



Mountain Regional Water

Summer 2016 Update

Work Session Outline

- Presentation (40 minutes)
 - General overview of the District
 - Efforts toward a more robust and resilient system
 - In-house capabilities
 - Progression to a more energy efficient system; past, present, future
 - Technological advancements
 - Community service & industry involvement
- Discussion (20 minutes)



GENERAL OVERVIEW OF THE DISTRICT



System Metrics

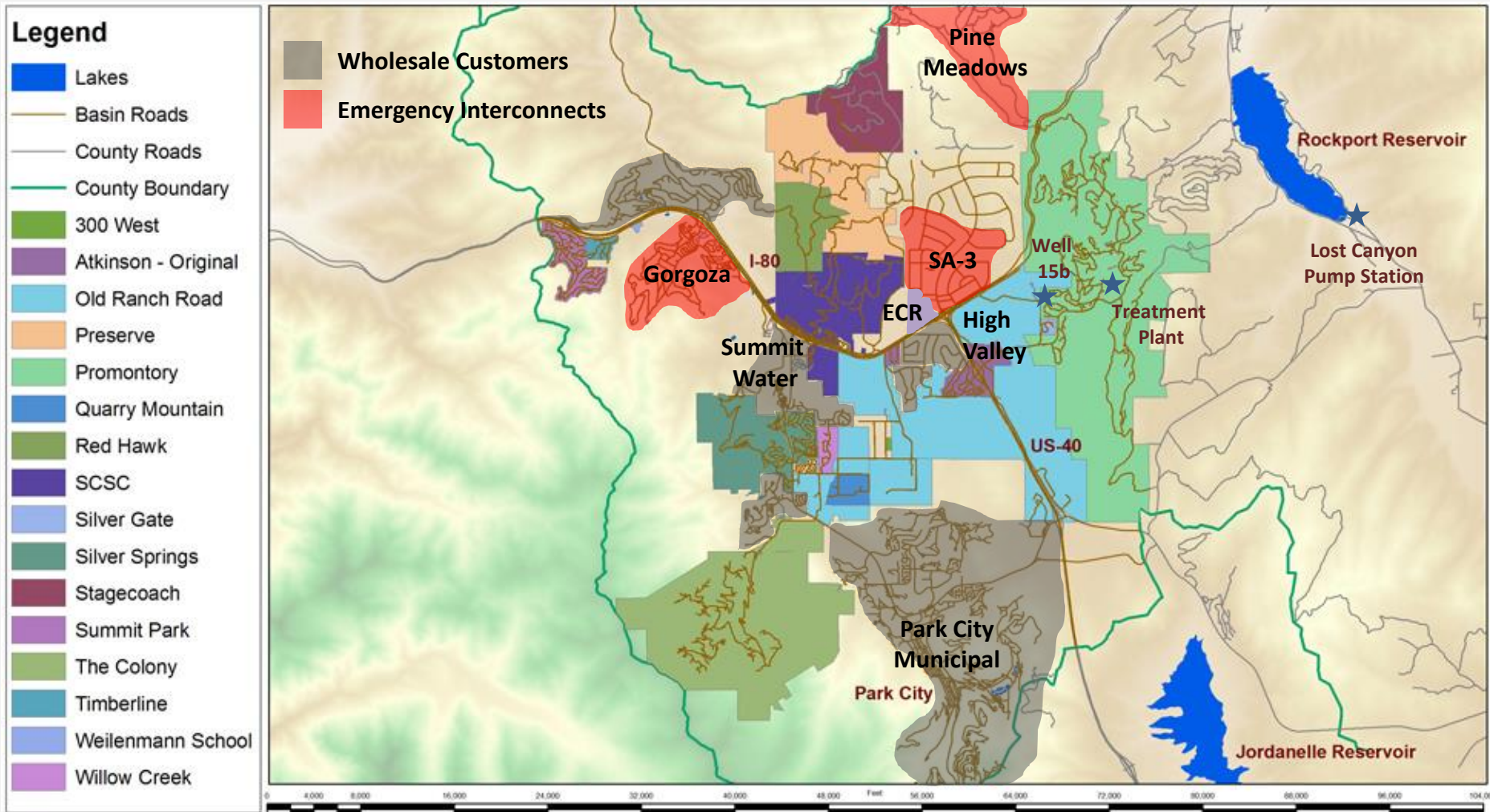
- 4,000 Rooftops
- Area: 25 mi²
- 10.5 million gallons delivered on peak day
- 5,800 acre-feet delivered annually
- 10,000 GPM capacity Lost Canyon pump station
- 4 MGD capacity treatment plant
- 10 Wells
- 1 Spring
- >200 Miles of pipe
- 10.7 MG stored
 - ~172,000 citizen days
 - ~15 district days



Lost Canyon Booster Station



Who Does Mountain Regional Serve?



Wholesale Water Delivery: 2016 Projections

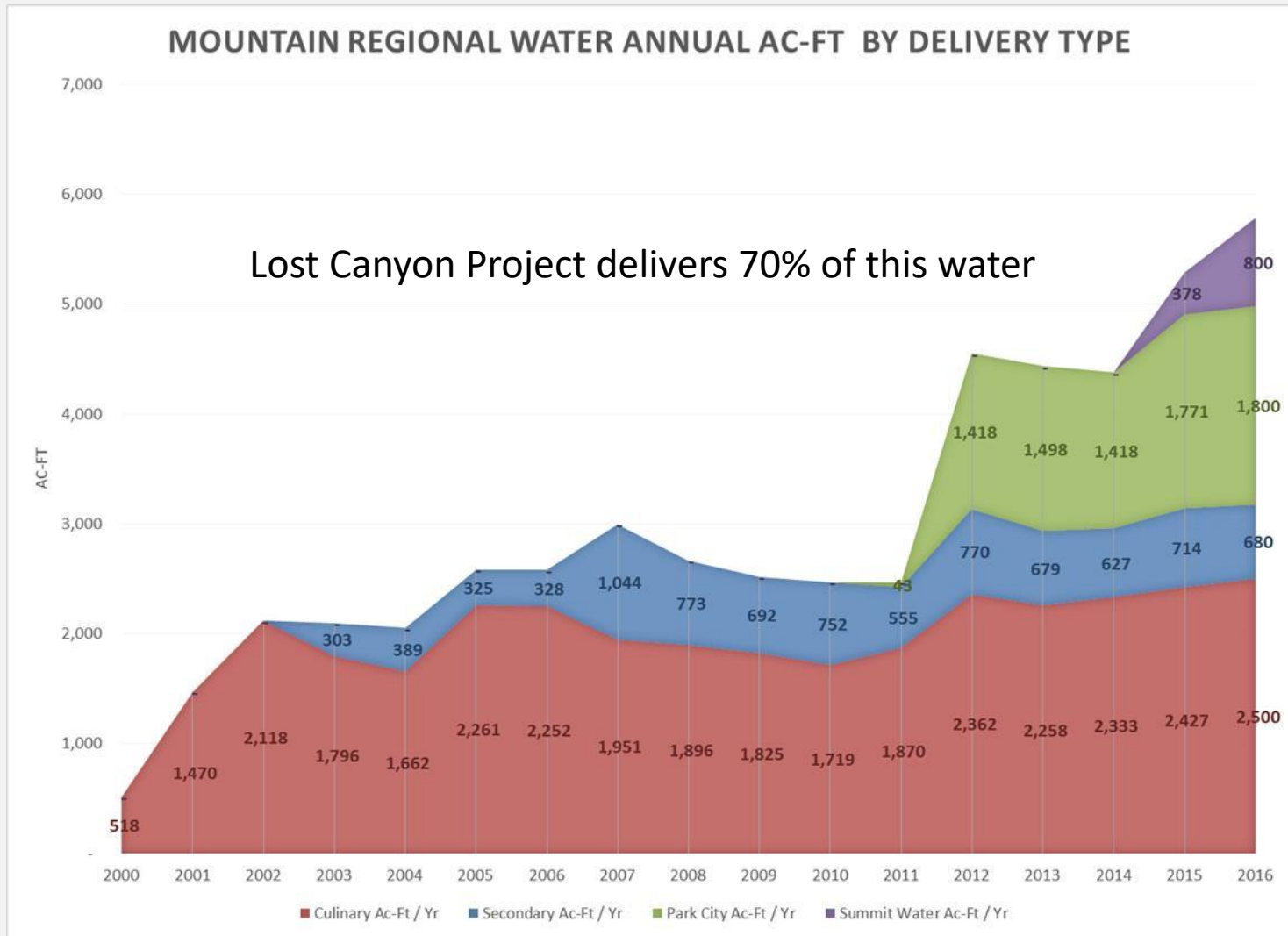
- ~ 40% of our production
- Promontory Golf Courses
 - Peter Dye Canyon course: 750 GPM
 - Painted Valley course: 890 GPM
- Park City Municipal
 - Quinn's Junction treatment plant: 2,800 GPM
- Weber Basin Interconnect
 - 613 GPM July, Aug, Sept



Quinn's Junction Delivery Pipeline



Water Delivery by Category



EFFORTS TOWARD A MORE ROBUST AND RESILIENT SYSTEM



District Composition Provides Resiliency

- Approximately 10 independent systems interconnected
- All systems include storage that can be transferred throughout district
- Benefit: built in resiliency due to our composition
- Detriment: linear exposure



Becoming More Robust

- To be more robust, we must identify our exposure
 - Increase Atkinson Zone storage
 - Pump Station Upgrades
 - Primary source redundancy
 - Improve transmission redundancy out of Promontory

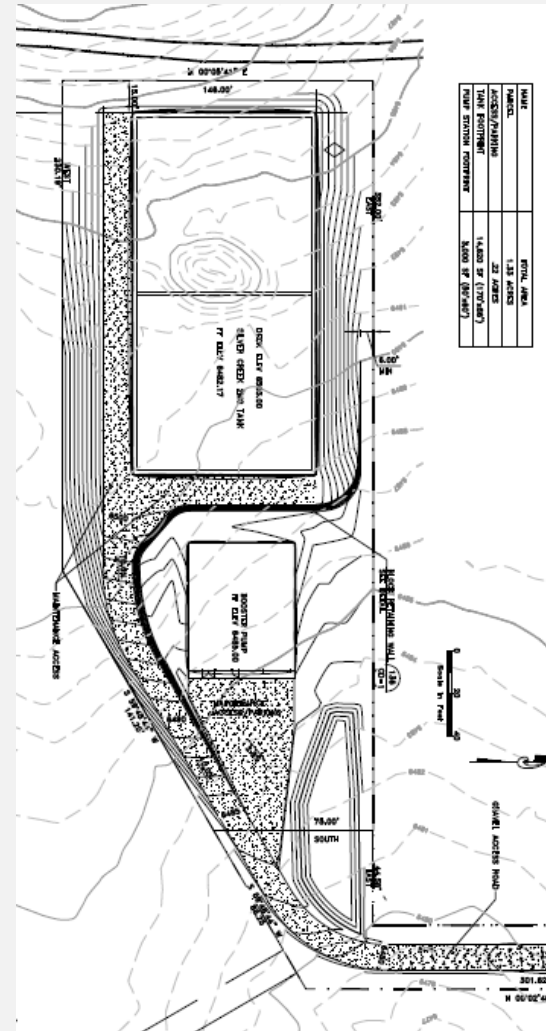


The tank we're glad we don't have!



Increase Atkinson Zone Storage – New 2 MG Silver Creek Tank

- Construction begins Summer 2016
- 2 MG storage reservoir in the hub of the District
- Brings total Atkinson storage to 2.7 MG
- Improves fire storage and flow availability to nearby commercial districts
- Net Zero Facility
 - Energy recovery turbines
 - MRW investigating solar array project in collaboration with County's Sustainability Department



Pump Station Improvements

- Blackhawk Pump Station
 - Complete retrofit
 - Doubled capacity
 - Geothermal cooling system
- Bear Hollow Pump Station
 - Surge tank added; mitigates future leaks at pump shutdown
 - Upgraded electrical improving pump performance and workplace safety
- Capacity upgrades to all 3 Colony booster stations



Blackhawk Pump Station Upgrades



Source Redundancy – Treatment Plant

- Middle Valley Tank
 - Located above Promontory's Nicklaus Golf Course
 - Constructed in 2015
 - Storage Capacity: 1 MG
 - Can directly feed Treatment Plant finished storage tank → provide service to Promontory customers
- Bison Bluffs Well
- New Silver Creek Tank



Middle Valley 1MG Tank



Source Redundancy – Well 15b

- Bison bluffs Well - Promontory
 - Greatest capacity well in Snyderville Basin: 1,500 GPM
 - Drilling completed January 2016
 - Highly successful drill operation: 2 months, below budget
 - Low noise electric rotary drill rig
 - Public outreach: door knocks
 - Only 1 public complaint



Security Provisions & Emergency Response

- Security
 - Authentication required for all sensitive actions
 - Investigation two-step methods
 - Cloud based data storage
- Emergency Response
 - All hands meet at MRW treatment plant
 - Distribution system isolated as required
 - MRW management to coordinate with incident command
 - Food, water, & fuel storage at treatment plant



IN-HOUSE CAPABILITIES



Transmission

- Plumbing reroutes, appurtenance replacement and maintenance
- Pump selection (pump station design), extraction, and installation
- Takeaway: our ability to perform our own maintenance reduces down time, increases service life, and reduces operating costs



Pump Extraction at Lost Canyon



Distribution

- Distribution
 - Construction inspection
 - Everything from water mains and transmission infrastructure to service laterals
- All leaks excavated and mended by in-house staff
- Preventative maintenance
 - PRVs
 - Hydrants
 - Flushing



Summit Park Leak



Treatment

- Treatment Plant
 - Footprint expansion, 2010
 - Enhanced both the pre-treatment and finishing processes
 - Capacity expansion, 2013
 - 1.5 MGD capacity upgrade
 - Enhanced sludge clarifier, Winter 2015
 - Improved water efficiency



Treatment Plant Expansion Project



General Expertise

- > 100 years combined experience in water service
- Licensed Engineer
- Licensed Surveyor
- Licensed Plumber
- Licensed Contractor
- Civil, Chemical, Electrical Engineers
- Operators commonly certified above minimum required level
- Regular in-house training classes
- Continuing education offered by the district
- Takeaway: our breadth in expertise allows us to tackle a wide range of design and operations challenges in-house and avoid hiring consultants



PROGRESSIONS IN ENERGY EFFICIENCY

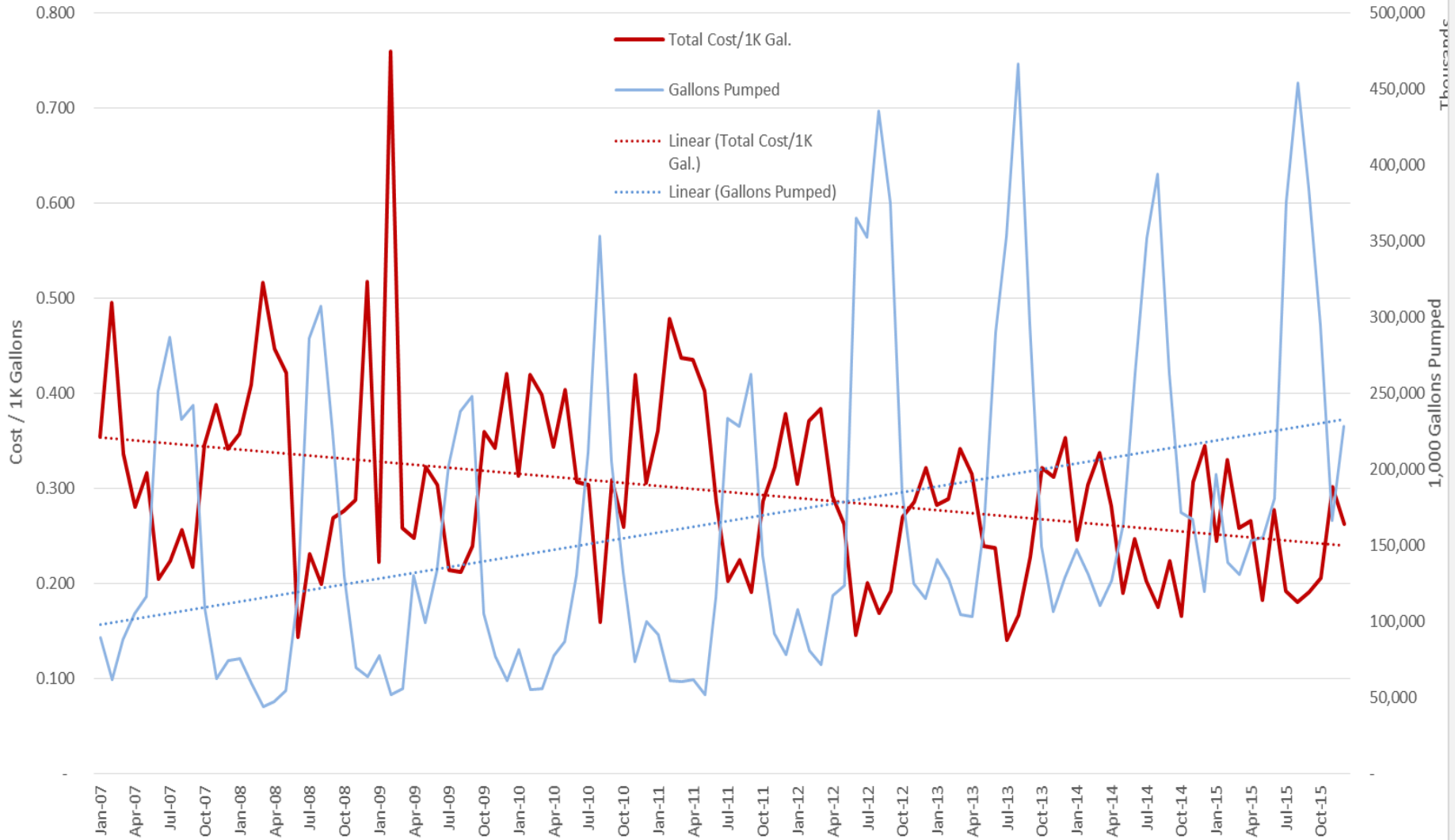


District Energy Data

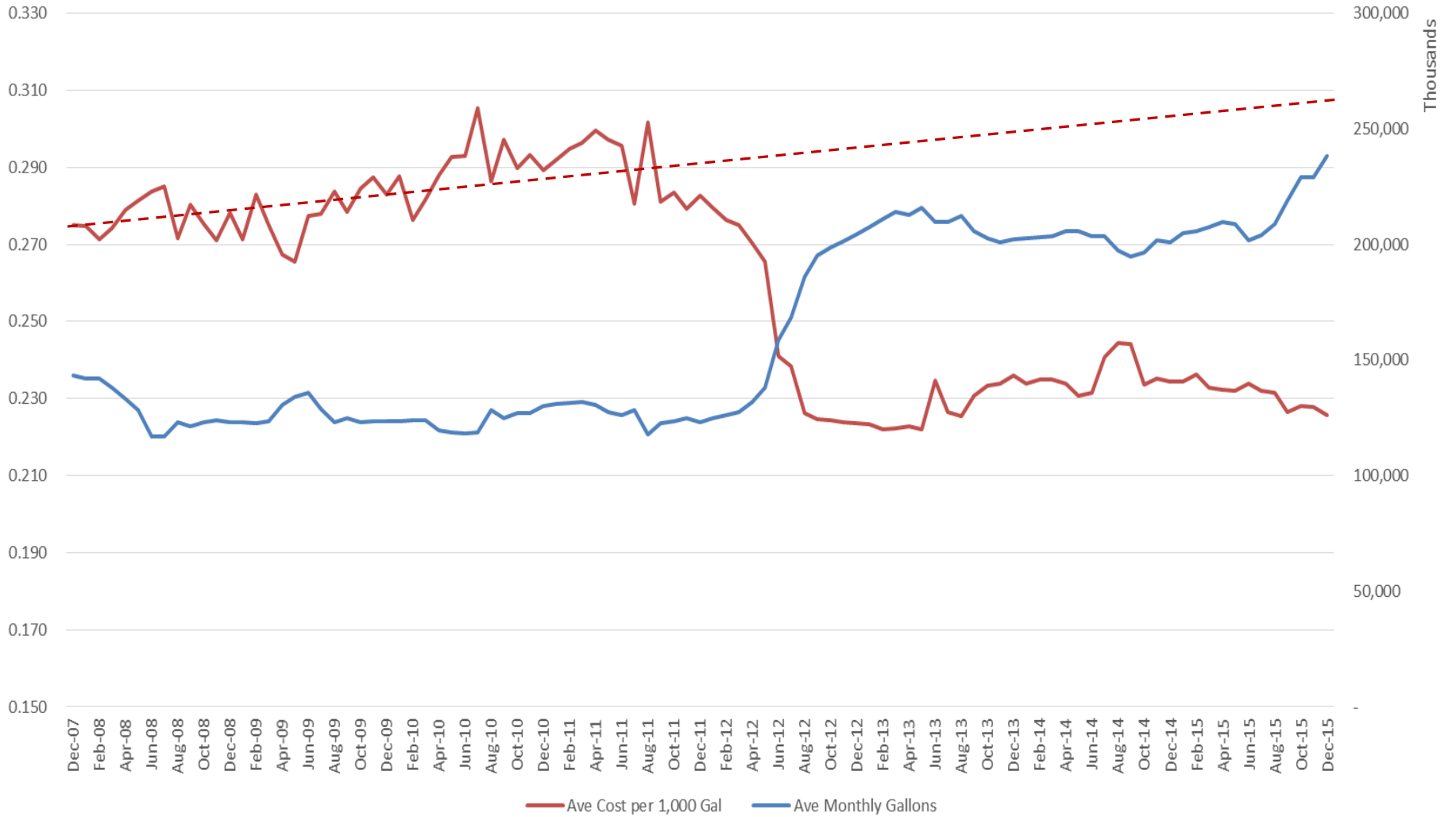
- 135 Pumps spread over 43 remote sites
- 6000' Elevation to 9300'
- 9,400 Horsepower in electric motors
- 1.72 Billion Gallons (2015)
- 8.75 Million Kilowatt Hours of Energy
- Energy is one of the largest direct costs of water delivery



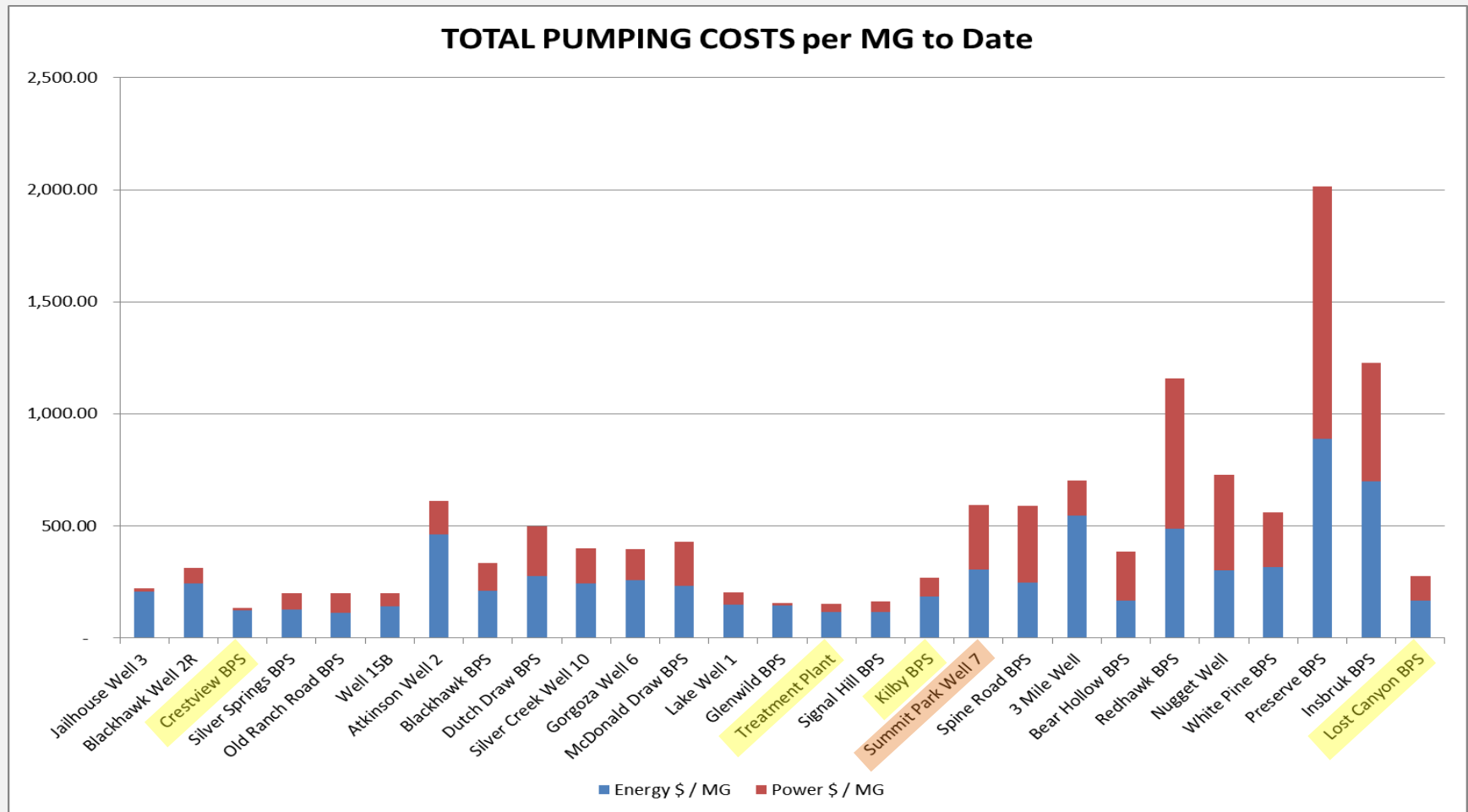
Energy and Power Pumping Costs per 1,000 Gallons



Running 12 Month Average Cost of Energy and Power per 1,000 Gallons vs. Gallons Pumped



Energy Efficient Choices



Strategic Energy Management Monthly Status Report

2014 SEM Water Cohort - RMP

North Salt Lake, Mountain Regional, Park City



TO: Chris Braun, Sam Christiansen, Bina Skordas
FROM: Jeff Hare
DATE: March 1, 2016

SUMMARY

During February 2016, cohort members continued to evaluate and implement low/no-cost measures, along with identifying and assessing capital projects. North Salt Lake has identified three potential capital projects, and Park City has hired a water engineering firm to assist in developing an energy management program for the water system.

ENERGY SAVINGS

Engagement goal to achieve by November 2016. Performance periods begins Nov 1, 2014.

- North Salt Lake: 1,065,000 kWh/yr, 25% annual savings
- Mountain Regional: 405,000 kWh/yr, 5% annual savings
- Park City: 405,00 kWh/yr, 6% annual savings
- **Total: 1,875,000 kWh/yr**

***NOTE:** The energy savings information listed below is preliminary pending external review of the baseline energy models. Currently, energy and production data are collected manually on a monthly basis. This data collection method causes delays in reporting.*

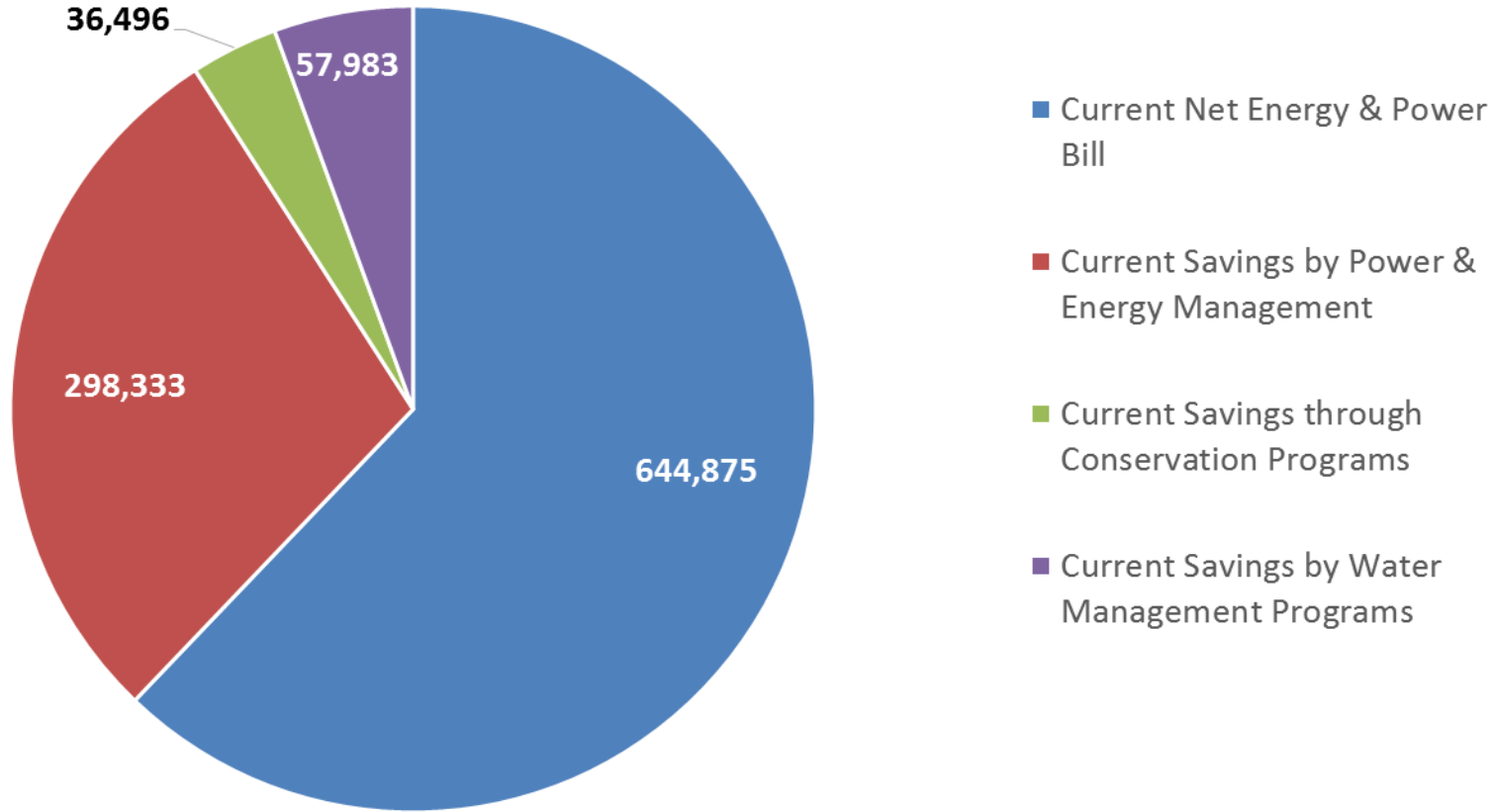
Engagement Savings to Through 11/30/2015

- North Salt Lake: 1,177,805 kWh, 24.8% during performance period
- Mountain Regional 503,945 kWh, 5.1% during performance period
- Park City: -550,619 kWh, -10.7% during performance period (No change due to data issues tied to an update to Park City's SCADA system)
- **Total**
 - 1,681,750, 90% to goal (without Park City)
 - 1,131,131 kWh, 60% to goal (all three)



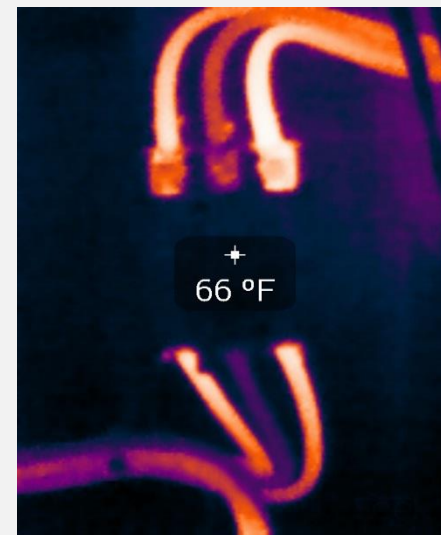
Mountain Regional 2015 Annual Energy & Power Cost Savings in Dollars

(Based on Original \$1,037,687 Dollar Annual Energy and Power Bill)



Future Efficiency Projects

- Geothermal heating and cooling in facilities
- Advanced tools for energy analysis
- LED lighting
- Power regeneration retro-fits
- Slow and Steady with increased Jockey Pump installations

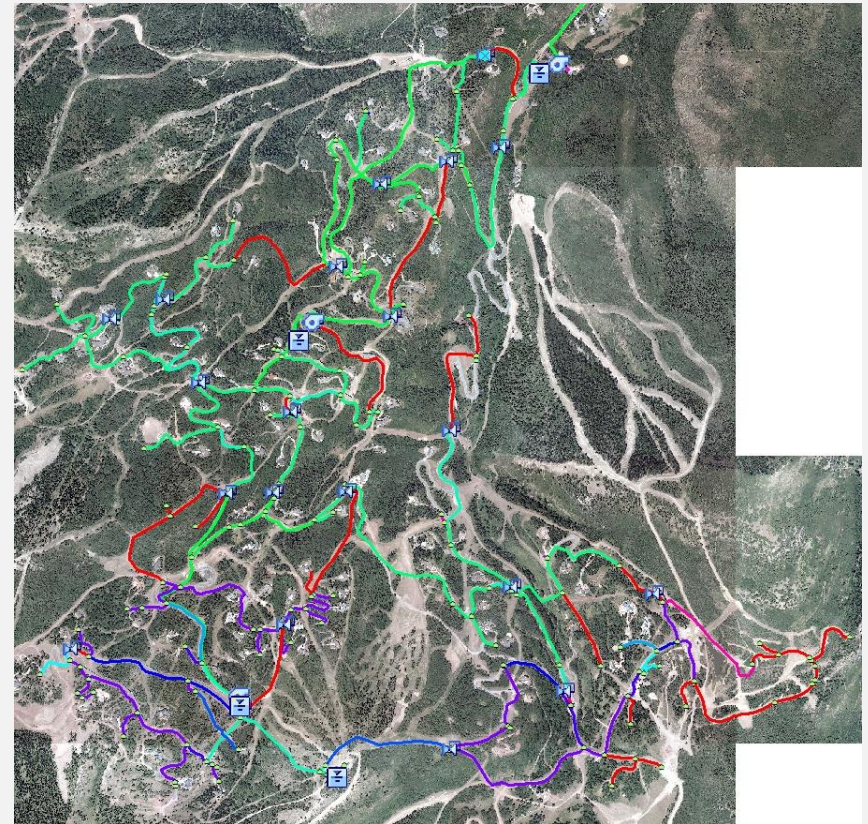


TECHNOLOGICAL ADVANCEMENTS



Hydraulic Modeling

- A computer representation of the District's infrastructure
 - Allows user to “see” how water moves throughout the District
 - Capital improvement project evaluation; analysis of alternatives
 - Water quality modeling
 - Infrastructure health assessment; are things operating as they should?
 - Fire flow analysis

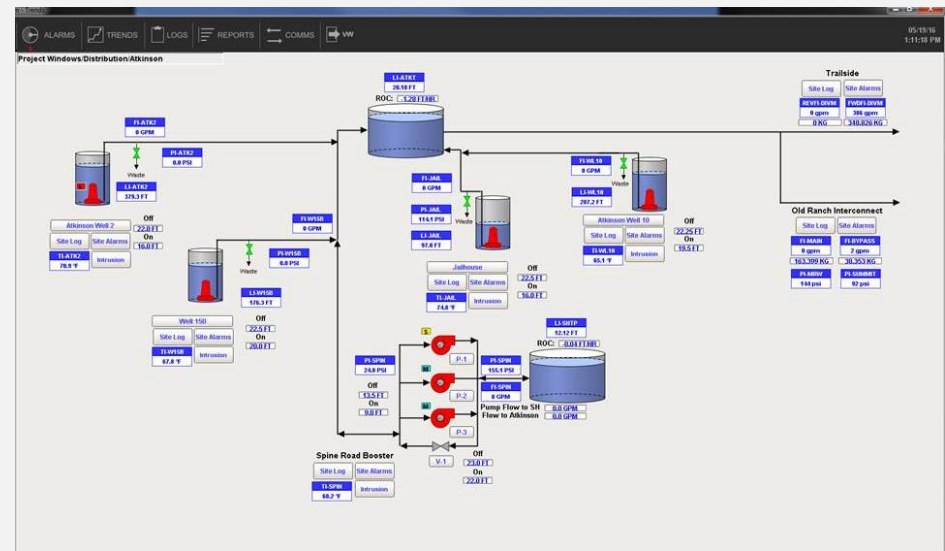


Hydraulic Model Representation: water quality simulation



Information Dissemination & Security

- Complete upgrade of our supervisory control system completed in 2015
- Upgraded remote site radio communications
 - real-time site status
 - enables immediate action
- Provides early detection for leaks (system and facility) and intrusion
- Automated energy efficient decision making



Supervisory control system



COMMUNITY SERVICE & INDUSTRY INVOLVEMENT



Community & Industry Involvement

- Northern Utah Water Quality Alliance
 - Moving beyond state regulations
- Weber River Partnership
 - Collaborative group focused on watershed improvement
- East Canyon Creek Watershed Committee
 - Collaborative group focused on watershed improvement
- Water Quality Advisory Group
 - Summit County based group focused on watershed & source protection
- Knowledge dissemination to professional associations
 - AWWA
 - RWAU
 - Utah Energy Nexus Summit
- DDW Energy Savings Handbook
 - Doug Evans contributing author
- Participation in the community Water Fair for local middle school children



East Canyon Creek augmentation by MRW during low flow event



QUESTIONS?

