MOUNTAIN REGIONAL WATER

To: Mountain Regional Water Administrative Control Board Members

From: Sam Grenlie, District Engineer

Date: February 20th, 2026

Re: 2026 Water and Energy Report

1. Introduction

The goal of this report is to outline strategies to reduce operational costs and environmental impact through efficient energy use. Energy and power represent one of the largest direct costs of the District's water delivery system. Every gallon of water pumped consumes energy, whether from a well or boosted to higher elevations. This energy depends on the volume, change in elevation (head), and other losses (like friction or electrical).

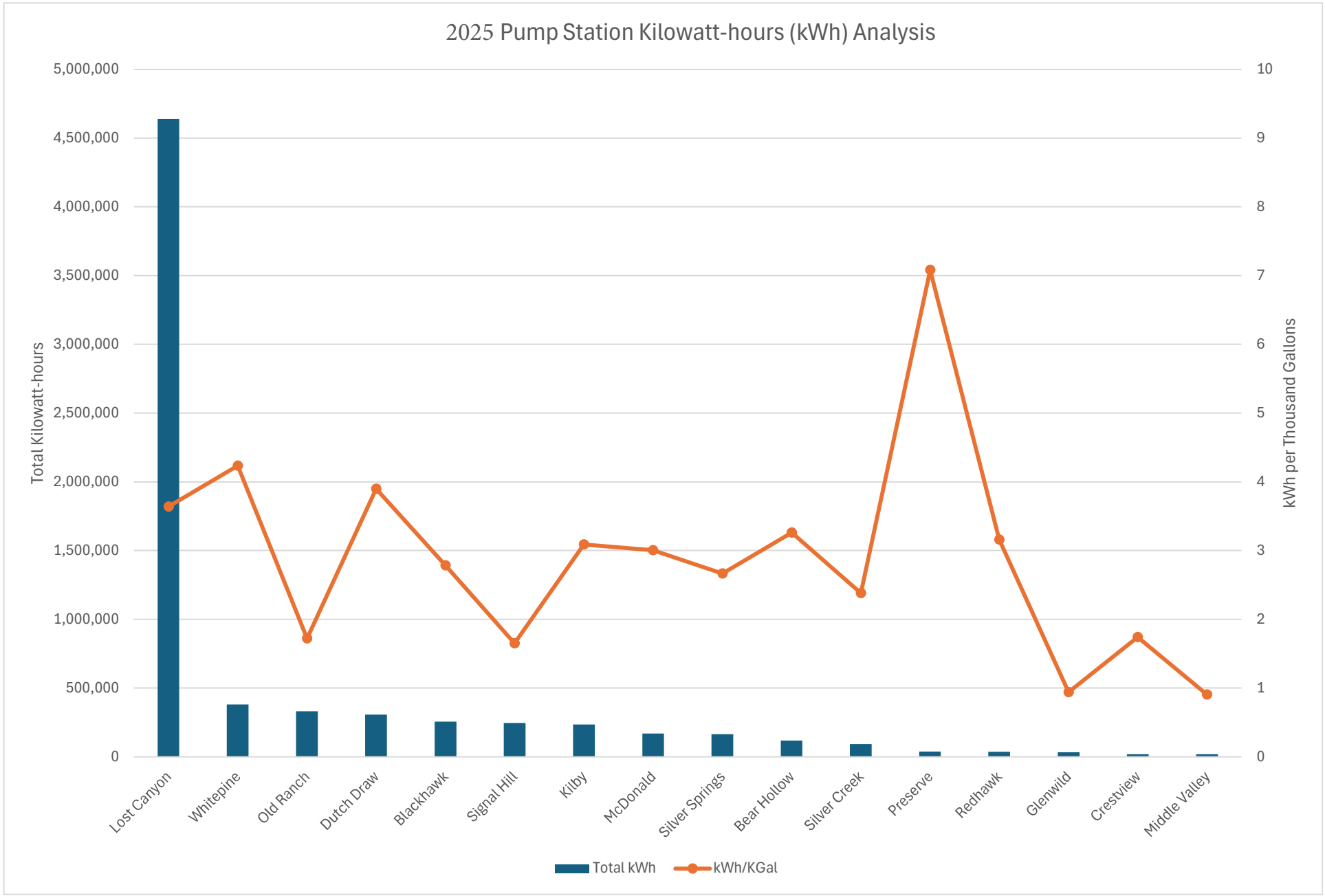
This analysis uses two metrics:

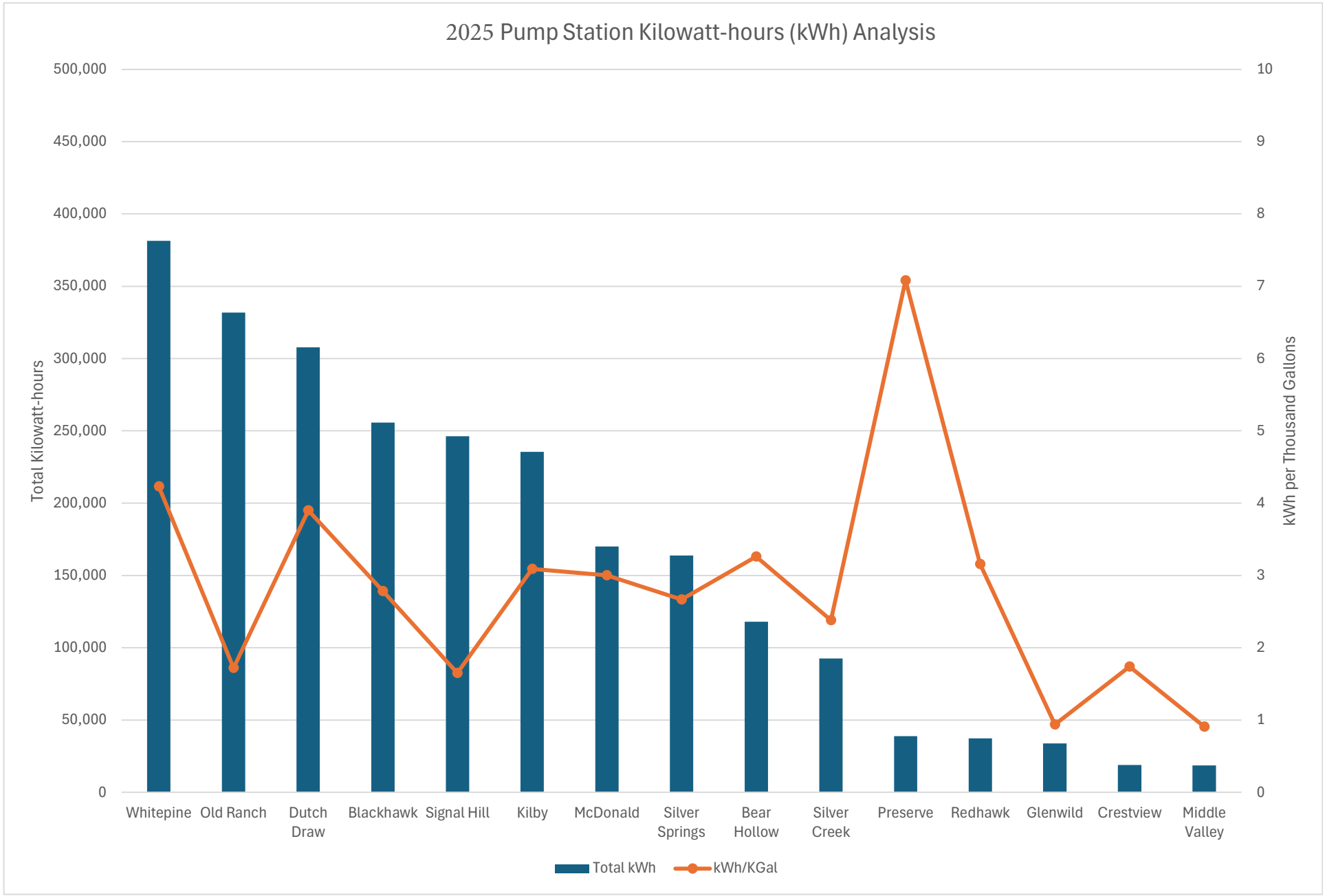
- Kilowatt-hours (kWh): This quantifies the total electrical "work" completed but doesn't describe how efficiently we are using that energy.
- Specific Energy (SE, kWh/Kgal): This measures how much energy it takes to move 1,000 gallons of water. A lower SE means a given system is working more efficiently.

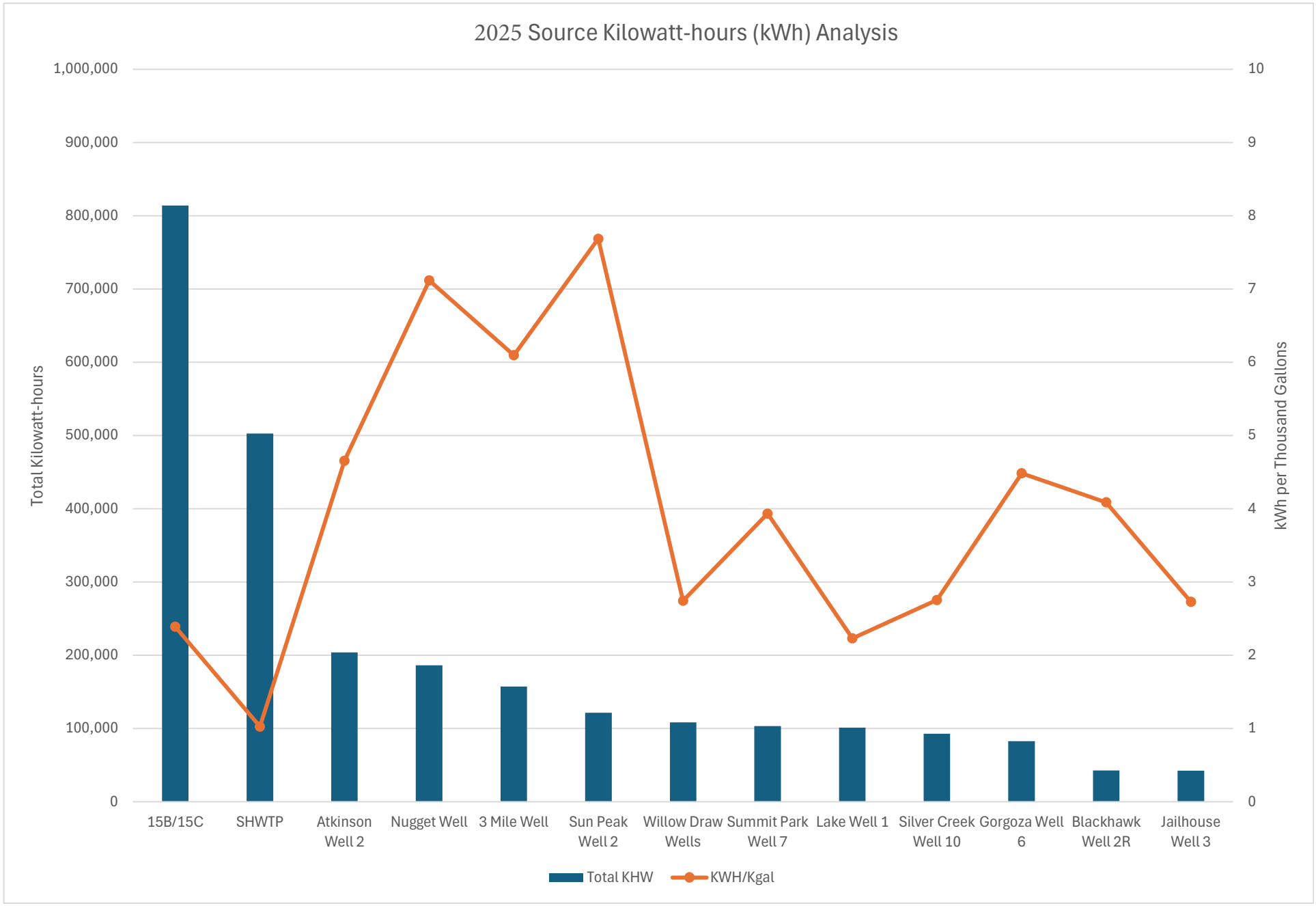
2. Current Operations & Cost Drivers

The following charts rank facilities from highest to lowest total kWh usage (bars) and overlay their corresponding efficiency (SE, orange line). This visualization identifies the primary cost drivers and facilities underperforming relative to their volume.

The charts are broken out by pump stations and water sources (wells and Signal Hill Water Treatment Plant, SHWTP). The SE axis (right hand side of page) remains the same across the charts for easy comparison. The Lost Canyon Booster Pump Station (LCBPS) is the District's largest energy consumer by far, and a second pump station chart is presented without LCBPS to allow for better comparison of the other pump stations in the District.


2025 Pump Station Kilowatt-hours (kWh) Analysis
Total Kilowatt-hours
kWh per Thousand Gallons
5,000,000
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
10
9
8
7
6
5
4
3
2
1
0
Lost Canyon
Whitepine
Old Ranch
Dutch Draw
Blackhawk
Signal Hill
Kilby
McDonald
Silver Springs
Bear Hollow
Silver Creek
Preserve
Redhawk
Glenwild
Crestview
Middle Valley
Total kWh
kWh/KGal


2025 Pump Station Kilowatt-hours (kWh) Analysis
Total Kilowatt-hours
kWh per Thousand Gallons
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
10
9
8
7
6
5
4
3
2
1
0
Whitepine
Old Ranch
Dutch Draw
Blackhawk
Signal Hill
Kilby
McDonald
Silver Springs
Bear Hollow
Silver Creek
Preserve
Redhawk
Glenwild
Crestview
Middle Valley
Total kWh
kWh/KGal


2025 Source Kilowatt-hours (kWh) Analysis
Total Kilowatt-hours
kWh per Thousand Gallons
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
10
9
8
7
6
5
4
3
2
1
0
15B/15C
SHWTP
Atkinson Well 2
Nugget Well
3 Mile Well
Sun Peak Well 2
Willow Draw Wells
Summit Park Well 7
Lake Well 1
Silver Creek Well 10
Gorgoza Well 6
Blackhawk Well 2R
Jailhouse Well 3
Total KHW
KWH/Kgal

2a. Current Operations & Cost Drivers, Pump Stations

The Lost Canyon Booster Pump Station consumed over 4,640,400 kWh in 2025, more than all other pump stations combined. This facility houses over 4,000 horsepower of pumps and motors that move ~9,000 gallons of raw water per minute (gpm) over 1,000 feet of head. Due to the scale of the project and innovative design, it remains a relatively efficient asset with a SE of 3.64 kWh/Kgal.

A significant portion of the District's infrastructure consists of smaller pump stations that were originally designed in isolation and later regionalized into the modern District. This legacy design often results in "stacked" pumping systems where water must pass through multiple stations to reach high-elevation zones, such as the North Ridge area (or the Colony). In these systems, energy costs are "compounded". Every gallon reaching the highest elevations has already consumed energy at each preceding booster station.

Bear Hollow and the Preserve Pump Stations show significantly higher Specific Energy values, with the Preserve reaching a high of 7.08 kWh/Kgal. While essential, these facilities represent a lower tier of efficiency compared to purpose-built regional assets.

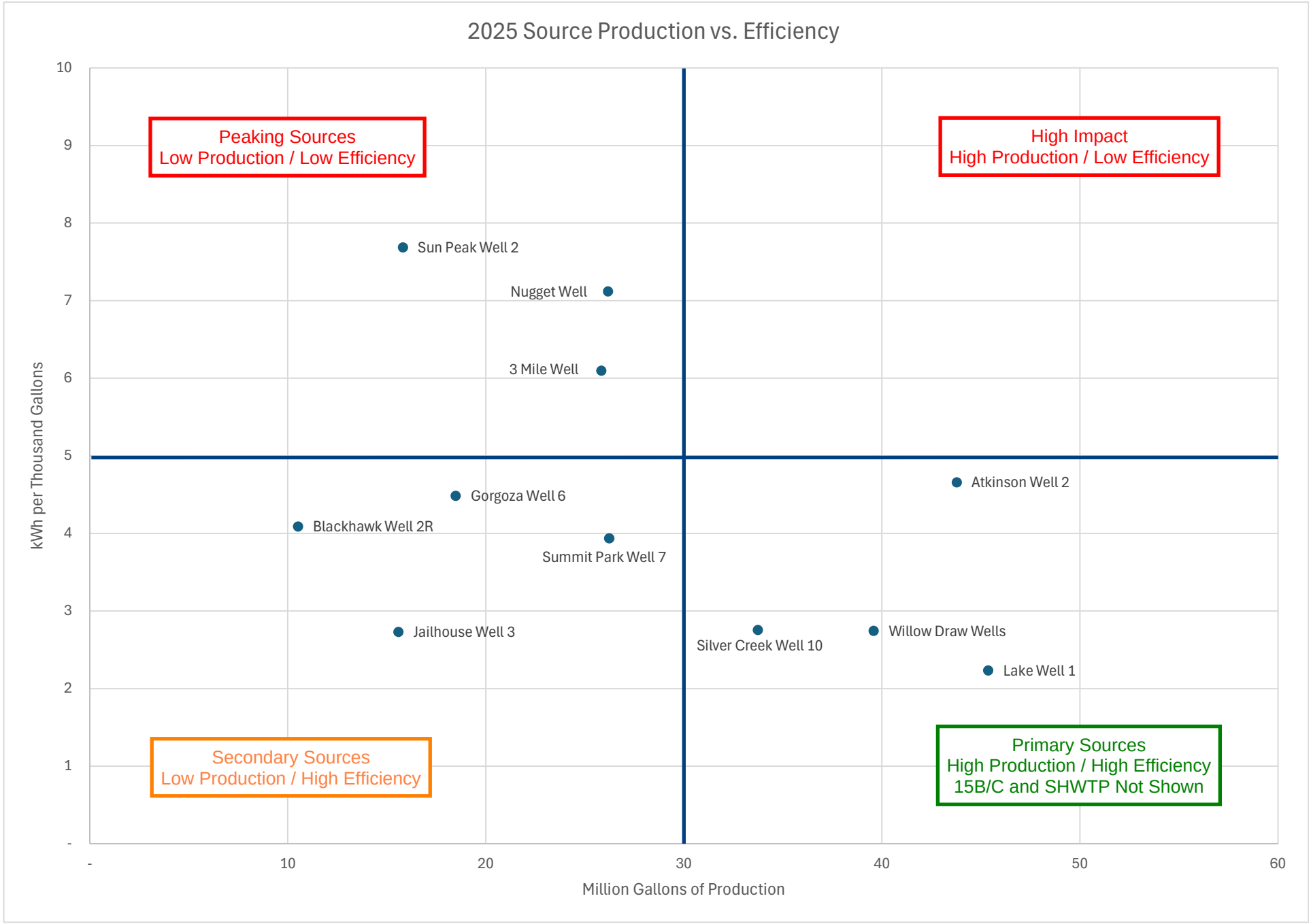
2b. Current Operations & Cost Drivers, Sources

Outside of pump stations, the District has two critical sources with efficient performance metrics:

- SHWTP: Has the lowest Specific Energy of any source in the District at ~1.0 kWh/Kgal.
- Wells 15B/15C: While they consumed the most total energy of the District wells (~814,000 kWh), they maintained an excellent SE of only ~2.4 kWh/Kgal.

3a. Efficiency Opportunities, Source Prioritization

To prioritize sources based on energy efficiency, facilities were mapped onto a Source Production vs. Efficiency Chart shown on the following page. This chart was divided into four quadrants to prioritize efficient sources. Note that the chart doesn’t include SHWTP or Wells 15B/15C. These sources are outliers in performance and critical for the District to meet demands.


2025 Source Production vs. Efficiency
Peaking Sources
Low Production / Low Efficiency
High Impact
High Production / Low Efficiency
Secondary Sources
Low Production / High Efficiency
Primary Sources
High Production / High Efficiency
15B/C and SHWTP Not Shown
Sun Peak Well 2
Nugget Well
3 Mile Well
Gorgoza Well 6
Blackhawk Well 2R
Summit Park Well 7
Jailhouse Well 3
Atkinson Well 2
Silver Creek Well 10
Willow Draw Wells
Lake Well 1
kWh per Thousand Gallons
Million Gallons of Production
10
9
8
7
6
5
4
3
2
1
-
10
20
30
40
50
60

Sources grouped nicely into four quadrants, as follows:

- **Primary Sources** (High Production / High Efficiency): critical assets that perform the "heavy lifting" at the lowest unit cost.
- **Secondary Sources** (Low Production / High Efficiency): less efficient backups providing system reliability and ability to meet Peak Day demands.
- **Peaking Sources** (Low Production / Low Efficiency): inefficient units restricted to peak demand periods.
- **High Impact** (High Production / Low Efficiency): this category should be avoided, and currently **no sources** are operated in this manner.

These categories can be utilized to select priority of the wells in the District SCADA system. Obviously, there are other considerations when prioritizing source like water rights, location within the system (Tank Zone), and water quality concerns. Whenever possible, the most efficient well is used.

3b. Efficiency Opportunities, Rate Optimization

Another efficiency opportunity utilizes “Off-Peak Pumping” using various rate schedules provided by Rocky Mountain Power / Pacificorp. LCBPS is the most extreme case, by shifting LCBPS to a high-voltage industrial Rate 9 service, the District expanded the off-peak pumping window significantly. This strategy moves heavy loads to periods of day that have a lower impact on the power grid, resulting in significant cost savings. This facility receives high voltage service from the 138 kV transmission lines of PacifiCorp, requiring the District to own and operate a 5-Megawatt sub-station to utilize this rate.

The District has achieved additional energy cost reductions through Rocky Mountain Power (RMP) rate structures across all its pumping facilities. As a commercial water utility, the District evaluates up to six different rate tariffs to identify the most cost-effective option for each situation. Finding the alignment of electrical demand with the appropriate rate schedule is a tradition of Mountain Regional, building off the efforts of Doug Evans’ work in this area for many years.

4. Conclusion and Next Steps

In general, the biggest impact practices have been, and will continue, to be implemented by the District. This includes leaning on our most efficient sources and managing LCBPS as efficiently as possible.

Moving forward, the District identified the following action items:

1. Short term (next calendar year)
    - Immediate: Conduct a focused energy audit of the Preserve and Bear Hollow Pump Stations and confirm the correct rate schedule and identify any opportunities for different pump configurations or other solutions to improve efficiency.
    - Confirm Well Priority to match the Quadrant Chart for the upcoming irrigation season, along with verifying water right available to make any changes.
2. Long Term:
    - As discussed, Bear Hollow and the Preserve show significantly higher Specific Energy. The pump stations were originally designed in isolation and later retrofitted into our regional system. As the System continues to grow, these systems will be evaluated for better regional performance:
        1. The Olympic Park is considering significant improvements to conveyance to allow for continued development and snowmaking. This could be an opportunity to rethink the Silver Springs and Sun Peak transmission systems (which include Bear Hollow Pump Station).
        2. Discussions continue with Pine Meadows Mutual Water Company for MRW to be a long-term wholesaler. If annexation were ever considered, improvements to the Preserve Pump Station could be tackled here.