

2017 ANNUAL ICR AND TRR WELL FIELD REPORT

Prepared for

ICR WATER USERS ASSOCIATION

Prepared

By

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PURPOSE OF THE REPORT

This report is one of an annual series of reports for the two well fields dating back to 2013 intended to provide a description of the conditions at each field including pumpage, water levels and yields of individual wells along with the water demand and use of water by the subdivisions served. The report also meets requirement of paragraph 8a, iii of the Settlement Agreement between ICRWUA, Harvard Simon I, LLC, and Talking Rock Land LLC dated July 30, 2013 that ICRWUA keep the latter two parties informed of the status of the TRR well field by providing a report on the annual water demand at Talking Rock and current groundwater levels at the well field.

ICR WATER USERS ASSOCIATION

The ICR Water Users Association (ICRWUA) is a private member owned non-profit water company formed in 1995 that provides water to the Inscription Canyon Ranch, Whispering Canyons, Preserve at the Ranch and Talking Rock subdivisions. The company also provides water to the Talking Rock Golf Course. Water for the first three subdivisions comes from the ICR well field consisting of two wells while water for the Talking Rock subdivision and golf course comes from the Talking Rock Ranch (TRR) well field consisting of three wells. The ICR well field and the three subdivisions it serves constitute the ICR groundwater system whereas the TRR well field and the customers it serves constitute the TRR groundwater system. The two systems are not connected. The company is regulated by the Arizona Corporation Commission.

As of December 2017 ICRWUA provided water to 554 residential customers, an increase of 18 from 2016 and 131 above that served in January 2009, table 1. Of this amount, some 318 residential customers were served in the Inscription Canyon Ranch, Whispering Canyons, and Preserve at the Ranch subdivisions, an increase of 4 customers above 2016 and 43 above 2009. The number of residential customers served at the Talking Rock subdivision in 2017 was 236, an increase of 14 from 2016 and 88 above 2009.

Table 1, Residential Customers Served December 2009 – December 2017

Subdivision	2009	2010	2011	2012	2013	2014	2015	2016	2017
ICR	275	282	273	283	291	303	312	314	318
TRR	148	160	161	169	190	208	216	222	236
Total	423	442	434	452	481	511	528	536	554

At full build-out of the four subdivisions as presently planned, the company will serve about 2,306 residential units.

In addition to providing water to residential customers in the four subdivisions and the Talking Rock Golf Course, ICRWUA also serves several commercial entities located within the Talking Rock and Inscription Canyon Ranch subdivisions while an additional amount of water is also provided to irrigate common areas in all of the subdivisions and for home construction purposes within the subdivisions.

TOTAL WELL FIELD DEMAND: 2009 - 2017

The individual and combined ICR and TRR well field water demand for 2009 through 2017 based on a calendar basis is shown in table 2. Annual demand for the Talking Rock Golf Course for the same years based on monthly billing that, for a given year, runs from mid –December of the previous year to mid-December of the next year is also shown (for instance, for the year 2017 the billing period is mid-December of 2016 through mid-December 2017).

Table 2, Individual and ICR and TRR Well Combined Annual Field Demand, 2009 – 2017, in gallons

Year	ICR	TRR	Combined	Golf Course
2009	29,988,500	108,222,500	138,211,000	93,892,000
2010	24,476,500	116,091,800	140,568,300	107,248,810
2011	25,125,980	106,658,000	131,783,980	102,180,500
2012	27,012,000	104,613,000	131,625,000	94,675,000
2013	26,375,000	107,520,000	133,895,000	96,138,000
2014	27,500,000	107,033,000	134,533,000	90,289,000
2015	25,669,000	94,270,000	119,939,000	81,941,000
2016	28,598,000	103,893,000	132,491,000	84,581,000
2017	29,391,000	111,343,000	140,734,000	88,782,000

The 2017 annual demand at the ICR and TRR well fields respectively was 29,391,000 gallons and 111,343,000 gallons. Combined demand for all uses for 2017 was 140,734,000 gallons, approximately 8.243 million gallons greater than 2016. The 2017 golf course use of 88,782,000 gallons represents slightly less than 80 percent of the total annual pumpage from the TRR well field and 63 percent of the combined pumpage from both well fields.

While the 2017 demand on the ICR well field is about 0.8 million gallons higher than that of 2016 it is still lower than that of 2009 by about 0.6 million gallons despite the increase of 43 residential units from 2009 to 2017 discussed above.

Total demand on the TRR well field increased from 2009 to 2017 by about 3.1 million gallons even though golf course demand decreased by about 5.1 million gallons over the same time period indicating that water demand from the well field in 2017 for other purposes besides the golf course has increased

by about 8.2 million gallons since 2009. This increase would reflect, at least in part, the increase of 88 residential units from 2009 to 2017 discussed above.

2017 RESIDENTIAL, COMMERCIAL, and LANDSCAPE DEMAND

The monthly and annual 2017 water demands for all major users within ICRWUA's service except the Talking Rock Golf Course and construction purposes are shown for the ICR and TRR groundwater systems in tables 3 and 4 respectively. Values shown are based on monthly billing records that date from December 15, 2016 through December 16, 2016 rather than on a calendar basis. Column 2 in tables 3 and 4 shows the monthly residential water demand in gallons; column 3 shows the number of residential units or homes served; column 4 shows the number of residential units served that consumed no water for the month; column 5 and 6 show the monthly demand for commercial and landscape use in gallons respectively; column 7 shows total residential, commercial and landscape demand in gallons for the month; column 8 shows average residential demand including landscape and commercial use in gallons per day per residence (gpd/r) for each month and for the year calculated by dividing total demand in column 7 by the number of residences that actually received water (column 3 minus column 4) during a given month or for the year.

As shown by the tables, monthly demand varies significantly with demand increasing during the drier pre-monsoon part of the year in response to increased residential and common area use of drip irrigation for plants. The increased use in the ICR groundwater system from May through November reflects a greater use of water for drip irrigation for residential landscape compared to the Talking Rock subdivision where the increase is more in response to an increase in irrigation of common areas.

The annual average use in gallons per day per residence in the ICR system including commercial and landscape demand increased from 239 gpd/r in 2016 to 250 gpd/r in 2017. In comparison the annual average use per residence in the TRR subdivision increased from 236 gpd/r to 254 gpd/r over the same time period.

Table 3, 2017 ICR Groundwater System Residential, Landscape, and Commercial Water Demand, in gallons

1 Month	2 Residential Demand	3 Residential Customers	4 Zero Use Residential Customers	5 Commercial Demand	6 Landscape Demand	7 Total Demand	8 Average Residential Use (gpd/r)
Jan	1,155,850	310	10	880	1,110	1,157,840	124
Feb	1,038,987	312	16	1,780	860	1,041,627	126
March	1,139,140	308	15	1,630	4,110	1,144,880	126
April	1,685,410	316	22	4,440	1,800	1,691,650	192
May	2,342,330	316	17	2,690	43,660	2,388,680	258
June	3,276,500	317	9	1,580	25,350	3,303,430	358
July	3,674,700	314	8	2,670	45,360	3,722,730	392
August	2,886,610	312	5	2,170	20,980	2,909,760	306
Sept	2,326,250	311	4	2,030	12,240	2,340,520	254
Oct	3,612,150	311	3	1,810	54,360	3,668,320	384
Nov	2,632,660	312	6	2,020	12,570	2,647,250	288
Dec	1,607,040	318	15	1,160	1,250	1,609,450	171
Total/Ave	27,377,627	313¹	11	24,860	223,650	27,626,137	250¹

¹average annual value.

Table 4, 2017 TRR Groundwater System Residential, Landscape, and Commercial Water Demand, in gallons

1 Month	2 Residential Demand	3 Residential Customers	4 Zero Use Residential Customers	5 Commercial Demand	6 Landscape Demand	7 Total Demand	8 Average Residential Use gpd/r
Jan	581,600	225	20	154,460	1,410	737,470	116
Feb	573,440	226	19	139,380	3,220	716,040	124
March	788,680	223	21	137,450	26,730	952,860	152
April	932,180	226	21	80,790	260,560	1,273,530	207
May	1,047,880	234	37	99,510	337,060	1,484,450	243
June	1,547,000	233	13	162,060	404,220	2,113,280	320
July	1,636,540	233	15	211,310	604,970	2,452,820	363
August	1,356,230	227	11	133,520	547,380	2,037,130	304
Sept	1,306,560	230	6	107,800	565,400	1,979,760	295
Oct	2,226,010	230	15	245,050	647,540	3,118,600	468
Nov	1,489,180	234	11	95,990	351,560	1,936,730	289
Dec	865,340	236	14	71,740	210	937,290	136
Total/Ave	14,350,640	230¹	17	1,639,060	3,750,260	19,739,960	254¹

¹average annual value.

THE ICR WELL FIELD

There are two wells in the Inscription Canyon Ranch (ICR) well field about 47 feet apart; ICR 1 and ICR 2. The latter well is often referred to as Whispering Canyon 1 (WC 1). ICR 1 is the original well constructed by the developer of the Inscription Canyon Ranch subdivision to serve the subdivision as initially planned. Whispering Canyons L.L.C constructed ICR 2 and paid all other cost associated with bringing this well on line. The well field provides water to the Inscription Canyon Ranch (ICR), Whispering Canyon (WC), and Preserve at the Ranch subdivisions.

The wells are located in Section 17, Township 16 North, Range 3 West. They are situated in the Mint Wash floodplain about one-half mile west of Williamson Valley road where the road crosses the wash. Construction of ICR 1 began on June 24, 1994 and was completed on August 5, 1994. Initial use of the well began in the mid-late 1990s. Construction of ICR 2 began March 30, 2002 and was completed April 10, 2002.

The wells are owned by Aqua Meadows and are on land owned by Aqua Meadows. ICRWUA has an agreement dated August 1, 1995 that gives the Association the right to operate and use ICR 1 as a water supply for the ICR and Preserve at the Ranch subdivisions for 100 years subject to renewal every 25 years. The purpose of this agreement is to satisfy the Arizona Department of Water Resources 100 Year Water Adequacy Requirement. An amendment to the agreement (Amendment 1) dated July 24, 2001 adds Whispering Canyon. It is the responsibility of ICRWUA to operate and maintain the two wells and pay all cost associated with operation and maintenance. Per contract with Aqua Meadows, the Association is permitted to withdraw 164,518,498 gallons per year for servicing the ICR, WC, and Preserve at the Ranch subdivisions.

The well field is managed so that ICR 1 is the main source of water. Well 2 serves as a backup well and is used in a manner to preserve its operational efficiency. Only one well is used on a given day and it is in service, on average for about 3 hours or less.

The aquifer tapped by the wells consists of a mixture of unconsolidated sediments consisting of a mixture of clay, silt, sand, and gravel. In places the sediment has been cemented to form a conglomerate. The base of the aquifer is formed by granitic and metamorphic rocks occurring at depth of about 223 ft. at ICR 1 and about 220 ft. at well 2. The pump intake at ICR 1 is 172 below land surface. Depth to the pump intake at ICR 2 is 160 feet.

The altitude of the water table varies naturally in accordance with the seasonal pattern of precipitation. At the time ICR 1 was completed the regional water table was at a depth of about 18 ft. below land surface. At ICR 2, which is slightly higher in elevation than well 1, the initial depth to water was 19 ft.

2017 Monthly Well Demand

Total pumpage at ICR wells 1 and 2 in 2017 was 29,391,000 gallons. Total pumpage at well 1 and well 2 for the year was 22,249,000 gallons and 7,142,000 gallons respectively, table 5. Monthly demand on the well field in 2017 increased from about 1,087,000 gallons in February to a high of 3,851,000 gallons in June when pumpage peaked. Demand slowly decreased from this level falling to about 1,672,000 gallons in December.

Table 5, 2017 ICR Wells 1 and 2 Monthly and Annual Pumpage, in gallons

Month	well 1	well 2	total
January	1,129,000	0	1,129,000
February	0	1,087,000	1,087,000
March	1,382,000	325,000	1,707,000
April	2,411,000	0	2,411,000
May	2,859,000	0	2,859,000
June	3,851,000	0	3,851,000
July	3,475,000	0	3,475,000
August	2,905,000	0	2,905,000
September	1,363,000	1,741,000	3,104,000
October	113,000	2,783,000	2,896,000
November	1,638,000	657,000	2,295,000
December	1,123,000	549,000	1,672,000
Total	22,249,000	7,142,000	29,391,000

2010-2017 Monthly Well Field Demand

The variation in monthly demand at the ICR well field from 2010 through 2017 is shown in table 6. Minimum demand occurs in one of the winter months, December, January, or February, with lowest demand generally occurring in February. The months of June and July are predominantly the months of highest demand although this has also occurred once in August. The difference between maximum and minimum demand for a given year averages about 2.44 million gallons and has been as much as approximately 2.76 million gallons.

Annual demand at the well field over this time period has ranged from a high of 29,391,000 gallons in 2017 to a low of 24,476,500 gallons in 2010. These rates correspond to an average daily pumping rate ranging from 56 gallons per minute (gpm) to 47 gpm compared to the capacity of each of the wells in the well field of approximately 375 gpm.

Table 6, Monthly and Annual ICR Well Field Water Demand, 2010 – 2017, in gallons

Month	2010	2011	2012	2013	2014	2015	2016	2017
Jan	1,250,000	1,237,000	1,161,000	1,418,000	1,485,000	1,433,000	1,243,000	1,129,000
Feb	747,300	1,172,980	1,172,000	1,006,000	1,408,000	1,238,000	1,379,000	1,087,000
March	1,438,200	1,441,000	1,423,000	1,710,000	1,771,000	1,601,000	1,919,000	1,707,000
April	1,862,000	2,088,000	2,036,000	2,480,000	2,440,000	2,299,000	2,349,000	2,411,000
May	2,577,000	2,572,000	2,973,000	3,046,000	3,019,000	2,488,000	2,992,000	2,859,000
June	3,170,000	2,981,000	3,464,000	3,700,000	3,753,000	3,183,000	3,662,000	3,851,000
July	3,295,000	2,889,000	3,274,000	2,985,000	3,270,000	3,013,000	3,872,000	3,475,000
August	2,552,000	3,327,000	2,995,000	2,817,000	2,603,000	2,820,000	3,031,000	2,905,000
Sept	3,050,000	2,674,000	2,727,000	2,172,000	2,305,000	2,636,000	2,769,000	3,104,000
Oct	1,838,000	2,234,000	2,621,000	2,304,000	2,642,000	2,161,000	2,369,000	2,896,000
Nov	1,493,000	1,389,000	1,764,000	1,495,000	1,469,000	1,375,000	1,793,000	2,295,000
Dec	1,204,000	1,121,000	1,402,000	1,242,000	1,335,000	1,422,000	1,220,000	1,672,000
Total	24,476,500	25,125,980	27,012,000	26,375,000	27,500,000	25,669,000	28,598,000	29,391,000

Maximum Daily Demand

Maximum Daily Demand for 2017 occurred on June 24th and equaled 682 gpd/r. Average daily demand for June, the month of highest water use was 403 gpd/r.

The July 2016 pumpage of 3,872,000 gallons exceeds that of all other months over the period of record recorded in table 6. This demand is equivalent to an average daily demand of approximately 124,900 gallons per day (gpd). There were 303 residential units served by the well field during this time and dividing the average daily use by residential units served results in an average daily use of 412 gpd/r. The maximum daily use during July was 185,000 gallons that in turn results in a maximum daily demand of 610 gpd/r.

Well Field Hours of Use and Yield

ICR 1 was used for 972.6 hours during 2017 for an average daily use of about 2.7 hours per day. Maximum use was in June when the well was pumped for 167.7 hours for an average use during the month of about 5.6 hours. ICR 2 was used for 321.5 hours for an average daily use during the year of 0.9 hours. Maximum use was in October when the well was pumped for 123 hours for an average use during the month of about 4.0 hours.

Average monthly yield from ICR 1 ranged from about 373 gpm in January to 386 gpm in March and April. Average yield during the year was 381 gpm.

Average monthly yield from ICR 2 ranged from about 366 gpm to about 379 gpm Average annual yield from ICR 2 was approximately 370 gpm.

Average yields for ICR well 1 and 2 over the last 5 years are shown below, table 7. As shown, the yield from either well has been essentially stable over this time.

Table 7 2013-2017 Average Annual Yields ICR Well Field Yields, in gpm

well	2013	2014	2015	2016	2017
ICR 1	385	385	385	374	381
ICR 2	375	370	375	369	370

Well Field Water Levels

There is a long-term decline in the water level of a pumped well until water in an amount equal to the rate the well is being pumped is diverted to the well from the aquifer’s discharge area or areas. Once this occurs, the long-term decline ceases. For the two ICR wells, this diversion would be expected to take decades if not longer to occur. If water levels fall too far before stabilizing, the wells will cease to be viable. It is important therefore to measure water levels through time in order to monitor the well field’s status. There is also a short term, but significant, decline in the water level at a well that is being pumped intermittently, such as those at the ICR well field. Water levels fall while the well is being pumped and subsequently rise when pumping ceases to an altitude equal to or near that existent before pumping. The latter depths are referred to herein as pumping and non-pumping depths to water respectively.

For practical reasons it is best to maintain the pumping water level in the wells at about two-thirds of the original thickness of the aquifer at each well. This consideration maximizes production relative the decline in the pumping water level in the well and to pumping cost. For both wells, this suggests that the maximum pumping depth to water should be about 152 ft.

Another consideration however is the requirement to maintain the pumping water level in a well above the pump intakes which as stated above, is 172 ft. at ICR 1 and 160 ft at ICR 2.

ICR Well 1

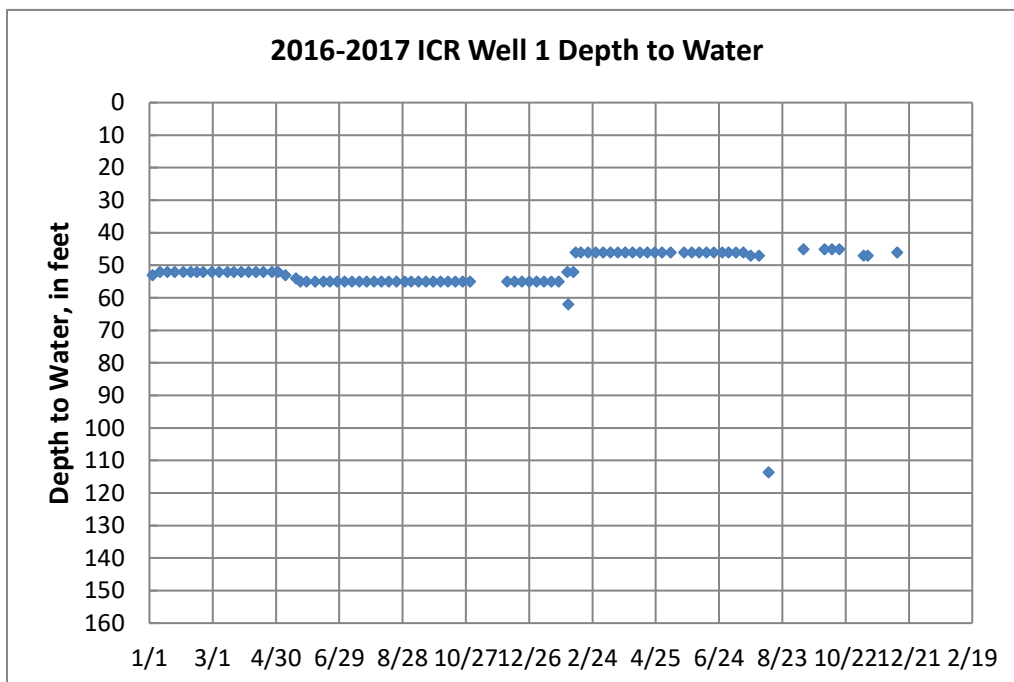
Non-pumping depths to water at ICR 1 in 2017 ranged from 45 to 55 feet below land surface, figure 1. For the most part of the year non-pumping water levels averaged about 46 feet below land surface compared to about 54 feet in 2016 for a difference of approximately 8 feet. The decrease in the well's non- pumping water level from that of 2016 followed a period of substantial precipitation in February 2017 that caused considerable flow in nearby Mint Wash and subsequent increased recharge to the aquifer tapped by the well field.

Pumping at either well in the well field causes a decline in the water level of the other by about 10 feet. This decline can be seen in figure 1 following measurement of the depth to water in ICR 1 on February 1, 2017 while ICR 2 was being pumped.

Because of the short hourly use of the well a pumping water level was recorded only once during 2017 following a one hour test at the well on August 10. At this time the pumping water level was recorded at 113.6 feet below land surface, a depth comparable with previous measurements over the last five years.

Pumping and non-pumping depths and stable well yields are consistent with continued viability of the well.

Figure 1



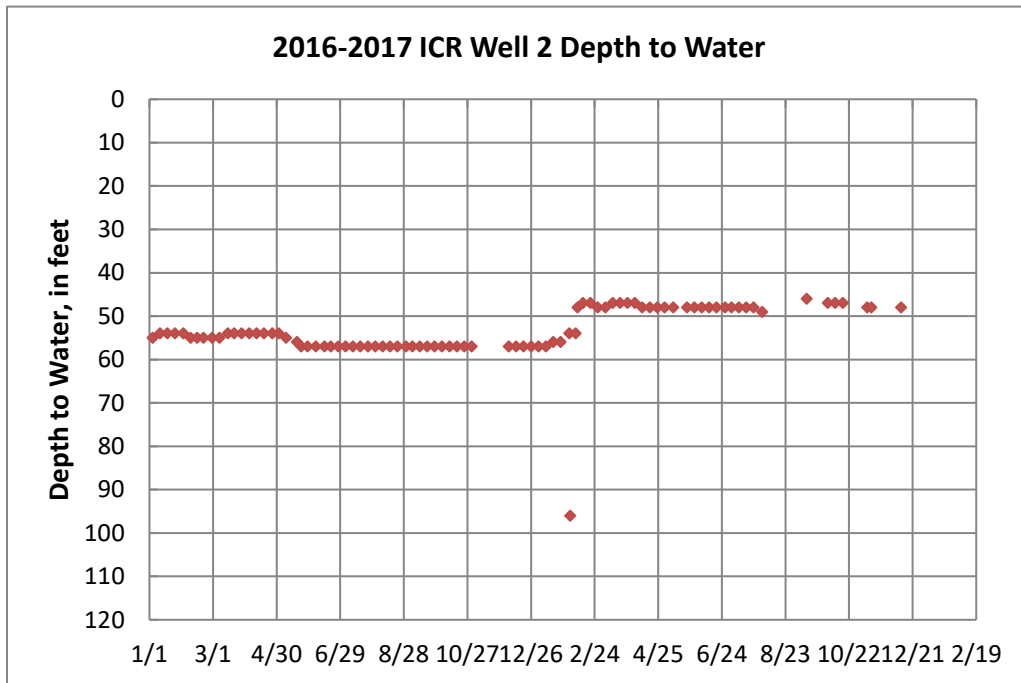
ICR Well 2

Non-pumping depth to water below land surface at ICR 2 in 2017 ranged from 47 to 57 feet, figure 2. For the most part of the year non-pumping water levels averaged about 48 feet below land surface compared to about 56 feet in 2016 for a difference of approximately 8 feet directly comparable to that in well 1.

As at ICR 1 pumping depths were not recorded since the well was not pumping during the daily visits. This depth was 96 feet when measured on February 1.

Pumping and non-pumping depths and stable well yields are consistent with continued viability of the well.

Figure 2



THE TALKING ROCK WELL FIELD

The Talking Rock Ranch (TRR) well field consists of three wells referred to as TRR wells TRR 1, 2, and 3. Construction of TRR 1 began on January 3, 2001 and was completed on February 5, 2001; construction of TRR 2 began on March 27, 2002 and was completed April 20, 2002; construction of TRR 3 began May 13, 2002 and was completed May 15, 2002. The wells are situated along the eastern edge of the Mint Wash floodplain immediately east of Williamson Valley road where the road crosses the wash. The well field services the Talking Rock subdivision and the Talking Rock Golf Course. The well field and the land it is on are owned by the ICR Water Users Association.

The aquifer tapped by the TRR well field consist of medium to coarse sand with small amounts of intermixed gravel and layers of gravel and sand mixed with minor amounts of silt and clay. Interbedded within this material is a layer of basalt that is encountered at depths ranging from 70 ft., 108 ft., and 118 ft. below land surface at wells 1, 2, and 3 respectively. Thickness of the basalt ranges from 41 ft. to 50 ft. Geologic logs of nearby wells indicate that the areal extent of the basalt is limited and does not extend to the ICR Well Field. The base of the aquifer is formed by granitic and metamorphic rocks occurring at depths ranging from about 300 ft. below land surface at well 1, 262 ft. at well 2, and 240 ft. below land surface at well 3.

The regional water table lies in the unconsolidated sands and gravel above the basalt. In the absence of pumping, the altitude of the water table varies naturally in accordance with the seasonal pattern of precipitation. Measured depth to water at completion of drilling for each well was 20 ft., 57 ft., and 23 ft. below land surface at wells 1, 2, and 3 respectively. Wells 1 and 3 are at about the same elevation above sea level whereas well 2 is about 10 ft. higher. Subsequent non-pumping measurements at the well field have shown that depth to water at well 2 is about 8-10 ft. greater than that at wells 1 and 3. This difference is consistent with the difference in elevation of well 2 compared to wells 1 and 3. This suggests that the initial water level measurement at well 2 was not representative of non-pumping conditions at the well field.

The pumping capacity at all three wells has been downsized from that originally installed due to initial overly optimistic estimates of the long-term yield of each well that resulted in unacceptable decline in water levels and air entrainment at all three wells. The pump at well 3 was downsized from 430 gpm to about 260 gpm in 2003 after which the well has been highly reliable. The pump at well 2 was downsized from about 530 gpm to a pump capacity of about 285 gpm in 2009. Due to an electrical problem the pump at well 2 failed in June 2013 and was replaced in July of that year. The capacity of the new pump ranges from about 275 to 290 gpm. The pump at well 1 was downsized in February 2012 and reliably yields about 330 gpm.

The well field is managed so that the wells are called up sequentially as demand increases. As a result on a given day, only one well is initially in service until demand requires an additional well. In general any two wells can meet daily demand except during the hottest and driest part of the year when the water demand for the Talking Rock Golf Course and irrigation of common areas is at its greatest. The general practice is to use either well 1 or 2 as the initial well on call followed by well 3.

2017 Monthly Well Field Demand

Total pumpage at wells 1, 2, and 3 for 2017 were 21,402,000 gallons, 54,569,000 gallons, and 35,372,000 gallons respectively, table 8. Total demand for the year equaled 111,343,000 gallons. Monthly demand on the well field in 2017 increased from about 745,000 gallons in January to about 4,329,000 gallons in March, 9,736,000 gallons in April, and 16,314,000 gallons in June when pumpage peaked. Demand slowly decreased from this level falling to about 4,690,000 gallons in December, table 8.

As discussed above, the TRR well field is generally operated with only two wells pumping during a given day. As also discussed above, either well 1 or well 2 serves as the primary well on call while well 3 is the second well to be called on to provide additional water if required. The remaining well (well 1 or 2) comes on line during periods when the primary well and well 3 cannot meet the immediate demand while maintaining the desired water level in the storage tanks.

The above pattern of use was not followed from January through March in 2017 in order to examine the impact on water levels (discussed below) with well 1 serving as the primary well and well 2 as the second well on call rather than well 3. Well 1 served as the primary well on call from January through March and again from November through December. Well 2 served as the primary well on call from April through October. With the exception of January through March, Well 3 served as the second well on call.

Table 8, 2017 TRR Wells 1, 2, and 3 Monthly and Annual Pumpage, in gallons

Month	Well 1	Well 2	Well 3	Total
January	709,000	36,000	0	745,000
February	683,000	50,000	0	733,000
March	3,985,000	339,000	5,000	4,329,000
April	1,557,000	5,271,000	2,908,000	9,736,000
May	49,000	9,271,000	5,539,000	14,859,000
June	146,000	9,913,000	6,255,000	16,314,000
July	154,000	7,664,000	4,806,000	12,624,000
August	519,000	7,255,000	4,489,000	12,263,000
September	267,000	8,266,000	4,911,000	13,444,000
October	2,449,000	6,504,000	3,915,000	12,868,000
November	6,941,000	0	1,797,000	8,738,000
December	3,943,000	0	747,000	4,690,000
Total	21,402,000	54,569,000	35,372,000	111,343,000

2010-2017 Monthly Well Field Demand

The variation in monthly demand at the TRR well field for 2010 through 2017 is shown in table 9. Minimum demand occurs in one of the winter months, December, January, or February. The months of June and July are predominantly the months of highest demand although this has also occurred in May. The difference between maximum and minimum demand for a given year averages about 13.8 million gallons and has been as much as 16.98 million gallons. The high difference between the maximum and minimum demand compared to the ICR well field reflects the summer demand of the Talking Rock Golf Course and the irrigation requirements of common areas.

Annual demand at the well field over the 2010-2017 time period has ranged from a high of 116,091,180 gallons in 2010 to a low of 94,270,000 gallons in 2015. These rates correspond to an average daily pumping rate ranging from about 220 gpm to 180 gpm compared to the capacity of TRR wells 1, 2, and 3 equal to 325 gpm, 257 gpm, and 225 gpm respectively.

Table 9, 2009-2016 Monthly and Annual TRR Well Field Demand, in gallons

Month	2010	2011	2,012	2013	2014	2015	2016	2017
Jan	2,691,500	4,263,000	3,499,000	6,554,000	6,041,000	2,176,000	951,000	745,000
Feb	5,747,700	805,000	3,750,000	1,130,000	4,805,000	3,078,000	2,668,000	733,000
March	7,192,600	4,708,000	5,363,000	6,648,000	8,162,000	4,349,000	7,804,000	4,329,000
April	13,290,000	10,180,000	9,641,000	12,076,000	12,214,000	12,537,000	10,098,000	9,736,000
May	14,925,000	11,283,000	12,560,000	14,674,000	14,255,000	11,789,000	11,894,000	14,859,000
June	11,287,000	16,018,000	14,342,000	15,433,000	15,584,000	13,142,000	17,698,000	16,314,000
July	14,144,000	14,087,000	17,613,000	10,726,000	13,072,000	11,093,000	17,930,000	12,624,000
August	9,511,000	15,325,000	11,203,000	12,199,000	6,243,000	10,572,000	7,920,000	12,263,000
Sept	13,306,000	12,985,000	7,540,000	7,447,000	7,133,000	8,922,000	8,454,000	13,444,000
Oct	10,756,000	7,266,000	6,860,000	10,927,000	7,138,000	10,264,000	10,281,000	12,868,000
Nov	7,612,000	6,734,000	7,525,000	6,679,000	6,809,000	4,513,000	5,736,000	8,738,000
Dec	5,629,000	3,004,000	4,717,000	3,027,000	5,577,000	1,835,000	2,459,000	4,690,000
Total	116,091,800	106,658,000	104,613,000	107,520,000	107,033,000	94,270,000	103,893,000	111,343,000

Maximum Daily Demand

As at the ICR well field, the maximum monthly demand at the TRR well field in 2017 was in June and equaled 16,314,000 gallons. This demand represents an average daily demand on the well field during that month of 378 gpm compared to 402 gpm in July 2016 that is the greatest average daily demand for a given month during the 2010-2017 period of record. Because of the overriding demand of the TRR Golf Course compared to all other demands at the TRR well field it is not possible to calculate a value for residential water use based on this value alone. The maximum daily use during July was 681,000 gallons that in turn results in a maximum daily demand at the well field of 473 gpm.

2010-2017 Golf Course Demand

The major demand on the TRR well field historically and for the foreseeable future is the Talking Rock Golf Course. Monthly and annual golf course demand for the years 2010 through 2017 based on monthly billing records that, as discussed above are not calendar based, are shown in table 10. As shown, demand has ranged from a high of 107,248,000 gallons in 2010 to a low of 81,941,000 gallons in 2015. As shown, golf course demand in 2017 was 88,782,000 gallons.

Table 10, Golf Course Demand 2009 – 2017, in gallons

Month	2010	2011	2012	2013	2014	2015	2016	2017
Jan	0	4,312,700	0	4,929,000	2,688,000	3,723,000	16,000	48,000
Feb	5,616,200	482,200	0	3,556,000	4,699,000	1,898,000	642,000	0
March	4,837,400	1,486,700	8,189,200	2,003,000	5,357,000	1,105,000	4,088,000	0
April	10,869,400	7,055,200	8,257,100	9,493,000	9,807,000	9,365,000	7,945,000	5,535,000
May	15,396,500	10,554,300	9,960,800	12,514,000	11,308,000	10,529,000	9,773,000	12,222,000
June	10,334,000	12,351,600	12,326,900	11,811,000	14,345,000	10,455,000	12,109,000	13,277,000
July	10,606,200	13,912,700	15,509,500	15,103,000	12,191,000	10,151,000	14,701,000	14,563,000
Aug	12,770,700	13,736,300	14,468,400	8,278,000	8,589,000	8,758,000	11,648,000	5,755,000
Sept	9,405,600	14,799,800	7,081,600	7,893,000	4,436,000	8,191,000	5,124,000	11,748,000
Oct	12,503,400	8,676,700	5,770,200	7,585,000	5,084,000	8,338,000	7,407,000	10,860,000
Nov	9,478,800	6,623,100	7,105,500	8,211,000	6,816,000	7,090,000	8,243,000	9,566,000
Dec	5,428,600	8,189,200	6,005,800	4,762,000	4,969,000	2,338,000	2,885,000	5,208,000
Total	107,248,810	102,180,500	94,675,000	96,138,000	90,289,000	81,941,000	84,581,000	88,782,000

Well Field Hours of Use and Yield

TRR 2 was the major well used during the year being on line for a total of 3,518 hours equivalent to an average daily use of approximately 9.64 hours. Production from the well ranged from low of 255 gpm during September following several months of heavy demand to 269 gpm in February when conditions were reversed. Average production from the well was 259 gpm. Total production from the well as shown in table 8 was 54,569,000 gallons.

TRR 3 was used a total of 2,607 hours during the year for an average daily use of 7.14 hours per day. Yield varied from 223 gpm in July, August, and September to 233 gpm in October and averaged 226 gpm. Total production from the well was 35,372,000, table 8.

TRR 1 was used for only 1,074 hours for an average use of 2.94 hours per day. Yield varied from 321 gpm in July to 341 gpm in February and averaged 332 gpm. Total production from the well was 21,402,000 gallons, table 8.

Table 11 shows average yields for TRR wells 1 and 3 over the last 5 years and the average yield of well 2 over the last 4 years. The pump in TRR well 2 was changed in 2013 due to an electrical problem negating the ability to calculate an average value for 2013. As shown, the individual yield from the wells has been essentially stable over this time.

Table 11 2013-2017 Average Annual TRR Well Field Yields, in gpm

Well	2013	2014	2015	2016	2017
TRR 1	330	330	332	325	332
TRR 2		268	262	257	259
TRR 3	228	225	224	225	226

Well Field Water Levels

As discussed above, there is a short term, but significant, decline in the water level at a well that is being pumped intermittently, such as those at the ICR and TRR well fields. Water levels fall while the well is being pumped and subsequently rise when pumping ceases to an altitude equal to or near that existent before pumping. The latter depths are referred to herein as pumping and non-pumping depths to water respectively. Because one or more of the wells at the TRR well field is often being pumped, it is uncommon to actually measure a non-pumping or pumping water level at a given well that its water level is not influenced by pumpage from one or two of the other wells. As a result, non-pumping water levels for the TRR wells only represent non-pumping at the well being discussed.

As also discussed above, the pumping water level in the wells should be limited to about two-thirds of the original thickness of the aquifer to maximize production relative to pumping cost. Under this consideration, the maximum depth to water at well 1 should be about 185 ft. For well 2 the maximum depth should be about 155 ft. and about 145 ft. at well 3. An additional consideration however, is that in order to limit problems with air entrainment at wells 1 and 2, the pumping level in well 1 should not be more than about 165 ft. below land surface and the pumping water level in well 2 should be no more than about 155 ft. below land surface.

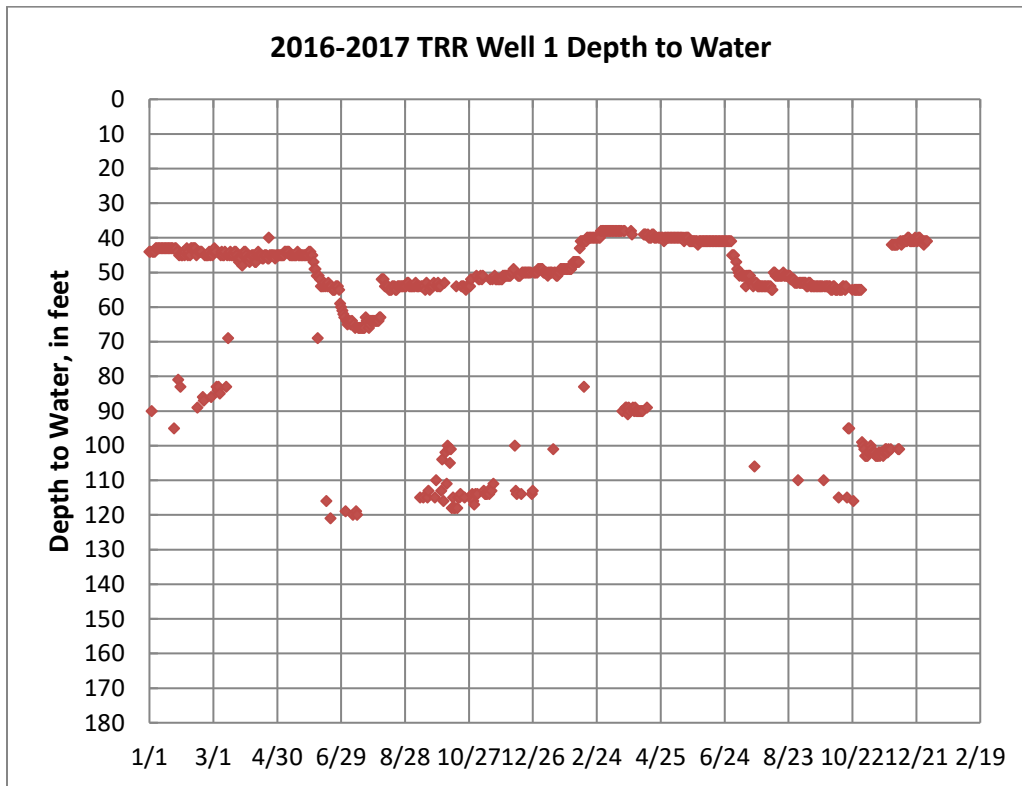
The pump intakes at TRR wells 1 and 2 are set at approximately 262 ft. below land surface. Maintaining a pumping level of 165 ft. or less at well 1, although not maximizing production relative to pumping cost, assures at least 97 ft. of water above the pump intakes. Maintaining a pumping level of 155 ft. or less at well 2 assures at least 107 ft. of water above the intakes and also meets the two-thirds rule. The pump intake at well 3 is set at approximately 230 ft. below land surface. Maintaining a pumping level of 145 ft. assures at least 85 ft. of water above the intakes.

TRR Well 1

Non-pumping depths to water at TRR well 1 in 2017 ranged from 38 to 54 feet below land surface, figure 3. The deeper non-pumping depths occurred during July through October when pumpage from TRR wells 2 and 3 was at its maximum. As shown on figure 3, non-pumping depths for 2016 ranged from about 43 to 54 feet. Depth to water between 54 to 70 feet represents pumping from TRR well 2 and/or TRR well 3.

Pumping depths at TRR well 1 ranged from about 70 feet to 115 feet depending on the time of year and the presence or lack thereof of pumpage from the other wells. This range is consistent with that of 2016 although pumping depths for October and November of 2017 are approximately 10 feet less than those for the same time period in 2016.

Figure 3



2017 pumping water levels at the well are considerably above 165 feet below land surface required to preclude air entrapment. As stated above, the base of the aquifer is at 300 feet below land surface while the intakes for the pump are at a depth of 262 feet, so that at its deepest point during the year, pumping water levels were about 147 feet above the intakes and 185 feet above the base of the aquifer.

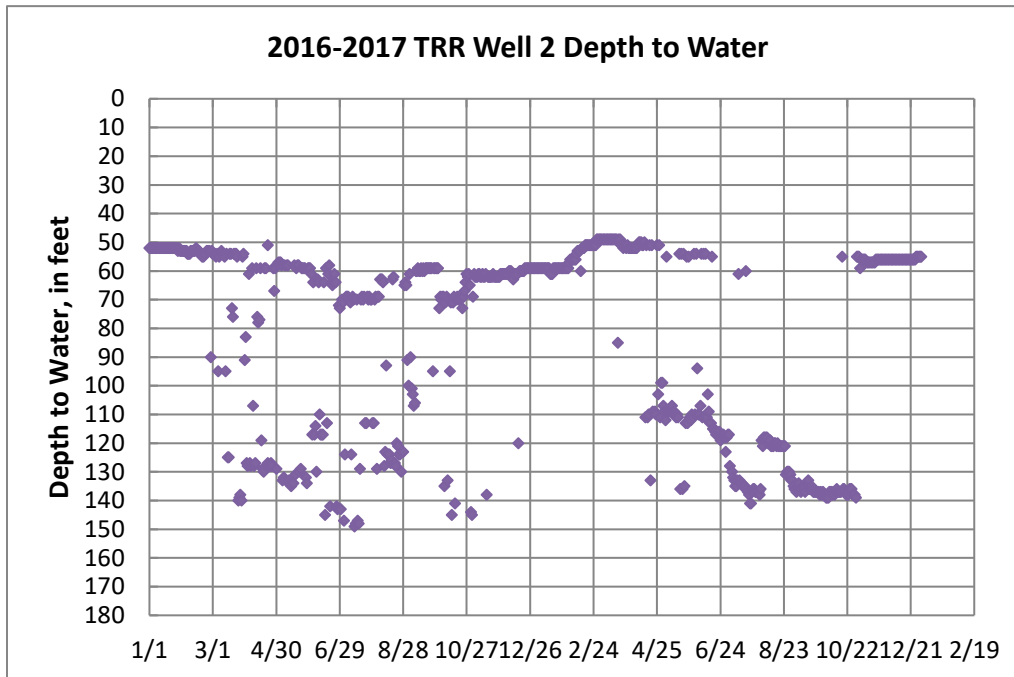
Pumping and non-pumping depths and stable well yields are consistent with continued viability of the well.

TRR Well 2

Non-pumping depths to water at TRR well 2 in 2017 ranged from 49 to 59 feet below land surface, figure 4. As shown in figure 4, non-pumping depths for 2016 ranged from about 52 to 64 feet. Depth to water ranging from about 64 to 90 feet represents pumping from TRR well 3 and/or TRR well 4.

Pumping depths for 2017 ranged from about 90 to 137 below land surface depending on the time of year and the presence or lack thereof of pumpage from the other wells compared to about 110 feet to 150 feet in 2016.

Figure 4



2017 water levels at the well are above 155 feet below land surface that is required to preclude air entrapment. As stated above, the base of the aquifer at the well is 262 feet below land surface while the intakes for the pump are also at this depth so that at its deepest point during the year, the pumping water level was about 125 feet above pump intakes and the base of the aquifer.

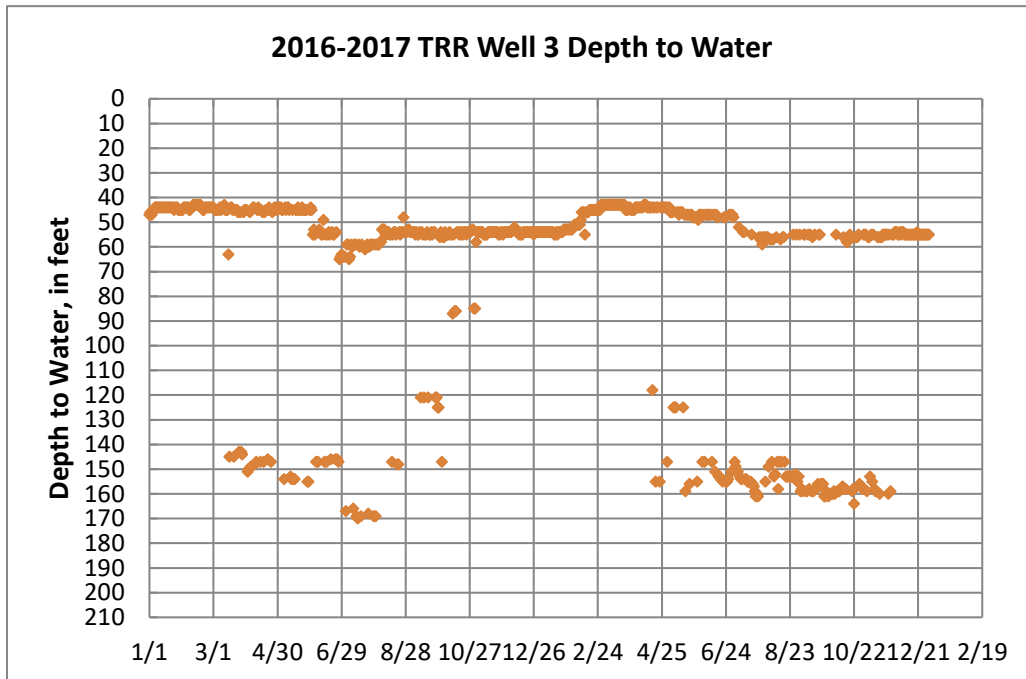
Pumping and non-pumping depths and stable well yields are consistent with continued viability of the well.

TRR Well 3

Non-pumping depths to water at TRR well 3 in 2017 ranged from 43 to 57 feet below land surface, figure 5. As shown on figure 5, non-pumping depths for 2016 ranged from about 43 to 65 feet. Depth to water ranging from about 65 to 90 feet represents pumping from TRR well 3 and/or TRR well 4.

Pumping depths for 2017 ranged from about 118 to 164 below land surface depending on the time of year and the presence or lack thereof of pumpage from the other wells compared to about 121 feet to 167 feet in 2016.

Figure 5



At their deepest point water levels in 2017 water levels were 66 feet above the pump intake and 76 feet above the base of the aquifer (240 feet below land surface).

Pumping and non-pumping depths and stable well yields are consistent with continued viability of the well.

SUMMARY

The ICR Water Users Association (ICRWUA) is a private non-profit water company that provides water to the Inscription Canyon Ranch, Whispering Canyons, Preserve at the Ranch and Talking Rock subdivisions. The company also provides water to the Talking Rock Golf Course. Water for the first three subdivisions comes from the ICR well field while water for the Talking Rock subdivision and golf course comes from the TRR well field.

The 2017 annual demand at the ICR and TRR well fields respectively was 29,391,000 gallons and 111,343,000 gallons. Combined demand for all uses for 2017 was 140,734,000 gallons, approximately 8.2412.55 million gallons greater than 2016. The 2017 golf course use of 88,782,000 gallons represents slightly less than 80 percent of the total annual pumpage from the TRR well field and 63 percent of the combined pumpage from both well fields. Average 2017 residential demand per residence including landscape and commercial use was 250 gallons per day compared to 239 gallons per day in 2016 for the subdivisions served by the ICR well field. Average 2017 residential demand per residence including landscape and commercial use was 254 gallons per day compared to 236 gallons per day in 2016 for the TRR subdivision served by the TRR well field.

The maximum 2017 monthly demand at both well fields occurred in June. Pumpage at the ICR Well Field equaled 3,851,000 gallons while that at the TRR Well Field equaled 16,314,000 gallons. These values are below the maximum monthly value recorded in 2016 for both well fields. The maximum daily residential demand during this month for the ICR system including other uses was 682 gpd/r. Because of the overriding demand of the golf course on the TRR well field it is not possible to calculate a maximum daily residential demand for the TRR system, but in terms of pumpage alone, the maximum daily demand at the TRR Well Field was 473 gpm.

There are two wells in the Inscription Canyon Ranch (ICR) well field about 47 feet apart; ICR 1 and ICR 2. The ICR well field is operated with only one well pumping during a given day with ICR 2 serving as a back-up well to ICR 1. ICR 1 was used for 972.6 hours during 2017 for an average daily use of about 2.7 hours per day. Maximum use was in June when the well was pumped for 167.7 hours for an average use during the month of about 5.6 hours. Average yield from ICR 1 ranged from about 373 gallons per minute (gpm) in January to 386 gpm in March and April. Average yield during the year was 381 gpm. Total production from the well for 2017 was 22,249,000 gallons.

ICR 2 was used for 321.5 hours during 2017 for an average daily use of about 0.9 hours. Maximum use was in October when the well was pumped for 123 hours for an average use during the month of about 4.0 hours. Average monthly yield from ICR 2 ranged from about 366 gpm to about 379 gpm. Average annual yield from ICR 2 was approximately 370 gpm. Total production from the well for 2016 was 7,142,000 gallons.

Average yields for ICR well 1 and 2 over the last 5 years have been essentially stable. This fact, when combined with pumping and non-pumping depths to water in both wells, is consistent with continued viability of the wells.

The Talking Rock Ranch (TRR) well field consists of three wells referred to as TRR 1, 2, and 3. The well field is managed so that the wells are called up sequentially as demand increases. As a result on a given day, only one well is initially in service until demand requires an additional well. In general any two wells can meet daily demand except during the hottest and driest part of the year when the water demand for the Talking Rock Golf Course is at its greatest. The general practice is to use either well 1 or 2 as the initial well on call followed by well 3.

TRR 2 was the major well used during the year being on line for a total of 3,518 hours equivalent to an average daily use of approximately 9.64 hours. Production from the well ranged from low of 255 gpm during September following several months of heavy demand to 269 gpm in February when conditions were reversed. Average production from the well was 259 gpm. Total production from the well as shown in table 8 was 54,569,000 gallons.

TRR 3 was used a total of 2,607 hours during the year for an average daily use of 7.14 hours per day. Yield varied from 223 gpm in July, August, and September to 233 gpm in October and averaged 226 gpm. Total production from the well was 35,372,000.

TRR 1 was used for only 1,074 hours for an average use of 2.94 hours per day. Yield varied from 321 gpm in July to 341 gpm in February and averaged 332 gpm. Total production from the well was 21,402,000 gallons, table 8.

As at the ICR well field, average yields for TRR wells 1 and 3 over the last 5 years and the average yield for TRR well 2 over the last four years have been essentially stable. This fact, when combined with pumping and non-pumping depths to water in the wells, is consistent with their continued viability.