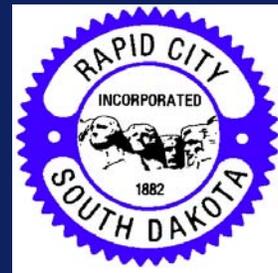


Rapid City's Jackson Springs Project



September 18, 2006
Presentation to City Council



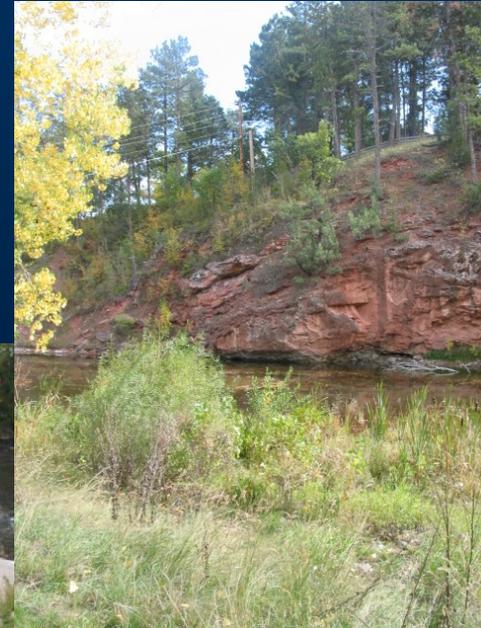
Presentation Outline

- Project Overview
 - Jackson Springs Infiltration Gallery
 - Regulatory Background
- Project Objectives
 - Phase 1A – Immediate Solution
 - Phase 1B – Short-Term Solution
 - Facility Evaluation
 - Source Water Evaluation
 - New vs. Existing WTP Evaluation
 - Process Evaluation
 - Phase 1C – Implementation of 1A Recommendation
- Recommendations





Jackson Springs Infiltration Gallery





Jackson Springs Gallery

- Major Rapid City water source reclassified as groundwater under the direct influence of surface water (GWUDI)
 - Historically provides as much as 50% of City's water supply
- Water rights for 10.46 cfs (6.76 MGD)
- SDDENR required source be in compliance or shutdown by February 10, 2006





Regulations

- Reclassification as GWUDI
 - Groundwater where pathogens are determined possible or likely to travel from nearby surface water sources
- Determined using Microscopic Particulate Analysis (MPA)
- Requires treatment equivalent to surface water sources (filtration) or compliance with Filtration Avoidance Criteria



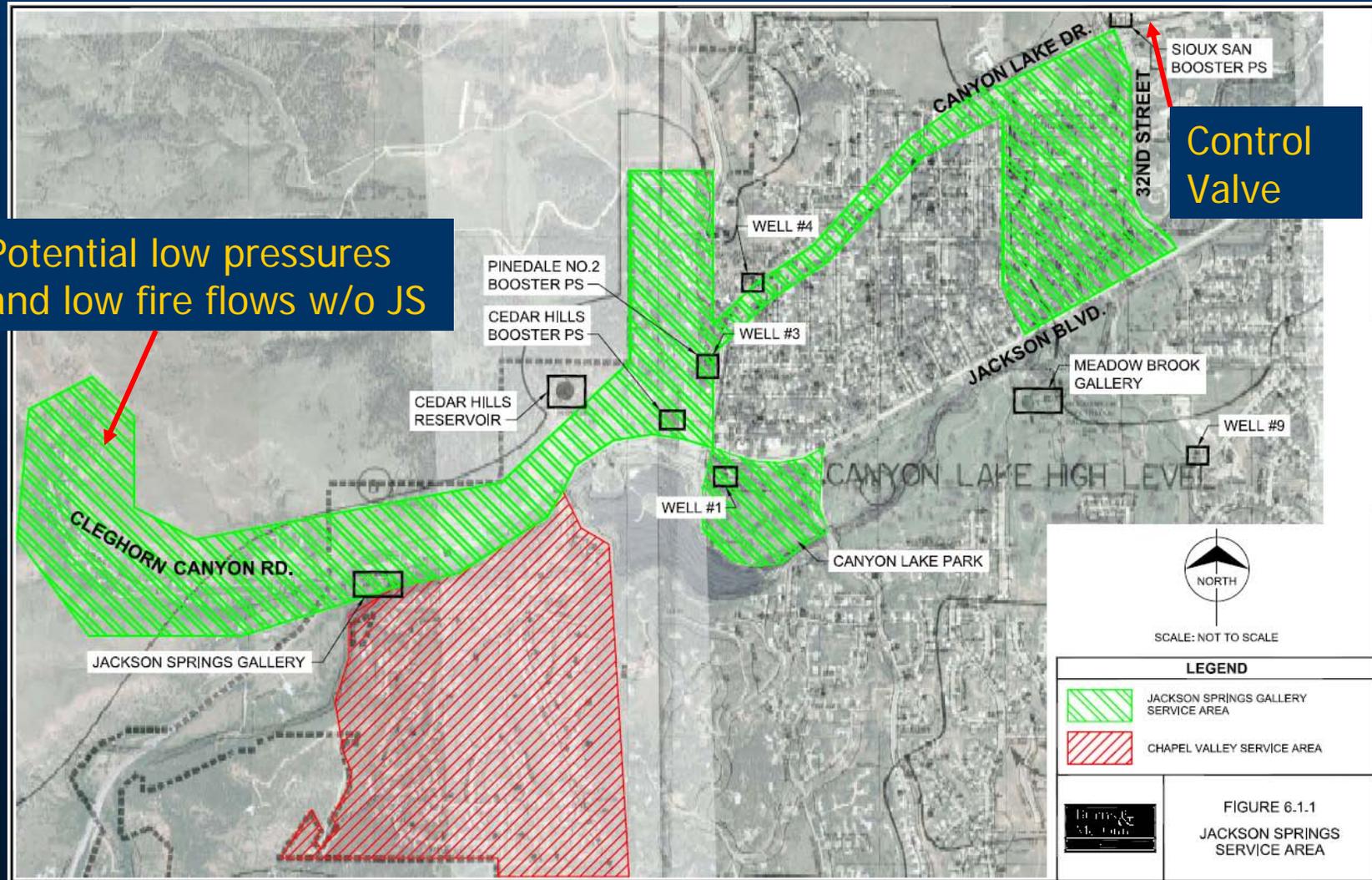


Project Phases

- Phase 1A – Develop an immediate solution to meet demand and provide adequate service to customers
- Phase 1B – Develop a short-term solution to utilize Jackson Springs source
- Phase 1C – Implementation of Phase 1A recommendation



Phase 1A Demand Analysis





Immediate Solutions

- #1 – Fish hatchery source
- #2 – Cleghorn Springs water supply
- #3 – Pursue a short-term waiver
- #4 – Filtration Avoidance Criteria
- #5 – Water main extension
- #6 – Reconfigure distribution system
- #7 – Combination of 5 & 6





#4 - Filtration Avoidance Criteria

- Source water quality monitoring
 - Microbial quality
 - Turbidity
- Daily calculation of total inactivation
- Redundant disinfection systems
 - UV disinfection determined to be best option
- Must comply with D/DBP and MCL's
- Watershed protection program

- Feasible but not practical -





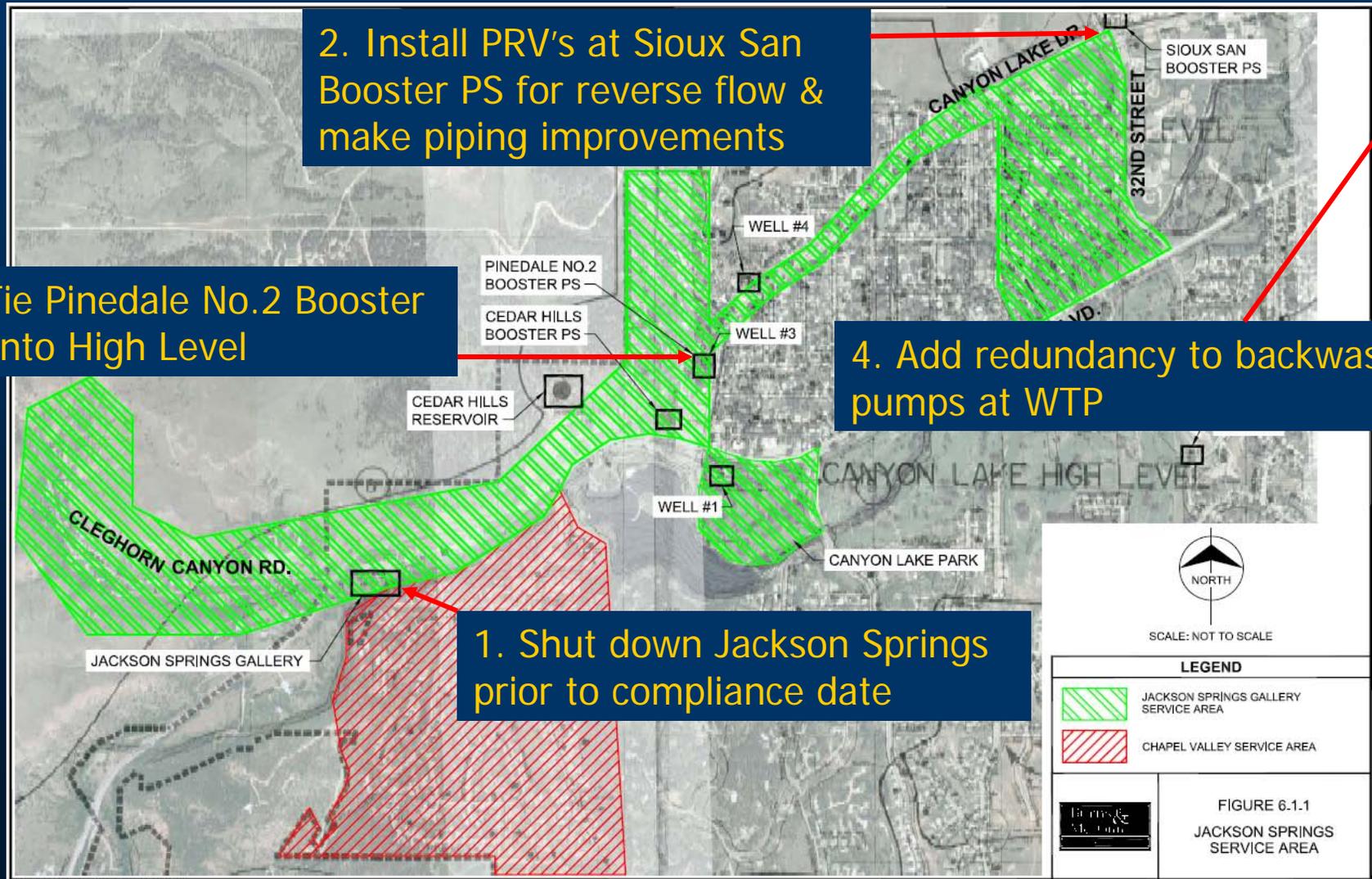
#5 – Water Main Extension

- Water main from Canyon Lake High Zone to Cleghorn Canyon
- Two alignments evaluated
 - 2,500 to 2,700 LF
 - Cost \$396k to \$471k
- Potential water quality and timing issues

- Feasible but not the preferred option -



Phase 1A Recommendation





Phase 1B

Short-Term Solution

- Facility Evaluations
- Source Water Evaluations
- Potential WTP Site and Process Evaluations
- Recommendations





Facility Evaluations

- City staff has done an excellent job of maintaining and operating facilities
- Immediate Life Safety
 - Chemical feed & storage (secondary containment, code issues, etc.)
- Short-Term Recommendations
 - Non-life safety code issues
 - Necessary facility improvements
 - Replacement of aging equipment
- Long-Term Recommendations
 - Additional equipment replacement





Facility Evaluations

Jackson Springs Gallery		Fair
Meadowbrook Gallery		
	Main pump house	Poor
	Pump house #2	Good
	Pump house #3	Good
	Clearwell	Good
Girl Scouts Gallery		
	Pump house #1	Poor
	Pump house #2	Good
	Chlorine shed	Poor
	Clearwell	Good
Surface Water Treatment Plant		Poor



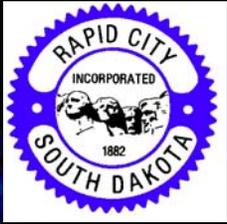


Facility Evaluations

Well Houses		
	1	Poor
	3	Good *
	4	Poor
	5	Excellent
	6	Good
	8	Excellent
	9	Excellent
	10	Excellent
	11	Excellent

* Well 3 shutdown due to water quality





Source Water Evaluations

- Regulatory evaluation
- Evaluation of water quality & quantity
- Summary of hydrogeology
- Review of potential future demands





WTP Alternative Evaluation

- Evaluated sites and treatment processes
 - Seven sites & existing plant (retrofit)
 - Conventional & advanced treatment
- Used a paired-comparison matrix method to prioritize criteria and conduct a cost/benefits analysis
- Evaluation team included City staff and engineering team





WTP Alternative Evaluation

- Siting Criteria
 - Floodplain avoidance
 - Site development
 - Site access
 - Land acquisition
 - Public acceptance
 - Future expansion
 - Raw water transmission
 - Finished water distribution
 - Additional pumping requirements





WTP Alternative Evaluation

- Process Criteria
 - Water quality
 - Footprint
 - Impact on community
 - Ease of operation
 - Operational flexibility
 - Maintenance
 - Future expansion
 - Raw water transmission
 - Finished water distribution
 - Additional pumping requirements
 - Vulnerability
 - Level of automation
 - Future regulations
 - Reliability
 - Sequencing/financing
 - Public perception





WTP Alternative Evaluation

- Best alternative:
 - 14-MGD plant located at Jackson/Cleghorn
 - Pretreatment and microfiltration or ultrafiltration membranes
 - Upgrade of existing plant at later date





Recommendation

Recommendation	Year
■ Implement life-safety issues	2007-2008
■ Build new 14-MGD WTP at Jackson/Cleghorn	2007-2010
■ Implement short-term facility improvements	2009-2011
■ Abandon Well House 1 & 4	After 2010
■ Install pipeline to deliver Meadowbrook & Girl Scouts gallery raw water to existing WTP	TBD
■ Abandon selected MB & GS facilities	TBD
■ Upgrade existing surface water treatment plant	TBD
■ Implement long-term facility improvements	2012-2016



Cost & Implementation

JSWTP Commissioned



Life/Safety JSWTP Engineering JSWTP Construction Short-Term Upgrades Long-Term Upgrades



Summary

- Problem:
 - Need to utilize Jackson Springs source that was recently reclassified by SDDENR (reliable, high quality source)
- Recommendation:
 - 14-MGD plant located at Jackson/Cleghorn
- Schedule
- Council action





Questions/Comments

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