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COUNTY OF INYO
WATER DEPARTMENT

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Updated Regression Models for Forecasting Pumping-Induced Water Table Fluctuations

Introduction

Multiple linear regression modeling of water table response to pumping has been used for the past several years by both LADWP and ICWD to develop and evaluate annual pumping plans. This report documents revisions that ICWD staff have made to the multiple linear regression models used for forecasting the effects of pumping on the water table. A previous report (Harrington, 1998) documents the selection, use, and evaluation of multiple linear regression models for drawdown forecasts. The present report documents further development of the regression models since that report. The changes documented here are: (1) revisions and updates to the data, and (2) additional criteria for choosing indicator wells. Methods for assessing the uncertainty in regression model predictions are also described.

Revisions and Updates to Data

LADWP provided ICWD with the most recent version of LADWP's Totals and Means report in November 1998, subsequent to the preparation and transmittal of the above referenced report. This latest version of Totals and Means contains corrections to the computation of Owens Valley runoff, which is one of the variables used in the regression models. Because it was anticipated that the revised computation of Owens Valley runoff would be used in future runoff forecasts, the regression models were revised to reflect this change.

Also, the data for the regression model derivation was updated through runoff-year 1996, which provided an additional two years of data. Timely updating of the data is important for two related reasons. First, lengthening the record provides more stable models by virtue of the larger sample size. Second, prior to the adoption of the Drought Recovery Policy in 1990, runoff and pumping were highly negatively correlated. Thus, including the most recent part of the record helps distinguish between the effects of pumping and runoff.

Criteria for Choosing Wells

Table 3 of the above referenced report (Harrington, 1998) identified 91 wells as potential indicator wells, based on statistical criteria. In order to prune down this unwieldy number of wells, the 91 wells were reexamined. In choosing indicator wells, the need to have thorough spatial coverage of the valley floor was balanced with the desire to use only the most reliable predictors. In addition to the

statistical criteria described by Harrington (1998), these other conditions governed the choice of indicator wells:

1. Wells with fewer than 12 years of data were excluded. Longer periods of record result in more stable models.
2. Wells that would be affected by planned alterations in hydrologic management were excluded. If future conditions are not anticipated to be similar to the conditions extant during the period of record from which the model was derived, then the model is not valid for those anticipated conditions. This applied to several wells in the Black Rock area that will be affected by management changes implemented under the Lower Owens River Project.
3. Wells distant from any groundwater dependent vegetation were excluded. Some wells in abandoned agricultural lands were retained as indicator wells because they are near groundwater dependent vegetation, and some wells in non-groundwater dependent vegetation were retained to complete the spatial coverage.
4. Wells located distant from the wellfields were excluded. This excluded a few wells east of Independence.
5. Lone Pine wellfield was excluded, because of its low pumping stress.
6. Well 409T, one of the eighteen indicator wells, was excluded because it flows intermittently.

These criteria resulted in thirty-seven wells suitable for use as indicator wells (Table 1). Appendix I contains the data for each well from which the models were developed.

Table 1. Proposed indicator wells. RP = reference point; LSC = land surface correction, i.e., the difference between the RP and the land surface; vegetation class is as defined in the Green Book; baseline water table is the average April 1985-1987 water table elevation; nominal base of rooting zone is based on 2 m for meadow communities or desert sink scrub, and 4 m for other scrub communities.

Wellfield	Station ID	RP (ft msl)	LSC (ft)	Vegetation class	Baseline water table elevation (ft msl)	Nominal base of rooting zone (ft msl)
BG	400T	3754.82	1.4	36120, desert sink scrub	3748.5	3746.9
"	399T	3786.66	0.8	45310, alkali meadow	3783.7	3779.3
"	398T	3804.03	1.6	45350, Nevada saltbush meadow	3798.0	3795.9
SS	511T	3804.67	0.7	36150, Nevada saltbush scrub, nearby alkali meadow	3800.1	3797.4
"	510T	3801.75	0.8	36120, desert sink scrub	3796.7	3794.4
"	447T	3848.33	0.5	36110, desert saltbush scrub	3826.5	3828.2
"	404T	3803.22	0.4	45350, Nevada saltbush meadow	3799.7	3796.3
"	402T	3808.99	0.7	36150, Nevada saltbush scrub	3800.9	3795.0
"	403T	3821.59	0.6	45310, alkali meadow	3816.3	3814.4
"	401T	3830.8	1.2	36150, Nevada saltbush scrub	3826.1	3829.6
IO	546T	3824.67	0.8	45350, Nevada saltbush meadow	3821.1	3817.3
"	453T	3835.25	0.8	45310, alkali meadow	3829.7	3827.9
"	450T	3770.60	0.8	45350, Nevada saltbush meadow	3768.1	3763.2
"	412T	3815.89	1.1	45310, alkali meadow	3811.6	3808.2
"	408T	3808.40	1.5	45350, Nevada saltbush meadow	3805.3	3800.3
"	407T	3810.24	1.1	36150, Nevada saltbush scrub	3802.7	3796.0
"	406T	3763.9	1.4	45310, alkali meadow	3762.4	3755.8
TS	454T	3813.21	0.4	45310, alkali meadow	3811.5	3806.3
"	415T	3822.64	0.9	36120, desert sink scrub	3804.1	3815.2
"	414T	3841.7	1.6	45310, alkali meadow	3835.3	3833.5
"	413T	3842.87	1.0	35210, big sagebrush scrub	3833.5	--------
TA	505T	3836.13	0.5	45310, alkali meadow	3817.5	3829.1
"	504T	3841.95	0.7	45310, alkali meadow	3831.2	3834.7
"	502T	3844.66	0.8	36120, desert sink scrub	3837.2	3837.3
"	421T	3867.84	1.1	14000, abandoned agriculture, nearby scrub communities	3833.53	3853.6
"	419T	3835.48	1.5	45310, alkali meadow	3828.9	3827.4
"	418T	3830.65	0.7	36120, desert sink scrub	3822.47	3823.4
"	417T	3843.85	3.6	35400, rabbitbrush scrub	3816.9	3827.1
BP	469T	3925.7	1.0	14000, abandoned agriculture, nearby scrub communities	3904.0	3911.6
"	426T	3884.60	1.3	36120, desert sink scrub	3873.2	3876.7
"	425T	3881.29	1.0	36150, Nevada saltbush scrub	3866.4	3867.2
LA	493T	4133.20	1.6	45310, alkali meadow	4115.7	4125.0
"	492T	4130.06	1.7	36130, desert greasewood scrub	4097.2	4115.2
"	490T	4078.26	1.0	14000, abandoned agriculture, nearby alkali meadow	4065.2	4070.7
"	438T	4142.11	3.2	36120, desert sink scrub	4132.5	4132.4
"	436T	4107.50	1.2	45310, alkali meadow	4099.1	4099.7
"	107T	4156.10	----	35100. Great Basin mixed scrub	4132.1	-------

Evaluation of Prediction Uncertainty

In order to use regression model predictions for developing and reviewing annual pumping plans, it is necessary to know the uncertainty in the prediction. Without such an estimate, it is impossible to know the significance of the prediction. Uncertainty in the model prediction arises from four sources: (1) errors in input variables that are derived from direct measurement, e.g., initial water level, (2) errors in input variables that are derived from forecasts, e.g., pumping and runoff , (3) uncertainty in

the regression coefficients (because we have limited data from which to develop the models, the regression coefficients are only estimates of their true values), and (4) uncertainty due to the structure of the model (because we know the linear model is not a perfect representation of the hydrologic system, even if we did know the regression coefficients exactly). Experimentation with these models has shown that both parameter uncertainty and error due to model structure contribute significantly to the uncertainty in the predicted water level (Harrington, 1998).

Errors in the measurement of initial water levels are negligible compared to other sources of uncertainty, therefore that source of error is not considered further. Errors due to deviations from the annual pumping plan are not relevant to these models, because their purpose is to analyze the annual pumping plan. Uncertainty due to the uncertainty in the annual April 1 runoff forecast is not included in the model; however, it could be included if the error distribution of the runoff forecasts was known. This would require comparing the records of forecasted runoff with observed runoff, deriving the distribution of the deviations in forecasted versus observed, and including that distribution as a probabilistic variable in the regression models.

Uncertainty in the model results was determined using bootstrap resampling and Monte Carlo simulation. There are two components to modeling the uncertainty: a bootstrap procedure where the period of record for each well is used to generate multiple sets of regression coefficients, and the addition of a normal deviate to the prediction based on the standard error of the estimate. The bootstrap method provides direct evaluation of the effect of coefficient uncertainty on the model prediction. The advantages of using bootstrap methods rather than using the standard error of the coefficients to fit probability distributions are that the bootstrap method automatically accounts for covariation between the regression coefficients, and it is nonparametric in the sense that no assumptions are made regarding the data or coefficient probability distributions (Efron, 1982; Press et al., 1992). Implementation of the bootstrap method involves generating alternative sets of regression data by drawing random samples from the existing record, and applying multiple linear regression to each data set so generated. Iterating this procedure (i.e. Monte Carlo simulation) produces probability distributions for the regression coefficients and the predicted change in water level; however, uncertainty due to the structure of the model is not accounted for. Addition of a zero mean normal deviate to the prediction accounts for uncertainty in the prediction due to the structure of the model. The standard deviation of the normal deviate is set equal to the standard error of the regression.

Given in Table 2 are the mean and standard deviation of regression coefficients produced by Monte Carlo simulation. The difference between regression coefficients derived from deterministic multiple linear regression and the mean coefficients in Table 2 is negligible, which provides assurance that the bootstrap Monte Carlo method is faithfully reproducing the important features of the data. Also, the mean coefficients could be used in a deterministic sense, but this would not provide any assessment of the uncertainty in the prediction produced. These coefficients differ slightly from those given in Harrington (1998), because the period of record has been extended with recent data and the changes in the computation of Owens Valley runoff. The coefficient standard deviations provided in Table 2 give a sense of the coefficient uncertainty produced by the bootstrap Monte Carlo simulation. Wells where runoff was not a significant variable were modeled using only pumping and initial water level. Determination of significance was based on the t-statistic significance level as described in Harrington (1998).

Table 2. Regression coefficient mean (μ) and standard deviations (σ) for proposed indicator wells.

	Regression coefficients							
	Initial water level		Pumping		Runoff		Intercept	
Wellfield, Well	μ	σ	μ	σ	μ	σ	μ	σ
BG, 400T	0.4915	8.267E-02	-2.379E-04	3.214E-05	----------	----------	1906	309.8
" , 399T	0.4375	0.1020	-2.86E-04	6.793E-05			2128	386.2
" , 398T	0.3918	6.848E-02	-1.165E-03	1.300E-04	3.934E-06	1.532E-06	2308	259.6
SS, 511T	0.1063	0.1063	-1.327E-04	4.051E-05	----------	----------	408.9	403.8
" , 510T	0.8170	6.102E-02	-1.193E-04	2.390E-05			694.9	231.5
" , 447T	0.8665	6.625E-02	-7.591E-04	1.507E-04	1.030E-05	4.775E-06	508.5	250.9
" , 404T	0.8432	7.394E-02	-1.461E-04	2.996E-05	----------	----------	596.1	280.8
" , 402T	0.8152	8.042E-02	-1.247E-04	3.274E-05	1.781E-06	1.120E-06	701.8	305.1
" , 403T	0.7751	4.461E-02	-3.180E-04	2.693E-05	2.384E-06	1.051E-06	858.0	169.7
" , 401T	0.5623	9.688E-02	-4.847E-04	1.515E-04	1.114E-05	3.325E-06	1669	369.8
IO, 546T	0.5515	9.762E-02	-2.590E-04	6.283E-05	----------	----------	1713	372.8
" , 453T	0.5883	0.1068	-4.300E-04	1.044E-04	----------	----------	1577	408.8
" , 450T	0.8573	0.1468	-1.218E-04	3.372E-05	----------	----------	538.3	552.7
" , 412T	0.5265	0.1494	-2.143E-04	6.685E-05	----------	----------	1804	569.3
" , 408T	0.8484	7.602E-02	-2.194E-04	3.995E-05	----------	----------	577.9	288.9
" , 407T	0.7504	5.575E-02	-3.235E-04	4.341E-05	----------	----------	949.8	211.7
" , 406T	0.7862	0.1157	-1.274E-04	2.955E-05	----------	----------	804.5	435.0
TS, 454T	0.7972	0.1023	-1.765E-04	6.647E-05	----------	----------	774.4	390.0
" , 415T	0.8067	0.0889	-1.051E-03	1.766E-04	----------	----------	750.7	339.2
" , 414T	0.8942	9.685E-02	-2.888E-04	7.839E-05	----------	----------	408.6	370.3
" , 413T	0.9285	7.862E-02	-3.461E-04	7.648E-05	----------	----------	278.0	300.9
TA, 505T	0.8573	6.230E-02	-3.107E-04	9.609E-05	----------	----------	548.2	237.4
" , 504T	0.6442	4.252E-02	-3.110E-04	3.420E-05	9.722E-06	2.140E-06	1360	162.0
" , 502T	0.6606	0.1096	-1.385E-04	5.073E-05	4.057E-06	4.055E-06	1301	419.2
" , 421T	0.6591	0.0450	-2.473E-04	2.142E-05	1.083E-05	1.930E-06	1303	171.5
" , 419T	0.7222	5.138E-02	-2.488E-04	3.950E-05	8.935E-06	2.614E-06	1061	195.3
" , 418T	0.8705	3.915E-02	-1.146E-04	1.205E-05	3.415E-06	8.527E-07	494.5	149.1
" , 417T	0.8479	6.498E-02	-3.049E-04	1.026E-04	----------	----------	583.8	247.6
BP, 469T	0.7651	0.0702	-1.221E-04	2.054E-05	2.832E-06	1.009E-06	918.5	273.6
" , 426T	0.8264	3.661E-02	-7.850E-05	1.856E-05	6.300E-06	5.245E-07	670.8	141.2
" , 425T	0.7696	4.543E-02	-1.234E-04	3.014E-05	1.012E-05	1.072E-06	888.4	174.7
LA, 493T	0.7290	9.637E-02	-6.524E-04	1.210E-04	----------	----------	1121	395.6
" , 492T	0.3474	9.490E-02	-4.530E-04	2.151E-04	2.437E-05	1.153E-05	2663	385.5
" , 490T	0.8839	0.1401	-1.634E-04	3.962E-05	----------	----------	473.9	568.5
" , 438T	0.5274	0.1066	-1.641E-04	5.482E-05	6.777E-06	3.296E-06	1950	439.1
" , 436T	0.4247	8.306E-02	-1.045E-04	4.381E-05	1.175E-05	2.865E-06	2352	340.1
" , 107T	0.5669	0.1026	-5.993E-04	9.721E-05	----------	----------	1794	424.2

References

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Appendix I. Regression Data

400T Bairs George				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3746.8	1387	465125	3746.9
1975	3746.9	3702	377308	3746.6
1976	3746.6	3894	249678	3747.0
1977	3747.0	5353	216567	3746.9
1978	3746.9	287	648737	3747.8
1979	3747.8	2720	411287	3747.
1980	3747.6	8	611023	3748.4
1981	3748.4	2288	351412	3748.1
1982	3748.1	156	667114	3748.7
1983	3748.7	3	792511	3749.0
1984	3749.0	64	502366	3748.8
1985	3748.8	826	428046	3748.5
1986	3748.5	1140	658839	3748.2
1987	3748.2	6485	280785	3746.8
1988	3746.8	4602	258845	3746.8
1989	3746.8	3293	261425	3747.2
1990	3747.2	358	215375	3747.9
1991	3747.9	231	265170	3748.1
1992	3748.1	140	254358	3748.5
1993	3748.5	110	441197	3748.2
1994	3748.2	246	276706	3748.7
1995	3748.7	274	637163	3748.9
1996	3748.9	0	558815	3748.7

399T Bairs George				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3781.6	1387	465125	3782.6
1975	3782.6	3702	377308	3782
1976	3782	3894	249678	3782
1977	3782	5353	216567	3782.5
1978	3782.5	287	648737	3783.9
1979	3783.9	2720	411287	3783.2
1980	3783.2	8	611023	3783.2
1981	3783.2	2288	351412	3783.2
1982	3783.2	156	667114	3784.4
1983	3784.4	3	792511	3784.3
1984	3784.3	64	502366	3784.1
1985	3784.1	826	428046	3783.3
1986	3783.3	1140	658839	3783.7
1987	3783.7	6485	280785	3781.9
1988	3781.9	4602	258845	3781.1
1989	3781.1	3293	261425	3781.1
1990	3781.1	358	215375	3782.4
1991	3782.4	231	265170	3782.3
1992	3782.3	140	254358	3783.6
1993	3783.6	110	441197	3782.5
1994	3782.5	246	276706	3784
1995	3784	274	637163	3784
1996	3784	0	558815	3783.8

398T Bairs George				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3791.5	1387	465125	3794.7
1975	3794.7	3702	377308	3792.7
1976	3792.7	3894	249678	3790.9
1977	3790.9	5353	216567	3789.7
1978	3789.7	287	648737	3797
1979	3797	2720	411287	3794.6
1980	3794.6	8	611023	3798.8
1983	3800.1	3	792511	3800.5
1986	3796.9	1140	658839	3798.4
1987	3798.4	6485	280785	3791.7
1988	3791.7	4602	258845	3790.1
1989	3790.1	3293	261425	3790.7
1990	3790.7	358	215375	3793.7
1991	3793.7	231	265170	3796.7
1992	3796.7	140	254358	3798.6
1993	3798.6	110	441197	3798.1
1994	3798.1	246	276706	3798.7
1995	3798.7	274	637163	3799.7
1996	3799.7	0	558815	3799.6

511T Symmes Shepherd				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1978	3795.7	655	648737	3795.77
1979	3795.7	5837	411287	3796.8
1982	3797.6	589	667114	3798.7
1983	3798.7	11	792511	3799.8
1984	3799.8	566	502366	3800.1
1985	3800.1	9020	428046	3800.2
1986	3800.2	5405	658839	3799.9
1987	3799.9	21545	280785	3797.5
1988	3797.5	18968	258845	3795.1
1989	3795.1	8533	261425	3794.3
1990	3794.3	1520	215375	3795.5
1991	3795.5	1254	265170	3795.3
1992	3795.3	2672	254358	3797
1993	3797	4571	441197	3795.4
1994	3795.4	5896	276706	3797.2
1995	3797.2	2896	637163	3797
1996	3797	1534	558815	3797.6

510T Symmes Shepherd				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1978	3791.9	655	648737	3793
1979	3793	5837	411287	3793.1
1980	3793.1	15	611023	3793.8
1981	3793.8	7620	351412	3794.6
1982	3794.6	589	667114	3796.1
1983	3796.1	11	792511	3797.2
1984	3797.2	566	502366	3797.3
1985	3797.3	9020	428046	3796.6
1986	3796.6	5405	658839	3796.4
1987	3796.4	21545	280785	3793.8
1988	3793.8	18968	258845	3792.7
1989	3792.7	8533	261425	3792.7
1990	3792.7	1520	215375	3793.4
1993	3794.6	4571	441197	3793.6
1994	3793.6	5896	276706	3795
1995	3795	2896	637163	3795.2
1996	3795.2	1534	558815	3795.4

447T Symmes Shepherd				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1979	3796.2	5837	411287	3801.5
1980	3801.5	15	611023	3809.4
1981	3809.4	7620	351412	3811.2
1982	3811.2	589	667114	3816.9
1983	3816.9	11	792511	3827.9
1984	3827.9	566	502366	3829.5
1985	3829.5	9020	428046	3824.6
1986	3824.6	5405	658839	3825.4
1987	3825.4	21545	280785	3808.5
1988	3808.5	18968	258845	3796.4
1991	3797.5	1254	265170	3801
1992	3801	2672	254358	3802.1
1993	3802.1	4571	441197	3803.2
1994	3803.2	5896	276706	3802.3
1995	3802.3	2896	637163	3804.7
1996	3804.7	1534	558815	3807.7

402T Symmes Shepherd				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3795.2	4534	465125	3795.4
1977	3794.9	16674	216567	3794.0
1978	3794.0	655	648737	3796.4
1979	3796.4	5837	411287	3796.4
1980	3796.4	15	611023	3797.1
1981	3797.1	7620	351412	3797.5
1982	3797.5	589	667114	3799.5
1983	3799.5	11	792511	3801.0
1984	3801.03	566	502366	3801.5
1985	3801.5	9020	428046	3800.3
1986	3800.3	5405	658839	3800.8
1987	3800.8	21545	280785	3797.4
1988	3797.4	18968	258845	3796.5
1989	3796.5	8533	261425	3796.1
1990	3796.1	1520	215375	3796.6
1991	3796.6	1254	265170	3796.8
1992	3796.8	2672	254358	3797.9
1993	3797.9	4571	441197	3797.6
1994	3797.6	5896	276706	3798.7

403T Symmes Shepherd				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3804.3	4534	465125	3805.5
1975	3805.5	12996	377308	3804.1
1976	3804.1	9742	249678	3804.9
1977	3804.9	16674	216567	3801.6
1978	3801.6	655	648737	3807.3
1979	3807.3	5837	411287	3808.0
1980	3808.0	15	611023	3811.9
1981	3811.9	7620	351412	3811.9
1982	3811.9	589	667114	3814.9
1983	3814.9	11	792511	3817.0
1984	3817.0	566	502366	3817.7
1985	3817.7	9020	428046	3815.6
1986	3815.6	5405	658839	3815.5
1987	3815.5	21545	280785	3810.1
1988	3810.1	18968	258845	3805.8
1989	3805.8	8533	261425	3806.7
1990	3806.7	1520	215375	3809
1991	3809	1254	265170	3810.4
1992	3810.4	2672	254358	3811
1993	3811	4571	441197	3810.6
1994	3810.6	5896	276706	3810.7
1995	3810.7	2896	637163	3811.3
1996	3811.3	1534	558815	3812.5

401T Symmes Shepherd				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1977	3806.8	16674	216567	3802.6
1978	3802.6	655	648737	3813.2
1979	3813.2	5837	411287	3809.7
1980	3809.7	15	611023	3821.0
1981	3821.0	7620	351412	3814.4
1982	3814.4	589	667114	3823.7
1983	3823.7	11	792511	3829.6
1984	3829.6	566	502366	3829.9
1985	3829.9	9020	428046	3821.9
1986	3821.9	5405	658839	3826.4
1987	3826.4	21545	280785	3813.7
1988	3813.7	18968	258845	3813
1989	3813	8533	261425	3815.7
1990	3815.7	1520	215375	3817.8
1991	3817.8	1254	265170	3819.1
1992	3819.1	2672	254358	3819.6
1993	3819.6	4571	441197	3820.2
1994	3820.2	5896	276706	3820.8
1995	3820.8	2896	637163	3822.3
1996	3822.3	1534	558815	3823.2

546T Independence Oak Creek				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1979	3817.12	6067	411287	3818.1
1980	3818.1	1173	611023	3818.5
1981	3818.5	954	351412	3817.3
1982	3817.3	1105	667114	3819.2
1983	3819.2	347	792511	3820.8
1984	3820.8	1735	502366	3820.8
1985	3820.8	3527	428046	3821.7
1986	3821.7	1091	658839	3820.7
1987	3820.7	19221	280785	3816.5
1988	3816.5	17969	258845	3813.4
1989	3813.4	16361	261425	3811.8
1992	3811.3	10547	254358	3813.4
1993	3813.4	6824	441197	3815.6
1994	3815.6	9550	276706	3814.1
1995	3814.1	9179	637163	3816.4
1996	3816.4	8047	558815	3818.2

453T Independence-Oak Creek				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3829.2	6359	465125	3831.1
1975	3831.1	8560	377308	3825.0
1976	3825.0	7872	249678	3822.5
1977	3822.5	13762	216567	3820.2
1978	3820.2	2521	648737	3825.1
1979	3825.1	6067	411287	3824.7
1980	3824.7	1173	611023	3827.2
1981	3827.2	954	351412	3823.3
1982	3823.3	1105	667114	3830.1
1983	3830.1	347	792511	3831.5
1984	3831.5	1735	502366	3830
1985	3830	3527	428046	3828
1986	3828	1091	658839	3831.3
1987	3831.3	19221	280785	3824.6
1988	3824.6	17969	258845	3821.5
1989	3821.5	16361	261425	3819.7
1990	3819.7	9913	215375	3817.9
1991	3817.9	10841	265170	3817.8
1992	3817.8	10547	254358	3818.5
1993	3818.5	6824	441197	3822.6
1994	3822.6	9550	276706	3819.2

450T Independence-Oak Creek				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3764.3	6359	465125	3764.6
1975	3764.6	8560	377308	3764.7
1976	3764.7	7872	249678	3764.4
1977	3764.4	13762	216567	3763.2
1978	3763.2	2521	648737	3764.1
1979	3764.1	6067	411287	3764.6
1980	3764.6	1173	611023	3766.2
1981	3766.2	954	351412	3766.1
1982	3766.1	1105	667114	3768.6
1983	3768.6	347	792511	3768.7
1984	3768.7	1735	502366	3768.1
1985	3768.1	3527	428046	3769.5
1988	3766	17969	258845	3765.1
1989	3765.1	16361	261425	3764.6
1990	3764.6	9913	215375	3765.1
1991	3765.1	10841	265170	3765.1
1992	3765.1	10547	254358	3765
1993	3765	6824	441197	3765.1
1994	3765.1	9550	276706	3765.1
1995	3765.1	9179	637163	3765.4
1996	3765.4	8047	558815	3765.5

412T Independence-Oak Creek				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3806.9	6359	465125	3806.9
1975	3806.9	8560	377308	3806.2
1976	3806.2	7872	249678	3806.1
1977	3806.1	13762	216567	3804.2
1978	3804.2	2521	648737	3808.8
1979	3808.8	6067	411287	3809.1
1980	3809.1	1173	611023	3809.9
1981	3809.9	954	351412	3807.9
1982	3807.9	1105	667114	3811.7
1983	3811.7	347	792511	3811.5
1984	3811.5	1735	502366	3811.7
1985	3811.7	3527	428046	3812.3
1986	3812.3	1091	658839	3810.8
1987	3810.8	19221	280785	3807.8
1988	3807.8	17969	258845	3806.9
1989	3806.9	16361	261425	3805.7
1990	3805.7	9913	215375	3806.4
1991	3806.4	10841	265170	3806.1
1992	3806.1	10547	254358	3807.3
1993	3807.3	6824	441197	3807.8
1994	3807.8	9550	276706	3807

408T Independence-Oak Creek				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3794.8	6359	465125	3796.5
1975	3796.5	8560	377308	3796.6
1976	3796.6	7872	249678	3795.3
1977	3795.3	13762	216567	3793.8
1978	3793.8	2521	648737	3796.7
1979	3796.7	6067	411287	3798.4
1980	3798.4	1173	611023	3799.6
1981	3799.6	954	351412	3802.0
1982	3802.0	1105	667114	3803.6
1983	3803.6	347	792511	3805.6
1984	3805.6	1735	502366	3805.1
1985	3805.1	3527	428046	3805.3
1986	3805.3	1091	658839	3805.4
1987	3805.4	19221	280785	3801.3
1988	3801.3	17969	258845	3798.9
1989	3798.9	16361	261425	3797.5
1990	3797.5	9913	215375	3799.6
1991	3799.6	10841	265170	3799.1
1992	3799.1	10547	254358	3800
1993	3800	6824	441197	3800.9
1994	3800.9	9550	276706	3801.9
1995	3801.9	9179	637163	3802.7
1996	3802.7	8047	558815	3805.2

407T Independence-Oak Creek				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3791.9	6359	465125	3793.3
1975	3793.3	8560	377308	3793.9
1976	3793.9	7872	249678	3790.6
1977	3790.6	13762	216567	3788.5
1978	3788.5	2521	648737	3792.6
1979	3792.6	6067	411287	3794.8
1980	3794.8	1173	611023	3796.2
1981	3796.2	954	351412	3799.2
1982	3799.2	1105	667114	3800.6
1983	3800.6	347	792511	3803.1
1984	3803.1	1735	502366	3802.9
1985	3802.9	3527	428046	3802.9
1986	3802.9	1091	658839	3802.2
1987	3802.2	19221	280785	3798
1988	3798	17969	258845	3793.1
1989	3793.1	16361	261425	3790.7
1990	3790.7	9913	215375	3792.8
1991	3792.8	10841	265170	3793.4
1992	3793.4	10547	254358	3794.7
1993	3794.7	6824	441197	3794.7
1994	3794.7	9550	276706	3796
1995	3796	9179	637163	3796.9
1996	3796.9	8047	558815	3798.1

406T Independence-Oak Creek				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3757.8	6359	465125	3757.8
1975	3757.8	8560	377308	3758.3
1976	3758.3	7872	249678	3757
1977	3757	13762	216567	3755.9
1978	3755.9	2521	648737	3756.6
1979	3756.6	6067	411287	3757.1
1980	3757.1	1173	611023	3758.7
1981	3758.7	954	351412	3758.7
1982	3758.7	1105	667114	3760.9
1983	3760.9	347	792511	3762.8
1984	3762.8	1735	502366	3762.9
1985	3762.9	3527	428046	3763.1
1986	3763.1	1091	658839	3761.1
1987	3761.1	19221	280785	3759.2
1988	3759.2	17969	258845	3757.8
1989	3757.8	16361	261425	3757.4
1990	3757.4	9913	215375	3758
1991	3758	10841	265170	3758.2
1992	3758.2	10547	254358	3758.2
1993	3758.2	6824	441197	3758.4
1994	3758.4	9550	276706	3758.6

454T Thibaut-Sawmill				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3808.8	12607	465125	3808.5
1975	3808.5	12005	377308	3808.3
1976	3808.3	13865	249678	3806.9
1977	3806.9	15651	216567	3807.2
1978	3807.2	8763	648737	3806.1
1979	3806.1	10518	411287	3807.6
1980	3807.6	13087	611023	3806.5
1981	3806.5	10511	351412	3809.2
1982	3809.2	10928	667114	3810.6
1983	3810.6	10698	792511	3811.5
1984	3811.5	10705	502366	3811.8
1985	3811.8	12744	428046	3811.6
1986	3811.6	14522	658839	3811
1987	3811	22018	280785	3809.6
1988	3809.6	20477	258845	3808
1989	3808	21930	261425	3806
1990	3806	16348	215375	3806.2
1991	3806.2	18156	265170	3805
1992	3805	16550	254358	3806.8
1993	3806.8	13737	441197	3805.8
1994	3805.8	14605	276706	3807.4
1995	3807.4	12528	637163	3808.4
1996	3808.4	15441	558815	3808.8

415T Thibaut-Sawmill				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1977	3784.9	15651	216567	3783.1
1978	3783.1	8763	648737	3797.1
1979	3797.1	10518	411287	3802.8
1980	3802.8	13087	611023	3803.9
1981	3803.9	10511	351412	3807.7
1982	3807.7	10928	667114	3810.5
1983	3810.5	10698	792511	3812.5
1987	3804.1	22018	280785	3800.4
1988	3800.4	20477	258845	3793.9
1989	3793.9	21930	261425	3788.4
1990	3788.4	16348	215375	3790.3
1991	3790.3	18156	265170	3789.6
1992	3789.6	16550	254358	3790.5
1993	3790.5	13737	441197	3794.3
1994	3794.3	14605	276706	3793.2
1995	3793.2	12528	637163	3801.3
1996	3801.3	15441	558815	3802.4

414T Thibaut-Sawmill				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3831.1	12607	465125	3831.2
1975	3831.2	12005	377308	3827.1
1976	3827.1	13865	249678	3829
1977	3829	15651	216567	3826.9
1978	3826.9	8763	648737	3826.8
1979	3826.8	10518	411287	3827.9
1980	3827.9	13087	611023	3828.5
1981	3828.5	10511	351412	3828.8
1982	3828.8	10928	667114	3831.3
1983	3831.3	10698	792511	3832.6
1984	3832.6	10705	502366	3834.5
1985	3834.5	12744	428046	3836
1986	3836	14522	658839	3835.5
1987	3835.5	22018	280785	3831.5
1988	3831.5	20477	258845	3829.8
1989	3829.8	21930	261425	3827.2
1990	3827.2	16348	215375	3824.6
1991	3824.6	18156	265170	3824.1
1992	3824.1	16550	254358	3823.1
1993	3823.1	13737	441197	3824.2
1994	3824.2	14605	276706	3823.3
1995	3823.3	12528	637163	3823
1996	3823	15441	558815	3826.6

413T Thibaut-Sawmill				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3824.3	12607	465125	3824.7
1975	3824.7	12005	377308	3823.5
1976	3823.5	13865	249678	3821.6
1977	3821.6	15651	216567	3822.5
1978	3822.5	8763	648737	3823.9
1979	3823.9	10518	411287	3825.3
1980	3825.3	13087	611023	3826.8
1981	3826.8	10511	351412	3827.8
1982	3827.8	10928	667114	3829.2
1983	3829.2	10698	792511	3832.1
1984	3832.1	10705	502366	3833
1985	3833	12744	428046	3834.8
1986	3834.8	14522	658839	3832.8
1987	3832.8	22018	280785	3827.6
1988	3827.6	20477	258845	3826
1989	3826	21930	261425	3823.9
1990	3823.9	16348	215375	3821.7
1991	3821.7	18156	265170	3821.5
1992	3821.5	16550	254358	3821.1
1993	3821.1	13737	441197	3818.8
1994	3818.8	14605	276706	3820.4
1995	3820.4	12528	637163	3821.6
1996	3821.6	15441	558815	3823.5

505T Taboose-Aberdeen				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1979	3798.8	16411	411287	3805.7
1980	3805.7	3632	611023	3809.3
1981	3809.3	26861	351412	3812.5
1982	3812.5	4606	667114	3816.1
1983	3816.1	3330	792511	3819.0
1984	3819.0	6685	502366	3820.2
1985	3820.2	25167	428046	3815.4
1986	3815.4	10771	658839	3817
1987	3817	40240	280785	3807
1988	3807	42316	258845	3793.3
1989	3793.3	24481	261425	3793.2
1990	3793.2	10807	215375	3796.7
1991	3796.7	7966	265170	3799
1992	3799	7481	254358	3800.9
1993	3800.9	5331	441197	3805.4
1994	3805.4	7583	276706	3805.1
1995	3805.1	6658	637163	3811.2
1996	3811.2	5656	558815	3812.9

504T Taboose-Aberdeen				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1978	3808.1	3711	648737	3818.3
1979	3818.3	16411	411287	3819.5
1980	3819.5	3632	611023	3828.3
1981	3828.3	26861	351412	3823.4
1982	3823.4	4606	667114	3830.4
1983	3830.4	3330	792511	3834.1
1984	3834.1	6685	502366	3834.4
1985	3834.4	25167	428046	3827.9
1986	3827.9	10771	658839	3831.2
1987	3831.2	40240	280785	3817
1988	3817	42316	258845	3809.9
1989	3809.9	24481	261425	3810.2
1990	3810.2	10807	215375	3813.6
1991	3813.6	7966	265170	3818.7
1992	3818.7	7481	254358	3821
1993	3821	5331	441197	3823.7
1994	3823.7	7583	276706	3824.6
1995	3824.6	6658	637163	3826.9
1996	3826.9	5656	558815	3828.8

502T Taboose-Aberdeen				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1976	3831.7	30890	249678	3829.26
1977	3829.2	34624	216567	3827.2
1978	3827.2	3711	648737	3833.6
1979	3833.6	16411	411287	3834.6
1980	3834.6	3632	611023	3837.5
1981	3837.5	26861	351412	3835.2
1982	3835.2	4606	667114	3838.7
1983	3838.7	3330	792511	3839.0
1984	3839.0	6685	502366	3838.8
1985	3838.8	25167	428046	3835.7
1986	3835.7	10771	658839	3837
1987	3837	40240	280785	3831.7
1994	3831.3	7583	276706	3831.6
1995	3831.6	6658	637163	3832.6
1996	3832.6	5656	558815	3834

421T Taboose-Aberdeen				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1977	3816.3	34624	216567	3813
1978	3813	3711	648737	3821.4
1979	3821.4	16411	411287	3824.1
1980	3824.1	3632	611023	3831.1
1981	3831.1	26861	351412	3827.0
1982	3827.0	4606	667114	3833.4
1983	3833.4	3330	792511	3837.4
1984	3837.4	6685	502366	3837.2
1985	3837.2	25167	428046	3829.8
1986	3829.8	10771	658839	3833.6
1987	3833.6	40240	280785	3822.4
1988	3822.4	42316	258845	3815.5
1989	3815.5	24481	261425	3814.2
1990	3814.2	10807	215375	3817.4
1991	3817.4	7966	265170	3820.9
1992	3820.9	7481	254358	3822.6
1993	3822.6	5331	441197	3825.3
1994	3825.3	7583	276706	3826.1
1995	3826.1	6658	637163	3829.3
1996	3829.3	5656	558815	3830.7

419T Taboose-Aberdeen				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3819.0	23831	465125	3818.6
1979	3812.7	16411	411287	3815.9
1980	3815.9	3632	611023	3823.5
1981	3823.5	26861	351412	3821.6
1982	3821.6	4606	667114	3826.2
1983	3826.2	3330	792511	3830.6
1984	3830.6	6685	502366	3831.5
1985	3831.5	25167	428046	3826.3
1986	3826.3	10771	658839	3829
1987	3829	40240	280785	3818.6
1988	3818.6	42316	258845	3809.6
1989	3809.6	24481	261425	3809.1
1990	3809.1	10807	215375	3810.5
1991	3810.5	7966	265170	3814
1994	3819.9	7583	276706	3821.2
1995	3821.2	6658	637163	3823.5
1996	3823.5	5656	558815	3825.4

418T Taboose-Aberdeen				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3816.3	23831	465125	3815.9
1975	3815.9	31886	377308	3814.4
1976	3814.4	30890	249678	3812.5
1977	3812.5	34624	216567	3810.4
1978	3810.4	3711	648737	3813.2
1979	3813.2	16411	411287	3814.7
1980	3814.7	3632	611023	3817.7
1981	3817.7	26861	351412	3817.8
1982	3817.8	4606	667114	3820.3
1983	3820.3	3330	792511	3822.1
1984	3822.1	6685	502366	3823.2
1985	3823.2	25167	428046	3821.8
1986	3821.8	10771	658839	3822.4
1987	3822.4	40240	280785	3817.9
1988	3817.9	42316	258845	3813.4
1989	3813.4	24481	261425	3811.7
1990	3811.7	10807	215375	3811.9
1991	3811.9	7966	265170	3813
1992	3813	7481	254358	3814
1993	3814	5331	441197	3815.4
1994	3815.4	7583	276706	3816.3
1995	3816.3	6658	637163	3817.8
1996	3817.8	5656	558815	3819

417T Taboose-Aberdeen				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1979	3798.1	16411	411287	3805.4
1980	3805.4	3632	611023	3809.1
1981	3809.1	26861	351412	3812.4
1982	3812.4	4606	667114	3816.1
1983	3816.1	3330	792511	3818.6
1984	3818.6	6685	502366	3819.6
1985	3819.6	25167	428046	3815
1986	3815	10771	658839	3816.2
1987	3816.2	40240	280785	3806.7
1988	3806.7	42316	258845	3792.5
1989	3792.5	24481	261425	3793
1990	3793	10807	215375	3796.5
1991	3796.5	7966	265170	3798.7
1992	3798.7	7481	254358	3800.5
1993	3800.5	5331	441197	3804.9
1994	3804.9	7583	276706	3804.5
1995	3804.5	6658	637163	3810.8
1996	3810.8	5656	558815	3812.4

469T Big Pine				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1977	3900.5	38001	216567	3899.0
1978	3899.0	24418	648737	3901.2
1979	3901.2	27637	411287	3901.6
1980	3901.6	24211	611023	3902.3
1981	3902.3	28462	351412	3902.3
1982	3902.3	22351	667114	3904.4
1983	3904.4	28119	792511	3904.6
1984	3904.64	28067	502366	3904.2
1985	3904.2	25911	428046	3903.6
1986	3903.6	25934	658839	3904.1
1987	3904.1	48663	280785	3900.5
1988	3900.5	42817	258845	3898.6
1989	3898.6	33950	261425	3898.4
1990	3898.4	20005	215375	3898.9
1991	3898.9	24537	265170	3899.1
1992	3899.1	24391	254358	3900.1
1993	3900.1	23061	441197	3900.9
1994	3900.9	24387	276706	3902.1
1995	3902.1	24972	637163	3902.7
1996	3902.7	22723	558815	3903.7

426T Big Pine				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3872.1	22506	465125	3872.5
1975	3872.5	30998	377308	3870.5
1976	3870.5	27307	249678	3868.8
1977	3868.8	38001	216567	3866.7
1978	3866.7	24418	648737	3868.6
1979	3868.6	27637	411287	3869
1980	3869	24211	611023	3870.4
1981	3870.4	28462	351412	3870.4
1982	3870.4	22351	667114	3871.8
1983	3871.8	28119	792511	3873.6
1984	3873.6	28067	502366	3873.2
1985	3873.2	25911	428046	3872.7
1986	3872.7	25934	658839	3873.2
1987	3873.2	48663	280785	3870.2
1988	3870.2	42817	258845	3867.7
1989	3867.7	33950	261425	3865.4
1990	3865.4	20005	215375	3864.9
1991	3864.9	24537	265170	3865
1992	3865	24391	254358	3865
1993	3865	23061	441197	3865.6
1994	3865.6	24387	276706	3865.7
1995	3865.7	24972	637163	3868.1
1996	3868.1	22723	558815	3869.3

425T Big Pine				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3866.9	22506	465125	3866.8
1975	3866.8	30998	377308	3862.8
1976	3862.8	27307	249678	3860.2
1977	3860.2	38001	216567	3857.4
1978	3857.4	24418	648737	3860.1
1979	3860.1	27637	411287	3860.2
1980	3860.2	24211	611023	3863.4
1981	3863.4	28462	351412	3862.4
1982	3862.4	22351	667114	3866.0
1983	3866.0	28119	792511	3868.6
1984	3868.6	28067	502366	3866.6
1985	3866.6	25911	428046	3865.6
1986	3865.6	25934	658839	3867
1987	3867	48663	280785	3861.9
1988	3861.9	42817	258845	3858
1989	3858	33950	261425	3855.3
1990	3855.3	20005	215375	3854.8
1991	3854.8	24537	265170	3854.7
1992	3854.7	24391	254358	3855.1
1993	3855.1	23061	441197	3857
1994	3857	24387	276706	3857.2
1995	3857.2	24972	637163	3859.4
1996	3859.4	22723	558815	3860.8

425T Big Pine				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1974	3866.9	22506	465125	3866.8
1975	3866.8	30998	377308	3862.8
1976	3862.8	27307	249678	3860.2
1977	3860.2	38001	216567	3857.4
1978	3857.4	24418	648737	3860.1
1979	3860.1	27637	411287	3860.2
1980	3860.2	24211	611023	3863.4
1981	3863.4	28462	351412	3862.4
1982	3862.4	22351	667114	3866.0
1983	3866.0	28119	792511	3868.6
1984	3868.6	28067	502366	3866.6
1985	3866.6	25911	428046	3865.6
1986	3865.6	25934	658839	3867
1987	3867	48663	280785	3861.9
1988	3861.9	42817	258845	3858
1989	3858	33950	261425	3855.3
1990	3855.3	20005	215375	3854.8
1991	3854.8	24537	265170	3854.7
1992	3854.7	24391	254358	3855.1
1993	3855.1	23061	441197	3857
1994	3857	24387	276706	3857.2
1995	3857.2	24972	637163	3859.4
1996	3859.4	22723	558815	3860.8

493T Laws				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1977	4093.0	15038	216567	4090.5
1978	4090.5	945	648737	4107.3
1979	4107.3	17933	411287	4102.3
1980	4102.3	1251	611023	4116.7
1981	4116.7	25313	351412	4107.1
1982	4107.1	1388	667114	4122.7
1983	4122.7	1113	792511	4122.6
1984	4122.6	7403	502366	4118.6
1985	4118.6	17369	428046	4110.8
1986	4110.8	8600	658839	4117.8
1987	4117.8	38241	280785	4103
1988	4103	38841	258845	4094.2
1989	4094.2	34785	261425	4082.1
1990	4082.1	16933	215375	4083.7
1991	4083.7	10949	265170	4088.3
1992	4088.3	10562	254358	4087.4
1993	4087.4	12618	441197	4103.2
1994	4103.2	16187	276706	4097.7
1995	4097.7	8249	637163	4106.5
1996	4106.5	11195	558815	4100.5

492T Laws				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1977	4074.4	15038	216567	4073.7
1978	4073.7	945	648737	4093.6
1979	4093.6	17933	411287	4082.9
1980	4082.9	1251	611023	4100.1
1981	4100.1	25313	351412	4086.3
1982	4086.3	1388	667114	4104.6
1983	4104.6	1113	792511	4106.9
1984	4106.9	7403	502366	4102.7
1985	4102.7	17369	428046	4091.3
1986	4091.3	8600	658839	4097.7
1987	4097.7	38241	280785	4081.2
1988	4081.2	38841	258845	4072.5
1993	4079.6	12618	441197	4088.2
1994	4088.2	16187	276706	4085.8
1995	4085.8	8249	637163	4092.5
1996	4092.5	11195	558815	4090

490T Laws				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1976	4059.8	16285	249678	4058.3
1977	4058.3	15038	216567	4057.8
1978	4057.8	945	648737	4061.8
1979	4061.8	17933	411287	4061.1
1980	4061.1	1251	611023	4064.3
1981	4064.3	25313	351412	4062.4
1982	4062.4	1388	667114	4067.3
1983	4067.3	1113	792511	4068.2
1984	4068.2	7403	502366	4065
1985	4065	17369	428046	4063.6
1986	4063.6	8600	658839	4067.1
1987	4067.1	38241	280785	4064.1
1988	4064.1	38841	258845	4061.1
1989	4061.1	34785	261425	4058.2
1990	4058.2	16933	215375	4056.9
1991	4056.9	10949	265170	4056.4
1992	4056.4	10562	254358	4056.5
1993	4056.5	12618	441197	4057.9
1994	4057.9	16187	276706	4058.2
1995	4058.2	8249	637163	4061.9
1996	4061.9	11195	558815	4061.1

438T Laws				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1976	4129.4	16285	249678	4127.6
1977	4127.6	15038	216567	4126.9
1978	4126.9	945	648737	4131.2
1979	4131.2	17933	411287	4128.1
1980	4128.1	1251	611023	4133.2
1981	4133.2	25313	351412	4128.0
1982	4128.0	1388	667114	4136.3
1983	4136.3	1113	792511	4134.9
1984	4134.9	7403	502366	4133.2
1985	4133.2	17369	428046	4131.9
1986	4131.9	8600	658839	4132.4
1987	4132.4	38241	280785	4125.3
1988	4125.3	38841	258845	4122
1989	4122	34785	261425	4122.4
1990	4122.4	16933	215375	4122.9
1991	4122.9	10949	265170	4123.7
1992	4123.7	10562	254358	4124.6
1993	4124.6	12618	441197	4124.7
1994	4124.7	16187	276706	4124.7
1995	4124.7	8249	637163	4127.5
1996	4127.5	11195	558815	4126.3

436T Laws				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1976	4095.2	16285	249678	4091.8
1977	4091.8	15038	216567	4090.7
1978	4090.7	945	648737	4095.6
1979	4095.6	17933	411287	4093.6
1980	4093.6	1251	611023	4099.6
1981	4099.6	25313	351412	4094.7
1982	4094.7	1388	667114	4102.2
1983	4102.2	1113	792511	4101.5
1984	4101.5	7403	502366	4100
1985	4100	17369	428046	4097.4
1986	4097.4	8600	658839	4099.9
1987	4099.9	38241	280785	4094.2
1988	4094.2	38841	258845	4090.3
1989	4090.3	34785	261425	4088.7
1993	4089.1	12618	441197	4092.8
1994	4092.8	16187	276706	4092.1
1995	4092.1	8249	637163	4096.6
1996	4096.6	11195	558815	4094.8

107T Laws				
Runoff year	Initial water table (ft msl)	Wellfield pumping (AF)	Owens Valley runoff (AF)	Final water table (ft msl)
1972	4126.7	28345	324924	4117.0
1973	4117.0	15974	519584	4119.2
1976	4126.5	16285	488837	4121.9
1977	4121.9	15038	255417	4119.3
1978	4119.3	945	686471	4126.8
1979	4126.8	17933	445747	4120.5
1980	4120.5	1251	683870	4132.2
1981	4132.2	25313	403773	4121.0
1982	4121.0	1388	751937	4135.5
1983	4135.5	1113	881746	4137.2
1984	4137.2	7403	560386	4134.8

1985	4134.8	17369	480287	4129.6
1986	4129.6	8600	711372	4131.9
1987	4131.9	38241	328682	4119