



Overview of Royal Gorge Presubmittal Draft Water Supply Alternatives Report

**Sierra Lakes County Water District
Board Meeting**

January 11, 2008

Agenda

- Purpose of Presentation
- Background
- Water Supplies and Availability
- Project Water Demand
- Summary of Water Supply Alternatives

Purpose of Presentation

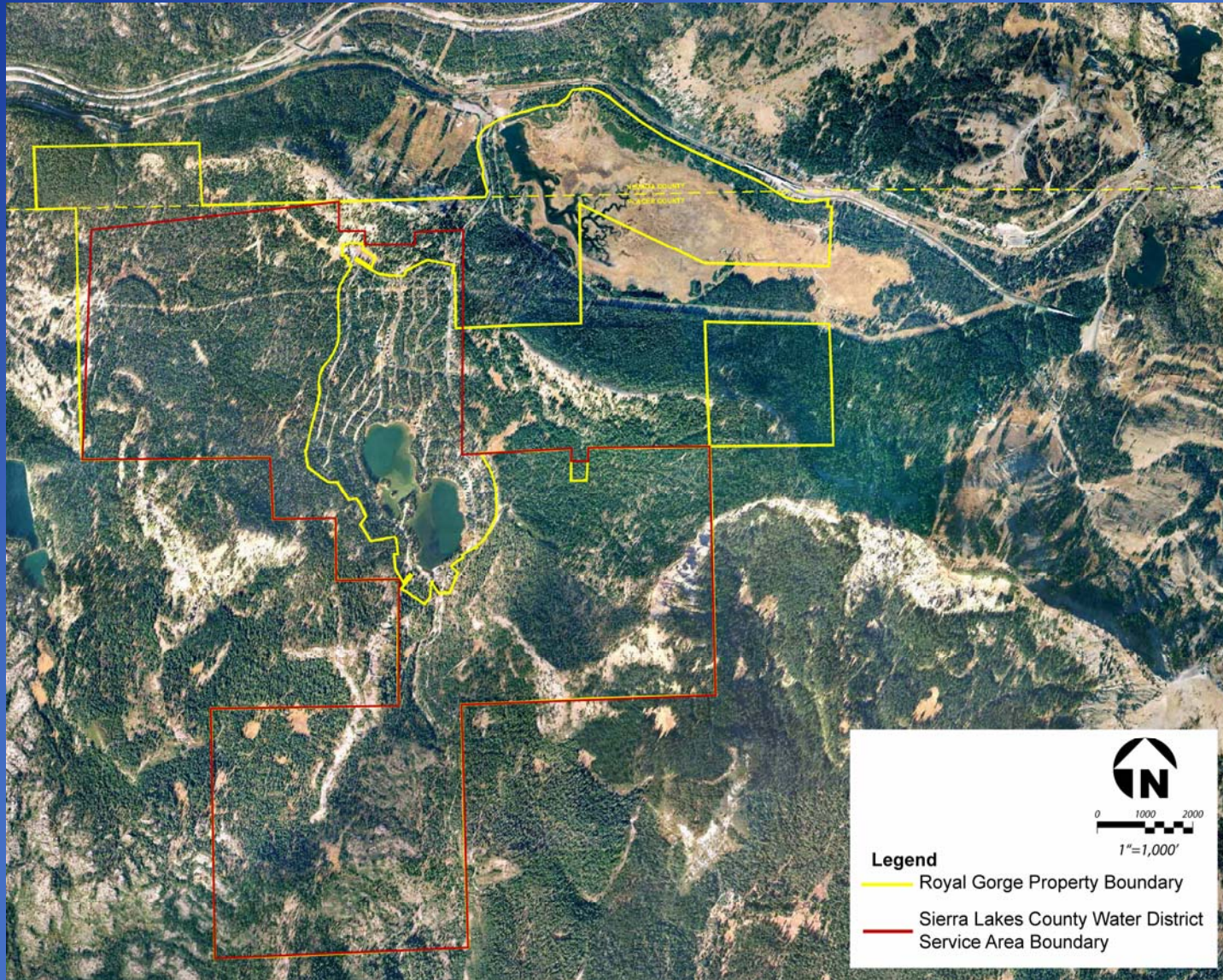
Overview of the work performed for the Draft Water Supply Alternatives Report, which offered a method of meeting the project's water needs through a variety of supply sources

Background

- **Why are we presenting to SLCWD tonight?**
 - The majority of the Royal Gorge property lies within the SLCWD service area.
 - SLCWD currently serves Royal Gorge.
 - SLCWD has supply under current water rights

Royal Gorge Property & SLCWD Service Area

(from District Map filed with the State Water Rights Board)



Water Supplies and Availability

- **SLCWD water availability**
- **Serene Lakes watershed hydrology**
- **Existing water resources**
- **New storage**
- **Groundwater on Royal Gorge property**

SLCWD Water Availability

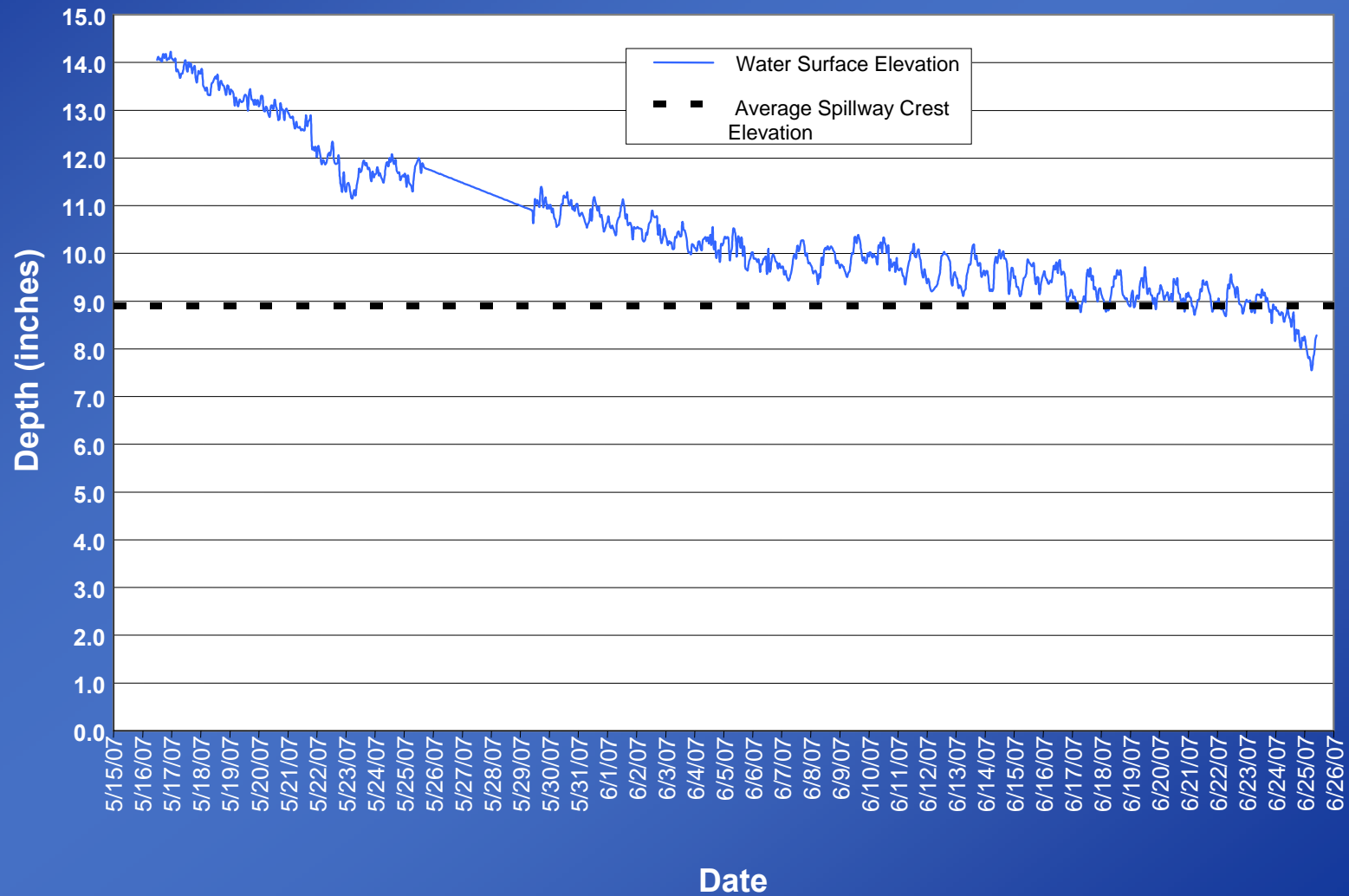
- District water right = 1,177 acre-feet per year (AFY)
 - 2006 SLCWD usage = 120 AF
 - Serene Lakes volume = 798 AF
 - Storage volume between intake piping and spillway = 425 AF
- SLCWD is storage-limited

Serene Lakes Watershed Hydrology

- SLCWD 1967 CIP estimated watershed runoff at 1,520 AFY in dry conditions
- SLCWD bimonthly Lake outflow measurements January through June 2005 & 2006
 - Daily flows estimated:
 - Low of 7 AF per day
 - High of 235 AF per day

Serene Lake Hydrology

May- June 2007 lake outflow=516 AF

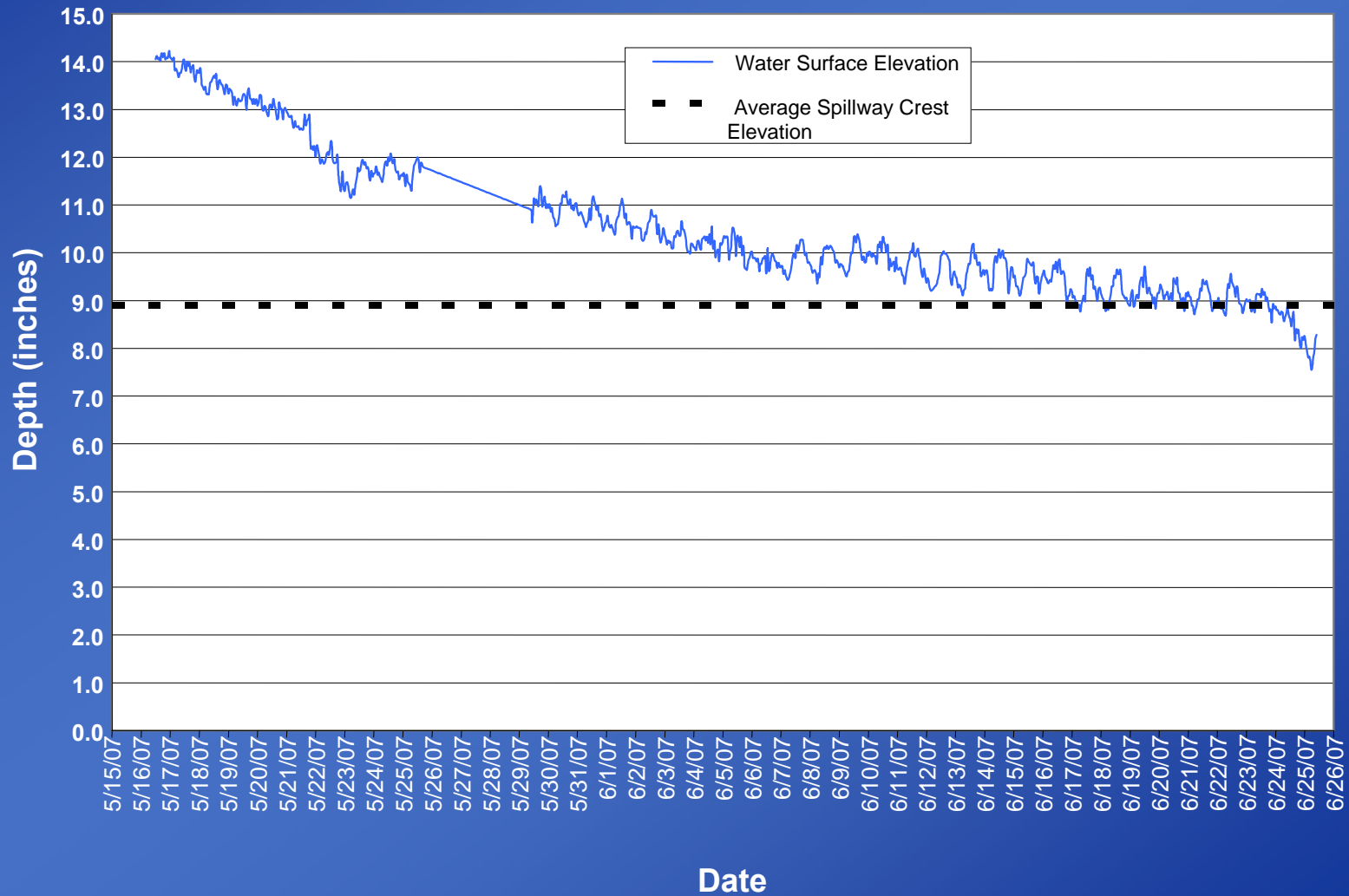


Serene Lakes Watershed Hydrology

- **State Water Resources Control Board characterized 2006/2007 water year as “dry”**
 - **American River region received only 55% of normal runoff**
- **Conclusion- even in a dry year, the Serene Lakes watershed produces significant quantities of water**

Existing Water Resources

January through June spills exceed 1,000 AF

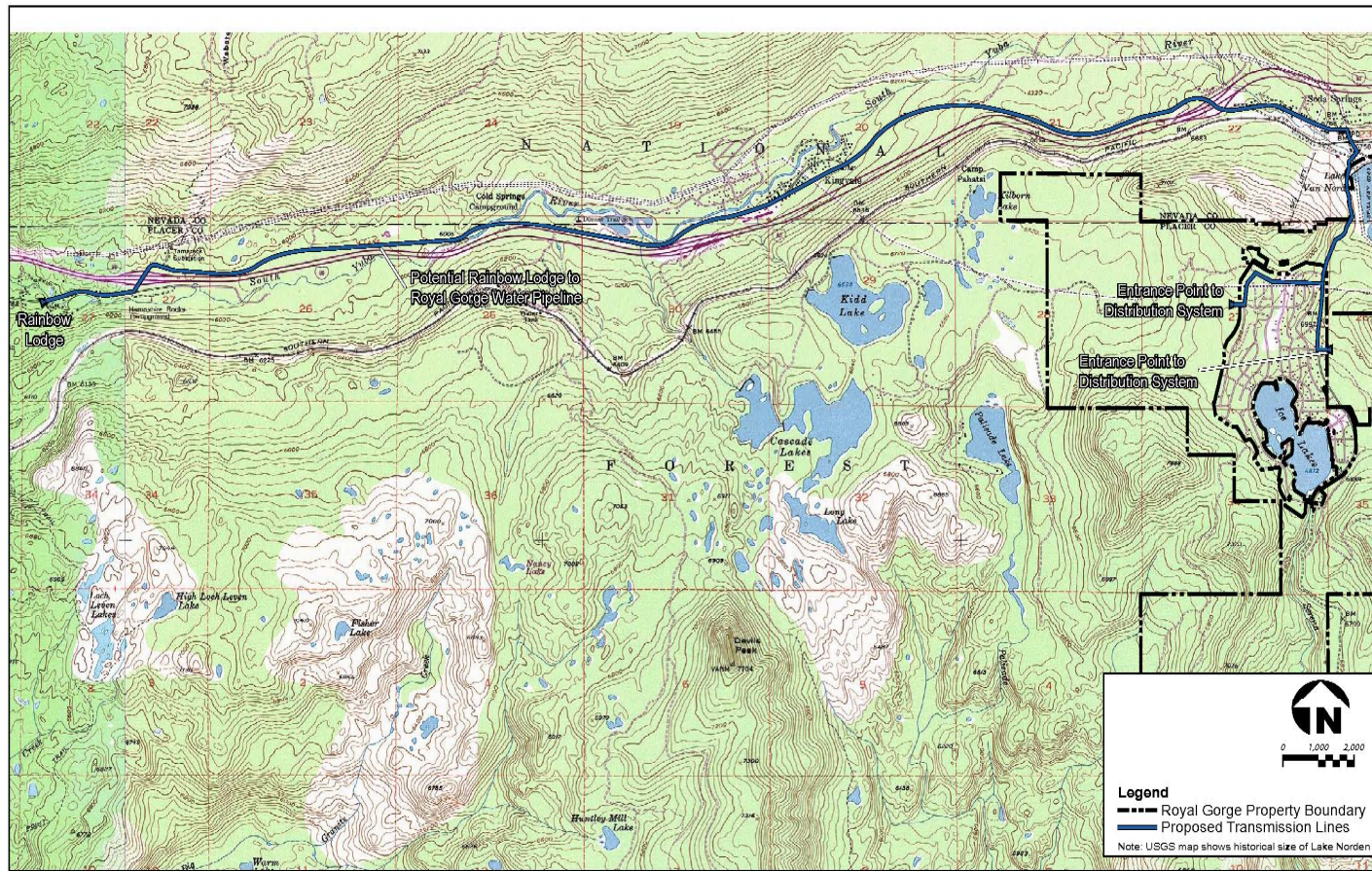


Existing Water Resources

- SLCWD groundwater wells
 - 2 wells
 - Tested in December 2007, produce 85 gpm total (137 AFY or 11 AF per month)
 - Use of 50% yield would provide 5.5 AFM

Existing Water Resources

Rainbow Lodge Wells



CDM

Figure 12
Rainbow Lodge Wells - Alternative Features

- Produce 6 acre-feet per month
- Water piped to Royal Gorge

New storage

- **Serene Lakes raise**

- **Raise lake levels 6” above current spillway creates additional 37 AF of additional storage**
- **Modify dam for seasonal summer storage**

New storage

■ Serene Lakes

– Use of stored water during off-season

- Drawing lakes down an additional 6” would provide 35 AF (2” per month in Oct through Dec)
- Current operations draw lakes down 2’
- A total draw down of 2.5’ is within informal SLCWD guideline and still 4.5’ from the intake
- Water stored in soil (bank storage) would provide lake recharge

New storage

■ East Lake

- New onsite storage reservoir on Royal Gorge property, west of Serene Lakes community
- Total capacity = 85 AF, usable capacity = 40 AF
- Filled in spring with water spilling from Serene Lakes
- Water used in July through December

New Storage

Serena Creek Reservoir

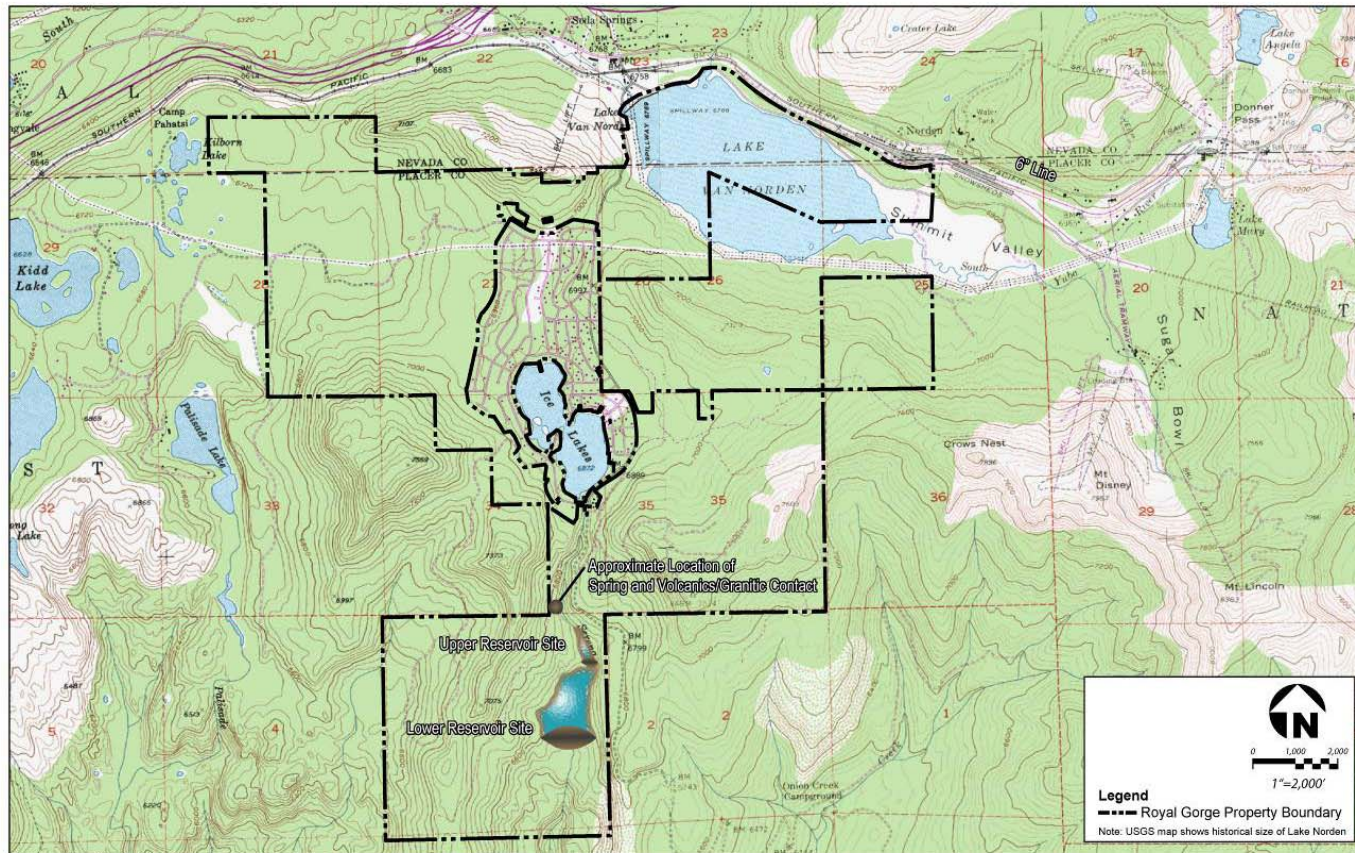


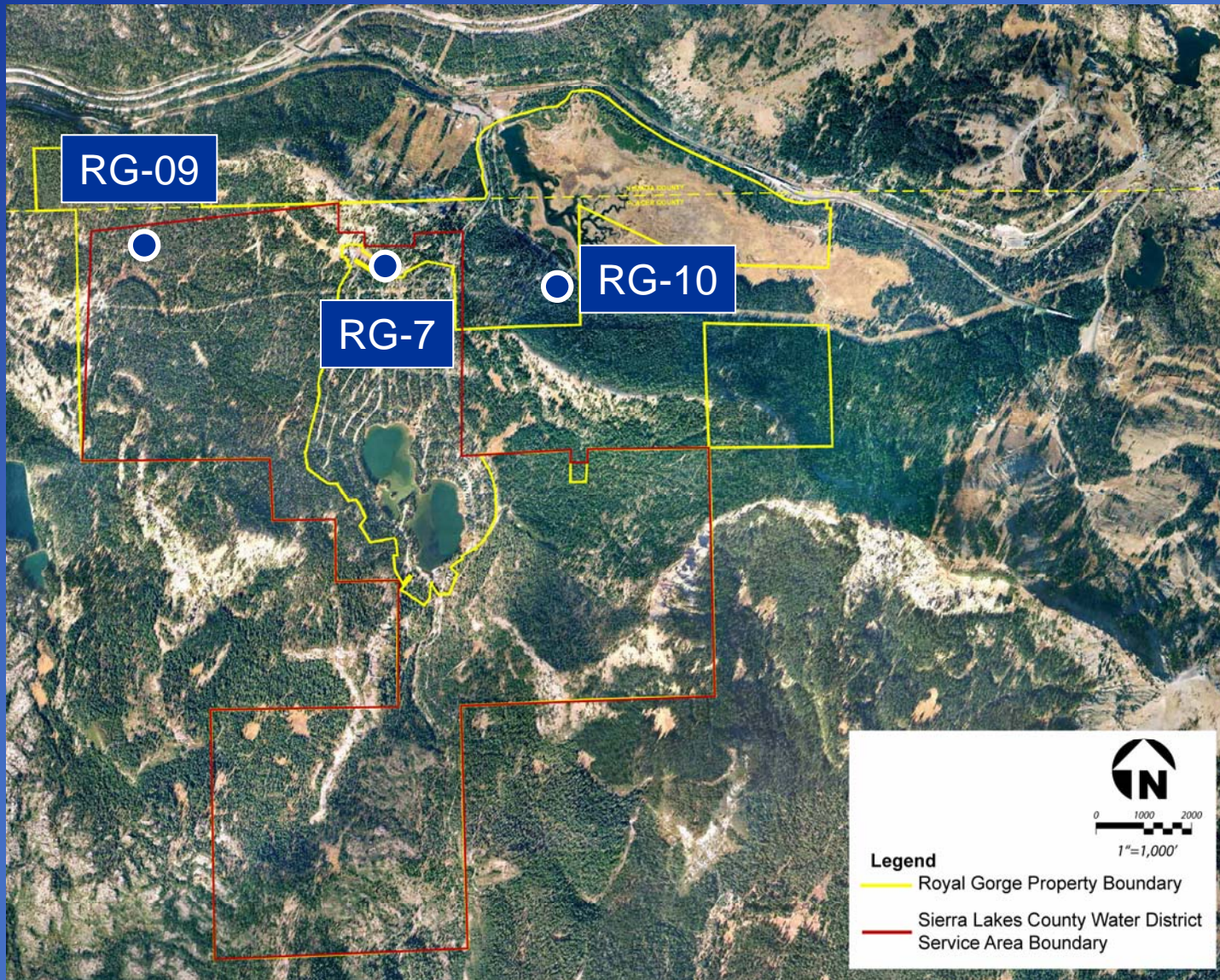
Figure 13
Potential Locations of Onsite Water Storage Reservoir on Serena Creek

- Provides up to 300 AFY
- Viable reservoir location
- Serena Creek is a seasonal stream

Groundwater on Royal Gorge property

- **New Royal Gorge groundwater wells drilled in Fall 2007**
 - Three wells with total pumping rate is 150 gpm (242 AFY)
 - 50% use factor production would be 75 gpm (121 AFY)

Location of Royal Gorge wells



Project Water Demand

■ Water Use Rates

- Residential water use rates from Placer County Water Agency plan for Martis Valley development:
 - 500 gallons per day (gpd) for single family units
 - 300 gpd for condo/town home/employee housing units
- For comparison, SLCWD average household usage rate in 2006 was 137 gpd
- Commercial water use rates from Florida study
 - 1.8 gpd per square foot
 - 250 gpd per restroom stall

Project Water Demand

■ Occupancy Rates

- Royal Gorge expects full-time occupancy to be less than 100% due to seasonal nature of ski complex, vacation homes
- US Census shows 52% of Placer County housing units are vacant
- Northstar residential/commercial development appropriate comparison to Royal Gorge. Placer County approved use of 46% initial occupancy rate increasing to 75%.

Project Water Demand

■ Occupancy Rates

- Royal Gorge evaluated:
 - 46%: Initial occupancy
 - 75%: conservative upper boundary for potential future demand
- These rates affect average annual water demand, not peak day demand

Project Water Demand at 46% Occupancy

Type of Occupancy	Estimated Average Daily Unit Demand (gpd)	Number of Units		Estimated Demand (gpd) 46%	Estimated Demand (AFY) 46%
Single Family Residential	500 gpd/unit	457	units	103,040	115
Condominium, Town Home, Employee Housing Unit	300 gpd/unit	603	units	76,866	86
Headquarters/ Summit Interpretive Center, Old Summit Station	250 gpd/restroom stall	26	stalls	2,990	3
Sales Pavilion, Post Office, Library	250 gpd/restroom stall	10	stalls	1,150	1
Commercial/lodging/amenity placeholder				5,437	6
Restaurants	1.8 gpd/sqft	22,500	sqft	18,630	21
Swimming Pools, Ice Rink, Sports Complex, Wellness Center	250 gpd/restroom stall	48	stalls	5,520	6
Ski Camp restrooms	250 gpd/restroom stall	10	stalls	1,150	1
Lake House				1,380	2
Total Demand				216,163	242

Source: King Engineering, October 17, 2007, "Summary of Domestic Water Demands for Royal Gorge Project", Appendix C.

Project Water Demand at 75% Occupancy

Type of Occupancy	Estimated Average Daily Unit Demand (gpd)	Number of Units		Estimated Demand (gpd) 75%	Estimated Demand (AFY) 75%
Single Family Residential	500 gpd/unit	457	units	168,000	188
Condominium, Town Home, Employee Housing Unit	300 gpd/unit	603	units	125,325	140
Headquarters/ Summit Interpretive Center, Old Summit Station	250 gpd/restroom stall	26	stalls	4,875	5
Sales Pavilion, Post Office, Library	250 gpd/restroom stall	10	stalls	1,875	2
Commercial/lodging/amenity placeholder				8,865	10
Restaurants	1.8 gpd/sqft	22,500	sqft	30,375	34
Swimming Pools, Ice Rink, Sports Complex, Wellness Center	250 gpd/restroom stall	48	stalls	9,000	10
Ski Camp restrooms	250 gpd/restroom stall	10	stalls	1,875	2
Lake House				2,250	3
Total Demand				352,440	395

Source: King Engineering, October 17, 2007, "Summary of Domestic Water Demands for Royal Gorge Project", Appendix C

Summary of Water Supply Alternatives

- Comparison of project water demand and available supplies shows there is more than sufficient supply in the SLCWD service area to serve Royal Gorge
- Report demonstrated one method of meeting project water needs

Potential Supply Alternative – 46% Occupancy

	Acre-Feet												
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Water Demand	22.6	22.2	21.1	19.2	17.8	16.5	23.6	25.2	19.0	15.7	16.6	22.4	242.0
Water Supply Sources													
1st Priority Sources													
New On Site Wells							10.1	10.1	10.1	10.1	10.1	10.1	60.5
Serene Lakes													
Spill Quantity	22.6	22.2	21.1	19.2	17.8	16.5							119.5
East Lake							6.7	6.7	6.7	6.7	6.7	6.7	40.0
SLCWD Wells							7.1	7.1	7.1	7.1	7.1	7.1	42.5
Serene Lakes													
Proposed Lake Level Raise, 6"							12.3	12.3	12.3				37.0
Off-Season Lake Level Decrease, 2" per month										11.7	11.7	11.7	35.0
Subtotal 1st Priority Sources	22.6	22.2	21.1	19.2	17.8	16.5	36.2	36.2	36.2	35.5	35.5	35.5	334.5
2nd Priority Sources													
Existing Wells							5.4	5.4	5.4	5.4	5.4	5.4	32.5
Subtotal 2nd Priority Sources	0.0	0.0	0.0	0.0	0.0	0.0	5.4	5.4	5.4	5.4	5.4	5.4	32.5
3rd Priority Sources													
Serena Creek Reservoir							50.0	50.0	50.0	50.0	50.0	50.0	300.0
Serene Lakes Dredging													
Subtotal 3rd Priority Sources	0.0	0.0	0.0	0.0	0.0	0.0	50.0	50.0	50.0	50.0	50.0	50.0	300.0
Total Sources	22.6	22.2	21.1	19.2	17.8	16.5	91.6	91.6	91.6	90.9	90.9	90.9	667.0

Potential Supply Alternative – 75% Occupancy

	Acre-Feet												
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Water Demand	36.9	36.3	34.4	31.3	29.1	26.9	38.6	41.1	31.0	25.6	27.2	36.5	395.0
Water Supply Sources													
1st Priority Sources													
New On Site Wells							10.1	10.1	10.1	10.1	10.1	10.1	60.5
Serene Lakes													
Spill Quantity	36.9	36.3	34.4	31.3	29.1	26.9							195.0
East Lake							10.0	12.0	4.0	2.0	4.0	8.0	40.0
SLCWD Wells							7.1	7.1	7.1	7.1	7.1	7.1	42.5
Serene Lakes													
Proposed Lake Level Raise, 6"							12.3	12.3	12.3				37.0
Off-Season Lake Level Decrease, 2" per month										11.7	11.7	11.7	35.0
Subtotal 1st Priority Sources	36.9	36.3	34.4	31.3	29.1	26.9	39.5	41.5	33.5	30.8	32.8	36.8	410.0
2nd Priority Sources													
Existing Wells							5.4	5.4	5.4	5.4	5.4	5.4	32.5
Subtotal 2nd Priority Sources	0.0	0.0	0.0	0.0	0.0	0.0	5.4	5.4	5.4	5.4	5.4	5.4	32.5
3rd Priority Sources													
Serena Creek Reservoir							50.0	50.0	50.0	50.0	50.0	50.0	300.0
Serene Lakes Dredging													
Subtotal 3rd Priority Sources	0.0	0.0	0.0	0.0	0.0	0.0	50.0	50.0	50.0	50.0	50.0	50.0	300.0
Total Sources	36.9	36.3	34.4	31.3	29.1	26.9	94.9	96.9	88.9	86.3	88.3	92.3	742.5