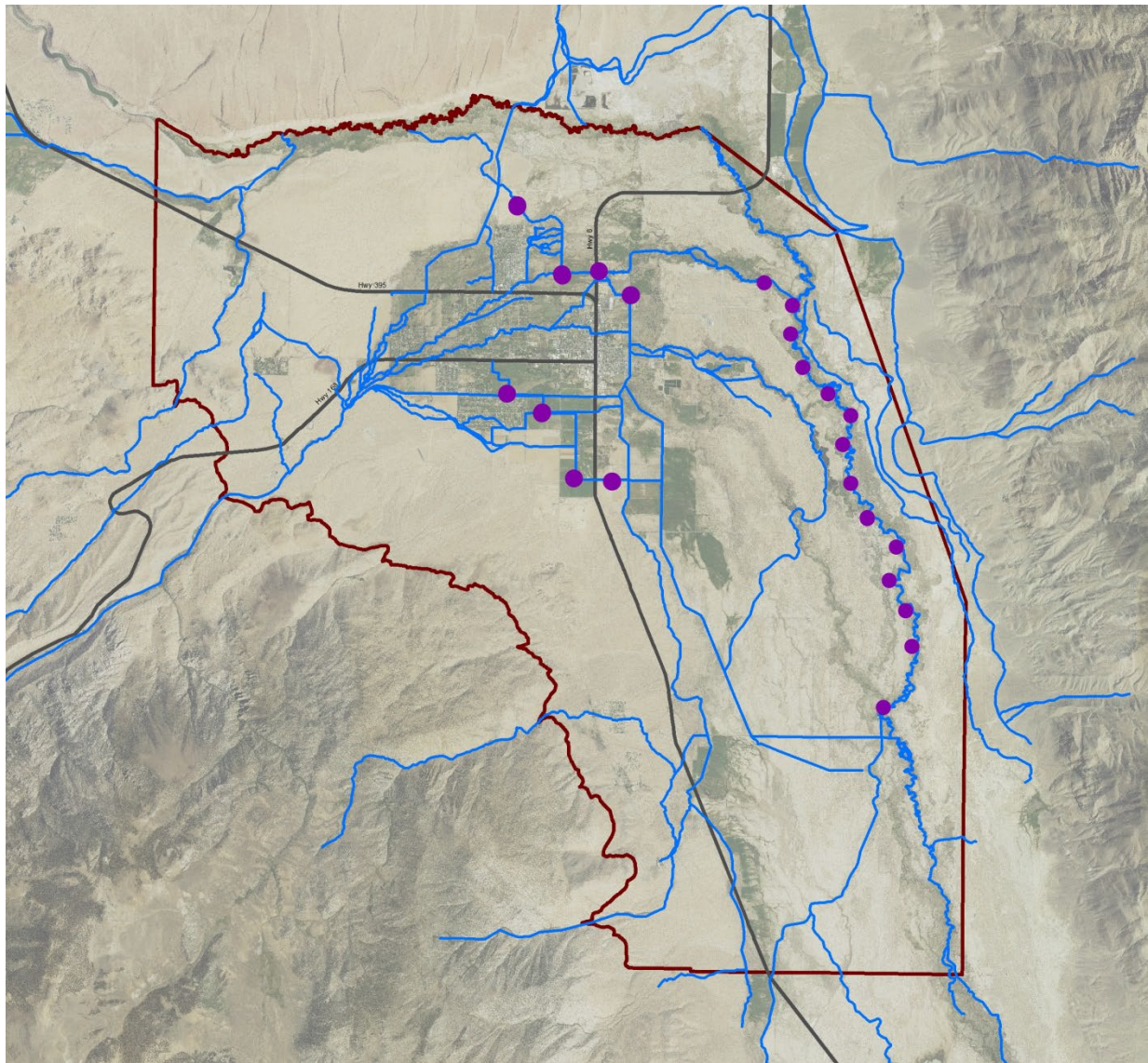


# THE BISHOP CONE AUDIT FOR THE 2021-22 RUNOFF YEAR



**Inyo County Water Department**  
**Final**  
**May 2023**

# **THE BISHOP CONE AUDIT FOR THE 2021-22 RUNOFF YEAR**

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# **THE BISHOP CONE AUDIT FOR THE 2021-22 RUNOFF YEAR**

## **1.0 INTRODUCTION**

The Bishop Cone Audit (Audit) is an annual comparison between Los Angeles Department of Water and Power's (LADWP) water usage on Los Angeles-owned lands on the Bishop Cone and its amount of groundwater extraction from wells on the Bishop Cone. The Bishop Cone Audit is required by the Inyo County/Los Angeles Long-term Groundwater Management Agreement (Water Agreement). The "Bishop Cone" is a reference to the legally defined area in the 1940 Hillside Decree which incorporates most of the Bishop Creek alluvial fan along with a portion of the northern Owens Valley from Bishop south towards Big Pine (Map 1). The Water Agreement and the Green Book (the technical appendix to the Water Agreement) define the terms, conditions, and procedures of the Bishop Cone Audit. Inyo County Water Department (ICWD) staff compiles the Bishop Cone Audit from data provided by LADWP. The Audit sums pumping and flowing well amounts and compares those totals to water use on Los Angeles-owned land during a given runoff year (April 1 to March 31) to determine whether LADWP's groundwater extractions exceed its surface water uses on the Bishop Cone.

## **2.0 BACKGROUND**

The City of Los Angeles owns prior appropriative surface water rights in the Bishop area. Los Angeles also owns groundwater rights on the Bishop Cone as a consequence of its ownership of overlying land. A system of ditches and canals exist to convey both surface water from Bishop Creek and the Owens River and also groundwater pumped from LADWP wells to irrigated land throughout the Bishop Cone with some water exiting the Cone. In 1930 and 1931, Los Angeles extracted groundwater from wells on the Bishop Cone for the purpose of export to Los Angeles. This export of groundwater was challenged by local residents, and in the 1940 Hillside Decree, Los Angeles agreed not to pump groundwater for the purpose of export off the Bishop Cone.

Relevant language of the 1940 Hillside Decree is presented below (a link to the entire decree can be found at the ICWD's website at [www.inyowater.org/documents/hillside-decree-1940/](http://www.inyowater.org/documents/hillside-decree-1940/)):

XI

*That the defendants [LADWP], their servants, agents, employees, and assigns, and each of them, be, and they are hereby, enjoined, prohibited, and restrained from in any manner whatsoever pumping, extracting, taking, or transporting out of the Bishop Cone area any subterranean waters from beneath said area: provided, however, that nothing in this judgment contained shall in any manner enjoin, prohibit, or restrain the defendants, their servants, agents, employees, assigns, or any of them, from maintaining or operating their presently-existing drainage ditches to the full extent of their present normal capacity, or from taking artesian water that may arise to the surface of said area outside the casings of any of defendants' capped wells, or from pumping, extracting, taking, or using any such water as may be reasonably necessary for beneficial use upon any lands belonging to the defendants, .....*

In 1972, Inyo County filed a California Environmental Quality Act suit claiming that increased groundwater pumping by LADWP was harming the environment of the Owens Valley and demanding that an Environmental Impact Report (EIR) be completed to analyze the effects of this increased pumping. After numerous legal challenges and negotiations, in 1991 an EIR was approved for LADWP's groundwater pumping and a long term groundwater management plan was agreed upon by Inyo County and LADWP. Section VII.A of the 1991 Water Agreement addresses the Bishop Cone and Hillside Decree with relevant language quoted below (full text of the 1991 EIR, the Water Agreement and the Greenbook can be found at the ICWD's website at <http://www.inyowater.org/documents/governing-documents/>):

*“Before the Department [LADWP] may increase groundwater pumping above present levels, or construct any new wells on the [Bishop] Cone, the Technical Group must agree on a method for determining the exact amount of water annually used on Los Angeles-owned lands on the Cone. The agreed upon method shall be based on a jointly conducted audit of such water uses. The Department’s annual groundwater extractions from the Cone shall be limited to an amount not greater than the total amount of water used on Los Angeles-owned lands on the cone during that year.”* (Water Agreement Section VII.A, Appendix A)

At its October 17, 1995 meeting, the Technical Group agreed to recommend to the Inyo County/Los Angeles Standing Committee the description of a Bishop Cone Audit procedure to be incorporated into the Green Book. The Standing Committee adopted the agreed-upon Bishop Cone Audit procedure on November 7, 1996 as Section IV.D of the Green Book.

Section IV.D.1.a. of the Green Book states: *“For the purposes of the Bishop Cone audit, water usage on Los Angeles-owned land on the Bishop Cone is defined as the quantity of water supplied to such land, including conveyance losses, less any return flow to the aqueduct system. Water usage is documented on a runoff-year basis and is compiled by LADWP each May in the Bishop Area Water Use Report [Bishop Cone Audit Uses Report].”* (Appendix B)

In theory compliance with the Water Agreement and the Green Book is simple: LADWP can only extract groundwater to be used on its lands and leases on the Bishop Cone with no flow leaving the system. In a simplified, hypothetical situation, LADWP would have groundwater extraction wells at the “top” of the cone which would provide surface water to ditches running downhill to its lands and leases. Upon reaching the “lowest” land, no surface water would leave. However, there are many practical factors that dictate and complicate how the Bishop Cone Audit accounts for LADWP extractions and uses. Some of these factors are: the Bishop Cone topography (generally sloping west to east in the Bishop area, and north to south from Bishop towards Big Pine), the location of LADWP-owned lands throughout the Bishop Cone area, the location of LADWP's groundwater extraction wells (in central Bishop), the location of LADWP's flowing wells (east of Bishop adjacent to the Owens River), the location of the various ditch and canal systems used to convey water in the Bishop Cone, and operational necessities for conveying surface water both on and off the Bishop Cone.

To illustrate further, the primary source of water available for use on LADWP lands in the topographically higher west Bishop area of the cone is LADWP surface water from Bishop Creek that is diverted into various ditches for irrigation (use) on LADWP-owned land. Groundwater pumped from LADWP wells in central Bishop supplements the remaining Bishop



Creek surface water. The now combined surface and groundwater flows east and south and is used on LADWP land in the central and southern portions of the Cone. Groundwater extracted from flowing wells provides water to the Owens River for export and/or downstream uses in the Owens Valley. Some mixture of surface and groundwater also leaves the Bishop Cone either in canals or the Owens River.

Prior to the adoption of the Water Agreement, several methods were researched to determine the best procedure for tracking LADWP's uses and extractions on the Bishop Cone. A final method was selected which compares the sum of pumped groundwater from production wells and flowing groundwater from artesian wells (extractions) to surface water applied to LADWP-owned lands on the Cone (uses). To determine the total uses, a lease-wise approach was selected which tracks the difference between water coming onto a given LADWP lease and the water (if any) that exits that lease to return to the conveyance system (ditch, canal, creek or river). LADWP supplies a listing of surface water uses by each individual lease account in its annual Bishop Cone Audit Uses Report (Use Report). Credit for a use is granted on accounts that have been agreed to and inspected by ICWD staff. A combination of monitoring devices are used to track extractions and uses on the Bishop Cone, including flumes, weirs, and propeller meters. Flow measurements are taken either manually or continuously using data-logging devices at these devices.

It is important to note that the Bishop Cone Audit does not attempt to compute a complete surface or groundwater budget. Its purpose is to monitor compliance with the dictates of the Water Agreement, the Green Book, and the legal interpretations of the Hillside Decree. The Audit compares LADWP's total water uses to groundwater extractions during a given runoff year. ICWD staff gave a presentation on the Bishop Cone Audit to the Inyo County Water Commission on December 7, 2016, explaining the principles of the BCA in detail. A copy of the PowerPoint presented at the ICWC meeting can be found on the ICWD website: [http://www.inyowater.org/wp-content/uploads/2016/12/Bishop-Cone-Audit-12\\_7\\_16.pdf](http://www.inyowater.org/wp-content/uploads/2016/12/Bishop-Cone-Audit-12_7_16.pdf)

### **3.0 WATER USES ON LADWP-OWNED LAND ON THE BISHOP CONE**

The location of the Bishop Cone and the pumping and flowing wells on the Bishop Cone are shown in Map 1. Also shown on Map 1 are the general locations of the LADWP-owned lease accounts used in the Bishop Cone Audit Uses Report (Appendix C).

Table 1 (below) is a compilation of water usage by account number in acre-feet (AF) on LADWP-owned land on the Bishop Cone for the runoff years of 2020-21 and 2021-22. These water-usage amounts are a yearly total of the surface water coming onto a given lease minus the surface water leaving the lease. Overall, there was a decrease in total water use on the Bishop Cone of 1,076 AF from 2020-21 (Use: 27,335) to 2021-22 (Use: 26,259). Runoff in 2020-21 was 75% of average and water uses were closer to their long-term averages. However, runoff in 2021-22 was severely below average (45%) and, due to low flows in Bishop Creek, many parcels were unable to have full irrigation amounts supplied.

**TABLE 1**  
**WATER USES ON LOS ANGELES-OWNED LAND ON THE BISHOP CONE**

<b>LADWP ACCOUNT NUMBER <sup>*2</sup></b>	<b>RUNOFF YEAR<sup>*1</sup> 2020-2021 (AF)</b>	<b>RUNOFF YEAR<sup>*1</sup> 2021-2022 (AF)</b>
BC502B (BA354B or BA362B)	716	631
BC302A	188	144
BC302B	1352	1296
BC311	3422	3331
BC313	1113	821
BC324	1477	1464
BC1478 (BAICR) <sup>*2</sup>	541	439
BC387A	680	428
BCRECF	391	591
BC339	407	275
BC393	103	106
BC362D	(No Credit) <sup>*3</sup>	(No Credit) <sup>*3</sup>
BC304	203	232
BC500	984	818
BC397 (BA387B) <sup>*2</sup>	3214	3143
BC361A	1304	1224
BC361B	2245	2671
BC502A (BA354A or 362A) <sup>*2</sup>	1039	955
BCRECA	328	342
BCRECC	0	0
BCRECD	2486	2559
BC338	2980	3085
BCOPRB	0	0
BCLAEMH	761	353
BC353	353	337
BC005A	1	54
BC005B	93	49
BC006A	96	141
BC1479 (BA342) <sup>*2</sup>	48	58
BC392	(No Credit) <sup>*3</sup>	(No Credit) <sup>*3</sup>
BC301	580	579
BC335	227	133
BCRVRECA	(No Credit) <sup>*3</sup>	(No Credit) <sup>*3</sup>
<b>TOTAL</b>	<b>27,335</b>	<b>26,259</b>

\*1 - A runoff year is defined as starting April 1st and ending March 31st of the following year.

\*2 – Former account names listed in parenthesis; in 2015/16 “BA” prefix was changed to “BC”

\*3 - Accounts need additional monitoring or diversion infrastructure to establish credit.

During fall 2016 through winter 2017, joint field visits to the active BCA accounts were conducted by ICWD and LADWP staff. Based on these visits and as a result of observations and discussion of past infrastructure workings, several accounts were either granted or denied credit for the 2016/17 Audit. The accounts denied credit for 2016/17 were: BC362D, BC392, and BCRVRECA. At these three sites, ICWD staff deemed there to be insufficient flow monitoring, potentially allowing unmetered water to affect the accounts without proper quantification. ICWD staff visited these BCA accounts in 2022 and no additional flow monitoring devices have been installed at these accounts. Therefore, BC362D, BC392, and BCRVRECA were not granted credit in the current year.

Also based on the 2016/17 field inspections, the method for calculating Use on a given account for the purpose of the BCA was changed. Prior to 2015/16, LADWP used Stockwater and Ditch Loss as credits to its lessees to distinguish between surface water used for irrigation and not used for irrigation. However, the Audit's water balance is to determine the total amount of water used on the Bishop Cone between metering devices. The Audit is not specifically concerned with how the water is used (stockwater or irrigation). Stockwater is simply water supplied to a parcel during the year for the purpose of providing surface water to stock instead of irrigation to grow plants; it is a distinction made by LADWP for the lessees but is a "Use" for the purpose of the Audit with properly metered water flowing through diversions onto an account and not exiting the account. Ditch Loss is a similar accounting distinction made by LADWP and its lessees; it is an estimation of the water that seeps into the ground from the Account's metering device prior to arriving at the actual surface water diversion point on the lease (these are sometimes large distances apart). The Ditch Losses are credited to the lessee to reflect water that cannot be used for irrigation. This water, however, is a Use for purposes of the BCA. The Stockwater and Ditch Loss estimates from previous BCA's (prior to 2015/16) have been replaced with the more rigorous and accurate calculation of subtracting flow onto each account from flow off of that account.

The data reporting format used by LADWP for the BCA has also been updated with approval from ICWD staff. The updated Use Report contained in Appendix C has been simplified by removing LADWP's internal, lessee-related notations. The new Use Report now contains totals of water entering and leaving a lease (the pertinent information for conducting the Audit). All flow monitoring stations were inspected during the 2016/17 field campaign.

Finally, ICWD staff continues to receive the previous LADWP version of the Use Report to check for historic consistency. The changes in adding Stockwater and Ditch Loss credits for BCA reporting are the primary reason 2015-16 Uses were substantially greater than 2014-15 Uses. The additional increase in Use between 2015-16 and 2016-17 is primarily due to increased surface water availability due to a moderately wet runoff year combined with operational spreading in early 2017. The increase in use from 2016-17 to 2017-18 is due to heavy runoff following the historic winter (appx. 200% of long-term average). As noted previously, LADWP actively spread surface water throughout the Owens Valley; and a significant amount of surface water was spread throughout the Bishop Cone.

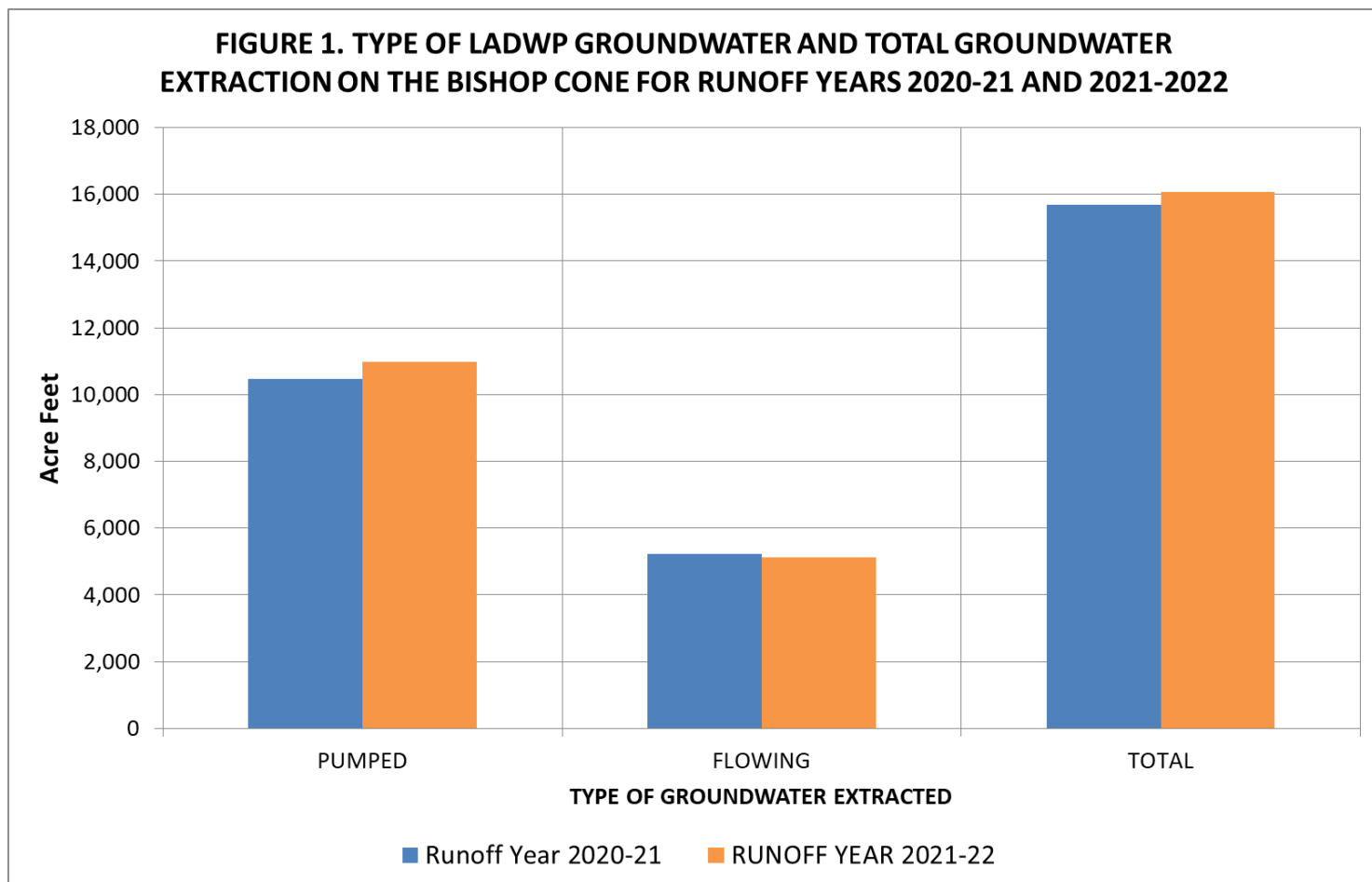
#### 4.0 TOTAL LADWP GROUNDWATER EXTRACTION ON LADWP-OWNED LAND ON THE BISHOP CONE FOR RUNOFF YEARS 2020-21 AND 2021-22

Section IV.D.1.d of the Green Book states: “Total groundwater extraction by LADWP will be compared with corrected water usage on the Bishop Cone for the runoff year. Total groundwater extraction is defined as the sum of all groundwater pumped by LADWP plus the amount of artesian water that flowed out of LADWP uncapped wells on the Bishop Cone during the runoff year.” (Appendix B)

Figure 1 (below) presents the total amount LADWP groundwater extraction and the groundwater extraction classified as flowing and pumped groundwater on the Bishop Cone in acre-feet for runoff years of 2020-21 and 2021-22.

For runoff year 2020-21, LADWP extracted 15,676 AF of groundwater (10,459 AF from pumped wells and 5,217 AF from flowing wells). For runoff year 2021-22, LADWP extracted 16,081 AF of groundwater (10,969 AF from pumped wells and 5,112 AF from flowing wells).

LADWP groundwater extractions on the Bishop Cone for the 2021-22 increased by 405 AF compared to the previous year. Both years were below average runoff.





Flowing and pumped groundwater on the Bishop Cone are broken into detail by each well in Table 2.

**TABLE 2**  
**FLOWING AND PUMPED GROUNDWATER BY WELL ON THE BISHOP CONE**  
**IN RUNOFF YEAR 2021-22**

<b>WELL</b>	<b>FLOWING GROUNDWATER (AF)</b>	<b>PUMPED GROUNDWATER (AF)</b>
F121	47	NA
F122	76	NA
F123	152	NA
F124	0	NA
F125	1093	NA
F126	376	NA
F127	408	NA
F128	265	NA
F129	84	NA
F130	424	NA
F131	744	NA
F132	334	NA
F133	294	NA
F134	699	NA
F136	116	NA
W140	NA	1206
W371	NA	350
W406	NA	2089
W407	NA	974
W408	NA	969
W410	NA	2409
W411	NA	1473
W412	NA	1499
<b>TOTAL</b>	<b>5,112</b>	<b>10,969</b>

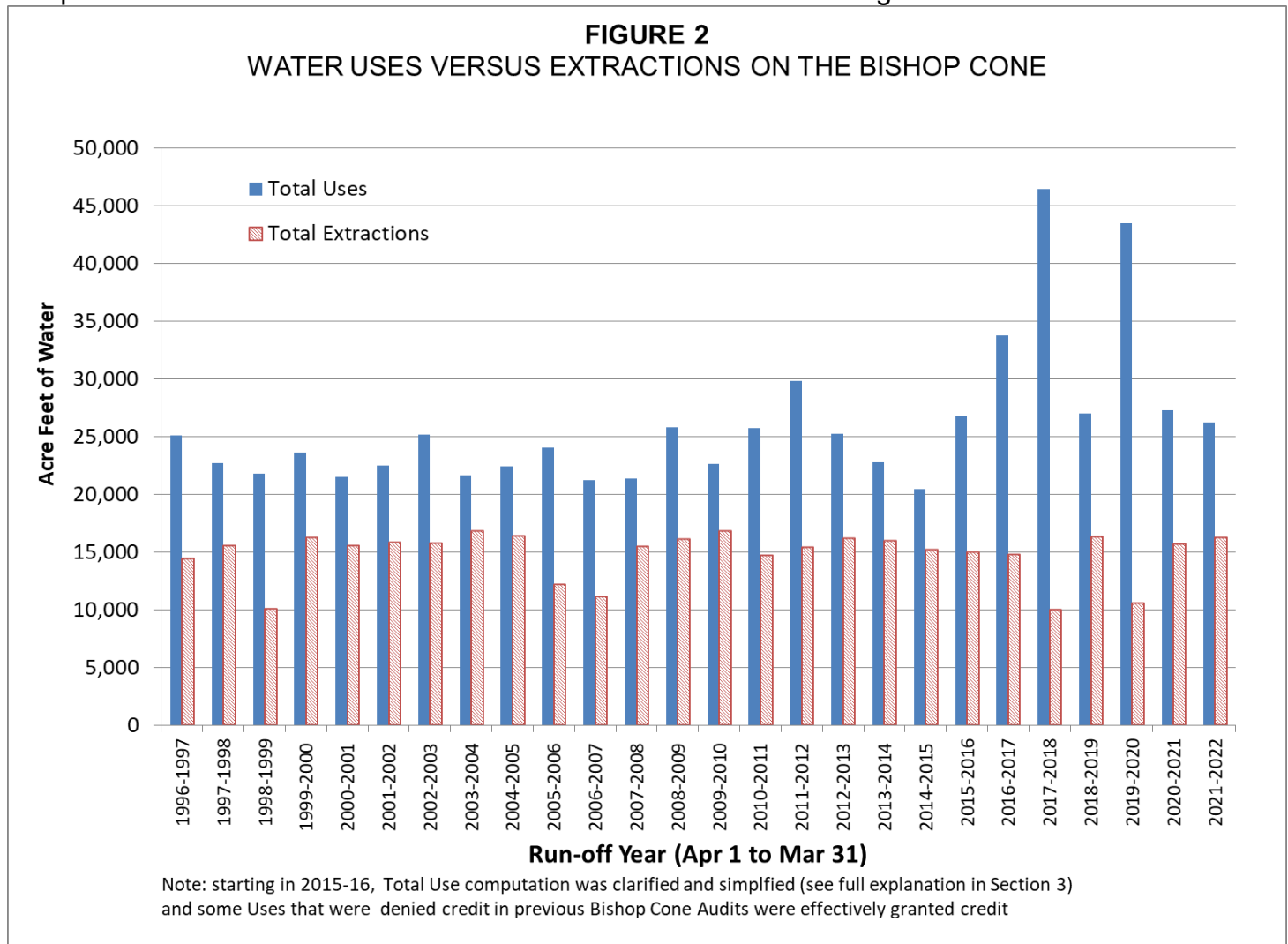
## 5.0 COMPLIANCE WITH THE INYO COUNTY/LOS ANGELES LONG-TERM GROUNDWATER MANAGEMENT AGREEMENT

The Water Agreement provides that, during any runoff year, total groundwater extraction by LADWP on the Bishop Cone shall not exceed water usage on Los Angeles-owned land on the Cone. Table 3, below, shows that LADWP was in compliance with the above provision for runoff years 2020-21 and 2021-22 as the total uses on the Bishop Cone exceeded the total groundwater extractions for each year.

**TABLE 3**  
**LADWP USES IN COMPARISON TO LADWP GROUNDWATER**  
**EXTRACTION ON THE BISHOP CONE**

	RUNOFF YEAR 2020-21 (AF)	RUNOFF YEAR 2021-22 (AF)
<b>TOTAL USES</b>	<b>27,335</b>	<b>26,259</b>
<b>TOTAL GROUNDWATER EXTRACTION</b>	<b>15,676</b>	<b>16,081</b>
<b>USES MINUS EXTRACTIONS</b>	<b>11,659</b>	<b>10,178</b>
<b>Hillside Decree Compliance?</b>	<b>YES</b>	<b>YES</b>

Figure 2 presents LADWP's water uses versus extractions since runoff year 1996-97. Uses have exceeded extractions throughout the data period; therefore, LADWP has been in compliance with Section IV.D.1.a. of the Green Book and the Water Agreement.



## **APPENDIX A**

Section VII.A of the Inyo County/Los Angeles Long-Term  
Groundwater Management Agreement

## **Section VII of the Agreement**

### **VII. GROUNDWATER PUMPING ON THE BISHOP CONE**

- A. Any groundwater pumping by the Department on the "Bishop Cone" (Cone) shall be in strict adherence to the provisions of the Stipulation and Order filed on the 26th day of August, 1940, in Inyo County Superior Court in the case of Hillside Water Company, a corporation, et al. vs. The City of Los Angeles, a Municipal Corporation, et al., ("Hillside Decree").

Before the Department may increase groundwater pumping above present levels, or construct any new wells on the Cone, the Technical Group must agree on a method for determining the exact amount of water annually used on Los Angeles-owned lands on the Cone. The agreed upon method shall be based on a jointly conducted audit of such water uses.

The Department's annual groundwater extractions from the Cone shall be limited to an amount not greater than the total amount of water used on Los Angeles-owned lands on the Cone during that year. Annual groundwater extractions by the Department shall be the total of all groundwater pumped by the Department on the Cone, plus the amount of artesian water that flowed out of the casing of uncapped wells on the Cone during the year. Water used on Los Angeles-owned lands on the Cone, shall be the quantity of water supplied to such lands, including conveyance losses, less any return flow to the aqueduct system.

- B. The overall management goals and principles and the specific goals and principles for each vegetation classification of this Stipulation and Order apply to vegetation on the Cone.

## **APPENDIX B**

Section IV.D of the Green Book



AGENDA ITEM 4

**MEMORANDUM**

7 November 1996

TO: Inyo County/Los Angeles Standing Committee  
FROM: Inyo County/Los Angeles Technical Group

**CONSIDERATION OF GREEN BOOK SECTION  
DESCRIBING THE BISHOP CONE AUDIT**

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**Background**

Section VII.A of the Inyo County/Los Angeles long-term water management agreement provides that "before the Department may increase groundwater pumping above present levels, or construct any new wells on the [Bishop] Cone, the Technical Group must agree on a method for determining the exact amount of water annually used on Los Angeles-owned lands on the Cone. The agreed upon method shall be based on a jointly conducted audit of such water uses."

At its 17 October 1995 meeting, the Technical Group agreed to recommend to the Inyo County/Los Angeles Standing Committee the attached description of a Bishop Cone audit to be incorporated into the Green Book (the technical appendix to the long-term agreement).

**Request**

The Technical Group requests that the Standing Committee adopt the attached description as section IV.D of the Green Book.

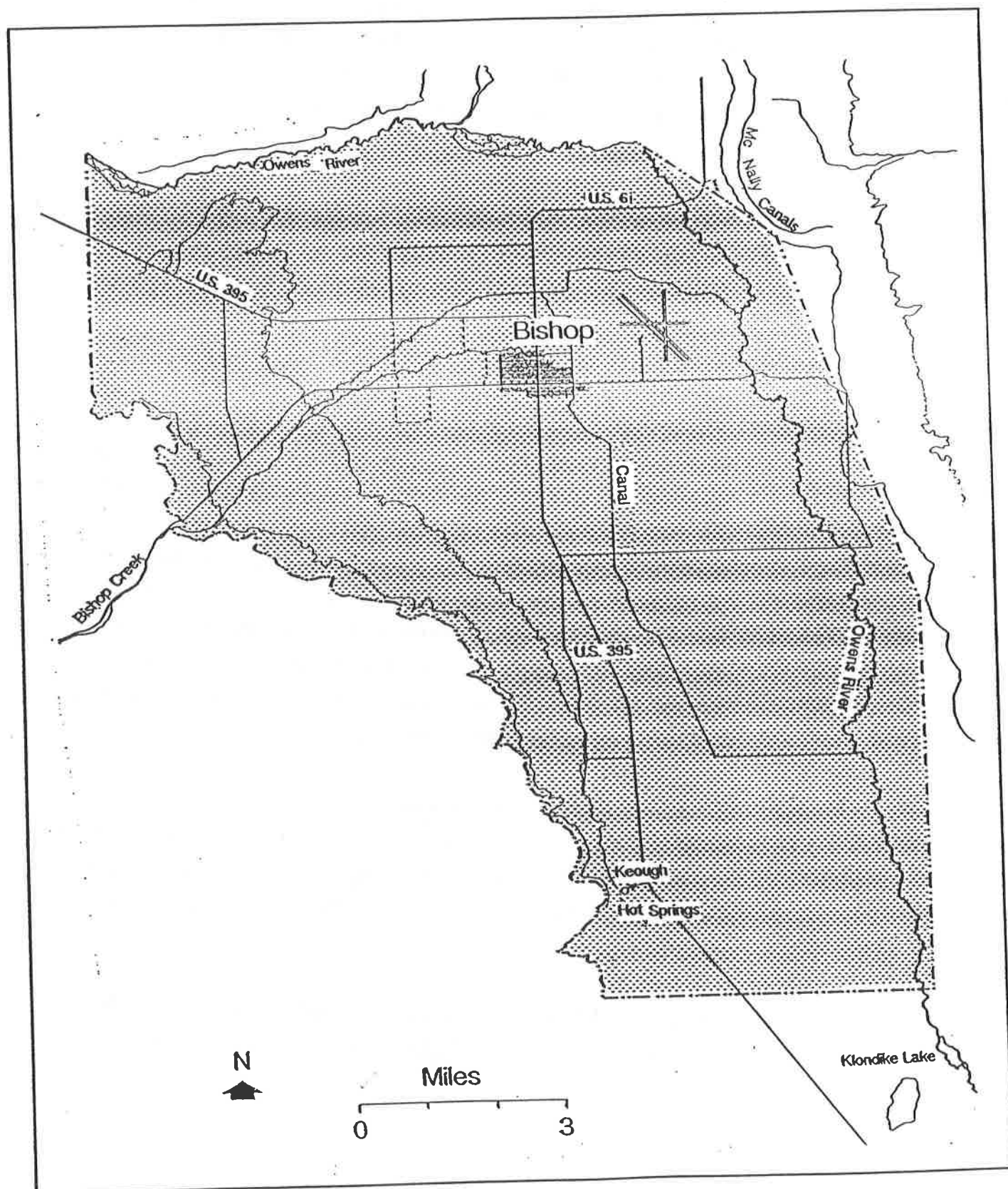
D. Bishop Cone Audit

This sub-section describes the procedures for conducting the Bishop Cone audit in accordance with Section VII.A of the Agreement. The Bishop Cone audit is an annual accounting of LADWP groundwater extraction and water usage on Los Angeles-owned land on the Bishop Cone. The Agreement provides that, during any runoff year, total groundwater extraction by LADWP on the Bishop Cone shall not exceed water usage on Los Angeles-owned land on the Cone. The area defined as the Bishop Cone is shown as Figure IV.D.1.

1. Procedures for Conducting the Bishop Cone Audit
  - a. For the purposes of the Bishop Cone audit, water usage on Los Angeles-owned land on the Bishop Cone is defined as the quantity of water supplied to such land, including conveyance losses, less any return flow to the aqueduct system. Water usage is documented on a runoff-year basis and is compiled by LADWP each May in the Bishop Area Water Use Report. At the conclusion of each runoff year, LADWP will forward the final water use report for the runoff year to Inyo County.
  - b. The final water use report will be compared for consistency with the previous year's report. If measuring stations have been added or removed from the water-use report during the year, or if a significant change in the pattern of water usage occurs (for example, an account that has not received water for one year receives a

FIGURE IV.D.1

## Bishop Cone Boundary



considerable amount the next year), the location will be field-checked. The field-check will evaluate whether changes in water usage warrant the changes noted in the report. If a change is made in the method of delivery to or return from an account that results in an overestimation of uses on the Bishop Cone, water usage for that account will not be credited to the total uses for the audit.

- c. Water usage for accounts BAIND (Bishop Indian Reservation), BA391 (outside of Bishop Cone boundary), and BAWEST (West Bishop private uses) will be subtracted from the total reported water usage.
- d. Total groundwater extraction by LADWP will be compared with the corrected water usage on the Bishop Cone for the runoff year. Total groundwater extraction is defined as the sum of all groundwater pumped by LADWP plus the amount of artesian water that flowed out of uncapped wells on the Bishop Cone during the runoff year. During any runoff year, total groundwater extraction by LADWP on the Bishop Cone shall not exceed water usage on Los Angeles-owned land on the Cone.
- e. A draft report summarizing the results of the Bishop Cone audit will be prepared annually as an Inyo County Water Department report and will be submitted to the Technical Group in June for a 30-day review.
- f. A final Bishop Cone audit report will be submitted in July to the Technical Group, the Standing

Committee, the Inyo County Board of Supervisors,  
and the Inyo County Water Commission.

LADWP will notify Inyo County of any changes in the status, location, or operation of any measuring station used to conduct the Bishop Cone audit at the time the final Bishop Area Water Use Report is submitted to the County. LADWP will also notify the County of any changes in the boundaries of the accounts included in the audit.

Upon request by Inyo County, LADWP will provide measuring station data for accounts included in the audit to assist the County in verifying water usage for individual accounts.



## **APPENDIX C**

Data on Uses and Total Groundwater Extracted on the Bishop Cone  
(Supplied by LADWP)

**2021/22 RUNOFF YEAR BISHOP CONE PUMPING WELL TOTALS**  
(ACRE-FEET)

	2021									2022			
<u>WELL</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>TOTAL</u>
W140	194	211	200	205	203	192	2	0	0	0	0	0	1206
W371	98	100	94	58	0	0	0	0	0	0	0	0	350
W406	96	206	195	197	193	183	37	197	203	201	180	199	2089
W407	161	167	161	165	164	156	0	0	0	0	0	0	974
W408	169	160	168	167	168	137	0	0	0	0	0	0	969
W410	207	238	232	238	237	225	0	107	238	237	214	236	2409
W411	242	252	243	250	249	237	0	0	0	0	0	0	1473
W412	240	249	240	247	245	236	42	0	0	0	0	0	1499
<b>TOTAL</b>	<b>1406</b>	<b>1583</b>	<b>1534</b>	<b>1526</b>	<b>1460</b>	<b>1366</b>	<b>81</b>	<b>304</b>	<b>441</b>	<b>439</b>	<b>394</b>	<b>435</b>	<b>10969</b>

**2021/22 RUNOFF YEAR BISHOP CONE FLOWING WELL TOTALS**  
(ACRE-FEET)

	2021									2022			
WELL	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
F121	5	3	3	3	3	3	3	5	6	6	3	3	47
F122	6	6	6	6	7	7	6	6	8	7	6	7	76
F123	14	14	13	13	14	10	11	12	13	13	12	14	152
F124	0	0	0	0	0	0	0	0	0	0	0	0	0
F125	99	92	94	99	104	87	76	85	95	91	81	91	1093
F126	33	33	32	31	31	30	31	31	32	32	28	32	376
F127	34	34	31	33	34	33	33	35	36	37	32	35	408
F128	23	22	21	15	22	20	25	23	23	24	22	25	265
F129	5	5	5	8	13	8	6	7	8	7	6	7	84
F130	38	33	32	39	53	32	28	31	34	37	32	35	424
F131	66	62	57	60	56	51	43	67	75	74	62	70	744
F132	24	25	25	27	27	27	34	32	30	28	25	28	334
F133	26	28	27	26	21	21	22	23	26	26	23	25	294
F134	57	57	49	52	60	59	63	64	64	62	53	59	699
F136	12	10	8	7	8	7	8	10	11	12	11	12	116
TOTAL	441	423	402	419	453	396	389	430	463	456	397	442	5112

LOS ANGELES DEPARTMENT OF WATER AND POWER  
NORTHERN AQUEDUCT OPERATIONS  
RUNOFF YEAR 2021-22

BISHOP CONE AUDIT RUNOFF SUMMARY  
IN ACRE-FEET

STAID	STATION NAME	+/-	2021					2022					TOTAL		
			APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR-MAR
	3049 #161 OTEY		17	61	61	71	53	31	24	26	23	33	35	49	484
	3377 OTEY DITCH RETURN AT MATLICK DITCH	(-)	16	44	45	60	54	22	25	27	23	35	33	45	430
BC005A			1	18	16	11	-1	9	-1	-1	-1	-1	2	3	54
	3378 OTEY DITCH DIV. ABOVE MATLICK DITCH		1	18	8	12	7	2	0	0	0	0	0	0	49
BC005B			1	18	8	12	7	2	0	0	0	0	0	0	49
	3048 #61-A FRANK ROUFF		47	70	78	77	87	58	40	29	41	39	40	52	657
	3063 DUGGAN DITCH FLOW THROUGH	(-)	42	61	67	64	72	47	32	22	33	31	34	12	516
BC006A			6	10	11	13	15	11	7	7	7	7	7	40	141
	3002 GEORGE DITCH W. OF SUNLAND AVENUE		57	48	56	51	40	43	67	31	30	33	30	22	508
	3264 NORTH INDIAN DITCH BELOW A-1 DRAIN B3A		93	144	118	116	77	61	27	28	41	85	35	29	853
	3068 GEORGE DITCH C-3	(-)	33	32	32	37	23	27	56	25	25	28	25	17	359
	3370 NORTH INDIAN DIVERSION W/O SUNLAND	(-)	8	13	6	10	8	6	0	0	0	0	0	0	51
	3364 NORTH INDIAN DITCH W/O HWY 395	(-)	56	94	77	60	30	31	26	10	23	70	23	13	512
BC1478			52	53	59	61	56	41	12	24	23	20	17	22	439
	3025 SOUTH INDIAN DITCH DIVERSION #3		5	7	12	12	12	11	0	0	0	0	0	0	58
BC1479			5	7	12	12	12	11	0	0	0	0	0	0	58
	3396 NELLIGAN DIV. #1		43	57	87	88	185	182	167	63	62	78	58	89	1159
	3397 NELLIGAN BELOW DIV. #1		103	117	102	125	119	102	82	84	63	72	58	70	1097
	3401 YOUNG DITCH #2		42	84	103	70	63	58	49	60	46	49	45	45	713
	3421 TOM KEY DITCH ABOVE DIVERSION		37	41	46	45	47	45	36	36	32	23	22	22	432
	3050 HOLLAND #63-B	(-)	23	25	30	30	30	25	28	20	16	20	19	22	287
	3404 NELLIGAN DITCH #2	(-)	88	109	115	130	182	181	218	123	113	135	98	133	1624
	3402 YOUNG DITCH #3	(-)	34	50	60	39	40	42	45	52	42	41	40	43	529
	3407 YOUNG DITCH #4	(-)	0	4	7	0	1	0	0	0	0	0	0	0	13
	3422 TOM KEY DITCH BELOW DIVERSION	(-)	31	32	36	36	38	37	32	35	30	21	20	20	369
BC301			49	79	89	92	121	104	10	14	1	5	5	9	579

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			APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR-MAR	
	3006 HALL DITCH @ GOLF COURSE RETURN		18	56	0	30	1	40	0	0	0	0	0	0	144	
BC302A			18	56	0	30	1	40	0	0	0	0	0	0	144	
	3161 BISHOP CK DITCH #16		53	81	61	63	69	51	23	30	25	31	21	23	531	
	3162 BISHOP CK DITCH #17		94	51	48	50	49	46	0	0	0	0	0	0	338	
	3164 BISHOP CK DITCH #20		27	59	49	63	70	44	18	21	22	17	16	21	427	
	3165 BISHOP CK DITCH #21		0	0	0	0	0	0	0	0	0	0	0	0	0	
BC302B			174	191	157	176	188	142	41	51	47	48	36	45	1296	
	3026 NEWLON DITCH BOYD PUMP PLANT		36	35	46	40	41	34	0	0	0	0	0	0	232	
BC304			36	35	46	40	41	34	0	0	0	0	0	0	232	
	3166 BISHOP CK DITCH #5		85	83	62	55	67	68	0	0	0	0	0	0	420	
	3022 BISHOP CK DITCH #5-A		66	90	93	73	74	79	0	14	9	0	0	0	497	
	3167 BISHOP CK DITCH #9		53	53	106	90	58	38	0	0	0	0	0	0	398	
	3168 BISHOP CK DITCH #30		332	340	240	240	261	297	58	52	53	49	42	47	2010	
	3392 FORD RAWSON-DIV 1A		1	1	1	2	2	0	0	0	0	0	0	0	7	
BC311			537	567	501	460	461	483	58	66	61	49	42	47	3331	
	3016 NORTH INDIAN DITCH ABOVE MUMY LANE #58-E		282	622	594	468	315	359	307	269	220	280	242	267	4225	
	3017 WONACOTT A-2		44	57	68	50	47	38	21	30	27	29	24	26	462	
	3015 WONACOTT A-1	(-)	65	87	112	82	78	70	32	43	37	37	33	38	713	
	3054 WONACOTT A-3 RETURN	(-)	15	17	34	20	17	6	3	17	12	4	0	0	145	
	3051 WONACOTT #58-F	(-)	27	33	32	31	30	25	22	6	13	18	16	16	271	
	3018 NORTH INDIAN B-2	(-)	146	392	380	305	168	204	229	183	160	201	175	192	2737	
BC313			74	150	105	79	68	91	42	51	24	48	42	47	821	
	3370 NORTH INDIAN DIVERSION W/O SUNLAND		8	13	6	10	8	6	0	0	0	0	0	0	51	
	3270 SOUTH INDIAN D-3		302	341	398	303	227	160	109	127	172	187	147	110	2583	
	3005 SOUTH INDIAN DITCH D-4	(-)	87	173	136	137	45	41	60	65	111	143	106	67	1171	
BC324			223	180	268	176	190	125	50	62	61	45	41	43	1464	
	3402 YOUNG DITCH #3		34	50	60	39	40	42	45	52	42	41	40	43	529	
	3407 YOUNG DITCH #4		0	4	7	0	1	0	0	0	0	0	0	0	13	
	3403 YOUNG DITCH RETURN TO NELLIGAN	(-)	12	14	24	11	16	20	64	67	52	53	46	32	409	
BC335			22	41	43	29	26	22	-19	-14	-10	-12	-6	11	133	



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			APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR-MAR	
	2026 FORD RAWSON CANAL BELOW BISHOP CK CANAL		593	609	641	875	934	212	0	0	0	0	0	0	3864	
	3368 RAWSON & KEOUGH DITCH E/O HWY 395		17	12	15	12	10	11	12	18	17	18	12	16	171	
	2004 FORD RAWSON CANAL DIV. #7	(-)	128	141	169	286	225	0	0	0	0	0	0	0	950	
	2043 YRIBARREN RETURN #2	(-)	0	0	0	0	0	0	0	0	0	0	0	0	0	
	3369 RAWSON & KEOUGH DITCH RETURN AT A-DRAIN	(-)	0	0	0	0	0	0	0	0	0	0	0	0	0	
BC338			482	480	487	600	719	224	12	18	17	18	12	16	3085	
	3170 KINGSLEY C-1		54	53	25	27	42	22	6	6	10	10	9	10	275	
BC339			54	53	25	27	42	22	6	6	10	10	9	10	275	
	3015 WONACOTT A-1		65	87	112	82	78	70	32	43	37	37	33	38	713	
	3053 TOMMY SMITH DITCH #162-A		6	18	24	17	11	10	0	0	0	0	0	0	86	
	3017 WONACOTT A-2	(-)	44	57	68	50	47	38	21	30	27	29	24	26	462	
BC353			27	48	68	49	42	42	11	12	10	9	9	12	337	
	3036 NORTH FORK BISHOP CREEK I-1(#155 STANLEY MATLICK)		31	125	150	128	79	57	22	24	20	3	2	4	644	
	3004 BISHOP CK N. FORK I-2		0	0	0	0	0	0	0	0	0	0	0	0	0	
	3316 IRRIGATION FROM WELL #406		79	160	193	115	125	82	0	0	0	0	0	0	754	
	3042 TATUM RETURN AT HIGHWAY 6	(-)	4	9	8	10	6	12	0	0	0	0	0	0	48	
	3039 TATUM RETURN AT BISHOP CK CANAL	(-)	9	10	9	11	9	2	0	6	14	19	18	19	126	
BC361A			97	266	325	223	189	125	22	18	6	-16	-17	-14	1224	
	3009 MATLICK DITCH F-10		64	131	263	157	94	38	51	52	52	46	36	49	1034	
	3040 MATLICK DITCH F-13 N		73	69	106	90	93	142	231	181	155	171	131	181	1623	
	3008 MATLICK DITCH F-13 E		13	22	12	23	18	17	8	6	5	1	0	0	127	
	3007 MATLICK DITCH F-14		25	27	26	28	33	38	37	21	17	25	28	29	335	
	3035 MATLICK DITCH #154		13	141	176	229	233	164	136	49	96	61	30	31	1360	
	3154 SCHILDER RETURN G-2	(-)	15	26	30	20	3	8	4	0	5	4	3	3	120	
	3037 MATLICK DITCH #63-A	(-)	42	43	37	42	51	52	52	33	28	35	39	33	488	
	3038 TATUM RETURN H-1	(-)	17	20	42	40	28	48	26	8	7	0	0	0	237	
	3003 MATLICK DITCH RETURN @ B-1 DRAIN	(-)	0	1	0	1	0	0	0	0	0	0	0	0	1	
	3010 MATLICK RETURN TO "C" DRAIN	(-)	29	6	14	10	7	12	144	151	156	165	128	139	960	
BC361B			85	295	460	414	381	278	239	118	129	100	56	116	2671	
	3388 INDIAN S. RETURN ON SEE-VEE LANE		61	112	120	63	45	42	36	21	8	5	4	21	538	
	3389 INDIAN MIDDLE RETURN ON SEE-VEE LANE		5	2	10	5	0	3	1	0	0	0	0	0	27	
	3390 INDIAN N. RETURN ON SEE-VEE LANE		11	26	42	51	14	3	14	15	12	1	4	14	207	
BC362D			77	139	172	119	59	49	51	37	20	6	8	35	772	

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			APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR-MAR	
	3043 NORTH INDIAN DITCH B-3		67	84	92	91	13	0	0	0	0	0	0	0	346	
	3011 WEST LINE L-2		8	20	14	11	7	8	2	0	7	3	0	0	82	
BC387A			75	104	106	102	20	8	2	0	7	3	0	0	428	
STAID	STATION NAME	+	-	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR-MAR
	3387 MATLICK DITCH TO THE N.			60	127	138	149	130	114	105	103	110	114	94	111	1355
	3398 MATLICK DITCH #1			115	191	277	252	150	108	83	111	97	88	67	73	1610
	3399 REINHACKLE #1			102	146	159	146	141	132	185	65	68	67	64	72	1347
	3400 YOUNG DITCH #1			46	67	83	64	77	43	2	0	0	0	0	0	382
	3424 MCLAREN TAILWATER			57	66	63	50	8	0	0	0	0	0	0	0	243
	3401 YOUNG DITCH #2	(-)		42	84	103	70	63	58	49	60	46	49	45	45	713
	3406 C-DRAIN AT INTAKE	(-)		153	239	241	306	226	227	308	219	198	192	159	175	2643
	3009 MATLICK DITCH F-10	(-)		64	131	263	157	94	38	51	52	52	46	36	49	1034
BC392				120	143	112	128	123	74	-33	-53	-21	-18	-15	-13	547
	3061 KINGSLEY DITCH PUMP DIV. AT DIV. #2			5	6	8	8	5	2	0	0	0	0	0	0	35
	3171 BISHOP CK DITCH #11			0	23	0	17	0	31	0	0	0	0	0	0	71
BC393				5	29	8	26	5	33	0	0	0	0	0	0	106
	3163 BISHOP CK DITCH #19			123	78	76	62	55	0	0	0	0	0	0	0	394
	3174 BISHOP CK DITCH #22			73	155	63	72	58	0	0	0	0	0	0	0	422
	3019 BISHOP CK CANAL DIV. #24			106	147	144	154	65	0	33	32	36	33	22	24	795
	3020 BISHOP CK CANAL DIV. #25			0	32	38	38	0	0	0	0	0	0	0	0	108
	3177 BISHOP CK DITCH #26			121	130	140	127	88	0	0	0	0	0	0	0	605
	3178 BISHOP CK DITCH #27			8	17	7	7	2	0	0	0	0	0	0	0	42
	3179 BISHOP CK DITCH #28			20	36	38	19	7	0	0	0	0	0	0	0	120
	3024 BISHOP CK CANAL DIV. #29			92	77	82	94	55	0	17	61	53	46	39	41	657
BC397				541	673	588	574	330	0	50	93	89	78	61	65	3143
	3012 GEORGE DITCH C-1			91	81	84	70	70	81	62	27	25	25	24	21	661
	3365 PARK W. RETURN S/O A-DRAIN			73	97	72	74	48	65	27	2	3	2	2	2	467
	3047 4 X - 58D			151	208	258	138	85	54	90	122	168	177	137	101	1688
	3366 SOUTH INDIAN DITCH DIVERSION #1 N/O SCHÖBER LANE			11	10	4	8	2	1	0	0	0	0	0	0	37
	3367 SOUTH INDIAN DITCH DIVERSION #2 N/O SCHÖBER LANE			68	81	68	51	16	9	1	0	0	0	0	0	295
	W408 WELL 408			169	160	168	167	168	137	0	0	0	0	0	0	969
	3002 GEORGE DITCH W. OF SUNLAND AVENUE	(-)		57	48	56	51	40	43	67	31	30	33	30	22	508
	3046 SOUTH INDIAN RETURN AT A-1 DRAIN	(-)		57	76	56	16	0	2	0	0	0	0	0	0	207
	3270 SOUTH INDIAN D-3	(-)		302	341	398	303	227	160	109	127	172	187	147	110	2583
BC500				146	173	145	136	122	142	4	-6	-6	-16	-14	-8	818

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			APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR-MAR	
BC502A	3027 HALL DITCH PUMP PLANT #2@DON TATUM LEASE( KOCH )		29	25	32	30	23	22	0	0	0	0	0	0	161	
	3028 HALL DITCH PUMP PLANT #4 AT DON TATUM LEASE		63	126	194	169	155	86	0	0	0	0	0	0	794	
			92	151	227	199	178	108	0	0	0	0	0	0	955	
BC502B	3031 A-1 DRAIN PUMP PLANT #1 S/O HALL DITCH		0	0	0	0	0	0	0	0	0	0	0	0	0	
	3032 A-1 DRAIN PUMP PLANT #3 AT WELL #140		113	88	105	100	109	117	0	0	0	0	0	0	631	
			113	88	105	100	109	117	0	0	0	0	0	0	631	
BCOPRB	2086 A-DRAIN DIV. TO ARKANSAS FLATS		0	0	0	0	0	0	0	0	0	0	0	0	0	
			0	0	0	0	0	0	0	0	0	0	0	0	0	
BCRECA	3155 BISHOP CK DITCH #5-B		0	0	0	0	0	0	116	142	76	7	0	0	342	
			0	0	0	0	0	0	116	142	76	7	0	0	342	
BCRECC	3021 BISHOP CK CANAL DIV. #67		0	0	0	0	0	0	0	0	0	0	0	0	0	
			0	0	0	0	0	0	0	0	0	0	0	0	0	
BCRECD	3194 SOUTH FORK BISHOP CREEK BELOW BISHOP CREEK CANAL		410	519	709	733	701	596	543	388	430	392	304	388	6112	
	3193 SANDERS POND RETURN AT OWENS RIVER	(-)	197	199	194	160	125	143	160	174	222	207	138	172	2090	
	3066 RAWSON POND #3 RETURN TO OWENS RIVER	(-)	57	59	147	220	199	136	170	79	145	91	56	103	1463	
			156	260	369	353	378	317	213	134	63	94	109	112	2559	
BCRECF	3023 KINGSLEY DITCH DIV. C-4		111	185	100	122	109	78	66	34	57	56	56	78	1052	
	3183 CEMETERY DITCH AT E. LINE ST.	(-)	61	73	63	83	84	45	17	3	0	0	0	32	461	
			50	111	37	39	25	33	50	31	57	56	56	46	591	
BCLAEMH	3242 BISHOP CK CANAL DIV. TO 5 BRIDGES #2		33	37	31	0	0	0	0	0	0	36	49	58	244	
	3317 BISHOP CK CANAL DIV. TO 5 BRIDGES #6		10	20	16	16	12	14	13	5	0	5	0	0	109	
			43	57	47	16	12	14	13	5	0	40	49	58	353	
BCRVRECA	3185 MCGEE CK AT ABERLOUR RANCH		195	196	159	156	138	140	165	173	174	174	159	189	2017	
	3235 MILL POND RETURN	(-)	127	114	78	57	53	50	98	173	100	50	63	62	1027	
			68	82	80	99	85	89	67	0	74	125	95	126	990	

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BC005A			1	18	16	11	-1	9	-1	-1	-1	-1	2	3	54	
BC005B			1	18	8	12	7	2	0	0	0	0	0	0	49	
BC006A			6	10	11	13	15	11	7	7	7	7	7	40	141	
BC1478			52	53	59	61	56	41	12	24	23	20	17	22	439	
BC1479			5	7	12	12	12	11	0	0	0	0	0	0	58	
BC301			49	79	89	92	121	104	10	14	1	5	5	9	579	
BC302A			18	56	0	30	1	40	0	0	0	0	0	0	144	
BC302B			174	191	157	176	188	142	41	51	47	48	36	45	1296	
BC304			36	35	46	40	41	34	0	0	0	0	0	0	232	
BC311			537	567	501	460	461	483	58	66	61	49	42	47	3331	
BC313			74	150	105	79	68	91	42	51	24	48	42	47	821	
BC324			223	180	268	176	190	125	50	62	61	45	41	43	1464	
BC335			22	41	43	29	26	22	-19	-14	-10	-12	-6	11	133	
BC338			482	480	487	600	719	224	12	18	17	18	12	16	3085	
BC339			54	53	25	27	42	22	6	6	10	10	9	10	275	
BC353			27	48	68	49	42	42	11	12	10	9	9	12	337	
BC361A			97	266	325	223	189	125	22	18	6	-16	-17	-14	1224	
BC361B			85	295	460	414	381	278	239	118	129	100	56	116	2671	
BC362D			77	139	172	119	59	49	51	37	20	6	8	35	772	
BC387A			75	104	106	102	20	8	2	0	7	3	0	0	428	
BC392			120	143	112	128	123	74	-33	-53	-21	-18	-15	-13	547	
BC393			5	29	8	26	5	33	0	0	0	0	0	0	106	
BC397			541	673	588	574	330	0	50	93	89	78	61	65	3143	
BC500			146	173	145	136	122	142	4	-6	-6	-16	-14	-8	818	
BC502A			92	151	227	199	178	108	0	0	0	0	0	0	955	
BC502B			113	88	105	100	109	117	0	0	0	0	0	0	631	
BCOPRB			0	0	0	0	0	0	0	0	0	0	0	0	0	
BCRECA			0	0	0	0	0	0	116	142	76	7	0	0	342	
BCRECC			0	0	0	0	0	0	0	0	0	0	0	0	0	
BCRECD			156	260	369	353	378	317	213	134	63	94	109	112	2559	
BCRECF			50	111	37	39	25	33	50	31	57	56	56	46	591	
BCLAEMH			43	57	47	16	12	14	13	5	0	40	49	58	353	
BCRVRECA			68	82	80	99	85	89	67	0	74	125	95	126	990	
BCAUDIT Raw Total			3429	4557	4677	4395	4003	2790	1021	812	747	705	606	826	28568	
Accounts with no ICWD Credit Totals (RVRecA, 362D, 392)			(-)	265	364	364	346	267	212	85	-16	73	113	88	148	2309
BC AUDIT ICWD "Use" Total			3164	4193	4313	4049	3736	2578	936	828	674	592	518	678	26259	