

ICWD 2024-25 ANNUAL REPORT

PUMPING MANAGEMENT AND GROUNDWATER CONDITIONS

2025-2026 Operations Plan Summary

In accordance with the Long Term Water Agreement (Water Agreement or LTWA), Los Angeles Department of Water and Power (LADWP) prepares an Operations Plan (Plan) each April for the ensuing 12-month runoff year spanning April 1 to March 31 of the following year. The 2025-26 Plan includes projected amounts for runoff, pumping, water used in the Owens Valley, water exported to Los Angeles, and an update of the groundwater mining calculations. The Plan must also comply with the pumping well On/Off provisions of the LTWA based on soil water and vegetation measurements. The Inyo County Water Department (ICWD) reviews LADWP's proposed Plan, considers current conditions, and performs an analysis of the effects of LADWP's proposed operations on groundwater levels in the Owens Valley that informs their recommendations that they present at a meeting where they receive public comment and input from the Inyo County Water Commission. ICWD then receives direction from the Inyo County Board of Supervisors and prepares a formal comment letter on LADWP's proposed Plan. Following a Technical Group meeting to resolve concerns raised by the County, LADWP finalizes the Plan.

Predicted runoff from the Owens River watershed during the 2025-26 runoff year is forecast to be 375,100 acre-feet (ac-ft or AF) or 92% of the 50-year (1971-2020) average. The actual runoff value will be available in 2026 when all surface water measurements that constitute the sum have been verified and tabulated. Planned pumping for 2025-26 is between 62,160 to 83,760 ac-ft. LADWP is predicting 95,100 ac-ft of water will be used in the Owens Valley, 49,780 ac-ft of which is planned for irrigation. The 2025-26 water exports from the Eastern Sierra (Inyo and Mono Counties) are planned to be slightly lower than 2024-25 exports at 269,000 ac-ft, or 55% of LADWP anticipated annual need.

The Water Agreement and Green Book include procedures to calculate a pumping limit to prevent groundwater mining to ensure that there is no long-term decline in aquifer storage; these calculations are summarized in Table 1.4 of LADWP's 2025-26 Operations Plan and are used to set a maximum pumping limit through September of 2025. Unlike the annual reporting periods which are based on runoff year (April to March), the annual period for the groundwater mining calculation is based on the water year (October 1 through September 30). The mining calculation is a comparison of LADWP pumping and recharge for each wellfield on a water year (WY) basis for the most recent 20-year period. The 19.5-year total of pumping (through April 2025) is subtracted from 20 years of recharge (recharge estimated through September 2025) to arrive at an April to September 2025 pumping limit for each wellfield and the Owens Valley as a whole.

For the 20-year groundwater mining calculation, recharge valley-wide is approximately 3.5 million ac-ft compared to 1.3 million ac-ft of pumping. The WY 2023-24 groundwater recharge in the Owens Valley from the mining calculation was 197,594 ac-ft compared to 33,433 ac-ft of pumping, and no wellfield was in violation of the mining provision in WY 2023-24. The 2024-25 WY estimate of groundwater recharge in the Owens Valley from the mining calculation was approximately 157,610 ac-ft compared to 26,400 ac-ft of actual pumping to-date, and no wellfield is projected to be in violation of the mining provision in 2025. LADWP's Table 1.4 summarized the groundwater mining limits for each wellfield.

Groundwater Mining Calculation from LADWP's Table 1.4 (reproduced below) of its 2025-26 Annual Operations Plan.

Table 1.4. Summary of Recharge and Pumping for WY 2006 - 2024 and Estimated Pumping Limit for Apr-Sep 2025 (AF)

Water Year	OWENS VALLEY	LAWS		BISHOP		BIG PINE		TABOOSE-THIBAUT		IND-SYM-BAIRS		LONE PINE		OWENS VALLEY	
	Runoff Percent(c)	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping
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	11,347	8,960	946	109,297	67,767
2015	43%	10,103	5,824	30,667	10,521	15,380	19,939	18,671	15,563	18,695	11,873	7,995	925	101,512	64,645
2016	63%	10,392	6,038	34,844	10,842	19,551	22,798	25,634	20,642	25,354	18,829	10,306	984	126,082	80,133
2017	175%	45,270	2,000	67,171	4,399	56,730	22,106	71,201	12,959	66,222	9,243	24,741	915	331,335	51,622
2018	93%	14,351	8,646	41,346	9,588	25,911	23,140	34,601	18,896	35,628	12,050	13,807	973	165,643	73,293
2019	132%	34,517	7,127	54,377	5,670	40,650	21,356	48,370	17,000	49,725	9,994	18,534	973	246,174	62,120
2020	76%	11,041	11,170	37,879	9,437	23,190	18,647	29,560	21,503	29,801	9,949	11,742	985	143,212	71,691
2021	46%	10,330	8,337	30,841	10,901	16,215	11,366	20,160	22,339	19,028	9,128	8,036	1,010	104,612	63,081
2022	51%	10,699	8,356	31,498	10,945	17,318	20,086	22,001	20,067	20,708	7,744	8,894	1,005	111,117	68,203
2023	197%	35,127	3,060	66,480	1,491	47,748	15,081	83,056	17,714	83,510	7,580	31,573	861	347,495	45,787
2024	103%	23,294	3,064	43,482	799	28,424	12,868	39,455	9,199	44,824	6,593	18,114	910	197,594	33,433
2025 (a)	88%	12,417	1,502	40,872	3,014	25,576	9,956	31,562	7,304	34,011	4,398	13,172	226	157,610	26,400
(b) TOTAL		346,353	126,113	839,151	170,058	537,769	407,186	713,394	356,095	727,767	220,203	285,205	17,958	3,449,639	1,297,613
Estimated Apr-Sep 2025 Pumping Limit			220,240		669,093		130,583		357,299		507,563		267,247		2,152,026

(a) Estimated Recharge for the 2025 Water Year; Approximate Pumping for First Half of Water year 2025 (Oct-Mar).

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

(c) Mining calculations are based on Water Year (October-September) instead of Runoff Year (April-March).

The Big Pine wellfield is the only wellfield close to its mining limit with pumping at 76% of the total recharge through WY 2024-25 (20-year total recharge of approximately 538,000 ac-ft compared to 407,000 ac-ft pumping). Pumping exceeded recharge during the five-year period of the WY 2012-2016 drought and most recently in WY 2022. This does not constitute a violation of the groundwater mining provision, but ICWD has suggested that pumping in this wellfield be curtailed to include only sole source, in-valley uses. A significant amount of water was spread into the Big Pine wellfield in WYs 2017, 2019, and 2023. Also note that pumping in Big Pine was somewhat reduced in 2020 due to a bacterial infection at the Fish Springs Hatchery. The relatively small difference between pumping and recharge in dry and some average years remains a concern and will continue to be monitored.

For the Owens Valley, the proportion of pumping to recharge in WY 2024-25 is projected to be 17% due to average runoff and pumping. Runoff (as an inflow) and pumping (as an outflow) are two of the components of the Owens Valley groundwater budget. It is important to note that evapotranspiration (evaporation and plant transpiration of groundwater primarily by native vegetation along the valley floor) is another primary component (as an outflow) of the groundwater budget; one that is implicitly protected by the Water Agreement. Therefore, looking at groundwater levels which track change in storage of the Owens Valley groundwater system and availability of groundwater to phreatophytic plants is of primary importance.

An expanded discussion of the 2025-26 Operations Plan is presented in the “2025-26 Operations Plan Details” subsection of this report.

2024-2025 Hydrologic Conditions

For the past runoff year, April 2024 through March 2025, the reported measured runoff was 404,291 ac-ft, approximately 99% of the 1971-2020 long-term average (Figure 1). Total LADWP pumping within the Owens Valley from Laws to Lone Pine for 2024-25 was 48,678 ac-ft, which was 63% of LADWP’s planned maximum pumping amount of 77,413 ac-ft (Table 1). Reported Owens Valley water uses for 2024-25 were 97,378 ac-ft, including 50,713 ac-ft of irrigation, and Eastern Sierra water exports were approximately 271,380 ac-ft, 60% of LADWP’s 2024-25 anticipated annual demand (450,000 ac-ft).

Table 1. LADWP maximum planned and actual pumping by wellfield for the 2024-2025 runoff year. ICWD estimated annual minimum pumping for sole source uses is included for reference only. It is not a constant and varies depending on runoff availability to supply irrigation or mitigation projects with surface water instead of groundwater where possible.

Wellfield	Estimated Minimum Pumping (ac-ft)	Planned Maximum Pumping (ac-ft)	Actual 2024-25 Pumping (ac-ft)	Percent Actual vs. Planned
Laws	6,300	8,290	4,293	52%
Bishop	10,400	9,000	3,811	42%
Big Pine	18,200	21,300	17,119	80%
Taboose-Aberdeen	300	11,325	3,985	35%
Thibaut-Sawmill	8,300	9,648	7,365	76%
Independence-Oak	6,500	9,930	8,472	85%
Symmies-Shepherd	1,200	5,040	2,602	52%
Bairs-Georges	500	1,980	113	6%
Lone Pine	1,000	900	918	102%
Total	52,700	77,413	48,678	63%

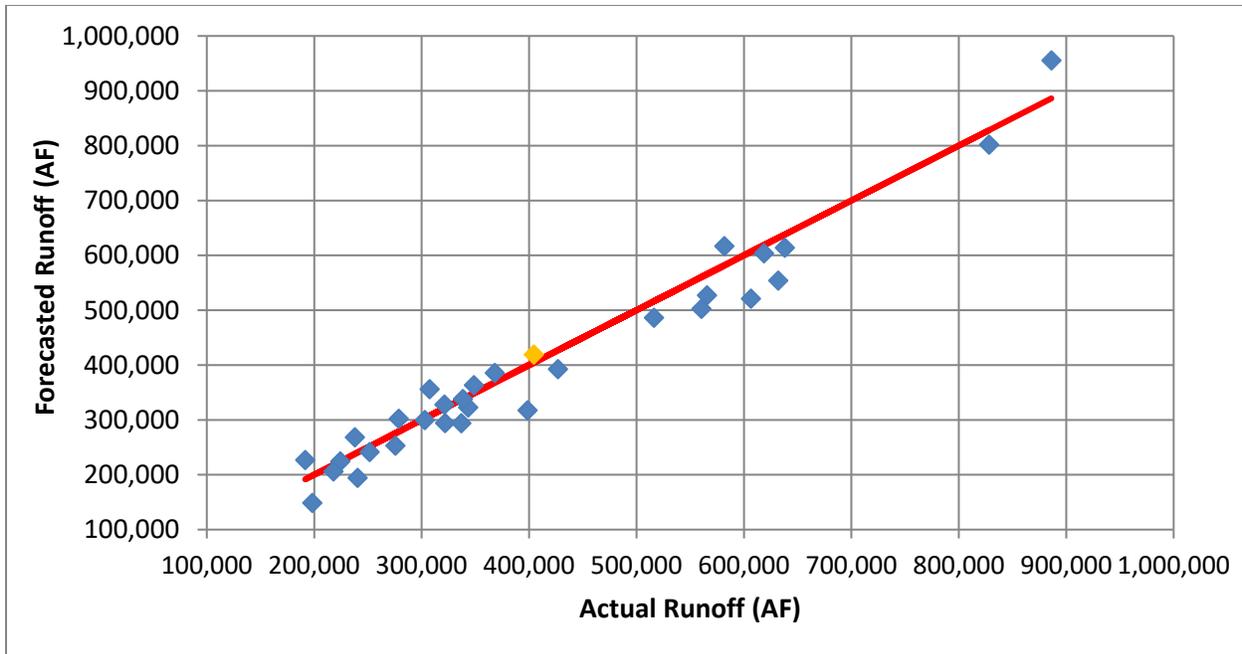


Figure 1. Comparison of actual and forecasted runoff 1994-2025 runoff years with 100% accuracy between forecast and actual runoff in red. The most recent year is the orange diamond (2024 actual runoff was 404,291 ac-ft; forecasted runoff was 419,300 ac-ft).

ICWD uses groundwater levels from a suite of key monitoring wells (Indicator wells) located throughout the Owens Valley near LADWP wellfields to both track and predict, using regression models, the effects of groundwater pumping on water tables. The effect of pumping and runoff in 2024-25 on water levels in the Indicator Wells is shown in the histogram in Figure 2 and listed in Table 2.

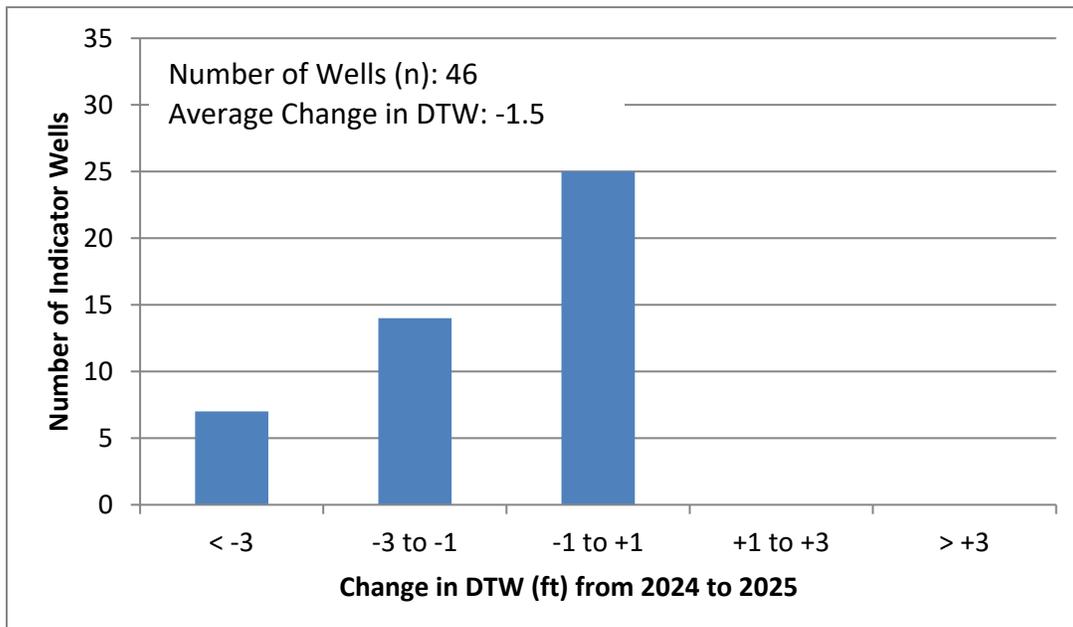


Figure 2. Histogram of change in Depth to Water between April 2024 and April 2025 for 46 Indicator test wells. Positive changes indicate rising (shallowing) water tables.

Groundwater levels decreased in 42 of the 46 Indicator monitoring wells (Figure 2) due to a combination of antecedent conditions of high 2024 water levels from the record wet 2023 winter, average 2024-25 runoff (99% of average), and low pumping (70% of 1992-2024 average). The average change in depth to water (DTW) in the 46 wells from April 1, 2024, to 2025 was a decrease of -1.5 feet, with a median decrease of -0.9 feet. The largest wellfield average decreases were observed in Laws (-3.4 ft), Big Pine (-1.5 ft), Independence-Oak (-1.6 ft), and Bairs-Georges (-2.1 ft). Taboose-Aberdeen (-0.6 ft), Thibaut-Sawmill (-0.9 ft), and Symmes-Shepherd (-0.4 ft) wellfields saw more moderate decreases of less than one foot. Despite valley-wide groundwater level decreases, levels remained above those of the mid-1980's vegetation baseline period in about 65% (30 of 46) of the Indicator wells. DTW is informational only and has no role in On/Off determination which relies on soil water and vegetation measurements. See the Soil Water Conditions Section of this report for additional details.

Table 2. Depth to water at Indicator wells, April 2025. All data are in feet from reference point on the test well. Negative values denote a decline in water level. Average values by wellfield are shown in orange text. Baseline at monitoring sites is the April average of water levels from years 1985-87. Baseline was predicted from monitoring site/Indicator wells regression models if the test well was not present from 1985-87.

Station ID, Monitoring site	DTW April 2025	Change from April 2024	Deviation from Baseline in 2025
	ft-bgs	ft	ft
Laws <i>Avg.</i>		-3.4	5.1
107T	19.29	-2.58	4.98
434T	4.93	-0.75	2.67
436T	5.37	-1.02	2.73
438T	8.79	-2.85	0.81
490T	6.45	-2.65	6.62
492T	21.19	-7.34	11.61
795T, LW1	7.67	-4.89	5.62
V001G, LW2	11.66	-3.10	7.96
574T, LW3†	9.83	-5.14	3.25
Big Pine		-1.5	5.1
425T	6.58	-4.91	8.32
426T	7.40	-0.65	4.17
469T	19.31	-0.01	2.36
572T	8.03	-1.07	3.87
798T, BP1	11.38	-2.26	4.67
799T, BP2	16.68	0.04	1.83
567T, BP3	5.68	-2.99	8.28
800T, BP4	6.34	0.01	7.25
Taboose-Aberdeen		-0.6	3.1

Station ID, Monitoring site	DTW April 2025	Change from April 2024	Deviation from Baseline in 2025
	ft-bgs	ft	ft
417T	22.15	-0.91	4.82
418T	4.45	-0.73	3.78
419T, TA1	3.76	-0.12	2.87
421T	30.88	-0.63	3.47
502T	7.54	-0.43	-0.05
504T	6.86	-1.02	3.91
505T	13.81	-0.93	4.79
586T, TA4	4.97	-0.89	3.35
801T, TA5	13.91	0.17	-0.39
803T, TA6	3.78	-0.91	4.92
Thibaut-Sawmill		-0.9	5.3
415T	8.78	-0.38	9.72
507T	4.98	-0.96	-0.31
806T, TS2	6.77	-1.50	6.41
Independence-Oak		-1.6	-2.1
406T	3.92	-2.35	-2.35
407T	9.53	-0.15	-2.23
408T	3.45	-0.65	-0.32
409T	4.02	-3.07	-2.42
546T	5.84	-1.81	-2.41
809T, IO1	9.27	-1.82	-2.70
Symmes-Shepherd		-0.4	-3.3
402T	9.62	-0.15	-1.59
403T	5.53	-0.74	-0.20
404T	5.19	-0.37	-1.62
447T	31.55	-1.35	-9.68
510T	6.63	-0.07	-1.63
511T	5.98	0.46	-1.35
V009G, SS1	13.75	-0.64	-6.92
Bairs-Georges		-2.1	1.2
398T	4.61	-1.12	1.74
400T	5.81	-0.89	0.49
812T, BG2	12.12	-4.25	1.34
Wellfield Average		-1.5	+2.1

The history of Owens Valley runoff and pumping since 1970 is presented in Figures 3 and 4, respectively. Since the Water Agreement and Drought Recovery Policy were adopted and implemented (1992), annual pumping has averaged approximately 69,800 ac-ft and runoff 408,000 ac-ft.

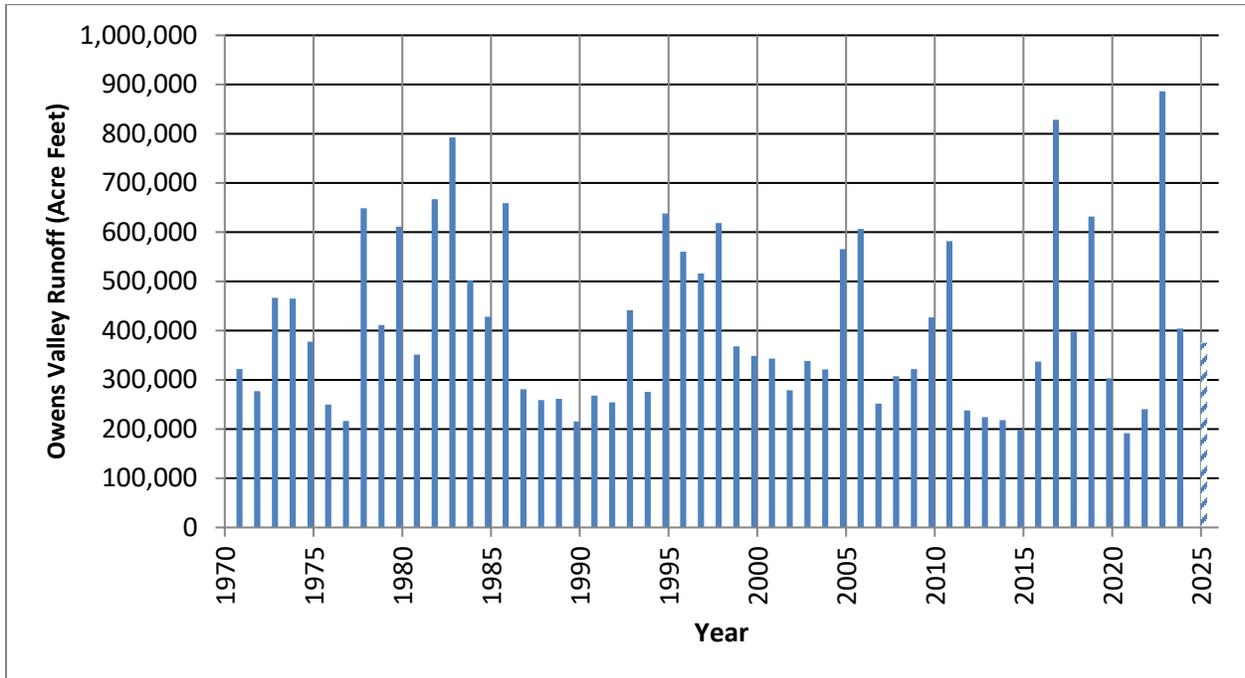


Figure 3. Measured Owens Valley runoff since 1970. Values are for the runoff year (e.g. runoff year 2024 includes April 1, 2024, through March 31, 2025). Dashed line is current runoff year estimate.

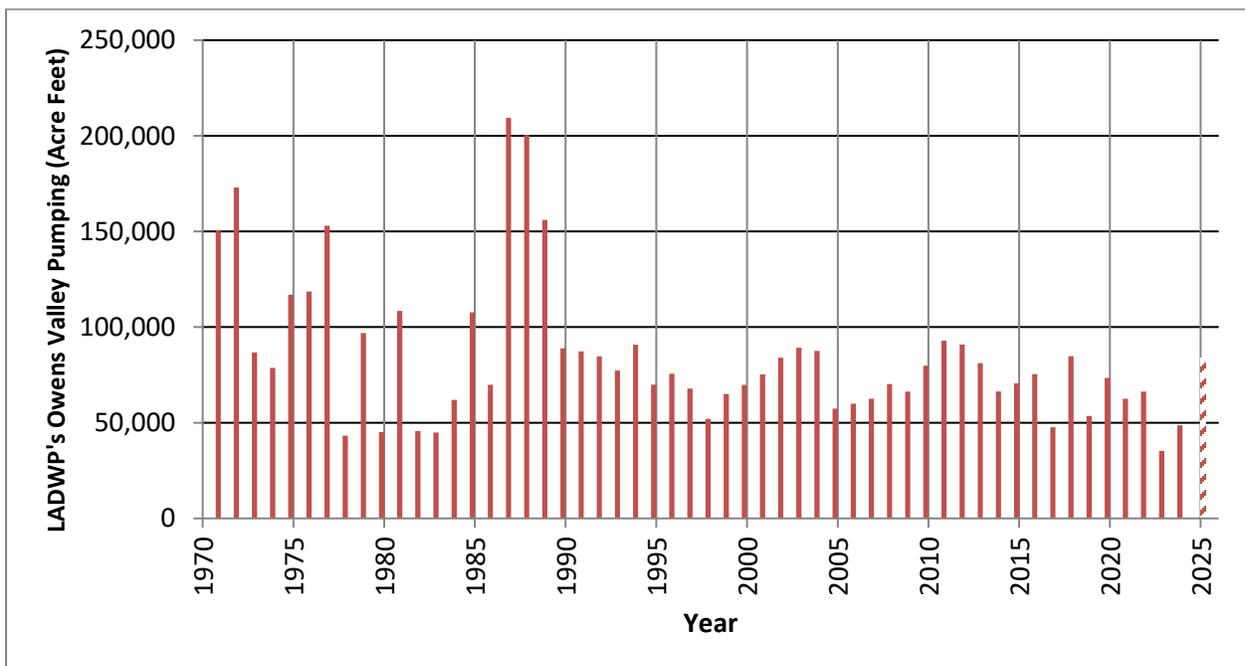


Figure 4. Total LADWP pumping in the Owens Valley since 1970 by runoff year. Dashed line is anticipated maximum pumping for current runoff year.

Groundwater data are collected from several hundred monitoring wells located throughout the Owens Valley each spring and fall. Most wells are also visited on more frequent (monthly-quarterly) schedules. A number of monitoring wells are also equipped with a pressure transducer and datalogger that records sub-daily water level measurements. Data presented in this section are depth to water below ground surface measured in feet (ft-bgs).

In addition to using Indicator wells, another method to assess hydrologic conditions in the Owens Valley is to compare recent groundwater levels with historic conditions in monitoring wells across the valley. The Water Agreement uses the vegetation conditions documented from surveys conducted from 1984 to 1987 as its baseline for comparison of vegetation change. Therefore, ICWD uses the average April groundwater levels from 1985 to 1987 as a hydrologic “baseline.” For more details and current vegetation status, see the vegetation graphs and interactive application available at <https://www.inyowater.org/documents/reports/inyo-county-water-dept-annual-report/>

While this hydrologic baseline is not specifically prescribed in the Water Agreement, it is a useful summary statistic representing the hydrology and the vegetation conditions of the baseline period. Also, the April timeframe is when DTW is typically shallowest each year for many of the wellfields. The hydrologic baseline DTW usually is an adequate indicator related to groundwater and vadose zone moisture availability for phreatophytic vegetation but should be considered a guide rather than a specific threshold that determines whether vegetation conditions are above or below baseline in the immediate vicinity of a monitoring well. Unlike the vegetation baseline, maintaining baseline DTW is not a requirement of the Water Agreement.

The very wet 2017, strong 2019, and record 2023 winter contributed to water table recovery (i.e., increases) from the recent drought periods. Runoff from these wet years and associated decreases in pumping resulted in increases in water levels across all wellfields to above baseline conditions by April of 2024, except for the chronically below baseline Independence-Oak and Symmes-Shepherd wellfields. During runoff year 2024-25 water levels declined from these high levels across all wellfields (Figure 5). Independence-Oak and Symmes-Shepard remained the two wellfields below baseline as of April 2025 (Figure 6) based on a set of approximately 180 monitoring wells that have measurements from the mid-1980s to the present.

Hydrographs plotting DTW for selected wells are provided in the following discussions of conditions for each wellfield. The hydrographs presented below were selected as representative wells that provide insight on water level changes over time.

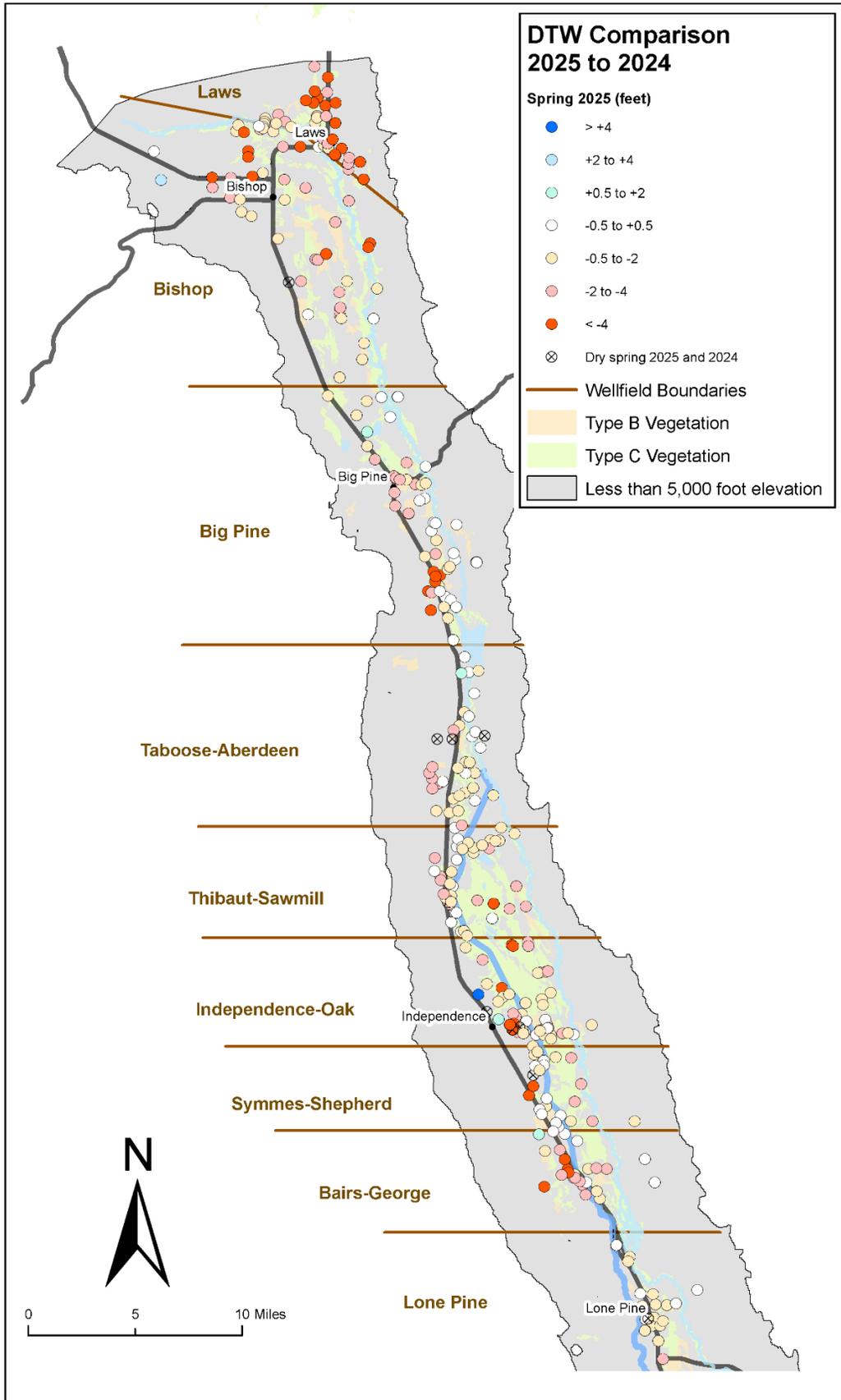


Figure 5. Change in water levels in Owens Valley monitoring wells from spring 2024 to 2025.

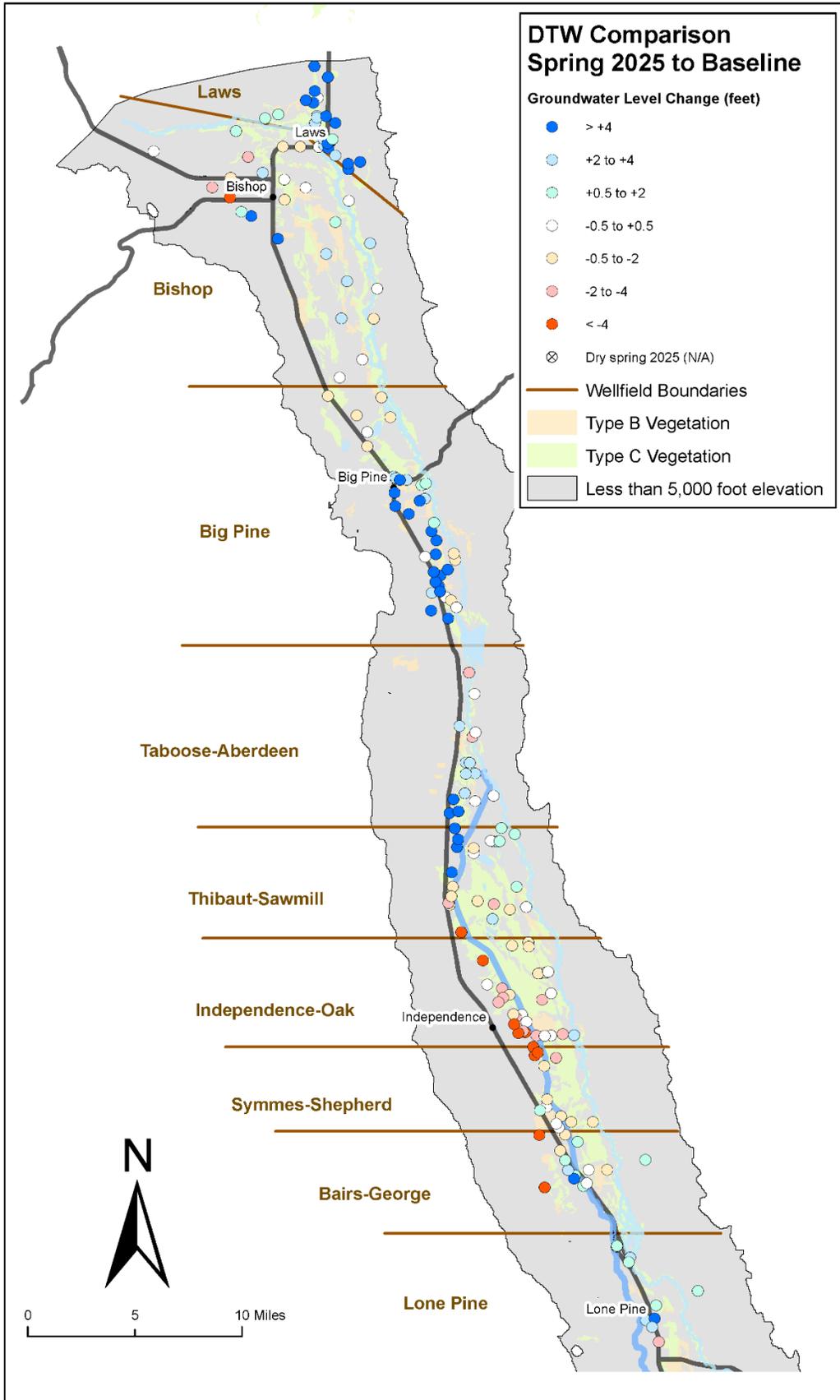


Figure 6. Spring 2025 groundwater levels wells compared with average water level in spring 1985-87.

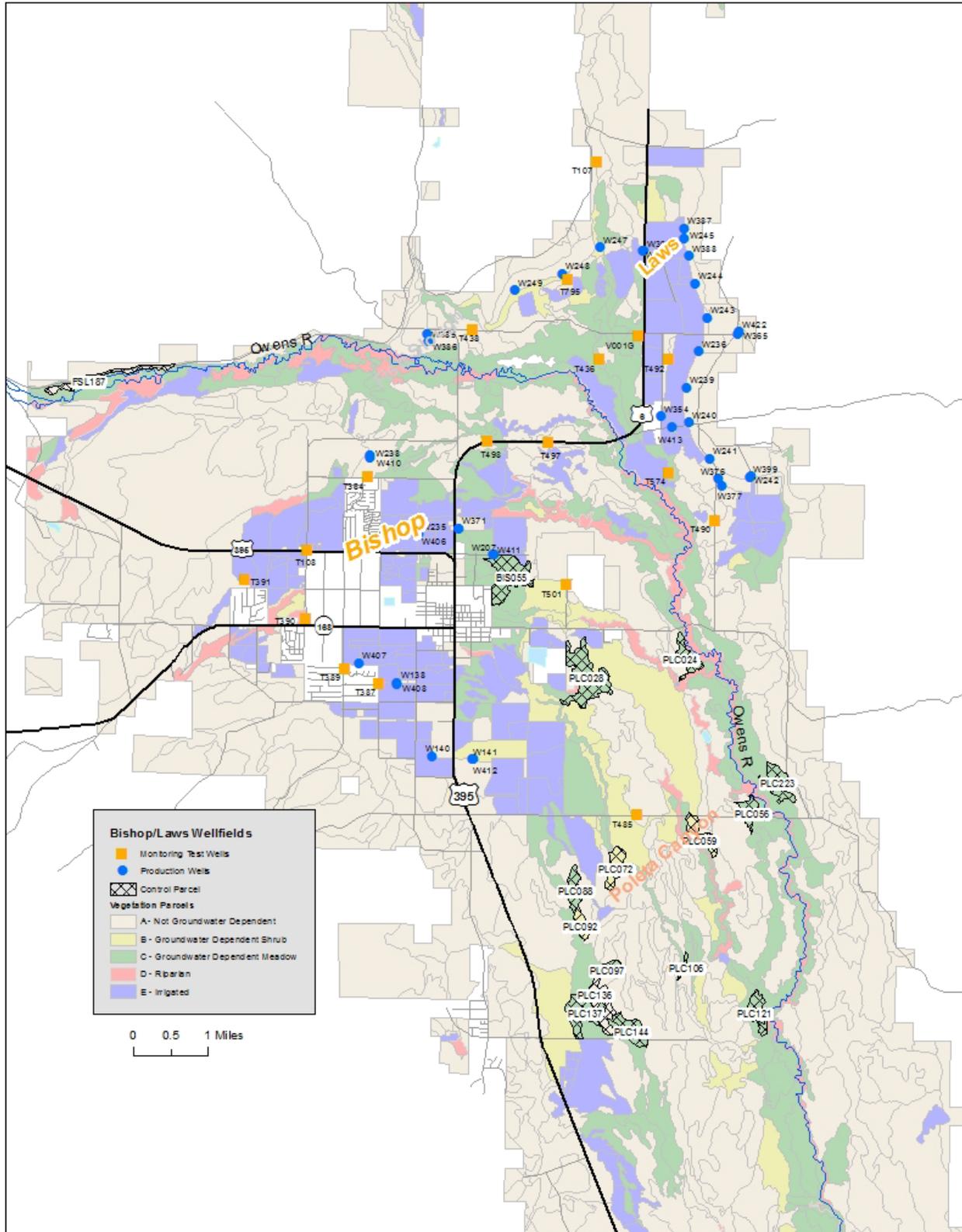


Figure 7. Map of monitoring wells and LADWP production wells in Laws and Bishop wellfields.

Laws Wellfield

In the 1970's and 80's, pumping along with irrigation and spreading from the Owens River via the McNally canals in Laws varied greatly from year-to-year, causing large fluctuations in the water table (Figures 8 and 9).

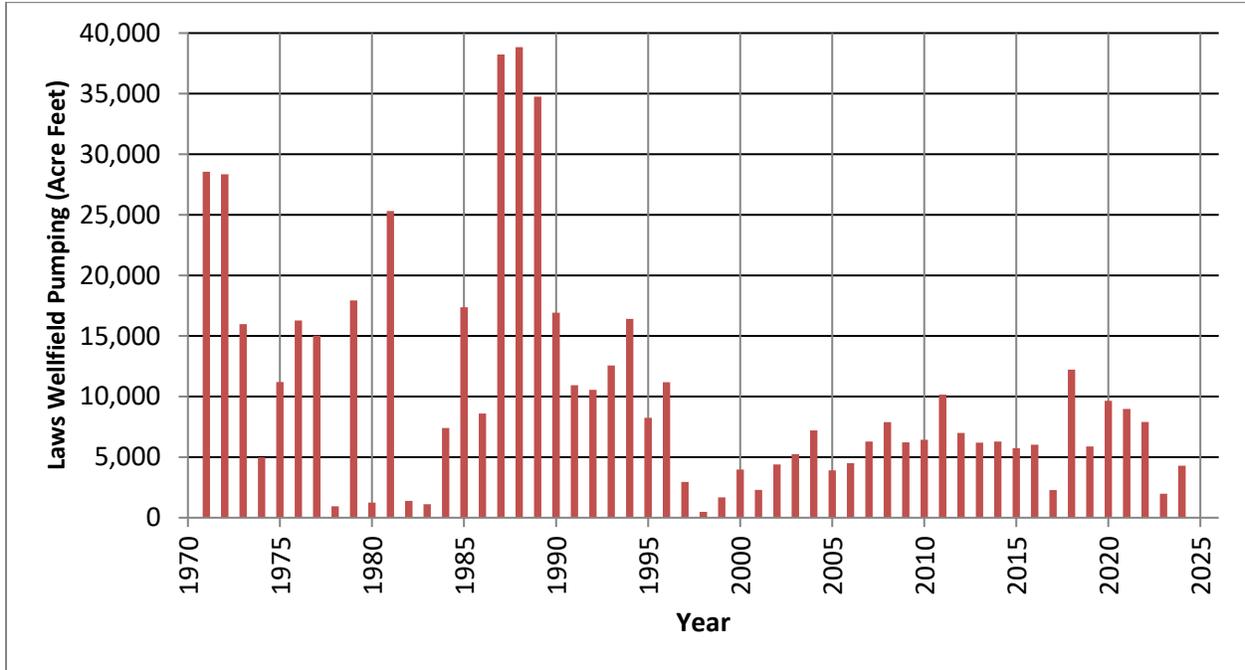


Figure 8. Pumping totals for the Laws wellfield.

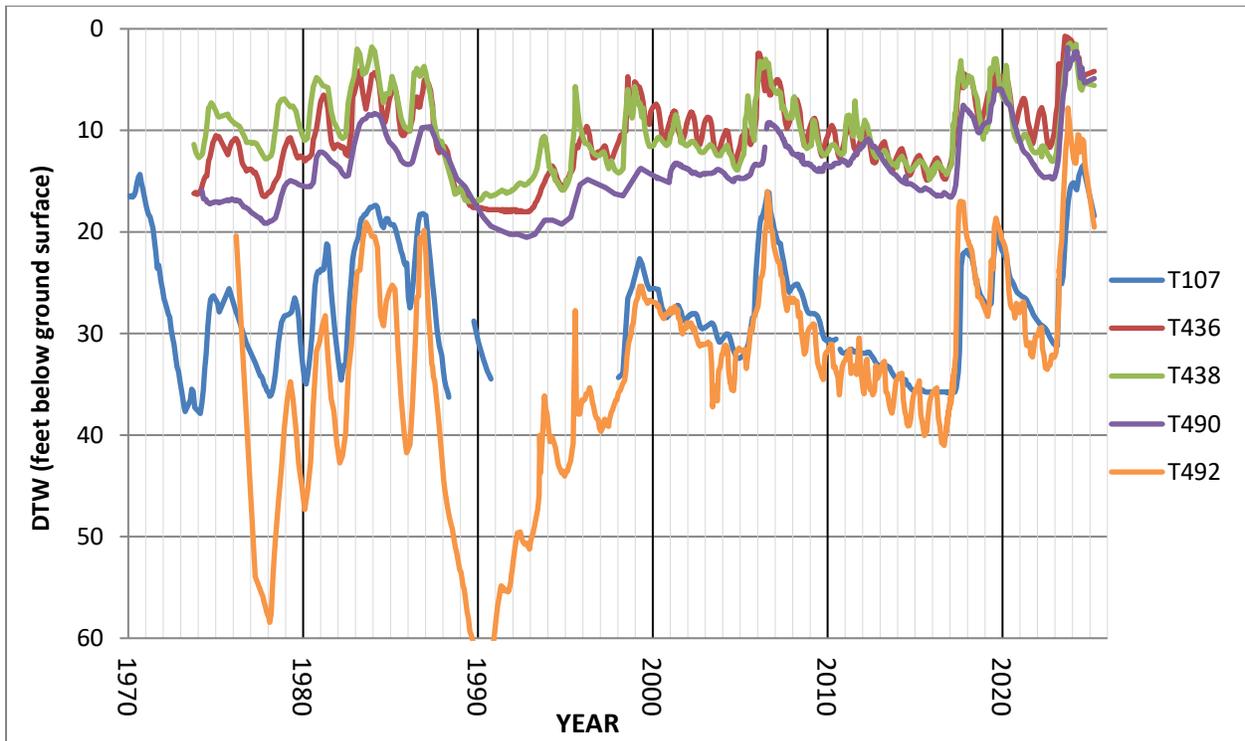


Figure 9. Hydrographs of Indicator wells in the Laws wellfield. Well T492 is dry if DTW is below 60 ft, and well T107 is dry if DTW is below 37 feet.

This was especially true for T107 and T492 due to their proximity to the McNally canals and LADWP pumping wells. Heavy pumping and low recharge in the late 1980's caused severe groundwater level decline in Laws. Under the Water Agreement, pumping has remained considerably below the maximum wellfield capacity. As a result, water levels rose, and beginning in 2000, water table fluctuations have been largely driven by pumping for local uses in the surrounding area and by water spreading following heavy snow winters (2005, 2006, 2011, 2017, 2019, 2023). In 2024-25, groundwater levels decreased in all Indicator wells from the high water levels observed from the runoff and spreading from the record wet 2023 winter. All Indicator wells were above baseline as of April 2025 (Table 2).

Bishop Wellfield

Groundwater pumping in the Bishop wellfield is managed differently than other wellfields in Owens Valley due to additional legal requirements governing LADWP operations. The environmental protections and goals of the Water Agreement still apply, however. The Water Agreement requires ICWD and Los Angeles to prepare an annual audit of pumping and uses on the Bishop Cone to demonstrate compliance with the Hillside Decree (the Decree itself does not contain audit procedures). The Hillside Decree is a 1940 Inyo County Superior Court stipulation and order under which LADWP groundwater extractions from both pumped and uncapped flowing wells cannot exceed the annual amount of water used on LADWP-owned land on the Bishop Cone.

The most recent Bishop Cone Audit examined conditions for the 2024-25 runoff year. Total LADWP groundwater extraction (pumping and flowing wells) on the Bishop Cone was 10,450 ac-ft compared with 33,557 ac-ft of recorded uses. Therefore, uses on the Bishop Cone exceeded extractions by approximately 23,107 ac-ft. If extractions had exceeded the amount of recorded uses, all groundwater could not have been used on the Bishop Cone and LADWP would be out of compliance with the Hillside Decree. This has not occurred since the audit procedures were implemented as part of the Water Agreement. The Bishop Cone Audit for the 2024-25 Runoff Year is available on ICWD's website at <https://inyowater.org/documents/reports/bishop-cone/>.

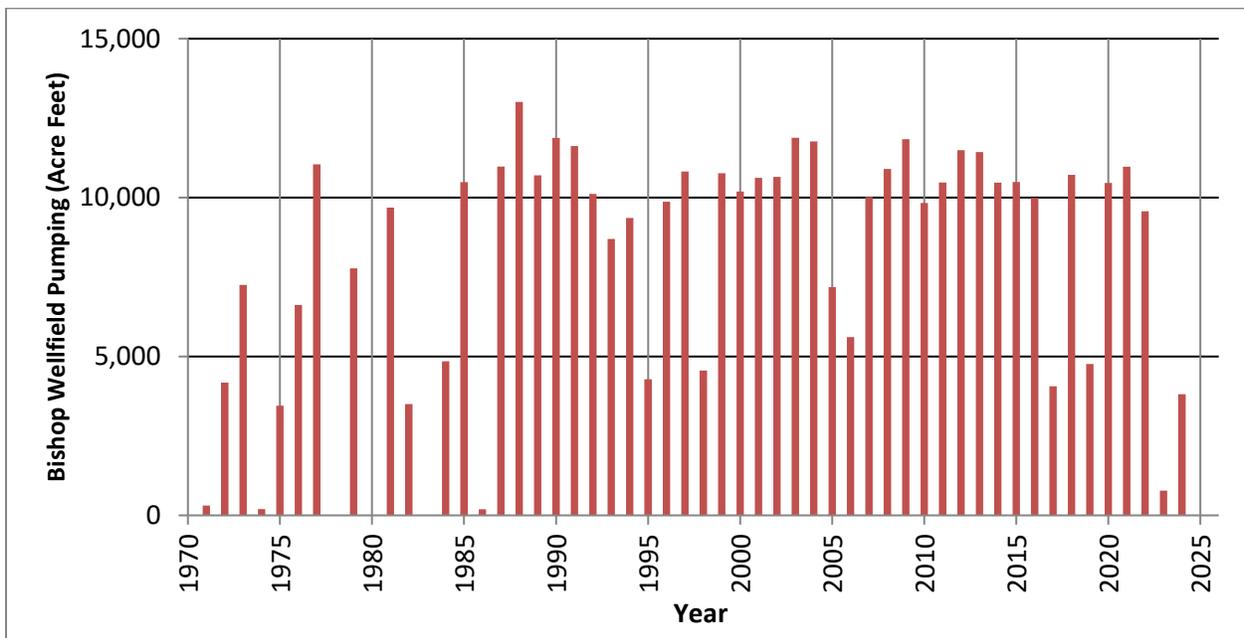


Figure 10. Pumping totals for the Bishop wellfield.

Pumping in the Bishop wellfield has been relatively constant for the past 35 years except in above-normal runoff years when pumping decreased, for example 1998, 2006, 2017, 2019, and 2023 (Figure 10). Because of the Hillside Decree and relatively constant pumping, ICWD does not routinely use Indicator wells to analyze LADWP’s annual operations plan for this wellfield. Water levels in west Bishop typically peak after the summer irrigation season. Groundwater levels from 1975 to 2025 at several test wells located west, north, and east of the city of Bishop are presented in Figures 11.a-c. Constant pumping and consistent recharge from irrigation has historically resulted in relatively stable water levels in the Bishop wellfield. However, the effects of the 2012-2016 drought (e.g., Figure 11.a) and the recent 2020-22 drought (e.g., Figure 11.b) can be seen in the groundwater levels from Bishop Cone wells.

It is likely that a combination of diminished surface water flows caused by the 2012-2016 drought and the change in Bishop Creek surface flows negatively affected shallow groundwater levels in west Bishop from fall of 2013 through the winter of 2014. Groundwater levels dropped precipitously, in some cases to their lowest recorded levels. Several domestic wells went dry. Hydrographs of these groundwater declines can be seen in Figure 12. The declining groundwater levels prompted both ICWD and LADWP to increase the frequency of their monitoring on the western half of the Bishop Cone in order to more fully understand the changes in groundwater levels during the prolonged drought.

Groundwater levels recovered from the low water tables of 2013-14. During this recovery, several residents of west Bishop noticed extremely shallow or perched groundwater at their properties. It is theorized that once creek and ditch flows returned to the area in 2014, increased seepage of surface water led to the oversaturation of the near surface sediments. Additional investigations were conducted in 2016, including a report issued by the Department of Water Resources.

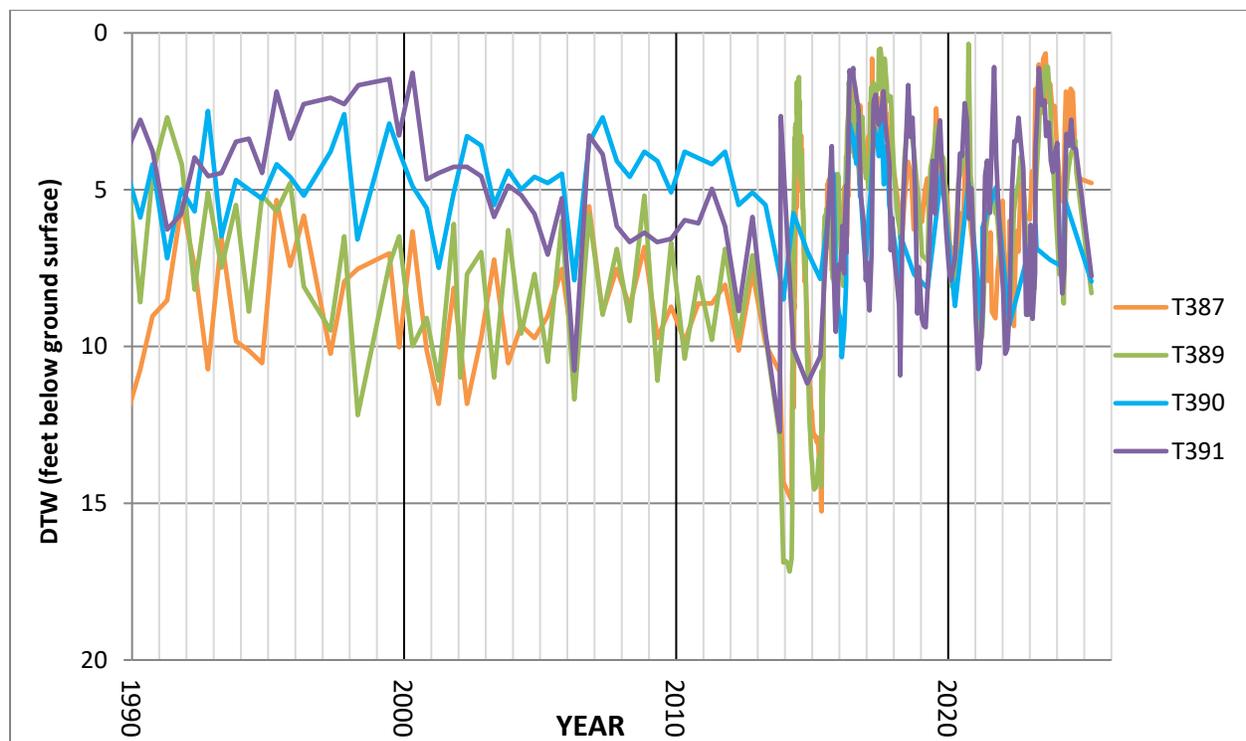


Figure 11.a. Hydrographs of selected monitoring wells in the western Bishop wellfield. Locations of the wells are shown in Figure 7.

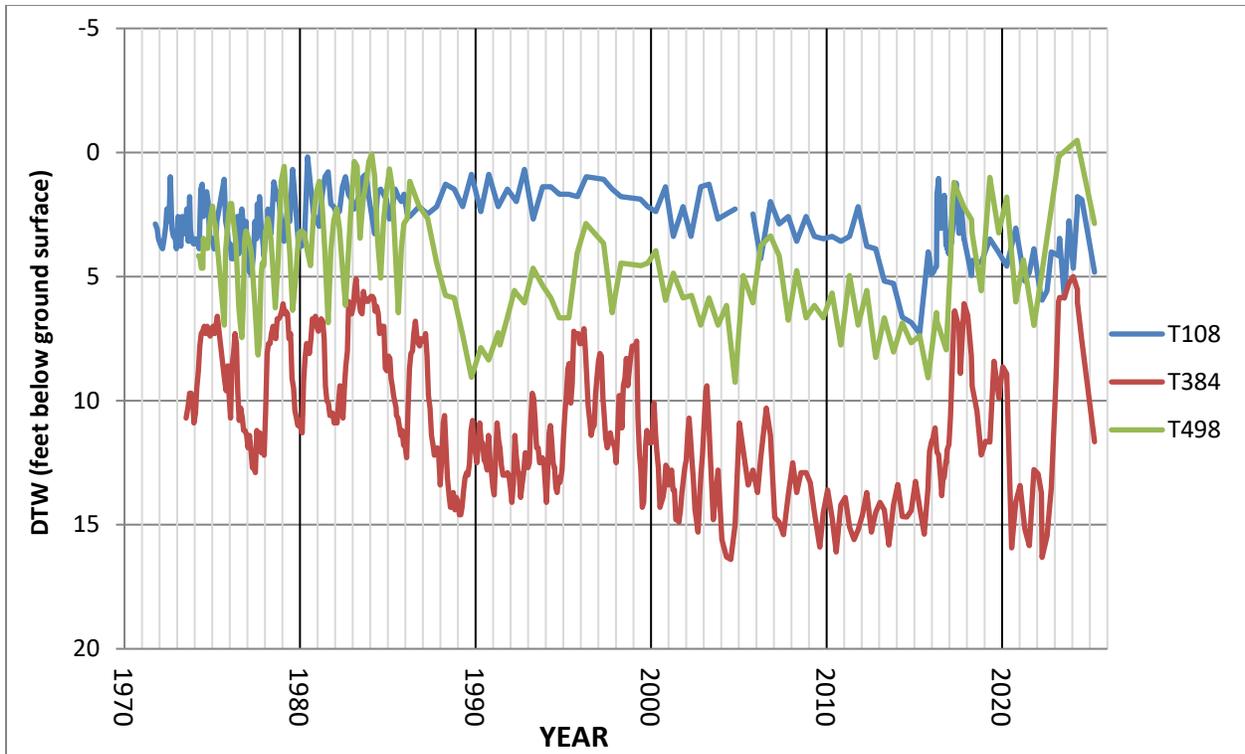


Figure 11.b. Hydrographs of selected monitoring wells in the northern Bishop wellfield. Locations of the wells are shown in Figure 7.

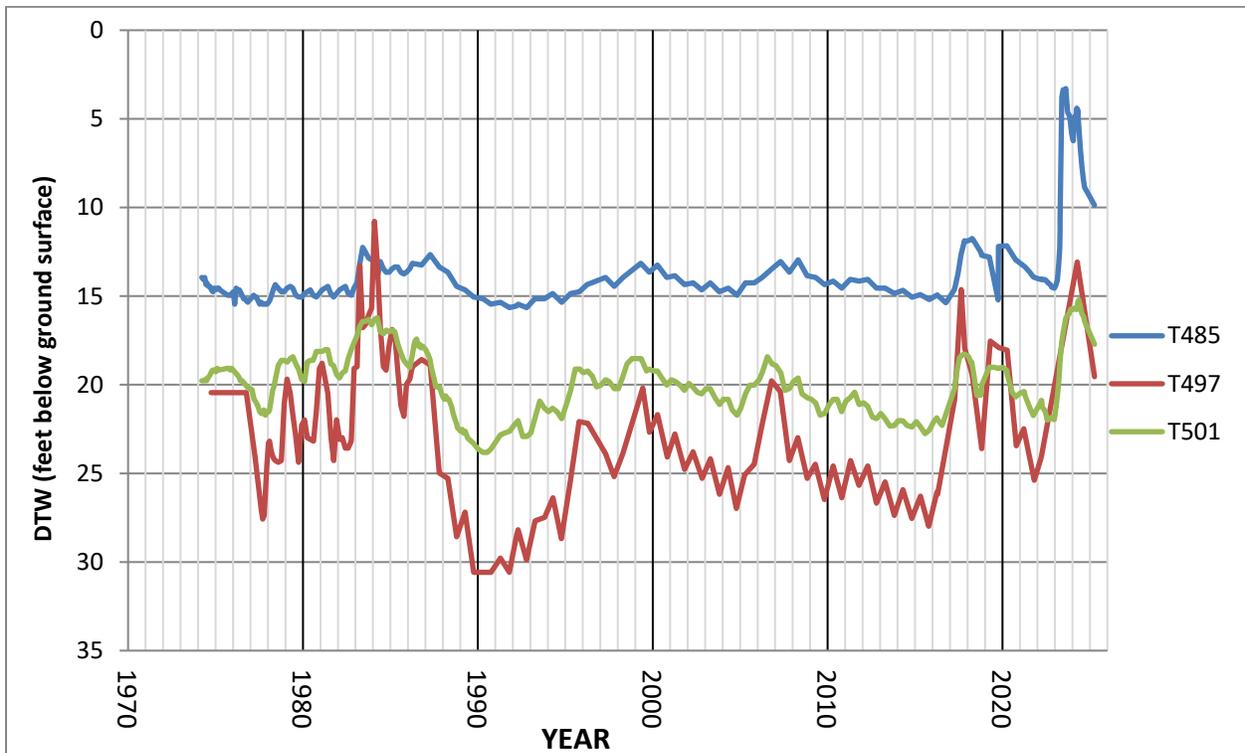


Figure 11.c. Hydrographs of selected monitoring wells in the eastern Bishop wellfield. Locations of the wells are shown in Figure 7.

After the summer/fall of 2017, fewer problems with shallow groundwater were reported, and it is probable that the natural sealing caused by decaying biomass in ditches and ponds led to a decrease in the 2014-15 seepage rates, lowering seepage back to their pre-2014 rates; and that the west Bishop hydrologic system has reverted to its historic equilibrium. Due to another significant winter in 2019-20 and the record wet 2023-24, flows in Bishop Creek significantly exceeded both the Chandler Decree minimums and also long-term averages, but no flooding problems were reported associated with shallow or perched groundwater.

For 2024-25, snowpack in the Bishop Creek drainage was approximately 89% of average (i.e., as of April 1, 2024); 2025-26 snowpack was 75% of the April 1 average. Creek flows are expected to be near or below long-term averages and are expected to exceed the primary Chandler flows for the 2025-26 season. Groundwater levels in spring 2025 were consistent with recent average levels since the end of the 2012-2016 drought in part because flows in Bishop Creek have remained at levels that have allowed ditches to remain active.

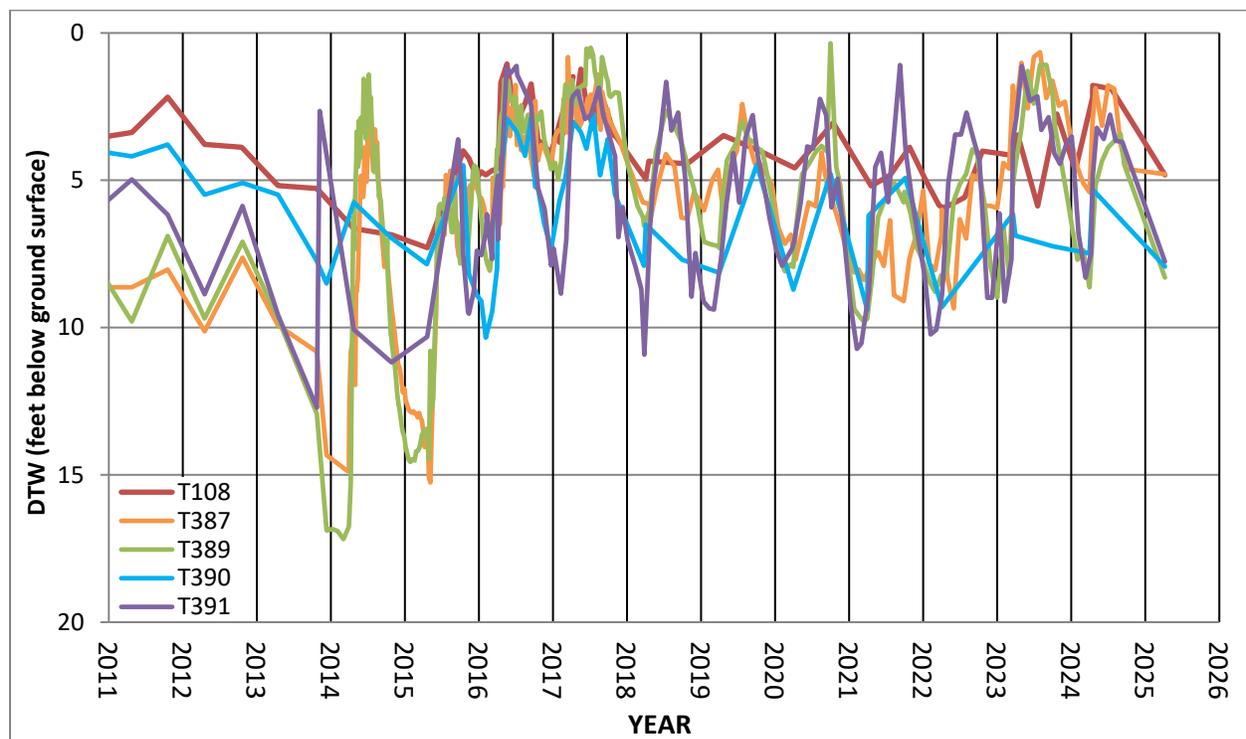


Figure 12. Recent hydrographs of selected monitoring wells in western Bishop wellfield. Locations of the wells are shown in Figure 7.

Important observations from recent Bishop Cone conditions:

- Surface water flows play an integral role in recharging shallow groundwater levels in west Bishop; and the interaction between surface water and groundwater recharge is very sensitive to changes in equilibrium conditions
- Semiannual monitoring in spring and fall does not capture the full range of groundwater fluctuations in the Bishop area
- Water management of Bishop Creek flows and the associated diversion and ditch flows should maintain some flow in area ditches during drought and/or low runoff years

- In west Bishop there is a delicate balance between enough surface water seepage to recharge area groundwater and too much seepage to overwhelm infiltration rates, leading to undesirable consequences to landowners from extremely shallow or perched water levels
- Many of the private wells in west Bishop are shallow and are, therefore, more vulnerable to impacts associated with lowered groundwater levels
- Conservative pumping practices should be used on LADWP wells W407 and W408 during drought and/or low runoff years
- Information gathered in west Bishop during the past several years should be taken into consideration in regard to LADWP's potential new wells at sites B2 and B5.

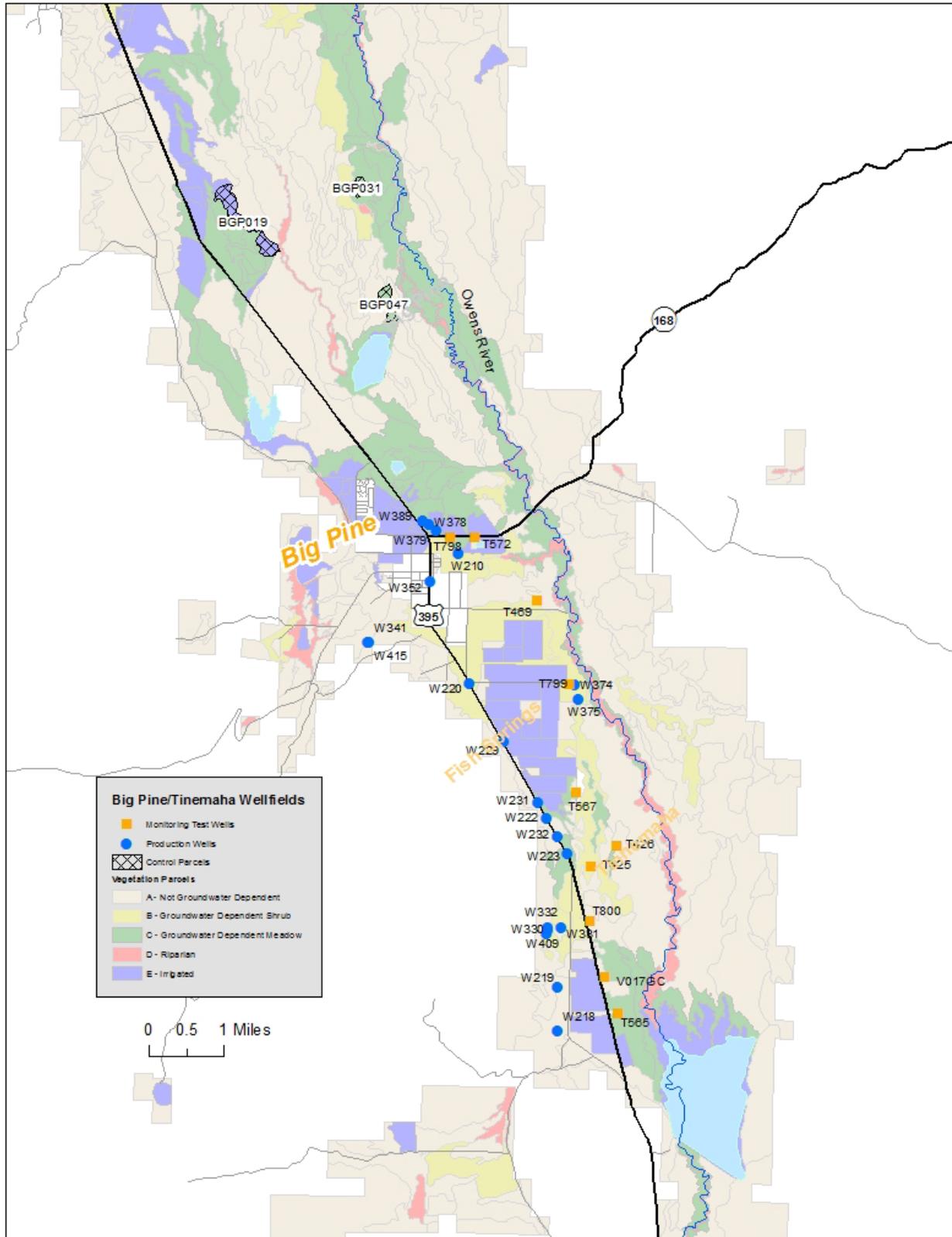


Figure 13. Map of monitoring wells and LADWP production wells in Big Pine wellfield.

Big Pine Wellfield

Since 1974, pumping in the Big Pine wellfield (Figure 13) has been consistently higher than other wellfields (Figure 14). Minimum pumping to supply uses in this wellfield include the Fish Springs Hatchery (approximately 17,600 ac-ft per year), Big Pine town supply (500 ac-ft per year), and the Big Pine northeast re-greening Project (100 ac-ft per year). Pumping under the Water Agreement has largely been to supply these uses. It should be noted that most of the hatchery pumped water also reaches the aqueduct.

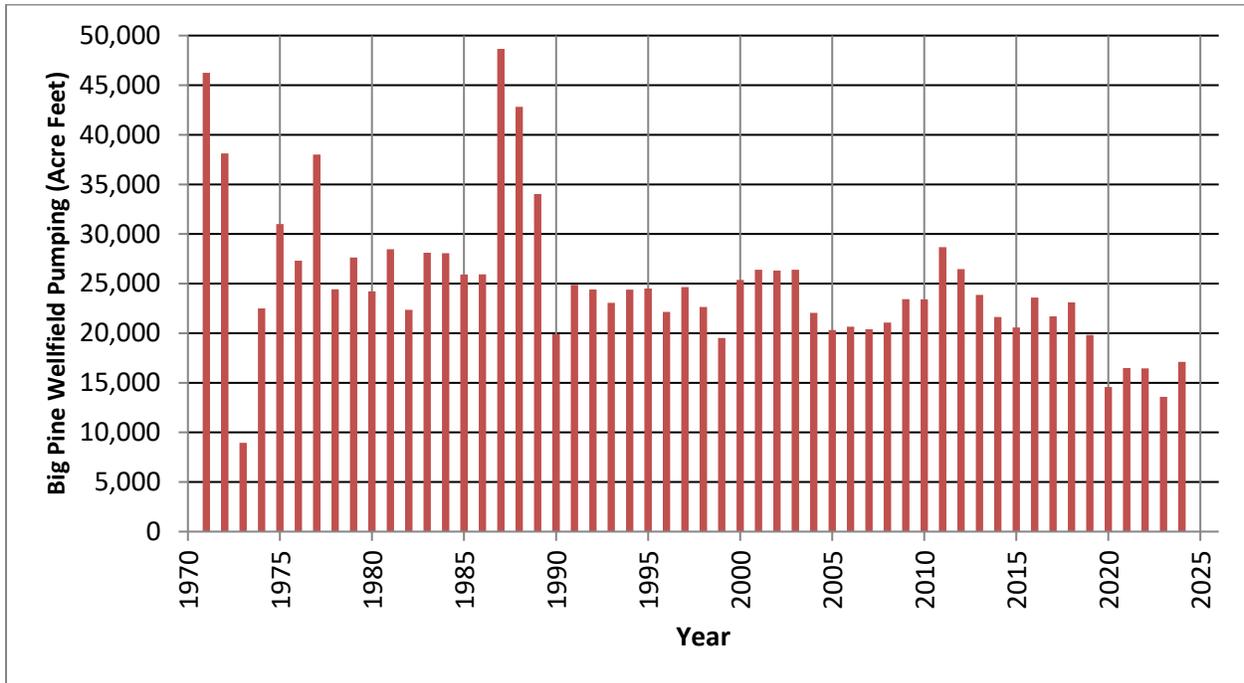


Figure 14. Pumping totals for the Big Pine wellfield.

The average 2024-25 decline in the eight Big Pine Indicator monitoring site wells was -1.5 feet (Figure 15 and Table 2). Levels were stable (change less than 0.1 ft) in three of the wells but declined by more than two feet in three of the eight wells. All of the eight Indicator monitoring wells are above baseline levels as of April 2025 with the Big Pine average at 5.1 feet above baseline. In addition to the Indicator wells, ICWD also examines two test wells located just east of U.S. 395 near W218 and W219 to assess possible impacts from the additional export pumping during extended droughts (Figure 16). Both V017GC and T565 are located in or adjacent to groundwater dependent vegetation. Water levels declined in response to drought and pumping from 2012 to 2016. In 2017, 2019, and 2023, LADWP actively spread water into the Big Pine wellfield, notably south of town along the Red Mountain cinder cone. Both V017GC and T565 have recovered significantly since 2017 and also remained above baseline levels as of April 2025.

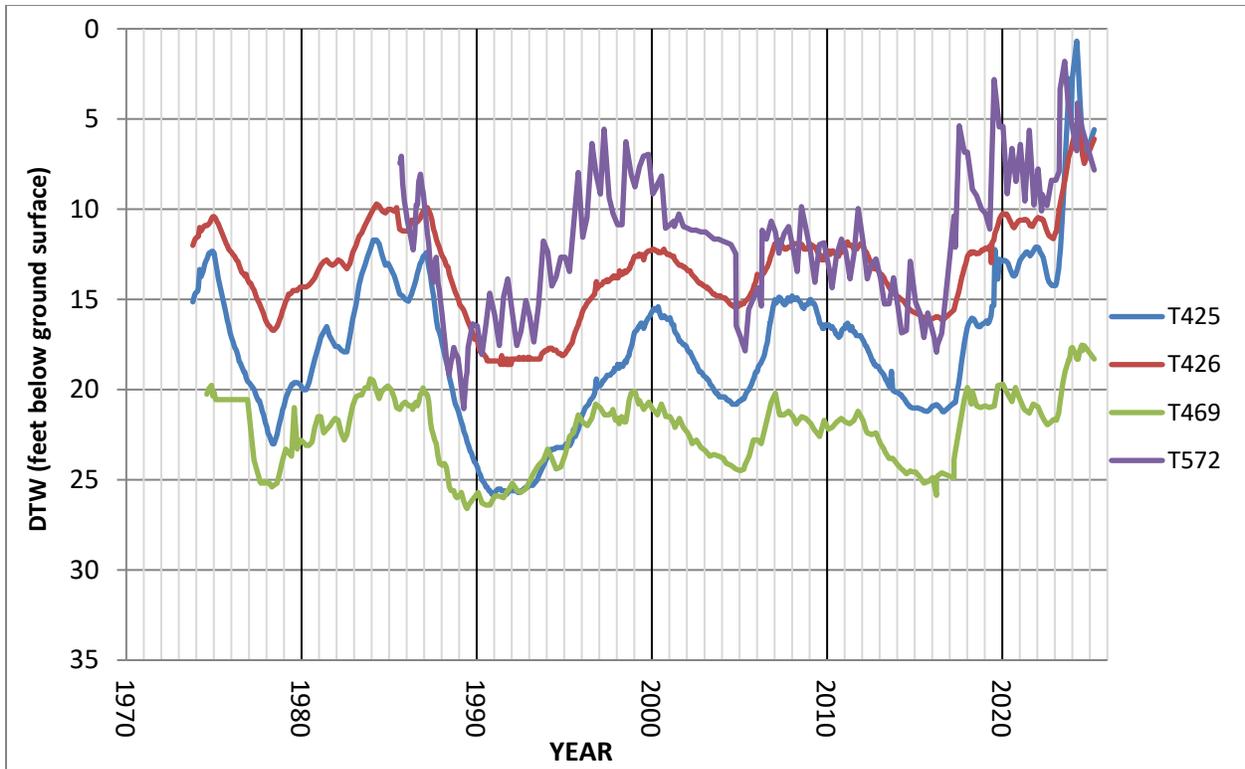


Figure 15. Hydrographs of Indicator wells in the Big Pine wellfield. Periods of missing data for T572 occurred when the well was plugged and in need of repair.

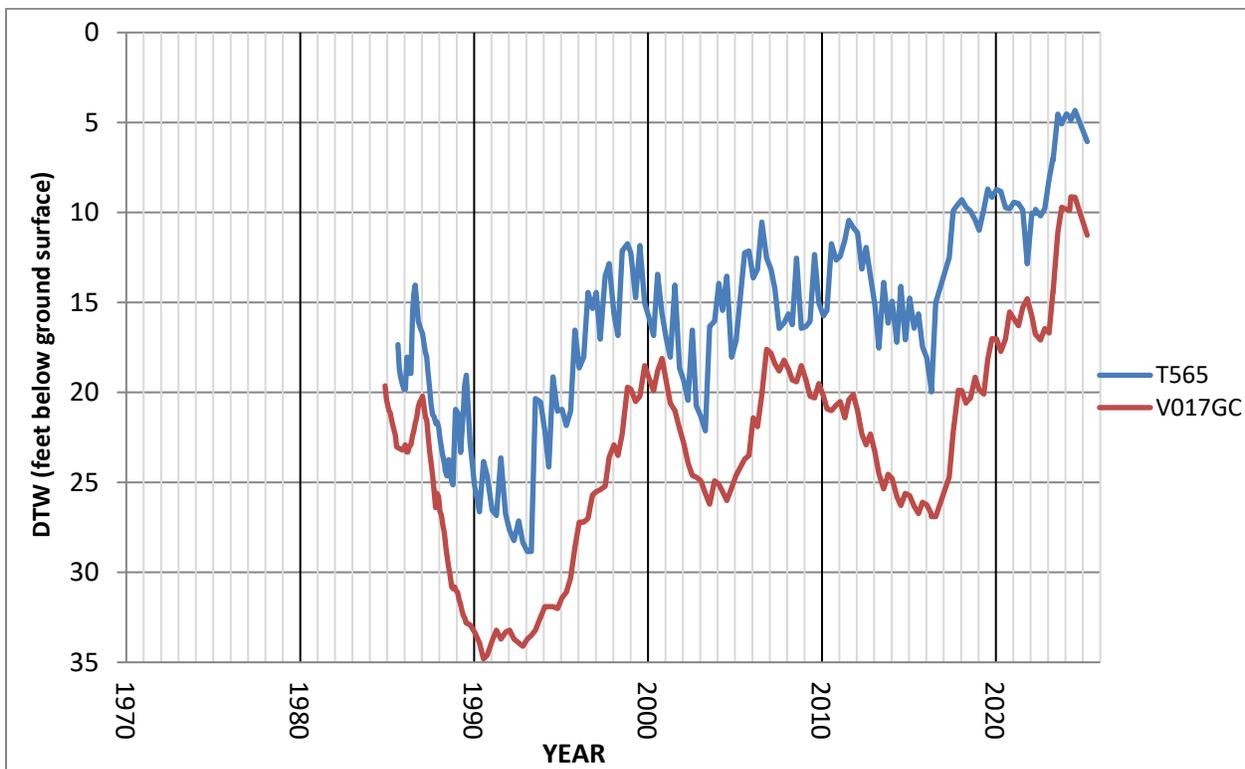


Figure 16. Hydrographs of monitoring wells in the southern Big Pine wellfield near pumping wells W218 and W219.

In 2020, a bacterial infection at the Fish Springs Fish Hatchery resulted in California Department of Fish and Wildlife (CDFW) drying and then disinfecting the hatchery over a several month period. Fry were reintroduced in a portion of the hatchery in spring 2021. Pumping for the hatchery was, therefore, reduced for both runoff years, especially during the August through December 2020 period. ICWD, CDFW, and LADWP staff collaborated in identifying potential opportunities to increase water-use efficiency at the Fish Springs Hatchery with the goal of reducing annual pumping amounts. Consequently, CDFW implemented a hatchery well pump discharge reduction valve project which was completed in 2025.

To track the groundwater response to the reduced hatchery pumping stress, ICWD staff has increased groundwater monitoring frequency starting in 2020 with additional focus on wells completed in the volcanic basalt cinders which comprise a deeper hydro-stratigraphic unit that the hatchery wells primarily source water from (“T and V” series wells with total depths in the 100-300 foot range). In the southern half of the Big Pine wellfield, groundwater levels in these V wells recovered between eight and nine feet in this unit from August through the end of 2020. The recovery was less notable in the more distant northern portion of the wellfield where additional hydrologic influences from fall through winter include declining seasonal flows in the Big Pine Creek, Big Pine Canal, and the Big Pine ditch systems. Recovery was also less discernible (less than 2 feet) in the shallower “T” wells screened primarily in the water table aquifer and not in the volcanic cinders. In addition to pumping stress, these shallow monitoring wells are also influenced by evapotranspiration demand, sub-irrigation from nearby fields and pastures, Owens River stage, and reduced runoff in the below-average 2020 to 2022 years. A summary power-point (Director’s Report) was presented at the March 31, 2021, Water Commission meeting; it can be found online at:

<https://www.inyowater.org/meetings/water-commission/water-commission-meetings/>

LADWP decommissioned W341, located west of Big Pine, and later converted it to a monitoring well in January 2024. Its pumping was replaced with adjacent well W415 for Big Pine town water system supply. W415 has additional capacity as compared to W341 of approximately one cfs. On May 6, 2020, the Inyo/Los Angeles Technical Group approved test procedures for the initial period of operation of W415 at pumping amounts above the exemption for town supply that would be consistent with Green Book Section VI strictures and consistent with the LTWA, as amended in 2002, which committed LADWP to provide both surface and pumped groundwater for the Big Pine Irrigation and Improvement Association (BPIIA) ditch system. The W415 test of its additional capacity for use in the Big Pine ditch system has not commenced, but the hydrologic and vegetation monitoring program is in place. The *Proposed 6-month Operational Test of W415* report can be found online among the meeting materials for the May 6, 2020, Inyo/Los Angeles Technical Group meeting at:

<https://inyowater.org/meetings/inyola-technical-group/>

Additionally, in an exchange of letters in 2020, Inyo and Los Angeles concurred that water exiting the Big Pine Community Service District into Big Pine Creek would be considered pumped make-up water for the BPIIA and issued as a credit.

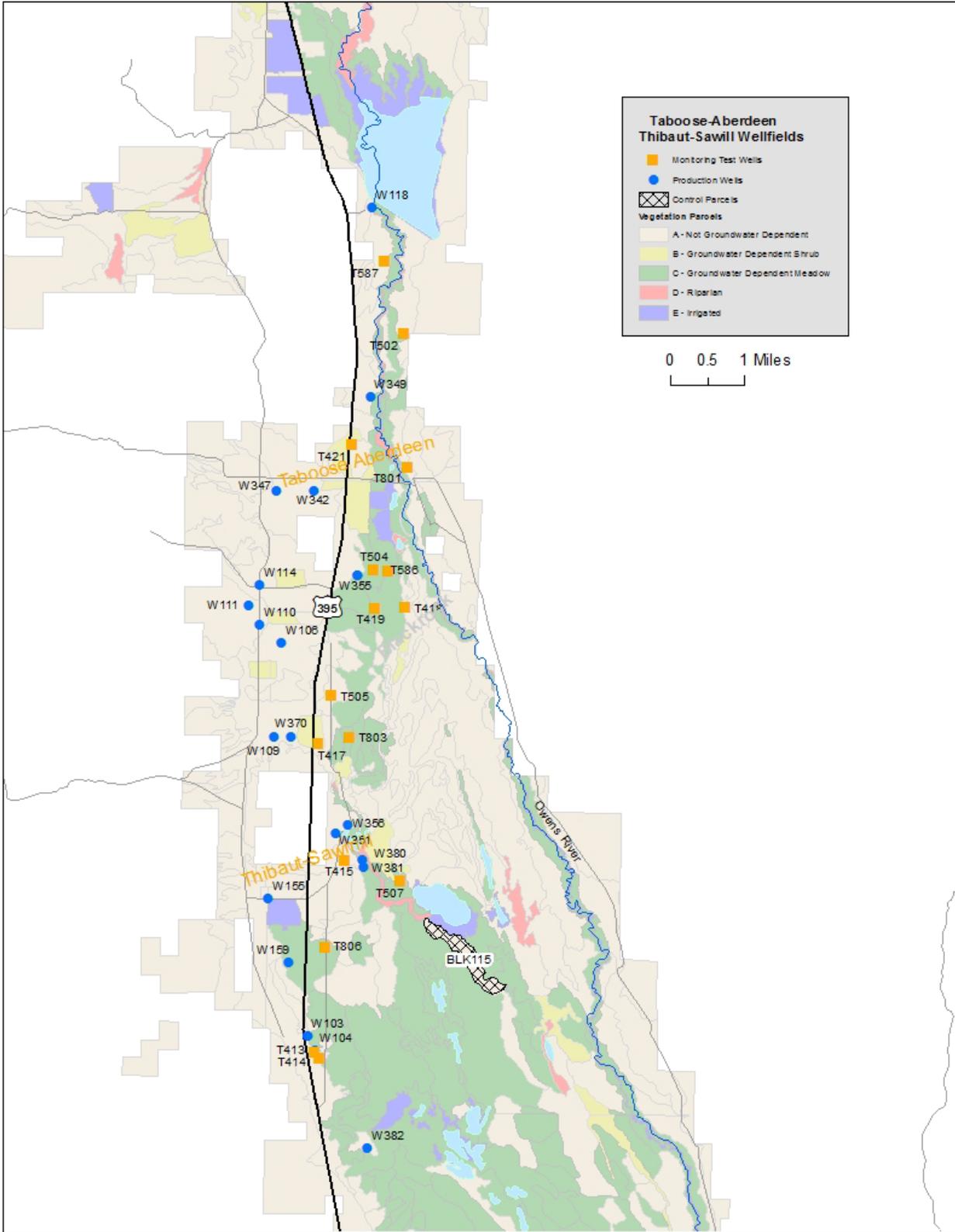


Figure 17. Map of monitoring and LADWP production wells in the Taboose-Aberdeen and Thibaut-Sawmill wellfields.

Taboose-Aberdeen Wellfield

Under the LTWA, pumping in the Taboose-Aberdeen wellfield (Figure 17) has remained much below the wellfield capacity (Figure 18). Minimum pumping for this wellfield is approximately 300 ac-ft to supply two mitigation projects at Big Seeley and Hines Springs, but nearly all of the pumping since 2010 has been for aqueduct supply. In April 2020, groundwater levels were above baseline levels in all but the two northern monitoring wells (T587 and T801). LADWP pumped more than 15,000 ac-ft of water from the wellfield in 2020-21 (the most pumping since 1989), and groundwater levels declined in all 10 Indicator wells by an average of -3.2 feet (Table 2). In 2022-23, LADWP's pumping was 13,835 ac-ft but groundwater levels were relatively stable or increased slightly due to the record wet 2023 winter. For each of the past two years, pumping has been less than 5,000 ac-ft (3,985 ac-ft in 2024-25). As of April 2025, groundwater levels in the 10 Indicator wells varied between 4.9 feet above to -0.4 feet below baseline, and the wellfield average was 3.1 feet above baseline. Groundwater levels remain above lows seen in the 2012-16 and 2020-22 droughts.

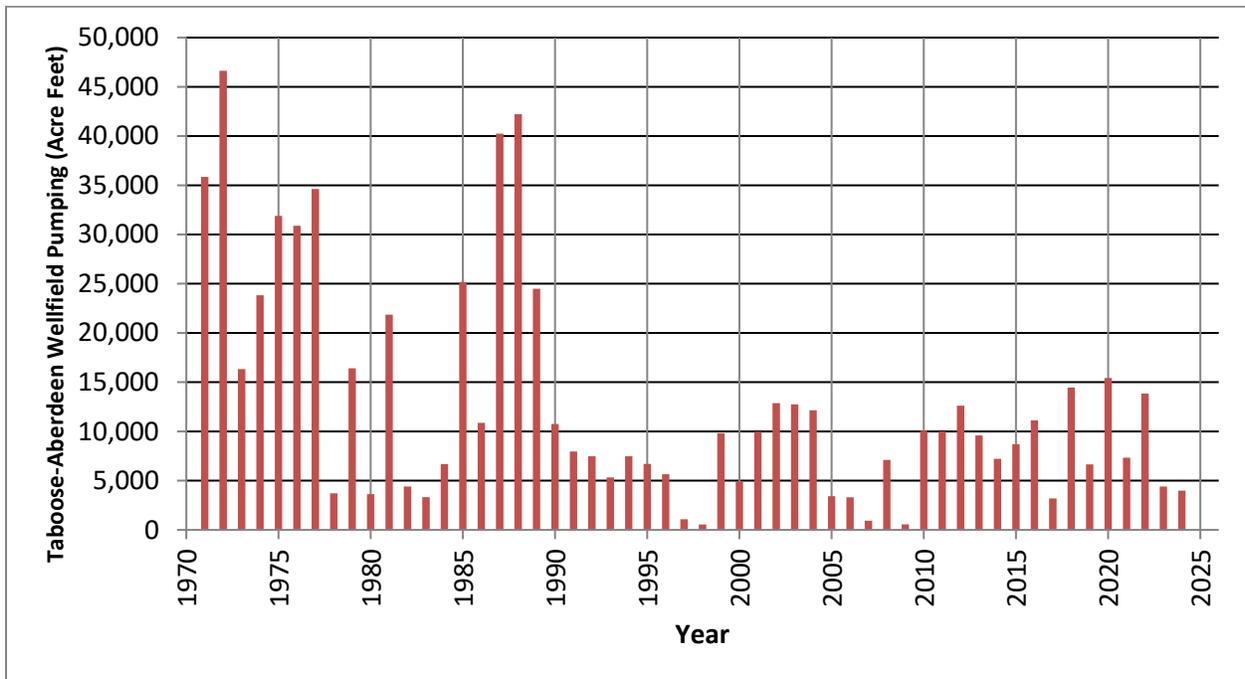


Figure 18. Pumping totals for the Taboose-Aberdeen wellfield.

Hydrographs for the Indicator wells exhibit similar response to fluctuations in pumping and runoff (Figures 19 and 20). Most of the recent pumping has been from well W349 and W118 located in the northern portion of the wellfield. Wells W349 and W118 pumped consistently from 2011 to 2016, were off for the majority of the 2017-18 runoff year, but resumed pumping in 2018. Data from monitoring well T587 (a non-Indicator well) are included because it is located adjacent to groundwater dependent vegetation near W118 and W349 and is used to assess the impacts of recent pumping.

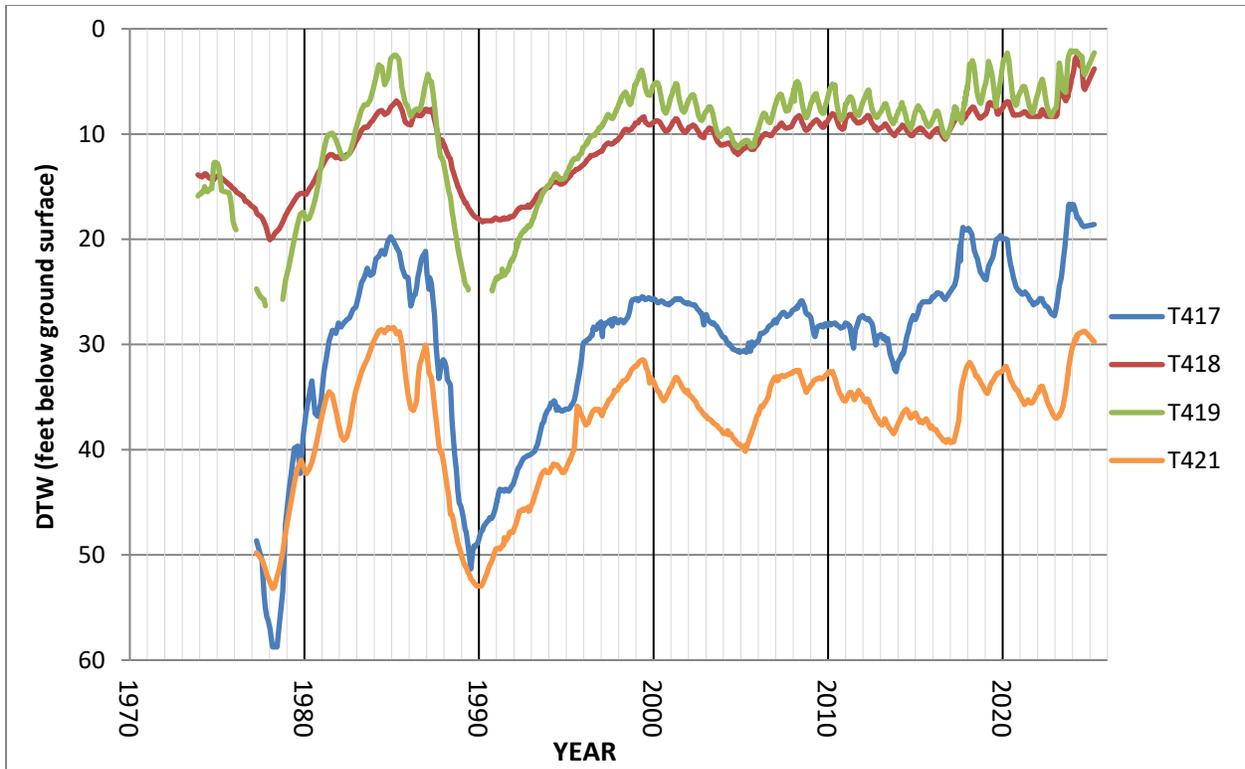


Figure 19. Hydrographs of Indicator wells in the Taboose-Aberdeen wellfield. Periods of missing data denote when the test well was dry.

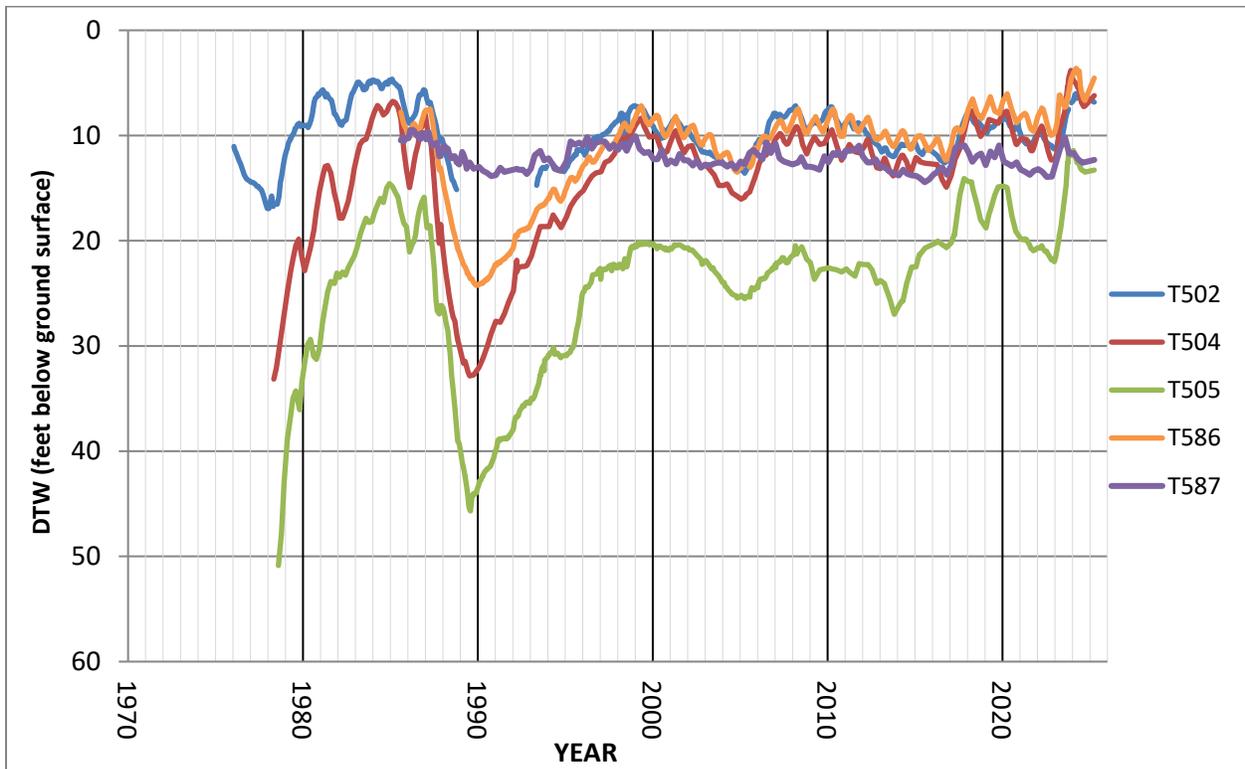


Figure 20. Hydrographs of Indicator wells and T587 in the Taboose-Aberdeen wellfield. Periods of missing data denote when the test well was dry.

Thibaut-Sawmill Wellfield

Historically, most pumping in the Thibaut-Sawmill wellfield has been to supply approximately 12,200 ac-ft annually to the Blackrock Fish Hatchery (Figure 21). In 2014, Inyo and Los Angeles agreed to reduce hatchery pumping to approximately 8,300 ac-ft as part of the settlement to the Blackrock 94 dispute.

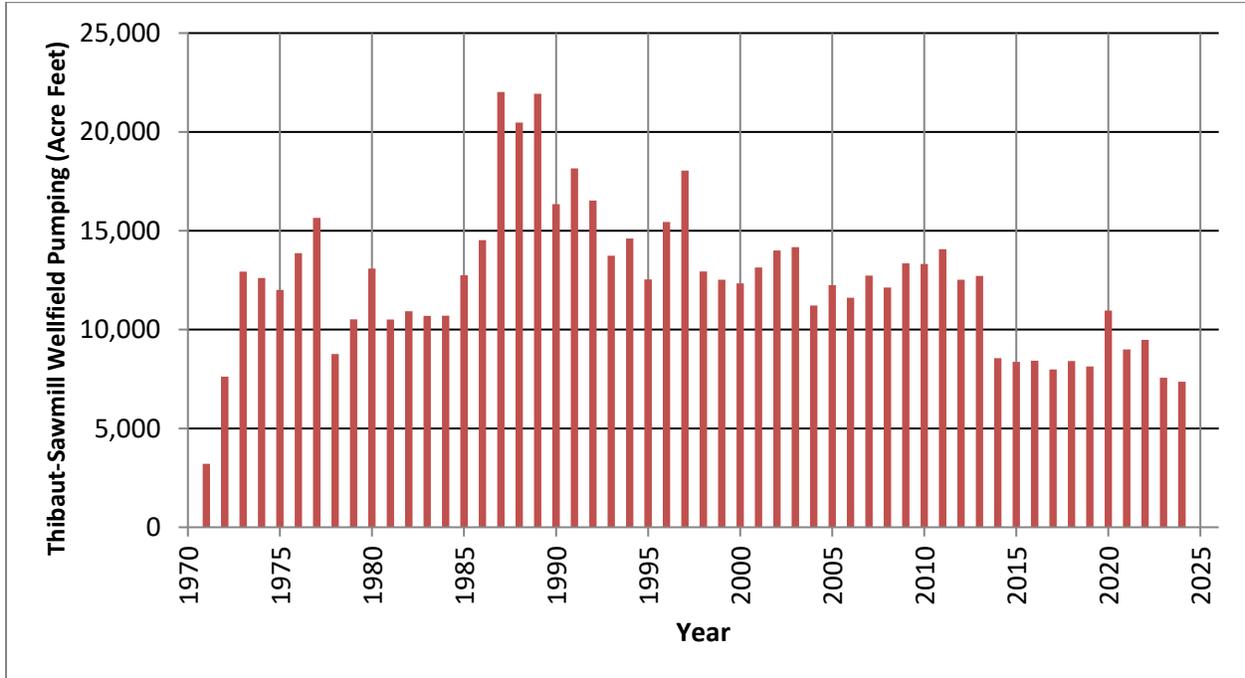


Figure 21. Pumping totals for the Thibaut-Sawmill wellfield.

Hydrographs of five test wells used to track water levels in Thibaut-Sawmill have exhibited different responses due to local water management within the wellfield (Figure 22). Wells T415, T507, and T806, responding to reduced hatchery pumping, exhibited a rising trend from 2014-2017 and are all above or near (T507 is -0.3 feet below) baseline levels as of April 2025. Over the past decade, the groundwater level at T507 has also responded to seasonal flooding associated with the Blackrock Waterfowl Management Area. In 2024-25, groundwater levels in these three Indicator wells decreased between -1.5 and -0.4 feet from the previous year (Table 2).

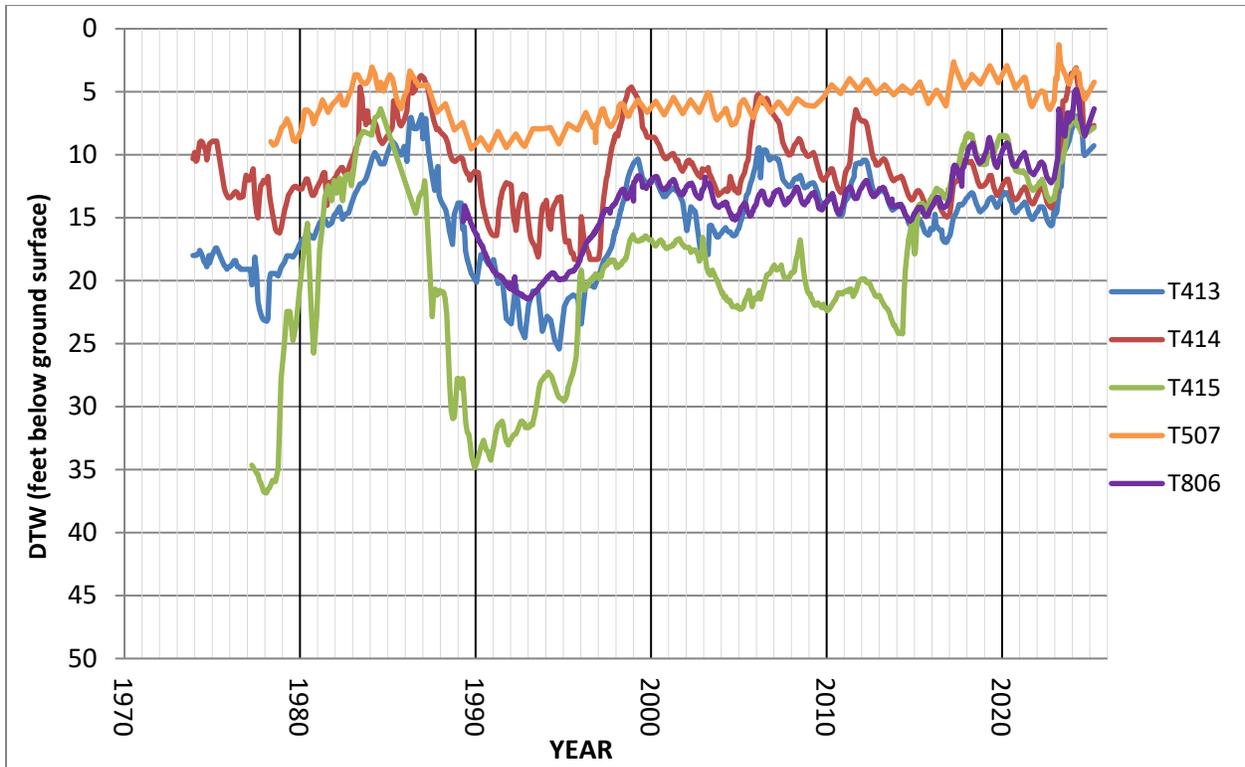


Figure 22. Hydrographs of selected test wells in the Thibaut-Sawmill wellfield.

Wells T413 and T414 are located in the southern portion of the wellfield and recovered several feet following the record wet 2023 winter to above baseline levels in spring 2024. However, the reduction in the hatchery pumping is not nearly as evident in these wells. Groundwater recharge from the average 2024-25 runoff year combined with pumping for the Blackrock Fish Hatchery contributed to water levels in both wells dipping back below their baseline levels. Two parcels, IND026 and IND029, in the southern portion of this wellfield have chronically depressed water levels and grass cover.

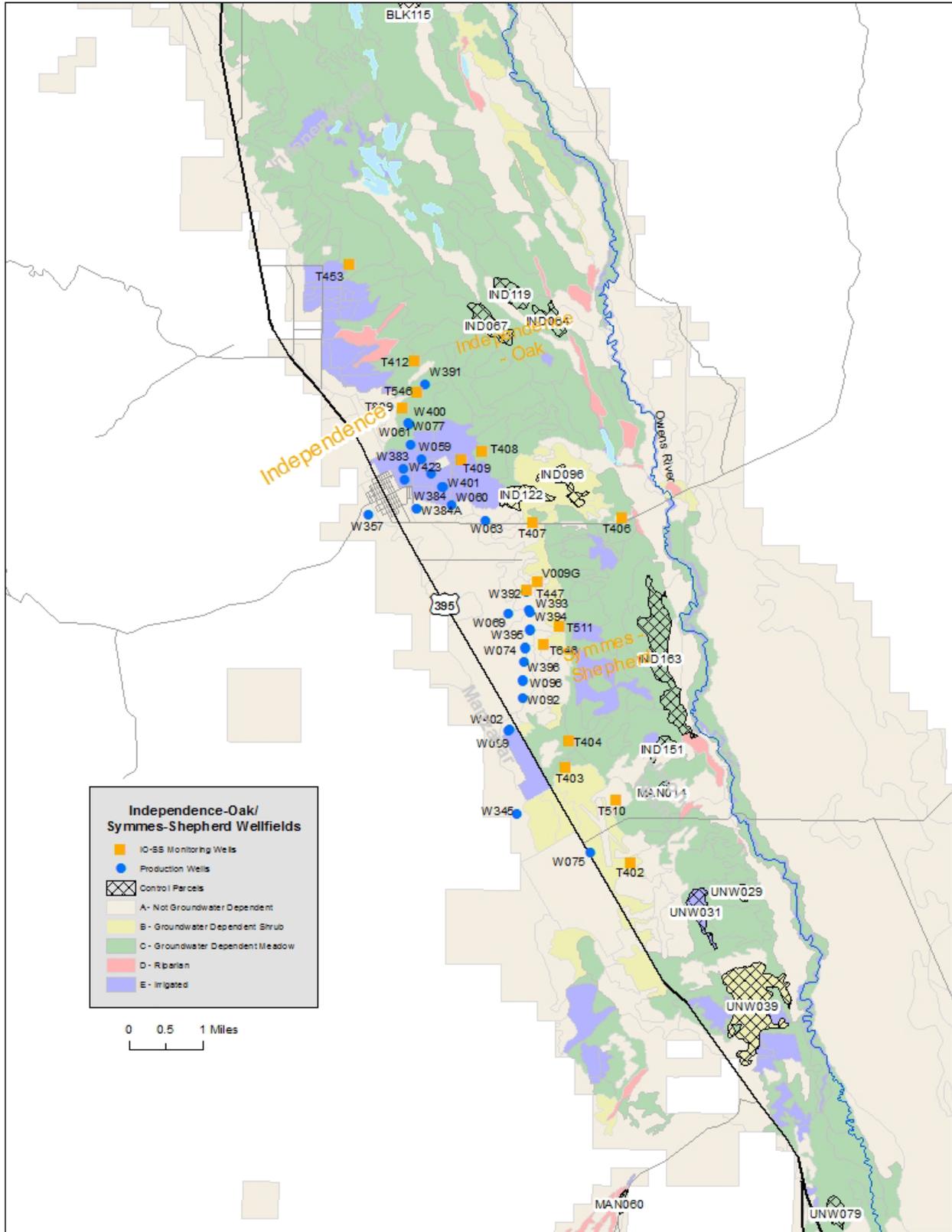


Figure 23. Map of monitoring and LADWP production wells in the Independence-Oak and Symmes-Shepherd wellfields.

Independence-Oak Wellfield

Pumping in this wellfield (Figure 23) is required to supply approximately 6,500 ac-ft annually for irrigation projects surrounding Independence and for town supply (Figure 24). LADWP pumped between 8,600-9,600 ac-ft from 2011 through 2016 during that drought; however, since the wet 2017 runoff year, LADWP has been pumping closer to the required amount (2017-24 average was 7,100 ac-ft). This past year, LADWP's pumping was somewhat higher at 8,472 ac-ft, primarily for irrigation and some for export. On/Off site IO1, which had been in "Off" status since October 1998, went into "On" status April 1, 2024. It changed to "Off" status October 1, 2024 (Table 2) and back to "On" status March 1, 2025. Although permitted by the On/Off status of IO1, LADWP did not pump either linked wells W391 or W400.

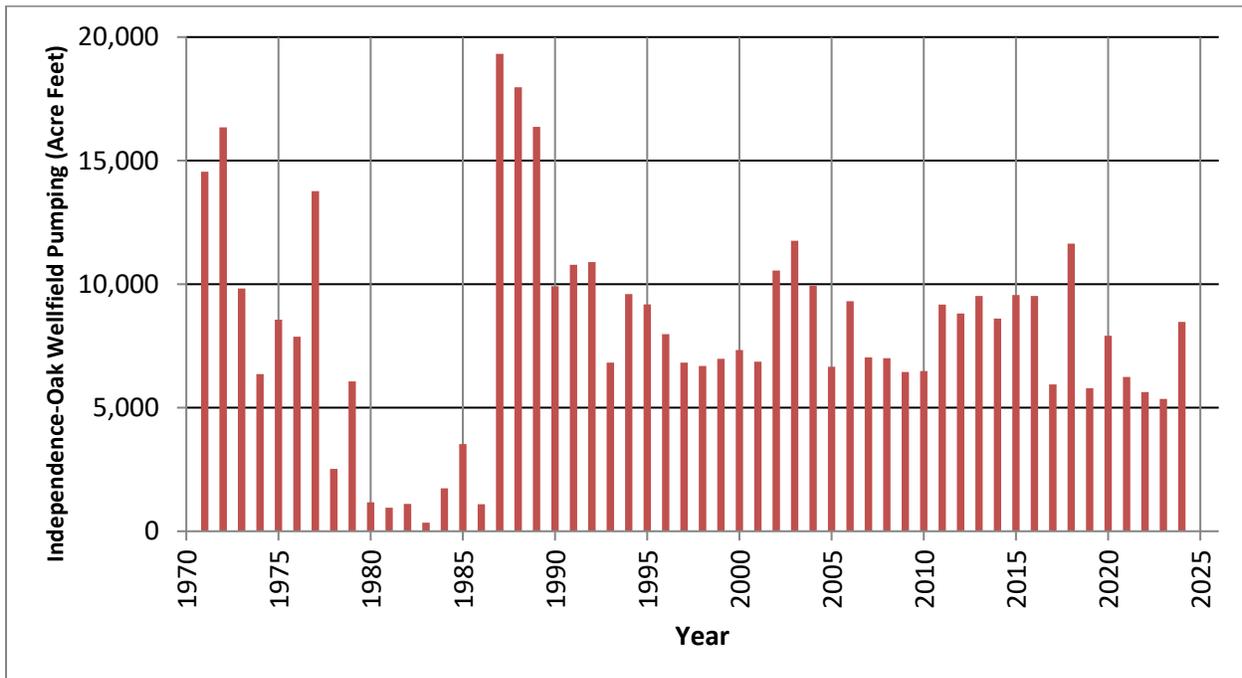


Figure 24. Pumping totals for the Independence-Oak wellfield.

Water levels were stable through the first decade of 2000 in the wells located in the center of the wellfield (T406, T407, T408, T409) but declined in response to the increased pumping during the second decade of 2000. However, in 2017 and 2019, the combination of reduced pumping for export and increased recharge from heavy runoff allowed water levels to rebound somewhat. As a result of lower runoff during the 2020-22 drought and additional pumping for export in 2020-21, groundwater levels generally trended downward (Figures 25 and 26). The record wet 2023 winter with corresponding lower pumping contributed to increases in groundwater levels across the wellfield but remained on average slightly below baseline even in April of 2024 when water levels in other wellfields had risen well above baseline levels.

All of the six Indicator wells in the Independence-Oak wellfield were below baseline in April 2025, ranging -0.3 feet to -2.7 feet, and the wellfield average was -2.1 feet below baseline (Table 2). Some of these chronic groundwater levels below baseline may be due to the additional irrigation associated with the Independence pasture, spring-field, and re-greening projects which were implemented after the mid-1980s and, although groundwater levels have declined in many of these wells, the majority are

located in Type-E irrigated pastures. However, due to persistent low groundwater levels compared with the baseline period along the perimeter of the irrigated pasture lands (T546, T809, T407), ICWD staff has recommended that LADWP pumping for export be minimized in this wellfield, especially during severe droughts like the recent one.

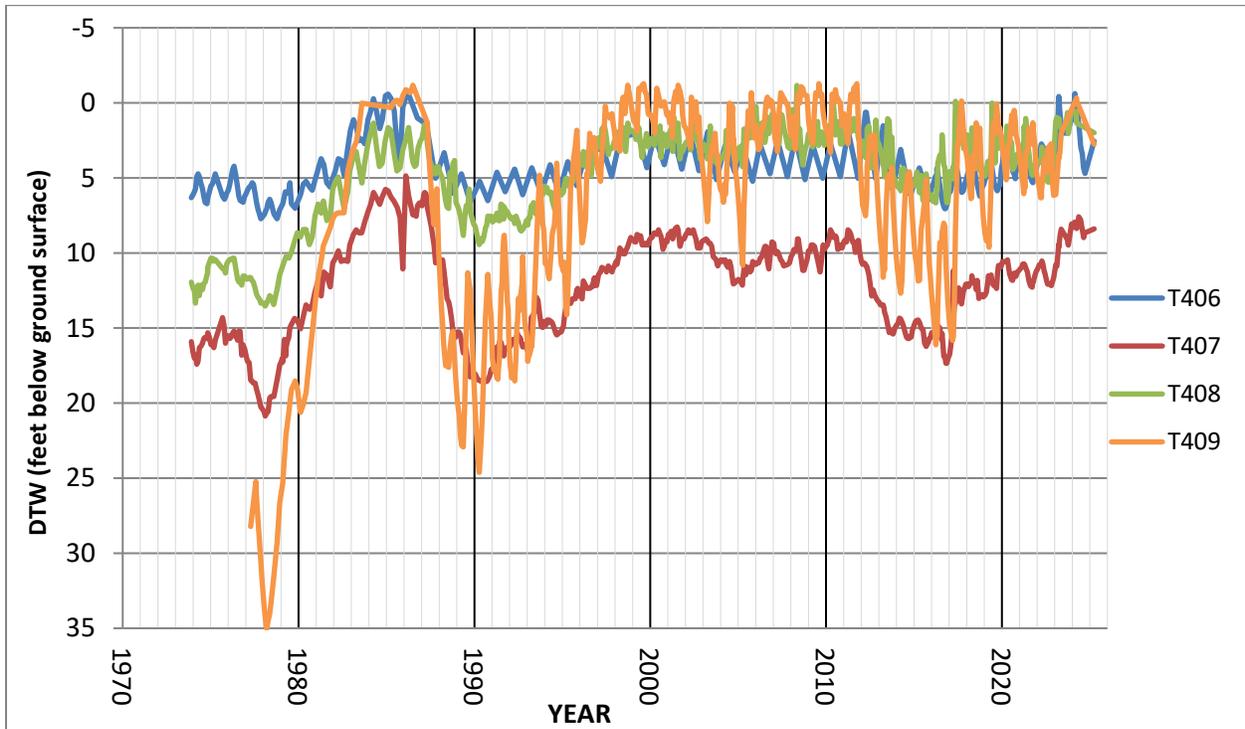


Figure 25. Hydrographs of selected test wells in the Independence-Oak wellfield.

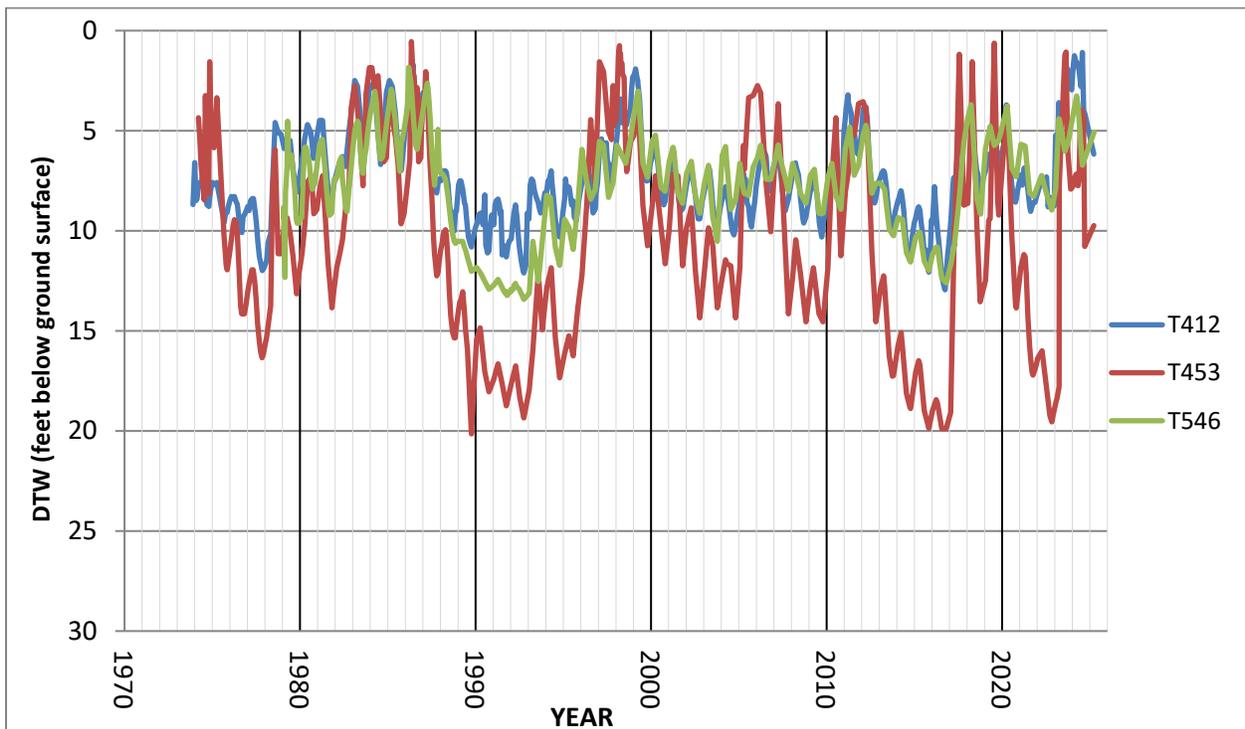


Figure 26. Hydrographs of selected test wells in the Independence-Oak wellfield.

Symmes-Shepherd Wellfield

In the 1970's and 80's, pumping in the Symmes-Shepherd wellfield (Figure 23) varied considerably (Figure 27). Under the Water Agreement, pumping was reduced with many of the wells linked to Green Book "Off" status permanent monitoring sites (see the Soil Water Conditions Section of this report). Approximately 1,200 ac-ft of "Exempt" status pumping is required to supply one mitigation project (W402 for Shepherd Creek Alfalfa Field). However, pumping for aqueduct supply increased from 2010 to 2016, primarily in the northern part of the wellfield, as one of the On/Off sites remained ON during much of that drought. All wells other than W402 did not pump from 2017 through 2020. As of April 2021, On/Off site SS3 went into "On" status. Subsequently, SS1 and SS4 went into "On" status April 2023, and these three sites have remained in "On" status. According to available records, LADWP pumped a limited amount of water from W396 this past winter, and W428 (replacement for W402) was operationally pumped for irrigation from spring into early fall of 2024.

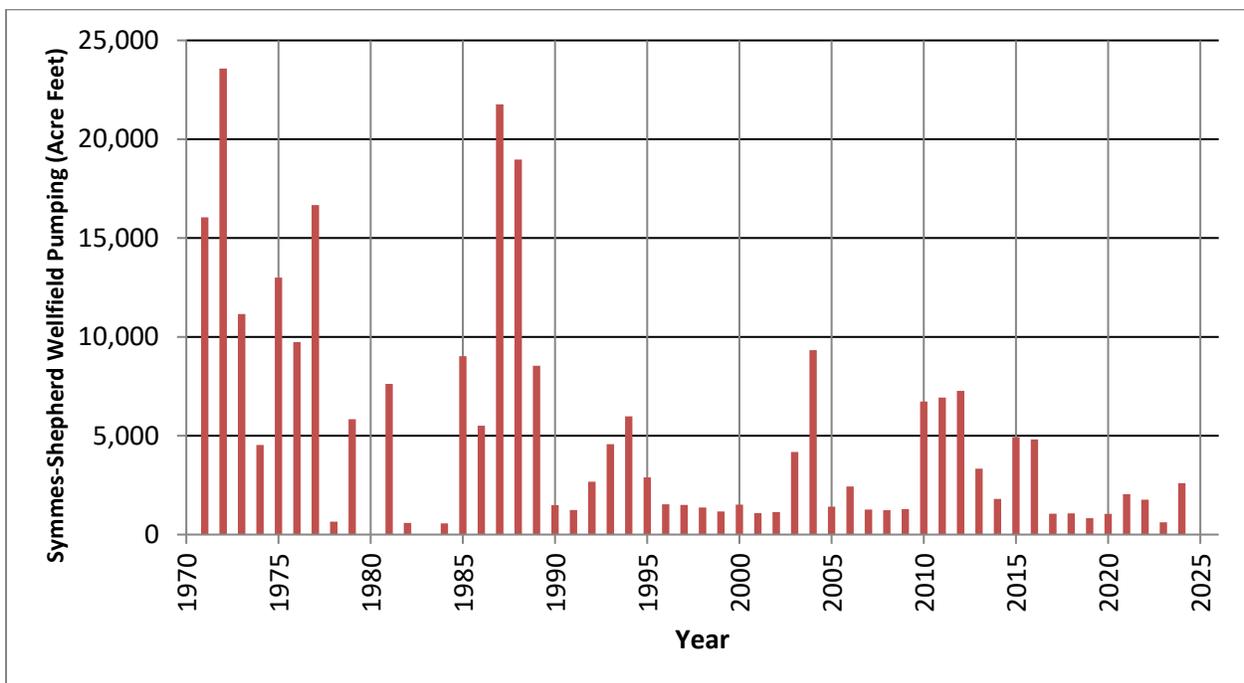


Figure 27. Pumping totals for the Symmes-Shepherd wellfield.

Groundwater levels were relatively stable in 2024-25, decreasing moderately overall. Groundwater levels ranged from a decline of -1.4 feet to an increase of 0.5 feet (Table 2). Some test wells are influenced by their proximity to the unlined portion of the Los Angeles Aqueduct (T402-404 and T510-511, see Figures 28 and 29), and water levels fluctuate little. Test wells T447 and V009G are located near pumping wells in the northwestern portion of the wellfield, and water levels responded by rising dramatically due to the reduction in pumping and ample runoff/water spreading in 2017-18. Water levels continued to rise by several feet during the 2019 and 2023 runoff years. Although groundwater levels have recovered to some extent and declines were minimal this past runoff year, water levels in all seven Indicator wells were below baseline as of April 2025 (Table 2).

Due to the declines in groundwater caused by pumping and the 2012-16 drought, Inyo County-owned contaminant monitoring wells at the Independence landfill were dry or within a few feet of becoming dry in spring 2017. Cessation of LADWP export pumping in 2017 combined with the subsequent high

runoff and recharge years has allowed water levels to recover 15 to 20 feet in T447 and V009G (Figure 28). However, ICWD continues to be concerned with water levels in Symmes-Shepherd that remain below baseline, ranging from -0.2 to -10 feet, as of 2025.

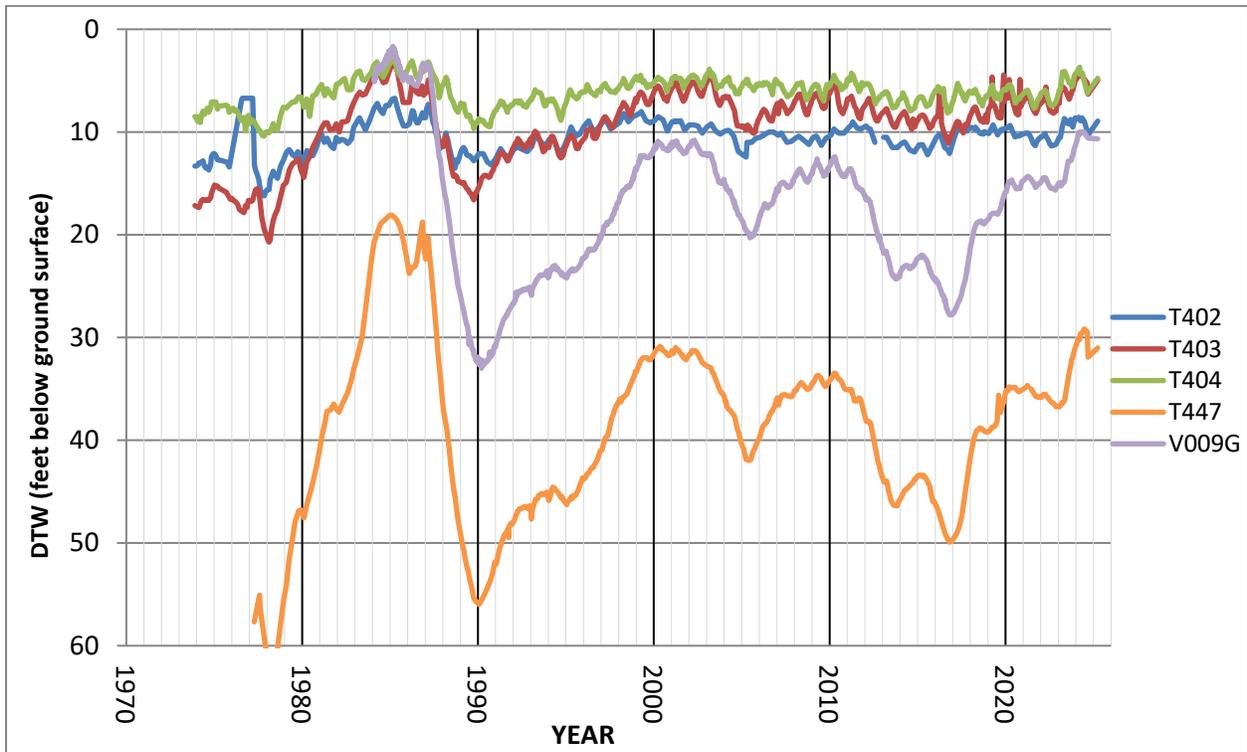


Figure 28. Hydrographs of Indicator wells in the Symmes-Shepherd wellfield.

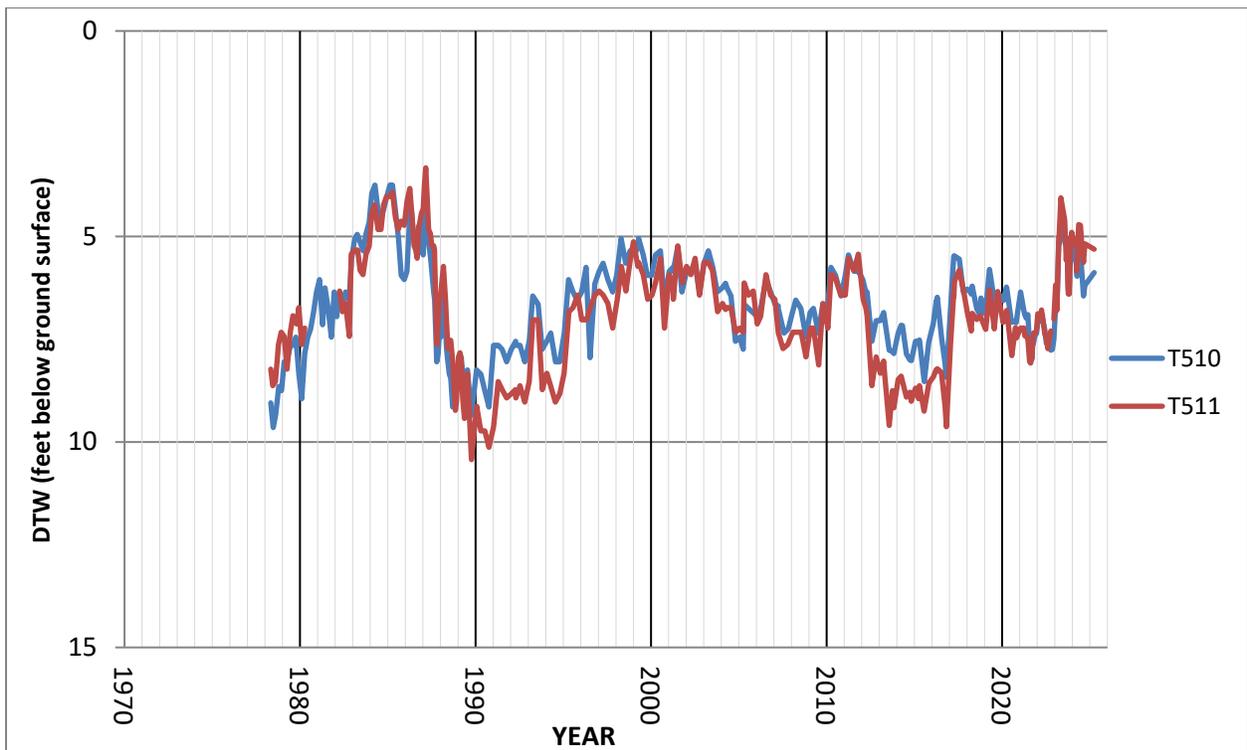


Figure 29. Hydrographs of Indicator wells in the Symmes-Shepherd wellfield.

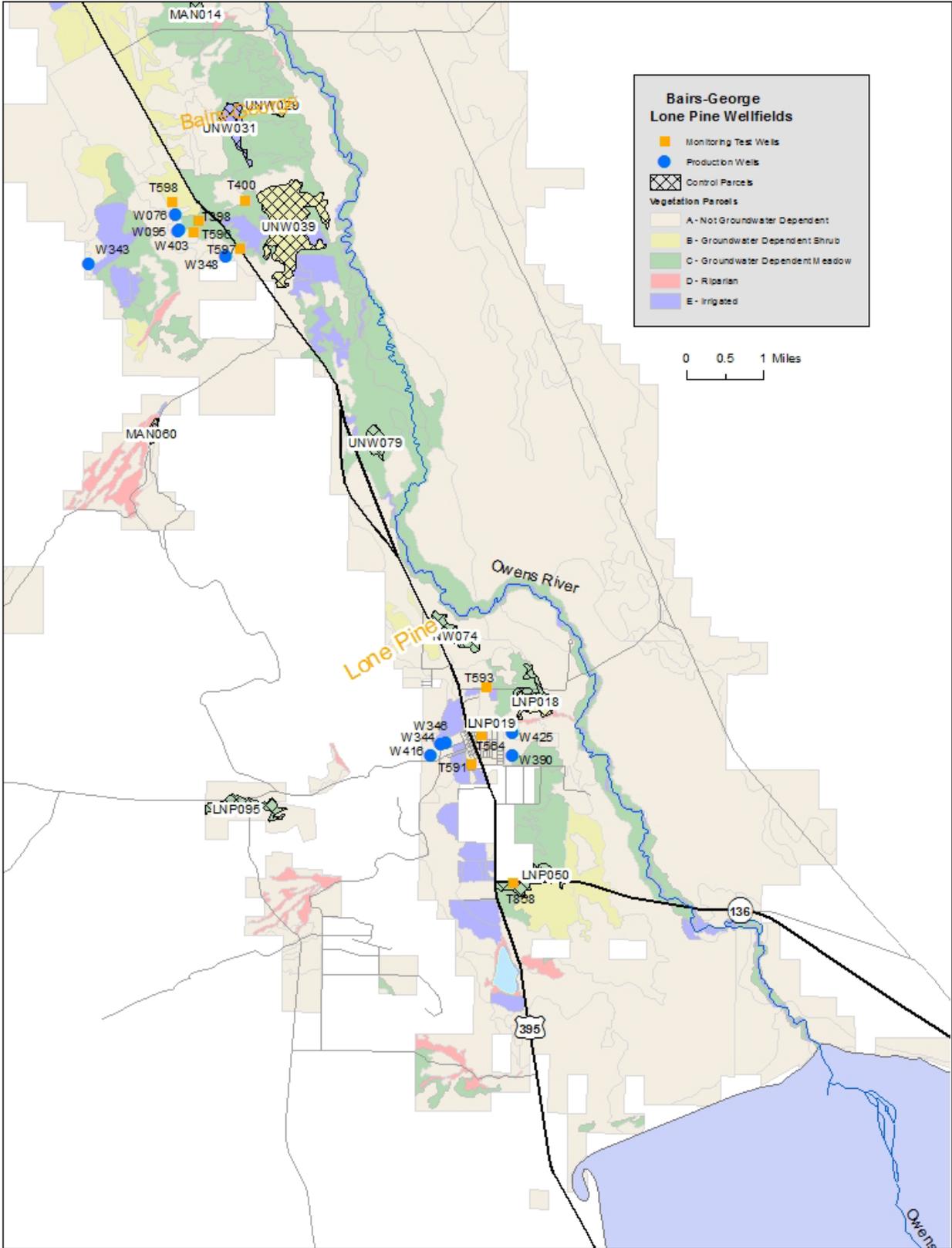


Figure 30. Map of monitoring and LADWP production wells in the Bairs-Georges and Lone Pine wellfields.

Bairs-Georges Wellfield

In the 1970's and 80's, pumping and water levels in the Bairs-Georges wellfield (Figures 30 and 31) varied considerably, but under the Water Agreement, pumping has been reduced substantially. In dry years when surface flows decline, well W343 is exempt and can be operated to supply irrigated pastures. Since the mid-1990's, groundwater levels in the three Indicator wells have been relatively stable. As in other wellfields, pumping for aqueduct supply increased in 2010-2016 compared with the lower amounts during the preceding 20 years. Both in 2018-2019 and 2020-21, LADWP pumped more than 2,000 ac-ft from the wellfield; the most pumping since 1989. Water levels declined several feet in response but have recovered somewhat since the record wet winter of 2023. As of April 2025, groundwater levels in Bairs-Georges were at or above baseline levels.

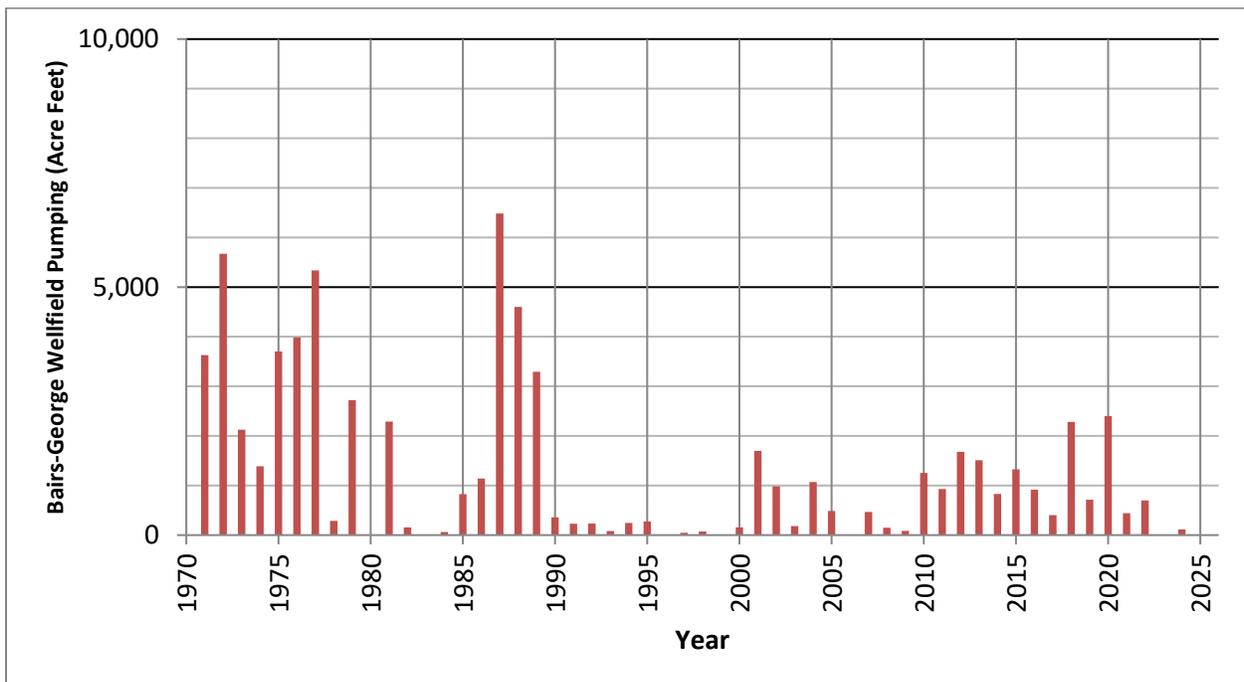


Figure 31. Pumping totals for the Bairs-Georges wellfield.

The pumping wells are located west of the Los Angeles Aqueduct. Monitoring wells T597 and T398 (Figure 32) are in the immediate vicinity of the aqueduct, and well T400 is east of the aqueduct. Water table fluctuations in these wells are lessened by the infiltration from the unlined portion of the aqueduct, though the water table response from the increase in pumping since 2010 coupled with the 2012-2016 drought is evident in T398 and T597. Pumping effects are less evident in T400.

Monitoring wells T596, T598, and T812 are located west of the aqueduct, and they exhibit larger fluctuations due to pumping (Figure 33). Of particular concern are the lower groundwater levels seen from 2012-16 and the recent 2020-22 trend in T598 and T812. Both wells showed groundwater level increases following the record wet winter of 2023 but have since declined and are approaching baseline levels. Bairs-Georges is a fault-bounded wellfield (to the west and east) and appears to have more limited recharge than other areas. Relatively low pumping stress in the wellfield and also from southern Symmes-Shepherd appears to have a measurable effect on groundwater levels. ICWD has communicated this concern with LADWP in annual letters regarding the operations plan and also in comments relating to the replacement of W076 with W430, drilled in early 2022 but not yet pump

equipped. Pumping in this wellfield and southern Symmes-Shepherd should be conservative during multi-year droughts. LADWP pumped 0 ac-ft in 2023-24 and 113 ac-ft this past runoff year in Bairs-Georges wellfield.

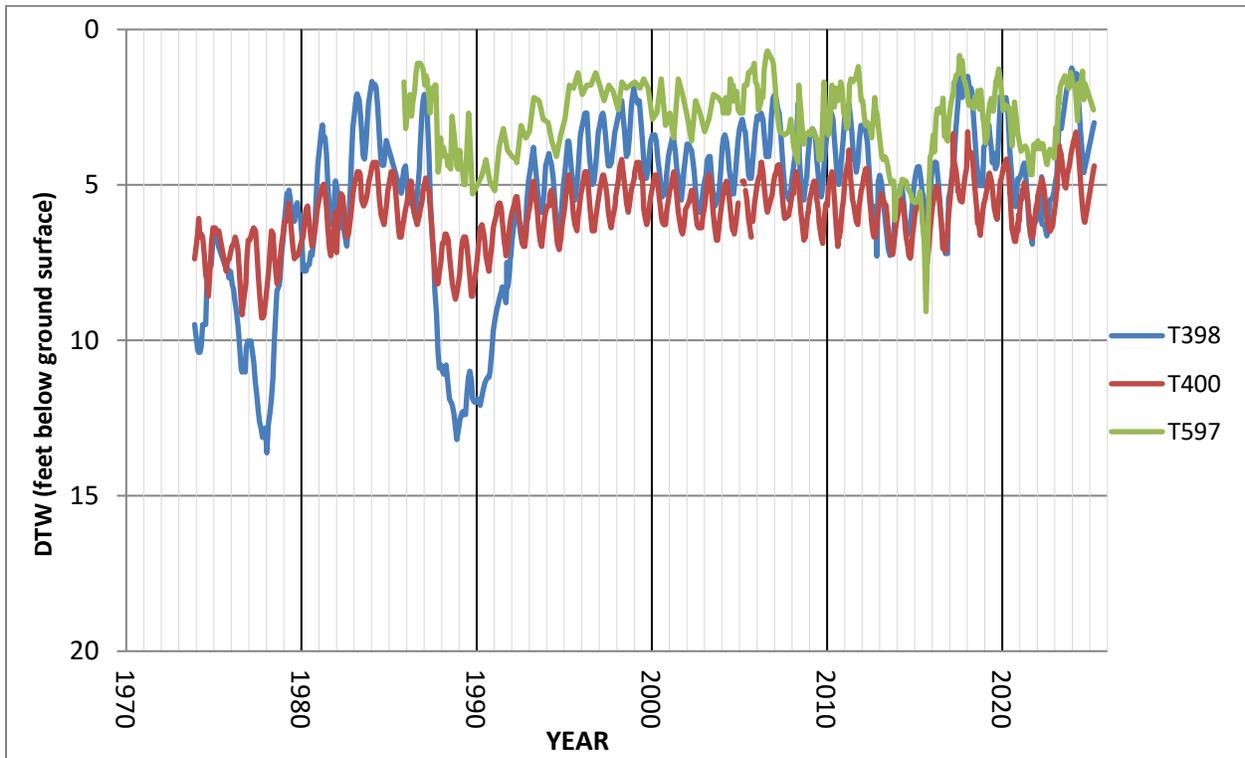


Figure 32. Hydrographs of Indicator wells and 597T in the Bairs-Georges wellfield.

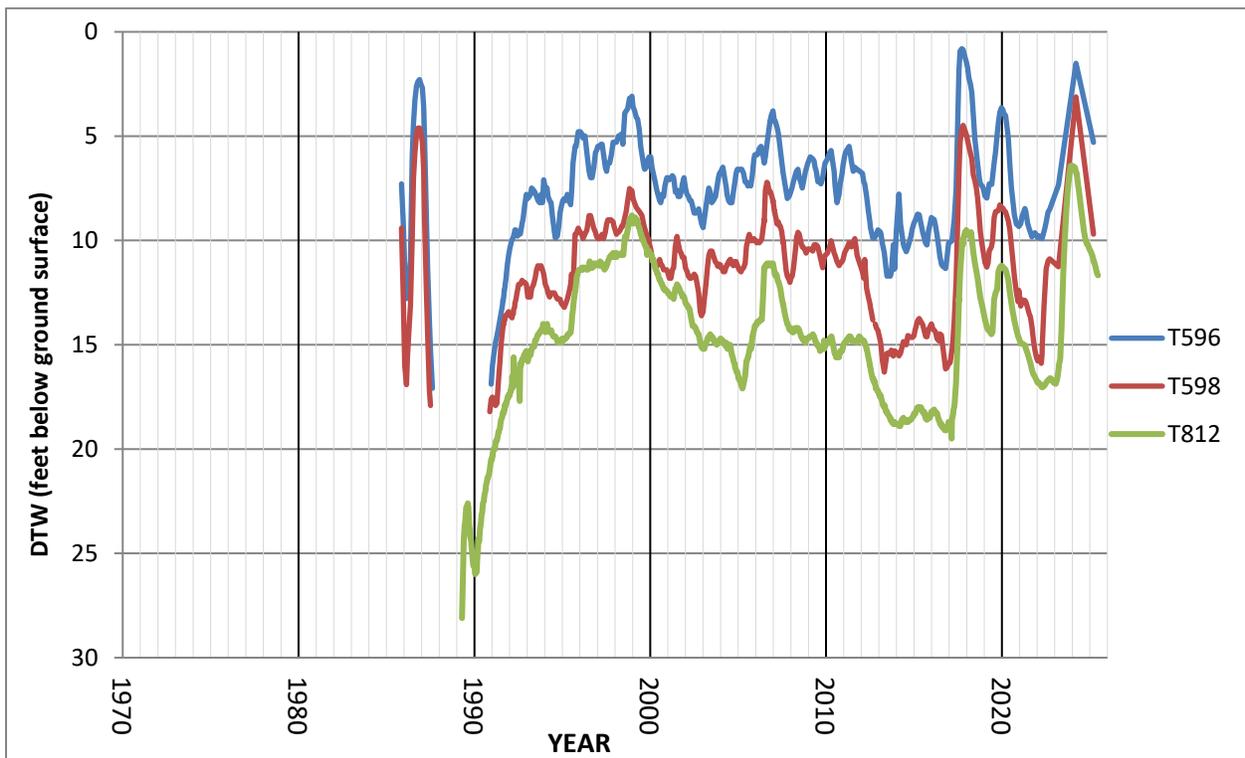


Figure 33. Hydrographs of selected wells in the Bairs-Georges wellfield.

Lone Pine Wellfield

Most pumping in the Lone Pine wellfield (Figure 30) has been to supply the town of Lone Pine and one mitigation project (approximately 1,300 ac-ft annually for irrigated agriculture). Pumping increased occasionally (e.g. in 2000) to offset aqueduct water previously supplied to Diaz Lake (Figure 34). In 2015, pumping also increased largely due to the operation of the W425 replacement Enhancement/Mitigation (E/M) well to supply Van Norman field. The previous well (W390) degraded, and production declined noticeably in 2008. The replacement well has capacity to fully supply the project. Because of the relatively constant pumping for sole-source uses, ICWD does not routinely use Indicator wells to analyze the annual operations plan for this wellfield.

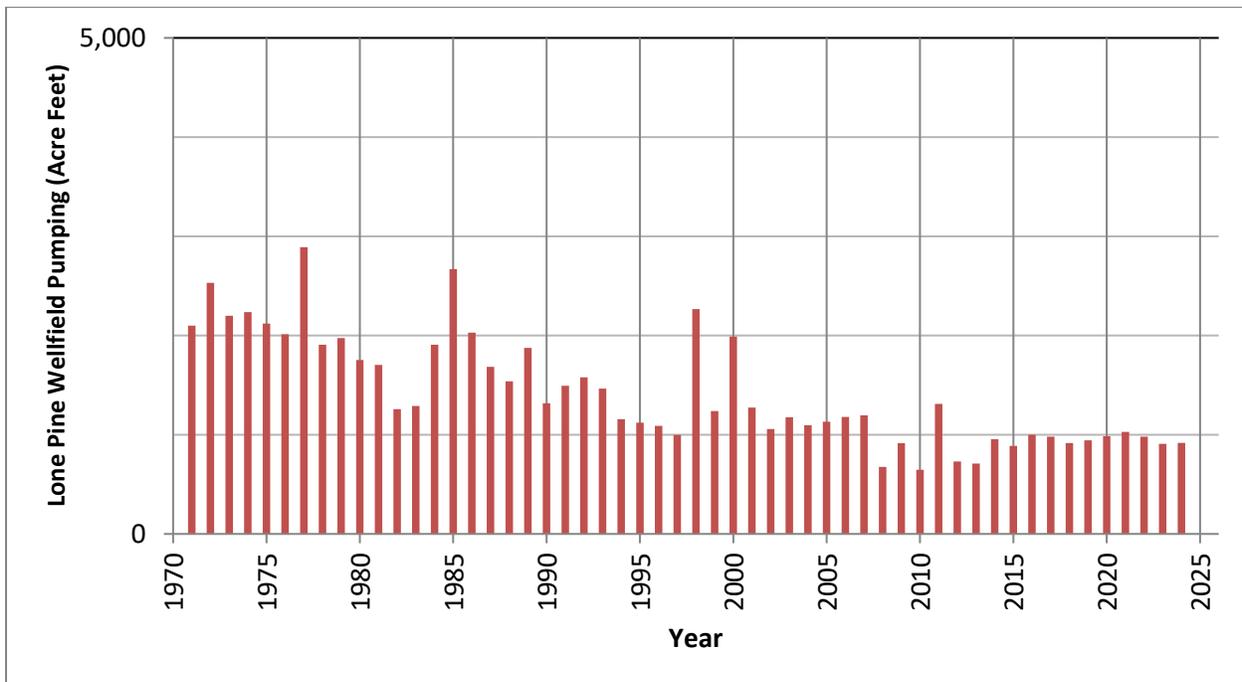


Figure 34. Pumping totals for the Lone Pine wellfield.

Hydrographs for test wells T564 and T591 are presented in Figure 35 to represent water levels near the town of Lone Pine where the LADWP pumping wells are located. Monitoring wells T593 and T858 are located in groundwater-dependent vegetation north and south of Lone Pine, respectively. All wells exhibit seasonal fluctuations as well as water table response to decreased recharge due to drought. Pumping effects are not as evident. Water levels rose in 2017 and again in 2019 due to heavy runoff, declined during the 2020-22 drought (Figure 6 and 35), and recovered following the record wet 2023 winter.

In early 2010, LADWP tested a new production well, W416, installed to increase aqueduct supply. This new production well has been modified, and initial tests to determine well capacity and performance have been completed. However, details of the operational monitoring have yet to be agreed upon by the Technical Group.

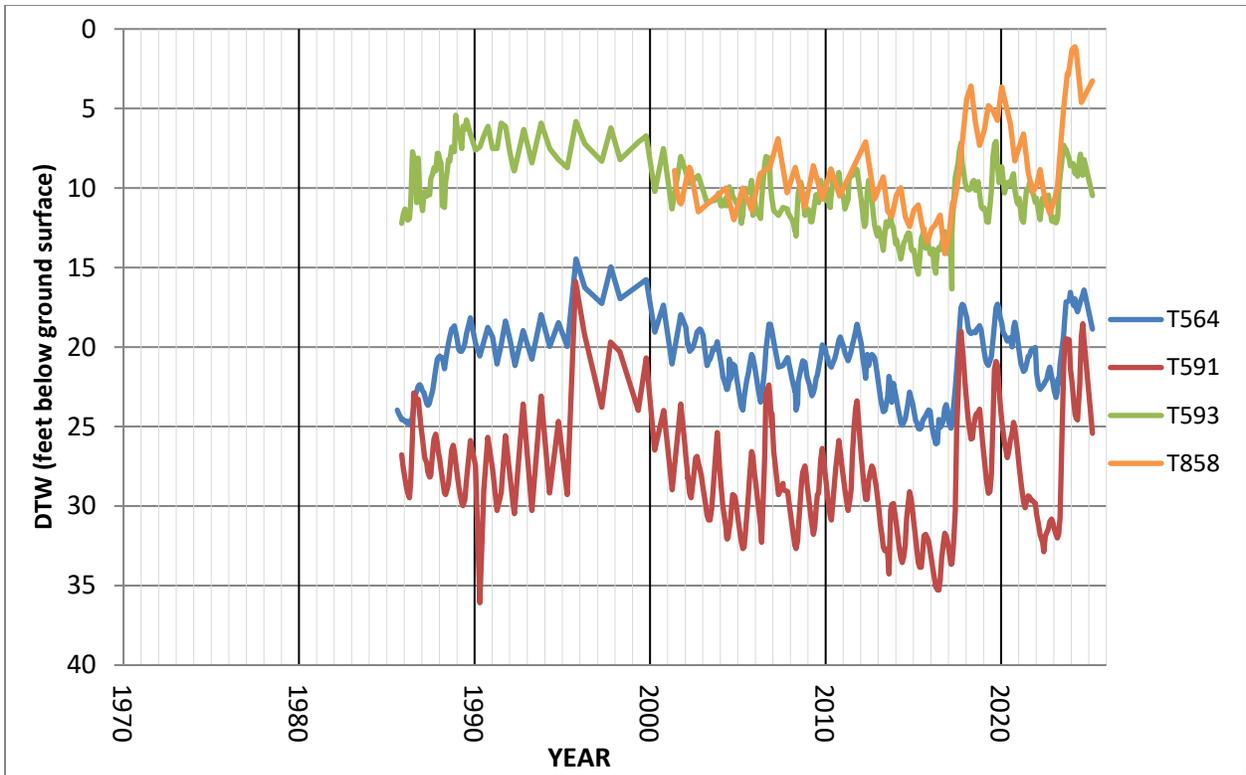


Figure 35. Hydrographs of selected test wells in the Lone Pine wellfield.

2025-26 Operations Plan Details

LADWP issued its Draft Operations Plan for the upcoming 2025-26 runoff year on April 20, 2025, as proscribed in the LTWA. The forecasted runoff for the Owens River watershed is 375,100 ac-ft (92% of normal). LADWP proposed a draft range of planned pumping for the year between 67,860 and 88,560 ac-ft. Inyo County, like most years, recommended reduced pumping amounts by wellfield below LADWP’s minimum proposed pumping for 2025-26 of 48,720 ac-ft.

In LADWP’s Final Operations Plan for the 2025-26 runoff year, LADWP provided a lower revised range of planned pumping for the year of 62,160 to 83,760 ac-ft (Table 3). The pumping, at the low-end, is for sole-source (in-valley) uses and some export; under LADWP’s high pumping scenario, significantly more pumping for aqueduct supply is planned (i.e., it is assumed that the difference between the planned minimum and maximum pumping of 21,600 ac-ft is mostly for export).

Table 3. LADWP planned minimum and maximum pumping (acre-feet per year) by wellfield for 2025-26 and Inyo County recommended reduced pumping.

Wellfield	LADWP MIN (62,160 ac-ft/yr)	LADWP MAX (83,760 ac-ft/yr)	Inyo County Recommended (48,720 ac-ft/yr)
Laws	6,000	10,500	5,500
Bishop	12,000	12,000	5,120
Big Pine	14,400	22,200	14,700
Taboose-Aberdeen	8,400	14,400	4,000
Thibaut-Sawmill	10,200	10,200	8,000
Independence-Oak	6,600	9,000	6,960
Symmes-Shepherd	3,360	3,360	2,640
Bairs-Georges	300	1,200	900
Lone Pine	900	900	900
Total	62,160	83,760	48,720

ICWD analyzed the effect of the Operations Plan on groundwater levels in the Owens Valley using regression models for a number of monitoring wells (Table 4). Most models rely on measured DTW in April 2025, planned wellfield pumping for the entire runoff year, and Owens Valley runoff to predict water levels next April. For several wells, Owens Valley runoff was not a statistically significant variable in the regression model. Water levels in those wells are correlated with pumping, and the models are still useful for evaluating the pumping plan. Also, models in Laws use the amount of water diverted from the Owens River into the McNally canals as the variable associated with recharge instead of runoff. No spreading is planned for Laws in 2025-26 (Table 2.8 of LADWP’s Plan).

The models used by ICWD to analyze the annual Operations Plan predict water levels one year in the future (e.g. April 2025 to April 2026) based on annual pumping for each wellfield. Three pumping scenarios are presented in Table 4: upper and lower proposed pumping limits from LADWP’s Final Plan, and Inyo County’s reduced pumping recommendation.

Table 4. ICWD predicted water level changes at Indicator wells and monitoring sites for: i) LADWP's proposed final minimum pumping, ii) LADWP's proposed final maximum pumping, and iii) Inyo County recommended reduced pumping. Negative DTW values denote a decline. Predictions in this table are made to 0.1 ft. Extra digits are presented for rounding transparency. Average values by wellfield are shown in orange text.

Station ID, Monitoring site	LADWP MIN (62,160 AF) 2026 vs 2025	LADWP MIN (62,160 AF) 2026 vs Baseline	LADWP MAX (83,760 AF) 2026 vs 2025	LADWP MAX (83,760 AF) 2026 vs Baseline	Inyo County Recommended (48,720 AF) 2026 vs 2025	Inyo County Recommended (48,720 AF) 2026 vs Baseline
	DTW change (ft)	DTW deviation from Baseline (ft)	DTW change (ft)	DTW deviation from Baseline (ft)	DTW change (ft)	DTW deviation from Baseline (ft)
Laws Avg.	-4.8	0.4	-5.9	-0.7	-4.6	0.5
107T	-6.36	-1.38	-7.86	-2.87	-6.19	-1.21
434T	-1.42	1.25	-2.06	0.61	-1.35	1.32
436T	-3.05	-0.32	-3.70	-0.97	-2.98	-0.25
438T	-3.25	-2.44	-3.79	-2.98	-3.19	-2.38
490T	-2.92	3.70	-3.20	3.42	-2.89	3.73
492T	-6.72	4.89	-9.13	2.48	-6.45	5.16
795T	-7.58	-1.96	-9.71	-4.10	-7.34	-1.73
V001g	-7.35	0.61	-8.59	-0.63	-7.22	0.74
574T	-4.16	-0.90	-4.83	-1.58	-4.08	-0.83
Big Pine	-0.8	4.3	-1.9	3.2	-0.8	4.3
425T	-0.70	7.62	-2.03	6.29	-0.75	7.57
426T	-0.25	3.92	-1.00	3.17	-0.28	3.89
469T	-0.48	1.88	-1.19	1.16	-0.50	1.85
572T	-0.87	3.00	-2.31	1.56	-0.92	2.95
798T, BP1	-2.02	2.65	-3.29	1.37	-2.07	2.60
799T, BP2	-0.03	1.80	-0.72	1.11	-0.06	1.77
567T, BP3	-1.42	6.86	-2.61	5.67	-1.47	6.82
800T, BP4	-0.32	6.93	-1.93	5.32	-0.38	6.87
Taboose-Aberdeen	-1.5	1.6	-2.8	0.3	-0.5	2.6
417T	-2.11	2.71	-3.68	1.14	-0.96	3.86
418T	-0.67	3.12	-1.35	2.44	-0.17	3.62
419T, TA1	-1.32	1.55	-2.94	-0.06	-0.13	2.74
421T	-2.13	1.34	-3.77	-0.30	-0.93	2.54
502T	-1.10	-1.14	-1.85	-1.89	-0.55	-0.59
504T	-1.99	1.92	-4.00	-0.09	-0.52	3.39
505T	-2.01	2.78	-3.61	1.18	-0.83	3.96
586T, TA4	-1.14	2.22	-2.48	0.88	-0.16	3.20
801T, TA5	-0.18	-0.56	-0.55	-0.93	0.09	-0.29
803T, TA6	-2.36	2.56	-3.85	1.07	-1.27	3.65
Thibaut-Sawmill	-0.4	4.9	-0.4	4.9	0.5	5.7
415T	-1.13	8.59	-1.13	8.59	0.57	10.29
507T	0.28	-0.04	0.28	-0.04	0.64	0.33

Station ID, Monitoring site	LADWP MIN (62,160 AF) 2026 vs 2025	LADWP MIN (62,160 AF) 2026 vs Baseline	LADWP MAX (83,760 AF) 2026 vs 2025	LADWP MAX (83,760 AF) 2026 vs Baseline	Inyo County Recommended (48,720 AF) 2026 vs 2025	Inyo County Recommended (48,720 AF) 2026 vs Baseline
	DTW change (ft)	DTW deviation from Baseline (ft)	DTW change (ft)	DTW deviation from Baseline (ft)	DTW change (ft)	DTW deviation from Baseline (ft)
806T, TS2	-0.24	6.17	-0.24	6.17	0.19	6.60
Independence-Oak	-0.4	-2.5	-1.1	-3.2	-0.5	-2.6
406T	-0.08	-2.43	-0.25	-2.60	-0.10	-2.46
407T	-0.25	-2.48	-1.07	-3.30	-0.37	-2.60
408T	-0.08	-0.40	-0.62	-0.94	-0.16	-0.48
409T	-0.83	-3.25	-2.50	-4.92	-1.08	-3.50
546T	-0.85	-3.26	-1.21	-3.61	-0.91	-3.31
809T, IO1	-0.33	-3.03	-1.16	-3.86	-0.45	-3.16
Symmes-Shepherd	-0.3	-3.6	-0.3	-3.6	-0.1	-3.4
402T	-0.20	-1.80	-0.20	-1.80	-0.12	-1.72
403T	-0.44	-0.64	-0.44	-0.64	-0.21	-0.41
404T	0.04	-1.59	0.04	-1.59	0.12	-1.50
447T	-0.77	-10.45	-0.77	-10.45	-0.24	-9.93
510T	0.06	-1.57	0.06	-1.57	0.14	-1.49
511T	-0.12	-1.46	-0.12	-1.46	-0.03	-1.38
V009G, SS1	-0.77	-7.70	-0.77	-7.70	-0.31	-7.23
Bairs-Georges	-0.4	0.8	-1.2	0.0	-0.9	0.3
398T	0.14	1.88	-1.09	0.65	-0.68	1.06
400T	-0.11	0.38	-0.34	0.15	-0.26	0.23
812T	-1.14	0.20	-2.20	-0.86	-1.85	-0.51
Wellfield Average	-1.2	+0.9	-1.9	+0.1	-1.0	+1.1

The upper limit of the pumping proposed in the Plan has historically been used by ICWD to evaluate LADWP’s proposed pumping because (1) it represents the maximum impact on the water table that the Plan could have, and (2) prior to 2017, LADWP had generally pumped near the upper end of the proposed range except in high runoff conditions. LADWP has pumped less than their proposed minimum in each of the past few years so some limited discussion of analysis of the lower limit is included herein.

ICWD’s analysis of the Plan and Inyo County’s reduced pumping recommendations below their minimum proposed pumping amounts are based on the goals and principles of the Water Agreement, the status of individual pumping wells according to Green Book soil water triggers, groundwater dependent vegetation conditions monitored by the Technical Group, water table conditions in each wellfield, groundwater uses within each wellfield, and the previous year’s actual pumping amount. LADWP’s minimum proposed pumping of 62,160 ac-ft for 2025-26 is less than the average pumping for the Owens Valley under the Water Agreement (69,809 ac-ft). Even in dry years, LADWP’s proposed annual Operation Plans do not include pumping for export from Bishop or Lone Pine wellfields as pumping in these wellfields is intended for in-valley uses.

Average groundwater levels are expected to decrease in all seven analyzed wellfields under LADWP's 2025-26 maximum and minimum proposed pumping scenarios (Table 4). The average deepening of the water table across the wellfields is estimated to be -1.9 feet year-over-year under LADWP's maximum pumping scenario, -1.2 feet under LADWP's minimum pumping scenario, and -1.0 feet with Inyo County recommended reduced pumping. By April 2026, under LADWP's maximum pumping scenario, average predicted water levels would be below baseline in Laws (-0.7 feet), Independence-Oak (-3.2 feet), and Symmes-Shepherd (-3.6 feet). In Big Pine, Taboose-Aberdeen, Thibaut-Sawmill, and Bairs-Georges, wellfield average water levels are predicted to be unchanged (0.0) to 4.9 feet above baseline. Concerns about and recommendations to LADWP's Draft 2025-26 Operations Plan are described in the Inyo County Water Department's April 30, 2025, letter to LADWP. A summary of these comments is presented here:

ICWD notes that the 2024-25 pumping (48,678 ac-ft) was lower than the predicted minimum from last year's Operations Plan. However, this amount of pumping still resulted in a lowering of DTW of -1.5 feet valley-wide, with the largest decline (-3.4 feet) occurring in the Laws wellfield. Together with average runoff, this low pumping helped to maintain water tables to above baseline in many (but not all) parts of the Owens Valley.

Given the nearly-average water year with sufficient runoff available, the County urges minimizing groundwater pumping for export and focusing instead on in-valley uses. The County-recommended 48,720 ac-ft of pumping is approximately what LADWP pumped in 2024-25. This figure also represents LADWP minimum proposed pumping from the previous year's Plan (2024-25) for all wellfields except Taboose-Aberdeen. Because of the relatively high minimum proposed pumping for that wellfield for 2024-25 (6,750 ac-ft), along with current groundwater and vegetation conditions, the County recommended a reduced extraction of 4,000 ac-ft. This would minimize the groundwater decline in the wellfield but is still well above the pumping needed for in-valley uses.

The Plan includes development of a plan for a proposed test of the modified W386 in Laws Wellfield (Five Bridges area) and preparation of an operation plan for W416 in Lone Pine Wellfield. The Plan also includes evaluation of the installation of wells at sites B-2 and B-5 that intends to address Inyo County's concern with the potential impacts on nearby non-LADWP wells. These activities, if performed in 2025-26, will necessitate a public process. LADWP also proposes equipping W429 (W371 replacement well in Bishop Wellfield) in 2025-26.

LADWP and the County jointly monitor both control and wellfield vegetation parcels each year. This program has consistently documented several parcels that underwent a perennial grass to woody transition early in the monitoring program, which is prohibited under the Agreement. The County would like the Technical Group to focus on implementing solutions, such as managing the groundwater regime in a manner compatible with baseline vegetation Agreement goals, exploring woody vegetation treatment if water levels are high enough to support the herbaceous component, and grouping parcels found to need similar management together so that solutions may be implemented widely and expediently.

Inyo County Water Department's full comment letter with detailed discussion of each wellfield can be found online at: <https://inyowater.org/documents/reports/ladwp-annual-owens-valley-reports/>.

Evaluation of 2024-2025 Depth to Water Predictions

As noted in the previous sub-section, ICWD routinely uses linear regression models for Indicator wells to predict the effects of pumping on DTW as part of its analysis of LADWP's annual Operations Plans. ICWD staff conducts an annual audit which examines the accuracy of these models by comparing the predictions with DTW measurements collected the following year on April 1. The regression models were constructed from historical data for wellfield pumping, Owens Valley runoff, and current water levels. The models in Laws rely on an estimate of the diversions into the McNally canals instead of Owens Valley runoff as the variable related to groundwater recharge. For four of the permanent monitoring sites, a second model was used that relies on predicted DTW in a nearby Indicator well that responds similarly to pumping and runoff. The models were originally developed by Harrington (1998) and Steinwand and Harrington (2003) and have been updated periodically. These reports are available on ICWD's website.

This analysis of the predictions includes uncertainty in the input variables (runoff forecast and planned pumping) as well as uncertainty in the empirical-based models. Model uncertainty includes all management actions and environmental conditions not captured in the regression model (e.g. atypical recharge or pumping operations near one of the test wells). Predictions for 46 Indicator wells made in April 2024 were compared to actual measured April 2025 DTWs (Table 2).

The 2024 predicted DTW values (i.e., April 2025 DTWs predicted in 2024) analyzed here focus on the higher maximum pumping amount (77,413 ac-ft) planned by LADWP in their 2024-25 pumping plan but some limited discussion of analysis of the lower limit pumping amount (51,470 ac-ft) is also included in this year's Annual Report since it is much closer to the 2024-25 actual pumping amount.

Actual pumping was approximately 63% (48,678 ac-ft) of the maximum planned amount (Table 1). Wellfield pumping totals for the year differed by as much as 7,340 ac-ft (i.e., maximum planned pumping in Taboose-Aberdeen wellfield less actual) of the planned amounts in wellfields with Indicator wells. The differences between planned and actual pumping decrease the accuracy of predictions. The model predictions also rely on forecasted Owens Valley runoff and unavoidably include the uncertainty in that prediction.

The LADWP runoff forecast has tracked actual runoff with accuracy since 1994. However, six of the past 10 years have seen runoff extremes at both the high and low end of the historic data. In 2018 and 2019 runoff years, LADWP's forecast under-predicted runoff by 75,000 and 81,000 ac-ft, respectively (second and third largest errors since 1994, Figure 1). These consecutive under-predictions were possibly due to continued water hold-over from the very wet 2017 winter (third largest) and the large amounts of surface water spread in the valley. Shallow groundwater levels in the Owens Valley, not widely seen since the 1980s, may also have contributed to LADWP's under-predictions. LADWP over-predicted 2021-22 runoff (118% of actual) and under-predicted 2022-23 runoff (81% of actual); but the past two years' predictions have been much closer to actual with predicted 2023-24 runoff 108% and this past year 104% of actual (Figure 1). Note that under-prediction of 2024-25 runoff (following the extreme 2023-24 high runoff) did not occur as it had following 2017-18. LADWP forecasted 2024-25 runoff was nearly equal to the long-term average (102%).

Model performance in 2023-24 and 2024-25 were more accurate than previous years despite less pumping than planned, shallow groundwater level antecedent conditions from the 2023-24 high runoff, and consequent large amounts of surface water spread in the valley. Actual DTW averaged by wellfield decrease from spring 2024 to spring 2025 was -1.5 feet (Table 2). The 2024 predicted decrease based on LADWP’s minimum pumping (51,470 ac-ft) was -1.4 feet and maximum pumping (77,413 ac-ft) was -2.2 feet.

Measured versus predicted change in DTW using LADWP’s maximum and minimum planned pumping are plotted in Figures 36 and 37, respectively. If the models were perfect predictors, the points would fall on the red 1:1 line. Actual groundwater levels were shallower in 38 and deeper in 8 of the 46 Indicator wells using maximum planned pumping which is a biased towards predicting deeper DTWs than were actually observed when measured in April 2025. This is due in part to significantly more model input pumping than actually occurred. The average absolute difference between 2024 water level predictions and 2025 measured water levels was 1.3 feet. Nearly two-thirds of the Indicator predictions (29 of 46) were within 1.5 ft of the actual deviation.

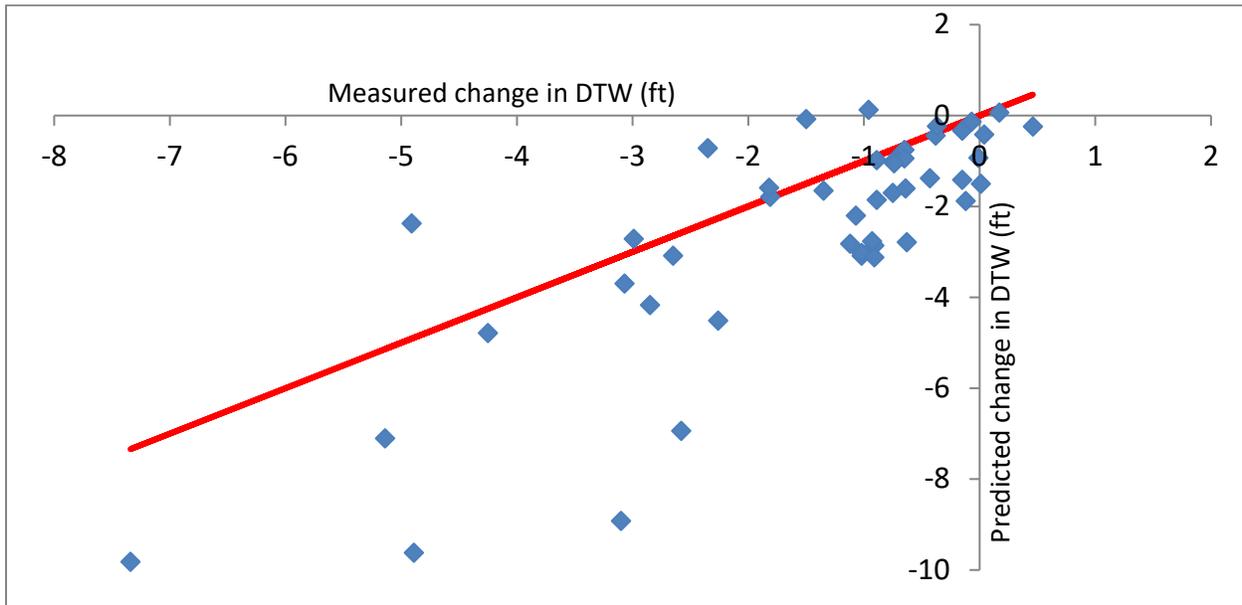


Figure 36. Measured and predicted change in DTW from April 2024 to April 2025 for 46 Indicator wells using maximum planned pumping and predicted runoff values. The solid red line is the 1:1 line. Negative values denote decline in water level. Data points right of the red line indicate actual groundwater level changes were more positive (shallower) than predicted.

Model predictions using LADWP’s minimum planned pumping compared to actual groundwater levels resulted in nearly an even split between shallower (22 of 46 of the wells) and deeper (24 of 46) than predicted levels (Figure 37). The average absolute difference between 2024 water level predictions and 2025 measured water levels was 1.0 feet. Model predictions were within 1.5 ft of actual in 83% of the wells (38 of 46), and within one foot of actual in 65% of the wells (30 of 46). This measure of model performance is satisfactory and comparable to previous non-extreme years.

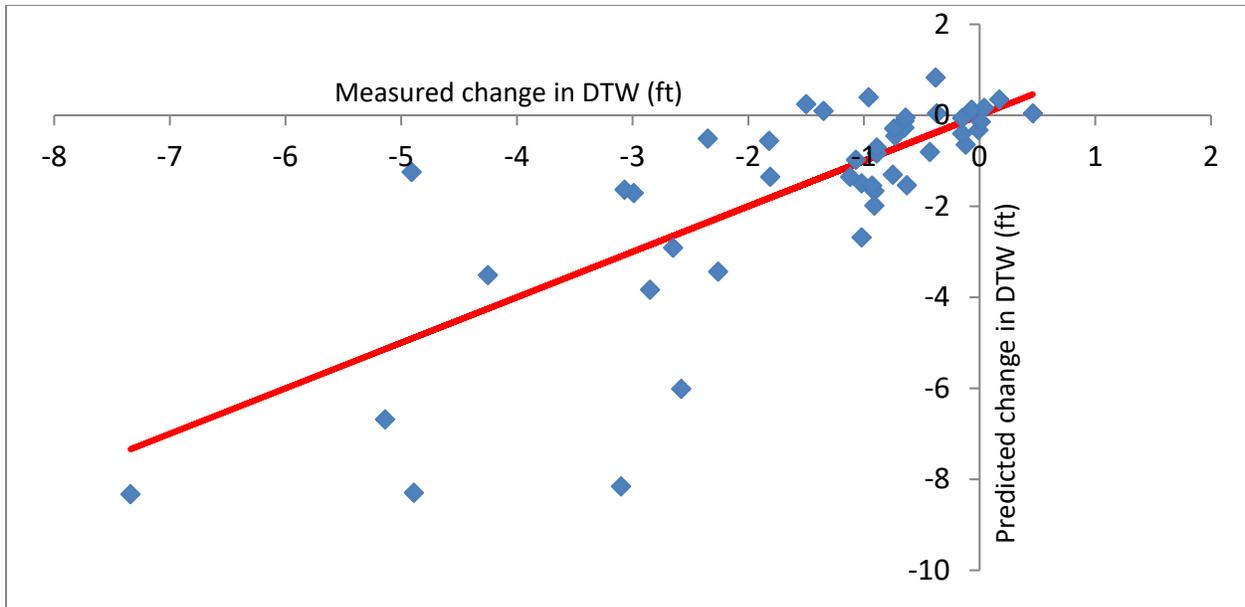


Figure 37. Measured and predicted change in DTW from April 2024 to April 2025 for 46 Indicator wells using minimum planned pumping and predicted runoff values. The solid red line is the 1:1 line. Negative values denote decline in water level. Data points right of the red line indicate actual groundwater level changes were more positive (shallower) than predicted.

The principal sources of error in 2024-25 predictions were a result of inaccurate inputs (i.e., primarily much less pumping than the planned maximum) combined with unforecasted diversions into the McNally canals (impacting model predictions in Laws wellfield), but not in the regression models' formulas themselves. The greatest difference between 2024 water level predictions and 2025 measured water levels were in Laws wellfield where the average difference was 2.7 feet deeper under the maximum planned pumping and 2.0 feet deeper under the minimum. This is due in part to the model input of 5,000 ac-ft of planned diverted water from the Owens River into the McNally canals. Actual diverted water was 23,001 ac-ft which contributed groundwater recharge that sustained shallower groundwater levels than were predicted.

For confirmation, the 2024 prediction models were re-run with actual values of runoff, pumping, and McNally canals diverted water (Figure 38). The subsequent model performance was somewhat improved from the minimum pumping scenario, with an average absolute difference between predicted and modeled DTW of approximately 0.9 feet. Model predictions were within 1.5 ft of actual in 76% of the wells (35 of 46), and within one foot of actual in 67% of the wells (31 of 46). Overall, actual groundwater levels were somewhat deeper than predicted (i.e., biased towards predicting shallower DTWs) in the majority of the wells (35 of 46).

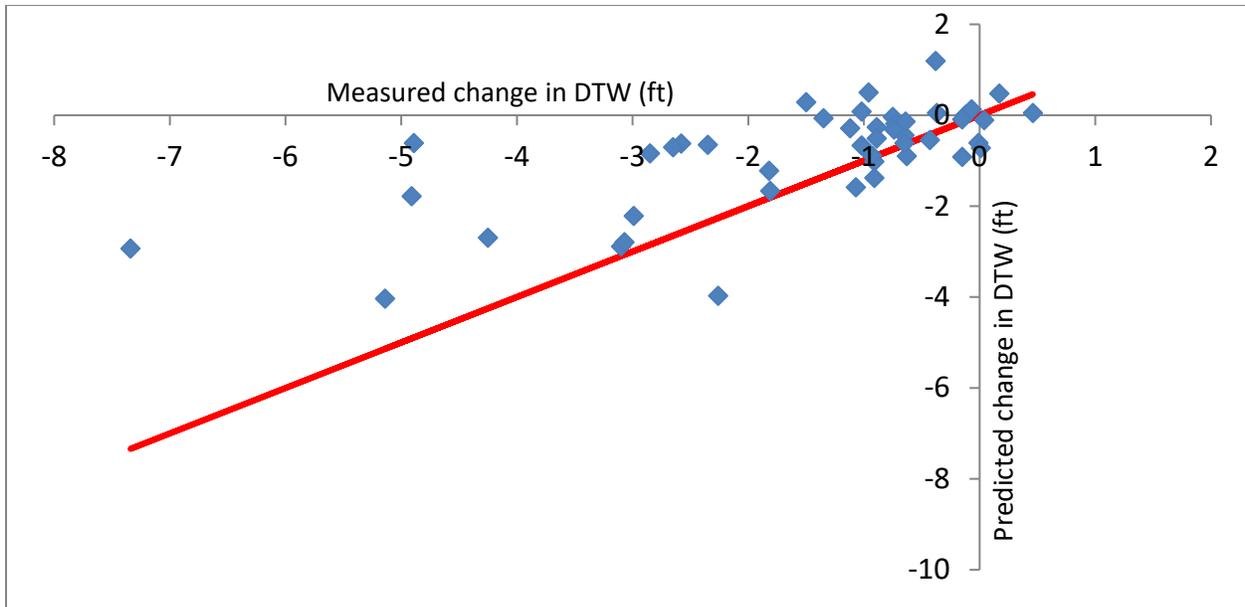


Figure 38. Corrected measured and predicted change in DTW from April 2024 to April 2025 for 46 Indicator wells using actual pumping and runoff values. The solid red line is the 1:1 line. Negative values denote decline in water level. Data points right of the redline indicate actual groundwater level changes were more positive (shallower) than predicted.

References

Harrington, R. F., Multiple regression modeling of water table response to groundwater pumping and runoff, Inyo County Water Department report, 1998.

Steinwand, A.L, and R.F. Harrington. 2003. Simulation of water table fluctuations at permanent monitoring sites to evaluate groundwater pumping. Report to the Inyo/Los Angeles Technical Group, February 25, 2003.