

2. OWENS VALLEY OPERATIONS PLAN FOR RUNOFF YEAR 2016-2017

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This year's annual operations plan and pumping program is consistent with the management strategy of the Water Agreement between the County of Inyo (County) and the City of Los Angeles (City) dated October 18, 1991. As stated in the Water Agreement:

The overall goal of managing the water resources within Inyo County is to avoid certain described decreases and changes in vegetation and to cause no significant effect on the environment which cannot be acceptably mitigated while providing a reliable supply of water for export to Los Angeles and for use in Inyo County.

The overall goal of the Water Agreement: environmental protections and a reliable water supply are the basis of the Los Angeles Department of Water and Power's (LADWP) operations plans. Groundwater pumping in the Owens Valley is managed in conformance with the provisions of the Water Agreement. The Water Agreement provides:

By April 20th of each year, the Department shall prepare and submit to the Inyo County Technical Group a proposed operations plan and pumping program for the twelve (12) month period beginning on April 1st. (In the event of two consecutive dry years when actual and forecasted Owens Valley runoff for the April to September period is below normal and averages less than 75 percent of normal, the Department shall prepare a proposed plan for the six (6) month period beginning on April 1st and October 1st, and submit such plans by April 20th and October 20th.)

2.1. Eastern Sierra Runoff Forecast

The Eastern Sierra Runoff Forecast for the 2016-17 runoff year (Table 2.1) is based on snow surveys of key Eastern Sierra watersheds in Inyo and Mono counties that contribute the majority of runoff water into the Owens Valley. The Eastern Sierra Runoff Forecast is used for planning aqueduct operations. The April 1 forecast Eastern Sierra runoff for 2016-17 runoff year is 293,800 acre-feet, or about 71% of the 1961-2010 long-term average annual runoff value of 412,284 acre-feet. This is following the driest year for the period of record and together with the low runoff during the previous four years, the driest five year runoff period for the period of record in the Owens Valley.

The forecast runoff for the period between April 1, 2016 through September 30, 2016, is 203,100 acre-feet for the Owens River Basin, which is 67% of the long-term average. The long-term average Owens Valley runoff between April 1 and September 30 based on 1961-2010 data is 303,903 acre-feet per year.

Figure 2.1 summarizes Owens Valley runoff and groundwater pumping by LADWP since the 1971 runoff year. This figure demonstrates this year's runoff compared to the past runoff in the Owens Valley.

Table 2.1 - Owens Valley Runoff Forecast for 2016-17 Runoff Year

**2016 EASTERN SIERRA
RUNOFF FORECAST
April 1, 2016**

APRIL THROUGH SEPTEMBER RUNOFF

	MOST PROBABLE VALUE		REASONABLE MAXIMUM	REASONABLE MINIMUM	LONG-TERM MEAN (1961 - 2010)
	(Acre-feet)	(% of Avg.)	(% of Avg.)	(% of Avg.)	(Acre-feet)
MONO BASIN:	73,000	71%	83%	58%	103,522
OWENS RIVER BASIN:	203,100	67%	80%	54%	303,903

APRIL THROUGH MARCH RUNOFF

	MOST PROBABLE VALUE		REASONABLE MAXIMUM	REASONABLE MINIMUM	LONG-TERM MEAN (1961 - 2010)
	(Acre-feet)	(% of Avg.)	(% of Avg.)	(% of Avg.)	(Acre-feet)
MONO BASIN:	90,100	74%	87%	60%	122,333
OWENS RIVER BASIN:	293,800	71%	84%	59%	412,284

NOTE - Owens River Basin includes Long, Round and Owens Valleys (not incl Laws Area)

MOST PROBABLE - That runoff which is expected if median precipitation occurs after the forecast date.

REASONABLE MAXIMUM - That runoff which is expected to occur if precipitation subsequent to the forecast is equal to the amount which is exceeded on the average once in 10 years.

REASONABLE MINIMUM - That runoff which is expected to occur if precipitation subsequent to the forecast is equal to the amount which is exceeded on the average 9 out of 10 years.

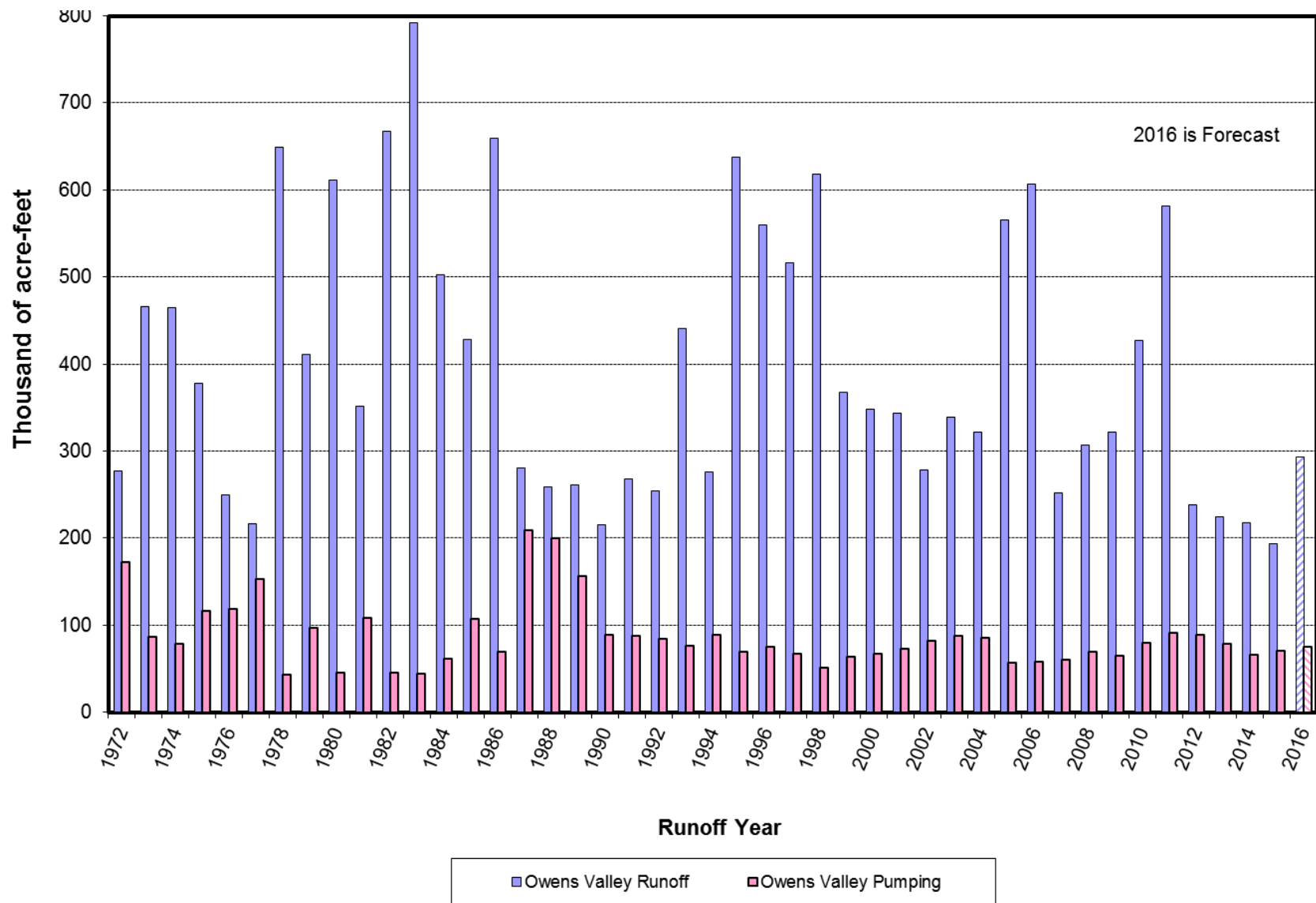


Figure 2.1 - Owens Valley Runoff and Groundwater Pumping

2.2. Owens Valley Groundwater Production

LADWP has prepared its 2016-17 Annual Owens Valley Operations Plan based on the goals and principles of the Water Agreement. The 2016-17 Annual Owens Valley Operations Plan is designed to avoid adverse impacts to the environment while providing a reliable supply of water for in-valley uses and export to Los Angeles for municipal use.

Under the terms of the Water Agreement, the acceptable amount of groundwater pumping from each Owens Valley wellfield is based on the ON/OFF status of monitoring sites located within each wellfield and the capacity of the wells linked to those sites (see Water Agreement Sections V.B and V.C). Table 2.2 lists the ON/OFF status of the monitoring sites within the Owens Valley as of April 2016. The Water Agreement or Technical Group has designated certain town supply wells, irrigation supply wells, fish hatchery supply wells, enhancement/mitigation (E/M) project supply wells, and other wells determined to not significantly impact areas with groundwater dependent vegetation as exempt from the ON/OFF provisions of the Water Agreement. These exempt wells may be pumped for their intended purpose.

Table 2.3 provides a breakdown of the available annual pumping capacity and planned groundwater pumping for the first six months of the 2016-17 runoff year by wellfield. Pursuant to Water Agreement Section V.D, LADWP shall submit a plan for the second six months of the runoff year on or about October 20, 2016. Table 2.3 also shows the monitoring sites in ON status as of April 2016, the wells associated with the ON status monitoring sites, and the exempt wells in each wellfield. Approximately 121,550 acre-feet of water is available for groundwater pumping from Owens Valley wellfields under the terms of the Water Agreement during the 2016-17 runoff year. LADWP plans to pump between approximately 46,160 and 51,510 acre-feet during the first six months of the 2016-17 runoff year. Groundwater pumping during the first six months of the 2016-17 runoff year will provide water for Owens Valley uses. For the entire 2016-17 runoff year, LADWP anticipates the total acre-feet of groundwater pumping to be in the range of the mid 70,000's.

Working both independently and with the Inyo/Los Angeles Technical Group, LADWP will monitor Owens Valley environmental conditions to assess if further changes to the planned pumping are needed. LADWP's 2016-17 groundwater management approach is substantially more conservative than the environmentally conservative pumping plans advocated by the Standing Committee during the dry years of the early 1990s. While LADWP plans to pump considerably less groundwater than made available under Water Agreement Section V, the Inyo/Los Angeles Standing Committee may agree upon additional reductions in groundwater pumping pursuant to Water Agreement Section IV.A.

Figure 2.2 compares the amount of Owens Valley groundwater pumping provided by the provisions of Water Agreement and the actual groundwater pumping by LADWP for each runoff year since 1992 (available pumping was not calculated prior to 1992). LADWP's anticipated pumping for the 2016-17 runoff year is consistent with its past conservative pumping plans. LADWP is committed to conducting its operations in a conservative, responsible, and environmentally sustainable manner.

In addition to complying with the ON/OFF provisions and the environmental protection goals of the Water Agreement, LADWP's 2016-17 pumping program considers the groundwater mining provisions of the Green Book. Table 2.4 shows the latest update of the mining calculations based on the procedures described in Section IV.C of the Green Book. As shown in this table, none of the wellfields in the Owens Valley will be in deficit by the end of the first half of the 2016-17 runoff year.

Table 2.5 is a list of Owens Valley wells exempted under the Water Agreement or by approval of the Technical Group from linkage to vegetation monitoring sites and the ON/OFF provisions. The table includes a list of wells by well number, general location of the exempt well, and the reason the well is exempt.

Table 2.6 details planned groundwater pumping for the first six months of the 2016-17 runoff year on a month-to-month basis for each wellfield. Pumping for town water systems, fish hatcheries, and enhancement/mitigation (E/M) projects is included in the pumping distribution. Owens Valley groundwater production for the 2016-17 runoff year is consistent with the provisions of the Water Agreement. No additional testing of wells subject to the Water Agreement is included in this year's planned pumping total and if performed, it will be in addition to the planned pumping for 2016-17. Planned pumping may also be increased to provide freeze protection for the Los Angeles Aqueduct (LAA).

The following is a discussion of the planned pumping program by wellfield. Figures 2.3, 2.4, and 2.6 through 2.10 locate LADWP's Owens Valley pumping wells by wellfield. These figures show the location of production wells, monitoring wells, and vegetation monitoring sites in each area.

Table 2.2 - Soil/Vegetation Water Balance Calculations for April 2016 According to Section III of the Green Book

Site	Oct 2015 soil AWC	30% Annual Precip.	Proj. soil AWC	October 2015 Veg Water Req./ Water Req. for well turn-on	Oct 2015 Status	April 2016 soil AWC	April 2016 Status	Soil AWC req. for well turn-on
	(cm)	(cm)	(cm)	(cm)		(cm)		(cm)
L1	1.6	NA	1.6	3.8/15.6	OFF	2.8	OFF	15.6, OFF 7-10
L2	7.3	4.7	12.0	7.0/NA	ON	7.5	ON	NA
L3	7.5	NA	7.5	12.4/25.2	OFF	12.6	OFF	25.2, OFF 10-11
BP1	0.9	NA	0.9	2.1/22.9	OFF	1.6	OFF	22.9†, OFF 10-97
BP2	1.3	NA	1.3	4.9/28.4	OFF	3.9	OFF	28.4, OFF 7-98
BP3	2.6	NA	2.6	4.2/10.6	OFF	5.6	OFF	10.6, OFF 7-12
BP4	35.3	4.9	40.2	7.5/NA	ON	37.9	ON	NA
TA3	6.3	NA	6.3	14.2/26.0	OFF	8.7	OFF	26.0, OFF 10-11
TA4	13.4	NA	13.4	8.8/23.3	OFF	17.6	OFF	23.3, OFF 10-11
TA5	21.4	4.9	26.3	3.9/NA	ON	22.9	ON	NA
TA6	8.8	NA	8.8	10.7/17.6	OFF	13.4	OFF	17.6, OFF 10-11
TS1	1.3	NA	1.3	3.1/20.4	OFF	4.5	OFF	20.4†, OFF 10-96
TS2	6.0	4.4	10.4	9.1/NA	ON	9.9	ON	NA
TS3	16.5	NA	16.5	12.8/32.9	OFF	22.8	OFF	32.9, OFF 10-12
TS4	33.2	NA	33.2	27.7/55.9	OFF	47.9	OFF	55.9, OFF 10-11
IO1	11.1	NA	11.1	35.0/42.2	OFF	13.5	OFF	42.2, OFF 10-98
IO2	4.5	NA	4.5	3.4/18.9	OFF	3.7	OFF	18.9, OFF 7-11
SS1	11.7	3.9	15.6	4.8/NA	ON	10.1	ON	NA
SS2	2.9	NA	2.9	1.5/25.6	OFF	4.0	OFF	25.6, OFF 7-11
SS3	18.9	NA	18.9	5.9/33.8	OFF	20.1	OFF	33.8, OFF 10-11
SS4	4.8	NA	4.8	4.8/15.9	OFF	4.9	OFF	15.9, OFF 7-05
BG2	23.0	4.0	27.0	1.7/NA	ON	23.5	ON	NA

†: These values of soil water required for well turn-on were derived using calculations based on %cover that were routinely performed in the past. The values have not been updated to conform to the Greenbook equations in section III.D.2, p. 57-59.

Table 2.3 - Annual Pumping Capacity According to Monitoring Sites with ON Status and Planned Pumping for the First Six Months of Runoff Year 2016-17

Wellfield	Monitoring	Associated Production Wells	Available Capacity (AF/year)	Planned Pumping (AF)
Laws	L2	236, 239, 243, 244	7,240	
	L5*	245, 387, 388	8,980	
	Exempt	236, 354, 422, 413	2,100	
	Wellfield Pumpage		18,320	6,600
Bishop**	All wells	140, 371, 406, 407, 408, 410, 411, 412	17,810	
	Wellfield Pumpage		17,810	9,000
Big Pine	BP4	331	7,530	
	Exempt	218, 219, 330, 332, 341, 352, 375, 415	25,750	
	Wellfield Pumpage		33,280	10,995-12,345
Taboose Aberdeen	TA5	349	12,130	
	Exempt	118, 355	2,620	
	Wellfield Pumpage		14,750	2,500-6,500
Thibaut Sawmill	TS2	155	940	
	Exempt	351, 356	8,000	
	Wellfield Pumpage		8,940	4,380
Indep. - Oak	Exempt	59, 60, 61, 65, 357, 383EM, 384EM, 401	15,710	
	Wellfield Pumpage		15,710	6,910
Symmes Shepherd	SS1	69, 392, 393	7,780	
	Exempt	402EM	1,200	
	Wellfield Pumpage		8,980	3,975
Bairs Georges	BG2	76, 343, 348, 403	2,860	
	Exempt	343	500	
	Wellfield Pumpage		2,860	960
Lone Pine	Exempt	344, 346, 425	900	
	Wellfield Pumpage		900	840
Total Owens Valley			121,550	46,160-51,510

* Monitoring site has yet to be located.

** Pumping is subject to the Hillside Decree

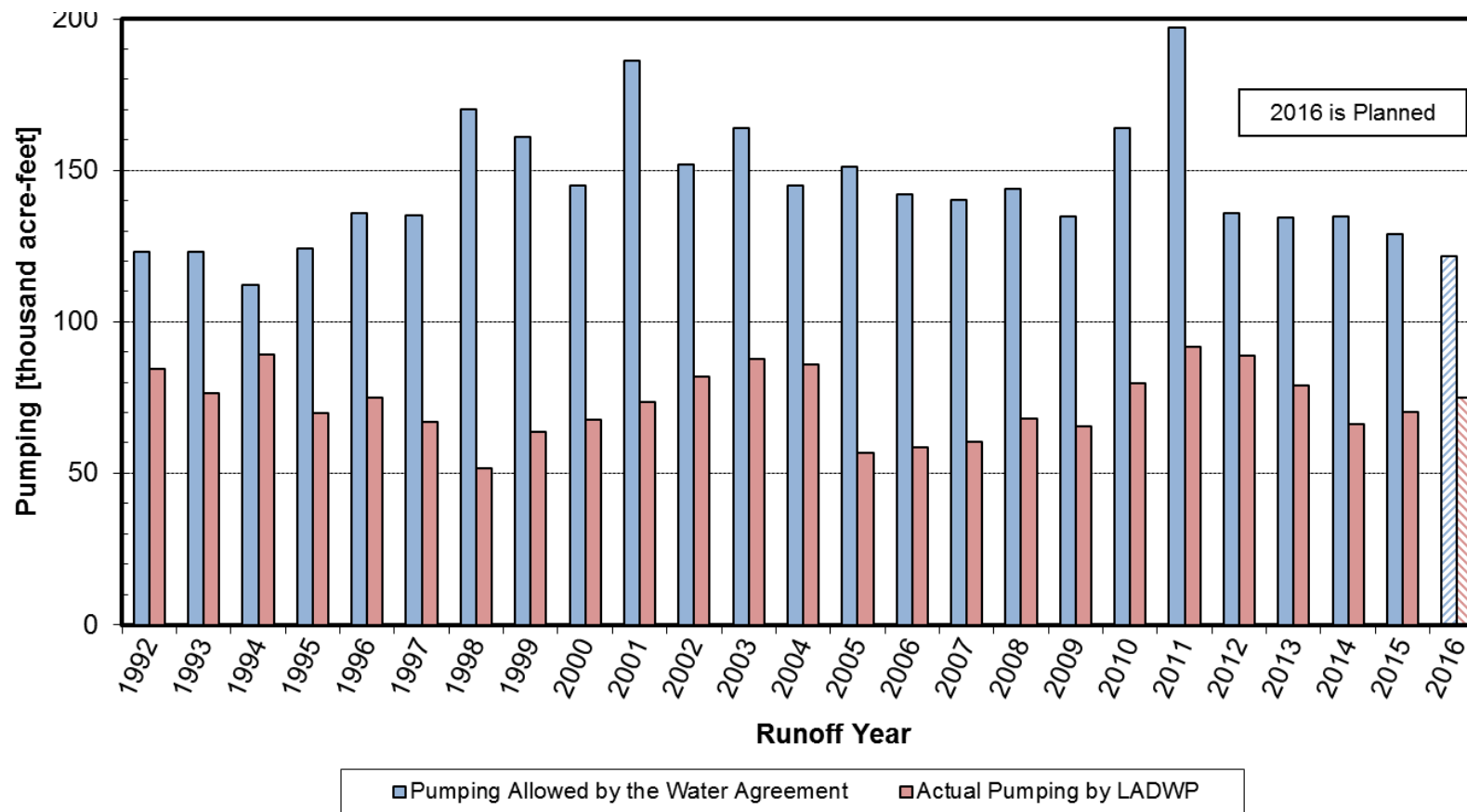


Figure 2.2 - Owens Valley Pumping – Provided by Water Agreement and Actual Since Inyo/Los Angeles Water Agreement

Table 2.4 - Summary of Recharge and Pumping for Water Year 1994 - 2015 and Estimated Pumping Limit for Apr-Sep 2016 in Acre-Feet

Water Year	OWENS VALLEY	LAWS		BISHOP		BIG PINE		TABOOSE-THIBAUT		IND-SYM-BAIRS		LONE PINE		OWENS VALLEY	
	Runoff Percent	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping
1997	125%	15,237	8,349	49,949	9,606	33,474	24,002	42,837	21,774	52,100	9,461	19,962	1,128	213,559	74,320
1998	139%	28,195	470	55,309	7,159	40,065	23,729	46,845	16,496	55,605	7,946	20,341	1,365	246,361	57,165
1999	95%	18,546	1,697	42,388	8,672	28,013	21,832	32,426	16,700	41,090	8,424	15,481	2,141	177,944	59,466
2000	80%	11,102	3,974	39,539	10,804	23,213	20,212	27,567	23,143	37,015	8,497	14,344	1,036	152,780	67,666
2001	77%	12,259	2,295	38,772	10,176	22,695	26,785	27,960	17,247	33,469	8,685	13,520	1,942	148,674	67,130
2002	63%	11,184	3,480	35,514	10,839	19,715	26,885	22,495	25,288	28,820	10,599	12,103	1,345	129,831	78,436
2003	75%	11,454	5,786	38,486	11,407	21,883	25,885	26,166	27,387	32,455	14,294	13,088	1,179	143,532	85,938
2004	71%	11,138	7,412	37,149	11,777	21,126	26,149	25,044	25,159	29,771	15,750	11,357	1,119	135,586	87,366
2005	120%	18,389	3,841	47,471	7,093	32,686	19,423	40,500	18,674	46,441	18,585	17,191	1,128	202,678	68,744
2006	138%	35,336	3,013	54,337	5,667	39,650	20,686	47,757	15,707	53,873	9,944	19,956	1,119	250,911	56,136
2007	64%	10,947	7,840	34,470	10,516	19,757	20,525	25,855	14,578	27,624	10,674	10,454	1,100	129,108	65,233
2008	68%	10,855	7,939	35,850	10,228	20,432	20,243	28,619	18,542	27,759	9,219	11,563	858	135,078	67,029
2009	73%	11,049	6,233	37,416	12,123	21,555	22,891	29,385	14,751	29,359	9,603	12,147	775	140,912	66,376
2010	93%	11,154	6,333	41,987	10,509	26,566	22,514	35,541	20,239	36,863	13,031	14,252	626	166,362	73,252
2011	134%	17,375	7,188	52,182	9,889	35,539	27,089	47,562	21,933	50,619	14,527	19,057	998	222,333	81,624
2012	72%	11,058	9,514	37,315	11,134	21,297	27,220	28,369	26,156	28,905	16,570	11,538	1,048	138,482	91,642
2013	62%	10,644	6,642	34,811	11,536	19,408	26,115	24,795	25,225	24,749	17,907	10,364	721	124,771	88,146
2014	50%	10,393	6,287	31,325	10,849	16,871	22,560	21,241	15,778	20,508	11,284	8,960	946	109,297	67,704
2015	43%	10,103	5,824	30,668	10,521	15,380	19,939	18,671	15,563	18,695	11,800	8,029	925	101,546	64,572
2016 (a)	66%	10,578	133	34,690	1,939	19,328	10,568	24,038	9,718	26,377	7,240	10,752	146	125,763	29,744
(b) TOTAL		286,997	104,250	809,626	192,444	498,655	455,252	623,674	390,058	702,096	234,040	274,460	21,645	3,195,509	1,397,689
Estimated Apr-Sep 2016 Pumping Limit			182,747		617,182		43,403		233,616		468,056		252,815		1,797,820

(a) Estimated Recharge for the 2016 Water Year; Approximate Pumping for First Half of Water year 2016 (Oct-Mar).

(b) Estimated 20 Year Total for Recharge; actual 19.5 Year Total for Pumping.

Table 2.5 - Exempt Wells in Owens Valley

LADWP Groundwater Pumping Wells Exempt from Water Agreement ON/OFF Provisions
Revised June 22, 2010

Well Number	WellField	Duration	Reason
354 p ⁽¹⁾	Laws	Annual	Sole Source-Town Supply
413 b ⁽¹⁾	Laws	Annual	Sole Source-Town Supply and E/M Supply
341 b ⁽¹⁾	Big Pine	Annual	Sole Source-Town Supply
352 b ⁽¹⁾	Big Pine	Annual	Same as above
415 p ^{(1) (6)}	Big Pine	Annual	Same as above
357 p ⁽¹⁾	Independence-Oak	Annual	Same as above
384 b ^{(1) (2)}	Independence-Oak	Annual	Same as above
344 p ⁽¹⁾	Lone Pine	Annual	Same as above
346 b ⁽¹⁾	Lone Pine	Annual	Same as above
330 ⁽³⁾	Big Pine	Annual	Sole Source-Fish Hatcheries
332 ⁽³⁾	Big Pine	Annual	Same as above
409 ⁽³⁾	Big Pine	Annual	Same as above
351	Thibaut-Sawmill	Annual	Same as above
356	Thibaut-Sawmill	Annual	Same as above
375	Big Pine	Annual	Make-up for Big Pine Re-greening
218	Big Pine	Annual	No impact on areas with groundwater dependent vegetation
219	Big Pine	Annual	Same as above
118	Taboose-Aberdeen	Annual	Same as above
401	Independence-Oak	Annual	Same as above
59	Independence-Oak	Annual	Same as above
60	Independence-Oak	Annual	Same as above
65	Independence-Oak	Annual	Same as above
383 E/M	Independence-Oak	Annual	Same as above
384 E/M ⁽²⁾	Independence-Oak	Annual	Same as above
61	Independence-Oak	Irrigation season	Sole Source-Irrigation; no impact on areas with groundwater dependent vegetation
402 E/M	Symmes-Shepherd	Irrigation season	Same as above
390 E/M	Lone Pine	Irrigation season	Same as above
343	Bairs-Georges	Irrigation season in below average runoff years	Sole Source-Irrigation in below average runoff years
365 ⁽⁴⁾	Laws	Annual	Sole Source-Irrigation; no impact on areas with groundwater dependent vegetation
236 ⁽⁴⁾	Laws	Irrigation Season	Sole Source-Irrigation
413 E/M ⁽⁵⁾	Laws	Irrigation Season	Sole Source-Irrigation

1. Primary town supply well is designated by p; Backup town supply well is designated by b.
2. Well 384 is a dual purpose well, water to Enhancement/Mitigation (E/M) supply is indicated by 384 and Independence domestic supply is indicated as 384 b.
3. Wells 330, 332, and 409 may only be pumped two at a time, unless pumped for testing or emergencies.
4. Well 365 designated as primary and Well 236 designated as backup irrigation supply.
5. Well 413 is a dual purpose well. Water is supplied to the Laws Museum Irrigation Projects east and west of the museum and Laws domestic supply is indicated as 413b.
6. Currently not pump-equipped.

Table 2.6 - Planned Owens Valley Pumping for the First Six Months of 2016-17 Runoff Year (acre-feet)

Month	Laws	Bishop	Big Pine	Taboose-Aberdeen	Thibaut-Sawmill	Indep.-Oak	Symmes-Shepherd	Bairs-Georges	Lone Pine	TOTAL
April	1,100	1,500	1,965	1,250	730	1,200	765	170	140	8,820
May	1,100	1,500	1,965	250-1,250	730	1,200	765	170	140	7,820-8,820
June	1,100	1,500	1,965	250-1,250	730	1,200	765	170	140	7,820-8,820
July	1,100	1,500	1,700-2,150	250-1,250	730	1,200	765	170	140	7,555-9,005
August	1,100	1,500	1,700-2,150	250-1,250	730	1,200	765	170	140	7,555-9,005
September	1,100	1,500	1,700-2,150	250	730	910	150	110	140	6,885-7,330
Total	6,600	9,000	10,995-12,345	2,500-6,500	4,380	6,910	3,975	960	840	46,160-51,510

Laws Wellfield (Figure 2.3)

Monitoring site L2 is in ON status. Production wells controlled by this monitoring site have an available production capacity of 7,240 acre-feet. Wells linked to monitoring site L5 have a capacity of 8,980 acre-feet. Exempt wells within the Laws Wellfield have a capacity of 2,100 acre-feet. The total available pumping capacity in the Laws Wellfield is 18,320 acre-feet. Well 236, associated with monitoring site L2, is used as a backup along with Well 422 as an exempt well irrigation water supply.

Planned groundwater pumping for the first half of the runoff year in the Laws Wellfield is approximately 6,600 acre-feet, contingent on water needs and environmental conditions. Groundwater pumping is planned to supply Owens Valley demands including the town water system, E/M projects, and irrigated lands.

LADWP modified production wells W385 and W386 associated with monitoring site L4 recently by sealing the screen zone within the shallow aquifer. LADWP has reclassified these wells as new wells to allow for further evaluation before starting to operate them. Well W385, currently numbered as W385R was pump equipped and LADWP is planning to conduct a two month operational test to determine potential effects on nearby resources. Results of this test should allow a comparison of the response of groundwater table to pumping well W385R with a similar test that was conducted in 1993-94. Data collected and analysis conducted from the proposed 2-months pumping test will be used in the California Environmental Quality Act documentation for operation of wells W385R and W386R.

Bishop Wellfield (Figure 2.4)

Pumping in the Bishop Wellfield is governed by the provisions of the Hillside Decree and the Water Agreement, which limit LADWP's annual groundwater extractions (pumping and flowing wells) from the Bishop Cone to an amount commensurate with the total amount of water used on City lands on the Bishop Cone (including conveyance and other losses). Under the current audit protocols, recent total water used on City lands within the Bishop Cone area has been approximately 24,000 acre-feet per year. In the 2016-17 Runoff Year, the total water used is likely to be reduced to approximately 18,000 acre-feet. The current total available groundwater extraction capacity in the Bishop Wellfield is approximately 17,810 acre-feet. The planned groundwater pumping from the Bishop Wellfield is approximately 9,000 acre-feet for the first half of the 2016-17 runoff year, contingent on water needs and environmental conditions.

Figure 2.5 shows water use on City lands on Bishop Cone in comparison with the groundwater extractions (flowing and pumping wells) for runoff years 1996 to present.

The current Bishop Cone Audit does not include a number of known uses and losses, including some uses that are currently being measured. These unaccounted for uses should be added to the total Bishop Cone Audit and the audit protocols should be revised to more accurately reflect actual uses and losses.

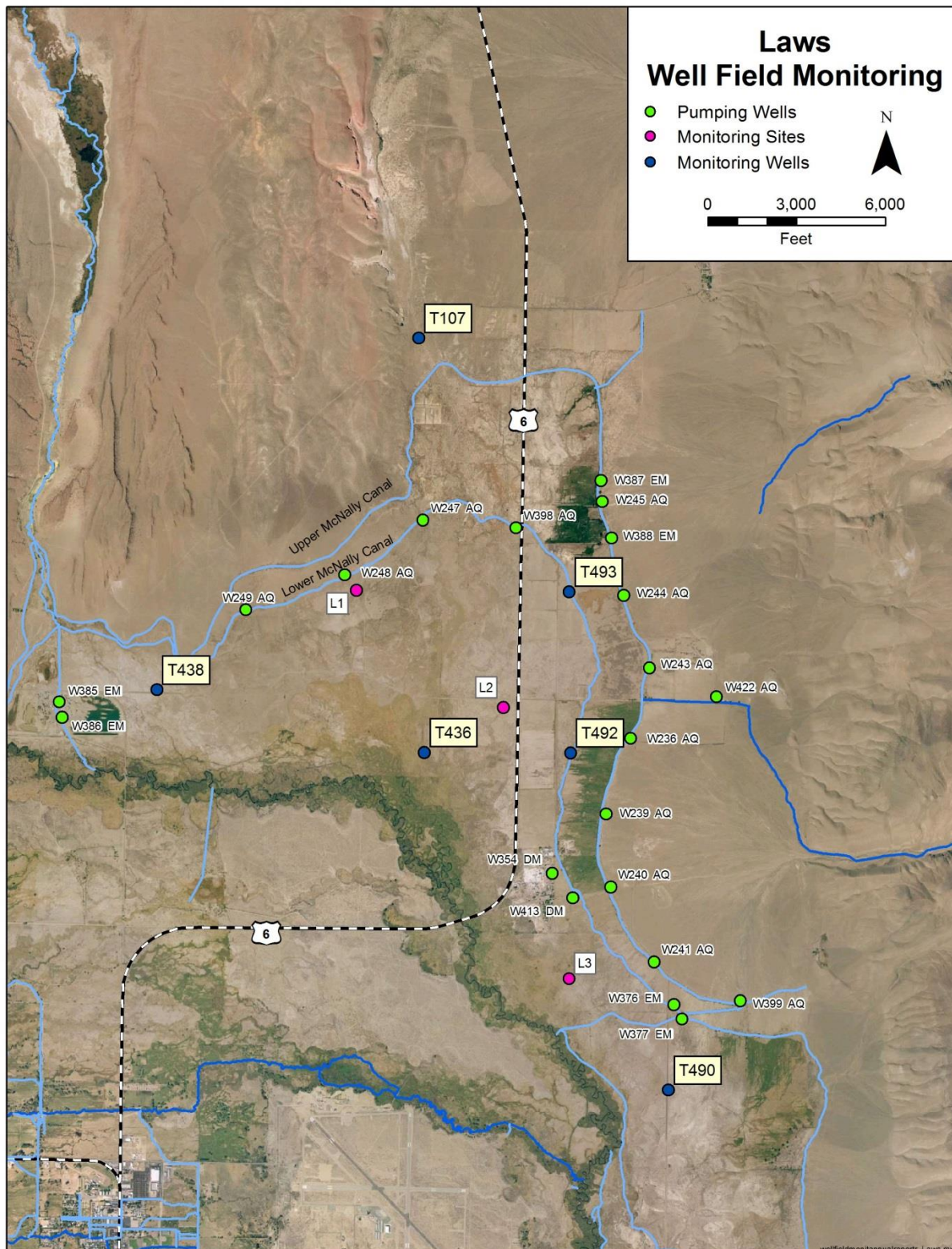


Figure 2.3 - Laws Wellfield

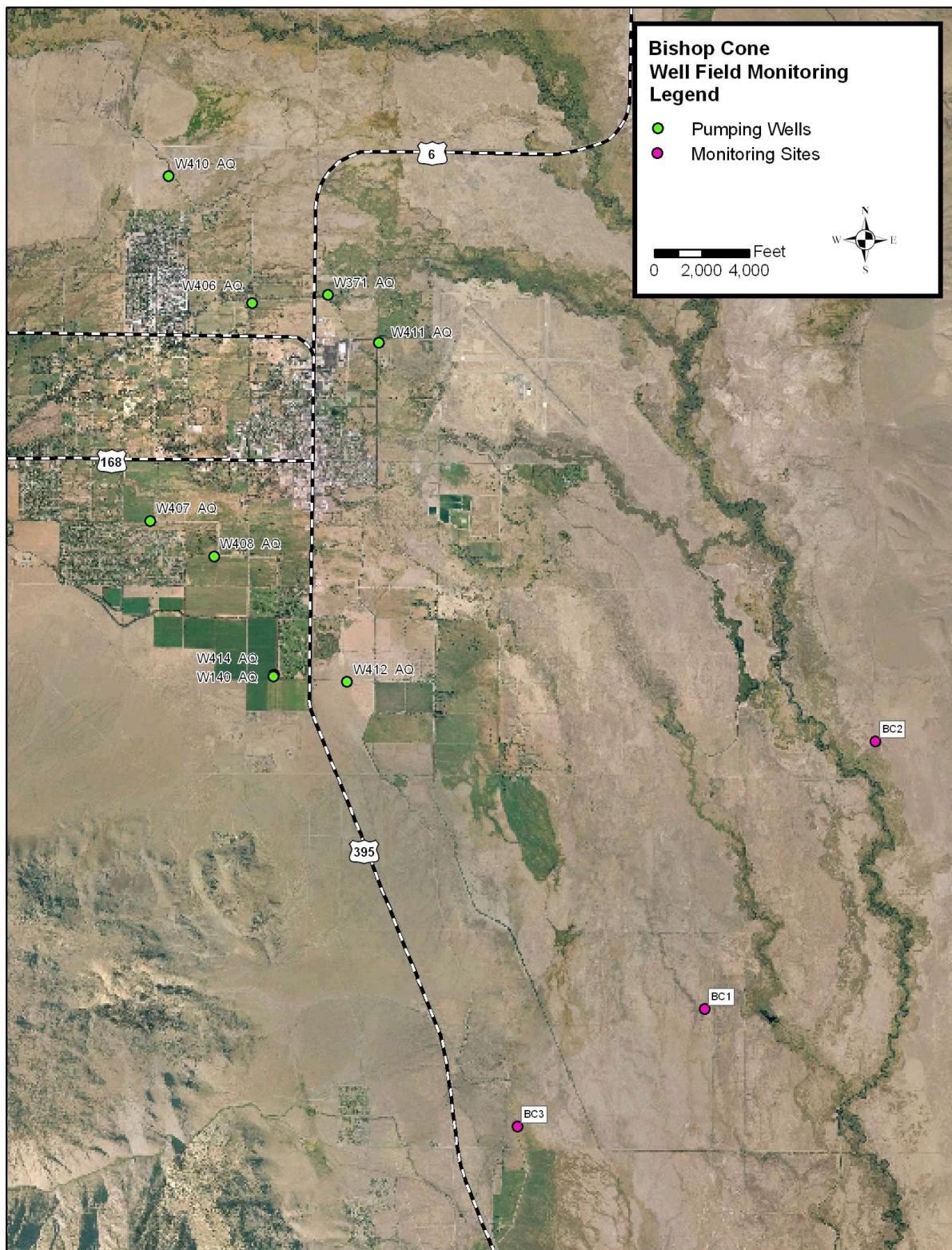


Figure 2.4 - Bishop Wellfield

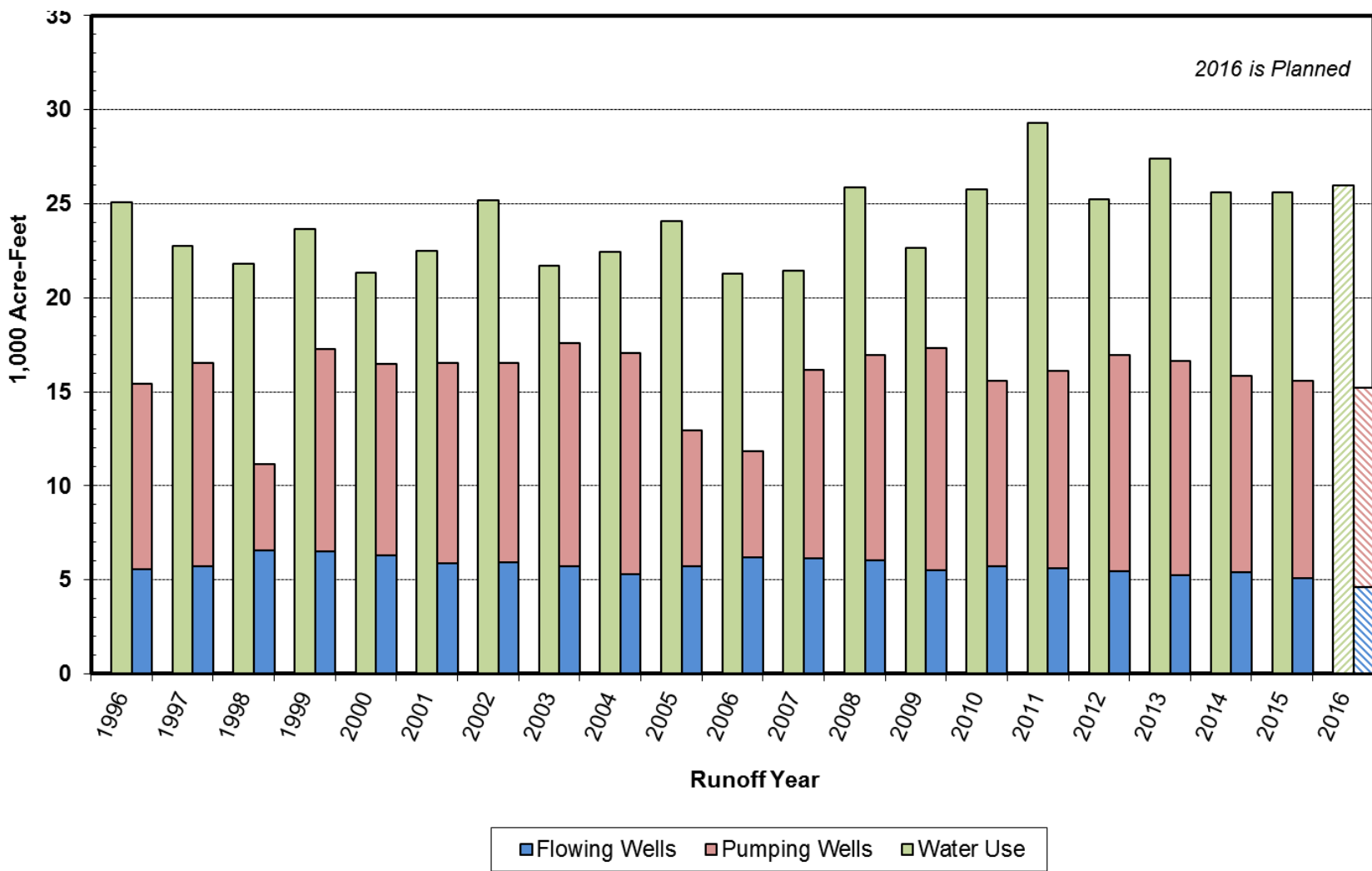


Figure 2.5 - Groundwater Extraction (flowing & pumping) and Water Use on Los Angeles Land in Bishop Cone

Big Pine Wellfield (Figure 2.6)

Monitoring sites BP4 is in ON status. Production Well 331, managed in conjunction with monitoring site BP4, has a production capacity of 7,530 acre-feet. Exempt wells including Well 218, Well 219, town supply wells, and Fish Springs Fish Hatchery wells in the Big Pine Wellfield have a combined capacity of 25,750 acre-feet. The total available capacity in the Big Pine Wellfield is 33,280 acre-feet. The total planned pumping in the Big Pine Wellfield is for the first half of the 2016-17 runoff year is between approximately 10,995 acre-feet and 12,345 acre-feet, contingent on water needs and environmental conditions.

Taboose-Aberdeen Wellfield (Figure 2.7)

Monitoring site TA5 is in ON status. Production Well 349 is controlled by monitoring site TA5 and has an available pumping capacity of approximately 12,130 acre-feet. Exempt Well 118 in the Taboose-Aberdeen Wellfield has a capacity of 2,380 acre-feet. Exempt well W355 pumps approximately 240 acre-feet to supply the Hines Spring project. The total available groundwater pumping capacity in the Taboose-Aberdeen Wellfield is 14,750 acre-feet. The planned groundwater pumping in the Taboose-Aberdeen Wellfield for the first half of the 2016-17 runoff year is contingent on water needs and prevailing environmental conditions and will range between approximately 2,500 acre-feet and 6,500 acre-feet.

Thibaut-Sawmill Wellfield (Figure 2.8)

Monitoring sites TS2 is in ON status. Production well W155, controlled by monitoring site TS2 has a production capacity of 940 acre-feet and can supply water for irrigation to Eight-Mile Ranch to supplement surface water for the ranch. Exempt Blackrock Fish Hatchery supply wells W351 and W356 have capacities of 13,200 acre-feet and 8,000 acre-feet respectively. The total available pumping capacity in the Thibaut-Sawmill Wellfield for the 2016-17 runoff year is approximately 8,940 acre-feet.

Based on the resolution of a dispute between Inyo County of LADWP regarding the conditions of the vegetation parcel BLK94, located west of the wellfield, the groundwater pumping to supply Blackrock Hatchery will be limited to approximately 8,000 acre-feet per year. Total planned pumping in the Thibaut-Sawmill Wellfield for the first half of the 2016-17 runoff year is planned to be approximately 4,380 acre-feet, subject to hatchery demands, water supply needs, and environmental conditions.

Independence-Oak Wellfield (Figure 2.8)

None of the monitoring sites in the Independence-Oak Wellfield are in ON status. Independence-Oak exempt wells have a combined capacity of 15,710 acre-feet. The total available pumping capacity in the Independence-Oak Wellfield is 15,710 acre-feet. The anticipated groundwater pumping in the Independence-Oak Wellfield for the first six months of the 2016-17 runoff year is approximately 6,910 acre-feet, which includes water for irrigation, town water system, and E/M project supply.

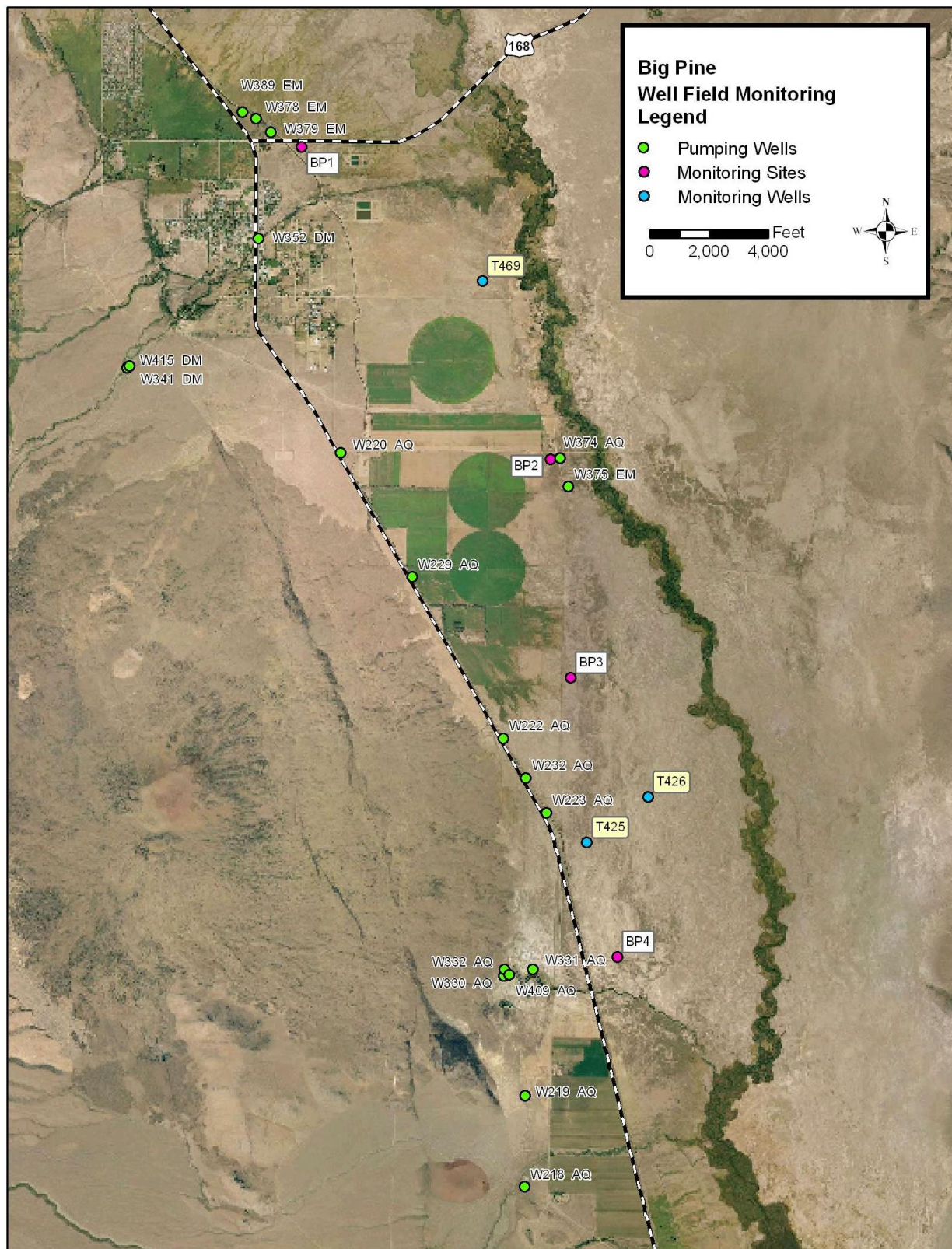


Figure 2.6 - Big Pine Wellfield

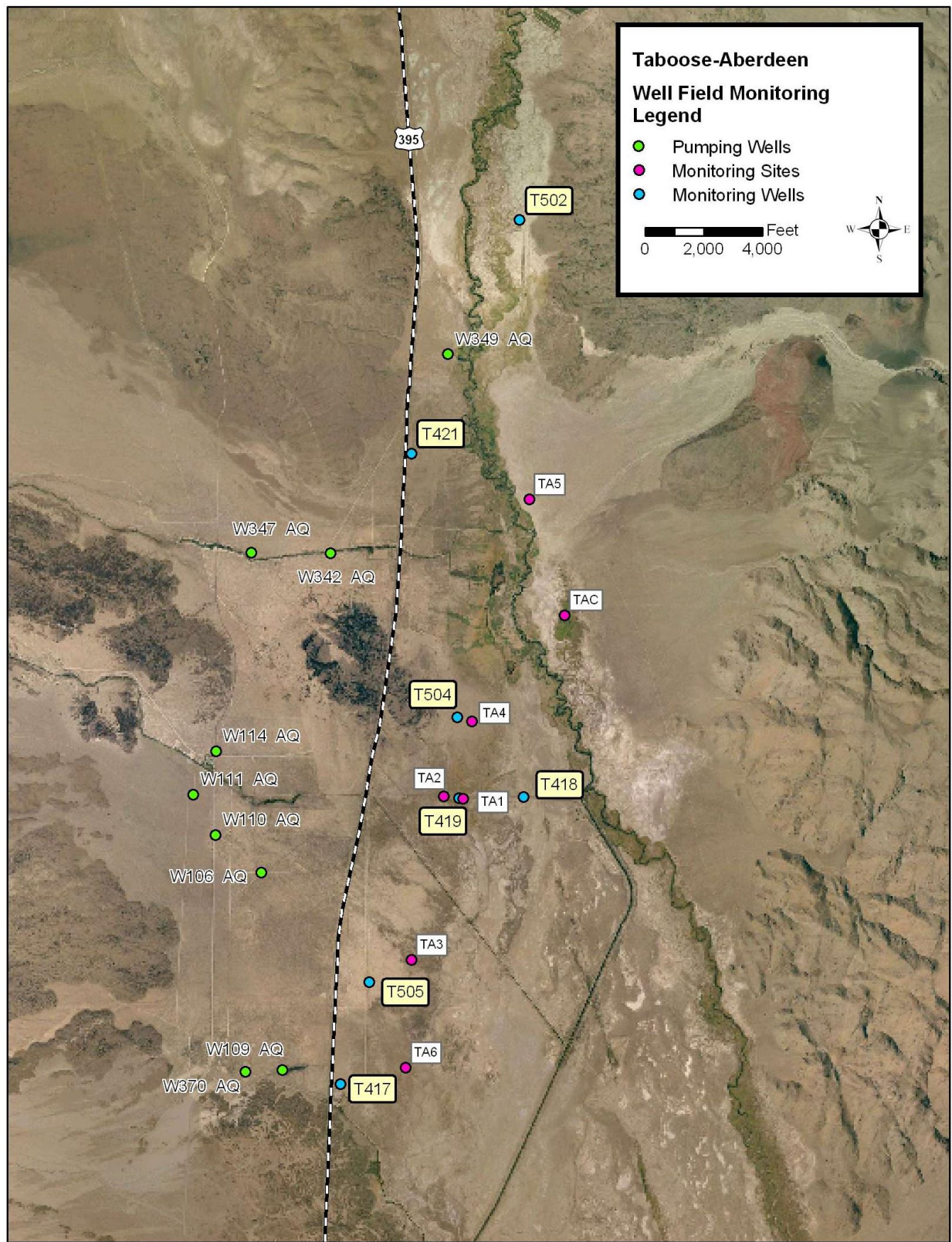


Figure 2.7 - Taboose-Aberdeen Wellfield

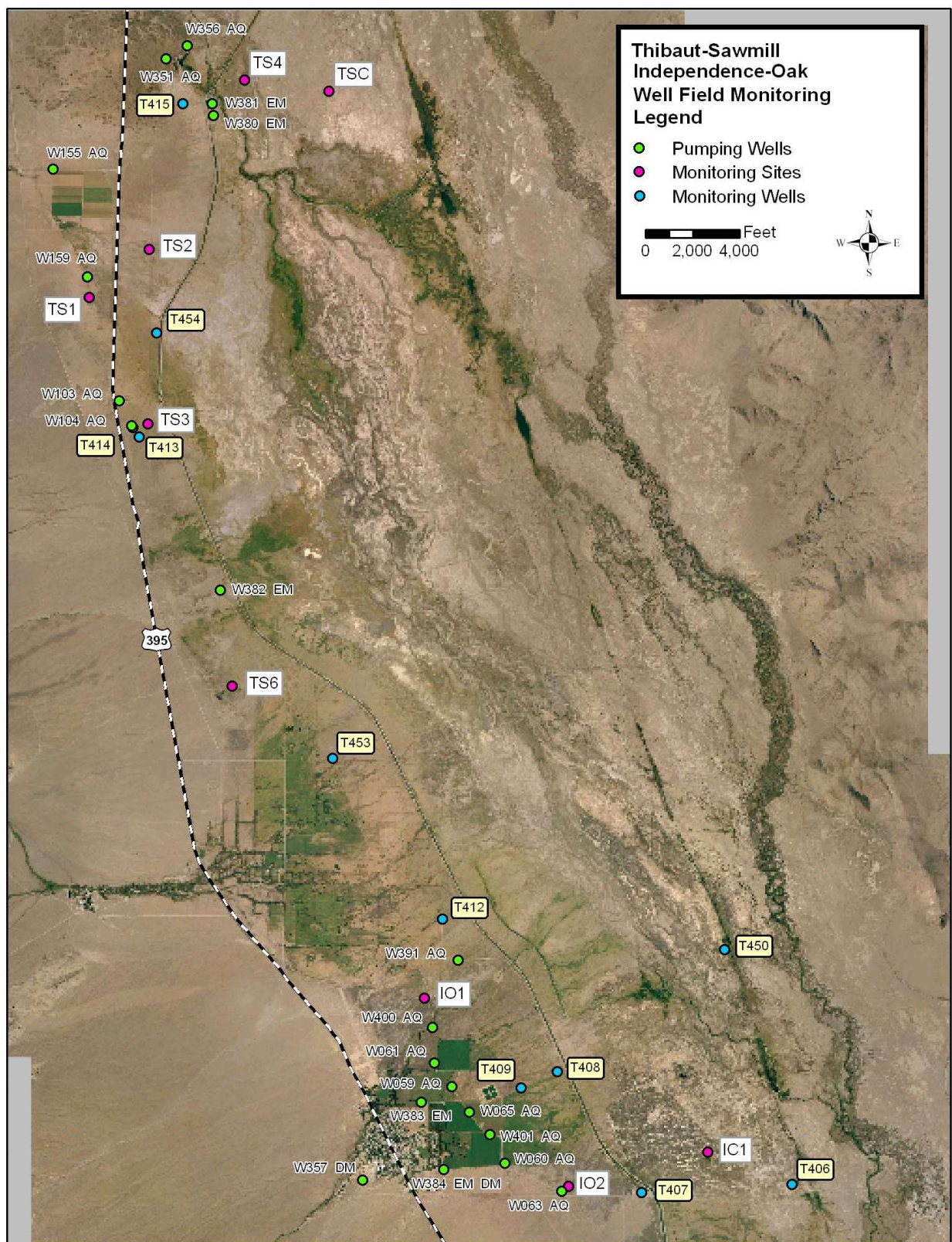


Figure 2.8 - Thibaut-Sawmill and Independence-Oak Wellfields

Symmes-Shepherd Wellfield (Figure 2.9)

Monitoring sites SS1 is in ON status. Monitoring site SS1 has an annual capacity of 7,780 acre-feet. Exempt Well 402 has a capacity of about 1,200 acre-feet. Total available capacity in the Symmes-Shepherd Wellfield for the 2016-17 runoff year is approximately 8,980 acre-feet. The total pumping in the Symmes-Shepherd Wellfield for the first six months of the 2016-17 runoff year is planned to be approximately 3,975 acre-feet, contingent on water needs and environmental conditions.

Bairs-Georges Wellfield (Figure 2.9)

Vegetation monitoring site BG2 is in ON status. The wells managed under this site have a combined annual capacity of approximately 2,860 acre-feet. Well 343 is exempted for pumping approximately 500 acre-feet (based upon a six month exemption period in dry years). The current total available capacity in the Bairs-Georges Wellfield for the 2016-17 runoff year is approximately 2,860 acre-feet. Groundwater pumping in the Bairs-Georges Wellfield for the first six months of the 2016-17 runoff year is planned to be approximately 960 acre-feet, contingent on water needs and environmental conditions.

Lone Pine Wellfield (Figure 2.10)

Lone Pine exempt wells are town supply wells W344 and W346, and E/M project supply Well W425. These three wells have an annual available capacity of approximately 900 acre-feet.

Well W416 is a production well in the Lone Pine Wellfield drilled in 2002. An operational pumping test was conducted on Well W416 during the 2009-10 runoff year. This well was modified in 2014 to seal the screen portion of the aquifer within the shallow aquifer. LADWP is planning to equip and conduct the initial operation of this well. If initial operation is performed during 2016-17 runoff year, it will be in addition to the currently planned pumping from Lone Pine Wellfield. The Technical Group has been requested to designate a monitoring site for this well.

The planned groundwater pumping from the Lone Pine Wellfield during the first six months of the 2016-17 runoff year is approximately 840 acre-feet, contingent on water supply needs and environmental conditions.

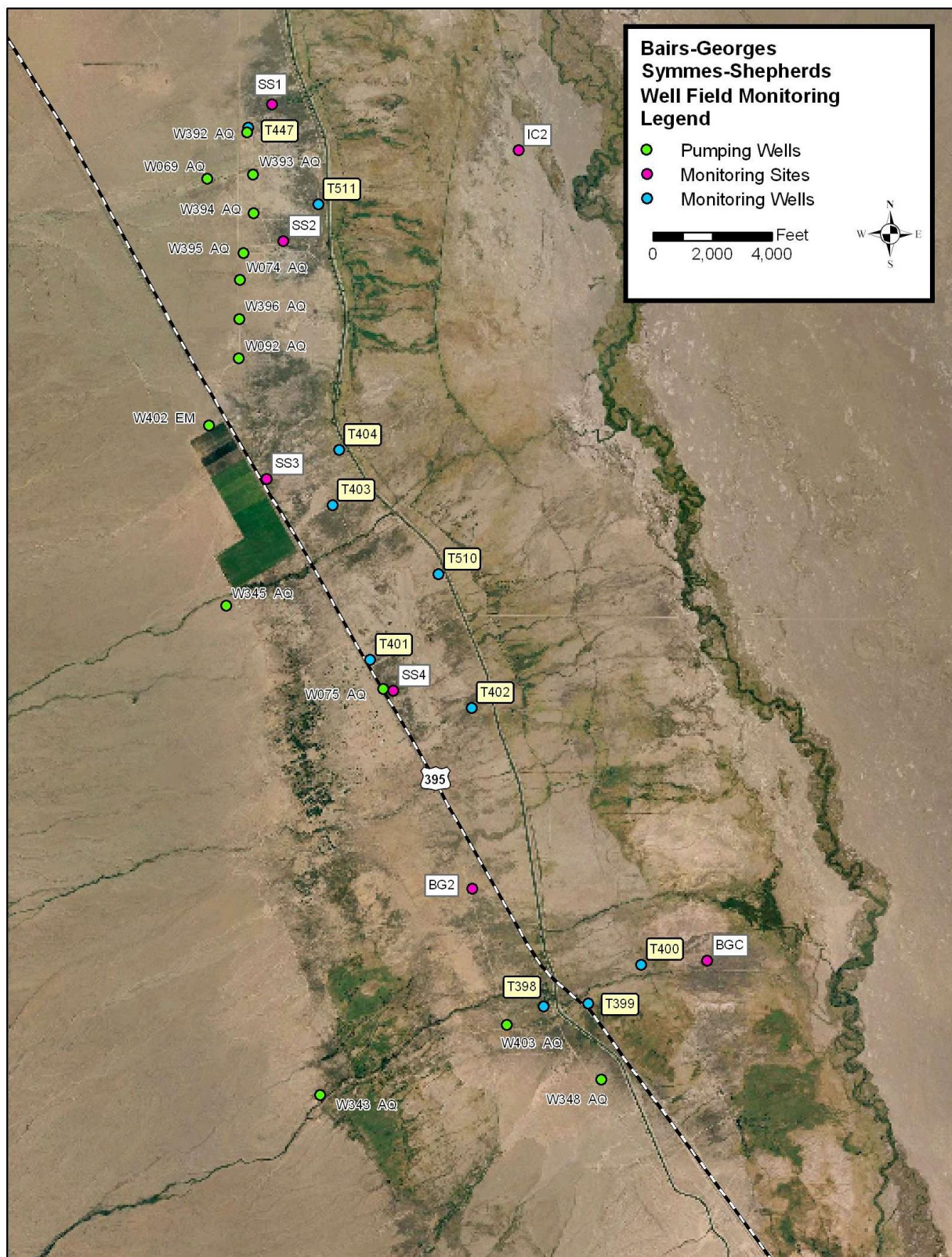


Figure 2.9 - Bairs-Georges and Symmes-Sheperds Wellfields

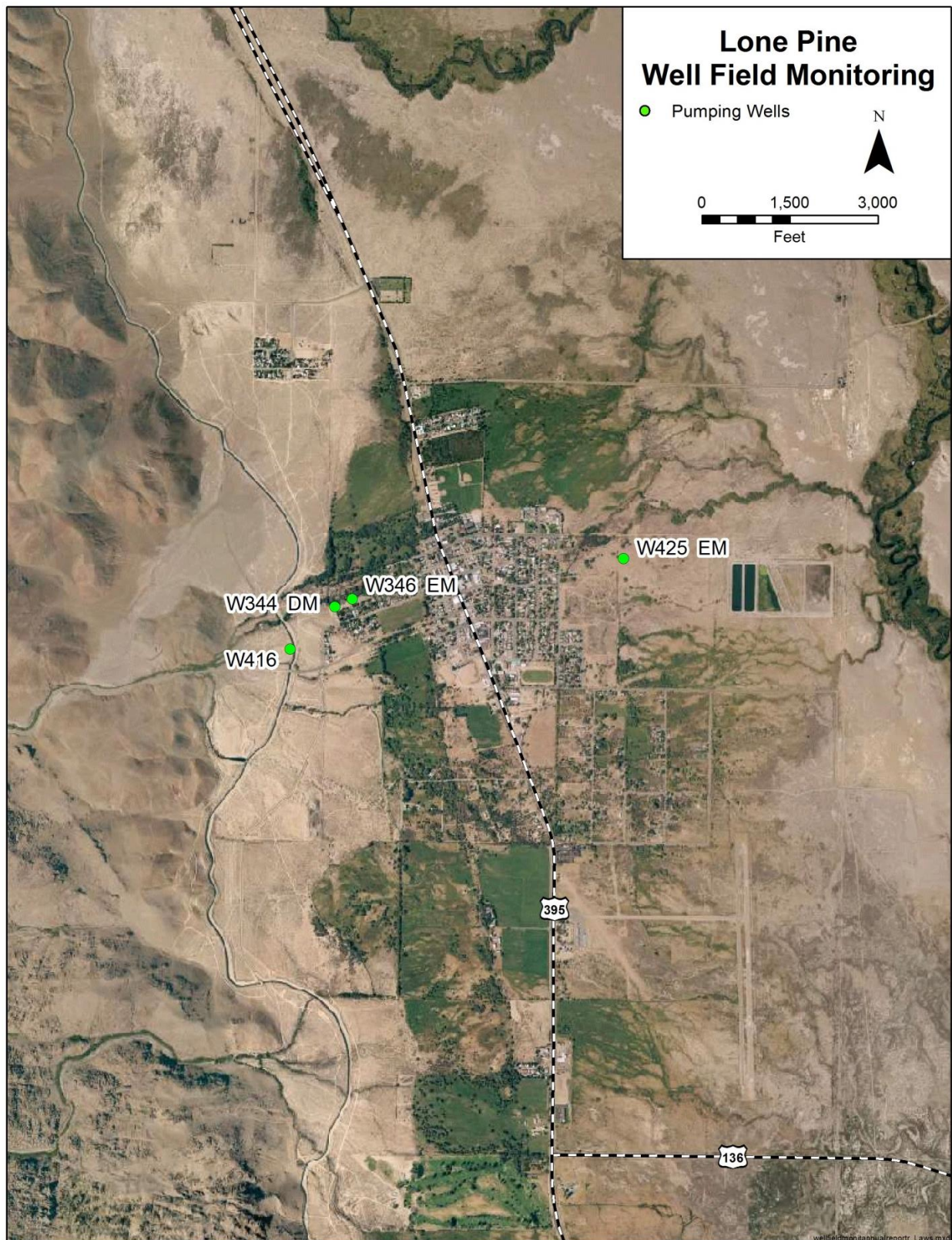


Figure 2.10 - Lone Pine Wellfield

2.3. Owens Valley Uses (Including Enhancement/Mitigation Projects)

Table 2.7 shows the historic (1981-82) uses and the planned monthly uses within the Owens Valley for 2016-17. The in-valley uses shown on Table 2.7 consist of irrigation, stockwater, recreation, and wildlife projects, E/M supply, Lower Owens River Project (LORP) usage, 1600 Acre-Feet Projects, and usage pursuant to California Health and Safety Code Section 42316 for dust abatement projects on Owens Lake. As shown in Table 2.7 and Figure 2.11, LADWP plans to provide approximately 158,400 acre-feet for in-valley uses this runoff year.

Irrigation makes up 45,000 acre-feet of the total 158,400 acre-feet of in-valley uses. This amount of irrigation water is the estimated physical maximum based on existing and anticipated conditions. LADWP intends to pursue a reduction in irrigation pursuant to the terms of the Long Term Water Agreement and Standing Committee direction. If a reduction is applied, the total in-valley uses will be reduced accordingly.

The primary consumptive use of water in the Owens Valley is the Owens Lake Dust Mitigation Program (OLDMP). Water use in the 2015-16 runoff year by the OLDMP was 46,573 acre-feet. Water used for dust mitigation during 2016-17 runoff year is anticipated to be up to 65,100 acre-feet.

Releases to the LORP from the LAA Intake facility began on December 6, 2006. An average flow of over 40 cubic feet per second (cfs) is now maintained throughout the entire 62 mile stretch of the Lower Owens River, south of the Intake structure. When needed, the releases at the Intake are augmented through additional releases at the Independence, Blackrock, Georges, Locust, and Alabama Spill Gates to maintain a continuous flow of at least 40 cfs in the river channel. Table 2.7 shows projected 2016-17 water use by the Lower Owens River Project on a monthly basis, totaling 17,000 acre-feet. Total LORP uses include the Lower Owens River, Owens Delta, Blackrock Waterfowl Management Area, and project associated losses.

The Water Agreement provides that “... *enhancement/mitigation projects shall continue to be supplied by enhancement/mitigation wells as necessary.*” Due to the monitoring sites controlling some of the production wells supplying E/M projects being in OFF status, the amount of water supplied to E/M projects has often exceeded the amount of water provided by E/M project supply wells. LADWP has chosen to supply certain E/M projects from surface water sources in the past. Future E/M allotments may be influenced by the availability of E/M wells and operational demands. Table 2.8 shows the planned water supply to E/M projects and the forecast imbalance between the E/M project water use and the E/M project groundwater supply through the end of the 2016-17 runoff year. E/M project water demands during the 2016-17 runoff year are expected to be approximately 3,450 acre-feet greater than E/M groundwater pumping. The cumulative E/M water supply shortfall is estimated to be approximately 194,700 acre-feet by the end of the runoff year.

The Technical Group is currently evaluating the water supply issues associated with the E/M projects and will provide its findings to the Inyo/Los Angeles Standing Committee. It is expected that the Standing Committee will be requested to take appropriate action

necessary to ensure water supplied to E/M projects is in conformance with the provisions of the Water Agreement.

Table 2.7 - Water Uses on City of Los Angeles Owned Lands in Owens Valley in 1981-82 and 2016-17 Runoff Year (acre-feet)

Use	April		May		June		July		August		September		TOTAL Apr-Sep	
	1981	2016	1981	2016	1981	2016	1981	2016	1981	2016	1981	2016	1981	2016
Irrigation	3,980	5,000	7,958	7,700	10,373	8,600	9,476	8,700	8,295	8,700	6,321	6,000	46,403	44,700
Stockwater	1,141	1,000	1,319	1,100	1,244	1,100	1,245	1,100	1,219	1,000	1,319	1,000	7,487	6,300
E / M	0	1,320	0	1,680	0	1,640	0	1,710	0	1,300	0	1,100	0	8,750
LORP	0	800	0	1,500	0	2,700	0	3,200	0	3,400	0	2,700	0	14,300
Owens Lake	0	8,000	0	10,800	0	7,500	0	2,000	0	4,000	0	9,800	0	42,100
Rec. & Wildlife	379	600	804	900	1,160	950	1,455	1,050	1,381	900	1,406	800	6,585	5,200
1600 ACFT Proj.	0	85	0	91	0	116	0	157	0	74	0	115	0	638
Total	5,500	16,805	10,081	23,771	12,777	22,606	12,176	17,917	10,895	19,374	9,046	21,515	60,475	121,988

Use	October		November		December		January		February		March		TOTAL Oct-Mar		TOTAL Apr-Mar	
	1981	2016	1981	2016	1981	2016	1982	2017	1982	2017	1982	2017	81-82	15-16	81-82	16-17
Irrigation	263	200	0	0	0	0	0	0	0	0	14	100	277	300	46,680	45,000*
Stockwater	1,065	900	1,045	900	1,050	850	1,007	850	1,010	850	1,098	850	6,275	5,200	13,762	11,500
E / M	0	250	0	100	0	100	0	100	0	100	0	100	0	750	0	9,500
LORP	0	1,200	0	800	0	300	0	250	0	250	0	600	0	3,400	0	17,700
Owens Lake	0	9,000	0	3,000	0	2,500	0	1,500	0	2,500	0	4,500	0	23,000	0	65,100
Rec. & Wildlife	781	700	713	500	565	500	478	500	342	300	447	300	3,326	2,800	9,911	8,000
1600 ACFT Proj.	0	215	0	215	0	105	0	97	0	185	0	145	0	962	0	1,600
Total	2,109	12,465	1,758	5,515	1,615	4,355	1,485	3,297	1,352	4,185	1,559	6,595	9,878	36,412	70,353	158,400

* 45,000 Acre-feet of irrigation water is the estimated physical maximum based on existing and anticipated conditions. LADWP intends to pursue a reduction in irrigation pursuant to the terms of the Long Term Water Agreement and Standing Committee direction.

NOTE: Rec & Wildlife includes LORP off-river lakes and ponds water use
An additional 3,200 acre-feet per year is provided to Indian lands

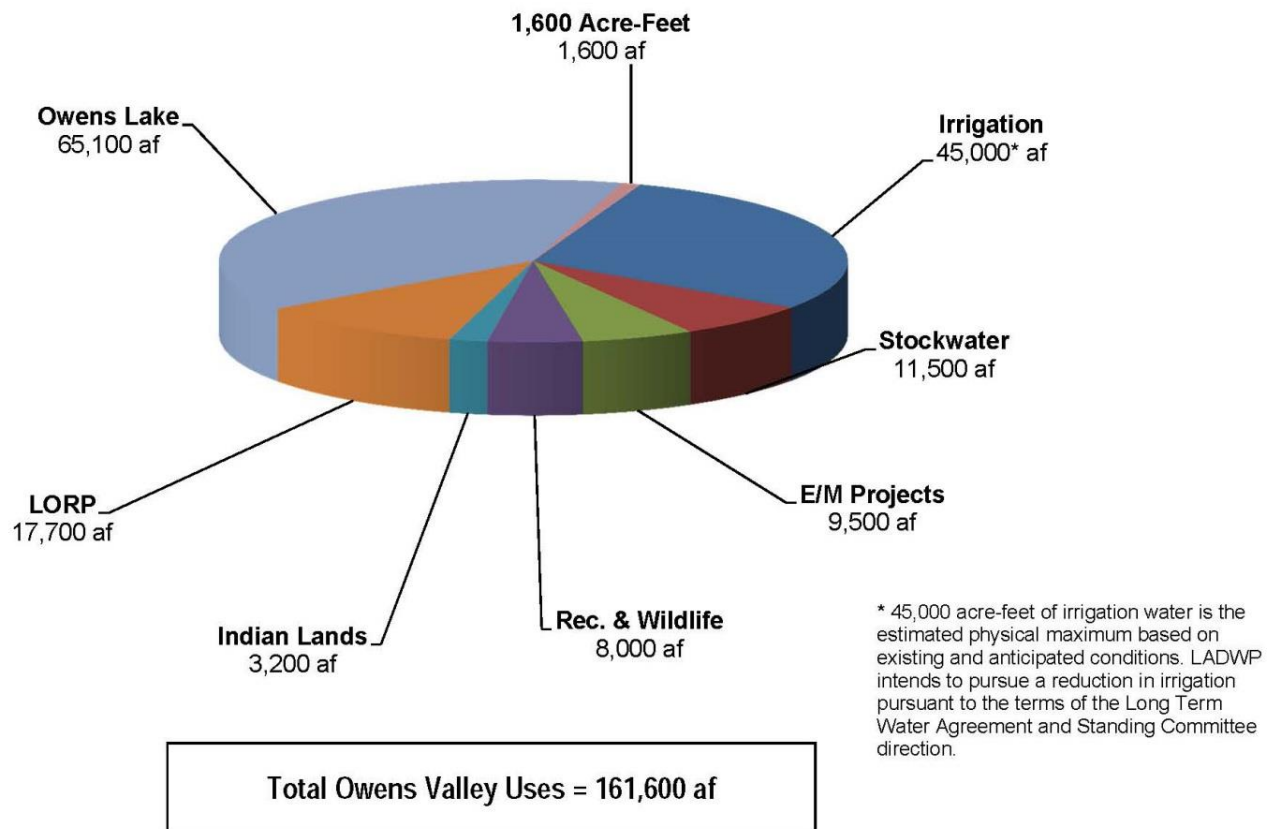


Figure 2.11 - Distribution of Planned Owens Valley Water Use for 2016-17 Runoff Year

**Table 2.8 - Owens Valley Groundwater Pumping and E/M Water Use
(1984-85 through 2016-17 Runoff Year (acre-feet))**

Runoff Year	Owens Valley Runoff (1)	Total Pumping	Non-E/M Pumping	E/M Pumping	E/M Water Uses	E/M Pumping & Use Imbalance	Cumulative E/M Pumping & Use Imbalance
1984-85	122	61,981	61,981	0	0		0
1985-86	103	107,718	107,718	0	109		0
1986-87	158	69,887	69,887	0	12,696	(3)	0
1987-88	68	209,394	179,884	29,510	29,360		0
1988-89	62	200,443	171,012	29,431	30,872		0
1989-90	63	155,972	133,409	22,563	23,330		0
1990-91	52	88,904	70,817	18,087	17,949		0
1991-92	64	87,310	71,520	15,790	20,517	-4,727	-4,727
1992-93	61	84,453	70,688	13,765	18,357	-4,592	-9,319
1993-94	105	76,329	67,338	8,991	19,310	-10,319	-19,638
1994-95	66	89,219	78,209	11,010	20,812	-9,802	-29,440
1995-96	153	69,752	57,180	12,572	22,943	-10,342	-39,782
1996-97	135	74,904	57,981	16,923	23,949	-7,026	-46,808
1997-98	124	66,914	52,760	14,154	21,608	-7,346	-54,154
1998-99	149	51,574	47,353	4,221	19,672	(3)	-54,154
1999-00	89	63,675	59,342	4,333	24,452	-20,117	-74,271
2000-01	84	67,795	61,456	6,339	20,782	-14,272	-88,543
2001-02	83	73,349	70,055	3,294	21,815	-18,521	-107,064
2002-03	66	81,979	76,059	5,920	21,394	-15,474	-122,538
2003-04	81	87,732	80,734	6,998	21,116	-14,118	-136,656
2004-05	77	85,820	78,110	7,710	18,918	-10,617	-147,273
2005-06	136	56,766	51,695	5,071	20,032	-14,285	-161,558
2006-07	146	58,621	53,925	4,696	17,357	(3)	-161,558
2007-08	61	60,338	53,413	6,925	11,565	-4,640	-166,198
2008-09	74	68,971	61,053	7,918	10,646	-2,728	-168,926
2009-10	77	64,138	57,946	6,192	10,697	-4,505	-173,431
2010-11	103	78,248	71,233	7,015	10,407	-3,392	-176,823
2011-12	140	91,699	84,365	7,334	11,462	-4,128	-180,951
2012-13	57	88,689	83,034	5,655	9,257	-3,602	-184,553
2013-14	54	78,809	73,678	5,131	8,222	-3,091	-187,644
2014-15	52	66,625	60,735	5,890	9,510	-3,620	-191,264
2015-16	47	70,272	65,148	5,124	8,800	-3,676	-191,320
2016-17 (2)	71	75,000	68,950	6,050	9,500	-3,450	-194,714

(1) Based on 1961-2010 average. Includes some runoff contribution to the Laws Wellfield from the White Mountains.

(2) this is only Apr-Sep pumping/uses. Forecast for planned pumping of 47,930 acre-feet (planned pumping ranges 36,250-47,830 acre-feet)

(3) surface water was available

2.4- Aqueduct Operations

Table 2.9 shows planned LAA reservoir storage levels and monthly deliveries to Los Angeles. Based on this plan, approximately 114,000 acre-feet will be exported from Inyo and Mono Counties to the City during the 2016-17 runoff year. This is approximately only half of the delivery that would occur in a normal year.

2.5- Water Exports to Los Angeles

Figure 2.12 provides a record of water exports from the Eastern Sierra to Los Angeles, averaging approximately 330,000 acre-feet per year since 1970. Figure 2.13 shows the LAA contribution to the City water supply relative to other sources and the total annual water supplied to Los Angeles since 1970. LADWP estimates that Los Angeles will require about 480,200 acre-feet of water during the 2016-17 runoff year. It is anticipated that water from the Eastern Sierra will make up about 24% of the 2016-17 supply. Water purchases from the Metropolitan Water District of Southern California will provide about 53% of the City's supply, groundwater from Los Angeles area aquifers will provide about 21%, and recycled water will supply about 2% of the City's water needs.

Table 2.9 - Planned Los Angeles Aqueduct Operations for 2016-17 Runoff Year

Month	Owens Valley-Bouquet Reservoir Storage 1st of month Storage (acre-feet)	Aqueduct Delivery to Los Angeles (acre-feet)
April, 2016	179,827	11,008
May	174,296	9,223
June	167,761	11,901
July	170,311	16,909
August	166,137	18,447
September	148,155	16,364
October	124,284	0
November	129,205	0
December	143,792	7,686
January, 2017	153,850	7,686
February	163,525	6,942
March	170,462	7,686
<i>TOTAL</i>	<i>-9,365</i>	<i>113,853</i>

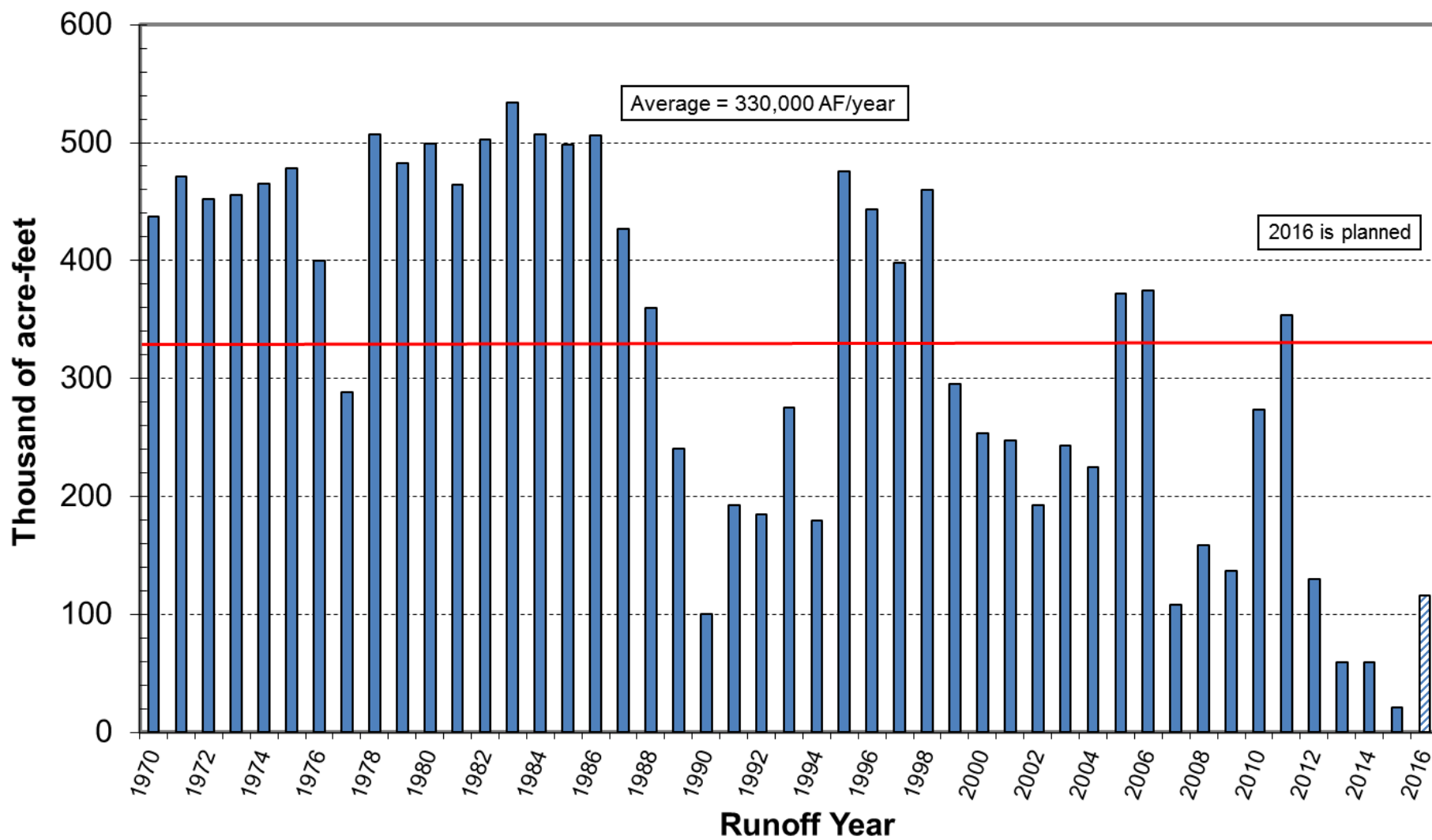


Figure 2.12 - Water Export from Eastern Sierra to Los Angeles

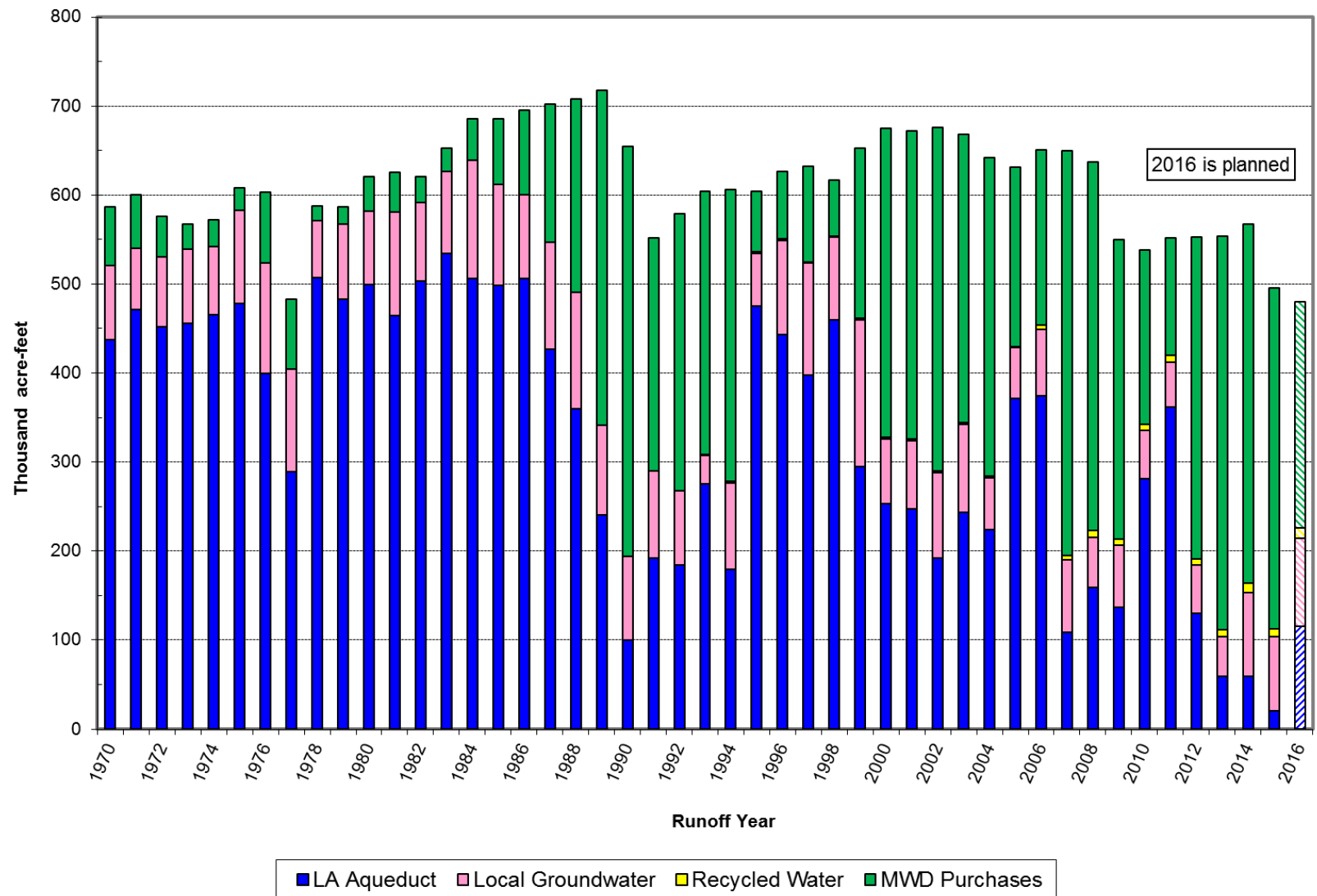


Figure 2.13 - Sources of Water for the City of Los Angeles