PREPARED FOR:

LAKE ROCKPORT ESTATES

PREPARED BY:

MOUNTAIN REGIONAL WATER

BOWEN COLLINS & ASSOCIATES

LAKE ROCKPORT ESTATES
MOUNTAIN REGIONAL WATER SSD

AUGUST 2025

LAKE ROCKPORT ESTATES ANNEXATION EVALUATION

ANNEXATION EVALUATION

August 2025

PREPARED FOR:

LAKE ROCKPORT ESTATES

MOUNTAIN REGIONAL WATER

PREPARED BY:

BOWEN COLLINS & ASSOCIATES

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

INTRODUCTION

Lake Rockport Estates Property Owners Association (LREPOA) has asked Bowen, Collins and Associates (BC&A) to perform an Engineering Evaluation as required for consideration of annexation to Mountain Regional Water Special Service District (MRW or District) as summarized below. The overall purpose of this evaluation is to identify the capabilities, deficiencies, and recommended improvements in Lake Rockport Estates (LRE) water system in accordance with regulatory requirements, Summit County Concurrency Program requirements, industry best practices, District construction standards, and interoperability requirements.

Phase 1 of the evaluation is described below. Phase 2 will be evaluated in the future and will expand on what improvements to LRE system may be needed to be compatible with MRW. Phase 1 will be combined with the Phase 2 evaluation into a water system masterplan.

A summary of the Evaluation Phases is below:

Phase 1

- **Chapter 2--Water Demand** – An examination of water demands expected in Lake Rockport Estates and the existing and future supplies available to meet these demands.
    - Evaluate the available flow records and system growth information to determine existing and build out average day demands, peak day demands, and peak instantaneous demands.
    - Review information for Rockport Estate's existing well to determine the ability of the well to meet existing and projected system demands, determine source quality and potential concerns.
    - Evaluate Integration Related Deficiencies. Identify potential impacts and deficiencies to the existing MRW system that may be caused by conveying wholesale water to the Rockport Estates system to meet future LRE demands.
    - Develop Cost Opinions for Recommended Improvements for a Wholesale Connection.

Phase 2—(still to be evaluated)

- **Existing Infrastructure**
- **Water Supply**
- **Update Hydraulic Model**
- **Conveyance and Storage**
- **Recommended Improvements**
- **Implementation Plan**
- **Masterplan Report**

REPORT ASSUMPTIONS

As a long-term planning document, this report is based on a number of assumptions relative to future growth patterns, service area expansion, and source availability. If any variables are significantly different than what has been assumed, the results of this report will need to be adjusted accordingly.

ACKNOWLEDGEMENTS

We recognize the significant effort and ongoing professional management, operation, and planning that continues to make Lake Rockport Estates and MRW successful water systems. This report provides system improvement recommendations for continued success in the future. The BC&A team wishes to thank the following individuals for their cooperation and assistance in working with us in preparing this document:

Paul Strader – President (LRE)

Skyler Kershner – Water Committee Chair (LRE)

Sara Strader (LRE Board Member)

Wendee Aquilar (LRE Board Member)

Candy Rust (LRE Board Member)

Rosemary Carroll (LRE Board Member)

MRW General Manager – Andy Garland

MRW District Engineer – Sam Grenlie

BC&A team member's roles on the project are also listed. The project was completed in BC&A's Draper, Utah office. Questions may be addressed to Jon Oldham, Project Manager at (801) 495-2224.

Jon Oldham (BCA) - Project Manager

Andrew McKinnon (BCA) – Project Engineer

CHAPTER 2
PHASE 1-WATER DEMAND

BACKGROUND/INTRODUCTION

Lake Rockport Estates (LRE) would like to improve its water source reliability and capacity to include a connection to Mountain Regional Water Special Service District (MRW) due to redundancy and reliability concerns about its existing water sources. The primary goal of this chapter is to evaluate the existing and buildout LRE water demands, potential connection locations to MRW and impacts to MRW related to this potential interconnect.

DEMANDS

LRE currently has relatively low water demand. Many of the users are only seasonally present (April through October), while other users store water for indoor use over the winter. Table 2-1 summarizes the existing users, water use, and future lots available to develop.

Table 2-1
Rockport Estates Existing Water Use

Lot Type	# of Connections	Persons	Existing Annual Use (gallons)	Existing Per Capita Demand (gallons per day)	Existing Annual Use (acre-ft)
Unoccupied Purchased Lots	44				
Fulltime Occupants	89	204	1,875,474	25.2	5.76
Part-time Occupants	44	102	579,174	15.5	1.78
Unpurchased Lots	146				
Total Lots	323		2,454,648		7.53

On a per capita basis for the full-time occupants, water demand was only 25 gallons per person per day. For planning purposes, however, it would not be prudent to use this historic low water use to plan for future demand. LRE has generally discouraged outdoor watering through its water system but does not have any specific limits in its covenants, conditions, and restrictions (CC&Rs). If LRE were to connect to MRW, it is assumed that residents may change water use habits to be similar to those in neighboring communities.

The nearest neighboring community with similar terrain and lot sizes includes the "West Hills" tank zone of the Promontory community. This area is currently supplied by MRW and would be the closest physical connection that could be made to support Rockport Estates. While the terrain and lot sizes of the West Hills subdivision are similar to Rockport Estates, most existing homes in West Hills are larger than Rockport Estates and the area allows irrigation for landscaping. It is therefore unsurprising that West Hills has significantly higher water demands than Rockport Estates.

Based on water usage and masterplan information from MRW, the average water use per connection of the West Hills tank zone is approximately 0.43 acre-ft/connection (~152 gallons per capita per day or gpcd based on average household size of 2.52 people). Occupancy in the West Hills tank zone consists of approximately 30 percent year-round occupied homes with the balance used as seasonal or secondary homes. This may be part of the reason why this value is still less than the Weber River region (a State of Utah geographic conservation planning division) baseline value for 2015 of 250

gpcd and less than the 2030 conservation target of 200 gpcd. Most homes still irrigate landscaping whether or not the home is occupied. The West Hills tank zone planning numbers were discussed with the project team and MRW personnel were comfortable with using West Hills existing demands for planning the potential future water demand of the Rockport Estates area.

The projected demands for the Rockport Estates system based on using typical West Hills levels of indoor and outdoor demand and assuming full-time residency with no restriction on outdoor irrigation are summarized in Table 2-2.

Table 2-2
Projected Rockport Estates Water Demands

Scenario	No. of Lots	Buildout Annual Indoor Demand[1] (acre-ft)	Annual Outdoor Demand[1] (acre-ft)	Total Annual Demand (acre-ft)	Buildout Peak Day Indoor Demand[2] (gpm)	Buildout Peak Day Outdoor Demand[3] (gpm)	Buildout Peak Day Demand (gpm)
Lots with Existing Water Connections	179	40.10	36.87	76.97	31	75	107
Total Buildout Lots	323	72.36	66.53	138.89	56	136	192

[1] Based on MRWSSD Master Plan data for West Hills Tank service area and similar outdoor use patterns per lot.
[2]For comparison, the peak average daily demand from LRE's upper tank was 29 gpm in 2025 (excluding construction water also recorded in 2025). The peak day demand factor for indoor was assumed to be 1.25.
[3]The outdoor demand peaking factor was assumed to be 3.3 for outdoor demand estimates (as applied to an average over 365 days).

AVAILABLE SUPPLY

This section includes a brief summary of the LRE existing water supply. A more complete evaluation will be performed in Phase 2. The Rockport Estates is currently supplied by a single well with the characteristics summarized in Table 2-3. A new well was drilled in 2023 but is not yet connected into the LRE system due in part to the lower than expected yield capacity.

Table 2-3
Existing Well Characteristics

Year Drilled	2009 (Well No. 2)	2023 (Well No. 3)
Total Bore Depth (ft)	755	1,492
Finished Well Depth (ft)	540	
Well Intake Depth (ft)	480	708
Depth to Static Water (ft)	86.9	269.18
Depth to Dynamic Water Level (ft)	292	
Casing Diameter (inch)	8	8
Casing Material	Steel / SST	Steel
Screen:	Yes, with Filter Pack	Roscoe Moss Ful Flow louvered
Initial Rated Yield / Pump Capacity (gpm)	90	21
Pump Size (hp)	40	50
Motor Type (VFD or Constant)	VFD	VFD
Stages	20	
Issues	iron water quality concerns	not connected to system

Although LRE's Well No. 2 has a 90 gpm pump, the groundwater yield of the well has reportedly been lower during drought condition years and seems to be affected by Rockport Reservoir levels. The well currently operates around 60 gpm based on system settings to fill LRE's tank approximately every other day. Based on available well level data and reported operations in recent years, the estimated reliable yield of the well appears to be closer to 30 gpm. This lower number will be used for planning purposes. Additional recommendations for testing the well to determine available yield and potential options for improving the yield may be included in Phase 2.

While Well No. 2 appears to have sufficient capacity to meet the existing needs of LREs indoor demands, it would not have sufficient capacity to meet LRE's buildout demands. Well No. 3 would increase the available supply for LRE, but not enough to meet buildout demands. This is a primary reason LRE is exploring a wholesale connection to MRW.

MRW Connection

Two potential tank sources are nearest to LRE that could be accessed to deliver water to LRE: the Middle Valley Tank and the West Hills Tank. Although a connection from the Middle Valley Tank zone to LRE would be the most energy efficient path for delivering water to LRE, this option would require a brand new pump station for MRW to construction maintain and operate. The West Hills Tank zone is 246 feet higher than necessary compared to the existing LRE Tank. However, it is likely the nearest possible connection in terms of distance. The project team discussed a potential connection to MRW from the Middle Valley Tank zone, but this was removed from consideration as it would require a new booster pump station, more challenging terrain, and more uncertainty on pipeline easements to deliver water to LRE.

Figure 2-1 shows two potential pipeline alignments to join MRW to LRE from the West Hills Tank zone with a few connection location options. Alignment A is a relatively direct path from Sage Lane up to the Rockport Tank following the edge of several lots in LRE. This alignment would require multiple additional permanent and temporary easements, construction on a steeper slope, and a potential access road for construction and future maintenance.

Alignment B follows Sage Lane, Rockport Blvd, and Crestview Dr up to the Rockport Tank. Alignment B is longer but would stay inside existing roadways and would be easier to access for future maintenance. Temporary construction easements will be needed after leaving the Promontory property and heading east for both alignment options. Alignment B was selected as the preferred option in coordination with the project team.

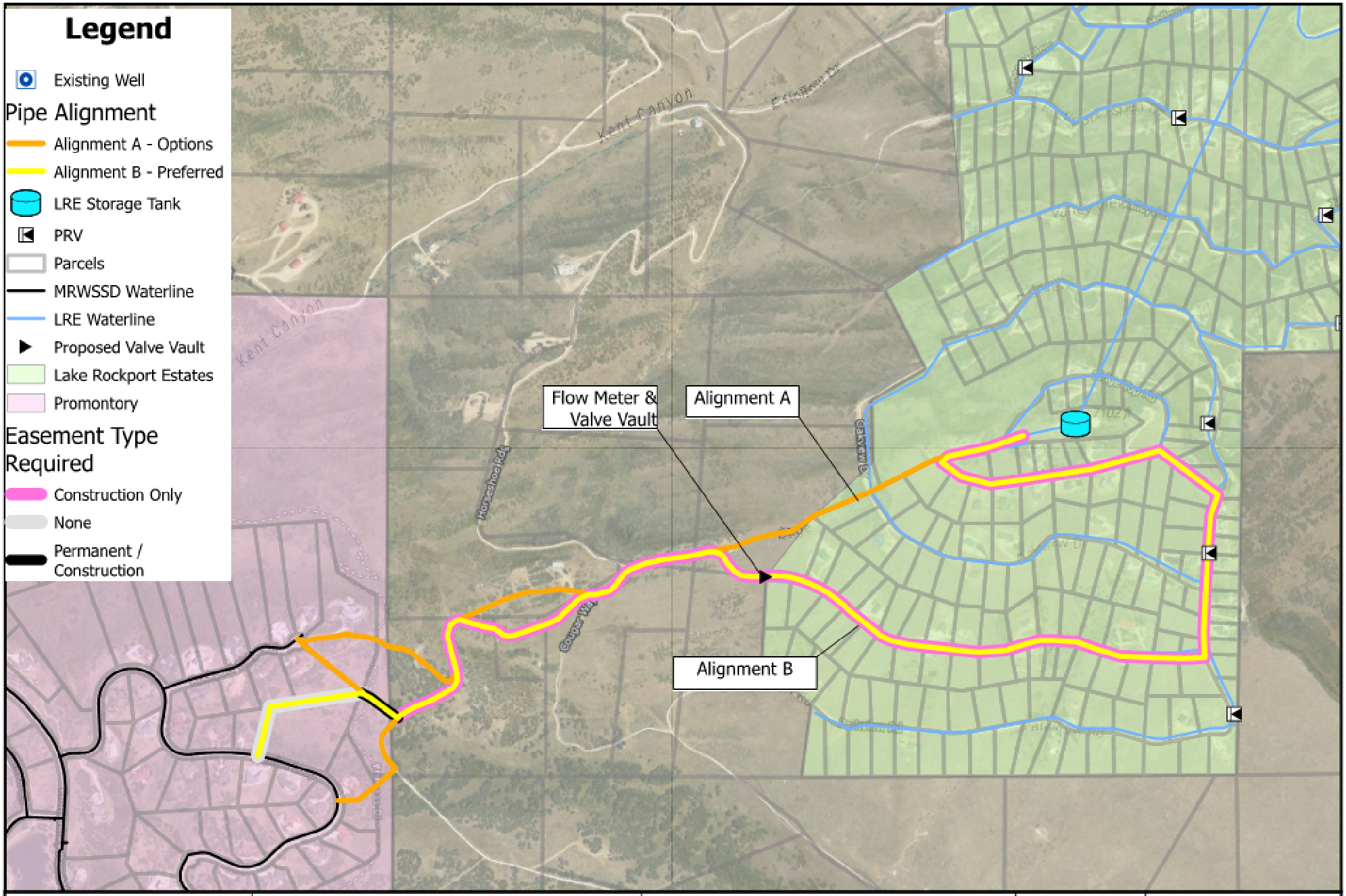
Each of the properties shown in the Promontory development have a 10-foot-wide utility and drainage easement around the perimeter. MRW is named as one of the utilities that may utilize these easements. As a result, no new easements should need to be purchased within Promontory to run along property lines toward LRE for a new waterline. Several lots have property lines that would be conducive to extending a waterline toward Sage Lane from the West Hills tank zone.

The recommended location to connect to MRW is along the west and north property line of 8366 N Sunrise Loop because the property is not yet developed and the property line is further away from existing buildings and existing landscaping than other lots. The property line also has a relatively mild slope (less than 3:1 horizontal to vertical) and the pipeline could be constructed without significant fill or restoration requirements. Other property lines shown on Figure 2-1 may also be feasible options for routing a new waterline.

A pressure reducing valve and metering station will be required to lower the hydraulic grade line by 106 psi (from 7366 feet, MRW West Hills Tank water surface elevation, to 7120 feet, LRE tank water surface elevation) to safely fill the LRE tank. The valve and meter station will need to have a supervisory control and data acquisition system (SCADA) to enable continuous flow control through the valve. Per MRW direction, the control valve and flow meter will need to be installed in an above ground structure for maintenance and communication needs. A suitable location will need to be determined during design of the pipeline. A location on the LRE property would likely be the most suitable. An approximately 10,000 foot long pipe would be required to connect along existing roadways up to the LRE tank following Alignment B.

Impacted MRW Facilities

- **West Hills Tank** – The West Hill Tank should be minimally impacted if the valve to fill the LRE Tank is operated as a steady flow control valve (31 gpm for existing indoor connections to 192 gpm for buildout connections with outdoor watering) to fill the Rockport Tank. If the valve is a solenoid-controlled diaphragm globe valve, flows can be maintained at a constant rate such that pass-through storage should not be needed. This should minimize any kind of equalization demand on the West Hills Tank. Some SCADA and radio control capabilities would be needed in the control valve meter station to enable this ability. The buildout equalization storage requirement for LRE is approximately 140,000 gallons.



BOWEN COLLINS & ASSOCIATES

LAKE ROCKPORT ESTATES

SUPPLY STUDY

MRWSSD CONNECTION ALTERNATIVE

NORTH:

SCALE: 1 in = 800 ft

0 400 800

FIGURE NO.

2-1

If a control valve is not able to set the flow control precisely for LRE, an estimated pass-through storage of roughly 35,000 gallons (roughly 25 percent of the buildout equalization storage for LRE) in West Hills Tank could be needed to offset control issues. This is also the result an imperfect match of pump capacities against demand. In 2065 based on the MRW Masterplan, the West Hills Tank would potentially have an excess storage of 104,000 gallons allowing sufficient excess storage to accommodate a small pass-through control storage volume.

- **Boosters** –
  - Signal Hill Booster (aka 3 Mile Booster) – The Signal Hill Booster Pump Station is the facility that delivers water to the West Hills Tank from the Signal Hill storage reservoir. Based on the MRW Masterplan in 2065, the peak demand for this booster station from the Promontory development was anticipated to be 841 gpm out of a capacity of 940 gpm (net surplus of 99 gpm). Demand on this pump station in 2020 was around 381 gpm. July 2025 peak day demand at West Hills Tank was 743 gpm. This usage indicates that the West Hills tank zone will likely require additional capacity to meet future demands in addition to increasing pumping capacity for LRE.
    - Based on the potential demand of LRE (192 gpm) and the potential additional growth within the West Hills tank zone (460 gpm based on latest master plan), the ultimate capacity of the Signal Hill pump station may need to be expanded to approximately 1,500 gpm (approximately a 60% increase in capacity). This increase may be feasible, but is dependent on pump can size, suction and discharge piping sizes, and electrical restrictions.
  - **Lost Canyon Booster –** The additional demand of the LRE will increase the demand on the Signal Hill raw water supply and treatment capacity. Based on planned improvements, LRE's inclusion will not require any additional improvements to these facilities, but LRE will need to participate in paying for ongoing or future improvements to the Lost Canyon Booster station and Signal Hill Water Treatment Plant.

POTENTIAL COSTS OF WHOLESALE CONNECTION

Potential costs of the wholesale connection are shown in Table 2-4 and include the following components:

- Metering & Flow Control/Pressure Reducing Valve Vault – A new vault for metering and a pressure reducing valve or flow control valve will be needed to connect to the LRE system.
- SCADA Control – SCADA monitoring and control of the valve at the metering vault will be needed to avoid relying on West Hills Tank storage which will have limited capacity at buildout.
- Pipeline Connection – A minimum of 10,000 feet of 8-inch pipe will be required to supply the LRE existing storage tank along Alignment B. Shorter alignments may be possible if additional easement can be acquired and MRW can tolerate some additional steep slopes along the alignment.
- Easements – The cost of easements to connect to LRE from the existing MRW service area are approximate. It is assumed there may be some permanent easements outside of the existing lots that may need to be purchased. In addition, some construction easements may need to be purchased along Sage Lane.

- Contingency – At this AACE Class 4 level of estimating, a 30 percent contingency has been included to account for unknowns that may be encountered during design.
- Impact Fee Costs – MRW assets for which LRE would need to participate in impact costs include Rockport Reservoir diversions, the Lost Canyon Pump Station & Pipeline, Signal Hill water treatment plant and other smaller assets. Excess capacity of District assets along with the cost of future assets needed to serve future growth are summarized in the MRW's impact fee facility plan and impact fee analysis (see Appendix A). The estimated existing capacity requirement of existing lots at LRE would be approximately 107 gpm. Impact fee costs are summarized in Table 2-4.

Table 2-4
Wholesale Connection Costs

Item	Quantity	Unit	Unit Price	Cost Estimate
Meter & Pressure Reducing Structure (standard CMU)	1	lump sum	$400,000	$400,000
SCADA Control & Power	1	lump sum	$100,000	$100,000
8-inch Pipe	10,316	feet	$250	$2,579,000
20-foot Easement Costs (Permanent)	280	feet	$360	$100,800
20-foot Easement Costs (Construction)	3,300	feet	$58	$191,400
Engineering/Administration		15%	$505,680	$505,680
Contingency		30%	$1,146,177	$1,145,471
Impact Fee Costs (Potential)*	107	gpm	$18,109	$1,928,649
Pump Expansion	1	lump sum	$450,000	$450,000
Total Connection Cost				**$7,401,000**

*based on estimated existing peak day demand for existing connections at West Hill's Tank zone usage and District's existing impact fee.

IMPACT FEE COST CONTRACT ALTERNATIVES

Excess capacity of District assets along with the cost of future assets are summarized in the MRW's impact fee facility plan and impact fee analysis (see Appendix A). There are several alternatives for how LRE could pay to use these assets:

- Annexation – If LRE annexes into MRW (subject to County approval), all of the existing connections would be required to pay an impact fee equivalent to the potential demand on MRW's assets. Future connections would pay an impact fee as they develop.
- Wholesale Agreement – Under a wholesale agreement (subject to County approval), the cost for conveyance and treatment would be passed through to LRE and LRE connections based on a negotiated agreement between MRW and LRE. There are several ways an agreement could be set up:
    - Estimated Existing Demand – LRE existing demand is significantly less than the potential demand. An agreement could be developed to charge LRE the cost of their existing demand with limits and exceedance costs to restrict demand. As additional demand developed or increased, LRE would need to purchase additional capacity to

avoid exceedance costs. This method would only be recommended if capital costs are difficult to finance and a slower method to finance demand is needed.

SUMMARY AND RECOMMENDATIONS

The following are recommendations for LRE to connect to MRW:

1. Pipeline – Alignment B is the preferred alignment for the pipeline. This would follow Sage Lane along existing roads wherever possible. This will enable easier future maintenance by MRW. The pipe will need to be designed for a max pressure of 240 psi depending on where the flow meter and control valve structure is constructed.
2. West Hills Connection - The recommended location to connect to MRW is along the west and north property line of 8366 N Sunrise Loop because the property is not yet developed and the property line is further away from existing buildings and existing landscaping than other lots. The slope of terrain along the property line is also less than 30 percent for the full alignment.
3. Flow Meter & Control Valve Structure – MRW needs to have an above ground structure built to house the flow meter and control valve. The valve will need to be controlled via MRW's SCADA system with an antenna and radio or cell signal for communication. A simple masonry building will need to be constructed with basic heating/lighting. Architectural embellishments will increase the cost of this structure but may be desired by LRE to match the characteristics of the development.
4. Total Costs – Total costs for the connection to LRE will likely range between $7 million and $8 million.
5. MRW Standards – The total costs identified above include only those costs to connect MRW's system to LRE and does not include the costs to upgrade the LRE system to meet MRW standards. Because most of the pipes in the existing system were built for seasonal use and are relatively shallow, most of the pipes would need to be replaced at a deeper depth to meet MRW standards. This will be discussed further as part of a system evaluation (Phase 2 of this project scope).

APPENDIX A

IFA EXCERPT

The full Impact Fee Analysis for Mountain Regional Water Special Service District is available for those interested. Only an excerpt summarizing the maximum fee per gpm after credits is included in this Appendix.

EXECUTIVE SUMMARY

Mountain Regional Water District (the District) commissioned Zions Public Finance, Inc. (Zions) to calculate the District's culinary water impact fees in accordance with Utah State Law. An impact fee is a payment of money imposed upon new development activity to mitigate the impact of the new development on public infrastructure. In conjunction with this project, the District prepared the *Water Impact Fee Facilities Plan* (IFFP) dated November 2023.[1]

The recommended impact fee structure presented in this analysis has been prepared to satisfy the Impact Fees Act, Utah Code Ann. § 11-36a-101 et. seq., and represents the maximum impact fees that the District may assess. The District will be required to use revenue sources other than impact fees to fund any projects identified in the IFFP that constitute repair and replacement, cure any existing deficiencies, or increase the level of service for existing users.

TABLE 6: MAXIMUM FEES PER GPM AFTER CREDITS

Year	TOTAL CREDITS ALL	GSA Max Fee	Promontory Max Fee
2023	($2,144.15)	$17,850.84	$5,152.27
2024	($2,015.73)	$17,979.26	$5,280.69
2025	($1,886.46)	$18,108.53	$5,409.95
2026	($1,755.85)	$18,239.14	$5,540.57
2027	($1,623.51)	$18,371.49	$5,672.91
2028	($1,489.70)	$18,505.29	$5,806.72
2029	($1,354.08)	$18,640.91	$5,942.34
2030	($1,216.04)	$18,778.95	$6,080.37
2031	($1,076.00)	$18,919.00	$6,220.42
2032	($954.26)	$19,040.73	$6,342.16

DRAPER, UTAH OFFICE
154 E 14075 S
DRAPER, UTAH 84020
PHONE: 801.495.2224

OGDEN, UTAH OFFICE
2036 LINCOLN AVENUE
SUITE 104
OGDEN, UTAH 84401
PHONE: 801.495.2224

PROVO, UTAH OFFICE
1712 S EAST BAY BLVD
SUITE 345
PROVO, UTAH 84606
PHONE: 801.495.2224

ST. GEORGE, UTAH OFFICE
20 NORTH MAIN
SUITE 107
ST.GEORGE, UTAH 84770
PHONE: 435.656.3299

BOISE, IDAHO OFFICE
776 E RIVERSIDE DR
SUITE 250
EAGLE, IDAHO 83616
PHONE: 208.939.9571

BOWEN COLLINS & ASSOCIATES

WWW.BOWENCOLLINS.COM