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Capacity Improvement Plan

for—

Mono County
Community Development

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List of Acronyms

Acronym	Description
AC	Acre
ADUs	Accessory dwelling units
AFA	Acre-feet annually
APN	Assessor's Parcel Number
CSD	Community Service District
Demand	Average daily use
FPD	Fire Protection District
Gal	gallons
gpd	Gallons per day
gpm	Gallons per minute
Hwy	Highway
JADU	Junior accessory dwelling unit
MSRs	Municipal Services Reviews
NFPA	National Fire Protection Association
psi	Pounds per square inch
PUD	Public Utility District
PVC	Polyvinyl chloride
sq ft	Square feet
SFR	Single-family residence
SR	State route

Section 1. Executive Summary

1.1 Scope

In accordance with the Special Districts Needs Assessment project scope and contract, Resource Concepts, Inc (RCI) has evaluated and performed an assessment of the capability and capacity of utility companies and fire districts within the communities of Bridgeport, June Lake, Crowley Lake, and Lee Vining to serve existing housing and facilities, as well as potential for increased demand from development and/or zoning modification to support more affordable housing. RCI performed data collection and analysis of the subject communities as targeted by Mono County to focus on and identify barriers that may exist to increased housing in each community. These communities have been identified as including Housing Element key sites and land use and vacancies that provide opportunities for further and denser development if they can be provided with water, sewer and fire protection services.

1.2 Demand Determination

The overall project was divided into the following three tasks: 1) Baseline survey, outreach, data collection and Municipal Service Review (MRS) update support; 2) Special District Needs Assessment Reports and Housing review; and 3) Capacity Improvement Project (CIP) Recommendations. This report is a summary of the Phase 3 effort and identifies capacity improvement recommendations for specific development scenarios in each community or special district. The development scenarios are defined in the Task 2 Special District Needs Assessments and include, as a baseline, the existing developed (as-built) condition, and progress with stepped potential development scenarios to full build-out at the maximum allowable density, including construction of Accessory Dwelling Units (ADUs).

1.3 Capacity Gap Analysis

The demand created by the development scenarios was estimated as the potential water demand and sewer disposal capacity and was equated to the number of additional households the current systems could support at the current use and disposal rates, or if deficient, the number of households the current system was short. The Special District Needs Assessment Reports concluded with recommended capacity improvement projects (CIPs) that might be considered to meet the demands of future development.

Importantly, the scope of this study includes consideration of the impact of construction of ADUs on the existing water and sewer systems. Although multiple ADUs may be allowed on existing residential parcels, this study limited the number of ADUs to just two (2) per existing and future single-family residential lot, as identified as Scenario 4 in each Special District Needs Assessment Report, to establish a reasonable scenario for capacity improvement projects that might be required to support ADU development. The Special District Needs Assessment Reports also provided the demand and capacity requirements for a scenario (Scenario 6) which is a hypothetical full build-out at the maximum density currently allowed by land use designation. None of the utilities have capacity to serve customers at full build-out for water or sewer with current capacities and water demand/sewer discharge. Projects are identified in each community to develop capacity to meet this potential build-out scenario.

1.4 Capacity Improvements and Types of Projects

This Capacity Improvement Plan (CIP) identifies strategies and methods to improve capacity of the water and sewer systems in each of the Special Districts to meet the demand created by the development scenarios, and to overcome identified barriers to housing development. Such strategies or types of projects for water systems include source development, increased storage, transmission improvements and extensions, treatment improvements, and water conservation and metering strategies. For wastewater systems, the types of projects include improved and expanded collection systems, increased permitted treatment facilities and ponds, as well as newly constructed treatment facilities.

1.5 Project Prioritization

This report identifies each potential project with a priority for purposes of further analysis and recommendation. Potential capacity improvement projects have been prioritized into two groups: Priority 1 – Sites with high benefit from improvement to existing systems; and Priority 2 – Sites requiring completely new facilities, or extensive expansions due to remoteness, both with high cost to benefit ratios. Within Priority 1, proposed projects have been further sorted into sub-categories: 1) Low cost/no new construction; 2) Minor costs/construction; and Capital improvement projects. Each of the Priority 1 projects has been evaluated based on overall cost and cost per additional housing unit, to the extent possible.

1.6 Proposed Capacity Improvement Projects – 17 Capital Improvement Priority Projects

Each community includes water conservation-related projects including water conservation public outreach, water conservation rebate programs, landscape irrigation management, and for all systems except June Lake and Mountain Meadows MWC, water meter installation and tiered rate structure.

Capital improvement projects identified are summarized below, showing the total project estimated cost, increase in housing units, and cost per additional housing unit.

Bridgeport

Bridgeport projects range in cost from just over $400,000 to almost $60 million, with costs per additional housing unit between $7,200 and $72,000.

Project B5 – Kirkwood Street Loop Water Replacement

Total Estimated Cost:	$650k - $800k
Increase in Housing Units:	26
Cost per Additional Housing Unit:	$25k - $30.8k

Project B6 – Stock Drive Water Extension

Total Estimated Cost:	$410k - $530k
Increase in Housing Units:	22
Cost per Additional Housing Unit:	$16.6k - $24k

Project B7 – Aurora Canyon Replacement Project

Total Estimated Cost:	$500k - $650k
Increase in Housing Units:	23
Cost per Additional Housing Unit:	$21.7k - $28.3k

Project B8 – Alpine Vista Sewer Extension

Total Estimated Cost:	$420k - $535k
Increase in Housing Units:	36
Cost per Additional Housing Unit:	$12k - $15k

Project B9 – Evans Tract Sewer Extension

Total Estimated Cost:	$1.15M - $1.47M
Increase in Housing Units:	160
Cost per Additional Housing Unit:	$7.2k - $9.2k

Project B10 – Bridgeport Water Treatment Plant

Total Estimated Cost:	$1.3M - $2.0M
Increase in Housing Units:	111
Cost per Additional Housing Unit:	$11.7k - $18k

Project B11 – Bridgeport Water Full Build-Out Improvements

Total Estimated Cost:	$39.8M
Increase in Housing Units:	635
Cost per Additional Housing Unit:	$62.6k

Project B12 – Bridgeport Wastewater Treatment Expansion

Total Estimated Cost:	$1.0M - $3.0M
Increase in Housing Units:	58
Cost per Additional Housing Unit:	$17.2k - $51.7k

Project B13 – Bridgeport Sewer Full Build-Out Improvements

Total Estimated Cost:	$58.6M
Increase in Housing Units:	813
Cost per Additional Housing Unit:	$72k

Crowley Lake

Crowley Lake projects range in cost from $530,000 to $15.4 million, with costs per additional housing unit between $5,300 and almost $22,000.

Project C5 – School District Parcel

Total Estimated Cost:	$1.6M - $2.1M
Increase in Housing Units:	309
Cost per Additional Housing Unit:	$5.3k - $6.7k

Project C6 – Crowley Lake Drive Water Extension

Total Estimated Cost:	$530k - $680k
Increase in Housing Units:	48
Cost per Additional Housing Unit:	$11k - $14.2k

Project C7 – Crowley Lake Water Full Build-Out Improvements

Total Estimated Cost:	$15.4M
Increase in Housing Units:	753
Cost per Additional Housing Unit:	$20.4k

Project C8 – Crowley Lake Sewer Full Build-Out Improvements

Total Estimated Cost:	$14.1M
Increase in Housing Units:	646
Cost per Additional Housing Unit:	$21.7k

June Lake

June Lake projects are those for full build-out and are over $30 million for water and almost $89 million for sewer. This equates to almost $23,000 and over $66,100 respectively.

Project J4 – June Lake Water Full Build-Out Improvements

Total Estimated Cost:	$30.6M
Increase in Housing Units:	1,351
Cost per Additional Housing Unit:	$22.7k

Project J5 – June Lake Sewer Full Build-Out Improvements

Total Estimated Cost:	$88.6M
Increase in Housing Units:	1,340
Cost per Additional Housing Unit:	$66.1k

Lee Vining

Lee Vining projects are those for full build-out and are over $12 million for water and over $7 million for sewer. This equates to $153,000 and over $90,200, respectively.

Project LV5 – Lee Vining Water Full Build-Out Improvements

Total Estimated Cost:	$12.1M
Increase in Housing Units:	79
Cost per Additional Housing Unit:	$153k

Project LV6 – Lee Vining Sewer Full Build-Out Improvements

Total Estimated Cost:	$7.1M
Increase in Housing Units:	79
Cost per Additional Housing Unit:	$90.2k

Infill-type projects are generally the most cost-effective for increasing the capacity of water and sewer systems for additional housing units. Full build-out scenarios typically have the highest per-unit cost.

All water systems considered have adequate current capacity at maximum day demand. All water systems except Bridgeport PUD have adequate capacity for current demand plus development of vacant parcels, not considering ADUs. Some water systems include available capacity to accommodate the current demand plus ADUs on currently developed single-family parcels.

All sewer systems except Lee Vining PUD have adequate current capacity at maximum day demand. June Lake PUD and Hilton Creek CSD have adequate capacity for current demand plus development of vacant parcels, not considering ADUs. None of the sewer systems include available capacity to accommodate the current demand plus ADUs on currently developed single-family parcels.

Section 2. Introduction

2.1 Project Scope

Mono County Special Districts Needs Assessment & Capacity Improvement

The goal of the overall project is to assess the capability and capacity of utility companies and fire districts within the Special Districts and communities of Bridgeport, June Lake, Crowley Lake, and Lee Vining to serve existing housing and facilities, as well as potential for increased density housing elements (i.e. Accessory Dwelling Units, ADUs). If it is determined that the utility lacks the capacity to support increased housing needs, this project concludes with Phase 3 (this report) by identifying strategies and improvement projects which may remove barriers to housing production. This project was multifaceted and divided into three (3) main phases.

Phase 1 Baseline Survey and Outreach. The first phase included contact and communication with utility managers and other special district representatives and collection of data (such as water system usage data, sewer system flow data, facility and system sphere of influence and characteristics). This data was used in conjunction with existing Municipal Services Reviews (MSRs) and demographic information to aid Mono County in updating the MSRs for Special Districts.

Phase 2 Needs Assessment and Barriers Evaluation. The second phase was the evaluation of the data collected in Phase 1, together with housing development opportunities to identify potential barriers to increase the capability of a district or utility to meet potential housing needs. A significant component in this phase included determining the current capacity of water and sewer systems, and estimating potential demand and flows for various scenarios to identify capacity shortfalls. Any barriers identified, such as limited distribution pipe sizes, lack of quality water supply, or need for treatment improvements, would be considered potential candidates for a Capacity Improvement Project, to be developed in Phase 3.

A key part of Phase 2 was the development of a standalone Special District Needs Assessment report for each of the focus communities of Bridgeport, June Lake, Crowley Lake, and Lee Vining. The Needs Assessment would conclude with a recommendation of possible Capacity Improvement projects included in this report. The evaluation and study incorporated information pulled from the Mono County Housing Element: Mono County Community Development, 6th Cycle Update, 2019-2027, adopted November 5, 2019, which identifies potential housing development opportunities associated with appropriate zoning and land use in key sites.

Phase 3 Capacity Improvement Plan Report. This report is the culmination of the data collection and analysis performed in Phases 1 and 2 for the purpose of identifying potential projects which Mono County may undertake to increase the capacity of selected utility systems. Specifically, Phase 3 focuses on the utility companies (water and sewer) located in the communities of Bridgeport, Crowley Lake, June Lake, and Lee Vining.

2.2 Utility Systems and Current Capacity

The water and sewer systems within the focus communities of Bridgeport, Crowley Lake, June Lake, and Lee Vining identified in the Phase 2 Needs Assessment that do not have sufficient capacity to support additional housing (specifically affordable housing projects) were prioritized for capacity improvement projects. The current capacity is normalized into either the flow or discharge rate in gallons per day (gpd) for a typical household which, for purposes of this study, is an equivalent single-family residence. The actual flow rate and capacity factors are variable from community to community as represented in the Phase 2 reports. Generally, for the average daily demand, discharge, and fire flow it was found that nearly every utility company has some excess capacity and can support additional housing under current conditions but does not have capacity to serve full build-out under current zoning densities.

Section 3. Capacity Summary

3.1 Current Capacity Assessment

Existing Infrastructure Capacity

Detailed capacity analyses were performed for Bridgeport, Crowley Lake, June Lake, and Lee Vining as part of the Special District Needs Assessments as a precursor to this Capacity Improvement Plan. A detailed analysis with various scenarios can be found in each Special District Needs Assessment. The Special District Needs Assessments are listed in the References Section for this plan.

A summary of the existing capacity and available capacity in each system is shown in Table 1, below.

Table 1: Current Water and Sewer System Capacity

System	Current Capacity (gpd)	Remaining Capacity (gpd at Max Day)	Household Equivalent
Bridgeport			
Bridgeport Public Utility District (PUD) Water	936,000	221,140	53
Bridgeport PUD Sewer	200,000	34,100	20
Crowley Lake			
Mountain Meadows Mutual Water Company (MWC) - Water	648,000	419,910	223
Hilton Creek Community Service District (CSD) - Sewer	176,000	41,000	113
June Lake			
June Lake PUD - Village System - Water	594,566	286,566	250
June Lake PUD - Down Canyon System - Water	406,000	169,400	272
June Lake PUD - Sewer	1,000,000	610,000	810
Lee Vining			
Lee Vining PUD - Water System	324,000	148,110	51
Lee Vining PUD - Sewer System	76,000	0	0

As this summary shows, the available housing capacity in each community and in each system within the communities varies. The sewer capacity is the limiting factor in Bridgeport, Crowley Lake, and Lee Vining while the water system capacity is the limiting factor in June Lake.

3.2 Demand Determination and Projections

Current Demand Determination

The average and maximum demand, data sources, and methodology for each system have been evaluated in detail in the Special District Needs Assessment Reports. A summary of the water and sewer demand for each system is provided in Table 2, below.

Table 2: Current Water Demand and Sewer Flow Estimates

System	Demand/Flow per Connection (gpd, Avg Day)	Total Demand/Flow (gpd, Avg Day)	Demand/Flow per Connection (gpd, Max Day)	Total Demand/Flow (gpd, Max Day)
Bridgeport				
Bridgeport PUD Water	1,474	250,624	4,205	714,860
Bridgeport PUD Sewer	576	55,300	1,728	165,900
Crowley Lake				
Mountain Meadows MWC - Water	628	76,030	1,885	228,090
Hilton Creek CSD - Sewer	121	45,000	363	135,000
June Lake				
June Lake PUD - Village System - Water	446	119,973	1,145	308,000
June Lake PUD - Down Canyon System - Water	220	83,699	623	236,600
June Lake PUD - Sewer	455	300,000	1,364	900,000
Lee Vining				
Lee Vining PUD – Water System	977	58,630	2,931	175,890
Lee Vining PUD – Sewer System	583	35,000	1,750	105,000

As shown in the table above, the water demand and sewer flow vary widely from system to system. This may reflect many factors, including but not limited to average household size, proportion of commercial use, occupancy rates, date of building construction (efficient fixtures), metering, and outdoor irrigation. The U.S. Geological Survey estimates each American uses an average of 80-100 gallons of water per day at home. With an average household size in Mono County of 2.33 persons (U.S. Census), the average household water use would be 186 to 233 gpd/household. The average design sewer discharge rates through communities in the Eastern Sierra average approximately 255 gpd/household.

Note the averages in the prior paragraph are just for residential use, while the values in Table 2 include all water use and sewer flows in the community, averaging over the number of connections. Even with this difference, it is easy to identify that some system average rates are significantly higher than average for both water and sewer. These higher-than-average rates may indicate potential for success with water conservation programs as discussed in Section 3.

Future Demand Growth

Future demand for various scenarios has been included in the Special District Needs Assessment Reports for each community. Scenarios considered include development of current vacant parcels with single service connections, development of key sites identified in the Housing Element, and development of Accessory Dwelling Units (ADUs) and Junior ADUs (JADUs). Scenarios were evaluated as to the ability to provide potential for additional housing. Such an evaluation included both multi-family and single-family housing opportunities, as the zoning supports, and development of ADUs and JADUs on existing developed and vacant single-family residential parcels. These factors have a varied influence on estimated future demand. Note that while future demand/discharge growth factors have been considered, they are not tied to any time frame or population projections.

Factors Influencing Demand

Many factors influence the water demand and sewer discharge in systems. Some of these factors are discussed below:

- **Multi-family development** – Multi-family development on vacant parcels is a priority for creating more affordable housing in each community. Typically, a multi-family development uses less water per dwelling unit than a single-family development.
- **Development of key sites (from the Housing Element)** – Key sites in each of the four considered communities have been identified in the Housing Element. Some of these sites have the potential for multi-family housing, while most of the sites will likely be developed as single-family housing in areas surrounded by existing single-family housing.
- **ADU development** – Construction of ADUs and JADUs is allowed on parcels that include one single-family home and on multi-family parcels. If the development of ADUs becomes widespread, both water demand and sewer flow could be significantly impacted.
- **Occupancy rate** – Many communities in the Eastern Sierra region include second homes and short-term rentals. This leads to seasonally varying occupancy and associated water demand and sewer flow. While these occupancy rates are not specifically known, occupancy is higher during the summer months. Greater vacancies outside of the summer months causes lower water demand and sewer flows overall than if properties were occupied year-round.
- **Population** – An increase in population within a water or sewer system increases water use and sewer discharge in that system, not considering water conservation.
- **Water Use and Sewer Discharge Rates** – As discussed in the Current Demand Determination section, water use per connection varies widely and is affected by many factors.

Demand Peaking Scenarios

In considering current use and available capacity for both water and sewer systems, the average day demand/flow and the maximum day demand/flow are used. The average day demand is taken as an average demand over the entire year and does not differentiate seasonally. While it is understood that water use increases during the summer months, the average demand and flow included in Table 2 are simple averages and do not reflect this variation for analysis purposes. Because water and sewer systems must be able to meet system needs during peak use conditions, the Special District Needs Assessment Reports and resulting data primarily consider the maximum day demand/flow in estimating available system capacity.

The maximum day demand for water systems in the Special District Needs Assessments have been determined in one of two ways. For systems that reported their maximum daily water use in the Electronic Annual Reports, that water use was divided by the number of water service connections to determine the maximum day demand per connection (Bridgeport PUD, June Lake PUD Village, June Lake PUD Down Canyon). For systems where the maximum day system-wide demand was not available, the maximum day demand is estimated as the average day demand multiplied by three (Crowley Lake MWC, Mountain Meadows MWC). In the case of Lee Vining, the reported maximum day demand was anomalously high (perhaps indicating a water line break or other event), so the factor of average day demand times three was used. The multiplier factor of three is slightly conservative compared to actual average and maximum day demand ratios for the three systems with maximum day demand data available. Those factors range from 2.56 to 2.85.

To obtain maximum sewer flow, the average sewer flow per connection was determined by dividing the current discharge by the number of sewer connections. The maximum day discharge was then determined by multiplying the average by a factor of three, as with water use. This peaking factor is supported within the Recommended Standards for Wastewater Facilities (Ten States Standards, Figure 1, page 10-6[1]), which is a widely used wastewater design reference. As an additional point of reference, sewer flows typically range from 70% to 130% of water use rates, with designers often assuming the average flow equals the water demand rates. As explained in the paragraph above, the peaking factor used for water demand in systems without actual peak flow data is 3.0, which is a conservative estimate based on measured values.

3.3 Capacity Gap Analysis

Capacity Gaps Identified

Capacity gaps in water and sewer systems are the difference between projected or needed capacity and actual capacity. Referring to this difference as a gap implies the actual capacity is less than the needed capacity. For the purposes of this analysis, capacity gaps can be the shortage in water production or sewer disposal capacity. We have also identified capacity gaps as some areas with inadequate infrastructure for residential development. All these factors can negatively affect the capacity of the water or sewer system to serve potential customers.

This analysis does not consider potential projects or identified needs related to system reliability or redundancy that would not otherwise improve system capacity during normal operation.

Risks of Capacity Gaps

One purpose of identifying capacity gaps is to enable analysis of the risks posed by these gaps and measures that would address them. Some risks of capacity gaps include:

- Limitations on commercial development, including needed services
- Inability to develop affordable housing
- Shortage of workforce housing
- Limitations on economic development

[1] Figure 1 on page 10-6 of the Ten States Standards includes peak flow multipliers for peak hourly flow, rather than maximum day flow. Maximum day flow is lower than peak hour flow. For a population of 1,000, the ratio of peak hourly flow to design average flow is approximately 4.

Section 4. Capacity Enhancement Strategies

Analysis of water system capacity incorporates consideration of both supply and demand. Analysis of sewer system capacity incorporates consideration of both discharge flow and treatment capacity. The following sections discuss capacity improvement from both sides for water and sewer systems.

4.1 Infrastructure Improvement Projects

When considering improving water and sewer system capacity, capital improvement and infrastructure plans are an important tool in improving the capacity in a system, through increasing the supply or treatment capacity or improving distribution and collection. Examples of potential infrastructure improvement projects include but are not limited to expansion of treatment facilities; construction of new water storage tanks/reservoirs; upgrading pumping stations; installation of replacement, upsized, or new water and sewer pipes; sewer main rehabilitation; development or rehabilitation of new water sources; wastewater treatment plant improvements; and improving system redundancy and interconnectivity.

Potential infrastructure improvement projects are identified and discussed further in Sections 6 through 9.

4.2 Optimization of Existing Infrastructure and Operations

Operational measures are an important part of protecting and improving system capacity, including evaluating the system for leaks, waste, and inefficiency; utilizing technology to control and prevent potential system waste; and maintaining emergency preparedness and response planning. For water systems that include individual service metering, an audit can be performed to compare the water quantity produced and the water delivered to customers to identify any significant variances that may indicate leaking in the system. For sewer systems, flow measurement can identify infiltration and inflow that negatively affects the sewer system capacity.

Systems can integrate advanced technologies such as remote monitoring systems, flow-control devices, and proactive system component analysis to identify potential problems that may affect system efficiency and reliability and address those issues prior to negative system impacts.

Modifying emergency preparedness and response planning can help to reduce potential water waste during emergencies or failures in the system by identifying and stopping water main leaks promptly. This can include investing in and properly maintaining backup power supplies and maintaining adequate materials for repairs during emergencies and disasters.

4.3 Water Conservation Planning

Water conservation programs can play an important role in reducing water use and subsequent sewer discharge. Water conservation initiatives typically aim to reduce water use through a variety of strategies such as improving infrastructure efficiency, promoting water-saving measures, implementing pricing strategies to encourage more efficient water use, and raising public awareness about water conservation.

Typical components of water conservation planning, which are discussed in more detail below include:

1) Education and outreach
2) Fixing Leaks
3) Retrofitting fixtures
4) Landscape irrigation management
5) Pricing incentives

Education and Outreach

Educating customers and community members about water saving practices, including those that follow these practices, can contribute to reduced water consumption per connection through customer behavior changes and participation in water conservation implementation efforts. All efforts listed below are most effective paired with education and outreach.

Fixing Leaks

According to the U.S. Environmental Protection Agency (EPA), a single leaking faucet can waste hundreds of gallons of water per year. Repairing household fixtures can lead to significant water savings per connection and in the system as a whole. Fixing leaking irrigation systems can lead to even more water savings than indoor fixtures. As an operational strategy, this can also include identifying and fixing leaks in the water system before the water reaches customers.

Retrofitting Fixtures

Installing low-flow faucets, shower heads, and toilets can reduce water usage per connection. In communities with older construction, potential water savings may be greater since older fixtures use more water and produce more sewer flow. As a part of water conservation programs, some utility providers offer rebates to customers for purchasing and installing low-flow fixtures to encourage participation.

Landscaping Irrigation Management

The EPA Water Sense program estimates about 30% of household water use occurs outdoors on average, which varies widely based on the climate and season. In dry climates, as much as 60% of household water use occurs outdoors. Encouraging or mandating the use of drought-tolerant plants and efficient irrigation systems (e.g. drip irrigation, adjusting sprinkler placement) can reduce outdoor water use. Additionally, many water conservation plans include limiting landscape watering schedules during summer months.

Pricing Incentives

Implementing tiered pricing structures can incentivize residents and businesses to reduce water use. Since not all water systems in the subject communities use water meters at each connection, this effort would require installation of meters for service connections.

Actual water savings resulting from water conservation efforts vary widely based on factors such as the effectiveness of the conservation measures implemented, the level of buy-in and compliance among users, the scale of implementation, local attitudes toward drought and conservation, and other factors. Water conservation also varies seasonally in areas with a great deal of outdoor irrigation and tourism.

Water conservation measures can also affect flows into sewer systems, as reduced indoor water use translates to reduced wastewater flowing into the sewers.

As an example, if water savings of 10% is achieved in Bridgeport, the available water system capacity would nearly double by increasing to 39 households, from an existing capacity of 20 households. As discussed in Section 2, some water and sewer system demands are much higher than average, which may indicate significant opportunity for water conservation.

Section 5. Project Prioritization Criteria

5.1 Criteria for Prioritizing Capacity Improvement Projects

For each of the communities included in this report, current water demand and sewer discharge compared to system capacity was assessed in their respective Special District Needs Assessment Report. Various development scenarios were evaluated to compare the projected water demand and sewer flows to the system capacities to identify capacity gaps and how much development could be sustained by the existing utility capacities. An evaluation of all key sites from the Housing Element, combined with the analysis of current system capacities and/or capabilities, reveals that not all sites are equal candidates for capacity improvement projects. Therefore, this report identifies each potential project with a priority for purposes of further analysis and recommendation. Potential capacity improvement projects have been prioritized into two groups: Priority 1 – Sites with high benefit from improvement to existing systems; Priority 2 – Sites requiring completely new facilities, or extensive expansions due to remoteness, both with high cost to benefit ratios. Within Priority 1, proposed projects have been further sorted into sub-categories: 1) Low cost/no new construction; 2) Minor costs/construction; and Capital improvement projects. Each of the Priority 1 projects have been evaluated based on overall cost and cost per additional housing unit, to the extent possible.

Most of the Priority 2 projects identified would include development of specific plans or subdivisions where the developer would be responsible for infrastructure development to serve the property, which may or may not become part of the utility-owned system. Additionally, many Priority 2 projects do not have current zoning designation to support the proposed development identified in the Housing Element.

Projects identified in the following sections for each community have been identified based on the priority criteria discussed in this section. Please note that the project description, capacity improvement, and cost estimate for each project are for planning purposes only, and further site investigation, design, permitting, and cost estimation are required for project completion. All information included here is based on the best available data at the time of this report. It is worth noting that construction costs have varied significantly in the three to four years leading up to this report, based on persistent variability in material and labor costs and inflation since the Covid-19 pandemic in 2020. Refer to Appendix A for project cost estimate calculations.

Additional considerations in cost estimates include the relative remoteness of Mono County communities, California Public Works projects bidding requirements and associated project management overhead, and possible grant funding requirements, all of which increase construction costs and can limit the pool of contractors and/or developers willing to undertake projects. Constructing larger projects and/or multiple projects at the same time can help to reduce construction and non-construction costs. Projects included here are sorted by community and by priority as discussed previously. Within each priority category and sub-category, the order is not meant to convey greater or lesser priority.

Section 6. Capacity Improvement Projects - Bridgeport

6.1 Proposed Projects

Capacity improvement projects in Bridgeport include two Priority 1, Low Cost/No New Cost projects; two Priority 1, Minor Cost/Construction projects, nine Priority 1, Capital Improvement Projects; and two Priority 2 projects. Capital Improvement Projects include water and sewer system improvements to accommodate the full build-out scenario.

6.2 Priority 1 Projects

Priority 1 projects are further divided into three categories: low or no cost and no new construction, minor cost and/or construction, and larger capital improvement projects.

6.3 Low Cost/No New Construction

Project B1 – Water Conservation Public Outreach

Project Description

This project consists of developing and presenting educational materials to customers and community members about water saving practices, which can contribute to reduced water consumption per connection through customer behavior changes as described in Section 4. Bridgeport PUD, Mono County, or other organizations can develop community-specific water conservation materials, use materials already developed by others, or a combination of the two. Opportunities for water conservation public outreach and education include, but are not limited to flyers within utility bills, billboards in the community, posters in public spaces like community centers, parks, and public offices, informational booths at community events and festivals, educational materials at schools, online outlets and social media advertising. Additionally, community groups such as Girl Scouts, Boy Scouts, church youth groups, and community service organizations may be willing to partner to further these efforts. No new construction is proposed with this project.

Capacity Improvement

It is difficult to project the quantitative impact of water conservation public outreach. Each community has unique challenges, opportunities, and priorities. The average water use in Bridgeport is much higher than the average household discharge and may represent a good potential for water savings with conservation efforts. Importantly, water conservation results are akin to the adage “a penny saved is a penny earned”; for every gallon of water saved, that functions the same as an additional gallon produced, but at no additional direct cost.

Cost Estimate

The costs associated with water conservation public outreach can be tailored to the potential budget available. There is not a set financial entry point, though there may be a level of spending below which no measurable effect is produced. Impact may be amplified by partnering with other community organizations. Costs associated with this effort may include but is not limited to: staff time (or consultant fees) for developing outreach materials, staff time (or consultant fees) for outreach, costs for hard-copy outreach materials, costs for advertising on billboards, social media, and other media, and travel costs.

Project B2 – Water Conservation Rebate Programs

Project Description

This project consists of developing and implementing a rebate program to encourage customers to replace older inefficient plumbing fixtures with new WaterSense-certified fixtures. Rebates can be structured so that payment for replacement of fixtures is tiered to prioritize the most water savings. Often, utilities offer these rebates contingent upon providing proof of purchase of the new fixtures and will then provide the rebate in the form of a credit on the utility bill. Typically, utilities have a limit on the maximum rebate amount per customer, and do not cover the entire cost of new fixtures. Areas with older construction, such as Bridgeport Townsite may have more potential for water savings from this program. No new construction is proposed with this project.

Capacity Improvement

It is difficult to project the quantitative impact of water conservation rebate programs. Each community has unique challenges, opportunities, and priorities. For example, the water savings achieved by replacing an old toilet with a newer, more water-efficient model can vary depending on factors such as the age and efficiency of the old toilet, the water usage habits of the household, and the specific characteristics of the new toilet. However, on average, replacing an old toilet with a newer WaterSense-certified toilet can result in significant water savings. For example, many older toilets installed prior to the mid-1990s use significantly more water per flush than modern toilets. Some older models can use as much as 3.5 to 7 gallons of water per flush. WaterSense-certified toilets, which meet the EPA's criteria for water efficiency, typically use 1.28 gallons per flush or less. Some high-efficiency toilets can use even less water, sometimes as low as 0.8 gallons per flush. As an example, a household that replaces two older toilets with new WaterSense-certified toilets may save over 8,000 gallons of water per year.

Cost Estimate

The costs associated with rebate programs include administration of the program, as well as the rebate amounts. Individual rebates are determined by the utility, as well as whether there is a limit on the number of rebates given annually. Ideally, the rebate amount for new fixtures should be just enough to encourage customers to take advantage of the program and replace fixtures. An example of potential rebates and associated water savings is shown below for illustrative purposes. This assumes a rebate of $50 for new toilets and a water savings of 2.22 gallons per flush. Replacement of fixtures is a change that results in water savings into the future without additional cost.

Table 3: Example Estimated Cost per Housing Unit

Total Estimated Cost (200 rebates)	$10,000
Increase in Housing Units	1
Cost per Additional Housing Unit	**$10,000**

6.4 Minor Costs/Construction

Project B3 – Water Meter Installation, Tiered Rate Structure

Project Description

This project consists of installation of water meters on all water connections throughout Bridgeport PUD. Installing water meters can lead to significant water savings by providing households with more accurate information about their water usage. However, the actual water savings achieved through the installation of water meters can vary widely depending on factors such as the initial water usage habits of the household, the effectiveness of water conservation measures implemented in response to metering, and the efficiency of the water metering system itself. Water savings is usually greater when tiered rate structures are adopted. Tiered rate structures typically include a base rate for water use up to a specified amount per customer per month, then a higher rate over that base amount. Communities can structure this with numerous tiers with increased rates for higher uses. This cost to customers can lead to voluntary water conservation behavior to save money.

Capacity Improvement

As with other water conservation efforts, it is difficult to project the quantitative impact of installing water meters. Bridgeport PUD does not currently use water meters for individual connections. Capacity improvement cannot be specifically quantified for meter installation, but communities with metered water connections use less water per connection than those systems without meters.

Cost Estimate

The costs associated with installation of water meters and development of a tiered rate structure include construction costs for meter installation and administrative costs for development of a tiered rate structure. For an approximate cost of $3,500 per water meter installed, potential costs are presented in Table 4, below. It is worth noting that unit costs will vary depending on how many meters are replaced at the same time.

Table 4: Example Estimated Cost for Water Meter Installation

Cost per meter installed	$3,500
Water Connections	258
Cost per Additional Housing Unit	**$903,000**

Project B4 – Landscaping Irrigation Management

Project Description

This project includes development and enforcement of outdoor watering restrictions, typically during the summer months. Bridgeport PUD may develop sprinkler watering restrictions, such as allowing irrigation every other day during the summer and not during the warmest parts of the day when landscape watering is most likely to be lost to evaporation. Encouraging or mandating the use of drought-tolerant plants and efficient irrigation systems (e.g. drip irrigation, adjusting sprinkler placement) can reduce outdoor water use further. This can be incorporated into building permit requirements. Public outreach and education can help to further this effort by educating landscape and yard maintenance professionals and homeowners about best practices for outdoor water use.

Capacity Improvement

As with other water conservation efforts, it is difficult to project the quantitative impact of restricting watering during the summer months, and other landscape irrigation measures. Factors that can affect the water savings in a community include the climate, weather, amount of grass turf in residential and commercial areas, and enforcement of regulations. Though not proposed here, more aggressive water conservation efforts include rebates to customers for removal of grass turf.

Cost Estimate

The costs associated with landscaping irrigation management include development of watering restriction guidelines and staff time for enforcement. Costs associated with requiring drought-tolerant plants and efficient irrigation systems include development of standards and minor staff time during plan review for building permits.

6.5 Capital Improvement Projects

Project B5 – Kirkwood Street Loop Water Replacement

Project Description

This project consists of replacement of up to 2,600 Linear Feet (LF) of 4- and 6-inch diameter water pipe with 6- and 8-inch water pipe. This would improve available fire flow in portions of Bridgeport Townsite, which would allow for additional development, including multi-family development. Network hydraulic modeling can be completed to determine the most appropriate pipe sizes and resulting available pressure and flow characteristics for various scenarios. This modeling, which is not part of the scope of this report, can help to determine where replacement of piping will have the most improvement for available fire flow. Figure 1 below shows parcels available for multi-family development that are located along 4-inch and 6-inch water mains, where improved fire flow is needed.

Capacity Improvement

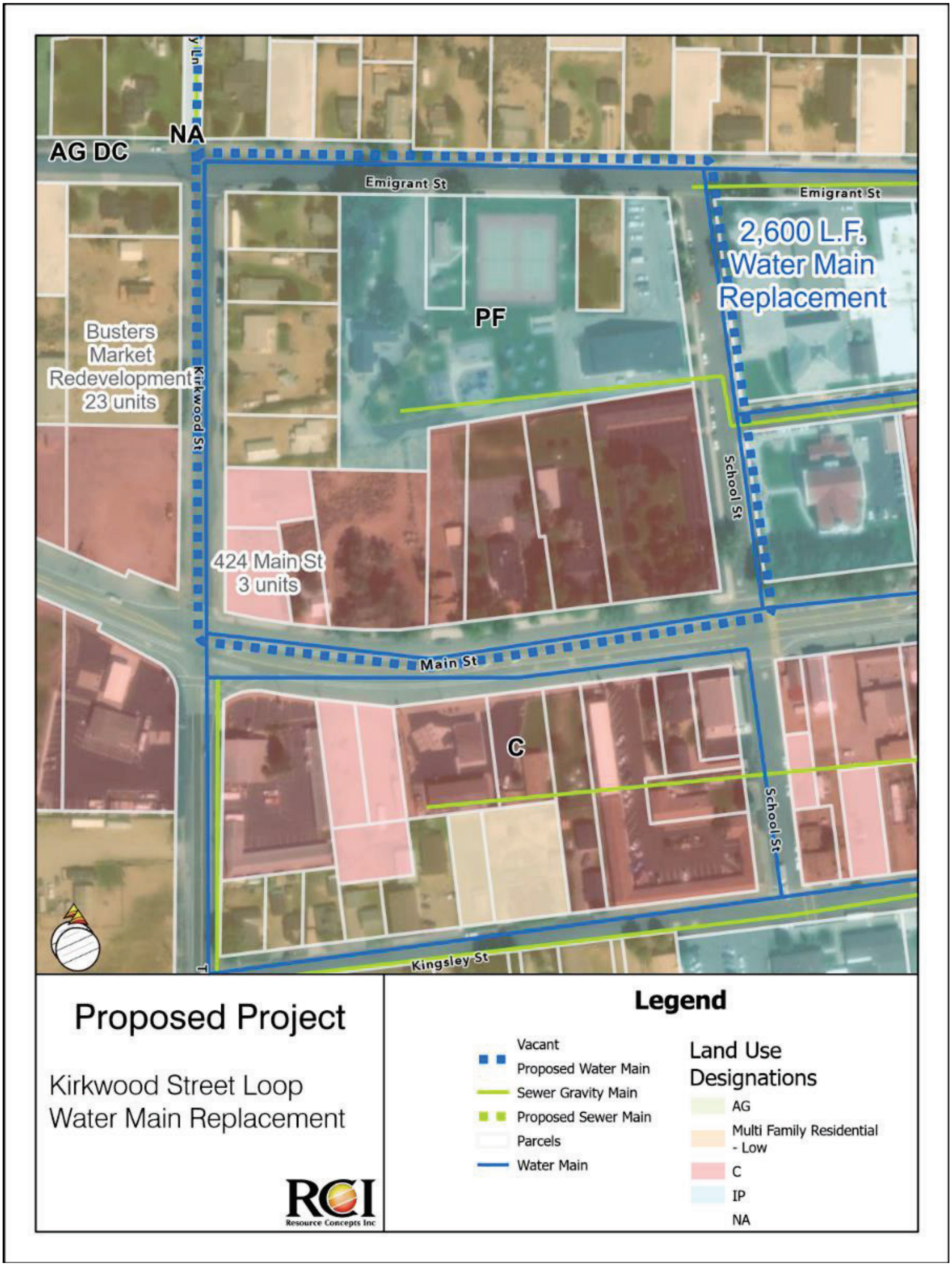
The figure shows the properties in the Bridgeport Townsite area that would be available for development with these improvements. A maximum of 26 multi-family residential units could be constructed on these lots based on current zoning and density regulations. Additionally, ADUs could be constructed on parcels that currently include a single-family residence. The Bridgeport PUD water system could accommodate this additional development, considered on its own. This project exceeds the available capacity of 20 households (as currently determined) of the Bridgeport PUD sewer system.

Cost Estimate

Table 5: Estimated Cost per Housing Unit

Total Estimated Cost	$650,000 to 800,000
Increase in Housing Units	26
Cost per Additional Housing Unit	**$25,000 to 30,800**

Figure 1: Kirkwood Street Loop Water Replacement Project



Project B6 – Stock Drive Water Extension

Project Description

This project consists of installation of approximately 1,600 LF of new 6- or 8-inch diameter water main to serve properties fronting Stock Drive within the Bridgeport Townsite area. No water infrastructure is currently located along this road. Sizing of the water main would be determined during the design phase for this project and would be affected by upsizing the water mains as described in the Kirkwood Street Loop Water Replacement Project. Upsizing water mains as part of the Kirkwood Street Loop Water Replacement Project would be necessary to complete this project, as the new water mains proposed in this project connect into the replacement water mains described in the prior project. Network hydraulic modeling, which is not part of the scope of this report, can be completed to determine the most appropriate pipe sizes and resulting available pressure and flow characteristics for various scenarios. Figure 2 below depicts the water main extension along Stock Drive, and the multi-family properties that will become available for development with this extension.

Capacity Improvement

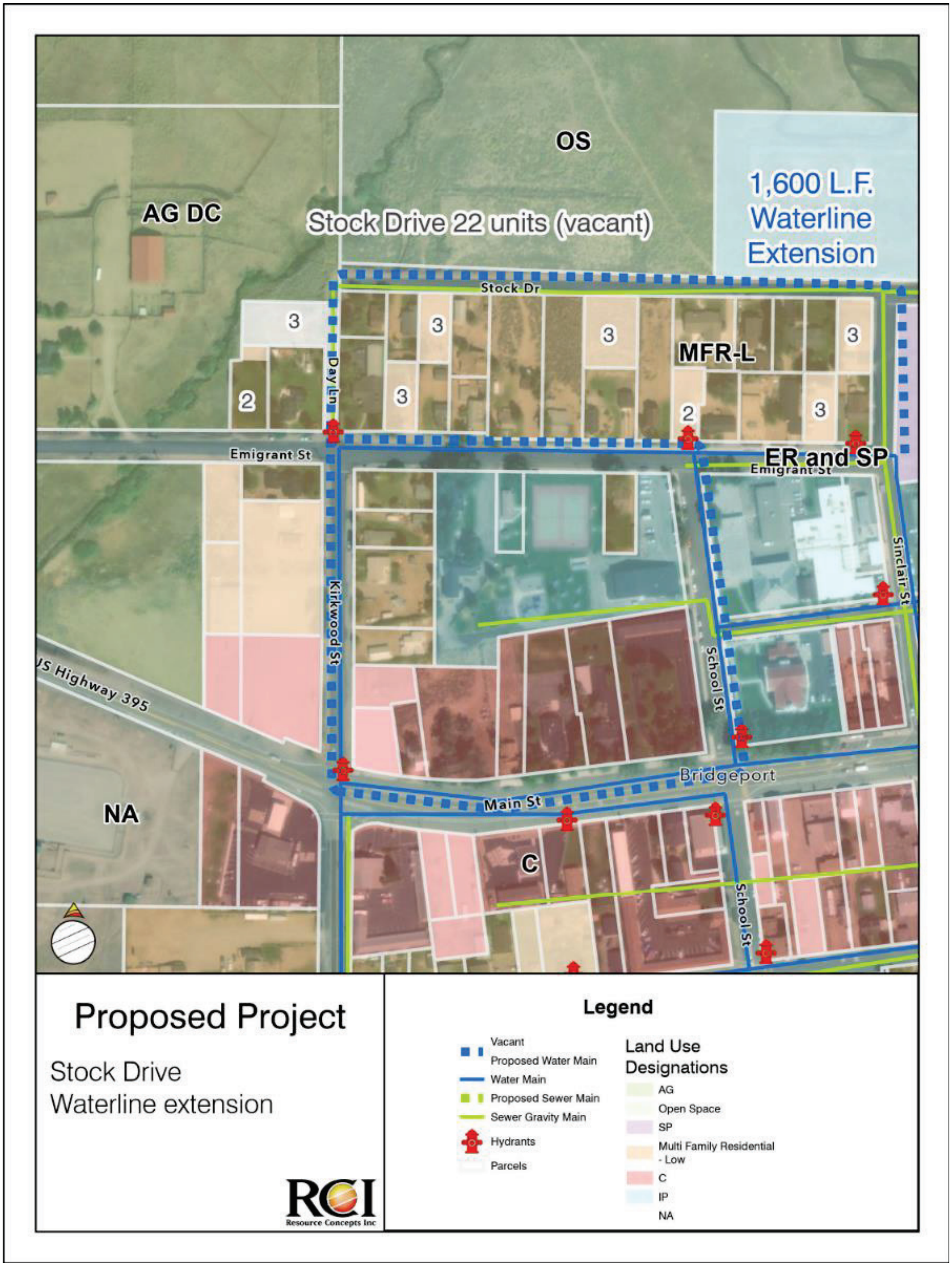
The figure shows the properties along Stock Drive that would be available for development with these improvements. A maximum of 22 multi-family residential units could be constructed on these lots based on current zoning and density regulations. The Bridgeport PUD water system could accommodate this additional development, considered on its own. This project exceeds the available capacity of 20 households (as currently determined) of the Bridgeport PUD sewer system.

Cost Estimate

Table 6: Estimated Cost per Housing Unit

Total Estimated Cost	$410,000 to $530,000
Increase in Housing Units	22
Cost per Additional Housing Unit	**$18,600 to 24,000**

Figure 2: Stock Drive Water Extension Project



Project B7 – Aurora Canyon Replacement Project

Project Description

This project consists of replacement of up to 2,040 LF of 4-inch diameter water pipe with 6- or 8-inch diameter pipe. This would improve available fire flow in the area of Aurora Canyon Road west of Buckeye Drive, which would allow for additional development, including multi-family development. Network hydraulic modeling, which is not part of the scope of this report, can be completed to determine the most appropriate pipe sizes and resulting available pressure and flow characteristics for various scenarios. This modeling can help to determine where replacement of piping will have the greatest effect to improve fire flow. Figure 3 below shows parcels available for multi-family development that are located along 4-inch water mains, where improved fire flow is needed.

Capacity Improvement

Figure 3 shows the properties in the Aurora Canyon Road area that would be available for development with these improvements. A maximum of 23 residential units could be constructed on these lots based on current zoning and density regulations. The Bridgeport PUD water system could accommodate this additional development, considered on its own. This project exceeds the available capacity of 20 households (as currently determined) of the Bridgeport PUD sewer system.

Cost Estimate

Table 7: Estimated Cost per Housing Unit

Total Estimated Cost	$500,000 to $650,000
Increase in Housing Units	23
Cost per Additional Housing Unit	**$21,700 to $28,300**

Project B8 – Alpine Vista Sewer Extension

Project Description

This project consists of extension of approximately 600 LF of sewer main south along Sierra View Drive to serve Alpine Vista Estates, which is currently served by water but not served by sewer, and parcels are too small for septic tanks. This sewer main will gravity flow north to the existing Art Webb lift station at SR 182 north of Sierra Street. This would allow for additional single-family development on 12 currently undeveloped lots. Figure 3 below shows the approximate connection location and sewer extension.

Capacity Improvement

Figure 3 shows the properties in the Alpine Vista Estates area that would be available for development with these improvements. A maximum of 12 single-family residential units could be constructed on these lots based on current zoning and density regulations, as well as up to 12 ADUs and 12 JADUs. The Bridgeport PUD water and sewer systems could accommodate this additional development excluding ADUs, considered on its own. The increase in potential housing including ADUs is within the current water system capacity but exceeds the available capacity of 20 households (as currently determined) for the Bridgeport PUD sewer system.

Cost Estimate

Table 8: Estimated Cost per Housing Unit, Excluding ADUs

Total Estimated Cost	$420,000 to $535,000
Increase in Housing Units	12
Cost per Additional Housing Unit	**$35,000 to $44,600**

Table 9: Estimated Cost per Housing Unit, Including ADUs

Total Estimated Cost	$420,000 to $535,000
Increase in Housing Units	36
Cost per Additional Housing Unit	**$12,000 to $15,000**

Figure 3: Aurora Canyon and Alpine Vista Estates Projects

Project B9 – Evans Tract Sewer Extension

Project Description

This project consists of a sewer main extension of approximately 4,600 LF (0.88 mi) south along US Hwy 395 to serve the Evans Tract area, which is currently served by water but not served by sewer. This area should gravity flow north to the existing CalTrans lift station at US Hwy 395 and Jack Sawyer Road. This extension would allow for additional development, including 36 single-family properties and multi-family development on currently undeveloped mixed-use lots. Figure 4 below shows parcels available for development in the Evans Tract area.

Capacity Improvement

Figure 4 shows the properties in the Evans Tract area that would be available for development with these improvements. A maximum of 88 residential units could be constructed on the 7 mixed-use and 36 single-family residential lots based on current zoning and density regulations and excluding ADUs. Including ADUs, another 36 ADUs and 36 JADUs would be possible. This project exceeds the available capacity in the Bridgeport PUD water and sewer system of 53 and 20 housing units, respectively (as currently determined) excluding and including ADUs.

Cost Estimate

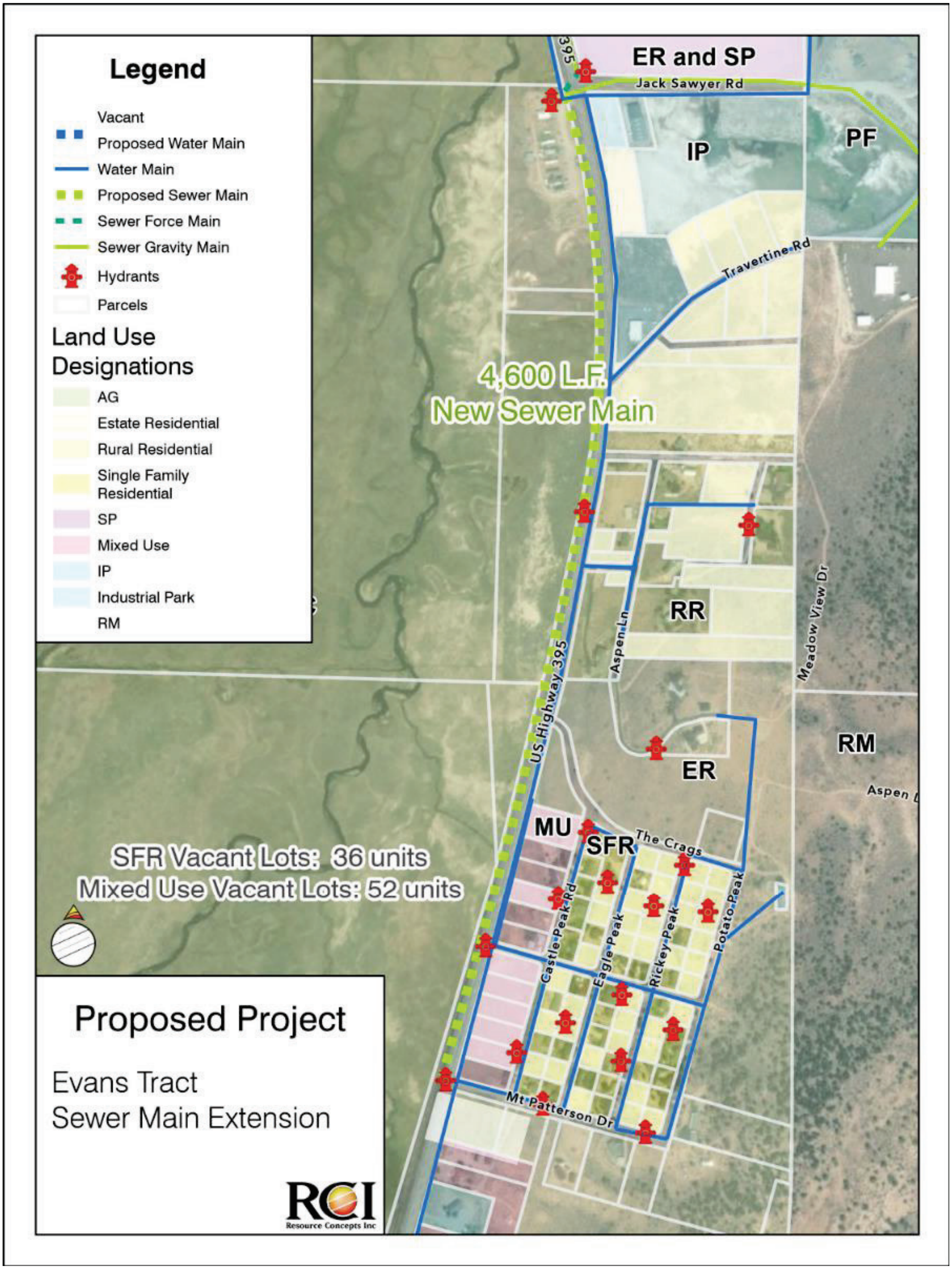
Table 10: Estimated Cost per Housing Unit, Excluding ADUs

Total Estimated Cost	$1.15 to $1.47 M
Increase in Housing Units	88
Cost per Additional Housing Unit	**$13,100 to $16,700**

Table 11: Estimated Cost per Housing Unit, Including ADUs

Total Estimated Cost	$1.15 to $1.47 M
Increase in Housing Units	160
Cost per Additional Housing Unit	**$7,200 to $9,200**

Figure 4: Evans Tract Sewer Extension Project



Project B10 – Bridgeport Water Treatment Plant

Project Description

This project consists of expansion of the existing water treatment plant in Bridgeport. The treatment plant currently reduces the concentration of naturally occurring arsenic in the groundwater produced by both currently active wells. The maximum flow of 650 gpm through the water treatment system is currently the limiting factor for the supply of water in the Bridgeport PUD water system. Based on information provided by Tom Mullinax, the certified operator of the Bridgeport PUD system, current peak flows in the summer are near the maximum flow rate in the treatment system. To increase the maximum flow, the treatment system capacity must be increased. Design and construction of the existing treatment system were costly, and expansion of the treatment system would not be a low-cost project.

Capacity Improvement

This project would increase the water system capacity throughout the entire Bridgeport PUD system where water infrastructure exists. The extent of increase in capacity is directly dependent upon the expansion completed for the water treatment system. For example, the existing system includes two coagulation filtration units, which accommodate a maximum flow of 650 gpm. If one additional treatment unit of the same size is added, the maximum flow may be increased to 975 gpm. This expansion would allow for an additional 468,000 gpd supply, which equates to an added capacity of approximately 111 households at the current maximum daily demand.

Cost Estimate

Based on the article abstract for “The Costs of Small Drinking Water Systems Removing Arsenic from Groundwater” originally published in Journal of Water Supply: Research and Technology – Aqua, the capital cost of various arsenic treatment systems ranged from $477 to $6,171 per gpm of design flow. Based on this information, a conservative range of approximately $4,000 to $6,200 per gpm is used for the estimated potential treatment system project cost, as shown in Table 12, below.

Table 12: Estimated Cost per Housing Unit

Cost per Design gpm	$4,000 to $6,200
Additional Design Capacity	325 gpm
Total Estimated Cost	$1.3 to 2.0 M
Increase in Housing Units	111
Cost per Additional Housing Unit	**$11,712 to $18,018**

Project B11 – Bridgeport Water Full Build-Out Improvements

Project Description

This project consists of expansion of the existing water system to accommodate future full build-out, including source development, water treatment expansion, additional water storage tanks, additional fire hydrants, and pipe replacement. The number of housing units this takes into consideration is based on full build-out of all vacant properties to their maximum density, as included in the Special District Needs Assessment for Bridgeport. This includes 15 units per acre on properties that allow that density (multi-family, mixed-use, etc.), a single primary residence plus one ADU and one JADU on each single-family parcel, and the addition of one ADU and one JADU on properties currently developed as single family. This build-out results in 909 total housing units, or 635 additional housing units. With this theoretical future build-out, we are using the current demand rates of 1,474 gpd per household for average day demand and 4,205 gpd per household for maximum day demand. Coupled with the number of potential households at full build-out of 909 housing units, the maximum day demand for water at full build-out would be 3,822,345 gpd.

In order to meet that demand, it is assumed that 3 new wells would need to be developed, based on an average production of 650 gpm per well. Water treatment flow would have to expand to meet the maximum day flow of 2,004 gpm, and three storage tanks adding approximately 1,575,000 gallons of storage to the system would be needed. Additional fire hydrants would be needed for new development, and replacement of some water mains would be necessary for the increased flows. We assume 20 fire hydrants and approximately 4.0 miles of water mains would be replaced or added.

Capacity Improvement

This project would increase the water system capacity throughout the entire Bridgeport PUD system to accommodate the maximum build out of 909 housing units (635 additional housing units) based on the information included in the Project Description above.

Cost Estimate

Based on the assumptions and descriptions included above, the planning-level approximate cost of this project is included in Table 13, below. Please note that these costs are approximate and current at the time of this report, and do not reflect projected cost inflation, though a project of this size would require significant time to complete.

Table 13: Estimated Households at Full Build-out

Additional Design Capacity	2,004 gpm
	2,886,345 gpd
Total Estimated Cost	$39,769,595
Increase in Housing Units	635
Cost per Additional Housing Unit	**$62,629**

Project B12 – Bridgeport Wastewater Treatment Expansion

Project Description

The capacity at the existing Bridgeport wastewater treatment plant is currently a limiting factor in sewer capacity for projects in Bridgeport. This project would expand the existing wastewater treatment facility at the existing site. It is recommended that measurement of the wastewater flows as described in the Special District Needs Assessment is completed prior to considering this project, as flows may be less than estimated in the Special District Needs Assessment, which would result in a greater estimated available capacity.

Capacity Improvement

This project would increase sewer system capacity throughout the entirety of Bridgeport where sewer infrastructure exists. The extent of increase in capacity is directly dependent upon the expansion completed for the wastewater treatment system. If we assume a 50% capacity expansion of 100,000 gpd at the same maximum day discharge rate of 1,728 gpd per connection, this expansion would allow capacity for approximately 58 additional housing units.

Cost Estimate

Based on wastewater treatment plant cost estimate included in the June Lake Public Utility District Wastewater Treatment Plant Evaluation Study (2020) identified in Section 7, the cost for new plant construction is $10 to $30 per design gallon per day. An example cost analysis is shown in Table 14, below. As shown in Table 14, the estimated cost range is large, with a very high cost per additional housing unit on the upper end of the estimate range.

Table 14: Estimated Cost per Housing Unit

Cost per Design gpd	$10 to $30
Additional Design Capacity	100,000 gpd
Total Estimated Cost	$1.0 to 3.0 M
Increase in Housing Units	58
Cost per Additional Housing Unit	**$17,241 to $51,724**

Project B13 – Bridgeport Sewer Full Build-Out Improvements

Project Description

This project consists of expansion of the existing sewer system to accommodate future full build-out, including wastewater treatment expansion, sewer manholes, main extension and replacement, and assumed addition of 2 lift stations. The number of housing units this takes into consideration is based on full build-out of all vacant properties to their maximum density, which is a total of 909 units, or an additional 813 housing units connected to the sewer system. This includes 15 units per acre on properties that allow that density (multi-family, mixed-use, etc.), a single primary residence plus one ADU and one JADU on each SFR parcel, and the addition of one ADU and one JADU on properties currently developed as single family. Additionally, we assume that all properties would be connected to sewer with future full build-out density. With this theoretical future build-out, we are using the current discharge rates of 576 gpd per household for average day discharge and 1,728 gpd per household for maximum day demand. Coupled with the number of potential households at full build-out of 909 housing units, the maximum day discharge for sewer at full build-out would be 1,570,752 gpd, which is an increase of 1,370,752 gpd above the current capacity.

Capacity Improvement

This project would increase the sewer system capacity throughout the entire Bridgeport PUD system to accommodate the maximum build out of 909 housing units based on the information included in the Project Description above, which is an increase of 813 housing units connected to sewer.

Cost Estimate

Based on the assumptions and descriptions included above, the planning-level approximate cost of this project is included in Table 15, below. Please note that these costs are approximate and current at the time of this report, and do not reflect projected cost inflation, though a project of this size would require significant time to complete. Full cost estimates are included in Appendix A.

Table 15: Estimated Cost per Housing Unit

Additional Design Capacity	1,370,752 gpd
Total Estimated Cost	$58,608,816
Increase in Housing Units	813
Cost per Additional Housing Unit	**$72,090**

6.6 Priority 2 Projects

1) **186 Milk Ranch Road – Bridgeport**

This 74.3-acre property is east of the Bridgeport Townsite area and has water and sewer infrastructure along the west boundary of the property. It may be possible to develop this property in a limited way, but full property development could be complicated by alkali flats and wetlands on the site. Based on the size of the property, even single-family development of the entire area would far exceed the available water and sewer capacity of Bridgeport PUD.

2) **BLM Land Exchange – Bridgeport**

The property identified as this key site is over 163 acres located north of Bridgeport, along the east side of Bridgeport Reservoir. This lot is owned by the Bureau of Land Management (BLM) and would have to go through the land disposal process to be considered for development.

Section 7. Capacity Improvement Projects – Crowley Lake

7.1 Proposed Projects

Capacity improvement projects in Crowley Lake include two Priority 1, Low Cost/No New Cost projects; two Priority 1, Minor Cost/Construction projects, four Priority 1, Capital Improvement Projects; and five Priority 2 projects. Capital Improvement Projects include water and sewer system improvements to accommodate the full build-out scenario.

7.2 Priority 1 Projects

Priority 1 projects are further divided into three categories: low or no cost and no new construction, minor cost and/or construction, and larger capital improvement projects.

7.3 Low Cost/ No New Construction

Project C1 – Water Conservation Public Outreach

Project Description

This project consists of developing and presenting educational materials to customers and community members about water saving practices, which can contribute to reduced water consumption per connection through customer behavior changes as described in Section 4. Crowley Lake MWC, Mountain Meadows MWC, Mono County, or other organizations can develop community-specific water conservation materials, use materials already developed by others, or a combination of the two. Opportunities for water conservation public outreach and education include, but are not limited to flyers within utility bills, billboards in the community, posters in public spaces like community centers, parks, and public offices, informational booths at community events and festivals, educational materials at schools, online outlets and social media advertising. Additionally, community groups such as Girl Scouts, Boy Scouts, church youth groups, and community service organizations may be willing to partner to further these efforts. Mountain Meadows MWC has a water conservation program in place. No new construction is proposed with this project.

Capacity Improvement

It is difficult to project the quantitative impact of water conservation public outreach. Each community has unique challenges, opportunities, and priorities. The average water use in Crowley Lake is higher than the average household use and may represent a good potential for water savings with conservation efforts. Importantly, water conservation results are akin to the adage "a penny saved is a penny earned"; for every gallon of water saved, that functions the same as an additional gallon produced, but at no additional direct cost.

Cost Estimate

The costs associated with water conservation public outreach can be tailored to the potential budget available. There is not a set financial entry point, though there may be a level of spending below which no measurable effect is produced. Impact may be amplified by partnering with other community organizations. Costs associated with this effort may include but are not limited to staff time (or consultant fees) for developing outreach materials, staff time (or consultant fees) for outreach, costs for hard-copy outreach materials; costs for advertising on billboards, social media, and other media, and travel costs.

Project C2 – Water Conservation Rebate Programs

Project Description

This project consists of developing and implementing a rebate program to encourage customers to replace older inefficient plumbing fixtures with new WaterSense-certified fixtures. Rebates can be structured so that payment for replacement of fixtures is tiered to prioritize the most water savings. Often, utilities offer these rebates contingent upon providing proof of purchase of the new fixtures and will then provide the rebate in the form of a credit on the utility bill. Typically, utilities have a limit on the maximum rebate amount per customer, and do not cover the entire cost of new fixtures. Areas with older construction may have more potential for water savings from this program. No new construction is proposed with this project.

Capacity Improvement

It is difficult to project the quantitative impact of water conservation rebate programs. Each community has unique challenges, opportunities, and priorities. For example, the water savings achieved by replacing an old toilet with a newer, more water-efficient model can vary depending on factors such as the age and efficiency of the old toilet, the water usage habits of the household, and the specific characteristics of the new toilet. However, on average, replacing an old toilet with a newer WaterSense-certified toilet can result in significant water savings. For example, many older toilets installed prior to the mid-1990s use significantly more water per flush than modern toilets. Some older models can use as much as 3.5 to 7 gallons of water per flush. WaterSense-certified toilets, which meet the Environmental Protection Agency's criteria for water efficiency, typically use 1.28 gallons per flush or less. Some high-efficiency toilets can use even less water, sometimes as low as 0.8 gallons per flush. As an example, a household that replaces two older toilets with new WaterSense-certified toilets may save over 8,000 gallons of water per year.

Cost Estimate

The costs associated with rebate programs include administration of the program as well as the rebate amounts. Individual rebates are determined by the utility, as well as whether there is a limit on the number of rebates given annually. Ideally, the rebate amount for new fixtures should be just enough to encourage customers to take advantage of the program and replace fixtures. An example of potential rebates and associated water savings is shown below for illustrative purposes. This assumes a rebate of $50 for new toilets and a water savings of 2.22 gallons per flush. Replacement of fixtures is a change that results in water savings into the future without additional cost.

Table 16: Example Estimated Cost per Housing Unit

Total Estimated Cost (200 rebates)	$10,000
Increase in Housing Units	2.4
Cost per Additional Housing Unit	**$4,167**

7.4 Minor Costs/Construction

Project C3 – Water Meter Installation, Tiered Rate Structure

Project Description

The Mountain Meadows MWC already meters all water connections and has a tiered rate structure. The Crowley Lake MWC does not currently meter connections. This project consists of installation of water meters on all water connections throughout Crowley Lake MWC. Installing water meters can lead to significant water savings by providing households with more accurate information about their water usage. However, the actual water savings achieved through the installation of water meters can vary widely depending on factors such as the initial water usage habits of the household, the effectiveness of water conservation measures implemented in response to metering, and the efficiency of the water metering system itself. Water savings is usually greater when tiered rate structures are adopted. Tiered rate structures typically include a base rate for water use up to a specified amount per customer per month, then a higher rate over that base amount. Communities can structure this with numerous tiers with increased rates for higher uses. This cost to customers can lead to voluntary water conservation behavior to save money.

Capacity Improvement

As with other water conservation efforts, it is difficult to project the quantitative impact of installing water meters. Crowley Lake MWC does not currently use water meters for individual connections. Capacity improvement cannot be specifically quantified for meter installation, but communities with metered water connections use less water per connection than those systems without meters.

Cost Estimate

The costs associated with installation of water meters and development of a tiered rate structure include construction costs for meter installation and administrative costs for development of a tiered rate structure. For an approximate cost of $3,500 per water meter installed, potential costs are presented in Table 17, below. It is worth noting that unit costs will vary depending on how many meters are replaced at the same time.

Table 17: Example Estimated Cost for Water Meter Installation

Cost per meter installed	$3,500
Water Connections	57
Cost per Additional Housing Unit	**$199,500**

Project C4 – Landscaping Irrigation Management

Project Description

This project includes development and enforcement of outdoor watering restrictions, typically during the summer months. All water utilities may develop sprinkler watering restrictions, such as allowing irrigation every other day during the summer and not during the warmest parts of the day when landscape watering is most likely to be lost to evaporation. Encouraging or mandating the use of drought-tolerant plants and efficient irrigation systems (e.g. drip irrigation, adjusting sprinkler placement) can reduce outdoor water use further. This can be incorporated into building permit requirements. Public outreach and education can help to further this effort by educating landscape and yard maintenance professionals and homeowners about best practices for outdoor water use.

Capacity Improvement

As with other water conservation efforts, it is difficult to project the quantitative impact of restricting watering during the summer months, and other landscape irrigation measures. Factors that can affect the water savings in a community include the climate, weather, amount of grass turf in residential and commercial areas, and enforcement of regulations. Though not proposed here, more aggressive water conservation efforts include rebates to customers for removal of grass turf.

Cost Estimate

The costs associated with landscaping irrigation management include development of watering restriction guidelines and staff time for enforcement. Costs associated with requiring drought-tolerant plants and efficient irrigation systems include development of standards and minor staff time during plan review for building permits. Administrative costs can be reduced by combining efforts of all water utilities.

7.5 Capital Improvement Projects

Project C5 – School District Parcel

Project Description

This project consists of the extension of water and sewer mains into the School District parcel in Crowley Lake, which is currently near existing utilities, but does not have infrastructure within the property. It may be possible to develop portions of the property with associated utility extensions without development of the entire property. In this way, development can be accomplished within defined budgets or housing capacity goals. Additionally, it may be possible to develop housing along the north boundary of the property with minimal water and sewer main extensions, as shown in Figure 5 below and consistent with the proposed Mammoth Unified School District Staff Housing project.

The extent of utility infrastructure needed varies significantly based on proposed development. For development of just the proposed staff housing, approximately 300 LF of both water and sewer mains would be required, while single-family development of the entire site would require approximately 3,500 LF of water mains and a similar quantity of sewer mains.

Capacity Improvement

For the proposed Mammoth Unified School District Staff Housing Project, ten residential units are proposed adjacent to the baseball field. For single-family development of the entire property at a density of 4 units per acre, this property could accommodate 103 residential units. This number of residential units is within the available capacity of both the Mountain Meadows MWC water system and the Hilton Creek CSD sewer system considered on its own. If all single-family residences also include ADUs and JADUs, the number of potential dwelling units would triple, and the project would be greater than the current capacity within both the water and sewer systems.

Cost Estimate

Table 18: Estimated Cost per Housing Unit, School District Staff Housing Project

Total Estimated Cost	$200,000 to $255,000
Increase in Housing Units	10
Cost per Additional Housing Unit	**$20,000 to $25,500**

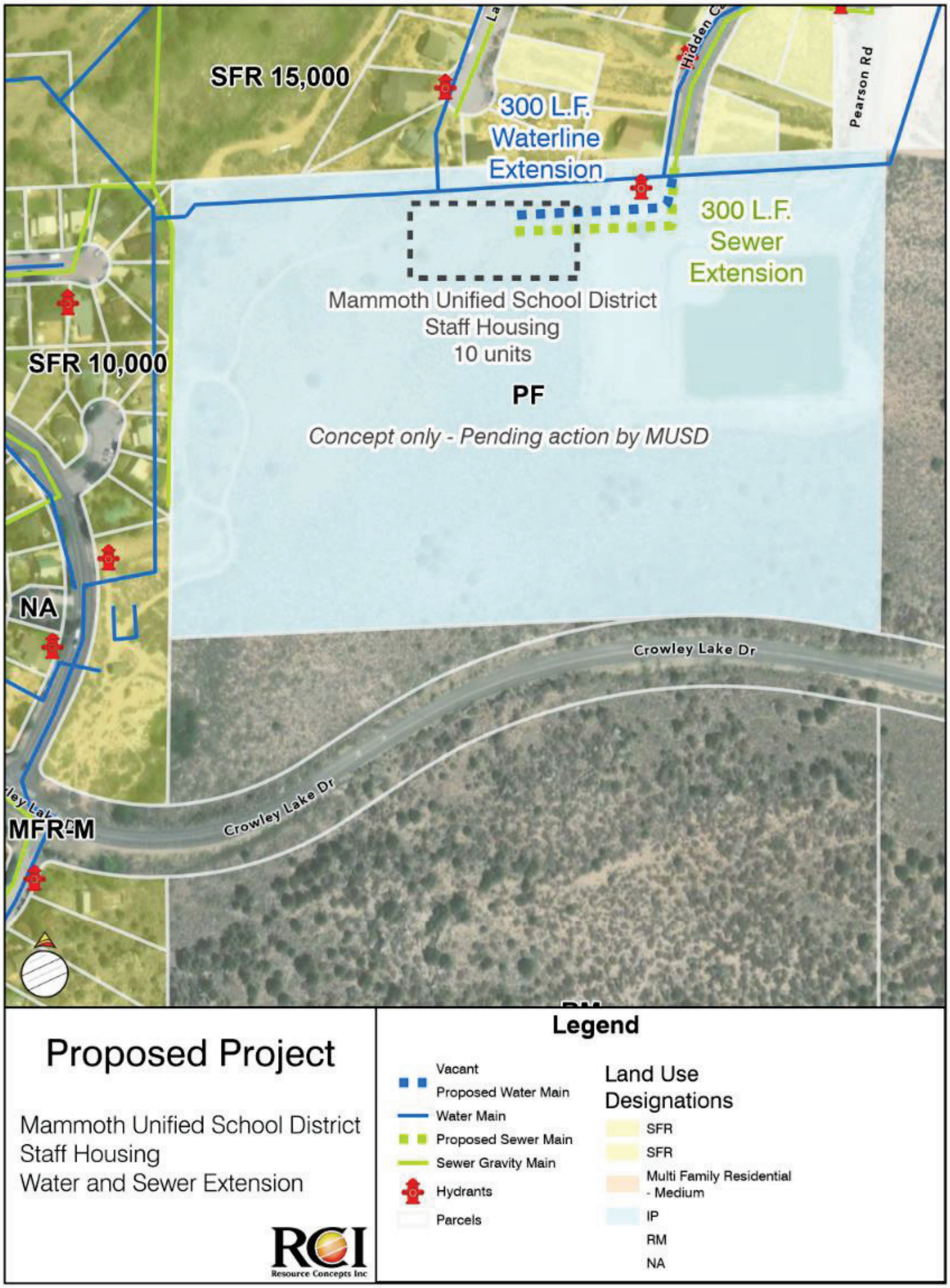
Table 19: Estimated Cost per Housing Unit, Single-Family Development, Excluding ADUs

Total Estimated Cost	$1.60 to $2.10 M
Increase in Housing Units	103
Cost per Additional Housing Unit	**$15,800 to $20,200**

Table 20: Estimated Cost per Housing Unit, Single-Family Development, Including ADUs

Total Estimated Cost	$1.60 to $2.10 M
Increase in Housing Units	309
Cost per Additional Housing Unit	**$5,300 to $6,700**

Figure 5: School District Parcel Water and Sewer Extension Project for School District Staff Housing



Project C6 – Crowley Lake Drive Water Extension

Project Description

This project consists of the extension of a water main north along Crowley Lake Drive to serve vacant mixed-use parcels that could be developed for multi-family housing. The properties along this part of Crowley Lake Drive are not currently within a water service district and would have to be annexed to provide service. Sewer infrastructure already exists within Crowley Lake Drive, and the properties are within the Hilton Creek CSD boundaries. To serve all the identified properties, an extension of approximately 1,900 LF of water main would be required. Figure 6 below shows the vacant mixed-use parcels along the identified water main extension.

Capacity Improvement

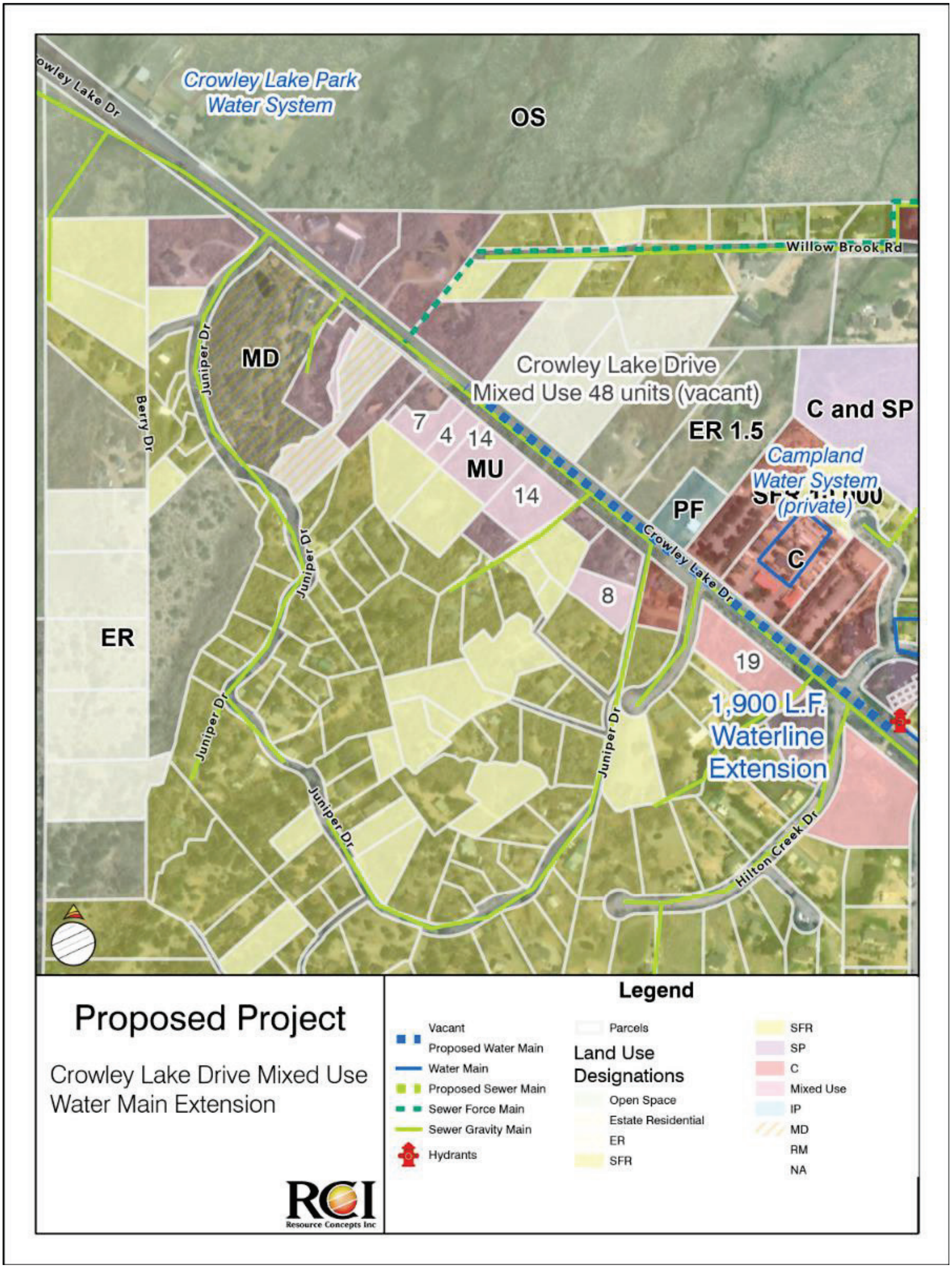
If each of the vacant mixed-use properties were developed as multi-family residential, 48 residential units could be constructed. This number of residential units is within the available capacity of both the Mountain Meadows MWC water system and the Hilton Creek CSD sewer system, considered on its own.

Cost Estimate

Table 21: Estimated Cost per Housing Unit

Total Estimated Cost	$530,000 to $680,000
Increase in Housing Units	48
Cost per Additional Housing Unit	**$11,000 to $14,200**

Figure 6: Crowley Lake Drive Water Main Extension Project



Project C7 – Crowley Lake Water Full Build-Out Improvements

Project Description

This project consists of expansion of the existing water system to accommodate future full build-out, including source development, water treatment expansion, additional water storage tanks, additional fire hydrants, and pipe replacement. The number of housing units this takes into consideration is based on full build-out of all vacant properties to their maximum density, which is 1,039 housing units, or 753 additional housing units. This includes 15 units per acre on properties that allow that density (multi-family, mixed-use, etc.), a single primary residence plus one ADU and one JADU on each SFR parcel, and the addition of one ADU and one JADU on properties currently developed as single family. With this theoretical future build-out at current demand, the maximum water demand is 1,920,815 gpd. With an approximate demand increase of twice the existing capacity, we assume a proportional increase in water storage as currently constructed.

In order to meet that demand, it is assumed that 2 new wells would need to be developed, based on an average production of 400 to 500 gpm per well. Water storage tanks adding approximately 670,000 gallons of storage to the system would be needed. Additional fire hydrants would be needed for new development, and replacement of some water mains would be necessary for the increased flows. We assume 30 fire hydrants and approximately four miles of water mains would be replaced or added.

Capacity Improvement

This project would increase the water system capacity throughout the entire Crowley Lake community to accommodate the maximum build out of 1,019 housing units based on the information included in the Project Description above. This represents an increase of 753 housing units for water service.

Cost Estimate

Based on the assumptions and descriptions included above, the planning-level approximate cost of this project is included in Table 22, below. Please note that these costs are approximate and current at the time of this report, and do not reflect projected cost inflation, though a project of this size would require significant time to complete.

Table 22: Estimated Cost Per Housing Unit

Additional Design Capacity	1,272,815 gpd
Total Estimated Cost	$15,411,725
Increase in Housing Units	753
Cost per Additional Housing Unit	**$20,467**

Project C8 – Crowley Lake Sewer Full Build-Out Improvements

Project Description

This project consists of expansion of the existing sewer system to accommodate future full build-out, including wastewater treatment expansion, sewer manholes, main extension and replacement, and assumed addition of 2 lift stations. The number of housing units this takes into consideration is based on full build-out of all vacant properties to their maximum density, which results in 1,019 total housing units. This includes 15 units per acre on properties that allow that density (multi-family, mixed-use, etc.), a single primary residence plus one ADU and one JADU on each SFR parcel, and the addition of one ADU and one JADU on properties currently developed as single family. Additionally, we assume that all properties would be connected to sewer with future full build-out density. With this theoretical future build-out and the current maximum sewer discharge rate of 363 gpd per household, this results in a discharge rate of 369,897 gpd, which is an additional 193,897 gpd above the current capacity. With maximum day discharge increasing by a factor of approximately 1.0, we assume an approximate proportional increase in the sewer treatment volume capacity needed and an increase in pumping stations and approximately half of the sewer mains and manholes, based on denser development.

Capacity Improvement

This project would increase the sewer system capacity throughout the entire Bridgeport PUD system to accommodate the maximum build out of 1,019 housing units based on the information included in the Project Description, above. This represents an increase in

Cost Estimate

Based on the assumptions and descriptions included above, the planning-level approximate cost of this project is included in Table 23, below. Please note that these costs are approximate and current at the time of this report, and do not reflect projected cost inflation, though a project of this size would require significant time to complete.

Table 23: Estimated Cost per Housing Unit

Additional Design Capacity	193,897 gpd
Total Estimated Cost	$14,075,897
Increase in Housing Units	646
Cost per Additional Housing Unit	**$21,789**

7.6 Priority 2 Projects

1) **Crowley Lake RM – Crowley Lake**

This 59.4-acre project property would require extension of water and sewer mains into the Crowley Lake RM parcel in Crowley Lake, which is currently adjacent to existing utilities, but does not have infrastructure within the property. This property was previously included in the Lakeridge Bluffs future development of 114 parcels. For single-family development as previously proposed, approximately 6,700 LF of water and sewer mains would be required to serve the entire development and would likely not result in affordable housing. This number of residential units is within the available capacity of both the Mountain Meadows MWC water system and the Hilton Creek CSD sewer system.

2) **379 Landing Road – Crowley Lake**

This project would require extension of water and sewer mains into the 9.0-acre property located at 379 South Landing Road in Crowley Lake, which is currently adjacent to existing utilities, but does not have distribution infrastructure within the property. The water and sewer infrastructure required for development varies based on eventual design, but a basic estimate of approximately 1,900 LF of water and sewer mains is reasonable for multi-family development. Based on the Housing Element, this property could accommodate approximately 53 housing units. This number of residential units is within the available capacity of both the Mountain Meadows MWC water system and the Hilton Creek CSD sewer system.

3) **Sunny Slopes Water – Crowley Lake**

This project would require extension of water mains into the 12.8-acre property located along the west side of Sunny Slopes, east of Crowley Lake, and within the Long Valley Area. This residential area is developed with single-family homes utilizing septic system for sewer and is served by Birchim CSD for water. Based on the Housing Element estimate, 11 single-family parcels could be developed with approximately 2,700 LF of water main extensions.

4) **Aspen Springs ER – Crowley Lake**

The Aspen Springs ER property is not located within any existing water or sewer service territories. Existing water and sewer infrastructure is approximately 2.3 miles to the west. Development of this area would require either a lengthy extension for existing water and sewer lines, development of new water and sewer systems to serve the property, or parcels large enough to be served by domestic wells and septic systems, which would likely not contribute to low- or moderate-income housing.

5) **Aspen Springs Mixed Use – Crowley Lake**

The Aspen Springs Mixed Use property is almost identical to the Aspen Springs ER site in utility limitations. It is not located within any existing water or sewer service territories. Existing water and sewer infrastructure is approximately 2.3 miles to the west. Development of this area would require either a lengthy extension for existing water and sewer lines, development of new water and sewer systems to serve the property or parcels large enough to be served by domestic wells and septic systems, which would likely not contribute to low- or moderate-income housing.

Section 8. Capacity Improvement Projects – June Lake

8.1 Proposed Projects

Capacity improvement projects in June Lake include two Priority 1, Low Cost/No New Cost projects; one Priority 1, Minor Cost/Construction project, two Priority 1, Capital Improvement Projects; and four Priority 2 projects. Capital Improvement Projects include water and sewer system improvements to accommodate the full build-out scenario.

8.2 Priority 1 Projects

Priority 1 projects are further divided into three categories: low or no cost and no new construction, minor cost and/or construction, and larger capital improvement projects.

8.3 Low Cost/ No New Construction

Project J1 – Water Conservation Public Outreach

Project Description

This project consists of evaluating the existing water conservation programs and developing and presenting educational materials to customers and community members about water saving practices, which can contribute to reduced water consumption per connection through customer behavior changes as described in Section 4. June Lake PUD, Mono County, or other organizations can develop community-specific water conservation materials, use materials already developed by others, or a combination of the two. Opportunities for water conservation public outreach and education include, but are not limited to flyers within utility bills, billboards in the community, posters in public spaces like community centers, parks, and public offices, informational booths at community events and festivals, educational materials at schools, online outlets and social media advertising. Additionally, community groups such as Girl Scouts, Boy Scouts, church youth groups, and community service organizations may be willing to partner to further these efforts. No new construction is proposed with this project.

Capacity Improvement

It is difficult to project the quantitative impact of water conservation public outreach. Each community has unique challenges, opportunities, and priorities. The average water use in the June Lake Village System is slightly higher than the average household use and may represent a good potential for water savings with conservation efforts. Importantly, water conservation results are akin to the adage "a penny saved is a penny earned"; for every gallon of water saved, that functions the same as an additional gallon produced, but at no additional direct cost.

Cost Estimate

The costs associated with water conservation public outreach can be tailored to the potential budget available. There is not a set financial entry point, though there may be a level of spending below which no measurable effect is produced. Impact may be amplified by partnering with other community organizations. Costs associated with this effort may include but is not limited to staff time (or consultant fees) for developing outreach materials, staff time (or consultant fees) for outreach, costs for hard-copy outreach materials; costs for advertising on billboards, social media, and other media, and travel costs.

Project J2 – Water Conservation Rebate Programs

Project Description

This project consists of developing and implementing a rebate program to encourage customers to replace older inefficient plumbing fixtures with new WaterSense-certified fixtures. Rebates can be structured so that payment for replacement of fixtures is tiered to prioritize the most water savings. Often, utilities offer these rebates contingent upon providing proof of purchase of the new fixtures and will then provide the rebate in the form of a credit on the utility bill. Typically, utilities have a limit on the maximum rebate amount per customer, and do not cover the entire cost of new fixtures. Areas with older construction may have more potential for water savings from this program. No new construction is proposed with this project.

Capacity Improvement

It is difficult to project the quantitative impact of water conservation rebate programs. Each community has unique challenges, opportunities, and priorities. For example, the water savings achieved by replacing an old toilet with a newer, more water-efficient model can vary depending on factors such as the age and efficiency of the old toilet, the water usage habits of the household, and the specific characteristics of the new toilet. However, on average, replacing an old toilet with a newer WaterSense-certified toilet can result in significant water savings. For example, many older toilets installed prior to the mid-1990s use significantly more water per flush than modern toilets. Some older models can use as much as 3.5 to 7 gallons of water per flush. WaterSense-certified toilets, which meet the Environmental Protection Agency's criteria for water efficiency, typically use 1.28 gallons per flush or less. Some high-efficiency toilets can use even less water, sometimes as low as 0.8 gallons per flush. As an example, a household that replaces two older toilets with new WaterSense-certified toilets may save over 8,000 gallons of water per year.

Cost Estimate

The costs associated with rebate programs include administration of the program as well as the rebate amounts. Individual rebates are determined by the utility, as well as whether there is a limit on the number of rebates given annually. Ideally, the rebate amount for new fixtures should be just enough to encourage customers to take advantage of the program and replace fixtures. An example of potential rebates and associated water savings is shown below for illustrative purposes. This assumes a rebate of $50 for new toilets and a water savings of 2.22 gallons per flush. Replacement of fixtures is a change that results in water savings into the future without additional cost.

Table 24: Example Estimated Cost per Housing Unit

Total Estimated Cost (200 rebates)	$10,000
Increase in Housing Units	3.9
Cost per Additional Housing Unit	**$2,564**

8.4 Minor Costs/Construction

Project J3 – Landscaping Irrigation Management

Project Description

This project includes development and enforcement of outdoor watering restrictions, typically during the summer months. All water utilities may develop sprinkler watering restrictions, such as allowing irrigation every other day during the summer and not during the warmest parts of the day when landscape watering is most likely to be lost to evaporation. Encouraging or mandating the use of drought-tolerant plants and efficient irrigation systems (e.g. drip irrigation, adjusting sprinkler placement) can reduce outdoor water use further. This can be incorporated into building permit requirements. Public outreach and education can help to further this effort by educating landscape and yard maintenance professionals and homeowners about best practices for outdoor water use.

Capacity Improvement

As with other water conservation efforts, it is difficult to project the quantitative impact of restricting watering during the summer months, and other landscape irrigation measures. Factors that can affect the water savings in a community include the climate, weather, amount of grass turf in residential and commercial areas, and enforcement of regulations. Though not proposed here, more aggressive water conservation efforts include rebates to customers for removal of grass turf.

Cost Estimate

The costs associated with landscaping irrigation management include development of watering restriction guidelines and staff time for enforcement. Costs associated with requiring drought-tolerant plants and efficient irrigation systems include development of standards and minor staff time during plan review for building permits.

8.5 Capital Improvement Projects

Project J4 – June Lake Water Full Build-Out Improvements

Project Description

This project consists of expansion of the existing water system to accommodate future full build-out, including source development, water treatment expansion, additional water storage tanks, additional fire hydrants, and pipe replacement. The number of housing units this takes into consideration is based on full build-out of all vacant properties to their maximum density, which results in a total of 2,000 housing units, which represents an increase of 1,351 households. This includes 15 units per acre on properties that allow that density (multi-family, mixed-use, etc.), a single primary residence plus one ADU and one JADU on each SFR parcel, and the addition of one ADU and one JADU on properties currently developed as single family. With this theoretical future build-out and current maximum day water use of 1,050 gpd per housing unit, the total maximum day water demand would be 2,100,000 gpd, or an increase of 1,099,434 gpd (764 gpm). With an approximate doubling of demand, we assume the addition of approximately the same amount of water storage as currently constructed, and a doubling of water treatment.

In order to meet that demand, it is assumed that 2 new wells would need to be developed, based on an average production of 400 to 500 gpm per well. Water storage tanks (or reservoirs) adding approximately 1.5 million gallons of storage to the system would be needed. Additional fire hydrants would be needed for new development, and replacement of some water mains would be necessary for the increased flows. We assume 70 fire hydrants and approximately six miles of water mains would be replaced or added.

Capacity Improvement

This project would increase the water system capacity throughout the entire June Lake PUD system to accommodate the maximum build out based on the information included in the Project Description above. This build-out would accommodate a total of 2,000 housing units, with a demand of 2.1 million gpd. This represents an increase in housing units of approximately 1,351.

Cost Estimate

Based on the assumptions and descriptions included above, the planning-level approximate cost of this project is included in Table 25, below. Please note that these costs are approximate and current at the time of this report, and do not reflect projected cost inflation, though a project of this size would require significant time to complete. Full cost estimates are included in Appendix A.

Table 25: Estimated Cost per Housing Unit

Additional Design Capacity	764 gpm
	1,099,434 gpd
Total Estimated Cost	$30,607,250
Increase in Housing Units	1,351
Cost per Additional Housing Unit	**$22,655**

Project J5 – June Lake Sewer Full Build-Out Improvements

Project Description

This project consists of expansion of the existing sewer system to accommodate future full build-out, including wastewater treatment expansion, sewer manholes, main extension and replacement, and assumed addition of 34 lift stations. The number of housing units this takes into consideration is based on full build-out of all vacant properties to their maximum density at current zoning, which is 2,000 housing units (an increase of 1,340 housing units). This includes 15 units per acre on properties that allow that density (multi-family, mixed-use, etc.), a single primary residence plus one ADU and one JADU on each SFR parcel, and the addition of one ADU and one JADU on properties currently developed as single family. Additionally, we assume that all properties would be connected to sewer with future full build-out density. With this theoretical future build-out and the current maximum sewer discharge rate of 1,364 gpd per household, this results in a discharge of 2,728,000 gpd, which is an additional 1,728,000 gpd above the current capacity. With maximum day discharge increasing by a factor of 2.7, we assume an approximate proportional increase in the sewer treatment volume capacity needed and an increase in pumping stations and sewer mains of approximately double the current infrastructure, based on denser development.

Capacity Improvement

This project would increase the sewer system capacity throughout the entire June Lake PUD system to accommodate the maximum build out based on the information included in the Project Description above. This represents an increase of 1,728,000 gpd, and 1,340 additional housing units.

Cost Estimate

Based on the assumptions and descriptions included above, the planning-level approximate cost of this project is included in Table 26, below. Please note that these costs are approximate and current at the time of this report, and do not reflect projected cost inflation, though a project of this size would require significant time to complete. Full cost estimates are included in Appendix A.

Table 26: Estimated Cost per Housing Unit

Additional Design Capacity	1,728,000 gpd
Total Estimated Cost	$88,570,700
Increase in Housing Units	1340
Cost per Additional Housing Unit	**$66,098**

8.6 Priority 2 Projects

1) **Highlands Specific Plan – June Lake**

This property is identified in the Housing Element as a priority site but is already developed for single-family homes and does not have areas for additional development, though there are some vacant single-family lots.

2) **Northshore Drive ER/SP – June Lake**

This project would consist of the extension of water and sewer mains into the Northshore Drive ER/SP property to allow for single and multi-family development on the 14.1-acre site. Based on the average surrounding residential density, the property could accommodate approximately 85 units. This scenario is within the available capacity of the June Lake PUD Sewer System, and within the capacity of the June Lake PUD – Village Water System.

3) **25 Mountain Vista Drive – June Lake**

This project would consist of extensions of water and sewer mains into the 25 Mountain Vista Drive property to allow for single and multi-family development on the 30.2-acre site. Based on the surrounding density of approximately 4 units per acre, the site would support approximately 121 residential units. In addition to extension of utilities, the site is currently owned by Inyo National Forest, and a land exchange would be necessary for development.

4) **Rodeo Grounds Specific Plan – June Lake**

This project would require extension of water and sewer mains into the 81.5-acre property located along June Lake Loop, west of Gull Lake. The water and sewer infrastructure required for development varies based on eventual design. Based on the previously proposed Rodeo Grounds Specific Plan, this property could accommodate approximately 789 housing units, though the proposed plan was a resort development with very little local housing. This number of residential units far exceeds the June Lake PUD – Village Water System and June Lake PUD Sewer System.

Section 9. Capacity Improvement Projects – Lee Vining

9.1 Proposed Projects

Capacity improvement projects in Lee Vining include two Priority 1, Low Cost/No New Cost projects; two Priority 1, Minor Cost/Construction projects, two Priority 1, Capital Improvement Projects; and one Priority 2 project. Capital Improvement Projects include water and sewer system improvements to accommodate the full build-out scenario.

9.2 Priority 1 Projects

Priority 1 projects are further divided into three categories: low or no cost and no new construction, minor cost and/or construction, and larger capital improvement projects.

9.3 Low Cost/No New Construction

Project LV1 – Water Conservation Public Outreach

Project Description

This project consists of developing and presenting educational materials to customers and community members about water saving practices, which can contribute to reduced water consumption per connection through customer behavior changes as described in Section 4. Lee Vining PUD, Mono County, or other organizations can develop community-specific water conservation materials, use materials already developed by others, or a combination of the two. Opportunities for water conservation public outreach and education include, but are not limited to flyers within utility bills, billboards in the community, posters in public spaces like community centers, parks, and public offices, informational booths at community events and festivals, educational materials at schools, online outlets and social media advertising. Additionally, community groups such as Girl Scouts, Boy Scouts, church youth groups, and community service organizations may be willing to partner to further these efforts. No new construction is proposed with this project.

Capacity Improvement

It is difficult to project the quantitative impact of water conservation public outreach. Each community has unique challenges, opportunities, and priorities. The average water use in Lee Vining is much higher than the average household demand and may represent a good potential for water savings with conservation efforts. Importantly, water conservation results are akin to the adage "a penny saved is a penny earned"; for every gallon of water saved, that functions the same as an additional gallon produced, but at no additional direct cost.

Cost Estimate

The costs associated with water conservation public outreach can be tailored to the potential budget available. There is not a set financial entry point, though there may be a level of spending below which no measurable effect is produced. Impact may be amplified by partnering with other community organizations. Costs associated with this effort may include but is not limited to staff time (or consultant fees) for developing outreach materials, staff time (or consultant fees) for outreach, costs for hard-copy outreach materials; costs for advertising on billboards, social media, and other media, and travel costs.

Project LV2 – Water Conservation Rebate Programs

Project Description

This project consists of developing and implementing a rebate program to encourage customers to replace older inefficient plumbing fixtures with new WaterSense-certified fixtures. Rebates can be structured so that payment for replacement of fixtures is tiered to prioritize the most water savings. Often, utilities offer these rebates contingent upon providing proof of purchase of the new fixtures and will then provide the rebate in the form of a credit on the utility bill. Typically, utilities have a limit on the maximum rebate amount per customer, and do not cover the entire cost of new fixtures. Areas with older construction, such as Bridgeport Townsite may have more potential for water savings from this program. No new construction is proposed with this project.

Capacity Improvement

It is difficult to project the quantitative impact of water conservation rebate programs. Each community has unique challenges, opportunities, and priorities. For example, the water savings achieved by replacing an old toilet with a newer, more water-efficient model can vary depending on factors such as the age and efficiency of the old toilet, the water usage habits of the household, and the specific characteristics of the new toilet. However, on average, replacing an old toilet with a newer WaterSense-certified toilet can result in significant water savings. For example, many older toilets installed prior to the mid-1990s use significantly more water per flush than modern toilets. Some older models can use as much as 3.5 to 7 gallons of water per flush. WaterSense-certified toilets, which meet the Environmental Protection Agency's criteria for water efficiency, typically use 1.28 gallons per flush or less. Some high-efficiency toilets can use even less water, sometimes as low as 0.8 gallons per flush. As an example, a household that replaces two older toilets with new WaterSense-certified toilets may save over 8,000 gallons of water per year.

Cost Estimate

The costs associated with rebate programs include administration of the program as well as the rebate amounts. Individual rebates are determined by the utility, as well as whether there is a limit on the number of rebates given annually. Ideally, the rebate amount for new fixtures should be just enough to encourage customers to take advantage of the program and replace fixtures. An example of potential rebates and associated water savings is shown below for illustrative purposes. This assumes a rebate of $50 for new toilets and a water savings of 2.22 gallons per flush. Replacement of fixtures is a change that results in water savings into the future without additional cost.

Table 27: Example Estimated Cost per Housing Unit

Total Estimated Cost (200 rebates)	$10,000
Increase in Housing Units	2.5
Cost per Additional Housing Unit	**$4,000**

9.4 Minor Costs/Construction

Project LV3 – Water Meter Installation, Tiered Rate Structure

Project Description

This project consists of installation of water meters on all water connections throughout Lee Vining PUD. Installing water meters can lead to significant water savings by providing households with more accurate information about their water usage. However, the actual water savings achieved through the installation of water meters can vary widely depending on factors such as the initial water usage habits of the household, the effectiveness of water conservation measures implemented in response to metering, and the efficiency of the water metering system itself. Water savings is usually greater when tiered rate structures are adopted. Tiered rate structures typically include a base rate for water use up to a specified amount per customer per month, then a higher rate over that base amount. Communities can structure this with numerous tiers with increased rates for higher uses. This cost to customers can lead to voluntary water conservation behavior to save money.

Capacity Improvement

As with other water conservation efforts, it is difficult to project the quantitative impact of installing water meters. Lee Vining PUD does not currently use water meters for individual connections. Capacity improvement cannot be specifically quantified for meter installation, but communities with metered water connections use less water per connection than those systems without meters.

Cost Estimate

The costs associated with installation of water meters and development of a tiered rate structure include construction costs for meter installation and administrative costs for development of a tiered rate structure. For an approximate cost of $3,500 per water meter installed, potential costs are presented in Table 28, below. It is worth noting that unit costs will vary depending on how many meters are replaced at the same time.

Table 28: Example Estimated Cost for Water Meter Installation

Cost per meter installed	$3,500
Water Connections	60
Total Cost	**$210,000**

Project LV4 – Landscaping Irrigation Management

Project Description

This project includes development and enforcement of outdoor watering restrictions, typically during the summer months. Lee Vining PUD may develop sprinkler watering restrictions, such as allowing irrigation every other day during the summer and not during the warmest parts of the day when landscape watering is most likely to be lost to evaporation. Encouraging or mandating the use of drought-tolerant plants and efficient irrigation systems (e.g. drip irrigation, adjusting sprinkler placement) can reduce outdoor water use further. This can be incorporated into building permit requirements. Public outreach and education can help to further this effort by educating landscape and yard maintenance professionals and homeowners about best practices for outdoor water use.

Capacity Improvement

As with other water conservation efforts, it is difficult to project the quantitative impact of restricting watering during the summer months, and other landscape irrigation measures. Factors that can affect the water savings in a community include the climate, weather, amount of grass turf in residential and commercial areas, and enforcement of regulations. Though not proposed here, more aggressive water conservation efforts include rebates to customers for removal of grass turf.

Cost Estimate

The costs associated with landscaping irrigation management include development of watering restriction guidelines and staff time for enforcement. Costs associated with requiring drought-tolerant plants and efficient irrigation systems include development of standards and minor staff time during plan review for building permits.

9.5 Capital Improvement Projects

Project LV5 – Lee Vining Water Full Build-Out Improvements

Project Description

This project consists of expansion of the existing water system to accommodate future full build-out, including source development, additional water storage tanks, additional fire hydrants, and pipe replacement. The number of housing units this takes into consideration is based on full build-out of all vacant properties to their maximum density. This includes 15 units per acre on properties that allow that density (multi-family, mixed-use, etc.), a single primary residence plus one ADU and one JADU on each SFR parcel, and the addition of one ADU and one JADU on properties currently developed as single family. With this theoretical future build-out and current maximum day water use of 2,931 gpd per housing unit, the total maximum day water demand would be 407,409 gpd, or an increase of 83,409 gpd (58 gpm) above the current capacity. With an increase in demand of approximately 26%, we assume a proportional increase in water storage.

In order to meet increased demand and also to provide an alternate water source to Lee Vining, it is assumed that one new well would need to be developed, based on an average production of at least 250 gpm. Water storage tanks adding approximately 90,000 gallons of storage to the system would be needed. Additional fire hydrants would be needed for new development, and replacement of some water mains would be necessary for the increased flows. We assume 10 fire hydrants and approximately two miles of water mains would be replaced or added.

Capacity Improvement

This project would increase the water system capacity throughout the entire Lee Vining PUD system to accommodate the maximum build out based on the information included in the Project Description, above. This represents 79 additional housing units based on the full build-out compared to the current number of connections.

Cost Estimate

Based on the assumptions and descriptions included above, the planning-level approximate cost of this project is included in Table 29, below. Please note that these costs are approximate and current at the time of this report, and do not reflect projected cost inflation, though a project of this size would require significant time to complete. Full cost estimates are included in Appendix A.

Table 29: Estimated Cost per Housing Unit

Additional Design Capacity	58 gpm
	83,409 gpd
Total Estimated Cost	$12,071,550
Increase in Housing Units	79
Cost per Additional Housing Unit	**$152,804**

Project LV6 – Lee Vining Sewer Full Build-Out Improvements

Project Description

This project consists of expansion of the existing sewer system to accommodate future full build-out, including wastewater treatment expansion, sewer manholes, and main extension and replacement. No lift stations or force mains are currently part of the system, and that is expected to remain the same. The number of housing units is based on full build-out of all vacant properties to their maximum density at current zoning, which is 139 housing units (an increase of 79 housing units). This includes 15 units per acre on properties that allow that density (multi-family, mixed-use, etc.), a single primary residence plus one ADU and one JADU on each SFR parcel, and the addition of one ADU and one JADU on properties currently developed as single family. Additionally, we assume that all properties would be connected to sewer with future full build-out density. With this theoretical future build-out and the current maximum sewer discharge rate of 1,750 gpd per household, this results in a discharge of 243,250 gpd, which is an additional 167,250 gpd above the current capacity. With maximum day discharge increasing by a factor of 220%, we assume an approximate proportional increase in the sewer treatment volume capacity needed and sewer mains of approximately double the current infrastructure, based on denser development.

Capacity Improvement

This project would increase the sewer system capacity throughout the entire Lee Vining PUD system to accommodate the maximum build out based on the information included in the Project Description above. This represents an increase in sewer system capacity of 167,250 gpd and an increase in housing units of 79.

Cost Estimate

Based on the assumptions and descriptions included above, the planning-level approximate cost of this project is included in Table 30, below. Please note that these costs are approximate and current at the time of this report, and do not reflect projected cost inflation, though a project of this size would require significant time to complete. Full cost estimates are included in Appendix A.

Table 30: Estimated Cost per Housing Unit

Additional Design Capacity	167,250 gpd
Total Estimated Cost	$7,124,825
Increase in Housing Units	79
Cost per Additional Housing Unit	**$90,188**

9.6 Priority 2 Projects

1) **Tioga Inn Specific Plan – Lee Vining**

The Tioga Inn Specific Plan property is not located within any existing water or sewer service territories. No water or sewer infrastructure currently serves the Tioga Inn Specific Plan area. Existing water mains are located approximately 2,600 feet (0.5 mile) to the west and sewer mains are located approximately 4,000 feet (0.76 mile) to the north. Development of this area would require either a lengthy extension for existing water and sewer lines, development of new water and sewer systems to serve the property or parcels large enough to be served by domestic wells and septic systems, which would likely not contribute to low- or moderate-income housing.

Section 10. Conclusions

10.1 Summary

The purpose of this Capacity Improvement Plan is to identify opportunities to improve the available capacity in water and sewer systems in Bridgeport, Crowley Lake, June Lake, and Lee Vining in Mono County, California, with attention to the potential for development of affordable housing.

Detailed capacity analyses were performed for Bridgeport, Crowley Lake, June Lake, and Lee Vining as part of Special District Needs Assessments completed as a precursor to this Capacity Improvement Plan. The available housing capacity in each community and in each system within the communities varies. While currently adequate, the sewer capacity will accommodate fewer additional housing units than the water systems in Bridgeport, Crowley Lake, and Lee Vining while the water system capacity in June Lake will accommodate fewer additional housing units than the sewer system. Water demand and sewer flows vary throughout communities but are generally higher than the U.S. average. It is recommended that sewer flows are measured prior to any sewer projects, to better determine the actual flows.

Future water demand and sewer flow for various scenarios are included in the Special District Needs Assessment Reports, and include consideration of development of vacant parcels, ADUs and JADUs, and key sites identified in the Housing Element. Additionally, full build-out scenarios have been included for water and sewer in all communities. Full build-out is considered as the maximum allowable housing density under current zoning, as well as ADUs on single-family parcels. Aside from these scenarios, some factors that influence water demand and sewer flow include the proportion of multi-family development, seasonal occupancy rates, population, and water use and sewer discharge rates.

Capacity gaps have been identified for various scenarios, as well as some strategies and projects to address these gaps. Lack of capacity in utility systems can lead to limited commercial and residential development, leading to limited economic development.

Capacity enhancement strategies include infrastructure improvement projects, optimization of existing infrastructure and operations, and water conservation planning. System and operations optimization and water conservation planning can be approached in a way to best utilize existing system resources and are lower-cost strategies. Priority infrastructure projects have been identified, focusing on those that may result in more affordable housing. Some improvement projects corresponding to key sites identified in the Housing Element are not prioritized as projects at this time based on being high-cost large-scale projects.

For improvement projects, we have included planning-level cost estimates to quantify the potential cost compared to the number of housing units that the project could result in. Additionally, the potential housing unit count has been compared to the available capacity in the water and sewer systems, indicating whether water supply or sewer treatment would be necessary to accommodate the project. For the prioritized projects, the cost per housing unit varies widely, with infill projects generally lower cost per additional housing unit, with full system build-out improvements generally higher cost per additional housing unit.

10.2 Implementation

The method and time frame of any of the identified capacity enhancement strategies and capacity improvement projects may be affected by many factors including housing demand in each community, funding availability, special district staffing, and community support, among others.

It may be more accessible for special districts to begin implementing actions identified in the Optimization of Existing Infrastructure and Operations Section with existing resources such as evaluating the system for leaks, waste, and inefficiency. Additionally, systems can review and update emergency response and preparedness planning regularly and with attention to protecting system capacity.

Water conservation planning is also an area of implementation that can be scaled to fit each special district's resources and needs. Additionally, this is an area where special districts and other entities can work together to maximize their resources, reach, and impact within communities. Systems can also consider opportunities to partner with other educational and public-service organizations to amplify messaging and efforts to promote water conservation.

For proposed capacity improvement projects, we have deliberately not recommended particular projects over others, as these decisions are affected by many local considerations and changing needs best assessed by special district and local decision makers. As discussed in the prioritization section, projects have been sorted into Priority 1 and Priority 2 projects, with sub-categories within Priority 1. These priority levels generally progress from lowest cost to greatest cost but are not necessarily sorted by priority within each sub-category.

Importantly, the authority for project implementation lies solely with the individual utility service providers and/or property owners. Mono County does not have and is not indicating a desire to have implementation authority with this Capacity Improvement Plan.

Section 11. References

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Appendix A

Project Cost Estimates

Cost Estimate

Project B5 - Kirkwood Street Loop Water Replacement

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$54,800	LS	1	$54,800
Traffic Control	$2,000	LS	1	$2,000
Demo & Remove Ex. Water	$10	LF	2600	$26,000
6"-8" Water Main and Appurtenances	$180	LF	2600	$468,000
AC Pavement Patch 3" AC on 8" AB	$10	SF	5200	$52,000
Construction Cost Subtotal				**$602,800**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting		EA		$20,000
Other Design (Geotech)		EA		$10,000
Survey		EA		$6,000
Testing, Inspection, and Construction Mgmt		EA		$8,000
Construction Contingency (10%)				$60,280
Non-Construction Cost Subtotal				**$104,280**
Total Estimated Capital Cost				**$707,080**

Total Estimated Cost	$707,080
Increase in Housing Units	26
Cost per Additional Housing Unit	$27,195.38

Cost Estimate

Project B6 - Stock Drive Water Extension

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$39,280	LS	1	$39,280
Traffic Control	$2,000	LS	1	$2,000
Demo & Remove Ex. Water	$10	LF	1600	$16,000
6"-8" Water Main and Appurtenances	$180	LF	1600	$288,000
AC Pavement Patch 3" AC on 8" AB	$10	SF	3200	$32,000
Construction Cost Subtotal				**$377,280**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting		EA		$20,000
Other Design (Geotech)		EA		$10,000
Survey		EA		$6,000
Testing, Inspection, and Construction Mgmt		EA		$8,000
Construction Contingency (10%)				$37,728
Non-Construction Cost Subtotal				**$81,728**
Total Estimated Capital Cost				**$459,008**

Total Estimated Cost	$459,008
Increase in Housing Units	22
Cost per Additional Housing Unit	$20,864.00

Cost Estimate

Project B7 - Aurora Canyon Replacement Project

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$43,040	LS	1	$43,040
Traffic Control	$2,000	LS	1	$2,000
Demo & Remove Ex. Water	$10	LF	2040	$20,400
6"-8" Water Main and Appurtenances	$180	LF	2040	$367,200
AC Pavement Patch 3" AC on 8" AB	$10	SF	4080	$40,800
Construction Cost Subtotal				**$473,440**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting		EA		$20,000
Other Design (Geotech)		EA		$10,000
Survey		EA		$6,000
Testing, Inspection, and Construction Mgmt		EA		$8,000
Construction Contingency (10%)				$47,344
Non-Construction Cost Subtotal				**$91,344**
Total Estimated Capital Cost				**$564,784**

Total Estimated Cost	$564,784
Increase in Housing Units	23
Cost per Additional Housing Unit	$24,556

Cost Estimate

Project B8 - Alpine Vista Sewer Extension

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$34,900	LS	1	$34,900
Traffic Control	$2,000	LS	1	$2,000
6"-8" Sewer Main	$180	LF	1600	$288,000
Precast Manhole	$9,000	EA	3	$27,000
AC Pavement Patch 3" AC on 8" AB	$10	SF	3200	$32,000
Construction Cost Subtotal				**$383,900**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting		EA		$20,000
Other Design (Geotech)		EA		$10,000
Survey		EA		$6,000
Testing, Inspection, and Construction Mgmt		EA		$8,000
Construction Contingency (10%)				$38,390
Non-Construction Cost Subtotal				**$82,390**
Total Estimated Capital Cost				**$466,290**

Total Estimated Cost	$466,290
Increase in Housing Units	12
Cost per Additional Housing Unit	$38,858

Total Estimated Cost	$466,290
Increase in Housing Units	36
Cost per Additional Housing Unit	$12,953

Cost Estimate

Project B9 - Evans Tract Sewer Extension

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (5%)	$53,350	LS	1	$53,350
Traffic Control	$3,000	LS	1	$3,000
6"-8" Sewer Main	$180	LF	4600	$828,000
Precast Manhole	$9,000	EA	16	$144,000
AC Pavement Patch 3" AC on 8" AB	$10	SF	9200	$92,000
Construction Cost Subtotal				**$1,120,350**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting		EA		$20,000
Other Design (Geotech)		EA		$10,000
Survey		EA		$6,000
Testing, Inspection, and Construction Mgmt		EA		$8,000
Construction Contingency (10%)				$112,035
Non-Construction Cost Subtotal				**$156,035**
Total Estimated Capital Cost				**$1,276,385**

Total Estimated Cost	$1,276,385
Increase in Housing Units	88
Cost per Additional Housing Unit	$14,504

Cost Estimate

Project B11 - Bridgeport Water Full Build Out

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$3,143,700	LS	1	$3,143,700
Source (well) Development	$1,750,000	EA	3	$5,250,000
Water Treatment Expansion	$6,000	gpm	2004	$12,024,000
Water Storage Tanks	$6.25	gallon	1575000	$9,843,750
8"-12" Water Mains	$200	LF	21,000	$4,200,000
Fire Hydrant Assembly	$6,000	EA	20	$120,000
Construction Cost Subtotal				**$34,581,450**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting, etc.		EA		$1,730,000
Construction Contingency (10%)				$3,458,145
Non-Construction Cost Subtotal				**$5,188,145**
Total Estimated Capital Cost				**$39,769,595**

Total Estimated Cost	$39,769,595
Increase in Housing Units	635
Cost per Additional Housing Unit	$62,629.28

Cost Estimate

Project B13 - Bridgeport Sewer Full Build Out

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$4,600,000	LS	1	$4,600,000
Lift Station	$70,000	EA	2	$140,000
8"-12" Sewer Main	$200	LF	21,000	$4,200,000
Precast Manhole	$9,000	EA	100	$900,000
Wastewater Treatment Expansion	$30	gpd	1370752	$41,122,560
Construction Cost Subtotal				**$50,962,560**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting, etc.		EA		$2,550,000
Construction Contingency (10%)				$5,096,256
Non-Construction Cost Subtotal				**$7,646,256**
Total Estimated Capital Cost				**$58,608,816**

Total Estimated Cost	$58,608,816
Increase in Housing Units	813
Cost per Additional Housing Unit	$72,090

Cost Estimate

Project C5 - School District Parcel

10-unit development

Construction Cost	Column1			
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$14,700	LS	1	$14,700
6" -8" Water Main	$180	LF	300	$54,000
Fire Hydrant Assembly	$6,000	EA	2	$12,000
6"-8" Sewer Main	$180	LF	300	$54,000
Precast Manhole	$9,000	EA	3	$27,000
Construction Cost Subtotal				**$161,700**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting		EA		$20,000
Other Design (Geotech)		EA		$6,000
Survey		EA		$8,000
Testing, Inspection, and Construction Mgmt		EA		$10,000
Construction Contingency (10%)				$16,170
Non-Construction Cost Subtotal				**$60,170**
Total Estimated Capital Cost				**$221,870**

Column1	Column2	Min	Max
Total Estimated Cost	$221,870	$199,683.0	$255,150.50
Increase in Housing Units	10	$10.0	$10.00
Cost per Additional Housing Unit	$22,187	$19,968.3	$25,515.05

Cost Estimate

Project C5 - School District Parcel

Full single-family development

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$141,600	LS	1	$141,600
6" -8" Water Main	$180	LF	3500	$630,000
Fire Hydrant Assembly	$6,000	EA	8	$48,000
6"-8" Sewer Main	$180	LF	3500	$630,000
Precast Manhole	$9,000	EA	12	$108,000
Construction Cost Subtotal				**$1,557,600**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting		EA		$60,000
Other Design (Geotech)		EA		$10,000
Survey		EA		$10,000
Testing, Inspection, and Construction Mgmt		EA		$12,000
Construction Contingency (10%)				$155,760
Non-Construction Cost Subtotal				**$247,760**
Total Estimated Capital Cost				**$1,805,360**

Column1	**Column2**	**Min**	**max**
Total Estimated Cost	$1,805,360	$1,624,824	$2,076,164.00
Increase in Housing Units	103	$103.0	$103.00
Cost per Additional Housing Unit	$17,528	$15,775.0	$20,156.93

Total Estimated Cost	$1,805,360	$1,624,824	$2,076,164.00
Increase in Housing Units	309	$309.0	$309.00
Cost per Additional Housing Unit	$5,843	$5,258.3	$6,718.98

Cost Estimate

Project C6 - Crowley Lake Drive Water Extension

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$44,400	LS	1	$44,400
Traffic Control	$2,000	LS	1	$2,000
6" -8" Water Main	$180	LF	2000	$360,000
Fire Hydrant Assembly	$6,000	EA	7	$42,000
AC Pavement Patch 3" AC on 8" AB	$10	SF	4000	$40,000
Construction Cost Subtotal				**$488,400**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting		EA		$30,000
Other Design (Geotech)		EA		$8,000
Survey		EA		$8,000
Testing, Inspection, and Construction Mgmt		EA		$8,000
Construction Contingency (10%)				$48,840
Non-Construction Cost Subtotal				**$102,840**
Total Estimated Capital Cost				**$591,240**

		Min	**Max**
Total Estimated Cost	$591,240	$532,116.0	$679,926.00
Increase in Housing Units	48	48	48
Cost per Additional Housing Unit	$12,318	$11,085.8	$14,165.13

Cost Estimate

Project C7 - Crowley Lake Water Full Build Out

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$1,220,000	LS	1	$1,220,000
Source (well) Development	$1,750,000	EA	2	$3,500,000
Water Treatment Expansion	$6,000	gpm	0	$0
Water Storage Tanks	$6.25	gallons	670000	$4,187,500
8"-12" Water Mains	$200	LF	21120	$4,224,000
Fire Hydrant Assembly	$6,000	EA	45	$270,000
Construction Cost Subtotal				**$13,401,500**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting, etc.		EA		$670,075
Construction Contingency (10%)				$1,340,150
Non-Construction Cost Subtotal				**$2,010,225**
Total Estimated Capital Cost				**$15,411,725**

Total Estimated Cost	$15,411,725
Increase in Housing Units	753
Cost per Additional Housing Unit	$20,467.10

Cost Estimate

Project C8 - Crowley Lake Sewer Full Build Out

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$1,120,000	LS	1	$1,120,000
Lift Station	$70,000	EA	2	$140,000
8"-12" Sewer Main	$200	LF	22440	$4,488,000
Precast Manhole	$9,000	EA	75	$675,000
Wastewater Treatment Expansion	$30	gpd	193897	$5,816,910
Construction Cost Subtotal				**$12,239,910**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting, etc.		EA		$611,996
Construction Contingency (10%)				$1,223,991
Non-Construction Cost Subtotal				**$1,835,987**
Total Estimated Capital Cost				**$14,075,897**

Total Estimated Cost	$14,075,897
Increase in Housing Units	646
Cost per Additional Housing Unit	$21,789

Cost Estimate

Project J4 - June Lake Water Full Build Out

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$2,400,000	LS	1	$2,400,000
Source (well) Development	$1,750,000	EA	2	$3,500,000
Water Treatment Expansion	$6,000	gpm	764	$4,584,000
Water Storage Tanks	$6.25	gallons	1500000	$9,375,000
8"-12" Water Mains	$200	LF	31680	$6,336,000
Fire Hydrant Assembly	$6,000	EA	70	$420,000
Construction Cost Subtotal				**$26,615,000**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting, etc.		EA		$1,330,750
Construction Contingency (10%)				$2,661,500
Non-Construction Cost Subtotal				**$3,992,250**
Total Estimated Capital Cost				**$30,607,250**

Total Estimated Cost	$30,607,250
Increase in Housing Units	1351
Cost per Additional Housing Unit	$22,655.26

Cost Estimate

Project J5 - June Lake Sewer Full Build Out

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$7,000,000	LS	1	$7,000,000
Lift Station	$70,000	EA	34	$2,380,000
8"-12" Sewer Main	$200	LF	68640	$13,728,000
Precast Manhole	$9,000	EA	230	$2,070,000
Wastewater Treatment Expansion	$30	gpd	1728000	$51,840,000
Construction Cost Subtotal				**$77,018,000**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting		EA		$3,850,900
Construction Contingency (10%)				$7,701,800
Non-Construction Cost Subtotal				**$11,552,700**
Total Estimated Capital Cost				**$88,570,700**

Total Estimated Cost	$88,570,700
Increase in Housing Units	1340
Cost per Additional Housing Unit	$66,098

Cost Estimate

Project LV5 - Lee Vining Water Full Build Out

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$950,000	LS	1	$950,000
Source (well) Development	$1,750,000	EA	1	$1,750,000
Water Treatment Expansion	$6,000	gpm	0	$0
Water Storage Tanks	$6.25	gallons	900000	$5,625,000
8"-12" Water Mains	$200	LF	10560	$2,112,000
Fire Hydrant Assembly	$6,000	EA	10	$60,000
Construction Cost Subtotal				**$10,497,000**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting, etc.		EA		$524,850
Construction Contingency (10%)				$1,049,700
Non-Construction Cost Subtotal				**$1,574,550**
Total Estimated Capital Cost				**$12,071,550**

Total Estimated Cost	$12,071,550
Increase in Housing Units	79
Cost per Additional Housing Unit	$152,804.43

Cost Estimate

Project LV6 - Lee Vining Sewer Full Build Out

Construction Cost				
Description	**Unit Price**	**Unit**	**Quantity**	**Total Price**
Mobilization/Demobilization (10%)	$560,000	LS	1	$560,000
Lift Station	$70,000	EA	0	$0
8"-12" Sewer Main	$200	LF	2640	$528,000
Precast Manhole	$9,000	EA	10	$90,000
Wastewater Treatment Expansion	$30	gpd	167250	$5,017,500
Construction Cost Subtotal				**$6,195,500**
Non-Construction Cost				
Description		**Unit**	**Quantity**	**Total Price**
Design and Permitting		EA		$309,775
Construction Contingency (10%)				$619,550
Non-Construction Cost Subtotal				**$929,325**
Total Estimated Capital Cost				**$7,124,825**

Total Estimated Cost	$7,124,825
Increase in Housing Units	79
Cost per Additional Housing Unit	$90,188