

Watermaster's Report

Ground Water District 63-S (Stewart Gulch)

March 1, 2013 to March 1, 2014

Withdrawals

The total withdrawal of low temperature geothermal water in GWD63-S in WY13 was 195.0 mgal (Figure 1). This amount was 18.6 mgal more than the withdrawal in WY12, which is a 10.5% increase (Table 1). Overall, the withdrawal from the Stewart Gulch aquifer system was 581.4 acre feet.

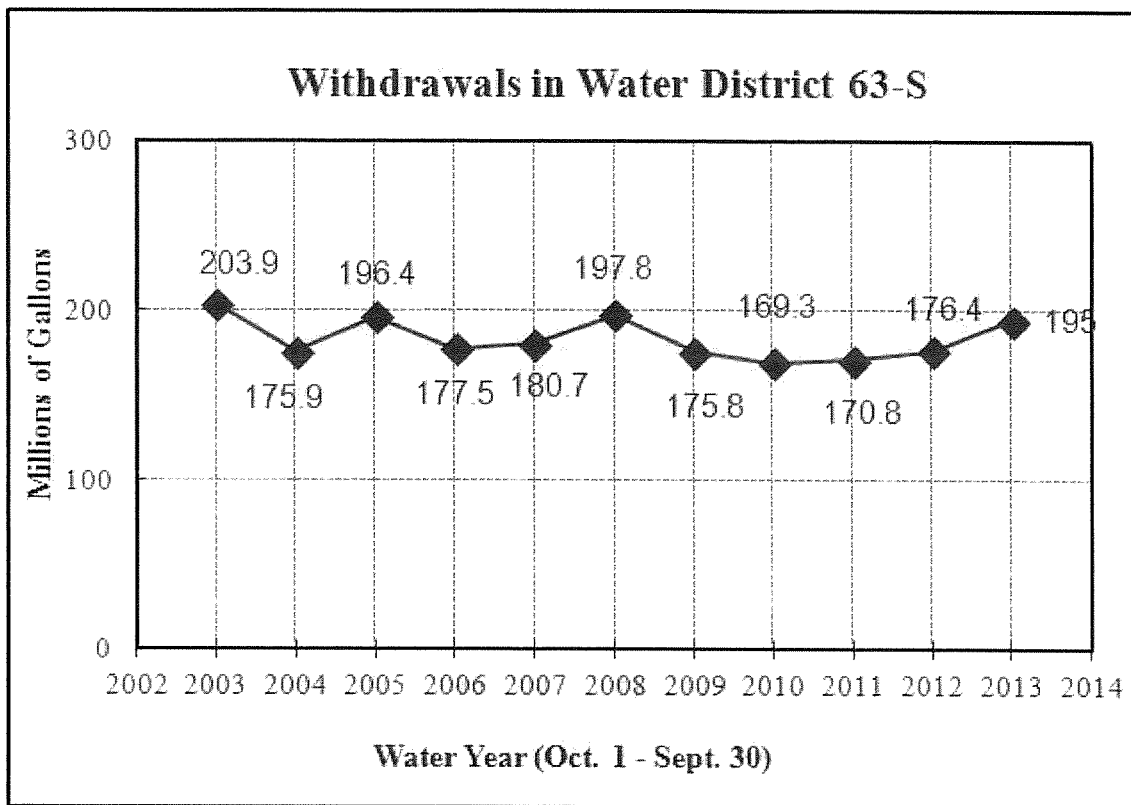


Figure 1. Low-temperature geothermal ground water withdrawals in Ground Water District 63-S for Water Years 2003-2013.

Table 1. Withdrawals¹ from Stewart Gulch Ground Water District 63-S geothermal wells for Water Year 2013 (October 1, 2012 through September 30, 2013).

Well	Withdrawals in WY13 (millions of gallons)	Change from WY12 (millions of gallons)	Percent Change from WY12
TTCI Tiegs (Triangle)	0	0	0
TTCI Silkey (Shed)	8.7	+0.8	+10%
TTCI House (Office)	0.5	+0.2	+60%
Edwards Greenhouse	58.1	-7.4	-11%
Terteling Ranch Windsock	62.1	-4.8	-7%
Terteling Ranch Pool	18.6	-0.6	-3%
Quail Hollow (Tee Ltd) Upper	8.8	+8.8	See Comments ²
Quail Hollow (Nibbler) Lower	32.3	+20.6	+276%
Whitehead	5.9	+0.9	+20%
Total	195.0	+18.6	+11%

¹These numbers contain some degree of uncertainty which is typically associated with measurement equipment and methods. Therefore, the amounts are being reported in millions with one decimal place.

²The withdrawal in WY12 was 71,700 gallons. Calculation of a Percent Change would be so high that it would be misleading to report.

The ownerships and locations of the wells allow them to be grouped into four individual withdrawal centers, which is a useful approach for summarizing the withdrawals in these localized areas within the District. Table 2 shows the four centers and the changes in withdrawals from WY12 to WY13

Table 2. Four withdrawal centers in GWD63-S and changes from WY12 to WY13.

Withdrawal Center	Number of Wells	Numerical change from WY12 to WY13	Percentage change from WY12 to WY13
Edwards Greenhouse	1	-7.4 mgal	-11%
Terteling Garden Center	3 (2 in use; 1 unused)	+1.0 mgal	+12%
Quail Hollow	2	+29.4 mgal	+351%
Terteling Ranch	2	-5.4 mgal	-6%

Water Levels

The reporting of water level monitoring data for the Terteling Company wells changed in WY13 as per an agreement between the water district members at the annual water district meeting in March 2013. The new approach requires the Terteling Company to submit water level monitoring data only for the Tiegs (Triangle) well. The justification for this change is based on years of observations that show the wells throughout GWD63-S have very similar hydrograph patterns related to natural cycles and withdrawal changes within the District. Thus, the four wells that are currently monitored by their owners for

water levels are the Tiegs, Edwards, Quail Hollow Lower, and Quail Hollow Upper. The Silkey well is used as a backup for the Tiegs well in the event that the transducer in the Tiegs wells should fail. Additionally, the Water Master conducts water level measurements at all nine wells listed in Table 1 in March and September.

Overall, ground water levels in GWD63-S wells showed a decreasing trend in WY13.

The Edwards well had a decrease in the maximum water level of 4.6 feet from late June 2012 to late June 2013 (Figure 2). Water levels continued to decline in July and August 2013 primarily because of higher than usual withdrawals at Quail Hollow Golf Course. The lowest water level of the season was recorded on August 21, 2013; the level had fallen 16.2 feet since late June. Water levels recovered about 12 feet by the end of September, remained unchanged until early November, and then began declining in response to the winter demand for heating. The minimum water level for the Edwards wells, which occurs annually in the December – February period, declined 4.6 feet from WY12 to WY13. The minimum water level in WY13 was very similar to the minimum values in Water Years 2007 to 2011, but it appears that it is going to be lower in Water Year 2014 than in previous years based on the readings as of late December 2013.

The Tiegs well had a decrease in the maximum water level of 5.6 feet, based on the late June readings in 2012 and 2013. The water levels dropped 17.5 feet from late June 2013 to mid August 2013 primarily due to Quail Hollow withdrawals. The Tiegs well had a decrease in the minimum water level of 4.9 feet based on the January readings in 2012 and 2013 (Figure 3).

The maximum water levels in the Quail Hollow (QH) wells were both lower in WY13 than in WY12. The QH Lower well declined 2.6 feet and the QH Upper well declined 4.6 feet. These measurements are based on the readings in June or July in 2012 and 2013 (Figures 4 and 5). The minimum levels for the Lower and Upper wells declined 4.1 feet and 4.2 feet, respectively, from January 2012 to January 2013.

The Windsock and Pool wells showed decreases of 0.7 feet and 3.3 feet, respectively, in the maximum water levels in WY13 (Figures 6 and 7). However, these observations are based on a single measurement at each well recorded in April by the Water Master.

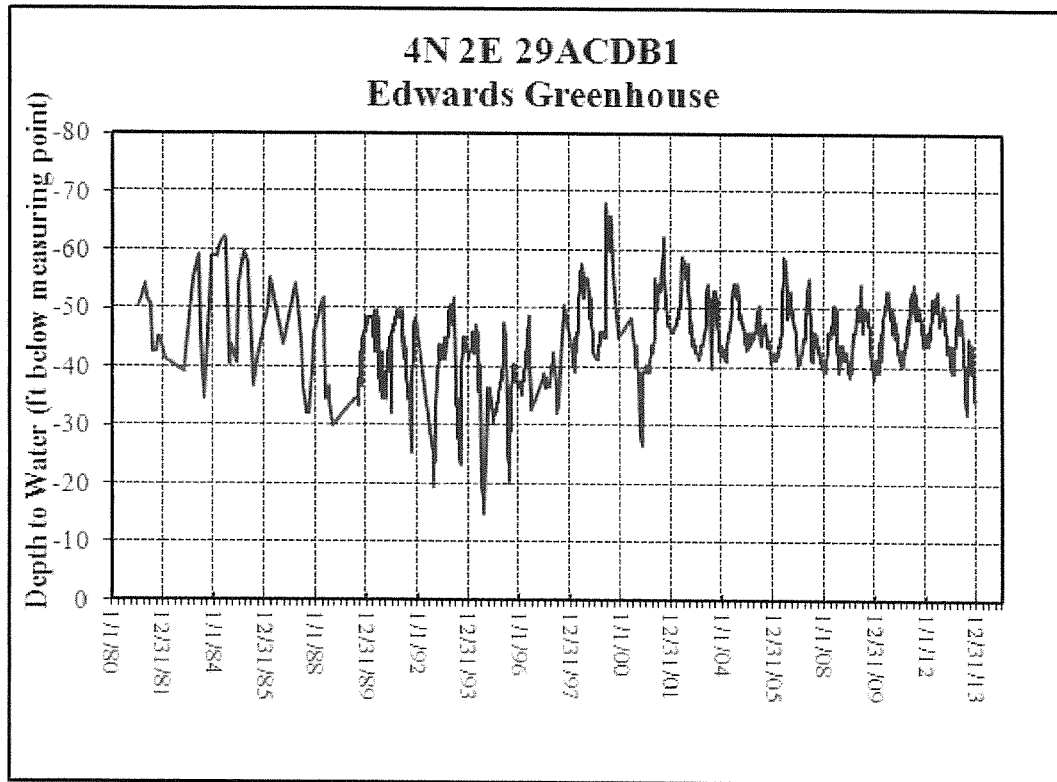


Figure 2. Water level hydrograph for the Edwards Greenhouse well.

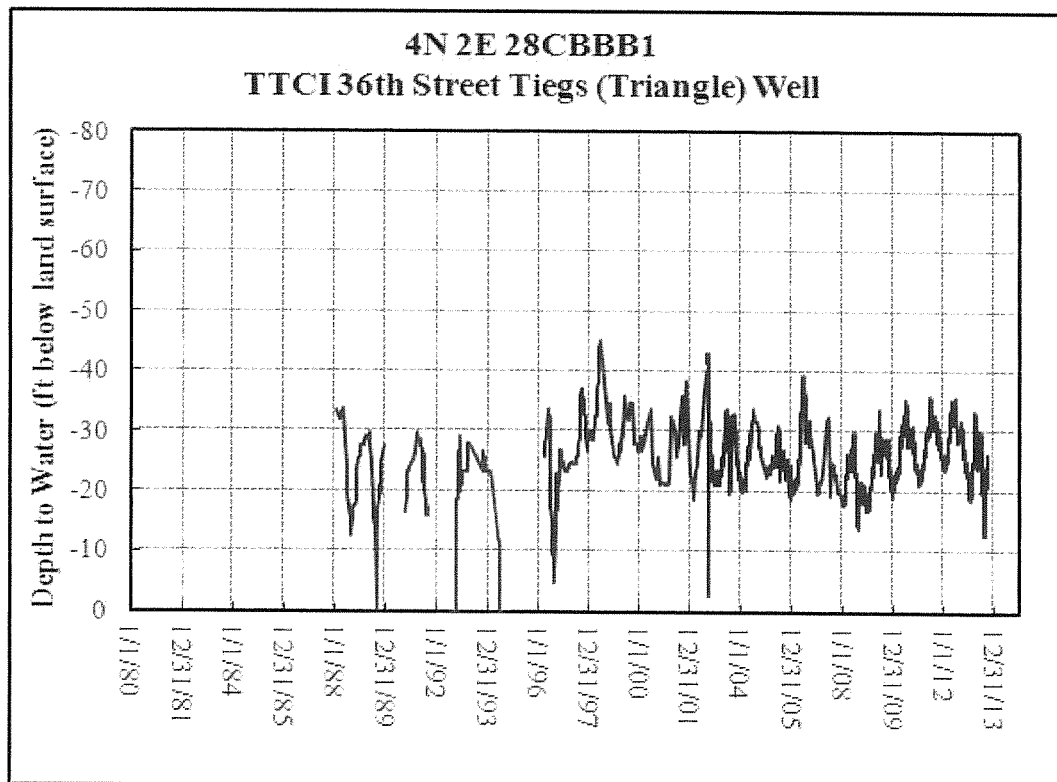


Figure 3. Water level hydrograph for the TTCI 36th Street Tiegs (Triangle) well.

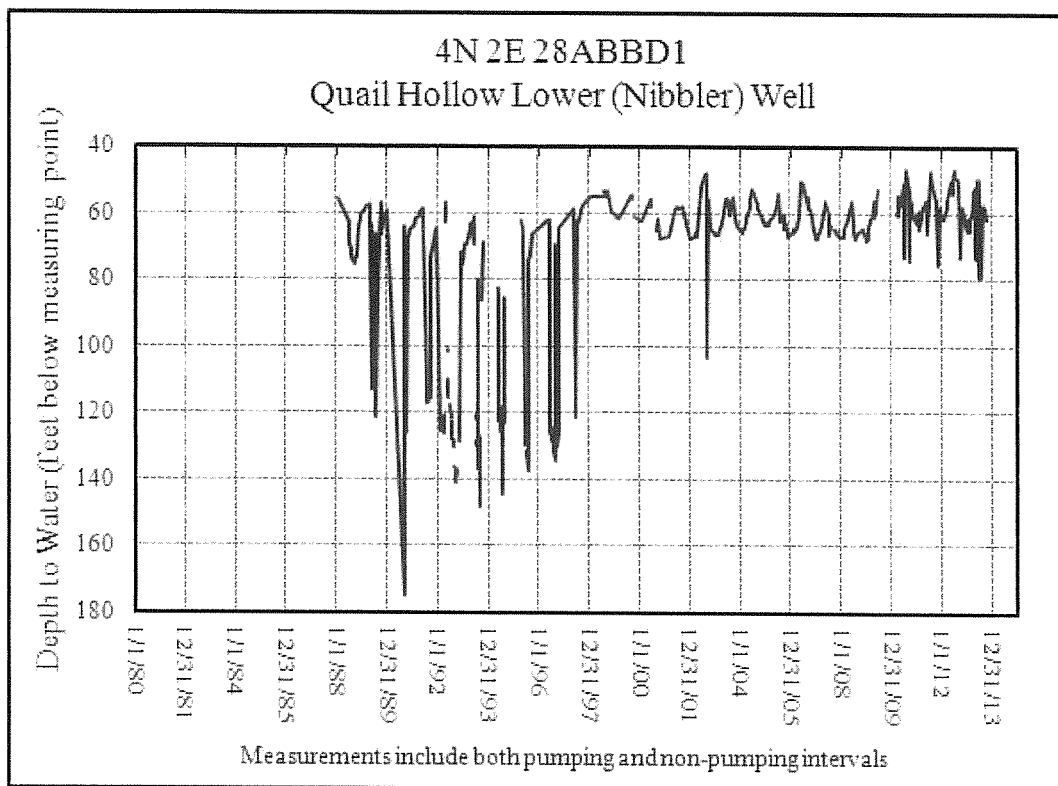


Figure 4. Water level hydrograph for the Quail Hollow Nibbler (Lower) well.

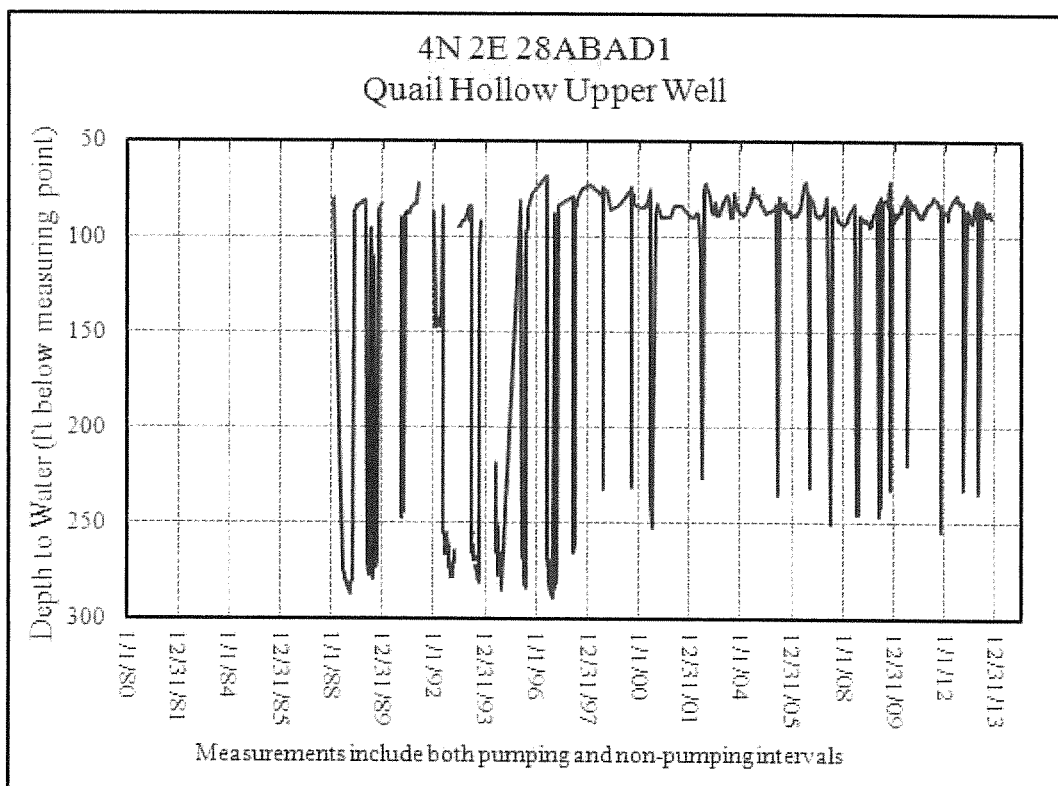


Figure 5. Water level hydrograph for the Quail Hollow Tee Ltd (Upper) well.

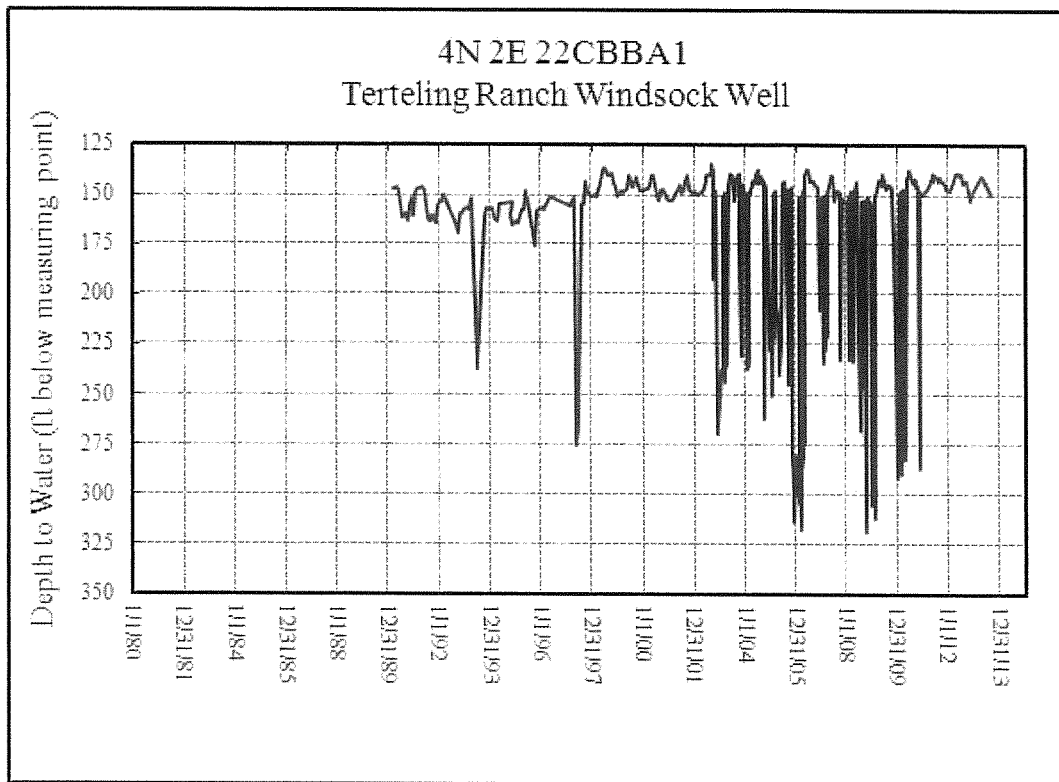


Figure 6. Water level hydrograph for the Terteling Ranch Windsock well.

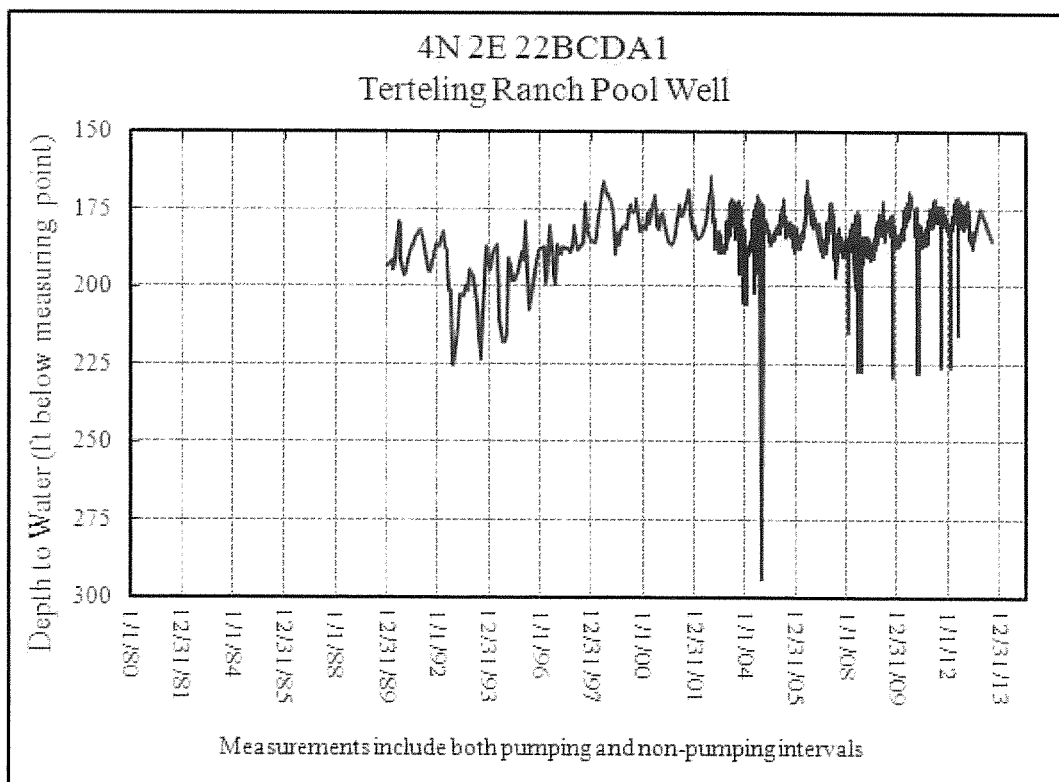


Figure 7. Water level hydrograph for the Terteling Ranch Pool well.

Watermaster Expenses

The Watermaster worked 7 hours in the time period from March 1, 2013 to February 28, 2014. The billing for these services is as follows:

Salary	\$ 196.91
Fringe	\$ 71.02
Supplies	\$ 0.00
Indirect	\$ 112.53

Total \$ 380.46

Table 3 is the assessment for the Watermaster's expenses for Ground Water District 63-S for March 1, 2013 through February 28, 2014

Table 3. Assessment for Watermaster's expenses for Water District 63S for March 1, 2013 through February 28, 2014.

Owner	Name	Percentage ¹	Assessment ²
Terteling Company	Flora Tiegs	0.000	\$0.00
Terteling Company	Flora Silkey	20.723	\$78.84
Terteling Company	Flora House	1.566	\$5.96
Edwards Greenhouses	Edwards	22.864	\$86.99
Terteling Company	Terteling Windsock	36.147	\$137.52
Terteling Company	Terteling Pool	9.714	\$36.96
Quail Hollow Golf Course	Quail Hollow Upper	6.562	\$24.97
Quail Hollow Golf Course	Quail Hollow Lower	2.444	\$9.30
Rose and Mary Ryan	Ryan	-	\$10.00
David Niznik	Whitehead	-	-
	Total	100	\$390.54

¹Percentages as determined at the 2004 Annual Meeting.

²Based on percentages in Column 3 times the Watermaster's Fees for this time period (\$380.46).

Respectfully submitted,

Kenneth Neely

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Watermaster for Ground Water District 63-S