.00
Pipelines						
2" Raw Water Transmission	700	l.f.	$10	$50	$42,000	
4" Treated Water Transmission	700	l.f.	$20	$50	$49,000	
Communication Conduit	700	l.f.	$5	$25	$21,000	
USFS Bridge Crossing	1	l.s.	$10,000	$15,000	$25,000	
					→	$137,000.00
Miscellaneous						
Rock Excavation	1	l.s.		$20,000	$20,000	
					→	$20,000.00

Construction Subtotal=	$377,500.00
15% Contingency=	$56,625.00
Construction Total=	$434,125.00
Planning/Design/Environmental Permitting to Date (80% funded by grant)=	$111,223.00
Inspection/Construction Management=	$20,000.00
HEC Loan/Grant Coordination=	$10,000.00
Total Project Cost Estimate=	$575,348.00


Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA
tel (530) 265-8021 www.sauerseng.com
Legend
Proposed Pipeline installed by DSPUD
Treatment Building by Contractor
Big Bend Parcels
Parking Asphalt
Connect to Existing Pipelines
Bridge Crossing
Pipeline Installed by DSPUD
Treatment Plant Bldg. & Site Work by Contractor
N
250 0 250 500 750 1000 ft
Option 3
Donner Summit Public Utility District
Big Bend Water System
Revised Scope of Work
Pipeline by DSPUD
Treatment Bldg. by Contractor
August 17, 2018

Option 3
Disinfection Only, New Building & Minimal Pipeline
(District Participation in Pipeline)

DSPUD Big Bend Water System Improvements
Preliminary Construction Estimate

August 17, 2018

Item	Quantity	Units	Materials	Labor	Extension	Category
Mobilization	1	l.s.	$36,000		$36,000	
Clearing & Grubbing	1	l.s.	$0	$5,000	$5,000	
					→	$41,000.00
Treatment Building and Restroom						
Site Grading	1	l.s.	$0	$8,000	$8,000	
Slab/Foundation	250	sq ft	$20	$20	$10,000	
Wood frame building	250	sq ft	$80	$80	$40,000	
Gravel Parking and Access	3000	sq ft	$1	$2	$9,000	
Electrical Service	1	l.s.	$12,000		$12,000	
Building Electrical	1	l.s.	$15,000	$15,000	$30,000	
					→	$109,000.00
Treatment System (No Filtration)						
Chemical Feed System	1	ea.	$2,500	$1,000	$3,500	
Flow Meter/Misc. Plumbing	1	ea	$2,500	$1,000	$3,500	
Contact Pipeline	200	l.f.	$30	$50	$16,000	
Chlorine Residual Analyzer	1	ea	$6,000	$3,000	$9,000	
Data Logger/Controller	1	ea	$4,000	$4,000	$8,000	
Autodialer	1	ea	$4,000	$2,500	$6,500	
Misc. Instrumentation/Control Wiring	1	ea	$10,000	$10,000	$20,000	
					→	$66,500.00
Pipelines						
2" Raw Water Transmission	700	l.f.	$10	$0	$7,000	
4" Treated Water Transmission	700	l.f.	$20	$0	$14,000	
Communication Conduit	700	l.f.	$5	$0	$3,500	
USFS Bridge Crossing	1	l.s.	$10,000	$0	$10,000	
					→	$34,500.00
Miscellaneous						
Rock Excavation	1	l.s.		$20,000	$20,000	
					→	$20,000.00

Construction Subtotal=	$271,000.00
15% Contingency=	$40,650.00
Construction Total=	$311,650.00
Planning/Design/Environmental Permitting to Date (80% funded by grant)=	$111,223.00
Inspection/Construction Management=	$20,000.00
HEC Loan/Grant Coordination=	$10,000.00
Total Project Cost Estimate=	$452,873.00