COLORADO
Department of Public Health & Environment

Drinking Water Project Needs Assessment (PNA) Form

Water Quality Control Division

General Information

Facility Name:	BLUE MOUNTAIN WATER DISTRICT			Original ID:	
Mailing Address 1:	PO Box 1188	Mailing Address 2:		County:	
City:	Golden	State:	CO	Zip Code:	80402
Property Address 1:	PO Box 1188	Property Address 2:		County:	
City:	Golden	State:	CO	Zip Code:	80402
Latitude :	39.7517291	Longitude :	-104.992107		
Name of Project:	Improvement/Expansion of Water Storage Facilities; Distribution; Water Meters				

Type of Project (Check all that apply)

☐ Treatment ☑ Distribution / Transmission ☐ Water Supply ☑ Water Storage

Please enter the following information for your organization if you have it. Visit http://fedgov.dnb.com/webform and https://www.sam.gov/portal/public/SAM/ for details. Note: you will be required to obtain both of these items prior to loan execution.

1. Applicant Information:

First Name:	Tom	Middle Name:		Last Name:	Bishop
Phone Number:	303-328-5369				
Mailing Address1:	P.O. Box 16789	Mailing Address2:			
City:	Golden	State:	CO	Zip Code:	80402
E-mail:	TBishop@asiccess.com				

Consulting Engineer Information:

First Name:	Sherri	Middle Name:		Last Name:	Jones
Phone Number:	303-810-2703				
Mailing Address1:	21220 Scott Rd	Mailing Address2:			
City:	Calhan	State:	CO	Zip Code:	80808-9240
E-mail:	Sherri.Jones@vista-engineering.com				

Self-Certification:

☑ Yes ☐ No Does the system intend to self-certify all or a portion of the project?

If yes, please identify the portions of the project that the system will self-certify.

☐ Distribution system piping ☑ Pump station (without integral treatment) ☑ Valves, hydrants, and/or meters

Provide additional explanation, if necessary:

Yes No

2. Executive Summary

Project includes
1) Adding 100,000-gal concrete water storage tank adjacent to existing 50,000-gal water storage tank. The additional volume will add fire and emergency storage.
2) Replacing 2 service pumps at Pump Station #3.
3) Replacing existing (115) nutating disc water meters with ultrasonic water meters.

3.System Structure and Operation

3.1 Legal Ownership of System (TMF: Managerial-1)

First Name: Blue Mountain Water District

Mailing Address1: P.O. Box 16789 Mailing Address2:

City: Golden State: CO Zip Code: 80402

Phone Number: 303-328-5369 Fax:

3.2 Organizational Chart

Include an Organizational Chart as Attachment 2.

3.3 Plans (TMF: Managerial-2)

Monitoring Plan - Include a copy of the Monitoring Plan as Attachment 3.
Cross Connection Control Plan - Include a copy of the Cross Connection Control Plan as Attachment 4.

Water Conservation Plan (if system sells over 2,000 acre feet of water annually) - Include a copy of the Water Conservation Plan as Attachment 5. ☑ Not Applicable

3.4 Current Operator in Responsible (ORC) Charge (TMF: Technical-14)

First Name: Gabrielle Middle Name: Last Name: Begeman

Certification Number: 10679 Certification Expiration Date: 05/22/2021

Operator Certification Level (check one) ☐ Staff Operator ☑ Contract Operator

Treatment ☐ Class D ☐ Class C ☐ Class B ☑ Class A

Distribution ☑ Class 4 ☐ Class 3 ☐ Class 2 ☐ Class 1

Combined Treatment/Distribution ☐ Class S ☐ Class T

3.5 Operator Certification (TMF: Technical-15)

☑ Yes ☐ No Do the system operators have adequate operator certification levels for the proposed project as defined by Regulation 100 Water and Wastewater Facility Operators Certification Requirements?

Explain the impact of the proposed project on the required operator in responsible charge (ORC) certification level and other predicted staffing changes.

This project will not result in a change in ORC certification level or predicted staffing changes.

3.6 Record Keeping (TMF: Managerial-3)

Describe the system's record retention policy that meets the requirements of the Colorado Primary Drinking Water Regulations (Regulation 11) including: record type, retention period, and record location.

The water systems records are kept electronically in the WTP office computer, as well as electronic records kept by the ORC. Records Locations and retention times are listed in the Public Water System Monitoring Plan.

3.7 Annual Budget (TMF: Financial-1)

☑ Yes ☐ No Does the system prepare an annual budget?

☑ Yes ☐ No Does the system prepare and maintain a Capital Improvement Plan?

Please provide a narrative of the process for annual budgeting and financial planning.

The basis of accounting used in the preparation of the budget is the Cash method. The District's budget includes projected revenues, which are derived mainly from water sales and property taxes.
The budget also includes expenditures for operating and maintaining the system, capital improvements required by new regulations, and buildings and treatment facilities for filtration, contaminant removal and chlorination. Each year, the District reviews revenue requirements for the coming year and sets the mill levy rate. By election in Nov 1995, the District is authorized to retain and expend for District purposes such operating revenues, without limit, whether or not they exceed the revenues or expenditures of the previous year. All operating funds and reserves are appropriated and transferred as needed to support the planned capital projects.

3.8 Financial Status (TMF: Financial-2)

Describe the current financial status and multi-year financial planning for the system including O&M costs, existing debt, required reserve accounts, rate structure, other capital improvement programs, and the system's reserve policies.

The District maintains financial statements that track the respective financial position, and respective changes in financial position and cash flows in accordance with accounting principles generally accepted in the United States of America. The District's current financial status is positive with a total net position of a little over $1,000,000. The annual revenues exceed annual expenses. The District's 20-year Cash Flow Projection indicates this project's loan repayment can be met while meeting expected expenses.

The District has no authorized, unissued debt. No general obligation bonds were outstanding as of December 31, 2019.

The District is subject to Article X, Section 20, of the Colorado State Constitution (The TABOR Amendment) which limits state and local taxing powers and imposes spending limits. In November 1995, the voters of the District approved retaining and spending the revenues and other funds collected from any and all fee services and grants without any other condition or limitation under Article X, Section 20, of the Colorado State Constitution. In November 2008, electors in the District approved a mill levy increase of 20 mills to a total of 31.405 mills. That approved mill levy was reduced for 2020 by a temporary (one year) mill levy reduction to 18.737 mills.

Sale of Water and property tax are the primary revenue sources for the District. District revenues are expected to increase annually from increased property tax. Home values tend to appreciate each year. The District could hold the mill levy at a constant value, with a resulting increase in revenue. Should the District need increased revenue, they can increase their annual mill levy.

As part of the compliance with the TABOR amendment, the District reserves a minimum of 3% of Fiscal Year Spending (excluding bonded debt service).

The District distinguishes between operating revenues and expenses, and non-operating items in the Statements of Revenues, Expenses and Changes

20-year cash flow projection
Include a copy of the 20-year cash flow projection as Attachment 8.

3.9 Audits (TMF: Financial-5)

Has the system submitted audits to the Department of Local Affairs or has the received State exemption of the statutory audit requirement?

☑ Yes - Provide a copy of the most recent audited financial statement or exemption from State as Attachment 9. ☐ No

3.10 Insurance (TMF: Financial-6)

Does the system maintain general liability insurance?

☑ Yes - Provide a copy of the most recent audited financial statement or exemption from State as Attachment 9. ☐ No

4. Project Purpose and Need

Discuss the issue or concern that the proposed project will address. Specific issues are outlined below. All issues must be discussed in each sub section below even if they are not the project driver.

4.1 Health and Compliance

Summarize the system's compliance status that necessitates the proposed project.

There are no compliance issues related to this project.

4.2 Existing facility limitations

Summarize existing water system facility(ies) limitations that necessitate the proposed project.

This project will provide fire and emergency storage for the District's distribution system. Pump Station #3's 40-yr-old, constant-speed pumps will be replaced with new variable-speed pumps. The mechanical water meters will be replaced with ultrasonic meters.

4.3 Operations and Maintenance Issues

Summarize operational and maintenance (O&M) issues with the existing water facilities.

The existing storage includes a 50,000-gal concrete tank in Zone 2 and a 10,000-gal steel tank in Zone 3. The storage volume meets the District's average water demand, but supplies only a portion of fire and emergency storage.

Pump Station #3 has 2 constant speed pumps. The pumps are 40 years old. The pumps have met their design life and require replacement.

5. Existing Facilities Analysis

5.1 Existing Source Water– Section required for treatment and supply projects

☑ Not applicable (for distribution and storage projects, only)

5.1.2 Water Rights (TMF: Technical-3)

5.2 Existing treatment– Required for treatment and supply projects only

☑ Not applicable (for distribution and finished water storage projects, only)

5.3 Distribution - Required for distribution and storage projects only

☐ Not applicable (for supply and treatment projects, only)

5.3.1 Overall Distribution System Description (TMF: Technical-11 and -12)
Discuss the existing finished water distribution system including: gravity vs. pumped pressurization, facility age, material type, condition of materials, amount of AC pipe, number of pressure zones, pump stations, and storage tanks.

Blue Mountain Water District has 115 (current) homes located in a mountain valley and the surrounding hills. The distribution system has three pressure zones to supply water at 65 psi ± 20 psi to each tap. The distribution system starts at the WTP, located at Elevation 6704 ft MSL, on the East side of Eastridge Road. The 4-inch DIP main enters the community at the North end of Blue Mountain Drive. The pipes branch at the intersection of Blue Mountain Drive and Ute Drive. A 4-inch DIP main travels up Ute Drive to the Zone 2 Pump Station. The clearwell's low water level is 7020 ft MSL. The water with boosted pressure continues to travel along Ute Drive to the intersection of Ute Drive and Westridge Road. A 4-inch DIP main travels up Westridge Road to the Zone 3 Pump Station. The Pump Station is located at Elevation 7200 ft MSL. Pressure is boosted and the water is pumped to the Zone 3 10,000-gallon storage tank, low water level 7510 ft MSL. A 4-inch DIP main continues to travel along Ute Drive to the intersection of Ute Drive and Blue Mountain Drive. The 4-inch main connects to a 6-inch DIP main located in Blue Mountain Drive. The 6-inch DIP main runs to the North, and connects to a 4-inch DIP main in Blue Mountain Drive. A fire hydrant with a pumper connection is located at the intersection of Blue Mountain Dr and the South end of Ute Drive. The 6-inch DIP main runs to the South and around to the East along Blue Mountain Drive and connects to the Zone 2 50,000-gallon storage tank through a 6-inch DIP branch. At the intersection of Blue Mountain Drive and the service road to Tank 2, a 4-inch DIP runs to the North along Eastridge Road, to its end. A 2-inch PVC main runs along Fern Way, to Winder Place, and connects to the 4-inch DIP in Blue Mtn Drive. The majority of the distribution pipe is DIP. Fern Way's 2-inch main is PVC. The design life of the DIP and PVC exceeds 50 years. The mains are in good shape. No AC pipe in the distribution system.

Discuss the estimated distribution system losses (i.e., the percent of water lost in the distribution system and not delivered/billed to customers).

The District monitors the volume of produced water by monitoring the hour meters of the well pumps, and turbine meters on the discharge line in each of the 3 pump stations, on a monthly basis. Additional monitoring records hour meters of the finished water pumps (Pump Station #1), hour meters of the Pump Station #2 pumps, and hour meters of the Pump Station #3 pumps on a monthly basis. Each tap is read every four (4) months. The production water volume is compared to metered water over the same period. Additionally, metered water is averaged over the number of taps to estimate the usage/tap. Comparing all these values helps to estimate if current production and usage is similar to empirical data. A variance could indicate a leak in one of the pressure zones. In general, the monthly volume of water produced exceeded the monthly volume of water metered. Water usage is typically divided between ±40% to Pressure Zone 1, ±40% to Pressure Zone 2, and ±20% to Pressure Zone 3.

Pressure Zone #1 is located in the center valley of the community. The difference between Metered water and Produced water over the quarters of the years 2015 through 2018 varied, and did not indicate a pattern based on season or annual demand. Pressure Zone #2 is located on a hills surrounding the center valley. The zone's high-pressure limit is 100 ft above Zone #1s. Again, the difference between metered water and produced water over the quarters of the years 2015 through 2018 varied, and did not indicate a pattern based on season or annual demand. Zone #3, located along the West side of the community, at the highest elevation, showed closer correlation between metered water and produced water.

5.3.2 Pressure (TMF: Technical-13)

Discuss if the existing distribution system is designed to maintain a minimum pressure of 20 psi at all ground level points in the distribution system under all conditions of flow as required in the CDPHE Design Criteria for Potable Water Systems (Design Criteria). The Design Criteria also recommends a normal working pressure in the distribution system of approximately 60 psi, and not less than 35 psi. Discuss how the distribution system meets the required and recommended distribution system pressures.

The distribution system is divided into three (3) pressure zones. The constant-speed pump systems are configured to supply a minimum of 35 psi to the highest point in each pressure zone during peak demand periods. As demand drops, distribution pressure will increase. Each tap is fitted with a pressure-reducing valve to prevent higher than design pressure from being supplied to a home's plumbing system. The distribution pumping systems were sized to provide the peak flow rate at the required total dynamic head when pumping. The systems were able to match demand by providing on/off cycles. In the early years, when demand was lower, the pump system's off cycles were longer. As demand grew, the pump's system's off cycles were shorter. Before the demand resulted in the pump systems running continuously, the pumps were replaced with larger pumps. Pump upgrades over the past decade included replacing the two pumps at Pump Station #1 with 10 HP vertical turbine pumps, and the two pumps at Pump Station #2 with 7.5 HP vertical turbine pumps. Pump Station #3 has two 7-stage, 15 HP pumps, that will be replaced as part of this project.

The pumping systems have field instruments to start/stop pumps, including an automatic shutoff to maintain at least 20 psi in the suction line under all operating conditions. The automatic control devices have a range between start and cutoff pressure to have a minimum cycle time of 15 minutes, and typical cycle time of ± 1 hour. Each pump has a positive-acting pump control valve on the discharge side between the pump and the shut-off valve.

Include a map illustrating any locations where a minimum pressure of 20 psi cannot be provided under all conditions of flow as Attachment 15. ☐ Not Applicable

5.3.3 Meters (TMF: Financial-4)

Discuss if the existing distribution system includes water meters.

All District taps are residential, and are metered with nutating disc meters. This project will replace the existing meters with ultrasonic meters. These new meters contain no moving parts, provide long-term accuracy, are accurate to 0.05 gpm to better measure low flows, and reduce measurement errors due to sand, suspended particles, and pressure fluctuations.

6.Facility Planning Analysis

6.1 Planning Area Description

6.1.1 Project Area Map

Provide a map showing a minimum of a 3-mile radius around the project area that includes environmental features (lakes, streams, wetlands, floodplains). Map must include current and proposed service area, existing drinking water facilities (plants, major distribution lines, water sources, storage facilities), existing wastewater outfalls/permitted discharge points, and any new or affected sources with regard to the pertinent watershed. Include the map as Attachment 16.

6.1.2 Urban Growth Boundary

☐ Yes ☑ No Is the project within or near an urban growth boundary?

6.1.3 Local and Regional Issues

☑ Yes ☐ No Were local and regional planning efforts considered?

Please describe.

The District is a stand-alone system. Adding fire and emergency storage improves the safety of the system.

☑ Yes ☐ No Were local and regional water quality and/or quantity efforts considered?

Please describe.

Local & regional water quality efforts were considered. The District has explored connecting to the regional water entities of City of Arvada and Denver Water, but connection has not been feasible. The District has continued their original approach to provide drinking water from the District's well field. The District has established a conservation plan to limit the amount of water used. The community has complied with the conservation request. The community is close to build-out. The District estimates the existing water supply will serve the community into the future, as long as users are fugal with their water use.

☑ Yes ☐ No Was consolidation with another water system / treatment facility considered?

If yes, describe the consolidation considerations. If no, please indicate why consolidation was not considered.

Connection to the City of Arvada or Denver Water is physically possible, but at an enormous cost. Components of a connection project include purchase of water rights, infrastructure improvements to connect to the regional system, and the political battle with the community and the regional system to enable the District to join.

6.2 Population and Water Demand Projections (TMF: Technical-2)

For a 20 year planning period, forecast the population growth, projected increase in Equivalent Residential Taps (ERT), and projected drinking water demands.

Current ERT - As Calculated in the Prequalification Form: 113

Population and Demand Projections - The department generally accepts two methodologies for projecting water flows over the 20 year planning period. Other methodologies are acceptable with a clear explanation and all assumptions and parameters listed:

☑ Method 1: Population based projections. Recommended for primarily residential systems and/or for systems without water meter data

☐ Method 2: Equivalent Residential Taps (ERT) Analysis. Recommended for systems with a high multifamily, commercial, industrial, irrigation demands.

Method 1 and 2 templates can be found at the end of this form.
Attach the population projection as Attachment 17.

Discuss supporting data and reasons for projected future growth during the 20 year planning period.
Note: Projects designed solely to serve future development or population growth are not eligible for State Revolving Fund financing.

The District has 136 taps: 113 Active, 10 Standby, and 13 Potential. The average daily usage is 197 gallons/tap. Growth is estimated at 1 new tap/5 years, or 4 new taps over the next 20 years. This project is not to serve future development, but add fire and emergency storage, upgrade a pump station, and replace all the water meters in the system.

6.3 Source Water Planning

6.3.1 Overall Water Resource Management Description (TMF: Technical-2)
For a 20 year planning period, describe the system's water resource management plan.

The District will maintain the established water resource management plan that limits water use to indoor. The District's wells are connected to an aquifer that has limited recharge from Coal Creek during normal precipitation events. Significant rainfall events can fill the underground reservoir. The District estimates water demands for the next 20 years can be met with existing water resources.

6.3.2 Water Rights (TMF: Technical-3)
For the 20 year planning period, discuss how the system will be able to meet the projected population and increased industrial/commercial water demands.

The Blue Mountain Water District serves an established residential community. Possible new residential taps are limited to 13. There are no commercial customers.

Provide documentation supporting the system's water rights, if not provided in section 5.1.2 above, as Attachment 18.

6.3.3 Source Water Supply Capacity (TMF: Technical-4)
For the 20 year planning period, discuss if the source water supply infrastructure is capable of delivering adequate source water to meet projected needs.

The existing source water supply infrastructure allows 4 wells to operate at one time. Daily demands are met with operating 2 wells at a time. Over the next 20 years, projected needs are estimated to increase at a rate of 1 tap/5 years, or 4 taps over the 20-year planning period. The current operating approach of running 2 wells at a time is projected to meet needs.

7.Assessment of Alternatives

7.1 Alternatives

For each alternative, please provide:
1. A description of the alternative addressing the issues identified in Section 4: Project Purpose and Need. (TMF: Technical-7)
2. Capital cost estimates and annual operation and maintenance costs.
3. Advantages and Disadvantages of each alternative.

Alternative 1 Title : No New Storage Tank

Alternative 1 Description (2000 character limit):

There are no health and compliance issues associated with the existing storage.
The existing facility limitation is that the existing distribution system storage does not provide fire and emergency storage. The existing 60,000 gallons provides the operational storage recommended by AWWA. The maximum day water use over the past 5 years was 31,746 gpd. The maximum average day over the same period was 24,198 gpd. The AWWA recommendation for operational water storage was the difference between the average demand and maximum average day, or 7,500 gallons.

The existing storage does not provide fire and emergency storage, in addition to operating storage. The recommended fire storage, based on the low-density residential development of the community, was 120,000 gallons. Emergency storage to provide water during events such as main breaks, power outages, or natural disasters was recommended to be 1/2(average day demand), or 10,900 gallons.

The water system has two storage tanks: a 50,000-gal tank located in Zone 2 (Tank #2) and a 10,000-gal tank located in Zone 3 (Tank #3). The WTP has a 20,000-gal clearwell, and Pump Station #2 has a 20,000-gal clearwell. The community is provided fire protection from a centrally-located fire hydrant with tanker fill connections located at the intersection of Blue Mtn Drive and the South end of Ute Drive. The water main between Tank #2 and the intersection of Blue Mtn Drive and the South end of Ute Drive is 6-inch ϕ DIP (minimum pipe size to supply water to a fire hydrant). The local fire protection district has a fire station at the North end of the community. A fire-fighting protocol has been established between the community and the fire district to fill tankers at the fire hydrant and transport water to the scene of the fire. This approach has worked to limit a structure fire to a single structure.

The operation & maintenance issue with having only 1 tank is that the tank is brought off-line for inspections.

Alternative 1 Capital and Operation and Maintenance Costs (2000 character limit):

Opinion of Probable Cost (Capital) for this alternative: $0.

The storage tank has had minimal operating and maintenance costs. The tank receives periodic inspections to check for damage to the access hatch, check for screens on vents and overflows, indication of leaks, and correct operation of field instrumentation for level control. Annual O&M cost for tank maintenance is estimated to be 4% of the annual Distribution Labor Budget of $48,000, or $1,920.

Alternative 1 Advantages and Disadvantages (2000 character limit):

Advantage:
There is no advantage to not installing a new tank.

Disadvantage:
Not installing a water storage tank would continue to limit the fire and emergency storage available in the community. The tank has to be taken off-line for inspection.

Alternative 2 Title : Steel Storage Tank

Alternative 2 Description (2000 character limit):

There are no health & compliance issues associated with installing a steel 100,000-gal water tank.
This alternative was to install a 100,000-gallon, bolted-steel, above-ground tank placed on a cast-in-place concrete foundation. The approximate tank dimensions would be 40 ft diameter x 11.5 ft high. The tank would be factory coated: glass-lined on the interior and epoxy-coated on the exterior. This finish would provide a corrosion-resistant surface. This type of tank has minimal maintenance costs associated with coating repair. The tank will have a vent, access hatch, overflow, and drain.

Alternative 2 Capital and Operation and Maintenance Costs (2000 character limit):

The opinion of probable cost for the steel tank was $362,320.

The storage tank has had minimal operating and maintenance costs. The tank receives periodic inspections to check for damage to the access hatch, check for screens on vents and overflows, indication of leaks, and correct operation of field instrumentation for level control. Annual O&M cost for tank maintenance is estimated to be 4% of the annual Distribution Labor Budget of $48,000, or $1,920.

Alternative 2 Advantages and Disadvantages (2000 character limit):

Advantages:
Advantages include a lower capital cost than a concrete tank. The annual maintenance for coating repair is minimal. The design life of a steel tank is 25 to 30 years. At an estimated unit cost of $2/gallon, the unit cost is approximately 0.6 of the cost of a concrete tank. Over 100 years (the design life of a concrete tank), the steel tank could have been replaced 3 to 4 times. Therefore, the life-cycle cost of a steel tank is similar to the life-cycle cost of a concrete tank.
Another advantage is to have 2 tanks operating in parallel. One tank can be taken off-line for inspection and/or repair while keeping one tank on-line.

Disadvantages:
Disadvantages include that the tank walls are exposed to freezing weather. Freezing is prevented by circulating the water throughout the tank. Circulation would come from pumping, increasing the annual power costs of the tank.

The main disadvantage to this type of tank is its visibility. The Blue Mountain community is located in a beautiful mountain valley. The Tank #2 location is up on the hill at the South end of the community. A steel tank would be visible from nearly everywhere in the community, and would add a negative, industrial aspect to the water system.

Alternative 3 Title : Concrete Storage Tank

Alternative 3 Description (2000 character limit):

There are no compliance issues associated with installing a concrete 100,000-gal water tank.

Alternative 3 is to install a 100,000-gal concrete storage tank adjacent to the existing 50,000-gal concrete tank. The tank will be set into the hill to provide weather protection, freeze protection, and to hide the tank from view of the community. The rectangular tank will be approximately 26' x 52' x 11.5' high. Water depth will be 10.5 ', with a 1' freeboard. A utility room will be constructed between the tanks to house the tanks control panel, sodium hypochlorite feed system, and spare part storage. The tank will have a vent, two access hatches, overflow, and drain. Mixing will be provided by a Tideflex header with duck-bill check inlet valves and Waterflex outlet valves.

Alternative 3 Capital and Operation and Maintenance Costs (2000 character limit):

The opinion of probable cost for the concrete tank was $643,472.

The storage tank has had minimal operating and maintenance costs. The tank receives periodic inspections to check for damage to the access hatch, check for screens on vents and overflows, indication of leaks, and correct operation of field instrumentation for level control. Annual O&M cost for tank maintenance is estimated to be 4% of the annual Distribution Labor Budget of $48,000, or $1,920.

Alternative 3 Advantages and Disadvantages (2000 character limit):

Advantages:
Advantages include concrete tanks have an approximate service life of 100 years, the longest of the tank types considered. Concrete tanks do not have interior or exterior coatings, reducing annual maintenance to nearly zero. Installing the tank into the hill will insulate the tank against freezing and hide the tank from view.

Disadvantages:
There are no disadvantages to installing a concrete tank.

Provide discussions of additional alternatives as Attachment 19.

8. Selected Alternative

8.1 Justification of Selected Alternative (TMF: Technical-6)

Please demonstrate why the selected alternative best meets system needs based on both monetary and non-monetary considerations. For treatment facility projects, if the EPA-BAT technology is not selected then the report must include a treatment rational.

Monetary:
Concrete tank has a similar life-cycle cost to a steel tank.
Operation & maintenance costs are similar between concrete and steel tanks.
Concrete tank will have lower annual (power) costs as freeze-protection pumping will not be required.

Non-monetary:
Concrete tank will be set into the hill, hiding it from view of the community.

8.2 Technical Description and Design Parameters (TMF: Technical-5)

For the selected alternative, please describe all proposed project components and assumed design parameters.

Selected alternative is to install a 100,000-gal concrete storage tank adjacent to the existing 50,000-gal concrete tank. The tank will be set into the hill to provide weather protection, freeze protection, and to hide the tank from view of the community. The rectangular tank will be approximately 26' x 52' x 11.5' high. Water depth will be 10.5 ', with a 1' freeboard. A utility room will be constructed between the tanks to house the tanks control panel, sodium hypochlorite feed system, and spare part storage. The tank will have a vent, two access hatches, overflow, and drain. Mixing will be provided by a Tideflex header with duck-bill check inlet valves and Waterflex outlet valves.

8.3 Proposed Process Flow Diagram

Include a proposed treatment facility process flow diagram or map of the distribution system, as applicable as Attachment 20.

8.4 Appropriateness of Treatment Technologies (TMF: Technical-6)

Discuss appropriateness of the proposed treatment process(es) to meet Regulation 11 considering anticipated source water quality and potential sources of contamination.

N/A

8.5 Environmental Impacts

Describe direct and indirect impacts on floodplains, wetlands, wildlife habitat, historical and archaeological properties, etc., including any projected permits and certifications.

The new tank will be constructed on the hill adjacent to the existing tank. The Pump Station #3 pumps will be installed in an existing building. The water meters will be installed in existing meter pits. There will be no impacts on floodplains, wetlands, wildlife habitat, historical and archaeological properties, etc.

8.6 Land Requirements

Identify all necessary sites and easements, permits and certifications, and specify if the properties are currently owned, to be acquired, or leased by the applicant.

The District's water existing treatment and distribution system is located on easements. The Tank #2 existing easement from Jefferson County Open Space has been expanded to include room for the New Tank #2A (100,000 gallon).

8.7 Construction Requirements

Discuss construction concerns such as subsurface rock, high water table, limited access, or other conditions that may affect cost of construction or operation of a facility.

The new tank will be located adjacent to the existing tank. The soils are expected to be disintegrated granite and sandstone mixed. The tank will be designed for spread footing not to exceed 4,000 lbs/square foot. Groundwater is not expected to be encountered during construction.

8.8 Operational Aspects

Discuss the operator staffing requirements, operator certification level requirements (including distribution), the expected basic operating configuration and process control complexities, and the operational controls and equipment that allows operational personnel to respond to routine and unanticipated treatment challenges, such as flow rate, chemical feed dosing, and process monitoring.

This project will not change the operator staffing requirements or operator certification level requirements. The new storage tank will include an integral mixing system to control water age. A chlorine monitor and hypochlorite feed system will be installed at the Tank #2 site. The equipment is similar to the chlorine monitoring equipment installed at the WTP. Therefore, this project does not add complexities to the distribution system.

8.9 Costs (TMF: Financial-2 and -3)

Summarize the capital costs associated with the selected alternative. The 20 year cash flow projection included in Attachment 7 must reflect the capital and operation and maintenance costs associated with the selected alternative.

The OPC for the 100,000-gallon concrete tank was $643,472.
The OPC for the Zone #3 Pumps was $50,238.
The OPC for the water meters was $47,359.
Total Project OPC was $741,068.

Please include an estimate of the projected increase in and total average monthly user charges. Does the user charge system allow for billing, collection, and enforcement?

Monthly User Charges are $150/ 4 month + tiered rates based on volume used. The tiered rates are
0 - 15,000 gallons/ 4 months @ $8/ 1,000 gallons,
15,000 - 30,000 gallons /4 months @ $20/1,000 gallons
and above 30,000 gallons/4 months @ 100/1,000 gallons.

8.10 Green Project Reserve

Check one or more green category that applies to the project:

☐ Green Infrastructure ☐ Water Efficiency ☐ Energy Efficiency ☐ Environmentally Innovative

Describe any green components incorporated into the selected alternative.

N/A

The system must reference the most recent copy of the EPA Green Project Reserve guidance and procedures. These references are available on the CDPHE WQCD GLU website under “Green Project Reserve”: https://www.colorado.gov/pacific/cdphe/wq-green-project-reserve
Include a business case for the project as Attachment 21, if applicable.

8.11 Environmental Checklist

Include the Environmental Checklist for the Selected Alternative as Attachment 22.

8.12 Project Implementation

8.12.1 Proposed Schedule

Loan application	11/15/2020	Design Plans (60 day review period)	11/15/2020
Advertisement for bids	02/01/2021	Award Contracts	05/01/2021
Start Construction	06/15/2021	Complete Construction	12/15/2021

8.12.2 Public Meeting

Provide documentation of a public meeting held or describe when and where the meeting will be held. The meeting must be noticed for 30 days. Provide the public notice, proof of publication, sign in sheet, and agenda as Attachment 23 or provide to your project manager in the Grants and Loans Unit after the meeting has taken place.

☐ Include the public meeting documentation as Attachment 23.

Or, will be provided to the Grants and Loans Unit project manager after the meeting takes place.

9. Projecting Water Flows Method 1: Population based projections

Assumptions/Data			Information Source
Current System Population	299	People	District Records
Current Service Area Population (If providing water to neighboring community)		People	
Population Growth Rates	0.53	% increase/year	Estimate based on records.
Average Daily per Capita Flow Rate	77	Gallons per capita day	District Flow Records
Maximum Daily per Capita Flow Rate	109	Gallons per capita day	District Flow Records
Peak Hour Factor	273	Gallons per capita day	Estimate based on engineering resources.

Year	System Population	Service Area Population (if different)	Average Daily Flow	Maximum Daily Flow	Peak Hour Flow
+0	0	0	23023	32591	81478
+5	302		23223	32874	82186
+10	304		23423	33158	82895
+15	307		23624	33441	83603
+20	309		23824	33725	84312

10. Projecting Water Flow Method 2: Equivalent Residential Taps (ERT)

Current Equivalent Residential Taps (ERT)		
A	Number of active residential taps:	0
B	Total annual consumption (gallons per year) - Residential	0
C	Estimated equivalent residential tap water usage Annual flow per ERT = B / A	0
D	Total annual consumption (gallons per year) - Commercial / Industrial / Irrigation	0

E	Estimated Commercial / Industrial / Irrigation flow in ERT # of commercial / industrial / irrigation ERT = D / C	0
F	Total ERTs = A + E	0

Population and Flow Assumptions / Data — Information Source

Current System Population	_____	People	_____
Current Service Area Population (If providing water to neighboring community)	_____	People	_____
Population Growth Rates	_____	% increase/year	_____
Average daily flow per ERT	_____	Gallons per capita day	_____
Maximum daily flow per ERT	_____	Gallons per capita day	_____
Peak Hour Factor	_____	Gallons per capita day	_____

Year	System Population	Service Area Population (if different)	Residential Taps (ERTs)	Multifamily Residential Taps (ERTs)	Commercial/ Industrial Taps (ERTs)	Irrigation Taps (ERTs)	Total Taps (ERTs)	Average Daily Flow	Maximum Daily Flow	Peak Hour Flow
+0										
+5										
+10										
+15										
+20										