

PRODUCTION AND SALES REPORT FOR 2014-2015



8/20/2015

Kinneloa Irrigation District

Prepared by Melvin L. Matthews, General Manager

Production and Sales Report for 2014-2015

SUMMARY OF PRODUCTION SOURCES, CUSTOMER SALES, RAINFALL, POWER COSTS AND LONG TERM STORAGE FOR THE WATERMASTER YEAR OF 2014-2015, JULY THROUGH JUNE

Production

The Kinneloa Irrigation District (KID) produced 710.5 acre-feet from our wells and tunnels during this period as shown in Figure 1. All of this water except for 9.0 acre-feet was produced for our retail customers which was 16.2% less than 837.4 acre-feet produced for retail customers last year. Figure 1 includes data for all production sources from 1994-1995 through 2014-2015 as well as for surface water and ground water which is diverted from our system for which we receive a spreading credit. Figure 2 shows total production from the KID wells and tunnels. This year our wells produced approximately 82% of the water and the tunnels produced 18% of the water. Tunnel production level is dependent on rainfall in the current and previous years and has ranged from a high of 530.1 acre-feet in 2005-2006 to a low of 127.6 acre-feet in the current year of 2014-2015. The tunnel production for 2014-2015 was significantly below the 21-year average of 265 acre feet. Figure 3 is a pie chart showing the percentage of total production by source.

Sales

Total sales to retail customers were 642.7 acre-feet as shown in Figure 4. The average monthly sales of water during the year from 1994-1995 to 2014-2015 are shown in Figure 5. Peak sales are usually in the July through October period and minimum sales usually occur in December through March period. Weather conditions in a particular year can cause these periods to shift and can drastically affect the total sales for the year. This year is the fourth consecutive year for significantly below-average rainfall. Figure 6 shows an analysis of the distribution of monthly water usage per customer for the month of June in four years from 2012 to 2015. June was chosen for this analysis because it represents average monthly water usage for the year. The data shows the percentage of our customers that used 10 units or less per month in June 2015 was 24.75% as compared to 17.4% in June 2014; used between 11 and 50 units per month in June 2015 was 49.67% as compared to 44.3% in June 2014; used between 51 and 100 units per month in June 2015 was 19.18% as compared to 27.5% in June 2014; and used more than 100 units per month in June 2015 was 6.39% as compared to 10.78% in June 2014. Each unit is equivalent to one hundred cubic feet (CCF) or 748 gallons. This usage pattern has been relatively constant over the past four years but the trend is for a greater number of customers to be in the lower usage categories.

Water Use Efficiency

The KID has extensively promoted measures to increase use efficiency over the past nine years and has participated in rebate programs to provide incentives to our customers to reduce water usage. The data indicates a 24% decrease in the 2014-2015 usage as compared to the base year of 2006-2007. However, the 2014-2015 usage is only 9.2% lower than the 21 year average of 708.2 acre-feet. It is too soon to know whether or not there has been permanent

reduction in water usage on a per capita basis due to the emergency drought regulations, our water conservation program or the extensive media coverage of the drought. A comparison of total water sales for January 2013 through June 2015 is shown in Figure 7.

Non-Revenue Water Use and Water Loss

The difference between the water produced and water sold (which is the water loss for the system) was 58.8 acre-feet or 8.4% as shown in Figure 1. The loss is attributed to system leaks, main flushing for water quality purposes, fire flow tests, unmetered water used for construction and other purposes, normal operational procedures at KID facilities and water meter inaccuracies. A water loss of less than 10% is considered to be excellent by industry standards.

Rainfall

Rainfall for 2014-2015 was 8.2 inches as shown in Figures 1 and 8 as compared to 5.2 inches in the previous year and the 21-year average of 21.5 inches. This is the fourth consecutive year where the rainfall has been substantially lower than the average and has contributed to the continued decline in tunnel production and the spreading credits. The KID has leased additional pumping rights from other agencies to offset this decline and has been able to meet customer demand. However, these supplemental production sources are not guaranteed and an increase in water-use efficiency may be needed to offset the loss of available water for production.

Power Cost

Figure 9 shows the power cost per acre-foot of total production for 2014-2015 and for the previous 20 years. Since most of our power consumption is for pumping, it is also an approximate indirect measure of production efficiency. However, it should be noted that this indicator does not take into account the percentage of well production vs. tunnel production nor does it take into account rising electricity rates. In years of high tunnel production, less water is pumped from our wells saving us considerable power cost.

Although electricity rates have increased over these years, we have been able to mitigate most of the increases by participating in various time-of-use and interruptible power programs that restrict our use of power to non-peak hours in exchange for lower rates. We have also installed higher-efficiency motors when equipment has been replaced. The net effect has been to stabilize our power costs. The 2014-2015 cost was \$162 per acre-foot of total production as compared to \$136 per acre-foot for the previous year and the 21-year average of \$106 per acre-foot. Even though we will continue to take advantage of cost-reduction programs, it will be more difficult to maintain our current cost especially considering the announced rate increases and the mandated switch to more “green” power in the years ahead.

Long Term Storage

The Raymond Basin Management Board (RBMB) established a long term storage program to cover situations such as prolonged drought or unusually high demand that might lead to over pumping of our water rights in the current year. This program is the equivalent of a savings account for surplus water. The KID activated our long term storage account for the first time in 2004-2005 by adding 327 acre-feet of surplus water as shown in Figure 1. The following year we added additional storage to bring the account to 848 acre-feet. Some of this storage was used in 2006-2007 to support our water sales to the City of Pasadena so the remaining storage at the end of 2006-2007 was 729 acre-feet. The net addition to our long term storage in 2007-2008 was 69 acre-feet and the total was 798 acre-feet at the end of that year. Due to

declining water levels in the Raymond Basin, the RBMB voted to suspend the program and freeze the total at the end of the 2008-2009 year.

The result of the additions and withdrawals, as shown in Figure 10, is that we still have 790 acre-feet in the account that can be used to offset any shortages in the future. We will not be able to add any surplus to the account unless the RBMB changes the policy. Our current plan is to use this water only if we are unable to lease temporary pumping rights at a reasonable cost or to acquire additional pumping rights from another Raymond Basin member. This additional water in storage is especially important to the KID considering that the RBMB has implemented a 30% reduction of our adjudicated pumping rights in order to address declining water levels in the basin. The RBMB will continue to monitor basin pumping levels to see if stabilization can be achieved without the injection of imported water or other recovery efforts.

Production Issues

Figure 1 shows that the Wilcox Well only produced 8.7 acre-feet of water in 2014-2015 as compared with 272.4 acre-feet in the peak year of 1999-2000. The declining level in the Raymond Basin aquifer at this facility has caused a 50% reduction in the available operational flow rate from this well because the output needs to be restricted to prevent entrainment of air and damage to the pump. This operational necessity is inefficient from a power standpoint and relegates this well to emergency and supplemental supply uses only. This also means that the lost production was shifted to the K-3 Well which accounted for 81% of our total annual production in 2014-2015. A continued decline in basin levels could also affect the K-3 Well in future years and our increased dependence on a single production source diminishes production reliability.

As mentioned above, the court-ordered adjudication of pumping rights in the Raymond Basin no longer matches the natural replenishment rate and the RBMB has not yet developed an external replenishment source. We are collectively addressing the problem through engineering studies and consideration of additional water resources and conservation measures that could be used in-lieu of pumping from the basin in order to stabilize the level.

All water agencies in the area except for the KID purchase imported supplemental water from the Metropolitan Water District or through its wholesale distributor, Foothill Municipal Water District. The KID has not needed to purchase imported water because our local tunnel water, adjudicated pumping rights and available leases have been sufficient to meet customer demand. However, our independence from imported water is not assured unless we are able to continue to lease unused pumping rights from other water agencies in the area. We will also continue to rely on our interconnections with the City of Pasadena for a water supply during system emergencies or for planned facility maintenance purposes but that water must be returned to Pasadena as soon as possible after an event.

The KID will continue to work with the Foothill Municipal Water District to develop a long term plan for supplemental water in case our ground water pumping rights are permanently reduced and leased pumping rights are no longer available.

Respectfully submitted to the Board of Directors,



Melvin L. Matthews, General Manager

Figure 1 Data for Watermaster Year (July through June) 1994-1995 to 2008-2009

Production in Acre-Feet															
Source	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
Wilcox Well	93.2	119.6	170.2	165.4	209.6	272.4	216.9	203.7	213.7	148.9	60.2	37.2	70.2	5.6	5.6
K-3 Well	285.3	238.3	263.8	330.9	567.3	562.5	425.2	514.3	457.1	551.0	319.3	423.5	860.1	543.9	611.2
Total Well	378.5	357.9	434.0	496.3	776.9	834.9	642.1	718.0	670.8	699.9	379.5	460.7	930.3	549.5	616.7
Hi-Low Tunnel	71.3	217.0	177.2	146.6	143.1	132.6	111.1	86.0	57.6	59.8	125.6	171.9	131.0	107.6	89.2
House Tunnel	37.8	43.9	35.4	33.1	41.1	31.5	26.2	21.5	16.7	12.7	12.6	44.9	26.5	20.6	12.8
Eucalyptus Tunnel	56.5	64.9	62.6	58.7	62.4	54.0	44.3	38.6	29.5	41.5	50.0	50.4	44.6	43.2	39.1
Delores Tunnel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	126.5	223.3	83.6	63.7	40.2
Far Mesa Tunnel	73.6	69.1	67.7	68.3	78.9	74.1	56.7	52.0	47.7	45.6	68.2	39.6	13.1	48.6	42.9
Total Tunnel	239.2	394.9	342.9	306.7	325.5	292.2	238.3	198.1	151.5	162.0	382.9	530.1	298.8	283.7	224.2
Total Production	617.7	752.8	776.9	803.0	1102.4	1127.1	880.4	916.1	822.3	861.9	762.5	990.8	1229.0	833.2	840.9
Deliveries from Pasadena	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.5	0.0	0.0	18.8	0.0	0.0	1.5
Deliveries to Pasadena	0.0	0.0	0.0	-139.5	-325.8	-222.9	-64.1	-87.3	-61.7	0.0	0.0	-160.6	-321.8	0.0	-42.4
Net Import/Export	0.0	0.0	0.0	-139.5	-325.8	-222.9	-64.1	-87.3	-30.2	0.0	0.0	-141.8	-321.8	0.0	-40.9
Total Production for Retail Customers	617.7	752.8	776.9	663.5	776.6	904.2	816.3	828.8	792.1	861.9	762.5	849.0	907.2	833.2	800.0
Diversions in Acre-Feet															
Source	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
Hi-Low Tunnel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	0.0	0.0	0.0	0.0	0.0	0.0
House Tunnel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	25.6	0.0	0.0	0.0	4.2
Kinneloa Canyon	140.7	50.2	54.3	56.8	48.6	52.1	33.4	28.9	12.2	9.5	31.2	40.4	45.4	27.2	21.4
Eucalyptus Tunnel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	0.0	0.0	0.0	0.0	0.0	0.0
Brown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.9	16.7	0.0	0.0	0.0
Eaton Wash Sub Total	140.7	50.2	54.3	56.8	48.6	52.1	33.4	28.9	38.0	9.5	81.7	57.2	45.4	27.2	25.6
Delores Tunnel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.4	31.1	21.5	44.5	0.0	0.0	0.0	0.0
Long Tunnel	35.8	37.2	39.2	39.2	38.9	37.7	38.1	38.0	36.0	35.3	46.8	44.7	37.4	36.0	34.3
Far Mesa Tunnel	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	30.2	42.5	0.0	0.0
Glen Wash	429.3	396.3	262.5	321.3	359.1	174.8	156.7	52.7	26.7	28.1	933.9	161.4	74.0	56.7	59.0
Tent Tunnel	5.1	5.5	5.4	5.3	5.8	3.4	2.4	2.3	2.1	2.0	3.2	3.5	2.9	2.5	2.1
Pasadena Glen Sub Total	470.2	439.0	307.1	365.8	403.8	215.9	201.8	134.4	95.9	86.9	1028.5	239.8	156.7	95.2	95.4
Sierra Madre Villa DB Outflow	-256.7	-32.8	-7.2	-33.7	0.0	0.0	0.0	0.0	0.0	0.0	-459.7	0.0	0.0	0.0	0.0
Net Pasadena Glen Sub Total	213.5	406.2	299.9	332.1	403.8	215.9	201.8	134.4	95.9	86.9	568.8	239.8	156.7	95.2	95.4
Total Diverted	354.2	456.4	354.2	388.9	452.4	268.0	235.2	163.3	133.9	96.4	650.5	297.0	202.1	122.4	121.0
Other Data															
	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
Rainfall (inches)	43.61	22.64	22.80	52.29	14.46	18.82	20.04	7.86	24.48	10.12	58.00	21.79	5.81	24.61	16.10
Water Sales (Acre-Feet)	584.3	668.8	679.9	600.4	666.3	782.9	710.9	739.1	717.7	772.6	672.6	785.8	847.3	754.1	729.7
Water Loss (Acre-Feet)	33.4	84.0	97.0	63.1	110.3	121.3	105.4	89.7	74.4	89.3	89.8	63.2	59.9	79.0	70.3
Water Loss (%)	5.4	11.2	12.5	9.5	14.2	13.4	12.9	10.8	9.4	10.4	11.8	7.4	6.6	9.5	8.8
RMBM Storage Account (Acre-Feet)											326.9	847.9	728.6	797.9	790.0
Power (\$)	71,086	55,137	68,132	57,193	86,488	97,064	77,780	111,676	111,062	100,410	87,537	82,476	112,924	89,011	92,204
Power (\$ per AF of Total Production)	115	73	88	71	78	86	88	122	135	116	115	83	92	107	110

Figure 1
Data for Watermaster Year (July through June) 2009-2010 to 2014-2015

Production in Acre-Feet							
Source	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	21 Year Average
Wilcox Well	7.3	7.1	9.5	57.6	11.5	8.7	99.7
K-3 Well	610.6	580.2	708.0	584.2	676.6	574.2	508.9
Total Well	617.8	587.3	717.5	641.9	688.0	582.9	608.6
Hi-Low Tunnel	80.1	98.8	94.3	53.5	36.2	40.2	106.2
House Tunnel	13.8	14.5	15.7	14.3	10.2	0.6	23.2
Eucalyptus Tunnel	37.4	39.8	40.5	40.7	41.5	40.0	46.7
Delores Tunnel	44.8	98.5	57.7	17.4	22.9	11.0	37.7
Far Mesa Tunnel	38.9	41.2	41.2	39.3	38.6	35.9	51.5
Total Tunnel	215.0	292.8	249.3	165.2	149.4	127.6	265.2
Total Production	832.9	880.0	966.8	807.0	837.4	710.5	873.9
Deliveries from Pasadena	0.0	0.0	1.2	0.0	0.0	0.0	2.5
Deliveries to Pasadena	-105.1	-217.4	-239.0	-47.8	0.0	-9.0	-97.3
Net Import/Export	-105.1	-217.4	-237.8	-47.8	0.0	-9.0	-94.8
Total Production for Retail Customers	727.8	662.7	729.1	759.3	837.4	701.5	779.1
Diversions in Acre-Feet							
Source	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	21 Year Average
Hi-Low Tunnel	0.0	0.0	0.0	0.0	0.0	0.0	0.6
House Tunnel	0.0	0.0	0.0	0.0	0.0	0.3	1.6
Kinneloa Canyon	21.2	37.8	37.8	35.6	27.7	30.4	40.1
Eucalyptus Tunnel	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Brown	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Eaton Wash Sub Total	21.2	37.8	37.8	35.6	27.7	30.7	44.8
Delores Tunnel	0.0	0.0	0.0	0.0	0.0	1.7	6.7
Long Tunnel	33.8	39.8	38.4	34.4	29.9	28.5	37.1
Far Mesa Tunnel	0.0	0.0	0.0	0.0	0.0	0.0	3.7
Glen Wash	45.1	188.0	88.7	89.2	73.1	55.6	192.0
Tent Tunnel	2.0	1.8	2.8	2.3	2.3	2.3	3.2
Pasadena Glen Sub Total	80.8	229.6	129.9	125.9	105.3	88.1	242.7
Sierra Madre Villa DB Outflow	0.0	0.0	0.0	0.0	0.0	0.0	-37.6
Net Pasadena Glen Sub Total	80.8	229.6	129.9	125.9	105.3	88.1	205.0
Total Diverted	102.1	267.4	167.7	161.4	133.0	118.8	249.8
Other Data							
	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	21 Year Average
Rainfall (inches)	23.63	31.34	11.77	8.32	5.20	8.20	21.5
Water Sales (Acre-Feet)	771.0	590.8	654.9	696.2	805.1	642.7	708.2
Water Loss (Acre-Feet)	61.9	71.8	74.2	63.1	32.4	58.8	75.8
Water Loss (%)	8.5	10.8	10.2	8.3	3.9	8.4	9.7
RBMB Storage Account (Acre-Feet)	790.0	790.0	790.0	790.0	790.0	790.0	748.3
Power (\$)	92,700	92,700	93,964	105,248	113,611	114,917	91,110
Power (\$ per AF of Total Production)	111	105	97	130	136	162	106

Figure 2
Total Production
July through June

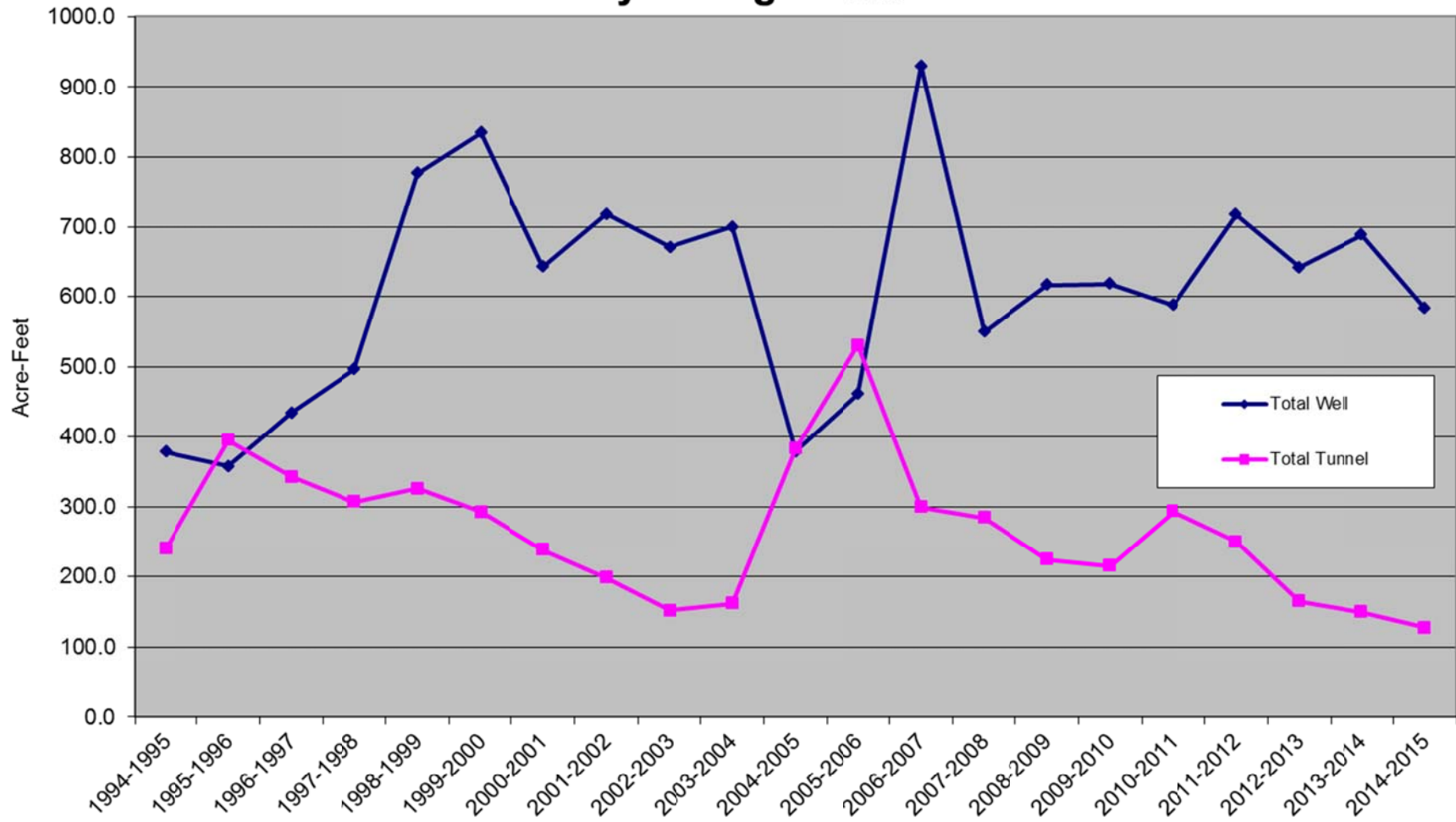


Figure 3
2014-2015 Production Sources
July through June

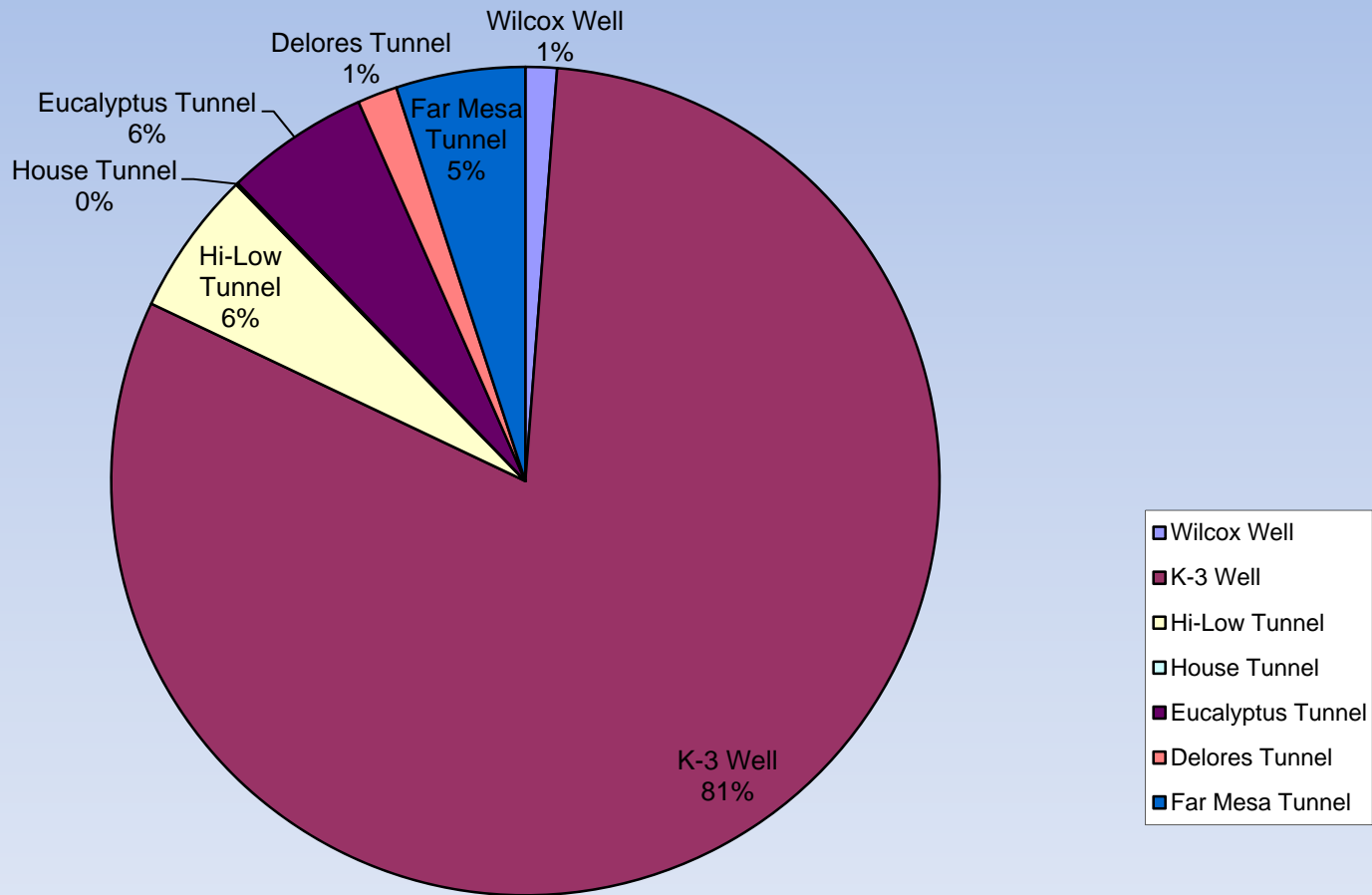


Figure 4
Annual Water Sales
July through June

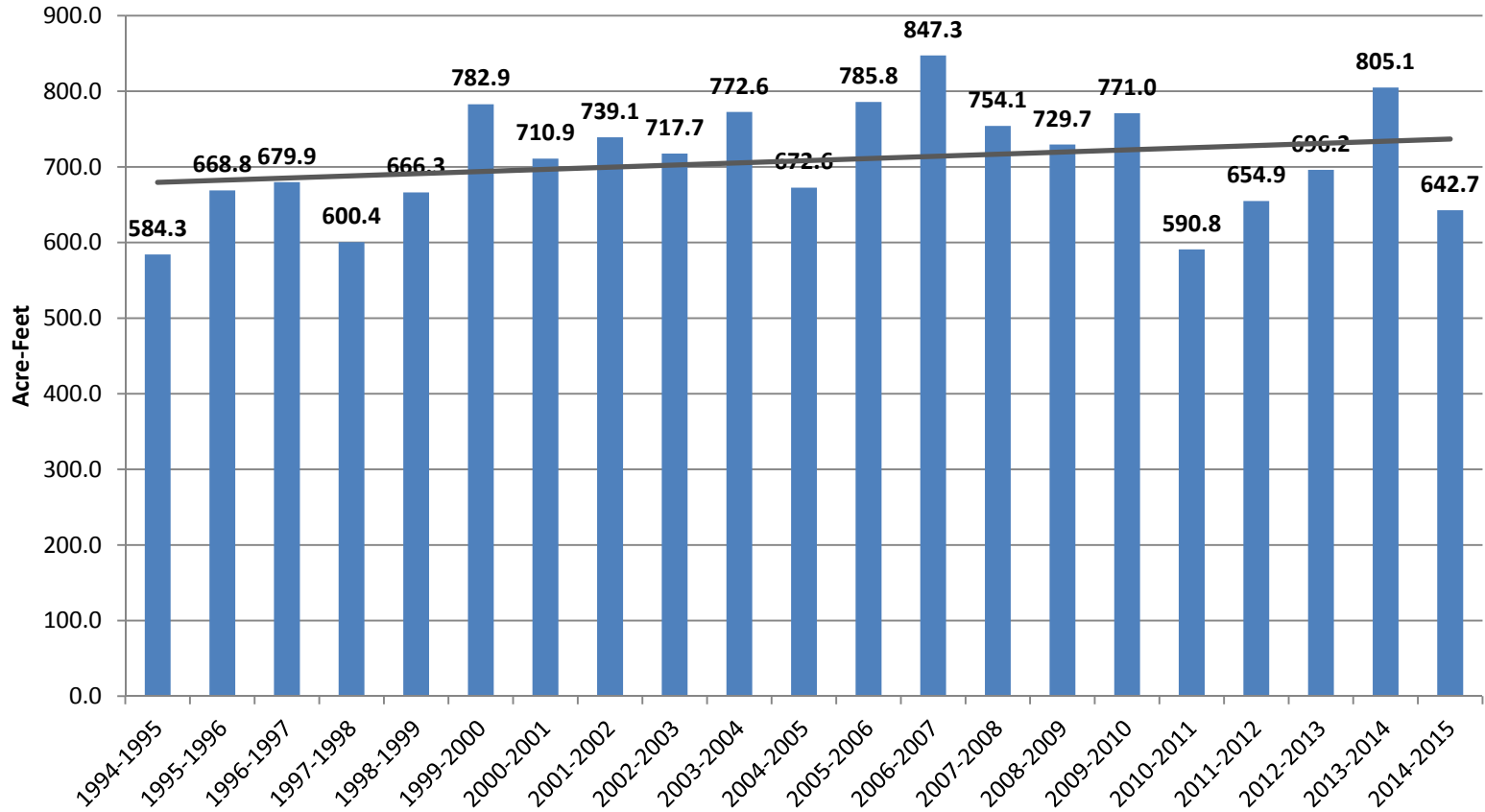


Figure 5

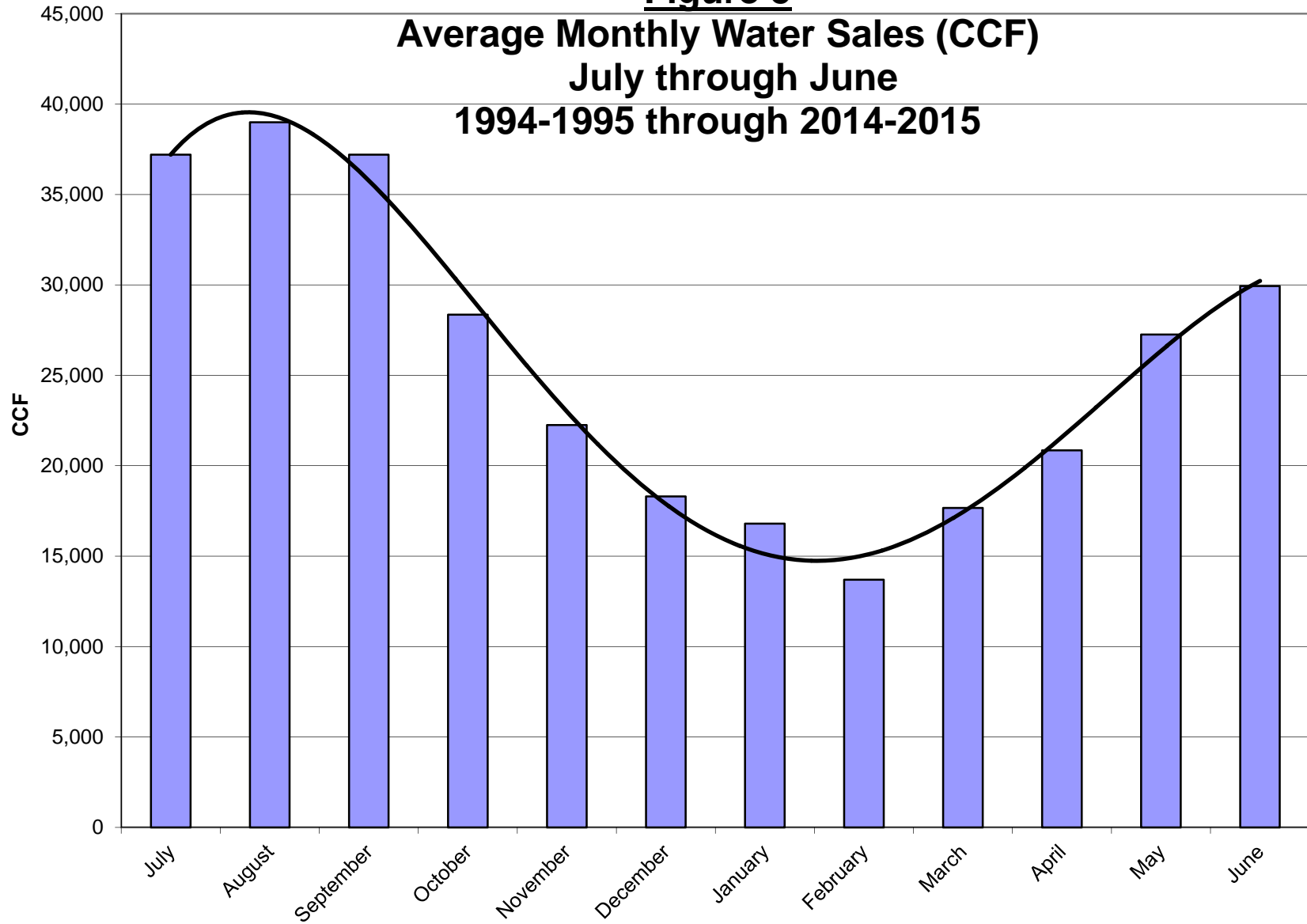


Figure 6 Water Usage per Customer

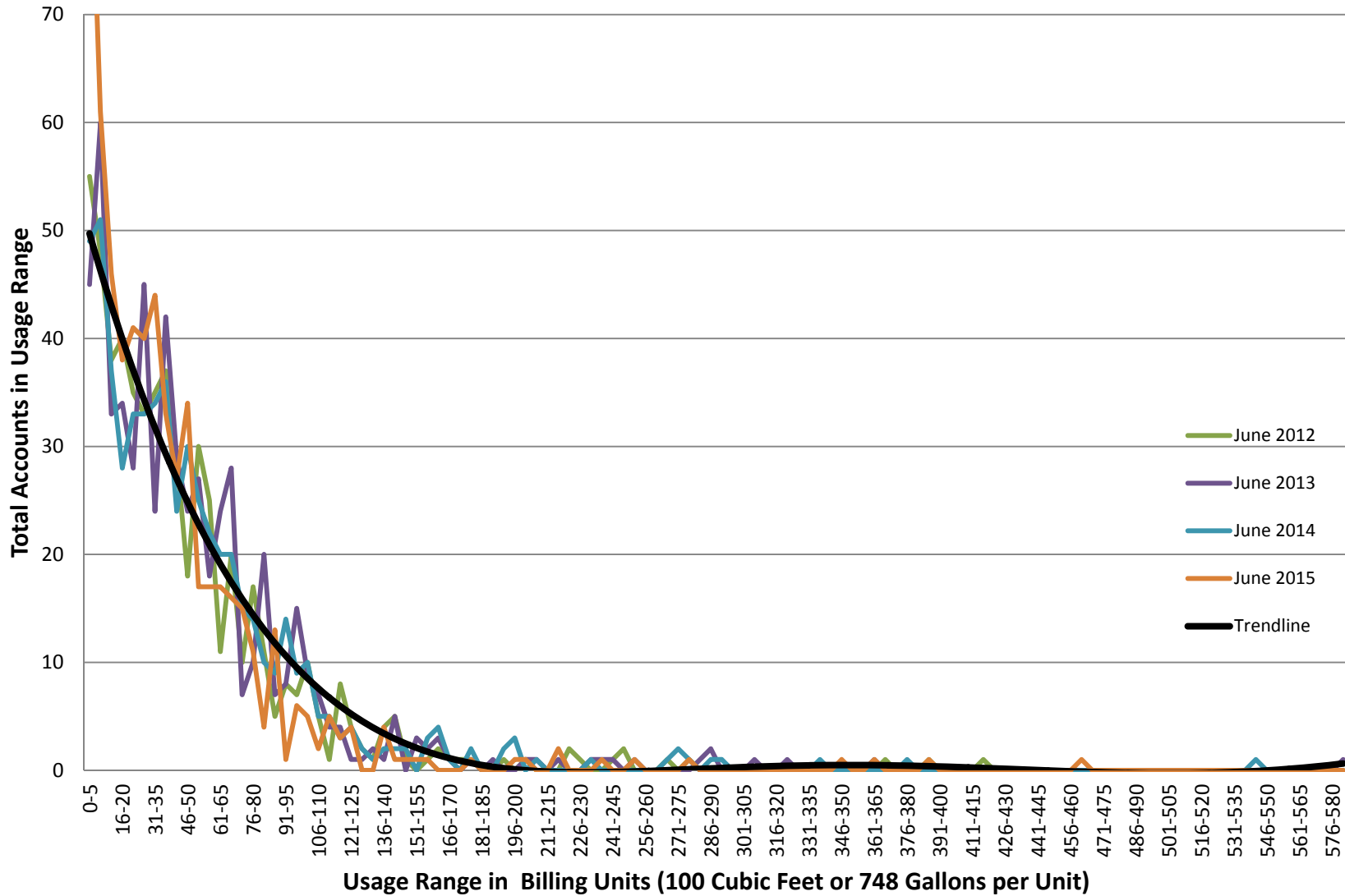


Figure 7
Total Monthly Water Sales
2013, 2014 and January through June 2015

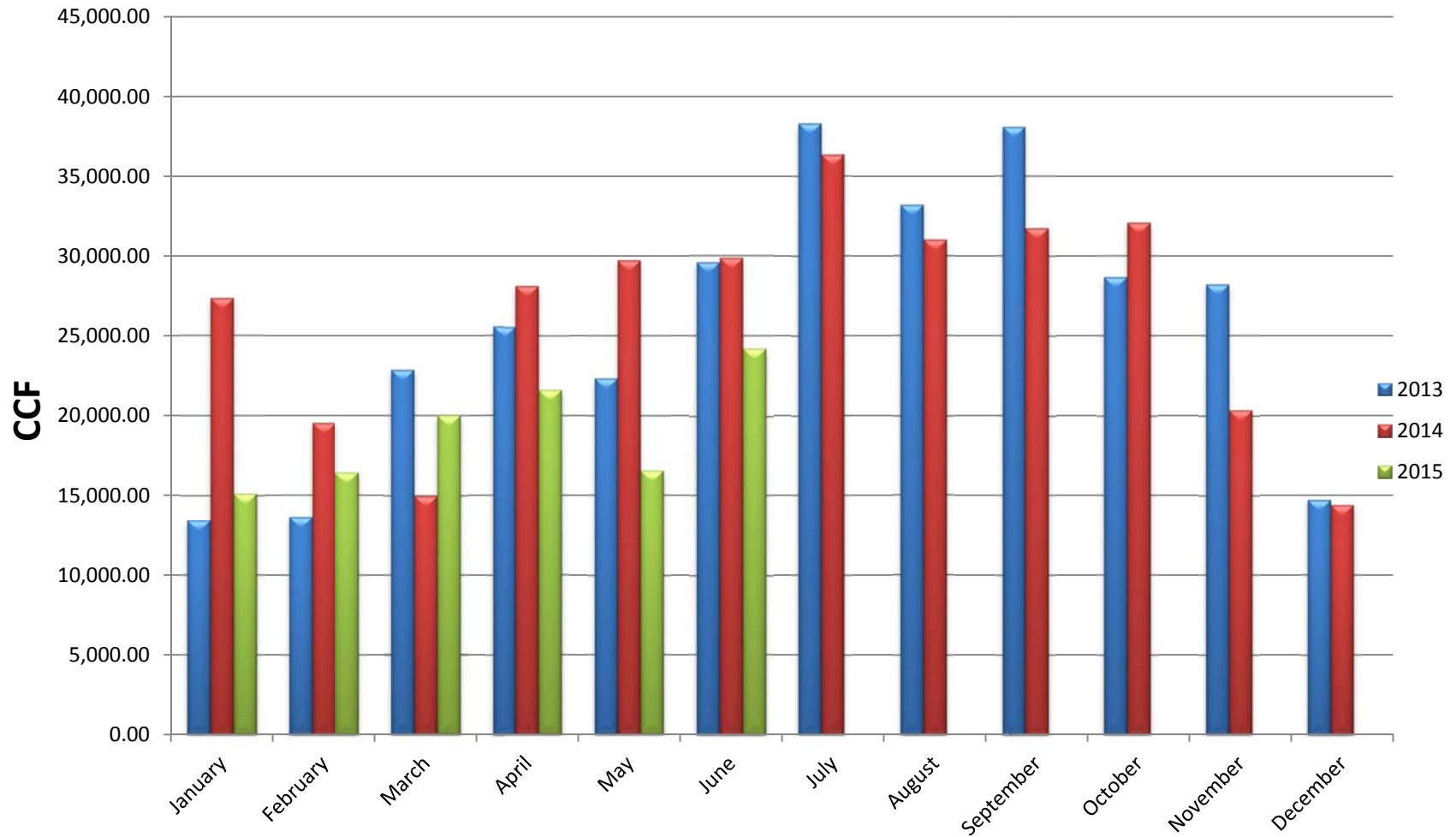


Figure 8 Rainfall July through June

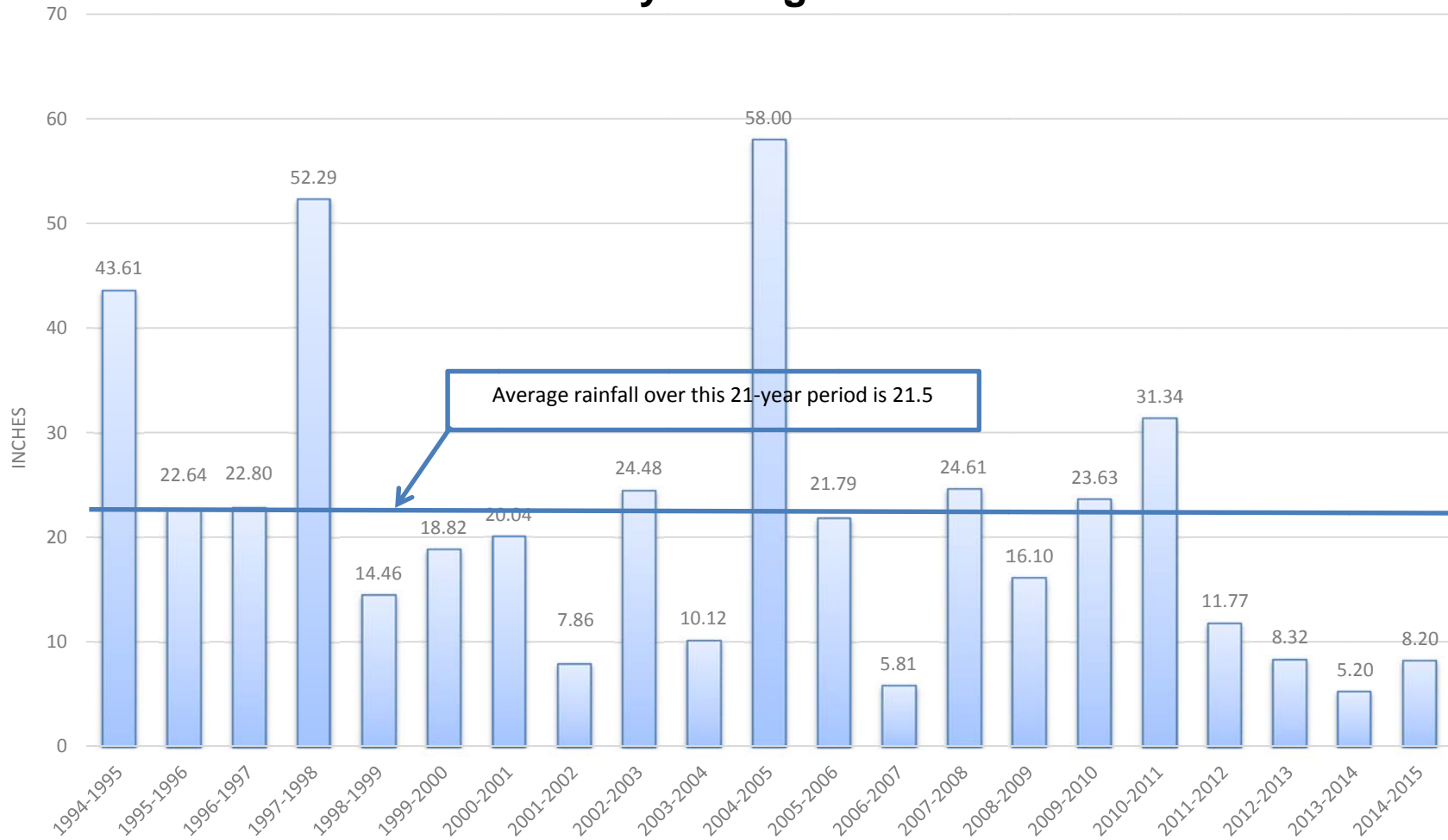


Figure 9
Power Cost in Dollars per Acre-Foot of
Total Production

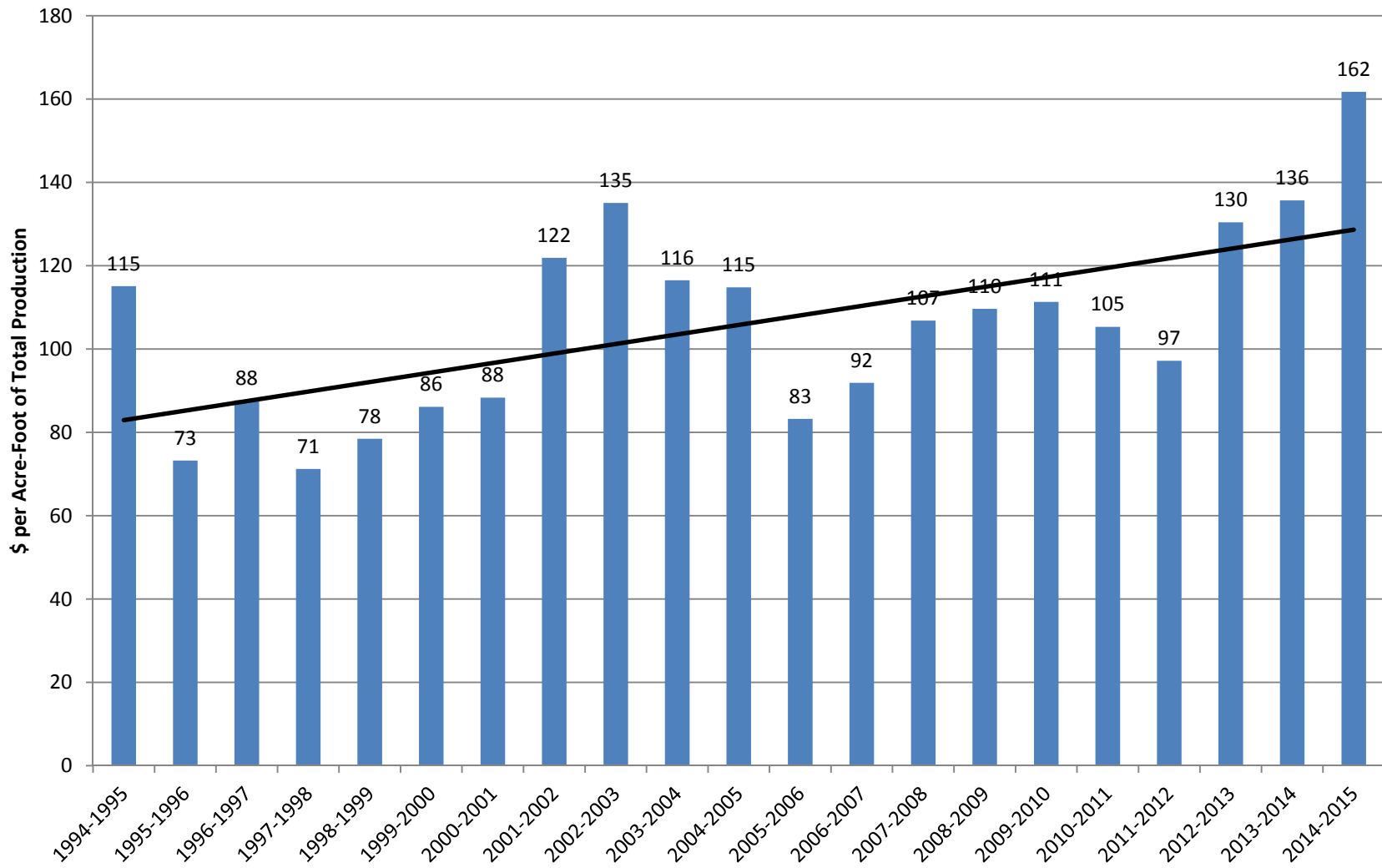


Figure 10
Long Term Storage

