

TOWN OF SACO

Water System Preliminary Engineering Report Draft PER

April 2026

Presented by:



2026 **DRAFT** PRELIMINARY ENGINEERING REPORT

SACO WATER SYSTEM

CHARTS-GRAPHS-TABLES

BACKGROUND AND SCOPE

- Much of the system was constructed in the 1960s.
- The in-town distribution system consists of 75% AC pipe
- There are 26 fire hydrants that are flushed twice per year.
- There are 172 service connections. Ten connections are located on the 6" PVC transmission main along Lake Road and 5 connections are located on the 6" PVC transmission main along Highway 243. There is one stock tank service connected to the 12" HDPE transmission main. The remaining 156 service connections are in town.
- Manual read water meters were added to the system in the late 1990s. Some of these water meters were upgraded with radio read water meters.
- Approximately 60% of the curb stops do not work and are stuck in an open position.
- Water system upgrades previously completed:
 - In 1984,
 - A new supply well and well house located on a rise between Beaver Creek and the Milk River about 9 miles NW of Saco.
 - A 6-inch PVC transmission main leaves the well house and runs east along the north side of Lake Road. At Highway 243, the line turns south and continues along the east side of the highway. The line connects to the former 100,000-gal tank located just south of Sudbrack Road (about 2 miles north of Saco). From the tank site, the line continues south to the north edge of the distribution system, just south of the Nelson South No. 25 Canal.
 - The 6" PVC transmission main has 3 manhole vaults along Lake Road which provides pressure surge relief.
 - There are 10 service connections between the well and the 100,000-gal tank and 5 service connections between the 100,000-gal tank and the town limits.
 - In 2007,
 - A new supply well and chlorine injection station at the well house.
 - Distribution system upgrades included
 - Replaced 2,300 feet of waterline with 6" PVC for the residential homes south of the Railroad tracks.
 - New 328 feet of 6" PVC along Conant St connecting to the existing waterline in 1st and 2nd Streets west of the school track.
 - New 347 feet of 6" PVC along Cherry St connecting to the existing waterline in Highway 243 and 1st Street W.
 - Replaced 434 feet of waterline with 6" PVC along Chestnut St between Wellington and Wilson Avenues.
 - In 2011,
 - A new 150,000-gal prestressed concrete tank replaced the 100,000-gal tank at the same location. The new concrete tank is 27 feet in diameter and 41 feet tall with 33 feet above ground. The existing 6" PVC transmission main was reconnected to the new concrete tank.

- A new 12" HDPE transmission main connects to the new concrete tank and continues parallel to and approximately 100 feet east of the existing 6" PVC transmission main.
 - Approximately ¾ mile north of town, the 12" HDPE transmission main diverges further to the east of the existing 6" PVC transmission main and connects to the north end of the distribution system at Chestnut St.
 - The 12" PVC has 1 service connection which supplies a stock tank.
- Figures 1 and 2 show the out-of-town transmission system and the town distribution system.
- The objective of this PER is to complete an analysis of Saco's water system

Figure 1. Out-of-Town Water System

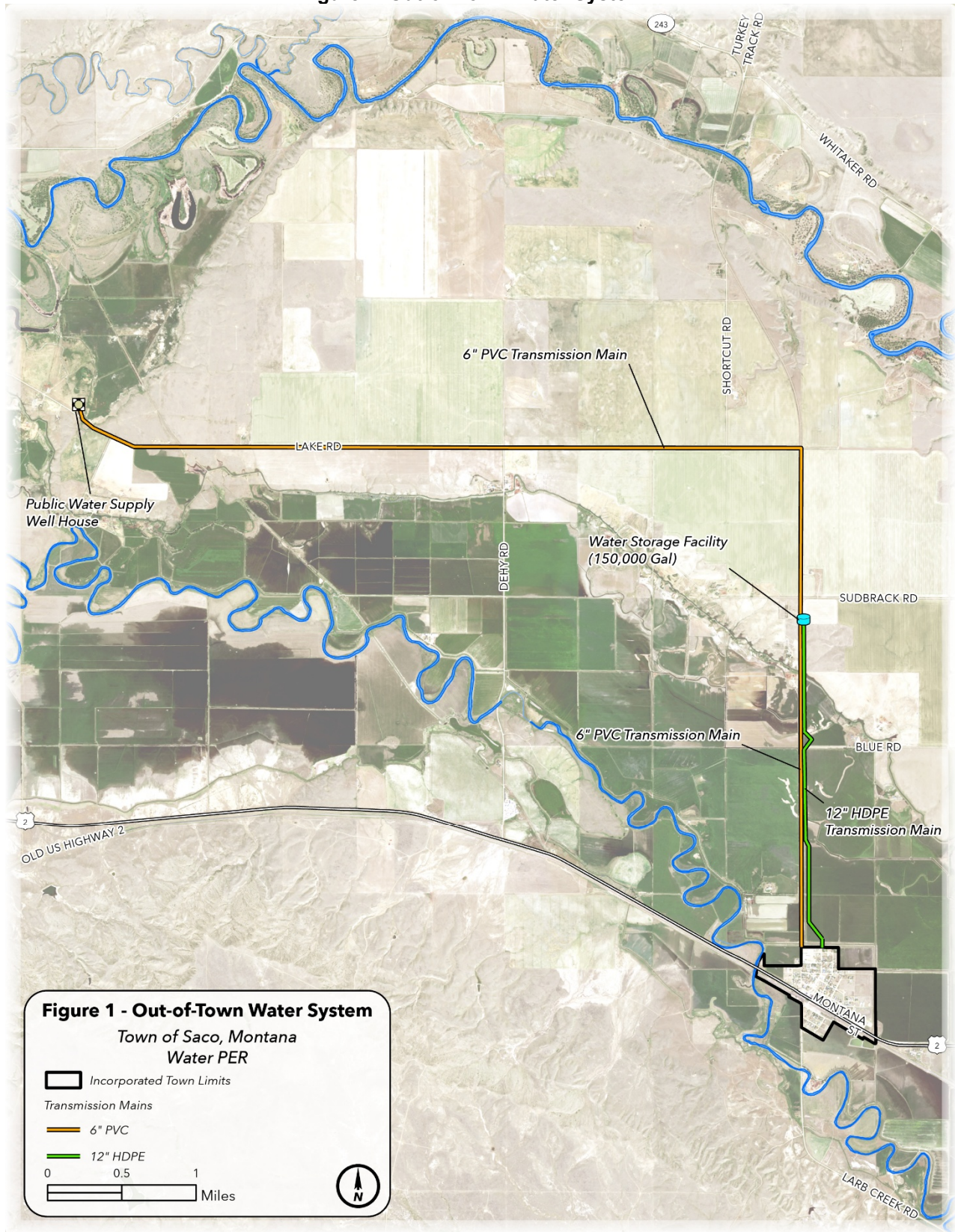
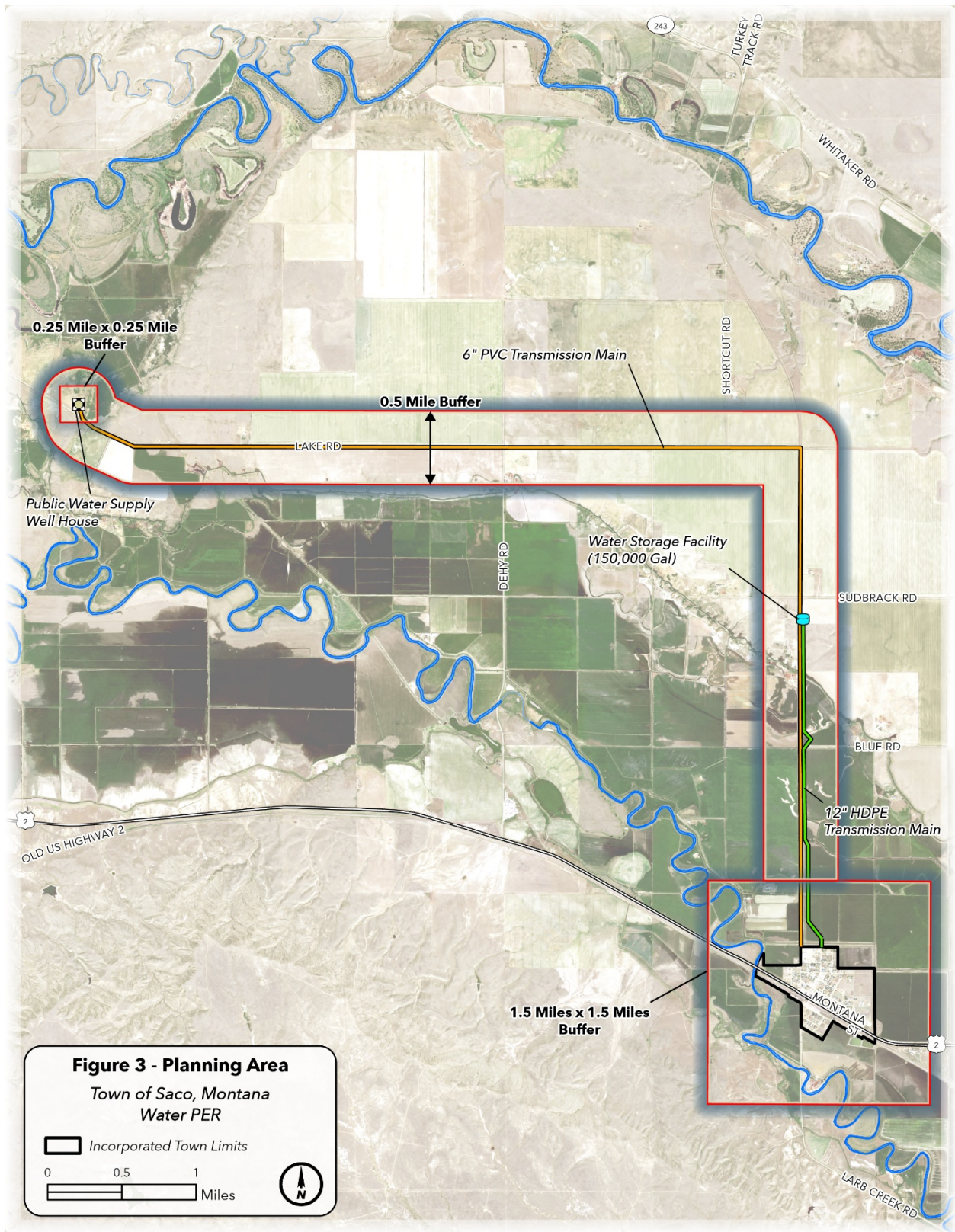


Figure 2. Distribution System



Figure 3. Planning Area



POPULATION AND PLANNING PERIOD

Table 1. Historic Population

Year	Town of Saco		Phillips County	
	Population	Total Period Growth	Population	Total Period Growth
(1) 1990	263	--	5,163	--
(1) 2000	224	-14.83%	4,601	-10.89%
(1) 2010	197	-12.05%	4,253	-7.56%
(1) 2020	159	-19.29%	4,217	-0.85%
Average		-6.42%		-2.77%

Notes:

(1) Sourced from U.S. Census Bureau QuickFacts

(2) Sourced from U.S. Census Bureau - Population Estimates Program

- Planning period of 20 years for analysis (design year 2046)
- The 2020 Decennial Census estimates the population of Saco as 159 people.
- Assuming 0.5% annual growth from 2020, Table 2 summarizes the population growth to 2046.

Table 2. Population Projections

Year	0.5% Annual Growth	1% Annual Growth
2024	161	161
2026	163	164
2031	167	173
2036	171	181
2041	175	191
*2046	180	200

*Design year

- Although Table 1 shows a recent population decline, a 0.5% annual growth rate was used to project future water system needs in case the number of water users increases during the planning period.
- The design-year (2046) population of 180 is 21 people higher than the 2020 population of 159. This increase corresponds to a 0.5% annual growth rate and is summarized in Table 2.

WATER DEMAND

- Saco's municipal supply comes from two groundwater wells located about nine miles northwest of town. Table 3 summarizes available well log data from Montana's Groundwater Information Center.

Table 3. Water Supply

Well Name	GWIC ID	Well Completion Date	Total Depth (ft.)	Max. Pumping Rate (gpm)
Well #1 (WL004)	166830	1985	68	200
Well #3 (WL006)	248787	2008	72	400

Historical Water Demands Based on Source Flow

- Knowing current water demand is necessary to calculate future water needs throughout the planning period.
- Source water flows in Saco are available for 2023, 2024, and 2025. The town records the daily flows for their source water. The daily flows were summed for each month in all 3 years. Table 4 summarizes average monthly water usage and resulting average water use per capita per day based on the estimated service population.

Table 4. Per Capita Water Use Based on Source Flows

Month	Average Source Flow/Month (gallons per day) ⁽¹⁾	Average Per Capita Use (gpcd) ⁽²⁾
January	20,775	127
February	18,851	116
March	20,422	125
April	25,538	157
May	38,783	238
June	51,076	313
July	67,721	415
August	65,756	403
September	49,666	305
October	26,877	165
November	20,341	125
December	21,128	130
Average	35,578	218

Notes:

⁽¹⁾ Based on 2023 - 2025 monthly source flow data.⁽²⁾ Based on existing service population of 163.

- Average day per capita use = 218 gpcd.
- The source water maximum day flow over the 3 years was on July 9th, 2025, for 137,600 gpd which converts to the max day per capita use = 844 gpcd.
- Peaking factor for the source flow = 3.87 (maximum day flow/average day flow).

Historical Water Demands Based on Metered Flow

- Town of Saco utility billings provide metered water-use data for residences, commercial customers, and the water fill station. Table 5 summarizes the 2023-2025 average monthly metered water use and the corresponding per capita water use (gpcd), calculated using the current service population of 163.

Table 5. Per Capita Water Use Based on Metered Flows

Month	Average Metered Flow/Month (gallons per day) ⁽¹⁾	Average Per Capita Use (gpcd) ⁽²⁾
January	14,842	91
February	16,497	101
March	14,803	91
April	17,273	106
May	29,661	182
June	45,364	278
July	45,401	279
August	48,967	300
September	43,101	264
October	25,031	154
November	17,442	107
December	14,349	88
Average	27,728	170

Notes:

⁽¹⁾ Based on 2023-2025 monthly metered flow data

⁽²⁾ Based on service population of 163

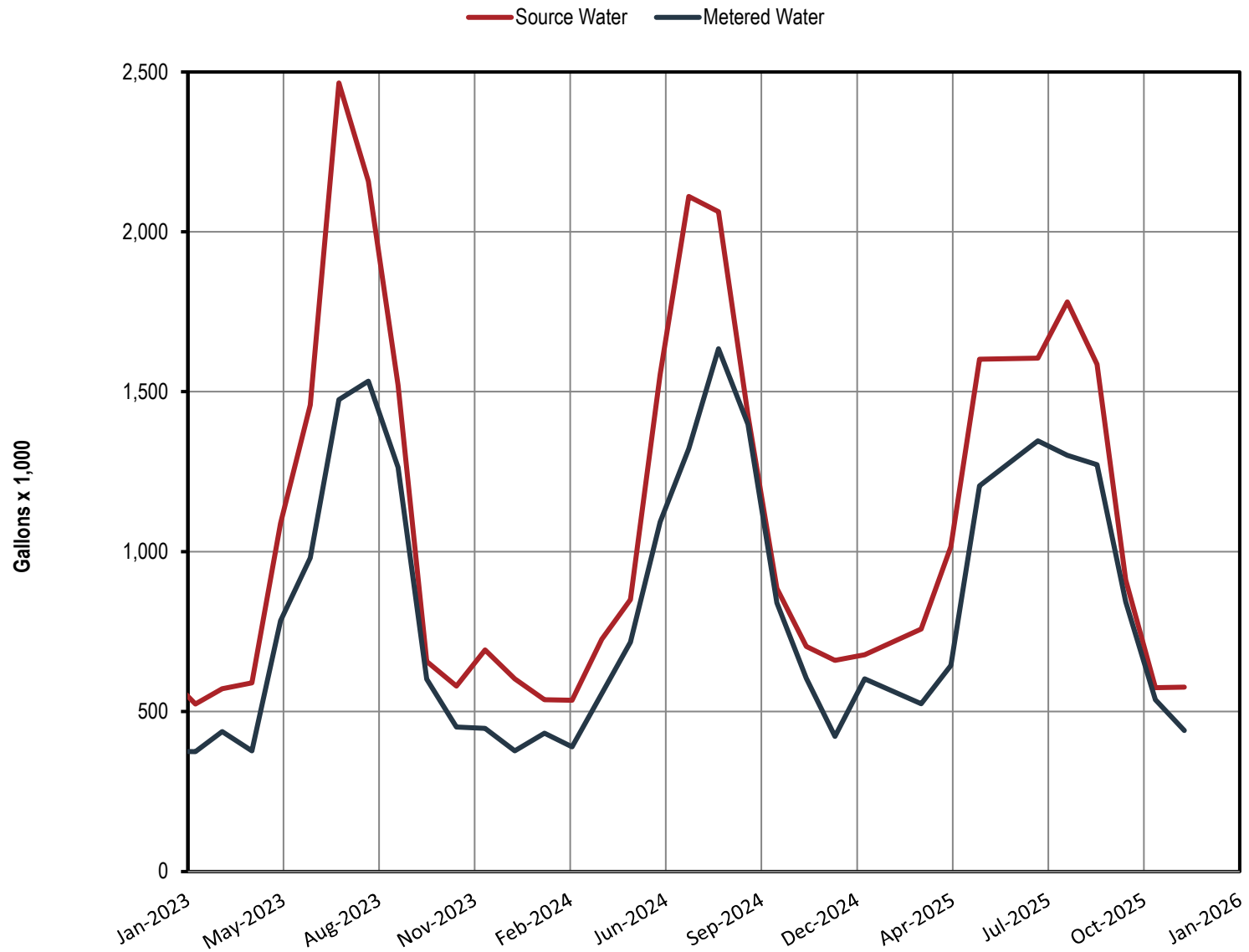
- Average day per capita use = 170 gpcd.
- Max day per capita use = 417 gpcd, estimated using the highest-volume metered month (June 2025) from the 2023-2025 billing record. Daily metered flow records were not available from the Town; therefore, this value represents the average day within the maximum month (not a true maximum-day value).
- Peaking factor = 2.45 (average day of the maximum month/avg day). This is not a true maximum day peaking factor without daily flow records. Therefore, the source flow peaking factor = 3.87 will be used for design.
- Typical maximum day to average day peaking factors range from 2.5 to 3.5 based on communities in Montana of similar size. However, Saco has daily flow records which provides an accurate peaking factor.

Unaccounted For Water

- Saco experiences water loss from water that is pumped into the system but never makes it to the customer. The difference between the amount of source water pumped into the distribution system and the amount of metered water used in town is the volume of water lost in the system, or “unaccounted-for” water.
- General factors that lead to unaccounted-for water:

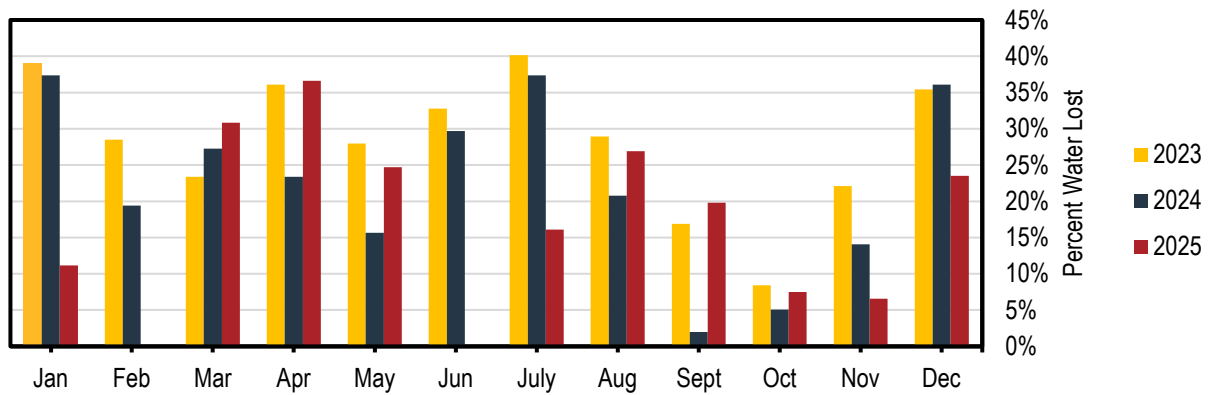
- Fire hydrant flushing. However, Saco's records noted the days they were flushing fire hydrants and these numbers have been removed from the system analysis.
 - Water mains breaking or leaking.
 - Water that is used for fighting fires.
 - No fires were reported from 2023-2025.
 - Leaking water service lines and connections to water mains.
 - Filling the ice-skating rink in-town.
- Excessive amounts of unaccounted-for water are associated with the following issues:
- Lost revenue.
 - Increased O&M costs from pumping and chemical expenses.
 - Potential for backflow and for contamination to enter the system.
- Figure 4 compares the average source water usage to the average residential and commercial metered water usage for years 2023 through 2025.

Figure 4. Source Water vs. Metered Water from 2023-2025



- Figure 5 summarizes the average annual water loss for the available source water and metered water data.

Figure 5. Average Annual Unaccounted-for Water



Note:

Average annual water loss for 2023 – 2025 are estimated using the average source water flow and the metered flow from each year.

- Average water loss is approximately 24% for 2023-2025.
- AWWA's recommendation for an acceptable percentage of unaccounted water is 10% or less.

Water Demand Projections

- The historical data provides a reliable basis for the calculated average day use and maximum day use. These numbers will become the building blocks for Saco's projected water demand. The projected water demand summarized in **Error! Reference source not found.** will establish the design criteria necessary to develop future improvements to the Town's water system.

Table 6. Projected Water Demands

Year	Estimated Service Population	Average Day Use (gpd) ⁽¹⁾	Average Day Use (gpm)	Maximum Day Use (gpd) ⁽²⁾	Maximum Day Use (gpm)
2024	161	30,107	21	116,561	81
2026	163	30,481	21	118,009	82
2031	167	31,229	22	120,905	84
2036	171	31,977	22	123,801	86
2041	175	32,725	23	126,697	88
*2046	180	33,660	23	130,317	90

(1) Based on the metered water average day demand with a 10% conservative increase: 187 gpcd

(2) Based on max. day to average day factor of 3.87

(3) 2046 Design population is based on 0.5% growth

WATER SUPPLY

- Per DEQ Circular 1, the water system must be able to provide the maximum daily demand with the highest capacity pump out of service. The projected maximum day demand for 2046 is 90.48 gallons per minute. The well data presented previously in Table 3, shows the maximum flow for each well. With the largest well out of service (Well 3 WL006), the supply of 200 gpm can meet the town's projected maximum day demand.
- The Town's water right allows a maximum pumping rate of 200 gpm from either well. This is greater than the projected 2046 maximum day demand of 90.48 gpm, so the water right provides sufficient capacity for the projected demand.

Table 7.Saco's Water Right Appropriation

Well Name	Water Right No.	GWIC ID No	Flow (gpm)	Maximum Volume (AF)	Priority of Water Right
GWIC Well 1	40J-5960500	166830	200	322.6	9/9/1985
GWIC Well 3 (Redundant Well)	40J-5960500	248747	200	322.6	9/9/1985

- A flow meter is located at each well
 - Flows recorded monthly.
 - Chemical injection not flow paced.
 - Total flows from well house flow meters do not correspond closely to total of the individual meters.
- The 2024 Sanitary Survey for Well 3 noted a gasket out of place and the bolts holding the bonnet cap were loose.
- There are no sample taps prior to chemical injection points.

WATER TREATMENT

- Water is treated with
 - Polyphosphate is injected at the well house to treat high iron and manganese.
 - Sodium hypochlorite is added at the well house after the polyphosphate.
- Town of Saco received two letters from DEQ regarding high manganese levels from both wells. Manganese does not have an EPA enforceable health limit but an EPA health advisory limit of 0.3 mg/L.
 - Well 1 had elevated Manganese levels of 0.672 mg/L from a water sample taken on September 30, 2024.
 - Well 3 had elevated Manganese levels of 0.668 mg/L from a water sample taken on November 22, 2022.
- Manganese impacts and treatment considerations:
 - Pipe scale formation and the impacts of later release of manganese, biofilm release, impacts on disinfectant demand, and/or cause taste and odor issues.
 - Health impacts for manganese may contribute to adverse neurological effects such as hyperactivity, impaired intellect, and poorer memory and motor function, at levels commonly found in drinking water.
 - A primary MCL for manganese may occur in the future by EPA.
 - EPA funding for emerging contaminants is available for the next 5 years.

- Consider a pilot study if not doing immediate project.
- Four removal mechanisms for manganese systems use one or more of:
 - Precipitation
 - Adsorption
 - Ion exchange
 - Biological uptake
- Polyphosphate sequestration does not remove manganese from water and may be creating a biofilm in the transmission mains.
- In November 2024, Montana Rural Water System's collected samples in the distribution system that confirmed the presence of iron bacteria and heterotrophic bacteria.
- Installing manganese removal, Saco will be able to stop using polyphosphate
- Chlorine
 - Chemical feed pump injects chlorine after the well house.
 - Due to the use of polyphosphate, the required minimum chlorine residual in the distribution system should be 0.2 mg/L.
 - Over 8 miles of transmission main to the distribution system makes it difficult for Saco to meet the minimum chlorine residual in the distribution system.
 - The elevated manganese and biofilm within the distribution system piping have created a substantial demand on chlorine. The chlorine residual at the entry point is 4-8.8 mg/L and the distribution system in town has chlorine residual of 0.1-0.08 mg/L.
 - MTDEQ has determined the chlorine residuals are a significant deficiency which is stated in their letter to Saco dated January 23, 2025.

WATER STORAGE

- 150,000-gallon prestressed concrete storage tank located approximately 2 miles north of Saco on the east side of U.S. Highway 243.
 - Constructed in 2011
 - Height: 41 feet
 - Diameter: 27 feet
 - Tank base at 2,283 feet
 - Maximum HGL = 2318 feet
 - Minimum HGL = 2316 feet
- Water storage is critical for two primary reasons:
 - Provides operational storage.
 - Provides fire suppression storage.
- Required Storage Capacity:
 - DEQ Circular 1, Chapter 7 requires "minimum allowable storage must be equal to the average day demand plus fire flow demand...where fire protection is provided". The commercial buildings require a maximum fire flow of 2000 gpm for 2 hours, or 240,000 gallons.
- Current Scenario:
 - Average Day Demand: 30,500 gpd
 - Fire Flow Demand: 2,000 gpm (residential) for 2 hours = 240,000 gallons
 - Total Storage Requirement: 270,500 gallons
- Future (year 2046) Scenario:
 - Average Day Demand: 33,700 gpd
 - Fire Flow Demand: 2,000 gpm (commercial) for 2 hours = 240,000 gallons

- Total Storage Requirement: 273,700 gallons
- Total current storage provided: 150,000 gallons
- Capacity is undersized for existing and future scenarios for firefighting capability. Table 8 shows storage deficiency.

Table 8. Storage Requirements

Storage Need	Year 2026 Demand (gallons)	Year 2046 Demand (gallons)
Operational (average day demand)	30,481	33,660
Emergency	0	0
Fire Suppression (2,000 gpm for 2 hrs.)	240,000	240,000
Total Required	270,481	273,660
Storage Deficit⁽¹⁾	120,481	123,660

⁽¹⁾Based on existing storage capacity of 150,000 gallons.

WATER DISTRIBUTION SYSTEM

- The existing Saco water distribution system consists of mostly asbestos cement pipe from the 1960s. PVC pipe has been installed in a few areas of town in 2007 project.
- Saco does not have lead service lines however the existing service lines should be replaced with HDPE.
- Table 9 summarizes the pipe diameters and materials in Saco's water system. Figures 1 and 2 show the transmission and distribution system's material and diameter.

Table 9. Existing Water System

AWWA C900 PVC Distribution Pipe	Length	% of Total System	% of Distribution System
6-inch Diameter	4,479		
8-inch Diameter	324		
Subtotal	4,679	6%	25%
HDPE DR17 Transmission Pipe	Length	% of Total System	% of Distribution System
12-inch Diameter	12,390	16%	
ASTM D3316 PVC Transmission Pipe	Length	% of Total System	% of Distribution System
6-inch Diameter	44,880	59%	
Asbestos Cement Distribution Pipe	Length		
1-inch Diameter	341		
2-inch Diameter	502		
3-inch Diameter	293		
4-inch Diameter	3,101		
6-inch Diameter	9,598		
Subtotal	13,835	18%	75%
Total Distribution System	18,514		
Total Existing System			75,784

- Approximately 75% of the distribution system is old asbestos cement pipe that has outlived its useful life.
- Any pipe 4 inches and smaller in diameter does not meet DEQ Circular 1 Standards.

WATER METERS AND CURB STOPS

- Manual read water meters were added to the system in the late 1990s. Some of these water meters were upgraded with radio read water meters.
 - Approximately 10 of the water meters do not work. Saco has continued to rebuild the non-working meters.
- Approximately 60% of the curb stops do not work and are stuck in the open position.

WATER MODEL SUMMARY

- Computer modeling was completed to evaluate the hydraulics of the existing and proposed systems and determine priority areas for pipe replacements.
 - The existing system model was created using record drawings and input into WaterCAD hydraulic modeling software.
 - The storage tank HGL operates between 2,316 feet and 2,318 feet and for modeling purposes, the HGL used is 2,318 feet.
 - Average day demand of 27,728 gpd was used from Table 4
 - Pipes and junctions were numbered by geographic area shown in Figure 6
 - 100s – Located in the original townsite and are located between Blue St and Stevens St and 1st Ave and Hwy 2
 - 200s – Located on the west side of Highway 243 in the Stile's Addition, the west side of Blue St to Highway 243, and Bell Addition bounded by Walnut Street, Wilson Street, 1st Ave, and Highway 243.
 - 300s – Located on the school block between Highway 243, Wilson Ave, the canal road, and Walnut St, and the remaining Bell Addition bounded by Chestnut St, Wilson Ave, Wellington Ave, and 1st Ave which is east of the school.
 - 400s – Located east of Stevens St and north of Highway 2/Taylor St.
 - 500s – Located south of the railroad tracks in the Nelson Addition.
- The existing system was analyzed using the following demands.
 - Average day demand: 19 gpm
 - Maximum day demand: 73.5 gpm
- Per DEQ Circular 1 requirements, pressures must remain at 35 psi for all service locations in the system.
- Figure 6 shows the existing system under maximum day demand. System pressures in town are 57 to 62 psi.
- DEQ Circular 1 requirements also state the water system must be able to provide adequate fire flow while keeping all pressures in the system at or above 20 psi. Fire flow availability is calculated during a maximum day demand. It is assumed that residential areas require 1,000 gpm fire flow and commercial areas require 2,000 gpm.
- Figure 7 shows the existing system's fire flow availability. The only area of town that provides fire flow is the subdivision to the east of the school from 1st Ave to Chestnut Street and Wellington Avenue to Wilson Avenue. Two improvements are needed to attain fire flow in 2046.

- Replacing the 6-inch AC pipes and the 4-inch and smaller pipes in Saco's distribution system.
 - Increasing the 6" PVC transmission pipe to an 8-inch HDPE pipe
- Figure 8 shows the projected 2046 max day demands and fire flow. To have these areas meet the 2,000 gpm fire flow, the 6" PVC transmission main would need to increase to 10 inches. The low average day and max day demands for Saco may cause water quality issues with a 10-inch transmission main due to the larger volume of water stored in a 10-inch main than an 8-inch main.

Figure 6. Saco Water Model Results 2026 Max Day Demand

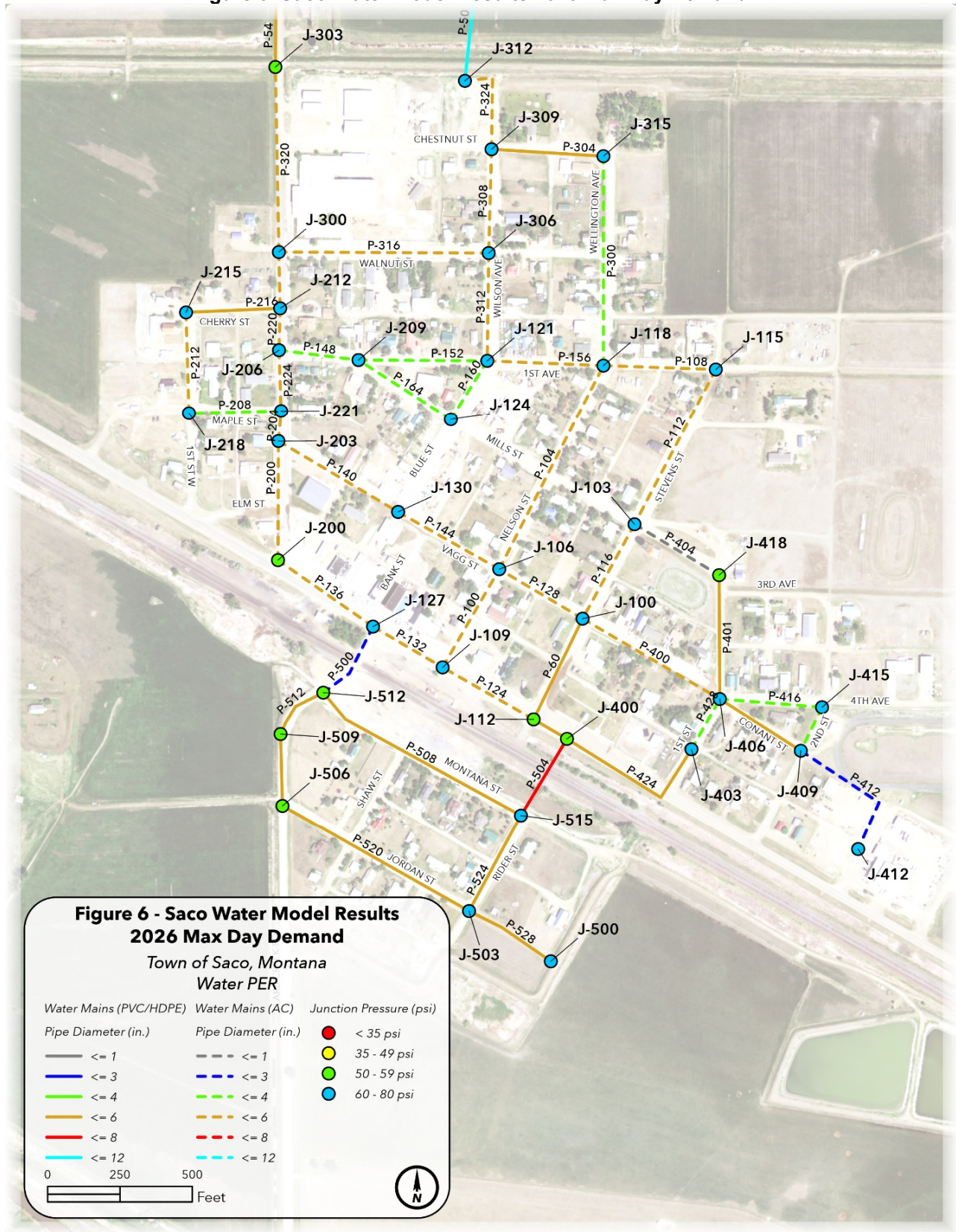


Figure 7. Saco Water Model Results 2026 Max Day Demand Plus Fire Flow

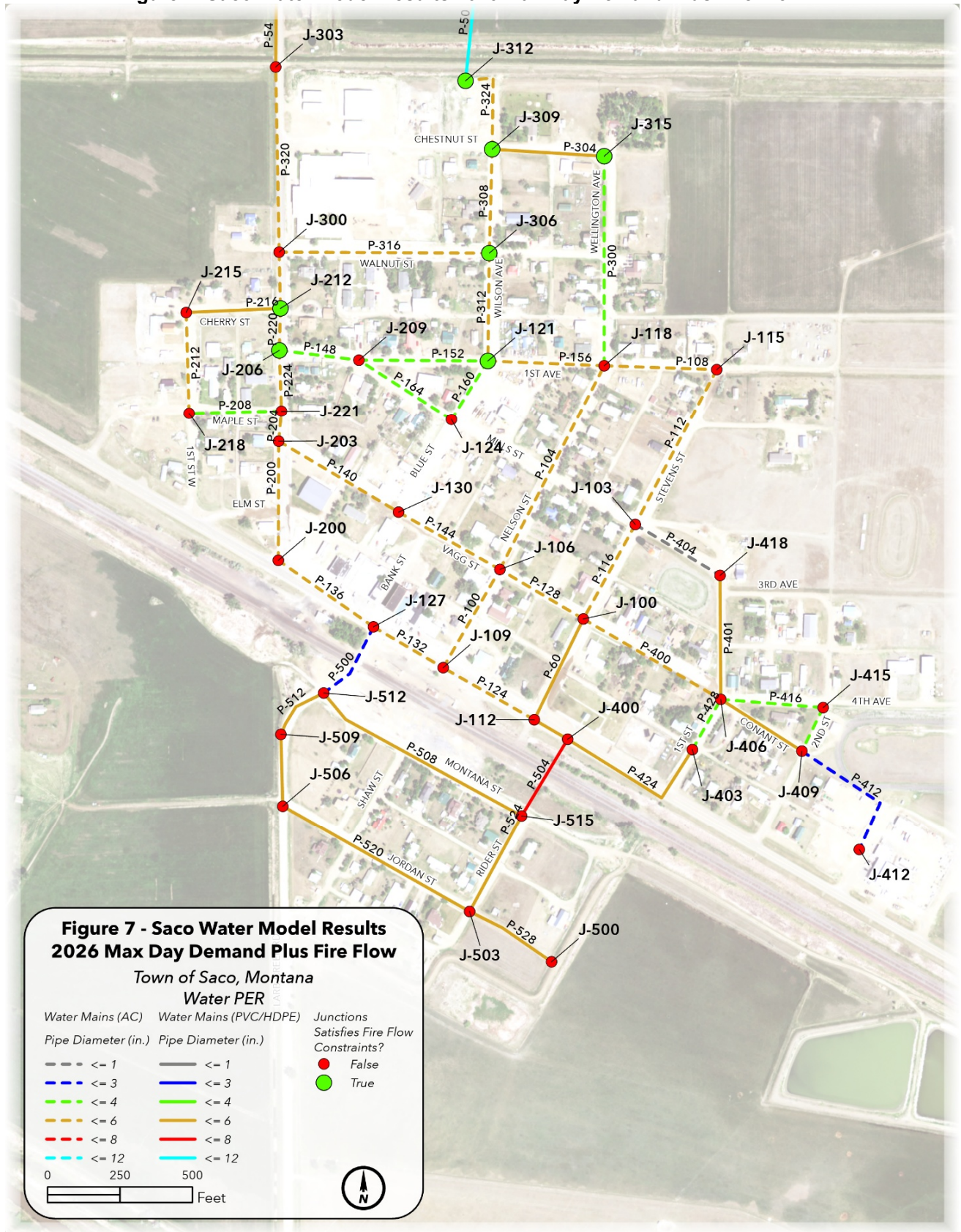


Figure 8. Saco Water Model Results 2046 Max Day Demand Plus Fire Flow

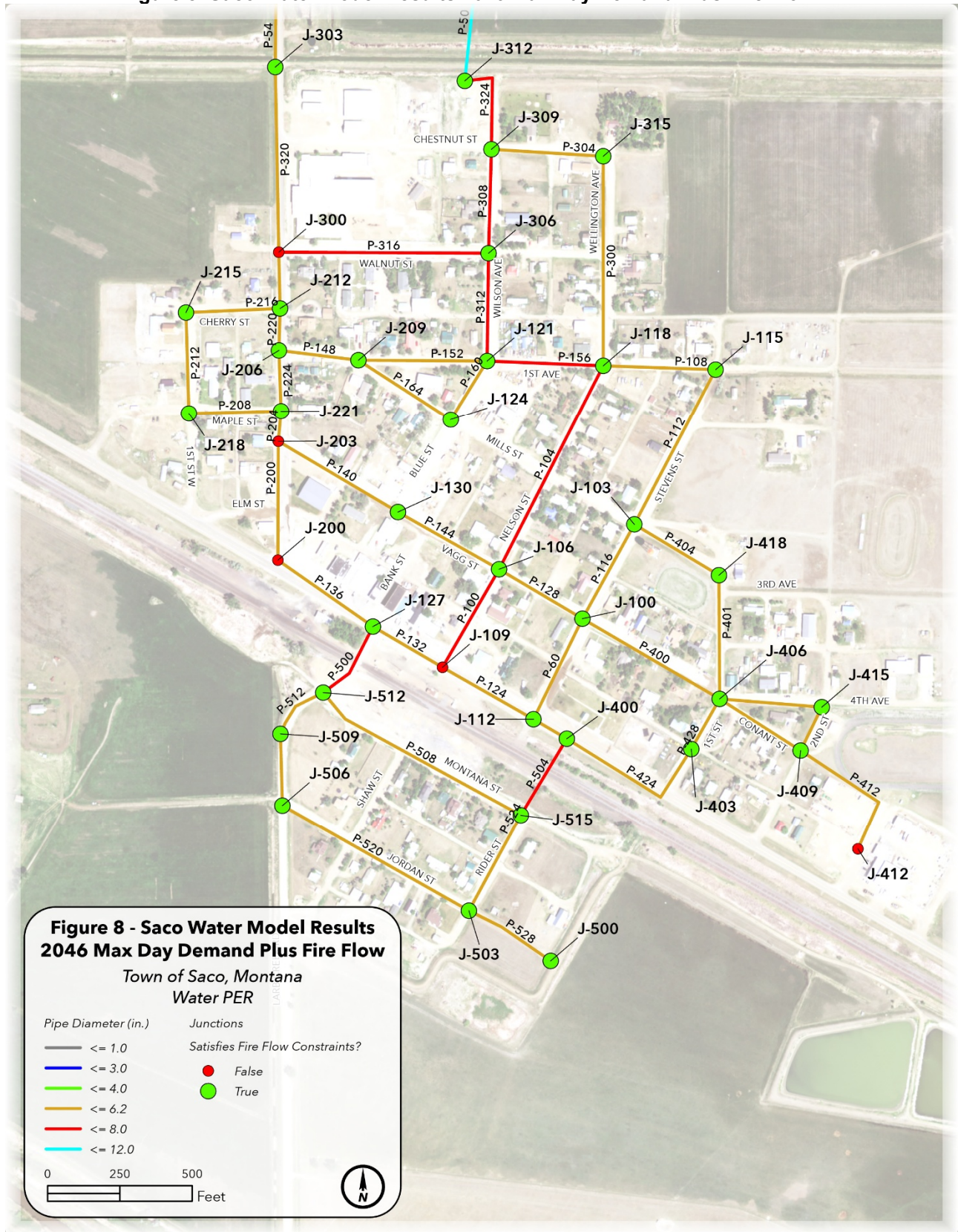
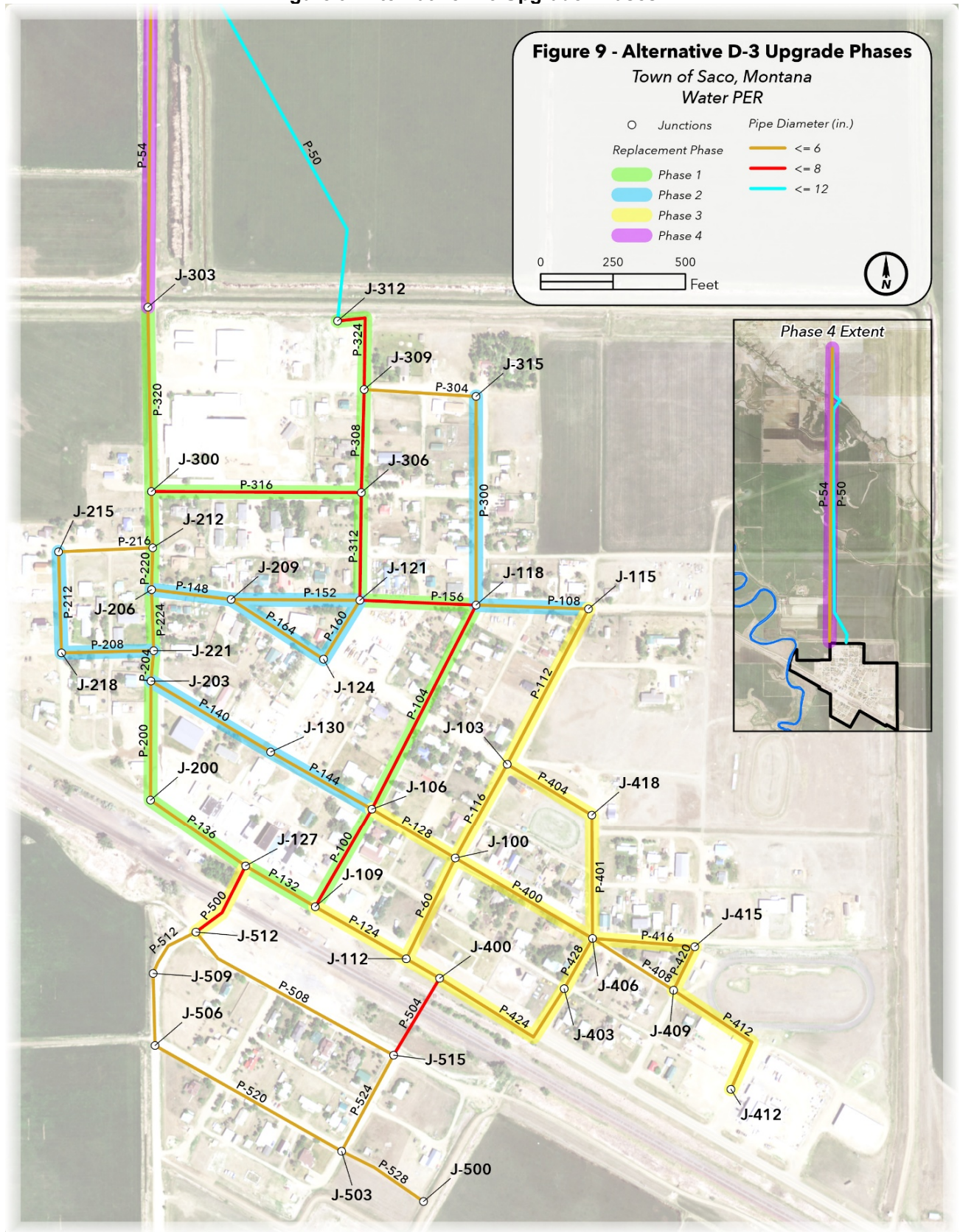


Figure 9. Alternative D-3 Upgrade Phases



DEFICIENCIES IDENTIFIED

- AC pipes are over 60 years old, have outlived their useful service life, and are brittle, which makes them more susceptible to failure.
- Leaks may have developed in the AC pipes but are undetected.
- Dead-end mains exist in the distribution system.
- 1-inch, 2-inch, 3-inch, and 4-inch distribution mains do not meet DEQ Circular 1 standards.
- Storage tank volume is deficient by 123,700-gal for providing the 2046 maximum fire flow of 2,000 gpm for 2 hours.
- Manganese concentrations exceed 0.3 mg/L Secondary Maximum Contaminant Level (SMCL). This is a non-enforceable standard but can have aesthetic or cosmetic effects in drinking water.
- Chlorine residuals in the transmission main and the distribution system are higher than or lower than required chlorine residuals of 0.2 mg/L.
- Confirmed presence of iron bacteria and heterotrophic bacteria in the water system.
- The Town has reported that about 70% of the curb stops have been mapped and about 60% of those curb stops do not work properly.

ALTERNATIVES

Storage

- Saco does not have adequate storage to provide adequate storage to fight a fire as required in Circular DEQ-1. There is a storage deficit of 120,500-gal for 2026 firefighting capabilities and a deficit of 123,700-gal for 2046 firefighting capabilities. An additional 125,000-gal tank is needed.
- Alternative R-1: No Action.
- Alternative R-2: 125,000-gal elevated steel storage tank in town.
 - Estimated Capital Cost: \$1,400,000
 - No additional O&M required.
- Alternative R-3: Construct an additional 125,000-gal concrete storage tank adjacent to the existing 150,000-gal concrete tank with new piping manifold for both tanks.
 - Estimated Capital Cost: \$1,400,000
 - No additional O&M required.

Treatment

- Manganese Levels - There are elevated manganese levels above 0.6 mg/L in both wells which are above the EPA health advisory limit of 0.3 mg/L.
 - No alternatives are presented here due to this project being funded through the emerging contaminants program.
- Chlorine Residuals - Chlorine residuals are either too high or too low depending on where the water samples are taken in the water system. When the water reaches the distribution system, the chlorine residual is close to zero. Changing from liquid sodium hypochlorite to chloramines was considered. However, due to the biofilm issues and the long transmission main to the distribution system, water age is a concern so this alternative was not considered. The best

alternative is to add a chlorine building downstream of the 150,000 -gal tank to ensure chlorine residuals can be maintained in the distribution system.

- T-1: No Action
- T-2: Chlorine Building downstream of the 150,000-gal tank
 - Precast 12 feet x 15 feet Chlorine Building with interior piping and manifold connecting to existing 12-inch and 6-inch pipes
 - Total Project Cost = \$400,000

Distribution

- Saco's distribution system has over 13,800 feet of AC pipe that was installed in the 1960s and is past its design life. Of the 13,800 feet of AC pipe, over 4,000 feet of it is 4-inches and smaller and does not meet DEQ Circular 1.
- The existing distribution system experiences 24% water loss which may be due to the AC pipes, curb stops, and old service lines leaking. Leaky water main piping presents a significant health hazard due to the potential for contamination from backflow events.
- The material of the AC pipe can be extremely hazardous if exposed and broken because of the release of asbestos fibers. Not only is the pipe inadequate, but also the pipe material itself presents a hazard to the community.
- Looping dead ends will allow the water to circulate thus maintaining the required chlorine residual,
- In November 2024, Montana Rural Water System's collected samples in the water system that confirmed the presence of iron bacteria and heterotrophic bacteria. This biofilm bacteria uses up the chlorine residual and presents a hazard to the community.
 - Alternative D-1: No Action
 - Alternative D-2: Ice Pigging of existing 6" PVC Transmission Main from the well to the 150,000-gal tank to remove biofilm.
 - Project Cost = \$115,000+
 - Alternative D-3: This alternative will build on the water system improvements completed in 2011 by replacing the remaining asbestos cement pipe and 4-inch and smaller pipes throughout the Saco in four phases. Each phase is shown in Figure 9.
 - Phase 1 – Upgrades the existing AC on the north end of Saco where the 6" PVC transmission main connects to the distribution system, continues south to Taylor Street (Hwy 2) then back towards the north to where the 12" HDPE transmission main connects to the distribution system. These large loop of 6" and 8" PVC will increase the fire flow along Taylor Street where many commercial buildings are located. This large loop will also be the basis for achieving fire flows when all phases are completed.
 - Phase 1 Cost = \$3,000,000
 - Phase 2 – Upgrades 4-inch AC pipes with 6-inch PVC and enhances the Phase 1 fire flow availability upgrades. After this phase, the town will have new 6-inch and 8-inch PVC pipes from Taylor Street to the canal and from Nelson St west.
 - Phase 2 Cost = \$1,700,000
 - Phase 3 –Upgrades the remaining AC pipes and smaller diameter pipes with 6-inch PVC on the east side of town. When this is complete the entire town will have PVC pipes of 6-inch and 8-inch diameter.
 - Phase 3 Cost = \$2,100,000
 - Phase 4 – Increases the diameter of the 6-inch PVC transmission main to 8 inches. This 6-inch PVC transmission main restricts the system's ability to achieve fire flow. During a 1,000-gpm fire flow event, the headloss gradient is 6.5 ft/1000 ft which translates to 31 psi pressure loss from the tank to the north edge of town. This area of town is around 57 psi during max day demand and

losing such a large amount of pressure during fire flow drops this area's pressure 26 psi. DEQ-1 requires the minimum system pressure cannot drop below 20 psi. Increasing to an 8-inch HDPE transmission main, decreases the headloss gradient to 4.6 ft/1000 ft which translates to 23 psi pressure loss.

- Phase 4 Cost = \$2,200,000

Table 10. Recommended Improvement Program

Item	Description	Estimated Cost
Priority #1	D-3: Phase 1 – Replacement of 6-inch AC Mains & Undersized Mains	\$ 3,000,000.00
Priority #2	D-2: Ice Pigging on Existing 6" PVC Transmission Main	\$ 115,000.00
Priority #3	T-2: Construction of a New Booster Chlorination Station	\$ 400,000.00
Priority #4	D-3: Phase 2 – Replacement of 6-inch AC Mains & Undersized Mains	\$ 1,700,000.00
Priority #5	D-3: Phase 3 – Replacement of 6-inch AC Mains & Undersized Mains	\$ 2,100,000.00
Priority #6	R-3: Additional 125,000-gal Existing Concrete Storage Tank with New Piping Manifold	\$ 1,400,000.00
Priority #7	D-3: Phase 4 – Upsize of 6-inch PVC Transmission Main	\$ 2,200,000.00
	Total	\$ 10,915,000.00

FUNDING STRATEGIES

- Target Rate
 - MHI: \$41,750
 - LMI: 62.5%
 - X.X% for combined water and sewer: \$109.XX/user/month
- Existing Average Residential Monthly Rate
 - Water: \$58.00
 - Sewer: \$27.00

FUNDING SOURCES

Montana Coal Endowment Program (MCEP)

- Primary focus is public health and safety
- Up to \$500,000 if the projected user rates are less than 125% of the target rate
- Up to \$625,000 if projected user rates are between 125% and 150% of the target rate
- Up to \$750,000 if the projected user rates are over 150% of the target rate
- MCEP grant recipients are required to match the grant dollar for dollar, but the match may come from a variety of sources, including other grants, loans, or cash contributions

Renewable Resource Grant and Loan Program (RRGL)

- The primary focus is to enhance Montana's renewable resources
- For public facilities projects that conserve, manage, develop, or protect renewable resources, grants of up to \$125,000 are available. Beginning in 2026, the DNRC will encourage a cash

contribution from each applicant. For this cycle, it's not required, but those who contribute may obtain a higher rank with a comparable application.

Community Development Block Grant (CDBG)

- CDBG is a federally funded program that is also administered by the Montana Department of Commerce (MDOC).
- Montana's CDBG Public and Community Facilities grants help local governments fund infrastructure improvements that primarily benefit low- to moderate-income Montanans. Projects can target LMI residents and provide a direct benefit, or they can provide an area-wide benefit to an entire community if at least 51% of the project's beneficiaries are LMI.
- The CDBG grant funds can be applied for in an amount of up to \$750,000, with a limit of \$20,000 per LMI household, so a community needs 38 LMI households to apply for the maximum grant funds. The use of CDBG funds requires a 25% local match that can be provided through cash funds, loans, or a combination thereof.
- Saco has 62.5% LMI and is eligible for a CDBG grant.

State Revolving Fund (SRF)

- SRF provides low-interest loan funds for both water and wastewater projects through the Drinking Water State Revolving Fund (DWSRF)
- Current loan terms include an interest rate of 2.5% for a maximum term of 20 or up to 30 years for longer term assets.
- The SRF program has also provided grants referred to as "loan principal forgiveness" on some projects. The amount of loan forgiveness varies year-to-year and is dependent on the availability of funds and the financial need of the community, as determined by SRF.
- SRF does not recommend assuming forgiveness in PER funding other than getting on the IUP for consideration, as forgiveness is determined annually.

USDA Rural Development (RD)

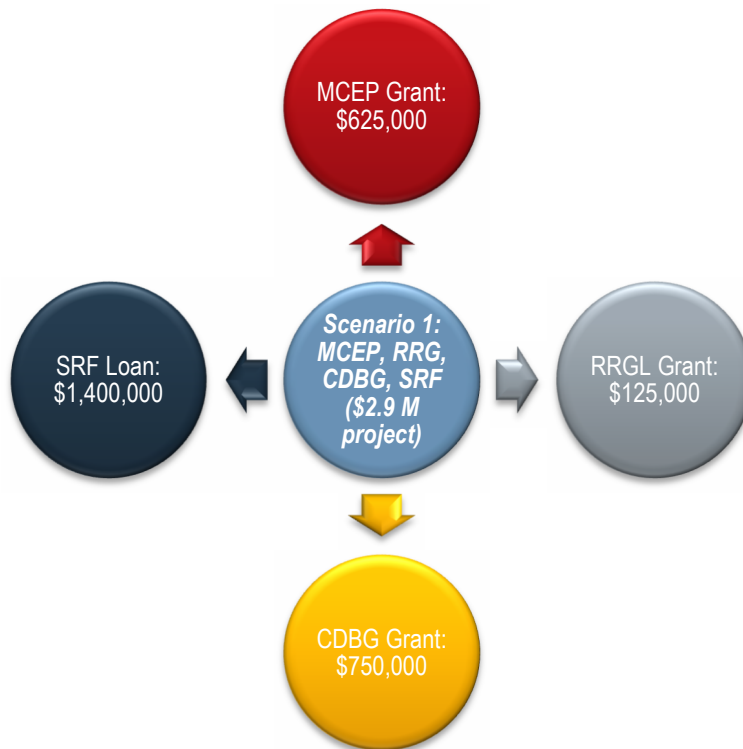
- RD provides grant and loan funding to municipalities for water and wastewater projects that improve the quality of life and promote economic development in Rural America. Municipalities with a population of less than 10,000 are eligible to apply, though priority is given to those with a population of less than 5,500.
- Grant eligibility and loan interest rates are based on the community's median household income (MHI) and user rates. A community's qualification for grant funding is based on its MHI compared to Montana's non-metropolitan median household income, which is \$63,617, as per data used by RD (2021 American Community Survey data).
- Saco's 2021 ACS MHI is: \$41,750
 - The threshold for RD's intermediate loan rate, as well as up to 45% of its project cost being grant-funded, is \$50,894. In other words, a community with an MHI that is less than \$63,617 but greater than \$50,894 qualifies for the intermediate rate.
 - If the MHI is less than \$50,894, it qualifies for the poverty rate, and up to 75% of the project cost is grant-funded. However, the project must address a severe public health or sanitation concern to allow for the 75% grant contribution. Without severe public health or sanitation concerns, the applicant qualifies for the 45% grant contribution.
 - Current RD interest rates are:
 - Market Rate: 4.75%
 - Intermediate Rate: 3.75%

- Poverty Rate: 2.875%

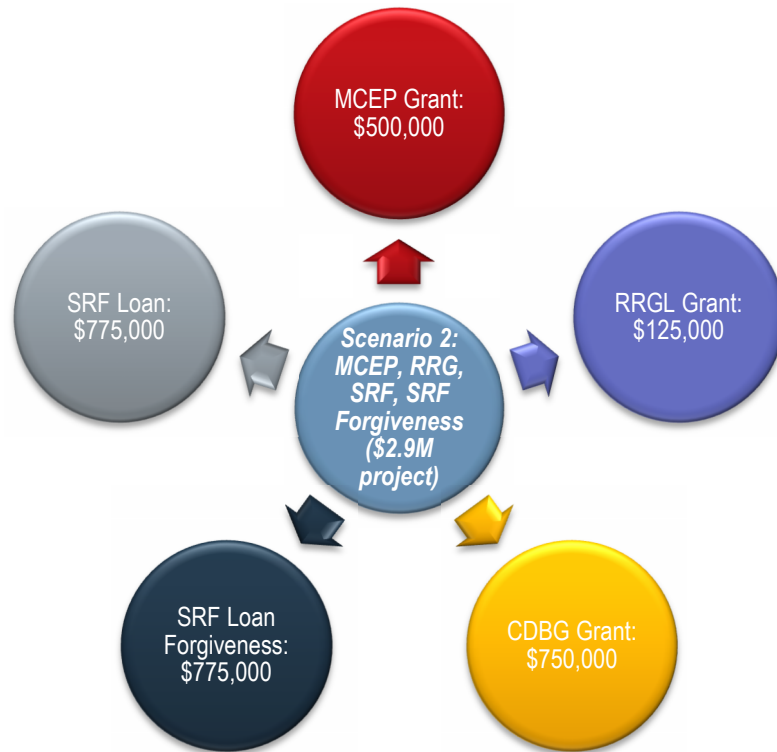
➤ **With an MHI of \$41,750, Saco is eligible for the poverty rate and up to 45% grant funding.**

FUNDING SCENARIOS

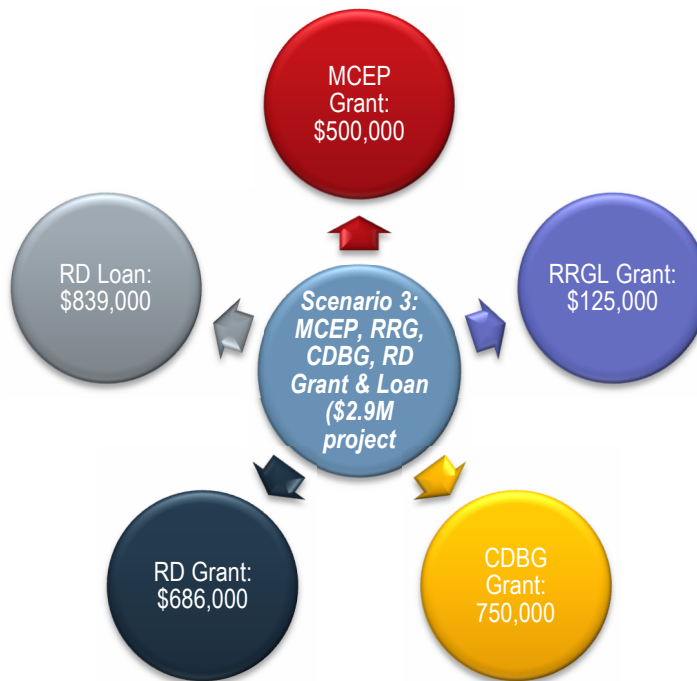
- Assumed current annual expenses of up to \$115,000 which includes existing debt service, which equates to a monthly user cost of around \$50/mo based on 193 EDUs.
 - It appears that rates and charges are just enough to cover expenses and build a reserve in the range of \$10,000/year.
- Assumed current annual revenues of \$127,000, resulting in an estimated average monthly rate of \$51.00 per user based on 172.9 EDUs



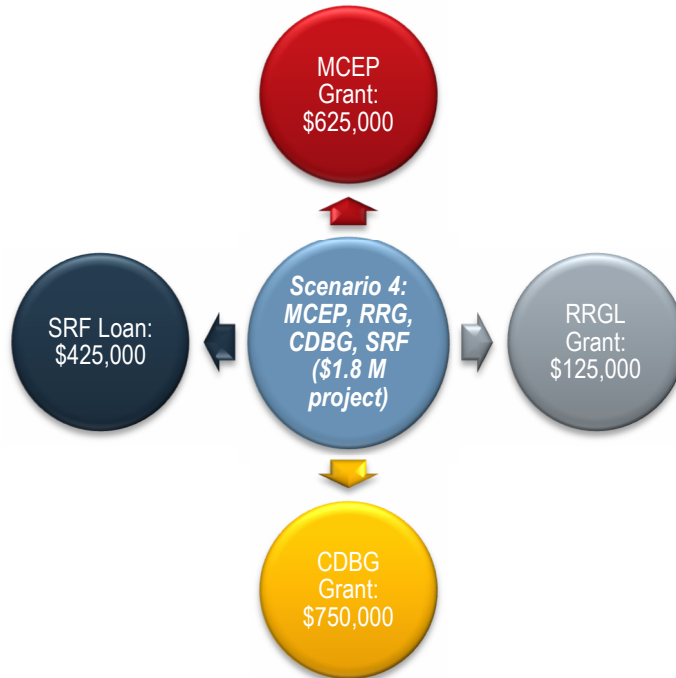
Over 50% grant
Estimated Rate Increase: \$42-44 per user per month



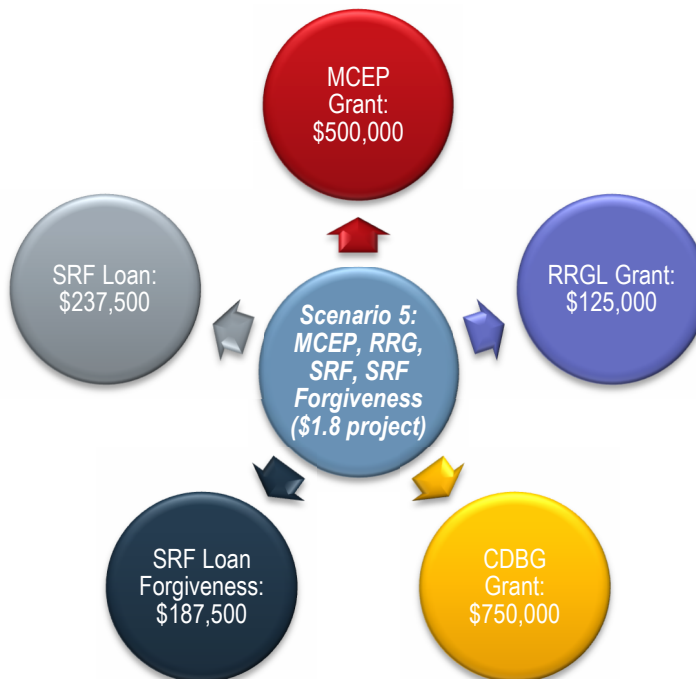
73% grant
Estimated Rate Increase: \$22-24 per user per month



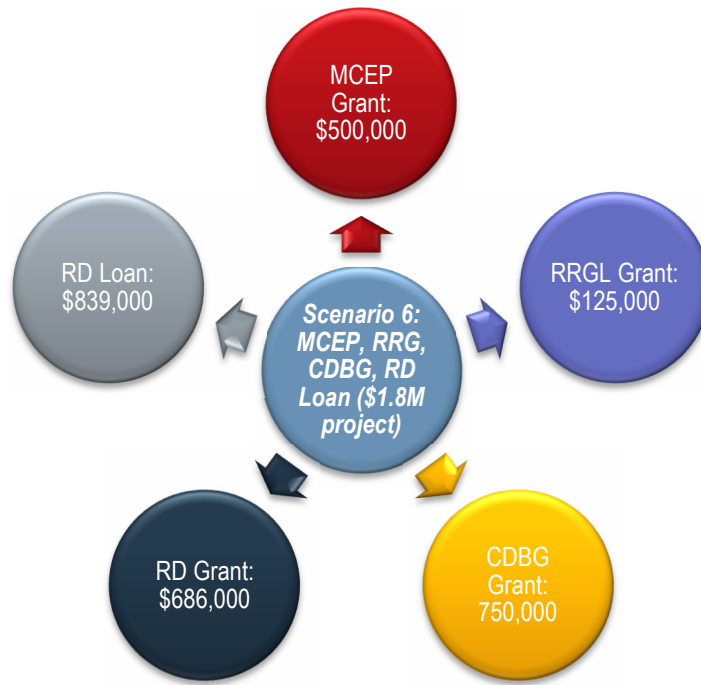
71% grant
Estimated Rate Increase: \$32-34 per user per month



Over 76% grant
Estimated Rate Increase: \$11-13 per user per month



87% grant
Estimated Rate Increase: \$6-8 per user per month



76% grant
Estimated Rate Increase: \$15-17 per user per month