

## CHAPTER 1

### Water Supply and Demands

As shown on the preceding page, the Kyle Canyon water system is divided into four major residential subdivisions: Echo View, Cathedral Rock, Old Town and Rainbow. The subdivisions are served by three groundwater wells and three water reservoirs. The system's water rights (permits 62265, 62266, 62267 and 62268) have a total combined duty of 480.895 acre-feet, roughly 156.7 million gallons of water per year. This figure refers to the maximum amount of water the wells are legally entitled to produce each year.

Production Wells:

Kyle Canyon is served by three primary groundwater wells: Echo Well No. 3, Echo Well No. 4 and the Rainbow Well.

Echo Wells No. 3 and 4 are geographically the highest in elevation (approximately 7,800 ft.) and serve as the exclusive water supply for the three highest neighborhoods, Echo View, Cathedral Rock and Old Town, which are located at 7,959 ft, 7,593 ft. and 7,350 ft., respectively. The two wells supply the Echo View Reservoir, which conveys groundwater to the Echo View neighborhood, and gravity feeds water downhill to serve the lower, Cathedral Rock and Old Town subdivisions.

The Rainbow Well serves the Rainbow subdivision, which is geographically the lowest in elevation at approximately 7,237 ft.

As illustrated in the table below, the lower Rainbow subdivision also depends on the Echo wells to meet peak demands; water from the Echo wells is gravity-fed to the lower Rainbow neighborhood. This typically occurs in the summer months when water demands in Rainbow exceed the production capacity of the Rainbow Well. However, due to a 600-ft. + vertical elevation difference between the Rainbow Well and the Echo View neighborhood, flows from the Rainbow Well cannot be transferred uphill to the higher neighborhoods. In 2002, over 23 million gallons of water from the Echo wells supplemented the water supply in the Rainbow subdivision.

The table below illustrates the complex operational capabilities of the three-groundwater wells.

	<b>Echo View</b> Elevation: ~7,800 ft.	<b>Echo View</b> Elevation: ~7,593 ft.	<b>Old Town</b> Elevation: ~7,350 ft.	<b>Rainbow</b> Elevation: ~7,237 ft.
Water Supply	* <i>Echo Well No. 3</i> Echo Well No. 4	* <i>Echo Well No. 3</i> Echo Well No. 4	* <i>Echo Well No. 3</i> Echo Well No. 4	* <i>Rainbow Well</i> Echo Well No. 3 Echo Well No. 4

\* *Primary Water Supply*

A well failure at either of the Echo wells has the potential to seriously stress the water system. The Rainbow well does not have the pumping or lift capacity to deliver water to the higher neighborhoods in the event of a well failure; consequently, while the Echo Wells supplement water needs in Rainbow, high overall system demands can contribute to well failures when water demands exceed the natural recharge rate of the well. It is for this reason that all neighborhoods need to reduce overall water demands on the system, especially during summer months when water use is typically higher.

The table below compares the safe water yield from each of Kyle Canyon’s production wells to the current pumping capacity and projected pumping capacity for 2003. The safe water yield is the ideal maximum production level to maintain effective well operations during normal and drought aquifer conditions.

<b>Production</b>	<b>Echo Well No. 3</b>	<b>Echo Well No. 4</b>	<b>Rainbow Well</b>
Normal Safe Yield	Max 8 hrs. on with 2 hr. recovery  Est. 280-330 gpm.	Max 24 hrs. on with 0 hrs. recovery  Est. 100 gpm.	Max 22 hrs. on with 2 hrs. recovery  Est. 135-145 gpm.
Drought Safe Yield	Max. 2 hrs. on with 8 hrs. recovery  Est. 180 gpm.	Max 20 hrs. on with 4 hrs. recovery  Est. 80-100 gpm.	Max 20 hrs. on with 4 hrs. recovery  Est. 110-115 gpm.
2003 Projected Safe Yield	Max 2 hrs on with 8 hrs. recovery  Est. 180 gpm.	Max 22 hrs on with 2 hrs. recovery  Est. 100 gpm.	Max 22 hrs. on with 2 hrs. recovery  Est. 115-120 gpm.

When community water demands begin to exceed the safe water yield of a well, the potential for well failure increases.

Water Reservoirs:

Kyle Canyon is also served by three water reservoirs: one (1) 100,000-gallon reservoir and one (1) 93,000-gallon reservoir in the Rainbow subdivision, and one (1) 100,000-gallon reservoir in the Echo View subdivision.

Similar to the well operations, elevation and lift capacity prohibit the transfer of water from the lower subdivisions to the Echo View area. Reservoirs will be filled to maximum capacity during summer months, and to the extent possible for safe operations of the system. In the event Echo Well No. 3 or 4 fails, storage is estimated to provide *less* than one full day of emergency water supply to the Echo View, Cathedral Rock and Old Town neighborhoods. This estimate is based on one well (either Echo Well No. 3 or Echo Well No. 4) remaining in production, the community immediately implementing emergency conservation measures and a total curtailment of water flows to the lower Rainbow subdivision. Under this scenario, the Rainbow subdivision would be required to reduce demands to coincide with the production capacity of the Rainbow Well and reservoirs.