Appendix D

Shortage Allocation Model Documentation

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Acronyms and Abbreviations

	Full Phrase
2007 FEIS	2007 Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead Final Environmental Impact Statement
2007 ROD	Record of Decision for the adoption of Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead
af/AF	acre-foot/feet
AFY	acre-feet per year
AOP	Annual Operating Plan
AWSA	2004 Arizona Water Settlements Act
CAP	Central Arizona Project
CAWCD	Central Arizona Water Conservation District
CRBPA	Colorado River Basin Project Act of 1968
CRMMS	Colorado River Mid-term Modeling System
CU	Consumptive Use
CVWD	Coachella Valley Water District
DCP	2019 Lower Basin Drought Contingency Plan
ICS	Intentionally Created Surplus
Interim Guidelines	2007 Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead
KAF	thousand acre-feet
LCWSP	Lower Colorado Water Supply Project
LMNRA	Lake Mead National Recreation Area
Lower Division States	Arizona, California, and Nevada
M&I	Municipal and Industrial (priority)
maf	million acre-feet
MWD	The Metropolitan Water District of Southern California
NIA	Non-Indian Agricultural (priority)
PABCO	Pacific Coast Building Products, Inc.
PPR	Present Perfected Right
QSA	Quantification Settlement Agreement
Reclamation	Bureau of Reclamation

Secretary	Secretary of the Interior
SEIS	Supplemental Environmental Impact Statement
SNWA	Southern Nevada Water Authority

Appendix D. Shortage Allocation Model Documentation

This appendix describes the Shortage Allocation Models and assumptions that were used to allocate shortages to water users in the States of Arizona, California, and Nevada (Lower Division States) as part of the analysis of alternatives in this Draft Supplemental Environmental Impact Statement (SEIS). Similar material was contained within Appendix G to the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead – Final Environmental Impact Statement (2007 FEIS).

D.1 Introduction

In order to assess the general socioeconomic effects of potential shortages to water users in the Lower Division States[1] under the action alternatives analyzed in this Draft SEIS, the Bureau of Reclamation developed a Shortage Allocation Model for each alternative and they documented the specific modeling assumptions in this appendix. This work is a supplement to a 2007 Shortage Allocation Model developed as part of the 2007 FEIS, reflecting the current conditions of Colorado River water use in the Lower Division States and the action alternatives under review in this Draft SEIS.

D.2 Background and Purpose

The Shortage Allocation Models were created to calculate the quantity of Colorado River water that would be available to water entitlement holders or water users under shortage conditions on the mainstream lower Colorado River. A shortage condition would exist during a year when the Secretary of the Department of the Interior (Secretary), as documented in the Annual Operating Plan (AOP), determines that there is less than 7.5 million acre-feet (maf) of water available to the Lower Division States.

The action alternatives under this Draft SEIS and their associated Shortage Allocation Models, which are described in detail in the following sections, require certain modeling assumptions with regard to how shortages may be allocated. Reclamation acknowledges there may be other interpretations of how shortages could be distributed. These modeling assumptions are not intended to represent current or future policy with respect to shortage sharing or to limit Secretarial discretion to distribute shortages. The Shortage Allocation Models are not a substitute for the annual process

[1] The US will conduct all necessary and appropriate discussions regarding the proposed federal action and implementation of the 1944 Treaty with Mexico through the International Boundary and Water Commission in consultation with the Department of State.

of reviewing water orders and determining annual water availability for each water entitlement holder on the lower Colorado River and, as such, cannot replicate the precision required for that process.

The Action Alternative 1 Shortage Allocation Model simulates shortage allocations and adjusts deliveries of Colorado River water in accordance with the priority of entitlements within each of the Lower Division States' apportionments. Entitlement holders are all persons or entities authorized to beneficially use Colorado River water pursuant to: 1) a right decreed by the United States Supreme Court, 2) a contract for the delivery of Colorado River water through the Secretary, or 3) a Secretarial reservation. For a current list of each state's Colorado River water entitlement holders, please see: https://www.usbr.gov/lc/region/g4000/contracts/entitlements.html.

The Action Alternative 2 Shortage Allocation Model simulates shortage allocations and reduces deliveries of mainstream Colorado River water to water users proportionally, or at the same percentage for each water user relative to their recent history of consumptive use. For this analysis, Calendar Year 2021 consumptive use is the baseline, as adjusted for conservation activities,[2] without regard to the priority systems within[3] and among the Lower Division States. The overall volumes of shortage are the same as Action Alternative 1.

In contrast to the Action Alternative 1 Shortage Allocation Model, in which total volumes of shortage were distributed among the Lower Division States independent of existing commitments under the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead (2007 Interim Guidelines) and 2019 Drought Contingency Plan (DCP), the Action Alternative 2 Shortage Allocation Model assigns the responsibility for existing commitments to certain water users, credits those commitments against the total shortage volume, and distributes the remaining additional shortage among those and other water users.

The No Action Alternative Shortage Allocation Model uses the same priority system as Action Alternative 1, but over a limited range of shortage volumes representing current commitments pursuant to the 2007 Interim Guidelines and 2019 Lower Basin DCP.

For the purposes of this SEIS, shortages implemented through operational decisions are referred to as "shortages", whereas shortages incurred as a result of unplanned or unforeseen hydrologic events and when water delivery requirements cannot be met are referred to as system shortage at dead pool or "system shortage"". The Shortage Allocation Models for each alternative cannot represent the effect of potential system shortages.

None of the Shortage Allocation Models developed for this Draft SEIS are intended as implementation tools, and they should only be used for decision support for Calendar Years 2024-2026 in this Draft SEIS.

[2] Conservation activities include creation of Intentionally Created Surplus (ICS) under the 2007 Interim Guidelines, system conservation, and contributions under the 2019 Lower Basin DCP.
[3] This alternative is formulated to reflect the intra-Central Arizona Project (CAP) priority system.

D.3 Alternative 1 Shortage Allocation Model

The Action Alternative 1 Shortage Allocation Model, similar to that developed for the No Action Alternative in the 2007 FEIS, represents the effect of the priority systems among and within the Lower Division States. As discussed in this section, the Action Alternative 1 Shortage Allocation Model is a set of Microsoft Excel worksheets that (given a volume of total shortage to the Lower Division States) distributes available water first among the states and subsequently among the entitlement holders within each state based on priority.

The discrete volumes (in acre-feet) of total shortage to the Lower Division States considered in the Action Alternative 1 Shortage Allocation Model are:

- 400,000
- 1,066,000
- 1,234,000
- 1,734,000
- 2,083,000
- 2,250,000
- 2,500,000
- 3,000,000
- 3,333,000
- 3,667,000
- 4,000,000

In the Action Alternative 1 Shortage Allocation Model, these volumes of shortage were distributed among the Lower Division States without regard to associated Lake Mead elevations, and without regard to existing commitments at those elevations (such as DCP contributions) that are not derived from an interpretation of priority among the Lower Division States. At certain proposed volumes of shortage, existing contributions under the Lower Basin DCP exceeded the volumes of shortage assigned to California in the Action Alternative 1 Shortage Allocation Model. Volumes of shortage assigned to the Lower Division States are assumed to be first satisfied by existing commitments.

D.3.1 Distribution Among States

With regard to distribution of available water among the Lower Division States, Action Alternative 1 considers their apportionments[4] as coequal, with the following exceptions.

First, the Colorado River Basin Project Act of 1968 (CRBPA) in Section 301(b) provides that in any year there is "insufficient main stream Colorado River water available for release to satisfy annual consumptive use of seven million five hundred thousand acre-feet in Arizona, California, and Nevada, diversions from the mainstream for the Central Arizona Project shall be so limited as to assure the availability of water in quantities sufficient to provide for the aggregate annual consumptive use by holders of present perfected rights, by other users in the State of California served under existing contracts with the United States by diversion works heretofore construct, and by other existing Federal reservations in that State, of four million four hundred thousand acre-feet of mainstream water, and by users of the same character in Arizona and Nevada. Water users in the State of Nevada shall not be required to bear shortages in any proportion greater than would have been imposed in the absence of this subsection 301(b)." Additionally, the language of the Arizona

[4] 2,800,000 acre-feet per year (AFY) to Arizona, 4,400,000 AFY to California, and 300,000 AFY to Nevada on a consumptive use basis.

priority system as contained in the CAP Master Repayment Contract[5] and other Arizona fourth priority Colorado River water delivery contracts, provides that CAP and other post-1968 contracts in Arizona are coequal in priority. For the purpose of the Action Alternative 1 Shortage Allocation Model, these provisions are assumed to reduce CAP and other Arizona fourth priority Colorado River water uses completely before water available to California is reduced below 4,400,000 AFY.

Second, Present Perfected Rights (PPR) are satisfied without regard to state lines, in order by priority in accordance with paragraph 5 of the Appendix to the 2006 Consolidated Decree of the U. S. Supreme Court in Arizona v. California (547 U.S. 150). PPR diversion entitlements total approximately 4.1 maf or 3.3 maf of estimated consumptive use and they are treated as a basin-wide senior priority that transcends state lines. In the event that insufficient Colorado River water is available to satisfy the needs of the PPR entitlement holders, a PPR worksheet included with the Action Alternative 1 Shortage Allocation Model shows the order in which the limited water supply would be delivered to the PPR holders (see **Table D-17** in **Section D.3.5**).

D.3.1.1 Stage 1 and Stage 2 Shortage Assumptions

As in the 2007 Shortage Allocation Model, in the Action Alternative 1 Shortage Allocation Model, shortages to the Lower Division States are characterized by two stages, Stage 1 and Stage 2. In Stage 1, shortages are imposed only upon Arizona and Nevada and they continue until the deliveries to the post-1968 water rights holders in Arizona (including the CAP) are reduced to zero (**Table D-1**). The maximum amount of Stage 1 shortage during the period of analysis is dependent on estimated water availability for the post-1968 water entitlement holders in Arizona.

The Stage 1 shortage sharing percentages are computed as follows:

- Nevada bears a reduction of 4.0 percent of the total Lower Division States shortage volume, computed as a ratio of Nevada's apportionment to the sum of the apportionments of the Lower Division States

  0.3 maf / 7.5 maf = 4.0 percent

- Arizona bears a reduction of 96 percent of the total Lower Division States shortage volume, which is the remaining shortage not borne by Nevada

  1 – 0.04 = 96 percent

[5] Contract No. 14-06-W-245 Between the United States and the Central Arizona Water Conservation District for Delivery of Water and Repayment of Costs of the Central Arizona Project, as amended.

Table D-1
Stage 1 Shortage Distribution

"Stage 1" Shortage Distribution	Arizona	California	Nevada	Total
Ratio of Apportionment to Total	=2,800,000/7,500,000 or 37.33%	=4,400,000/7,500,000 or 58.67%	=300,000/7,500,000 or 4%	
Percentage Assignment of Shortage	96.00%	0.00%	4.00%	

Distribution of Available Water Until Arizona Fourth Priority is Eliminated (Threshold Approximated)

Lower Division States Supply (AF)	Lower Division States Shortage Volume (AF)	AZ Shortage Volume (AF)	Water Available to AZ (AF)	CA Shortage Volume (AF)	Water Available to CA (AF)	NV Shortage Volume (AF)	Water Available to NV (AF)	Lower Division States Shortage Volume (AF)
7,500,000	-	-	2,800,000	-	4,400,000	-	300,000	-
7,400,000	(100,000)	(96,000)	2,704,000	-	4,400,000	(4,000)	296,000	(100,000)
7,300,000	(200,000)	(192,000)	2,608,000	-	4,400,000	(8,000)	292,000	(200,000)
7,200,000	(300,000)	(288,000)	2,512,000	-	4,400,000	(12,000)	288,000	(300,000)
7,100,000	(400,000)	(384,000)	2,416,000	-	4,400,000	(16,000)	284,000	(400,000)
7,000,000	(500,000)	(480,000)	2,320,000	-	4,400,000	(20,000)	280,000	(500,000)
6,900,000	(600,000)	(576,000)	2,224,000	-	4,400,000	(24,000)	276,000	(600,000)
6,800,000	(700,000)	(672,000)	2,128,000	-	4,400,000	(28,000)	272,000	(700,000)
6,700,000	(800,000)	(768,000)	2,032,000	-	4,400,000	(32,000)	268,000	(800,000)
6,600,000	(900,000)	(864,000)	1,936,000	-	4,400,000	(36,000)	264,000	(900,000)
6,500,000	(1,000,000)	(960,000)	1,840,000	-	4,400,000	(40,000)	260,000	(1,000,000)
6,434,000	(1,066,000)	(1,023,360)	1,776,640	-	4,400,000	(42,640)	257,360	(1,066,000)
6,400,000	(1,100,000)	(1,056,000)	1,744,000	-	4,400,000	(44,000)	256,000	(1,100,000)
6,300,000	(1,200,000)	(1,152,000)	1,648,000	-	4,400,000	(48,000)	252,000	(1,200,000)
6,266,000	(1,234,000)	(1,184,640)	1,615,360	-	4,400,000	(49,360)	250,640	(1,234,000)
6,200,000	(1,300,000)	(1,248,000)	1,552,000	-	4,400,000	(52,000)	248,000	(1,300,000)
6,100,000	(1,400,000)	(1,344,000)	1,456,000	-	4,400,000	(56,000)	244,000	(1,400,000)
6,000,000	(1,500,000)	(1,440,000)	1,360,000	-	4,400,000	(60,000)	240,000	(1,500,000)
5,900,000	(1,600,000)	(1,536,000)	1,264,000	-	4,400,000	(64,000)	236,000	(1,600,000)
5,800,000	(1,700,000)	(1,632,000)	1,168,000	-	4,400,000	(68,000)	232,000	(1,700,000)
5,766,000	(1,734,000)	(1,664,640)	1,135,360	-	4,400,000	(69,360)	230,640	(1,734,000)
5,759,415	(1,740,585)	(1,670,962)	1,129,038	-	4,400,000	(69,623)	230,377	(1,740,585)

After deliveries to the fourth priority entitlements within Arizona are expected to be reduced to zero, additional reductions are applied to Arizona, California, and Nevada. This Stage 2 shortage is the amount of additional shortage above the Stage 1 shortage volume, and the additional shortage is distributed according to the Stage 2 ratios (**Table D-2**).

The Stage 2 shortage sharing percentages are computed as follows:

- Nevada bears 4.0 percent of the Stage 2 shortage in addition to its Stage 1 shortage, computed as a ratio of Nevada's apportionment less the amount of shortage applied to Nevada under Stage 1, over the sum of the apportionments of the Lower Division States less the total amount shorted to users under Stage 1

  (0.3 maf – Nevada Stage 1 shortage) / (7.5 maf – total Stage 1 shortage) = 4.0 percent
- Arizona bears approximately 20 percent of the Stage 2 shortage in addition to its Stage 1 shortage, computed as a ratio of Arizona's apportionment less the amount of shortage applied to Arizona under Stage 1, over the sum of the apportionments of the Lower Division States less the total amount shorted to users under Stage 1

  (2.8 maf – Arizona Stage 1 Shortage) / (7.5 maf – total Stage 1 shortage) = 19.6 percent[6]
- California bears approximately 76 percent of the Stage 2 shortage, computed as a ratio of California's apportionment over the sum of the apportionments of the Lower Division States less the total amount shorted to users under Stage 1

  (4.4 maf) / (7.5 maf – total Stage 1 Shortage) = 76.4 percent

[6] The breakpoint between Stage 1 and Stage 2, when California begins to share in shortage, is a precise point at which no Arizona fourth priority Colorado River water is available. Over the long run, this breakpoint is nonstationary and annually varies based on use by Arizona priorities one through three. For this Action Alternative 1 Shortage Allocation Model, a shortage volume of 1,670,962 af to the State of Arizona is taken as the estimated volume necessary to reduce Arizona fourth priority Colorado River water availability to zero, based on average Arizona priority one through three use of 1,129,038 af over the four highest of the last 5 years of published water accounting data (through 2021). The total volume of Stage 1 shortage is directly dependent on this assumption, as are the state ratios for distribution of Stage 2 shortage. Reclamation will solicit feedback on the suitability of this approach for long-term operations as part of future decision-making processes.

Table D-2
Stage 2 Shortage Distribution

"Stage 2" Shortage Distribution	Arizona	California	Nevada	Total
Ratio of Curtailed Apportionment to Remainder	= (2,800,000-1,670,962)/(7,500,000-1,740,585) or 19.60%	Remainder	= (300,000-69,623)/(7,500,000-1,740,585) or 4%	
Percentage Assignment of Shortage	19.60%	76.40%	4.00%	

Distribution of Available Water After Arizona Fourth Priority is Eliminated (Threshold Approximated)

Lower Division States Supply (AF)	Lower Division States Shortage Volume in Addition to Stage 1 Shortage (AF)	AZ Shortage Volume in Addition to Stage 1 Shortage (AF)	Water Available to AZ (AF)	CA Shortage Volume (AF)	Water Available to CA (AF)	NV Shortage Volume in Addition to Stage 1 Shortage (AF)	Water Available to NV (AF)	Lower Division States Shortage Volume (AF)
5,700,000	(59,415)	(11,647)	1,117,391	(45,391)	4,354,609	(2,377)	228,000	(1,800,000)
5,600,000	(159,415)	(31,251)	1,097,787	(121,787)	4,278,213	(6,377)	224,000	(1,900,000)
5,500,000	(259,415)	(50,854)	1,078,184	(198,184)	4,201,816	(10,377)	220,000	(2,000,000)
5,417,000	(342,415)	(67,125)	1,061,913	(261,593)	4,138,407	(13,697)	216,680	(2,083,000)
5,400,000	(359,415)	(70,457)	1,058,581	(274,581)	4,125,419	(14,377)	216,000	(2,100,000)

The results of these assumptions are summarized in **Table D-3** below showing a distribution of shortage and available water volumes among the Lower Division States over a range of shortage from zero to 2.083 million AFY (as modeled for 2024) and to 4.0 million AFY (as modeled for 2025–2026).

Table D-3
Detailed Distribution by Lower Division State Under the Action Alternative 1 Shortage Allocation Model

Total Lower Division States Shortage Volumes (AF)	Arizona Shortage Volume (AF)	Arizona Available Water (AF)	California Shortage Volume (AF)	California Available Water (AF)	Nevada Shortage Volume (AF)	Nevada Available Water (AF)
-	-	2,800,000	-	4,400,000	-	300,000
(100,000)	(96,000)	2,704,000	-	4,400,000	(4,000)	296,000
(200,000)	(192,000)	2,608,000	-	4,400,000	(8,000)	292,000
(300,000)	(288,000)	2,512,000	-	4,400,000	(12,000)	288,000
(400,000)	(384,000)	2,416,000	-	4,400,000	(16,000)	284,000
(500,000)	(480,000)	2,320,000	-	4,400,000	(20,000)	280,000
(600,000)	(576,000)	2,224,000	-	4,400,000	(24,000)	276,000
(700,000)	(672,000)	2,128,000	-	4,400,000	(28,000)	272,000
(800,000)	(768,000)	2,032,000	-	4,400,000	(32,000)	268,000
(900,000)	(864,000)	1,936,000	-	4,400,000	(36,000)	264,000
(1,000,000)	(960,000)	1,840,000	-	4,400,000	(40,000)	260,000
(1,066,000)	(1,023,360)	1,776,640	-	4,400,000	(42,640)	257,360
(1,100,000)	(1,056,000)	1,744,000	-	4,400,000	(44,000)	256,000
(1,200,000)	(1,152,000)	1,648,000	-	4,400,000	(48,000)	252,000
(1,234,000)	(1,184,640)	1,615,360	-	4,400,000	(49,360)	250,640
(1,300,000)	(1,248,000)	1,552,000	-	4,400,000	(52,000)	248,000
(1,400,000)	(1,344,000)	1,456,000	-	4,400,000	(56,000)	244,000
(1,500,000)	(1,440,000)	1,360,000	-	4,400,000	(60,000)	240,000
(1,600,000)	(1,536,000)	1,264,000	-	4,400,000	(64,000)	236,000
(1,700,000)	(1,632,000)	1,168,000	-	4,400,000	(68,000)	232,000
(1,734,000)	(1,664,640)	1,135,360	-	4,400,000	(69,360)	230,640
(1,740,585)	(1,670,962)	1,129,038	-	4,400,000	(69,623)	230,377
(1,800,000)	(1,682,609)	1,117,391	(45,391)	4,354,609	(72,000)	228,000
(1,900,000)	(1,702,213)	1,097,787	(121,787)	4,278,213	(76,000)	224,000
(2,000,000)	(1,721,816)	1,078,184	(198,184)	4,201,816	(80,000)	220,000
(2,083,000)	(1,738,087)	1,061,913	(261,593)	4,138,407	(83,320)	216,680
(2,100,000)	(1,741,419)	1,058,581	(274,581)	4,125,419	(84,000)	216,000
(2,200,000)	(1,761,023)	1,038,977	(350,977)	4,049,023	(88,000)	212,000
(2,250,000)	(1,770,824)	1,029,176	(389,176)	4,010,824	(90,000)	210,000
(2,300,000)	(1,780,626)	1,019,374	(427,374)	3,972,626	(92,000)	208,000
(2,400,000)	(1,800,229)	999,771	(503,771)	3,896,229	(96,000)	204,000
(2,500,000)	(1,819,833)	980,167	(580,167)	3,819,833	(100,000)	200,000
(2,600,000)	(1,839,436)	960,564	(656,564)	3,743,436	(104,000)	196,000
(2,700,000)	(1,859,039)	940,961	(732,961)	3,667,039	(108,000)	192,000

Total Lower Division States Shortage Volumes (AF)	Arizona Shortage Volume (AF)	Arizona Available Water (AF)	California Shortage Volume (AF)	California Available Water (AF)	Nevada Shortage Volume (AF)	Nevada Available Water (AF)
(2,800,000)	(1,878,643)	921,357	(809,357)	3,590,643	(112,000)	188,000
(2,900,000)	(1,898,246)	901,754	(885,754)	3,514,246	(116,000)	184,000
(3,000,000)	(1,917,849)	882,151	(962,151)	3,437,849	(120,000)	180,000
(3,100,000)	(1,937,453)	862,547	(1,038,547)	3,361,453	(124,000)	176,000
(3,200,000)	(1,957,056)	842,944	(1,114,944)	3,285,056	(128,000)	172,000
(3,300,000)	(1,976,659)	823,341	(1,191,341)	3,208,659	(132,000)	168,000
(3,333,000)	(1,983,129)	816,871	(1,216,551)	3,183,449	(133,320)	166,680
(3,400,000)	(1,996,263)	803,737	(1,267,737)	3,132,263	(136,000)	164,000
(3,500,000)	(2,015,866)	784,134	(1,344,134)	3,055,866	(140,000)	160,000
(3,600,000)	(2,035,469)	764,531	(1,420,531)	2,979,469	(144,000)	156,000
(3,667,000)	(2,048,604)	751,396	(1,471,716)	2,928,284	(146,680)	153,320
(3,700,000)	(2,055,073)	744,927	(1,496,927)	2,903,073	(148,000)	152,000
(3,800,000)	(2,074,676)	725,324	(1,573,324)	2,826,676	(152,000)	148,000
(3,900,000)	(2,094,280)	705,720	(1,649,720)	2,750,280	(156,000)	144,000
(4,000,000)	(2,113,883)	686,117	(1,726,117)	2,673,883	(160,000)	140,000

Note: At 4,000,000 af or more of shortage using the Action Alternative 1 Shortage Allocation Models' ratios for the distribution of available water between states, not all of the shortage to California can be distributed among non-PPR entitlements. (See **Section D.3.5** for an alternative approach to the Action Alternative 1 Shortage Allocation Model to ensure that PPRs can be satisfied (or reduced) in the prescribed order without regard to state lines.)

D.3.2 Distribution Within States

D.3.2.1 Introduction

In accordance with Section II (B)(3) of the Consolidated Decree and Section 301(b) of the CRBPA, the Secretary has the authority to declare and allocate shortages to the Lower Division States. Although some explicit guidance is given by the Supreme Court and Congress with regard to how shortages would be allocated according to priority additional detail, it is based on interpretation of intra-state priority systems and water delivery contracts executed on behalf of the Secretary in accordance with Section 5 of the Boulder Canyon Project Act. The action alternatives under this Draft SEIS and their associated Shortage Allocation Models, which are described in detail in the following sections, require certain modeling assumptions with regard to how shortages may be allocated. Reclamation acknowledges there may be other interpretations of how shortages could be distributed and these modeling assumptions are not intended to represent current or future policy with respect to shortage sharing or to limit Secretarial discretion to distribute shortages. The Shortage Allocation Models are not a substitute for the annual process of reviewing water orders and determining annual water availability for each water entitlement holder on the lower Colorado River and, as such, cannot replicate the precision required for that process.

To determine the hydrologic impacts of the shortage alternatives, assumptions were made with regard to how shortages might be shared. These assumptions are made to facilitate analysis of the full range of potential impacts of each alternative and they are not intended to represent current or future policy with respect to shortage allocation. The Shortage Allocation Model is not designed to

replicate some of the annual processes that must be undertaken in determining the quantity of water that can be approved for diversion by specific users.

Unless otherwise noted, these assumptions also apply to the Shortage Allocation Model for the No Action Alternative described in **Section D.5**.

D.3.2.2 General State Assumptions

- Each state is using its entire apportionment each year.
- For the purpose of comparing the impacts of alternatives considered in this Draft SEIS, DCP contributions are assumed to represent reductions in deliveries, although parties retain flexibility in how to meet those contribution commitments.
- Because state apportionments are quantified in terms of consumptive use, unquantified and diversionary entitlements were estimated in terms of an equivalent consumptive use. For diversionary entitlements, the consumptive use to diversion ratios for calculating consumptive use equivalent entitlements were derived from the 2021 *Colorado River Accounting and Water Use Report: Arizona, California, and Nevada*[7] or equivalent source data for each entitlement holder (with the exception of PPRs for which the Supreme Court estimated both a diversion and consumptive use). Unquantified entitlements were modeled at their level of consumptive use in 2021, including conservation activities; this should not be taken as a limit on the future exercise of those entitlements.
- Entitlement holders with multiple priorities are assumed to divert their highest-priority water first, until it is fully utilized, although specific geographic restrictions may exist for the actual use of various priorities.
- Entitlements are used as the basis for distributing the available water supply to individual users.
- With the exception of PPRs, entitlement holders within a priority or sub-priority share in a pro-rata distribution of available water on the basis of entitlement, except as prescribed by contract or other determination. Within priorities other than PPRs, priority dates are not considered except as they pertain to grouping entitlements by priority.
- Current and/or future paybacks of overruns or underruns under the Inadvertent Overrun and Payback Policy, creation or use of Intentionally Created Surplus, or interstate storage and release are not considered in the Shortage Allocation Model.
- PPRs (on a consumptive use or equivalent basis) are not included in the distribution of shortage within each state; they are subtracted from the water calculated to be available to each state, which is then distributed in satisfaction of non-PPR entitlements, and the PPRs are accounted for in a separate PPR worksheet. A fill order is assumed for PPRs, although no shortages are modeled to invoke that fill order.
- Individual entitlements are assigned to one of three categories (domestic, irrigation, or Tribal) by their primary use or intended benefit, for the purpose of generalizing shortage impacts. No attempt is made to pro-rate shared irrigation and domestic entitlements by actual use. The current proportions of irrigation and domestic use of these entitlements may

[7] Internet website: https://www.usbr.gov/lc/region/g4000/4200Rpts/DecreeRpt/2021/2021.pdf, also known as "Decree Accounting".

change in a shortage condition due to contract-specific terms and conditions and/or the discretion of the entitlement holder.

D.3.2.3 Nevada Assumptions

- Nevada has eight water delivery priorities[8] as established in the Robert B. Griffith Water Project Contract No. 7-07-30-W0004, as amended, for delivery of Colorado River water between the US and the State of Nevada; the contract also provides for the Southern Nevada Water Authority (SNWA) to divert the balance of any remaining un-allocated, unused, and surplus water in Nevada. That priority system is assumed to govern the distribution of available water among Nevada entitlement holders. (See **Table D-4**.)
- Shortage to Nevada entitlement holders is calculated relative to their consumptive use entitlement (or equivalent).
- Deliveries to Nevada are no longer assumed to be constrained by Lake Mead surface elevation as assumed in the 2007 FEIS; however, the Action Alternative 1 Shortage Allocation Model does not reflect the effect of potential system shortages.
- Entitlements associated with each Nevada entitlement holder are available at: https://www.usbr.gov/lc/region/g4000/contracts/entitlements.html.

[8] Internet website: https://www.usbr.gov/lc/region/g4000/contracts/entitlements/Entitlements_NV_priority.pdf.

Table D-4
Framework for Priority-Based Distribution of Available Water Within Nevada

Priority	Entitlement Holder	Contract No.	Priority Date	Use	Entitlements		
					Diversion (AFY)	CU or Estimated Equivalent (AFY)[1]	Cumulative CU (AFY)
9th	Any contracts dated after 3-2-1992, SNWA Contract						
8th – Balance & Surplus	Southern Nevada Water Authority	2-07-30-W0266	3/2/1992	M&I	balance + surplus	93,975	
	TOTAL					93,975	291,303
8th	Big Bend Water District	2-07-30-W0269	3/2/1992	M&I	10,000	4,718	
	Robert B. Griffith Project Sub. to City of Boulder City (8,918af) Sub. to City Henderson (27,021af) Sub. to City of North Las Vegas (26,635af) Sub. to Las Vegas Valley Water District (232,426af)	7-07-30-W0004	3/2/1992	M&I	308,000	146,342	
	TOTAL				**318,000**	151,060	197,327
7th	Southern Nevada Water Authority (Formerly Boy Scouts of America)[2]	9-07-30-W0011	11/9/1998	M&I	10	5	
	Bureau of Reclamation (includes Sportsman Park)	Secretarial Res.	11/9/1998	M&I	300	168	
	Nevada Dept. of Wildlife (formerly Nevada Dept. of Fish & Game)	14-06-300-2405	10/18/1972	M&I		25	
	US Air Force (4,000af) (Delivery from SNWA)[2]	F26600-78-DOO11, amended by F-26600-01-D-A111 (Included in 07-07-30-W0004 in P8)	1/23/1978, amended 5/1/2000		4,000	1,901	
	TOTAL				**4,310**	2,099	46,267
6th	Las Vegas Valley Water District[2]	14-06-300-2130	9/22/1969	M&I	15,407	7,320	
	TOTAL				**15,407**	7,320	44,169
5th	Lakeview Company (Hacienda Casino)	14-06-300-1523	2/12/1965	M&I	0	0	
	Pacific Coast Building Products, Inc. (PABCO)	5-07-30-W0089	6/19/1985	M&I	928	928	
	TOTAL				**928**	928	36,848

Priority	Entitlement Holder	Contract No.	Priority Date	Use	Entitlements		
					Diversion (AFY)	CU or Estimated Equivalent (AFY)[1]	Cumulative CU (AFY)
4th	Basic Water Company (formerly Basic Management, Inc.)	14-06-300-2083	9/18/1969	M&I	8,208	8,208	
	City of Henderson	0-07-30-W0246	5/22/1990	M&I	15,878	14,503	
	Southern Nevada Water Authority (From Basic Water Company)[2]	2-07-30-W0266	3/2/1992	M&I	14,950	7,103	
	TOTAL				**39,036**	29,814	35,920
3rd	Boulder City[3]	14-06-300-978	5/15/1931, 1/4/1960	M&I	5,876	5,876	
	TOTAL				5,876	5,876	6,106
2nd	Lake Mead National Recreation Area[4], Executive Order No. 5339	1964 Decree	4/25/1930	M&I	Unquantified, estimated ~1,500	230	
	TOTAL				**1,500**	230	230
NEVADA TOTALS					385,057	291,303	

Note: CU means Consumptive Use. All units are in acre-feet per year.
Subcontracts are displayed below the Entitlement Holder and indented five spaces.
In a shortage, PPRs are delivered water in order of priority date regardless of state lines. PPRs are not included in this table and they are accounted for in a separate PPR worksheet.
[1]2021 Decree Accounting values and Diversion/CU conversion ratios were used to estimate not specified and unquantified entitlements.
[2]Water for this entitlement is delivered through the Robert B. Griffith Project. 2021 Decree Accounting for the Robert B. Griffith Project and Las Vegas Wash return flows were used to estimate the consumptive use equivalent for these diversions.
[3]Though Boulder City's entitlement is delivered through the Robert B. Griffith Project, there are no return flows from Boulder City, so its consumptive use was assumed to be equivalent to diversion.
[4]This unlimited entitlement is estimated based on 2021 use, minus the Lake Mead National Recreation Area PPR.

D.3.2.4 California Assumptions

- Entitlements shown in **Table D-5** for California priorities one through three exclude the full volume of PPR entitlements held by those same parties, which are subject to a separate priority system.
- Reclamation recognizes that the Quantification Settlement Agreement (QSA) and related agreements help California parties meet the water needs of PPRs by agreeing that certain parties to the Seven Party Agreement would make water available to satisfy the requirements of the PPR holders while keeping the priorities within the Seven Party Agreement intact. In addition, the QSA helped quantify entitlements in the Seven Party Agreement, which is necessary to model shortages. Therefore, the quantified entitlements in the QSA for the Imperial Irrigation District and the Coachella Valley Water District, minus the amount specified for PPR use, were modeled in the Action Alternative 1 and No Action Shortage Allocation Models.
- QSA transfers and exchanges between Imperial Irrigation District, Coachella Valley Water District, and The Metropolitan Water District of Southern California (MWD) were included and modeled within priority three entitlements.
- Although MWD has a fourth priority Seven Party Agreement entitlement of 550,000 af, MWD's consumptive use equivalent entitlement is calculated (for modeling purposes) to equal the balance of California's apportionment after full use of higher priority entitlements. During a shortage, MWD may acquire a minimum of 25,000 af from the Palo Verde Irrigation District, though this is not modeled in the Action Alternative 1 and No Action Shortage Allocation Models.
- Entitlements associated with each California entitlement holder are available at: https://www.usbr.gov/lc/region/g4000/contracts/entitlements.html.
- Shortage to California entitlement holders is calculated relative to their consumptive use entitlement (or equivalent).

Table D-5
Framework for Priority-Based Distribution of Available Water Within California

Priority	Entitlement Holder	Contract No.	Priority Date	Use	Diversion (AFY)	CU Entitlement (AFY)	Entitlements	
							CU or Estimated Equivalent (AFY)	Cumulative CU (AFY)
4th	The Metropolitan Water District of Southern California (MWD) (4)	I1r-645	1930, 1931	M&I		550,000	444,352	**1,705,724**
	TOTAL				**0**	**550,000**	**444,352**	
3rd	Palo Verde Irrigation District (3b) – Lower Palo Verde Mesa Lands[1]	PVID20733C_P5	1933	Ag	≤16,000 acres	Unquantified	**4,156**	
	Coachella Valley Water District (CVWD) Total (3a)	I1r-781	1934			330,000	330,000	
	Use by CVWD (3a)[2]			Ag			**394,000**	
	Reduction for Misc. PPR Use						*-3,000*	
	Diverted by MWD (Coachella Canal Lining Project, MWD Exchange with San Diego County Water Authority)	QSA Transfer					*-21,500*	
	Diverted by MWD (Coachella Canal Lining Project, Supplemental Water delivered to San Luis Rey Settlement)	QSA Transfer					*-4,500*	
	Transfer from IID to CVWD						*93,000*	
	Imperial Irrigation District (IID) (3a)	I1r-747	1932			615,000	615,000	
	Use by IID (3a)[3]			Ag			**137,800**	
	Reduction for Misc. PPR Use						*-11,500*	
	Diverted by MWD (1988 IID-MWD Water Conservation Agreement/1989 Approval Agreement)	QSA Transfer					*-105,000*	
	Diverted by MWD (All-American Canal Lining Project, MWD Exchange with SDCWA)	QSA Transfer					*-56,200*	
	Diverted by MWD (All-American Canal Lining Project, Supplemental to San Luis Rey Settlement Parties)	QSA Transfer					*-11,500*	
	Diverted by MWD (IID transfer to SDCWA, MWD Exchange with SDCWA)	QSA Transfer					*-200,000*	
	Transfer to CVWD						*-93,000*	
	MWD Diversions from QSA			M&I			**398,700**	**1,261,372**
	Diverted by MWD (Coachella Canal Lining Project, MWD Exchange with San Diego County Water Authority)	QSA Transfer					*21,500*	
	Diverted by MWD (Coachella Canal Lining Project, Supplemental Water delivered to San Luis Rey Settlement)	QSA Transfer					*4,500*	
	Diverted by MWD (1988 IID-MWD Water Conservation Agreement/1989 Approval Agreement)[1]	QSA Transfer					*105,000*	
	Diverted by MWD (All-American Canal Lining Project, MWD Exchange with SDCWA)	QSA Transfer					*56,200*	
	Diverted by MWD (All-American Canal Lining Project, Supplemental to San Luis Rey Settlement Parties)	QSA Transfer					*11,500*	
	Diverted by MWD (IID transfer to SDCWA, MWD Exchange with SDCWA)	QSA Transfer					*200,000*	
	TOTAL					**945,000**	**934,656**	

Priority	Entitlement Holder	Contract No.	Priority Date	Use	Diversion (AFY)	CU Entitlement (AFY)	Entitlements	
							CU or Estimated Equivalent (AFY)	Cumulative CU (AFY)
2nd	Yuma Project, Reservation Division (Bard Unit Only – Indian Unit Under PPRs)[4]	Water Certificates	1905	Ind./Ag	≤25,000 acres		3,459	**326,716**
	TOTAL				**0**	**0**	**3,459**	
1st	Palo Verde Irrigation District – Valley Lands (1)[5]	PVID20733C_P2	1933	Ag	≤104,500 acres	Unquantified	323,258	**323,258**
	TOTAL				**0**	**0**	**323,258**	
	CALIFORNIA TOTALS				291,175	2,458,023	**1,705,724**	0

Notes: CU means Consumptive Use; all units are in AFY (acre feet per year).

Priorities are based on the California Seven Party Agreement, modified for the PPRs identified by the Consolidated Decree (which are accounted for in the PPRs tab) and to account for the QSA transfers.

Unless otherwise noted, 2021 Decree Accounting values and Diversion/CU conversion ratios were used to estimate not specified and unquantified entitlements.

At 4maf of shortage, this state distribution may provide insufficient water to fulfill PPRs in the State of California. This analysis assumes no further shortage would be applied to California below that point. PPRs are not included in this table and they are accounted for in a separate PPR worksheet.

[1]PVID Lower Palo Verde Mesa Lands' 2022 Diversion of 9,134 af was assumed to be more representative of future conditions than the 2021 Diversion. The CU/Diversion ratio of about 0.455 for the entire PVID, based on 2021 accounting, was used to estimate the CU equivalent.

[2]Up to 15,000 af may be delivered by MWD for CVWD, via the Colorado River Aqueduct, pursuant to the terms of the 1988 IID/MWD Conservation Agreement/1989 Approval Agreement. This 15,000 af is accounted for in MWD's Diversions from the QSA as part of the 105,000 af diverted per the 1988 IID-MWD Water Conservation Agreement/1989 Approval Agreement.

[3]Non-Colorado River water is pumped from the Lower Colorado Water Supply Project (LCWSP) wellfield and discharged into the All-American Canal for delivery to IID. IID forbears the consumptive use of an equivalent amount of Colorado River, up to a maximum of 10,000 af per year, to make such water available, via exchange, to the LCWSP beneficiaries (includes MWD and the City of Needles and its subcontractors). For purposes of the Shortage Allocation Model, the 10,000 af is included in IID's estimated CU equivalent; if the LCWSP was non-operational, that water would be diverted from the Colorado River by IID.

[4]The Yuma Project CU Estimated Equivalent is based on the 2021 CU from the Bard Unit, plus the amount conserved by the Bard Unit that was made available to MWD, minus the CU from PPR 28, which is accounted for in the PPRs tab. The Yuma Project Reservation Division Indian Unit is not accounted for here, since its use is fully satisfied by PPR 23, also listed in the PPRs tab.

D.3.2.5 Arizona Assumptions

- In 2007, consumptive use schedules were provided by ADWR for use in the Shortage Allocation Model for the period 2008 through 2060. ADWR and Reclamation have not undertaken a process to update those schedules; shortage to Arizona entitlement holders is instead assessed relative to recent available data as described below for each priority.
- CAP excess and unused water contracts and mainstream unused apportionment or surplus (fifth and/or sixth priority) entitlements are not available in shortage and they are assumed to bear the remainder of any shortage not assigned to other parties within Arizona; they are out of priority in all levels of shortage modeled for Action Alternative 1 and they are not itemized.
- The Shortage Allocation Models do not attempt to redistribute water that may be available within a priority, but they are unordered by any specific entitlement holder.
- Entitlements associated with each Arizona entitlement holder are available at: https://www.usbr.gov/lc/region/g4000/contracts/entitlements.html.

Water available to entitlement holders in Arizona is distributed through each priority according to the following assumptions. These assumptions do not necessarily reflect operational procedure, but they are necessary to produce a general approximation of the effect of shortages on specific priorities and entitlement holders for the purpose of comparing alternatives in this Draft SEIS.

D.3.2.5.1 Arizona Priority Two and Three Assumptions

Arizona priority two is for Secretarial Reservations and Perfected Rights established or effective prior to September 30, 1968. Arizona priority three is for entitlements pursuant to contracts between the US and water users in the State of Arizona executed on or before September 30, 1968. The second and third priorities are coequal.

The available supply to Arizona priorities two and three is calculated as the available supply to Arizona minus an average of the 4 highest of the last 5 years (2017–2021) of use by the first priority (PPR), or 519,154 AF. That supply is divided between priorities two and three in proportion to the sum of the consumptive use (or equivalent) entitlements within each priority: about 10 percent to priority two and about 90 percent to priority three. The 2007 Shortage Allocation Model did not distinguish between priority two and three supplies. The following assumptions for distribution within those priorities are intended to improve the accuracy of estimated impacts by considering contract-specific priority language.

Shortage is measured by the difference between water available to an entitlement during shortage and the 2021 adjusted consumptive use of that entitlement. Shortage is assumed to begin for priorities two and three when available supply is less than total 2021 adjusted consumptive use for both priorities, not reflecting the potential difference between orders and use. In addition, distributions of available water on the basis of entitlement may result in a shortage to certain entitlements and no shortage to others. The Shortage Allocation Models do not contain data for estimated orders in this priority or attempt to redistribute water that may be available, but unordered.

Water available to priority two is distributed among its five entitlements in proportion to their consumptive use (or equivalent) entitlement relative to the total for priority two.

Water available to priority three is distributed among its 28 entitlements in six groups according to project and/or division or pertinent contract terms. The alphanumeric sub-priority naming conventions for the six groups (shown in **Table D-6** below) are not operational or contractual designations, and they are only used as an organizational tool specific to this analysis. Five of the six groups are assumed to be coequal within priority three, and they are distributed water in proportion to the sum of the consumptive use (or equivalent) entitlements within each group, relative to the total for all five groups. They are discussed in detail in the sections that follow.

Table D-6
Framework for Priority-Based Distribution of Available Water Within Arizona Priorities 2 and 3

Priority	Water Allocation % by Priority	Sub-Priority	Project	Division	Water Allocation % by Project/Division	Entitlement Holder	Contract No.	Priority Date	Use	Entitlements	
										Diversion (AFY)	CU or *Estimated Equivalent* (AFY)
2nd	9.94%	N/A	N/A	N/A	N/A	Cibola National Wildlife Refuge	Secretarial Res.	8/21/1964	M&I	34,500	16,793
						Lake Mead National Recreation Area	Consolidated Decree	4/25/1930	M&I	unquantified	*306*
						Bureau of Reclamation – Davis Dam	Secretarial Res.	4/26/1941	M&I	100	*3*
						Imperial National Wildlife Refuge	Consolidated Decree	2/14/1941	M&I	28,000	23,000
						Havasu National Wildlife Refuge	Consolidated Decree	1/22/1941	M&I	41,839	37,399
										P2 Total	**77,501**
3rd	90.06%	3b	Boulder Canyon		Remainder	City of Yuma	14-06-W-106	11/12/1959	M&I		48,522
										Project/Division Subtotal	**48,522**
		3a5 Subordinate	Gila	Yuma Mesa	33.03%	Union Pacific Railroad (formerly Southern Pacific Co.)	14-06-303-1524	12/21/1959	M&I	48	*29*
						Kaman, Inc.	14-06-303-1555	12/2/1959	M&I	2	0
						Department of the Navy, MCAS	14-06-300-937	1/1/1959	M&I	3,000	*3,000*
						City of Yuma (cemetery)	14-06-303-1078	5/1/1956	M&I	60	0
						Yuma Mesa Fruit Growers' Association	14-06-303-1196	10/1/1956	M&I	15	0
						Desert Lawn Memorial Park Association	14-06-300-1079	5/1/1956	M&I	200	*140*
						Sturges, Harold	I76R-733	1/1/1952	Ag	335	*0*
						Sturges, Irma	I76R-735	1/1/1952	Ag	385	*0*
		3a5				**Yuma Mesa Irrigation & Drainage District (10,000af M&I)**	5-07-30-W0095	5/26/1956	M&I/Ag		141,519
						Yuma Irrigation District (5,000af M&I)	5-07-30-W0093	7/23/1962	M&I/Ag		67,278
						North Gila Valley Irrigation and Drainage District (2,500af M&I)	5-07-30-W0094	5/12/1953	M&I/Ag		*3,920*
										Project/Division Subtotal	***215,886***
		3a4	Gila	Wellton-Mohawk	42.53%	**Wellton-Mohawk Irrigation and Drainage District (12,000af M&I)**	1-07-30-W0021	3/4/1952	M&I/Ag		278,000
										Project/Division Subtotal	***278,000***
		3a3	Various		11.73%	Ak-Chin Indian Community	1985 Settlement Contract	1/1/1956	M&I/Ag	50,000	*50,000*
						Chandler (Salt River Pima-Maricopa Exchange)	9-07-30-W0235	3/4/1952	M&I	4,278	*4,278*
						Gilbert (Salt River Pima-Maricopa Exchange)	9-07-30-W0241	3/4/1952	M&I	6,762	*6,762*
						Glendale (Salt River Pima-Maricopa Exchange)	9-07-30-W0236	3/4/1952	M&I	3,000	*3,000*
						Mesa (Salt River Pima-Maricopa Exchange)	9-07-30-W0239	3/4/1952	M&I	2,760	*2,760*
						Phoenix (Salt River Pima-Maricopa Exchange)	9-07-30-W0240	3/4/1952	M&I	5,000	*5,000*
						Scottsdale (Salt River Pima-Maricopa Exchange)	9-07-30-W0237	3/4/1952	M&I	100	*100*
						Tempe (Salt River Pima-Maricopa Exchange)	9-07-30-W0238	3/4/1952	M&I	100	*100*
						Department of the Army -- Yuma Proving Ground	I76r-696	6/12/1951	M&I	1,129	*1,129*
						Gila Monster Farms (formerly Sturges)	6-07-30-W0337	1/1/1952	Ag	6,285	3,516
										Project/Division Subtotal	***76,645***
		3a2 Subordinate	Yuma		10.69%	Yuma Union High School District	14-06-303-179	1/1/1953	M&I	200	*150*
		3a2				**Yuma County Water Users Association (14,701af M&I includes YAO)**	14-06-300-621 & Certificates	4/1/1957	M&I/Ag	unquantified	*69,690*
										Project/Division Subtotal	***69,840***
		3a1 Subordinate	Yuma Auxiliary		2.02%	University of Arizona	14-06-300-144	1/1/1954	Ag	1,088	*1,088*
						Camille Allec, Jr. (Formerly Yuma Mesa Grapefruit Company)	14-06-303-528	12/23/1953	Ag	120	0
		3a1				**Unit B Irrigation & Drainage District**	14-06-300-44	12/22/1952	Ag	unquantified	*12,145*
Grand Total	**100.00%**									**Project/Division Subtotal**	**13,233**
										P3a Total	**653,605**
										P3 Total	**702,127**
										P 2 & 3 Grand Total	**779,628**

The Yuma Mesa Division of the Gila Project

Approximately 33 percent of the available priority three water, up to the limit of the sum of the consumptive use (or equivalent) entitlements within the Division, is distributed among the Division's 11 entitlements. That water is first made available to Yuma Mesa Irrigation and Drainage District, Yuma Irrigation District, and North Gila Valley Irrigation and Drainage District coequally in proportion to their consumptive use entitlements.[9]

Any water remaining for the Division after satisfaction of the district contracts is made available to Union Pacific Railroad, Department of the Navy (Marine Corps Air Station), and Desert Lawn Memorial Park Association coequally in proportion to their consumptive use equivalent entitlements.[10]

The Kaman, City of Yuma (Cemetery), Yuma Mesa Fruit Growers Association, Harold Sturges, and Irma Sturges entitlements[11] are assumed to be unexercised and they are not distributed water; they are shown with a consumptive use equivalent entitlement of zero.

The Wellton-Mohawk Division of the Gila Project

Approximately 43 percent of the available priority three water, up to the limit of Wellton-Mohawk Irrigation and Drainage District's consumptive use entitlement, is made available to the District.[10]

The Yuma Project

Approximately 11 percent of the available priority three water is first made available to the Yuma County Water Users Association up to the limit of its consumptive use equivalent entitlement. Any water remaining for the Yuma Project after satisfaction of the Association contract is made available to Yuma Union High School District.[11]

The Yuma Auxiliary Project

Approximately 2.0 percent of the available priority three water, up to the limit of the sum of the consumptive use equivalent entitlements within the Yuma Auxiliary Project, is distributed among the Yuma Auxiliary Project's three entitlements. That water is first made available to Unit B Irrigation and Drainage District up to the limit of its consumptive use equivalent entitlement. Any water remaining for the Yuma Auxiliary Project after satisfaction of the District contract is made available to the University of Arizona.[11] The Camille Allec, Jr. entitlement[11] is assumed to be unexercised and it is not distributed water; it is shown with a consumptive use equivalent entitlement of zero.

Various Entitlements

A group of 10 entitlements established under various authorities shares approximately 12 percent of the available priority three water, up to the limit of the sum of the consumptive use (or equivalent) entitlements within the group. Water is distributed to the Ak-Chin Indian Community; the Arizona cities of Chandler, Gilbert, Glendale, Mesa, Phoenix, Scottsdale, and Tempe; the Department of the Army (Yuma Proving Ground); and Gila Monster Farms coequally in proportion to their consumptive use (or equivalent) entitlements. The distribution of water is stated in terms of

[9] Domestic use within each district's entitlement is assumed to be subordinated to irrigation use in the district, but it is not itemized separately.

[10] Water use is subject to availability and it is assumed not to be detrimental to a water service for the project or prior appropriators.

quantities available at the mainstream point of diversion, and no assumptions are made about the further distribution of priority three water delivered through the CAP.

The City of Yuma

The City of Yuma gets a distribution of all remaining priority three water, up to the limit of its consumptive use entitlement (minus a portion assumed to be satisfied by PPR No. 21), reflecting that water delivery under its Contract No. 14-06-W-106 is subject to the prior fulfillment of contracts for the diversion of Colorado River water at Imperial Dam and for the delivery of such water through the Gila Gravity Main Canal or the All-American Canal for the irrigation of lands in the State of Arizona.

D.3.2.5.2 Arizona Priority Four Assumptions

Reclamation implemented the State of Arizona's August 6, 2009, Arizona Shortage Sharing Recommendation and the "pool" approach described by letter dated January 25, 2021, to inform approval of fourth priority water orders for calendar years 2022 and 2023. Consistent with the Arizona mainstream Colorado River water priority system, the approach recognizes that the fourth priority Colorado River water entitlements of the P4(i) or 'mainstream' users and the CAP are coequal.

The Action Alternative 1 and No Action Shortage Allocation Models use the same fourth priority shortage sharing assumptions documented and described in:

- Reclamation's September 14, 2022 letter notifying interested parties of a Tier 2 Shortage Condition and required DCP contributions in calendar year 2023
- Reclamation's September 28, 2022 letter to the Central Arizona Water Conservation District announcing the calendar year 2023 available CAP supply

Those assumptions result in the P4(i) pool receiving 9.85 percent of the Arizona fourth priority Colorado River water available under the modeled shortage scenarios, while the remainder is available for diversion as fourth priority water by the CAP to fulfill CAP contracts and subcontracts.

D.3.2.5.3 P4(i) (Mainstream) Framework and Assumptions

Water is distributed to each entitlement within the P4(i) pool in proportion to its diversion[11] volume relative to the current total for the pool, 151,274 AFY, which does not include outstanding ADWR recommendations, unallocated water, or reserved water not yet placed under contract. (See **Table D-7**.)

Contracts and subcontracts are itemized separately, meaning an entity's total modeled supply may be the sum of multiple distributions.

[11] The Bureau of Land Management consumptive use entitlement is shown as a diversion equivalent for parity within the pool.

Table D-7
Framework for Priority-Based Distribution of Available Water Within Arizona P4(i) (Mainstream)

4th Priority Mainstream Entitlement Holders	4th Priority Contract Information				Initial Proportional Distribution of 4th Priority Mainstream Available Supply			
	Contract Number(s)	Date	Type of Use	Diversion Entitlement in AFY	Divided By	Sum of Entitlements in AFY	Equals	Proportionate Share of 4th Priority Mainstream Pool
Arizona Game and Fish Commission	07-XX-30-W0509	2007	Irrigation	2,838.00	/	151,274	=	1.876%
Arizona State Land Department	4-07-30-W0317	1999	Irrigation	6,607.00	/	151,274	=	4.368%
Beattie Farms, Southwest	05-XX-30-W0446	2006	Irrigation	1,110.00	/	151,274	=	0.734%
Bishop, Alfred F. and Erma Jean Family Trust	21-XX-30-W0718	1983	Irrigation	420.00	/	151,274	=	0.278%
Cathcart, Bruce Y. and Lora M. and James Y. and Maria E.	21-XX-30-W0719	1983	Irrigation	126.00	/	151,274	=	0.083%
ChaCha, LLC	09-XX-30-W0539	2009	Irrigation	2,100.00	/	151,274	=	1.388%
Cibola Sportsman's Club, Inc.	21-XX-30-W0717	1983	Irrigation	216.00	/	151,274	=	0.143%
Cibola Valley Irrigation and Drainage District	2-07-30-W0028	1983	Irrigation/Domestic	7,442.52	/	151,274	=	4.920%
Cocopah Indian Reservation	Consolidated Decree in AZ v. CA	1974	Irrigation/Domestic	2,026.00	/	151,274	=	1.339%
Curtis, Armon	3-07-30-W0037	1983	Irrigation	300.00	/	151,274	=	0.198%
Gila Monster Farms, Inc.	6-07-30-W0337	1997	Irrigation	1,435.00	/	151,274	=	0.949%
GM Gabrych Family Limited Partnership	17-XX-30-W0628	2018	Irrigation	4,500.00	/	151,274	=	2.975%
GSC Farm, LLC	13-XX-30-W0571	2013	Irrigation	2,913.30	/	151,274	=	1.926%
Hopi Tribe	04-XX-30-W0432	2004	Irrigation	4,278.00	/	151,274	=	2.828%
JRJ Partners, L.L.C.	06-XX-30-W0448	2007	Irrigation	1,080.00	/	151,274	=	0.714%
Mohave Valley Irrigation and Drainage District	14-06-W-204	1968	Irrigation/Domestic	35,060.00	/	151,274	=	23.176%
North Baja Pipeline, LLC	04-XX-30-W0433	2005	Irrigation/Domestic	480.00	/	151,274	=	0.317%
Ogram Boys Enterprises, Inc.	01-XX-30-W0402	2005	Irrigation	924.00	/	151,274	=	0.611%
Ott, Larry and Gina, and Lee C. and Candace M.	18-XX-30-W0639	2018	Irrigation	480.00	/	151,274	=	0.317%
Pasquinelli, Gary J. and Barbara J.	5-07-30-W0065	1986	Irrigation	486.00	/	151,274	=	0.321%
Red River Land Company, LLC	17-XX-30-W0630	2018	Irrigation	300.00	/	151,274	=	0.198%
Western Water, LLC	16-XX-30-W0619	2018	Irrigation	536.48	/	151,274	=	0.355%
Arizona State Land Department	7-07-30-W0358	2004	Domestic	1,534.00	/	151,274	=	1.014%
Arizona State Parks Board - Windsor Beach	7-07-30-W0364	1998	Domestic	90.00	/	151,274	=	0.059%
B&F Investment, LLC	06-XX-30-W0453	2006	Domestic	60.00	/	151,274	=	0.040%
Bullhead City	2-07-30-W0273	1994	Domestic	15,210.00	/	151,274	=	10.055%
Bullhead City (MCWA Subcontract)	Subcontract to 04-XX-30-W0431	2004	Domestic	2,139.00	/	151,274	=	1.414%
Bullhead City (MCWA Subcontract)	Subcontract No. 95-102 to 5-07-30-W0320	1995	Domestic	7,000.00	/	151,274	=	4.627%
Bureau of Land Management (diversion estimated)	8-07-30-W0373	2000	Domestic	6,169.00	/	151,274	=	4.078%
Crystal Beach Water Conservation District	6-07-30-W0352	1997	Domestic	132.00	/	151,274	=	0.087%
Desert Lawn Memorial Park Association, Inc.	14-06-300-2587	1975	Domestic	360.00	/	151,274	=	0.238%
Ehrenburg Improvement District	8-07-30-W0006	1977	Domestic	735.00	/	151,274	=	0.486%
EPCOR Water Arizona Inc.	20-XX-30-W0690	2021	Domestic	1,874.00	/	151,274	=	1.239%
Fisher's Landing Water and Sewer Works, L.L.C.	06-XX-30-W0450	2006	Domestic	53.00	/	151,274	=	0.035%
Frontier Communications West Coast Inc.	14-06-300-2506	1974	Domestic	1.00	/	151,274	=	0.001%
Gold Dome Mining Corporation	0-07-30-W0250	1990	Domestic	7.00	/	151,274	=	0.005%
Gold Standard Mines Corp.	3-07-30-W0038	1983	Domestic	75.00	/	151,274	=	0.050%
Golden Shores Water Conservation District	9-07-30-W0203	1989	Domestic	2,000.00	/	151,274	=	1.322%
Hillcrest Water Company	5-07-30-W0078	1985	Domestic	84.00	/	151,274	=	0.056%
Lake Havasu City	3-07-30-W0039	1995	Domestic	19,192.70	/	151,274	=	12.687%
Lake Havasu City (MCWA Subcontract)	Subcontract to 04-XX-30-W0431	2004	Domestic	2,139.00	/	151,274	=	1.414%
Lake Havasu City (MCWA Subcontract)	Subcontract No. 95-101 to 5-07-30-W0320	1995	Domestic	7,250.00	/	151,274	=	4.793%
La Paz County	08-XX-30-W0530	2008	Domestic	350.00	/	151,274	=	0.231%
McAlister Family Trust	7-07-30-W0355	1998	Domestic	40.00	/	151,274	=	0.026%
Mohave Valley Irrigation and Drainage District (MCWA Subcontract)	Subcontract No. 09-101 to 5-07-30-W0320	1995	Domestic	1,250.00	/	151,274	=	0.826%
Mohave Water Conservation District	9-07-30-W0012	1979	Domestic	1,800.00	/	151,274	=	1.190%
Mohave Water Conservation District (MCWA Subcontract)	Subcontract No. 95-103 to 5-07-30-W0320	1995	Domestic	3,000.00	/	151,274	=	1.983%
Parker, Town of	2-07-30-W0025	1982	Domestic	1,030.00	/	151,274	=	0.681%
Quartzsite, Town of	7-07-30-W0353	1999	Domestic	1,070.00	/	151,274	=	0.707%
Roy, Estates of Anna R. and Edward P.	6-07-30-W0124	1986	Domestic	1.00	/	151,274	=	0.001%
Shepard Water Company, Incorporated	08-XX-30-W0535	2009	Domestic	50.00	/	151,274	=	0.033%
Somerton, City of	03-XX-30-W0419	2006	Domestic	750.00	/	151,274	=	0.496%
Springs Del Sol Domestic Water Improvement District	08-XX-30-W0524	2008	Domestic	100.00	/	151,274	=	0.066%
TV Marble Canyon AZ, LLC	5-07-30-W0322	1996	Domestic	70.00	/	151,274	=	0.046%
Total				**151,274**				**100%**

Each entitlement's proportional share of the available P4(i) supply is initially calculated on a diversion basis, then converted to a consumptive use equivalent using consumptive use to diversion ratios from the calendar year 2021 *Colorado River Accounting and Water Use Report: Arizona, California, and Nevada*[12] or equivalent source data. Shortage is calculated as the difference between each entitlement's consumptive use equivalent supply and its 2021 consumptive use adjusted for participation in conservation programs (if applicable). The Shortage Allocation Models do not contain data for estimated orders in this priority, and they do not illustrate the potential effect of the pool approach to redistributing water that may be available, but unordered under any specific entitlement.

D.3.2.5.4 CAP Framework and Assumptions

In the Action Alternative 1 and No Action Alternative Shortage Allocation Models, Arizona priority three Colorado River water entitlements delivered through the CAP are modeled alongside other priority three entitlements. Terms and conditions for priority in case of shortage to the CAP relate only to fourth priority water. The Shortage Allocation Models attempt to reflect the legislative and contractual terms and conditions applicable to CAP shortages.

Levels of shortage to date have not required the implementation of shortage provisions in all CAP contracts, and their modeling should be understood as theoretical.

Available CAP supply is first made available to Indian and Municipal & Industrial (M&I) Priority long-term contracts and subcontracts, and then to Non-Indian Agricultural (NIA) Priority long-term contracts and subcontracts. After all long-term contracts and subcontracts are fulfilled[13], the remaining available water could be ordered under one-year excess contracts; however, none of the Action Alternative 1 shortage volumes provide for enough available supply for excess contracts under the assumptions of the model.

The Action Alternative 1 and No Action Alternative Shortage Allocation Models calculate available CAP supply as described in Reclamation's September 28, 2022 letter to the Central Arizona Water Conservation District. A range of available CAP supply from zero to 1,251,317 AF, in rounded 10,000 af increments except at pivotal quantities, is presented in **Table D-8** below showing all of the discrete levels of supply modeled.

[12] Internet website: https://www.usbr.gov/lc/region/g4000/4200Rpts/DecreeRpt/2021/2021.pdf, also known as Decree Accounting.

[13] Under Article 3.(b) of the 1985 Contract Between the United States and the Ak-Chin Indian Community to Provide Permanent Water and Settle Interim Water Rights, in any year in which sufficient surface water is available, the Secretary shall deliver certain additional water to the Ak-Chin Indian Community. Such water is assumed to be available if there is unused CAP water after CAP orders under contracts and subcontracts are fulfilled; however, there is no unused CAP water at the volumes of shortage modeled for Action Alternative 1.

Table D-8
Discrete Levels and Distribution of Available CAP Supply Modeled in the Shortage Allocation Model

Available CAP Supply (AF)	Indian Priority Share	Indian Priority Supply (AF)	M&I Priority Supply (AF)	NIA Priority Supply (AF)
1,251,317	Full Supply	343,079	638,823	269,415
1,250,000	Full Supply	343,079	638,823	268,098
1,240,000	Full Supply	343,079	638,823	258,098
1,230,000	Full Supply	343,079	638,823	248,098
1,220,000	Full Supply	343,079	638,823	238,098
1,210,000	Full Supply	343,079	638,823	228,098
1,200,000	Full Supply	343,079	638,823	218,098
1,190,000	Full Supply	343,079	638,823	208,098
1,180,000	Full Supply	343,079	638,823	198,098
1,170,000	Full Supply	343,079	638,823	188,098
1,160,000	Full Supply	343,079	638,823	178,098
1,150,000	Full Supply	343,079	638,823	168,098
1,140,000	Full Supply	343,079	638,823	158,098
1,130,000	Full Supply	343,079	638,823	148,098
1,120,000	Full Supply	343,079	638,823	138,098
1,110,000	Full Supply	343,079	638,823	128,098
1,100,000	Full Supply	343,079	638,823	118,098
1,090,000	Full Supply	343,079	638,823	108,098
1,080,000	Full Supply	343,079	638,823	98,098
1,070,000	Full Supply	343,079	638,823	88,098
1,060,000	Full Supply	343,079	638,823	78,098
1,050,000	Full Supply	343,079	638,823	68,098
1,040,000	Full Supply	343,079	638,823	58,098
1,030,000	Full Supply	343,079	638,823	48,098
1,020,000	Full Supply	343,079	638,823	38,098
1,010,000	Full Supply	343,079	638,823	28,098
1,000,000	Full Supply	343,079	638,823	18,098
990,000	Full Supply	343,079	638,823	8,098
981,902	Formula	343,079	638,823	-
980,000	Formula	342,595	637,405	-
970,000	Formula	340,051	629,949	-
960,000	Formula	337,508	622,492	-
950,000	Formula	334,964	615,036	-
940,000	Formula	332,420	607,580	-
930,000	Formula	329,876	600,124	-
920,000	Formula	327,332	592,668	-
910,000	Formula	324,789	585,211	-
900,000	Formula	322,245	577,755	-
890,000	Formula	319,701	570,299	-
880,000	Formula	317,157	562,843	-
870,000	Formula	314,613	555,387	-
860,000	Formula	312,070	547,930	-

Available CAP Supply (AF)	Indian Priority Share	Indian Priority Supply (AF)	M&I Priority Supply (AF)	NIA Priority Supply (AF)
853,079	36.37518%	310,309	542,770	-
850,000	36.37518%	309,189	540,811	-
840,000	36.37518%	305,552	534,448	-
830,000	36.37518%	301,914	528,086	-
820,000	36.37518%	298,276	521,724	-
819,828	36.37518%	298,214	521,614	-
810,000	36.37518%	294,639	515,361	-
801,574	36.37518%	291,574	510,000	-
800,000	36.37518%	291,001	508,999	-
790,000	36.37518%	287,364	502,636	-
780,000	36.37518%	283,726	496,274	-
770,000	36.37518%	280,089	489,911	-
760,000	36.37518%	276,451	483,549	-
750,000	36.37518%	272,814	477,186	-
740,000	36.37518%	269,176	470,824	-
730,000	36.37518%	265,539	464,461	-
720,000	36.37518%	261,901	458,099	-
710,000	36.37518%	258,264	451,736	-
700,000	36.37518%	254,626	445,374	-
690,000	36.37518%	250,989	439,011	-
680,000	36.37518%	247,351	432,649	-
670,000	36.37518%	243,714	426,286	-
660,000	36.37518%	240,076	419,924	-
650,000	36.37518%	236,439	413,561	-
640,000	36.37518%	232,801	407,199	-
630,000	36.37518%	229,164	400,836	-
620,000	36.37518%	225,526	394,474	-
610,000	36.37518%	221,889	388,111	-
600,000	36.37518%	218,251	381,749	-
590,000	36.37518%	214,614	375,386	-
580,000	36.37518%	210,976	369,024	-
570,000	36.37518%	207,339	362,661	-
560,000	36.37518%	203,701	356,299	-
550,000	36.37518%	200,064	349,936	-
540,000	36.37518%	196,426	343,574	-
530,000	36.37518%	192,788	337,212	-
520,000	36.37518%	189,151	330,849	-
510,000	36.37518%	185,513	324,487	-
500,000	36.37518%	181,876	318,124	-
490,000	36.37518%	178,238	311,762	-
480,000	36.37518%	174,601	305,399	-
470,000	36.37518%	170,963	299,037	-
460,000	36.37518%	167,326	292,674	-
450,000	36.37518%	163,688	286,312	-
440,000	36.37518%	160,051	279,949	-
430,000	36.37518%	156,413	273,587	-

Available CAP Supply (AF)	Indian Priority Share	Indian Priority Supply (AF)	M&I Priority Supply (AF)	NIA Priority Supply (AF)
420,000	36.37518%	152,776	267,224	-
410,000	36.37518%	149,138	260,862	-
400,000	36.37518%	145,501	254,499	-
390,000	36.37518%	141,863	248,137	-
380,000	36.37518%	138,226	241,774	-
370,000	36.37518%	134,588	235,412	-
360,000	36.37518%	130,951	229,049	-
350,000	36.37518%	127,313	222,687	-
340,000	36.37518%	123,676	216,324	-
330,000	36.37518%	120,038	209,962	-
320,000	36.37518%	116,401	203,599	-
310,000	36.37518%	112,763	197,237	-
300,000	36.37518%	109,126	190,874	-
290,000	36.37518%	105,488	184,512	-
280,000	36.37518%	101,851	178,149	-
270,000	36.37518%	98,213	171,787	-
260,000	36.37518%	94,575	165,425	-
250,000	36.37518%	90,938	159,062	-
240,000	36.37518%	87,300	152,700	-
230,000	36.37518%	83,663	146,337	-
220,000	36.37518%	80,025	139,975	-
210,000	36.37518%	76,388	133,612	-
200,000	36.37518%	72,750	127,250	-
190,000	36.37518%	69,113	120,887	-
180,000	36.37518%	65,475	114,525	-
170,000	36.37518%	61,838	108,162	-
160,000	36.37518%	58,200	101,800	-
150,000	36.37518%	54,563	95,437	-
140,000	36.37518%	50,925	89,075	-
130,000	36.37518%	47,288	82,712	-
120,000	36.37518%	43,650	76,350	-
110,000	36.37518%	40,013	69,987	-
100,000	36.37518%	36,375	63,625	-
90,000	36.37518%	32,738	57,262	-
80,000	36.37518%	29,100	50,900	-
70,000	36.37518%	25,463	44,537	-
60,000	36.37518%	21,825	38,175	-
50,000	36.37518%	18,188	31,812	-
40,000	36.37518%	14,550	25,450	-
30,000	36.37518%	10,913	19,087	-
20,000	36.37518%	7,275	12,725	-
10,000	36.37518%	3,638	6,362	-
-	36.37518%	-	-	-

Through a variety of arrangements, contractors and subcontractors may make their water available for end use by others. The Shortage Allocation Models do not replicate those arrangements, and they only provide approximate estimates at the allocation level that interested parties could then consider in planning for administering their respective arrangements during shortage conditions.

The Shortage Allocation Models do not attempt to replicate the provisions of the CAP priority system that provide for unordered water to be made available to other contractors or subcontractors within a priority, or unordered water from one priority to be made available to another.

Shortage volumes are calculated as the difference between available water distributed to each allocation and the 2024–2026 projected water orders associated with that allocation, as compiled for the 2023 Arizona DCP Implementation Plan Exhibit 7.1 dated December 15, 2022[14]. Allocations which are currently unused are shown as bearing no shortage.

D.3.2.5.4.1 CAP Indian Priority Assumptions

The overall deliverable quantity of Indian Priority supply is calculated as authorized in the 2004 Arizona Water Settlements Act (AWSA) (Public Law 108-451) section 104(d). The available Indian Priority supply is then distributed as described in applicable law, contracts, and subcontracts and as noted below.

Shortage to the Ak-Chin Indian Community's Indian Priority irrigation allocation is shown at the allocation level, and it does not reflect the conditional entitlement to a portion of that allocation that is held by the San Carlos Apache Tribe. In addition, the shortages attributed to Indian Priority allocations, pursuant to the internal priority system of the Indian Priority pool, do not account for the existence of external arrangements and commitments that would affect the ultimate impacts of shortage. Shortages attributed to Indian Priority allocations in the Shortage Allocation Models form the basis for additional analyses on a case-by-case basis.

For the purpose of calculating water available to individual Indian Priority allocations, the Indian Priority supply is distributed under a set of assumptions consistent with AWSA section 104(d) and the approach described in Exhibit 5.3.4.1 to the Tohono O'odham Settlement Agreement, *Secretary's Approach for Determining the Amount of Water Available to the Nation During a Time of Shortage Under 1980 Contract*, except as provided in the following paragraph.

Calculations for the distribution of water are performed as though all Indian Priority entitlements were fully used during the most recent calendar year, which was not a Time of Shortage.

These assumptions yield the distribution of available Indian Priority water over a range of discrete available CAP supplies shown in **Table D-9** below.

[14] Internet website: https://new.azwater.gov/sites/default/files/media/2022.12.15%20Exhibit%207.1%20Public%20Posting.pdf.

Table D-9
Distribution of CAP Indian Priority Supply

	Post-AWSA Contracts						Pre-AWSA Contracts									
Available CAP Supply (AF)	Indian Priority Share	Indian Priority Supply (AF)	Distribution to Contractors (AF)				Indian Priority Share	Indian Priority Supply (AF)	Distribution to Contractors (AF)							
			Gila River Indian Community	Tohono O'odham Nation (Homeland)	White Mountain Apache Tribe	Scottsdale (Yavapai Prescott Indian Tribe)			Ak-Chin Indian Community	Fort McDowell Yavapai Nation	Pascua Yaqui Tribe	San Carlos Apache Tribe	Salt River Pima-Maricopa Indian Community	Sif Oidak District	Tonto Apache Tribe	Yavapai Apache Nation
990,000	Full Supply	343,079	191,200	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
981,902	Formula	343,079	191,200	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
980,000	Formula	342,595	190,716	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
970,000	Formula	340,051	188,172	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
960,000	Formula	337,508	185,629	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
950,000	Formula	334,964	183,085	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
940,000	Formula	332,420	180,541	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
930,000	Formula	329,876	177,997	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
920,000	Formula	327,332	175,453	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
910,000	Formula	324,789	172,910	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
900,000	Formula	322,245	170,366	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
890,000	Formula	319,701	167,822	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
880,000	Formula	317,157	165,278	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
870,000	Formula	314,613	162,734	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
860,000	Formula	312,070	160,191	37,800	1,218	500	Full Supply	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
853,079	36.37518%	310,309	158,430	37,800	1,218	500	Imputed	343,079	58,300	18,233	500	12,700	13,300	8,000	128	1,200
850,000	36.37518%	309,189	157,802	37,800	1,218	500	Imputed	340,000	57,951	18,233	500	12,684	13,220	7,952	128	1,200
840,000	36.37518%	305,552	155,762	37,800	1,218	500	Imputed	330,000	56,820	18,233	500	12,631	12,962	7,797	128	1,200
830,000	36.37518%	301,914	153,723	37,800	1,218	500	Imputed	320,000	55,688	18,233	500	12,579	12,704	7,642	128	1,200
820,000	36.37518%	298,276	151,683	37,800	1,218	500	Imputed	310,000	54,556	18,233	500	12,527	12,446	7,486	128	1,200
819,828	36.37518%	298,214	151,648	37,800	1,218	500	Imputed	309,828	54,536	18,233	500	12,526	12,441	7,484	128	1,200
810,000	36.37518%	294,639	149,644	37,800	1,218	500	Imputed	300,000	53,424	18,233	500	12,474	12,188	7,331	128	1,200
801,574	36.37518%	291,574	147,925	37,800	1,218	500	Either	291,574	52,470	18,233	500	12,430	11,970	7,200	128	1,200
800,000	36.37518%	291,001	147,635	37,726	1,216	499	36.37518%	291,001	52,367	18,197	499	12,406	11,946	7,186	128	1,198
790,000	36.37518%	287,364	145,789	37,254	1,200	493	36.37518%	287,364	51,712	17,970	493	12,251	11,797	7,096	126	1,183
780,000	36.37518%	283,726	143,944	36,783	1,185	487	36.37518%	283,726	51,058	17,742	487	12,095	11,648	7,006	125	1,168
770,000	36.37518%	280,089	142,098	36,311	1,170	480	36.37518%	280,089	50,403	17,515	480	11,940	11,499	6,916	123	1,153
760,000	36.37518%	276,451	140,253	35,839	1,155	474	36.37518%	276,451	49,749	17,287	474	11,785	11,349	6,827	121	1,138
750,000	36.37518%	272,814	138,407	35,368	1,140	468	36.37518%	272,814	49,094	17,060	468	11,630	11,200	6,737	120	1,123
740,000	36.37518%	269,176	136,562	34,896	1,124	462	36.37518%	269,176	48,439	16,832	462	11,475	11,051	6,647	118	1,108
730,000	36.37518%	265,539	134,717	34,425	1,109	455	36.37518%	265,539	47,785	16,605	455	11,320	10,901	6,557	117	1,093
720,000	36.37518%	261,901	132,871	33,953	1,094	449	36.37518%	261,901	47,130	16,377	449	11,165	10,752	6,467	115	1,078
710,000	36.37518%	258,264	131,026	33,482	1,079	443	36.37518%	258,264	46,476	16,150	443	11,010	10,603	6,377	113	1,063
700,000	36.37518%	254,626	129,180	33,010	1,064	437	36.37518%	254,626	45,821	15,923	437	10,855	10,453	6,288	112	1,048
690,000	36.37518%	250,989	127,335	32,538	1,048	430	36.37518%	250,989	45,167	15,695	430	10,700	10,304	6,198	110	1,033
680,000	36.37518%	247,351	125,489	32,067	1,033	424	36.37518%	247,351	44,512	15,468	424	10,545	10,155	6,108	109	1,018
670,000	36.37518%	243,714	123,644	31,595	1,018	418	36.37518%	243,714	43,857	15,240	418	10,390	10,005	6,018	107	1,003
660,000	36.37518%	240,076	121,798	31,124	1,003	412	36.37518%	240,076	43,203	15,013	412	10,235	9,856	5,928	105	988

	Post-AWSA Contracts						Pre-AWSA Contracts									
Available CAP Supply (AF)	Indian Priority Share	Indian Priority Supply (AF)	Distribution to Contractors (AF)				Indian Priority Share	Indian Priority Supply (AF)	Distribution to Contractors (AF)							
			Gila River Indian Community	Tohono O'odham Nation (Homeland)	White Mountain Apache Tribe	Scottsdale (Yavapai Prescott Indian Tribe)			Ak-Chin Indian Community	Fort McDowell Yavapai Nation	Pascua Yaqui Tribe	San Carlos Apache Tribe	Salt River Pima-Maricopa Indian Community	Sif Oidak District	Tonto Apache Tribe	Yavapai Apache Nation
650,000	36.37518%	236,439	119,953	30,652	988	405	36.37518%	236,439	42,548	14,785	405	10,080	9,707	5,839	104	973
640,000	36.37518%	232,801	118,108	30,181	972	399	36.37518%	232,801	41,894	14,558	399	9,924	9,557	5,749	102	958
630,000	36.37518%	229,164	116,262	29,709	957	393	36.37518%	229,164	41,239	14,330	393	9,769	9,408	5,659	101	943
620,000	36.37518%	225,526	114,417	29,237	942	387	36.37518%	225,526	40,584	14,103	387	9,614	9,259	5,569	99	928
610,000	36.37518%	221,889	112,571	28,766	927	381	36.37518%	221,889	39,930	13,875	381	9,459	9,109	5,479	97	913
600,000	36.37518%	218,251	110,726	28,294	912	374	36.37518%	218,251	39,275	13,648	374	9,304	8,960	5,389	96	898
590,000	36.37518%	214,614	108,880	27,823	897	368	36.37518%	214,614	38,621	13,420	368	9,149	8,811	5,300	94	883
580,000	36.37518%	210,976	107,035	27,351	881	362	36.37518%	210,976	37,966	13,193	362	8,994	8,661	5,210	93	868
570,000	36.37518%	207,339	105,190	26,880	866	356	36.37518%	207,339	37,311	12,966	356	8,839	8,512	5,120	91	853
560,000	36.37518%	203,701	103,344	26,408	851	349	36.37518%	203,701	36,657	12,738	349	8,684	8,363	5,030	89	838
550,000	36.37518%	200,064	101,499	25,936	836	343	36.37518%	200,064	36,002	12,511	343	8,529	8,213	4,940	88	823
540,000	36.37518%	196,426	99,653	25,465	821	337	36.37518%	196,426	35,348	12,283	337	8,374	8,064	4,850	86	808
530,000	36.37518%	192,788	97,808	24,993	805	331	36.37518%	192,788	34,693	12,056	331	8,219	7,915	4,761	85	793
520,000	36.37518%	189,151	95,962	24,522	790	324	36.37518%	189,151	34,039	11,828	324	8,064	7,765	4,671	83	778
510,000	36.37518%	185,513	94,117	24,050	775	318	36.37518%	185,513	33,384	11,601	318	7,909	7,616	4,581	81	763
500,000	36.37518%	181,876	92,272	23,579	760	312	36.37518%	181,876	32,729	11,373	312	7,753	7,467	4,491	80	749
490,000	36.37518%	178,238	90,426	23,107	745	306	36.37518%	178,238	32,075	11,146	306	7,598	7,317	4,401	78	734
480,000	36.37518%	174,601	88,581	22,635	729	299	36.37518%	174,601	31,420	10,918	299	7,443	7,168	4,312	77	719
470,000	36.37518%	170,963	86,735	22,164	714	293	36.37518%	170,963	30,766	10,691	293	7,288	7,019	4,222	75	704
460,000	36.37518%	167,326	84,890	21,692	699	287	36.37518%	167,326	30,111	10,463	287	7,133	6,869	4,132	73	689
450,000	36.37518%	163,688	83,044	21,221	684	281	36.37518%	163,688	29,456	10,236	281	6,978	6,720	4,042	72	674
440,000	36.37518%	160,051	81,199	20,749	669	274	36.37518%	160,051	28,802	10,008	274	6,823	6,571	3,952	70	659
430,000	36.37518%	156,413	79,354	20,278	653	268	36.37518%	156,413	28,147	9,781	268	6,668	6,421	3,862	69	644
420,000	36.37518%	152,776	77,508	19,806	638	262	36.37518%	152,776	27,493	9,554	262	6,513	6,272	3,773	67	629
410,000	36.37518%	149,138	75,663	19,334	623	256	36.37518%	149,138	26,838	9,326	256	6,358	6,123	3,683	65	614
400,000	36.37518%	145,501	73,817	18,863	608	250	36.37518%	145,501	26,183	9,099	250	6,203	5,973	3,593	64	599
390,000	36.37518%	141,863	71,972	18,391	593	243	36.37518%	141,863	25,529	8,871	243	6,048	5,824	3,503	62	584
380,000	36.37518%	138,226	70,126	17,920	577	237	36.37518%	138,226	24,874	8,644	237	5,893	5,675	3,413	61	569
370,000	36.37518%	134,588	68,281	17,448	562	231	36.37518%	134,588	24,220	8,416	231	5,738	5,525	3,323	59	554
360,000	36.37518%	130,951	66,436	16,977	547	225	36.37518%	130,951	23,565	8,189	225	5,583	5,376	3,234	57	539
350,000	36.37518%	127,313	64,590	16,505	532	218	36.37518%	127,313	22,911	7,961	218	5,427	5,227	3,144	56	524
340,000	36.37518%	123,676	62,745	16,033	517	212	36.37518%	123,676	22,256	7,734	212	5,272	5,077	3,054	54	509
330,000	36.37518%	120,038	60,899	15,562	501	206	36.37518%	120,038	21,601	7,506	206	5,117	4,928	2,964	53	494
320,000	36.37518%	116,401	59,054	15,090	486	200	36.37518%	116,401	20,947	7,279	200	4,962	4,779	2,874	51	479
310,000	36.37518%	112,763	57,208	14,619	471	193	36.37518%	112,763	20,292	7,051	193	4,807	4,629	2,785	50	464
300,000	36.37518%	109,126	55,363	14,147	456	187	36.37518%	109,126	19,638	6,824	187	4,652	4,480	2,695	48	449
290,000	36.37518%	105,488	53,518	13,676	441	181	36.37518%	105,488	18,983	6,596	181	4,497	4,331	2,605	46	434
280,000	36.37518%	101,851	51,672	13,204	425	175	36.37518%	101,851	18,328	6,369	175	4,342	4,181	2,515	45	419
270,000	36.37518%	98,213	49,827	12,732	410	168	36.37518%	98,213	17,674	6,142	168	4,187	4,032	2,425	43	404
260,000	36.37518%	94,575	47,981	12,261	395	162	36.37518%	94,575	17,019	5,914	162	4,032	3,883	2,335	42	389

	Post-AWSA Contracts						Pre-AWSA Contracts									
Available CAP Supply (AF)	Indian Priority Share	Indian Priority Supply (AF)	Distribution to Contractors (AF)				Indian Priority Share	Indian Priority Supply (AF)	Distribution to Contractors (AF)							
			Gila River Indian Community	Tohono O'odham Nation (Homeland)	White Mountain Apache Tribe	Scottsdale (Yavapai Prescott Indian Tribe)			Ak-Chin Indian Community	Fort McDowell Yavapai Nation	Pascua Yaqui Tribe	San Carlos Apache Tribe	Salt River Pima-Maricopa Indian Community	Sif Oidak District	Tonto Apache Tribe	Yavapai Apache Nation
250,000	36.37518%	90,938	46,136	11,789	380	156	36.37518%	90,938	16,365	5,687	156	3,877	3,733	2,246	40	374
240,000	36.37518%	87,300	44,290	11,318	365	150	36.37518%	87,300	15,710	5,459	150	3,722	3,584	2,156	38	359
230,000	36.37518%	83,663	42,445	10,846	349	143	36.37518%	83,663	15,056	5,232	143	3,567	3,435	2,066	37	344
220,000	36.37518%	80,025	40,599	10,375	334	137	36.37518%	80,025	14,401	5,004	137	3,412	3,285	1,976	35	329
210,000	36.37518%	76,388	38,754	9,903	319	131	36.37518%	76,388	13,746	4,777	131	3,256	3,136	1,886	34	314
200,000	36.37518%	72,750	36,909	9,431	304	125	36.37518%	72,750	13,092	4,549	125	3,101	2,987	1,796	32	299
190,000	36.37518%	69,113	35,063	8,960	289	119	36.37518%	69,113	12,437	4,322	119	2,946	2,837	1,707	30	284
180,000	36.37518%	65,475	33,218	8,488	274	112	36.37518%	65,475	11,783	4,094	112	2,791	2,688	1,617	29	269
170,000	36.37518%	61,838	31,372	8,017	258	106	36.37518%	61,838	11,128	3,867	106	2,636	2,539	1,527	27	254
160,000	36.37518%	58,200	29,527	7,545	243	100	36.37518%	58,200	10,473	3,639	100	2,481	2,389	1,437	26	240
150,000	36.37518%	54,563	27,681	7,074	228	94	36.37518%	54,563	9,819	3,412	94	2,326	2,240	1,347	24	225
140,000	36.37518%	50,925	25,836	6,602	213	87	36.37518%	50,925	9,164	3,185	87	2,171	2,091	1,258	22	210
130,000	36.37518%	47,288	23,991	6,130	198	81	36.37518%	47,288	8,510	2,957	81	2,016	1,941	1,168	21	195
120,000	36.37518%	43,650	22,145	5,659	182	75	36.37518%	43,650	7,855	2,730	75	1,861	1,792	1,078	19	180
110,000	36.37518%	40,013	20,300	5,187	167	69	36.37518%	40,013	7,200	2,502	69	1,706	1,643	988	18	165
100,000	36.37518%	36,375	18,454	4,716	152	62	36.37518%	36,375	6,546	2,275	62	1,551	1,493	898	16	150
90,000	36.37518%	32,738	16,609	4,244	137	56	36.37518%	32,738	5,891	2,047	56	1,396	1,344	808	14	135
80,000	36.37518%	29,100	14,763	3,773	122	50	36.37518%	29,100	5,237	1,820	50	1,241	1,195	719	13	120
70,000	36.37518%	25,463	12,918	3,301	106	44	36.37518%	25,463	4,582	1,592	44	1,085	1,045	629	11	105
60,000	36.37518%	21,825	11,073	2,829	91	37	36.37518%	21,825	3,928	1,365	37	930	896	539	10	90
50,000	36.37518%	18,188	9,227	2,358	76	31	36.37518%	18,188	3,273	1,137	31	775	747	449	8	75
40,000	36.37518%	14,550	7,382	1,886	61	25	36.37518%	14,550	2,618	910	25	620	597	359	6	60
30,000	36.37518%	10,913	5,536	1,415	46	19	36.37518%	10,913	1,964	682	19	465	448	269	5	45
20,000	36.37518%	7,275	3,691	943	30	12	36.37518%	7,275	1,309	455	12	310	299	180	3	30
10,000	36.37518%	3,638	1,845	472	15	6	36.37518%	3,638	655	227	6	155	149	90	2	15
-	36.37518%	-	-	-	-	-	36.37518%	-	-	-	-	-	-	-	-	-

D.3.2.5.4.2 CAP M&I Priority Assumptions

The M&I Priority supply is calculated as the remainder of available CAP supply (up to 981,902 AF) not made available for delivery as Indian Priority supply. When available CAP supply equals or exceeds 981,902 AF, the Indian and M&I Priorities receive a full supply.

The available M&I Priority supply is distributed to each allocation in proportion to 2024–2026 projected water orders, relative to total projected orders for M&I Priority water. (The proportions are shown below in **Table D-10**.) This assumption is consistent with a joint consultation undertaken by Reclamation and the Central Arizona Water Conservation District (CAWCD) with M&I Priority water users in 2022.

Table D-10
Distribution of CAP M&I Priority Water in Proportion to 2024-2026 Orders

M&I Contractor or Subcontractor	2024-2026 Orders (AF)	Percentage of Orders
Freeport-Morenci (SCAT Lease)	5,645	0.94%
Scottsdale (SCAT Lease)	12,500	2.07%
ASARCO	21,000	3.48%
Avondale	5,416	0.90%
AZSLD	5,200	0.86%
AZWC, Casa Grande	8,884	1.47%
AZWC, Coolidge	2,000	0.33%
AZWC, Superstition	6,285	1.04%
AZWC, White Tank	968	0.16%
Buckeye	223	0.04%
CAGRD	6,426	1.07%
Carefree WC	886	0.15%
Cave Creek	2,606	0.43%
Chandler	8,654	1.44%
Chaparral City WC	8,909	1.48%
Circle City	-	0.00%
El Mirage	508	0.08%
Eloy	2,171	0.36%
EPCOR, AF	11,093	1.84%
EPCOR, PV	3,231	0.54%
EPCOR, SC	4,189	0.70%
EPCOR, SCW	2,372	0.39%
Florence	2,048	0.34%
Freeport-Miami	2,906	0.48%
FWID	2,854	0.47%
Gilbert	7,235	1.20%
Glendale	17,236	2.86%
Goodyear	10,742	1.78%
Greater Tonopah, Water Utility	64	0.01%
Green Valley CWC	-	0.00%
Green Valley DWID	-	0.00%
Marana	2,336	0.39%
Maricopa Cty P&R	665	0.11%
Mesa	43,503	7.22%
Metro DWID (Includes ICS Creation)	13,460	2.23%
Oro Valley	10,305	1.71%
Peoria	27,121	4.50%
Phoenix	122,204	20.28%
Pine	-	0.00%
Queen Creek	495	0.08%
Rio Verde Utilities	812	0.13%
San Tan ID	-	0.00%

M&I Contractor or Subcontractor	2024-2026 Orders (AF)	Percentage of Orders
Scottsdale	52,810	8.76%
Spanish Trail WC	3,037	0.50%
Surprise	10,249	1.70%
Tempe	4,315	0.72%
Tonopah	-	0.00%
Tonto Hills DWID	71	0.01%
Tucson	144,191	23.93%
Vail WC	1,857	0.31%
WUCFD, Apache Junction	2,919	0.48%
TOTAL	**602,601**	**100.00%**

D.3.2.5.4.3 CAP NIA Priority Assumptions

Only when available CAP Supply is calculated to be greater than 981,902 AF, the NIA Priority supply is calculated as the difference between available CAP supply and the sum of the Indian and M&I Priority entitlements. NIA Priority supply is assumed not to be available when available CAP supply is less than 981,902 AF.

The Shortage Allocation Models do not contain data for use in the most recent year that a full supply was available. However, available water is distributed first to NIA Priority contracts and subcontracts executed prior to 2021 (NIA-A) (**Table D-11**), until their orders are fully satisfied, before available water is distributed to NIA Priority contracts and subcontracts executed in 2021 or later (NIA-B) (**Table D-12**). Within each sub-priority, available water is distributed to each allocation in proportion to 2024-2026 projected water orders, relative to total projected orders for the sub-priority.

Table D-11
Distribution of CAP NIA-A Priority Water in Proportion to 2024-2026 Orders

NIA A Priority Contractor or Subcontractor	2024-2026 Orders (AF)	Percentage of Orders
GRIC (own account)	102,415	50.93%
Tohono O'Odham - Schuk Toak & San Xavier	28,200	14.02%
CAGRD [GRIC]	18,185	9.04%
Phoenix	37,280	18.54%
Chandler	3,924	1.95%
Gilbert	1,537	0.76%
Glendale	682	0.34%
Mesa	5,551	2.76%
Scottsdale	3,306	1.64%
Tempe	23	0.01%
TOTAL	**201,103**	**100.00%**

Table D-12
Distribution of CAP NIA-B Priority Water in Proportion to 2024–2026 Orders

NIA B Priority Contractor or Subcontractor	2024-2026 Orders (AF)	Percentage of Orders
WMAT	-	0.00%
Buckeye	2,786	6.26%
CAGRD	18,185	40.84%
Carefree WC	112	0.25%
Cave Creek	386	0.87%
El Mirage	1,318	2.96%
EPCOR, San Tan (ST)	3,217	7.22%
Freeport	5,678	12.75%
Gilbert	1,832	4.11%
Marana	515	1.16%
Queen Creek	4,162	9.35%
Resolution Copper	2,238	5.03%
Rosemont Copper	1,124	2.52%
SRP	2,160	4.85%
WUCFD, Apache Junction	817	1.83%
TOTAL	**44,530**	**100.00%**

D.3.3 Shortage Allocation Model Results

The tables in this section summarize the results of the Action Alternative 1 Shortage Allocation Model over a range of total shortages to the Lower Division States between 400,000 AFY and 4,000,000 AFY.

Table D-13 below illustrates the results of the Action Alternative 1 Shortage Allocation Model, showing a progressive loss of supply first to Arizona fifth and sixth priority entitlements, entitlements to unused CAP water, and CAP excess contracts, then to the Arizona fourth priority until it is reduced in full. Significant impacts occur to the Arizona second and third priorities and to Nevada, but all post-Boulder Canyon Project Act entitlements in California are reduced in full and there would be insufficient supply within California to fulfill PPRs at a shortage of 4,000,000 AFY. (See **Section D.3.5** of this appendix for further discussion of this result.)

Table D-13
Action Alternative 1 Shortage Allocation Model Regional Summary

Summary of Shortage Impacts by State and Priority		Range of Analyzed Volumes of Total Shortage to Lower Division States for Action Alternative 1 (AF)										
		400,000	1,066,000	1,234,000	1,734,000	2,083,000	2,250,000	2,500,000	3,000,000	3,333,000	3,667,000	4,000,000
Arizona	**Priority**											
	5th, 6th, and CAP Agricultural and Other Excess	286,465	333,921	339,609	351,774	365,748	372,121	381,106	394,679	399,838	404,989	410,046
	4th Priority i (Mainstream)	0	32,228	39,643	63,122	63,445	63,445	63,445	63,445	63,445	63,445	63,445
	4th Priority ii (CAP)[1]											
	NIA Priority	97,535	245,633	245,633	245,633	245,633	245,633	245,633	245,633	245,633	245,633	245,633
	M&I Priority	0	265,389	360,827	602,601	602,601	602,601	602,601	602,601	602,601	602,601	602,601
	Indian Priority	0	146,189	198,928	332,533	332,533	332,533	332,533	332,533	332,533	332,533	332,533
	2nd & 3rd Priorities	0	0	0	68,977	128,127	154,492	194,514	278,958	339,078	399,403	459,625
	1st Priority (Present Perfected Rights)	0	0	0	0	0	0	0	0	0	0	0
	Subtotal	**384,000**	**1,023,360**	**1,184,640**	**1,664,640**	**1,738,087**	**1,770,824**	**1,819,833**	**1,917,849**	**1,983,129**	**2,048,604**	**2,113,883**
California[2]	**Priority**											
	4th Priority (MWD)	0	0	0	0	261,593	389,176	444,352	444,352	444,352	444,352	444,352
	3rd Priority (IID, CVWD, PVID, QSA Diversions by MWD)	0	0	0	0	0	0	135,816	517,799	772,200	934,656	934,656
	2nd Priority (Yuma Project Reservation Division)	0	0	0	0	0	0	0	0	0	3,459	3,459
	1st Priority (PVID)	0	0	0	0	0	0	0	0	0	89,250	323,258
	Present Perfected Rights (PPRs)[3]	0	0	0	0	0	0	0	0	0	0	20,393
	Subtotal	**0**	**0**	**0**	**0**	**261,593**	**389,176**	**580,167**	**962,151**	**1,216,551**	**1,471,716**	**1,726,117**
Nevada	**Priority**											
	8th Priority (SNWA - Balance & Unused)	16,000	42,640	49,360	69,360	83,320	90,000	93,975	93,975	93,975	93,975	93,975
	8th Priority (SNWA & Big Bend)	0	0	0	0	0	0	6,025	26,025	39,345	52,705	66,025
	7th Priority (Boy Scouts, USBR, NV Dept of Wildlife)	0	0	0	0	0	0	0	0	0	0	0
	6th Priority (Las Vegas Valley Water District)	0	0	0	0	0	0	0	0	0	0	0
	5th Priority (PABCO & Lakeview Co.)	0	0	0	0	0	0	0	0	0	0	0
	4th Priority (Henderson & Basic Management)	0	0	0	0	0	0	0	0	0	0	0
	3rd Priority (Boulder City)	0	0	0	0	0	0	0	0	0	0	0
	2nd Priority (Lake Mead National Rec Area)	0	0	0	0	0	0	0	0	0	0	0
	1st Priority (PPRs: LMNRA & Fort Mojave Indian Reservation)	0	0	0	0	0	0	0	0	0	0	0
	Subtotal	**16,000**	**42,640**	**49,360**	**69,360**	**83,320**	**90,000**	**100,000**	**120,000**	**133,320**	**146,680**	**160,000**
	Total	**400,000**	**1,066,000**	**1,234,000**	**1,734,000**	**2,083,000**	**2,250,000**	**2,500,000**	**3,000,000**	**3,333,000**	**3,667,000**	**4,000,000**

Note: Orange highlights indicate the level at which available water for a priority is reduced to zero.

[1]Agricultural and other CAP excess contracts do not confer a Colorado River water entitlement, and they cannot be exercised under any of the scenarios modeled here.

[2]The first increment of shortage volumes required by Action Alternative 1 is satisfied by 2019 DCP contributions. In some elevation tiers, the 2019 DCP contributions for California exceed the 2024 shortage volume under Action Alternative 1, which follows the priority system. In these instances, the shortage allocation model for the No Action Alternative will show higher shortages to California than the shortage allocation model for Action Alternative 1.

[3]At 4,000,000 af of shortage using these ratios for the distribution of available water between states, not all of the shortage (20,393 AF) can be distributed among non-PPR entitlements in California. That volume is shown as a shortage to PPRs to call attention to it, but this should not be taken as a statement that the shortage would be applied to those users.

Disclaimer: These modeling results (for Action Alternative 1) should only be used to compare the relative magnitude of effects reasonably expected to occur under the alternatives evaluated in this SEIS. Modeling assumptions should not be taken as agency position with respect to contract or statutory interpretation, and they are not intended to limit Secretarial discretion with respect to current or future policy. This model is not a substitute for the annual process of reviewing water orders and determining which can be filled, and they cannot replicate the precision required of that process.

Table D-14 below illustrates the effects of shortage on Tribes under the Action Alternative 1 Shortage Allocation Model. There are no impacts on Tribes with PPRs, significant impacts to the Ak-Chin Indian Community's Arizona third priority entitlement, and a progressive loss of supply to all Tribal entitlements with a basis in the Arizona fourth priority or junior. (The Ak-Chin Indian Community's entitlement up to an additional 10,000 AFY of CAP water is not itemized in this table).

Table D-14
Action Alternative 1 Shortage Allocation Model Tribal Summary

Summary of Consumptive Use Impacts to Tribal Allocations			Range of Analyzed Volumes of Total Shortage to Lower Division States for Action Alternative 1 (AF)									
Arizona			400,000	1,066,000	1,234,000	1,734,000	2,083,000	2,250,000	2,500,000	3,000,000	3,333,000	3,667,000	4,000,000
Priority	**Entitlement Holder**	**County**											
4(i)	Hopi Tribe[1]	La Paz County	0	1,769	2,090	3,046	3,059	3,059	3,059	3,059	3,059	3,059	3,059
4(i)	Cocopah Indian Reservation[2]	Yuma County	0	0	0	0	0	0	0	0	0	0	0
CAP Indian Priority	Gila River Indian Community[1]	Maricopa and Pinal County	0	93,392	121,074	191,200	191,200	191,200	191,200	191,200	191,200	191,200	191,200
CAP Indian Priority	Tohono O'odham Nation (Schuk Toak & San Xavier Districts)[1]	Pima County	0	12,807	19,880	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800
CAP Indian Priority	White Mountain Apache Tribe	Apache, Gila, and Navajo	0	0	0	0	0	0	0	0	0	0	0
CAP Indian Priority	Ak-Chin Indian Community[1]	Pinal County	0	23,607	33,426	58,300	58,300	58,300	58,300	58,300	58,300	58,300	58,300
CAP Indian Priority	Fort McDowell Yavapai Nation	Maricopa County	0	6,177	9,589	18,233	18,233	18,233	18,233	18,233	18,233	18,233	18,233
CAP Indian Priority	Pascua Yaqui Tribe	Pima County	0	169	263	500	500	500	500	500	500	500	500
CAP Indian Priority	San Carlos Apache Tribe	Gila County	0	4,481	6,807	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700
CAP Indian Priority	Salt River Pima-Maricopa Indian Community	Maricopa County	0	5,385	7,625	13,300	13,300	13,300	13,300	13,300	13,300	13,300	13,300
CAP Indian Priority	Tohono O'odham Nation Sif Oidak District	Pinal County	0	0	0	0	0	0	0	0	0	0	0
CAP Indian Priority	Tonto Apache Tribe	Gila County	0	0	0	0	0	0	0	0	0	0	0
CAP Indian Priority	Yavapai Apache Nation	Gila County	0	0	0	0	0	0	0	0	0	0	0
CAP M&I Priority	San Carlos Apache Tribe	Gila County	0	7,991	10,865	18,145	18,145	18,145	18,145	18,145	18,145	18,145	18,145
CAP NIA-A Priority	Tohono O'odham Nation (Schuk Toak & San Xavier Districts)	Pima County	7,433	28,200	28,200	28,200	28,200	28,200	28,200	28,200	28,200	28,200	28,200
CAP NIA-A Priority	Gila River Indian Community	Maricopa and Pinal County	31,787	120,600	120,600	120,600	120,600	120,600	120,600	120,600	120,600	120,600	120,600
CAP NIA-B Priority	White Mountain Apache Tribe	Apache, Gila, and Navajo	0	0	0	0	0	0	0	0	0	0	0
3	Ak-Chin Indian Community[1]	Pinal County	0	0	0	7,547	12,607	14,862	18,239	24,992	29,489	34,000	38,497

Summary of Consumptive Use Impacts to Tribal Allocations			Range of Analyzed Volumes of Total Shortage to Lower Division States for Action Alternative 1 (AF)									
1 (PPR)	Cocopah Indian Reservation[1]	Yuma County	0	0	0	0	0	0	0	0	0	0
1 (PPR)	United States (Cocopah Indian Tribe)1	Yuma County	0	0	0	0	0	0	0	0	0	0
1 (PPR)	Fort Mojave Indian Reservation[1]	Mohave County	0	0	0	0	0	0	0	0	0	0
1 (PPR)	Fort Yuma Indian Reservation[1]	Yuma County	0	0	0	0	0	0	0	0	0	0
1 (PPR)	Colorado River Indian Reservation[1]	La Paz County	0	0	0	0	0	0	0	0	0	0
		Subtotal	**39,219**	**304,579**	**360,420**	**509,571**	**514,644**	**516,899**	**520,276**	**527,029**	**531,526**	**536,037**	**540,534**
California[3]												
Priority	**Entitlement Holder**	**County**										
PPR	Chemehuevi Indian Reservation[1]	San Bernardino	0	0	0	0	0	0	0	0	0	0
PPR	Fort Mojave Indian Reservation[1]	San Bernardino	0	0	0	0	0	0	0	0	0	0
PPR	Fort Yuma Indian Reservation[1]	Imperial	0	0	0	0	0	0	0	0	0	0
PPR	Colorado River Indian Reservation[1]	San Bernardino, Riverside	0	0	0	0	0	0	0	0	0	0
		Subtotal	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Nevada												
Priority	**Entitlement Holder**	**County**										
1 (PPR)	Fort Mojave Indian Reservation[1]	Clark	0	0	0	0	0	0	0	0	0	0
		Subtotal	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		Total	**39,219**	**304,579**	**360,420**	**509,571**	**514,644**	**516,899**	**520,276**	**527,029**	**531,526**	**536,037**	**540,534**
Summary by County												
Arizona		**# of Entitlement Holders /County**										
	Coconino County	0	0	0	0	0	0	0	0	0	0	0
	Gila County	4.33	0	12,472	17,672	30,845	30,845	30,845	30,845	30,845	30,845	30,845
	La Paz County	2	0	1,769	2,090	3,046	3,059	3,059	3,059	3,059	3,059	3,059
	Maricopa County	2.3	9,536	75,760	89,717	125,073	125,073	125,073	125,073	125,073	125,073	125,073
	Mohave County	1	0	0	0	0	0	0	0	0	0	0
	Pima County	3	7,433	41,176	48,343	66,500	66,500	66,500	66,500	66,500	66,500	66,500
	Pinal County	3.70	22,251	173,401	202,597	284,107	289,167	291,422	294,799	301,552	306,049	310,560	315,057
	Yuma County	4	0	0	0	0	0	0	0	0	0	0
	Apache County	0.33	0	0	0	0	0	0	0	0	0	0
	Navajo County	0.33	0	0	0	0	0	0	0	0	0	0
	Subtotal Arizona Tribal	**21**	**39,219**	**304,579**	**360,420**	**509,571**	**514,644**	**516,899**	**520,276**	**527,029**	**531,526**	**536,037**	**540,534**
California												
	San Bernardino	2.5	0	0	0	0	0	0	0	0	0	0
	Riverside	0.50	0	0	0	0	0	0	0	0	0	0
	Imperial	1	0	0	0	0	0	0	0	0	0	0
	Subtotal California Tribal	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Nevada												
	Clark	1	0	0	0	0	0	0	0	0	0	0
	Subtotal Nevada Tribal	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: PPRs are included here to provide a complete list of tribal entitlements, but they should not be impacted at the evaluated levels of shortage.
Note: Orange highlights indicate the level at which available water for a user under this priority is reduced to zero.

Note: This preliminary analysis attributes shortage to the base allocation or entitlement according to its priority. The ultimate impacts, both financial and in terms of the lost productive value of water, are diverse according to their varied uses and compensation structures under a large body of exchanges, leases, and other federal and non-federal arrangements and commitments. This distribution of shortage to the base allocation only provides the initial necessary information to assess impacts in detail as part of administering the related contracts; actual water orders received each year will affect those impacts.
[1]Denotes full or substantial use in tribal agricultural operations, which may or may not be impacted according to the terms of related agreements.
[2]This user also holds a PPR entitlement, which should not be impacted at these levels of shortages.
[3]At 4,000,000 af of shortage using these ratios for the distribution of available water between states, not all of the shortage (20,393 AF) can be distributed among non-PPR entitlements in California. On the Regional Summary, that volume is shown as a shortage to PPRs to call attention to it, but this should not be taken as a statement that the shortage would be applied to those users.
Disclaimer: These modeling results (for Action Alternative 1) should only be used to compare the relative magnitude of effects reasonably expected to occur under the alternatives evaluated in this SEIS. Modeling assumptions should not be taken as agency position with respect to contract or statutory interpretation, and they are not intended to limit Secretarial discretion with respect to current or future policy. This model is not a substitute for the annual process of reviewing water orders and determining which can be filled, and it cannot replicate the precision required of that process.

As shown in **Table D-15** below from the Action Alternative 1 Shortage Allocation Model, consistent with 2022 and 2023 operations, water supplies to central and mainstream Arizona irrigators via Arizona fifth and sixth priority entitlements, entitlements to unused CAP water, and CAP excess contracts are immediately impacted at all levels of shortage. Irrigation water supplies from the Arizona P4(i) are potentially reduced in full, as are irrigation water supplies to the University of Arizona in the Arizona third priority. Irrigation water supplies from the California first, second, and third priorities are also potentially reduced in full, with significant impacts possible to other water users.

Table D-15
Action Alternative 1 Shortage Allocation Model Irrigation Summary

Summary of Consumptive Use Impacts to Irrigation			Range of Analyzed Volumes of Total Shortage to Lower Division States for Action Alternative 1 (AF)										
Arizona			400,000	1,066,000	1,234,000	1,734,000	2,083,000	2,250,000	2,500,000	3,000,000	3,333,000	3,667,000	4,000,000
Priority	**Entitlement Holder**	**County**											
All Other	5th and 6th Priority Contracts, and CAP Agricultural and Other Excess	Maricopa, Pinal, and Pima	286,465	333,921	339,609	351,774	365,748	372,121	381,106	394,679	399,838	404,989	410,046
4(i)	Arizona Game and Fish Commission	La Paz County	0	1,173	1,386	2,021	2,029	2,029	2,029	2,029	2,029	2,029	2,029
4(i)	Arizona State Land Department	Yuma County	0	2,393	2,845	4,187	4,205	4,205	4,205	4,205	4,205	4,205	4,205
4(i)	Beattie Farms, Southwest	Yuma County	0	281	356	582	585	585	585	585	585	585	585
4(i)	Bishop, Alfred F. and Erma Jean Family Trust	La Paz County	0	59	91	185	186	186	186	186	186	186	186
4(i)	Cathcart, Bruce Y. and Lora M. and James Y. and Maria E.	La Paz County	0	25	34	63	63	63	63	63	63	63	63
4(i)	ChaCha, LLC	Yuma County	0	301	445	871	877	877	877	877	877	877	877
4(i)	Cibola Sportsman's Club, Inc.	La Paz County	0	74	90	138	139	139	139	139	139	139	139
4(i)	Cibola Valley Irrigation and Drainage District2	La Paz County	0	3,078	3,637	5,301	5,323	5,323	5,323	5,323	5,323	5,323	5,323
4(i)	Curtis, Armon	Yuma County	0	80	100	161	162	162	162	162	162	162	162
4(i)	Gila Monster Farms, Inc.[3]	Yuma County	0	144	229	480	483	483	483	483	483	483	483
4(i)	GM Gabrych Family Limited Partnership	La Paz County	0	1,665	1,972	2,887	2,899	2,899	2,899	2,899	2,899	2,899	2,899
4(i)	GSC Farm, LLC	La Paz County	0	1,204	1,423	2,074	2,083	2,083	2,083	2,083	2,083	2,083	2,083
4(i)	JRJ Partners, L.L.C.	Yuma County	0	366	440	659	662	662	662	662	662	662	662
4(i)	Mohave Valley Irrigation and Drainage District[2,3]	Mohave County	0	10,733	12,722	18,641	18,719	18,719	18,719	18,719	18,719	18,719	18,719
4(i)	North Baja Pipeline, LLC[2]	La Paz County	0	65	98	196	197	197	197	197	197	197	197
4(i)	Ogram Boys Enterprises, Inc.	Yuma County	0	340	403	591	593	593	593	593	593	593	593
4(i)	Ott, Larry and Gina, and Lee C. and Candace M.	Yuma County	0	94	127	225	226	226	226	226	226	226	226

Summary of Consumptive Use Impacts to Irrigation			Range of Analyzed Volumes of Total Shortage to Lower Division States for Action Alternative 1 (AF)										
4(i)	Pasquinelli, Gary J. and Barbara J.	Yuma County	0	37	70	169	170	170	170	170	170	170	170
4(i)	Red River Land Company, LLC	La Paz County	0	123	145	212	213	213	213	213	213	213	213
4(i)	Western Water, LLC	La Paz County	0	0	0	62	64	64	64	64	64	64	64
3	Sturges, Harold	Yuma County	0	0	0	0	0	0	0	0	0	0	0
3	Sturges, Irma	Yuma County	0	0	0	0	0	0	0	0	0	0	0
3	Yuma Mesa Irrigation & Drainage District (10,000af M&I)[1]	Yuma County	0	0	0	3,698	18,234	24,713	34,411	53,809	66,728	79,686	92,605
3	Yuma Irrigation District (5,000af M&I)[1]	Yuma County	0	0	0	0	0	0	0	3,395	9,537	15,697	21,839
3	North Gila Valley Irrigation District (2,500af M&I)[1,3]	Yuma County	0	0	0	542	945	1,124	1,393	1,930	2,288	2,647	3,005
3	Wellton-Mohawk Irrigation and Drainage District (12,000af M&I)[1]	Yuma County	0	0	0	26,080	54,214	66,754	85,527	123,072	148,078	173,158	198,163
3	Gila Monster Farms (formerly Sturges)[3]	Yuma County	0	0	0	531	887	1,045	1,283	1,757	2,074	2,391	2,707
3	Yuma County Water Users Association (14,701af M&I includes YAO's 489.95af conversion	Yuma County	0	0	0	10,392	17,459	20,610	25,326	34,758	41,040	47,341	53,623
3	University of Arizona	Yuma County	0	0	0	974	974	974	974	974	974	974	974
3	Camille Allec, Jr. (Formerly Yuma Mesa Grapefruit Company)	Yuma County	0	0	0	0	0	0	0	0	0	0	0
3	Unit B Irrigation & Drainage District[3]	Yuma County	0	0	0	909	2,248	2,845	3,739	5,526	6,716	7,910	9,101
		Subtotal	286,465	356,157	366,223	434,605	500,587	530,064	573,637	659,780	717,151	774,671	831,940
California[4]													
3	Palo Verde Irrigation District (3b) - Lower Palo Verde Mesa Lands	Riverside County	0	0	0	0	0	0	604	2,302	3,434	4,156	4,156
3	Coachella Valley Water District (CVWD) (3a)	Riverside County	0	0	0	0	0	0	57,253	218,276	325,517	394,000	394,000
3	Imperial Irrigation District (IID) (3a)	Imperial County	0	0	0	0	0	0	20,024	76,341	113,848	137,800	137,800
2	Yuma Project, Reservation Division[4] (Bard Unit Only - Indian Unit Under PPRs)	Imperial County	0	0	0	0	0	0	0	0	0	3,459	3,459
1	Palo Verde Irrigation District - Valley Lands	Riverside, Imperial	0	0	0	0	0	0	0	0	0	89,250	323,258
		Subtotal	0	0	0	0	0	0	77,880	296,919	442,799	628,665	862,672
Nevada													
None	None		0	0	0	0	0	0	0	0	0	0	0
		Subtotal	0	0	0	0	0	0	0	0	0	0	0
		Total	**286,465**	**356,157**	**366,223**	**434,605**	**500,587**	**530,064**	**651,517**	**956,699**	**1,159,951**	**1,403,335**	**1,694,612**
Summary by County													
	Arizona	**# of Entitlement Holders /County**											
	Coconino County	0	0	0	0	0	0	0	0	0	0	0	0
	La Paz County	10	0	7,467	8,878	13,139	13,196	13,196	13,196	13,196	13,196	13,196	13,196
	Mohave County	1	0	10,733	12,722	18,641	18,719	18,719	18,719	18,719	18,719	18,719	18,719
	Yuma County	20	0	4,036	5,014	51,050	102,924	126,028	160,615	233,186	285,398	337,767	389,979
	Pima County	0.2	57,293	66,784	67,922	70,355	73,150	74,424	76,221	78,936	79,968	80,998	82,009
	Pinal County	0.5	143,233	166,961	169,805	175,887	182,874	186,060	190,553	197,340	199,919	202,494	205,023
	Maricopa County	0.3	85,940	100,176	101,883	105,532	109,724	111,636	114,332	118,404	119,951	121,497	123,014

Summary of Consumptive Use Impacts to Irrigation			Range of Analyzed Volumes of Total Shortage to Lower Division States for Action Alternative 1 (AF)									
	Subtotal Arizona Irrigation	**32**	**286,465**	**356,157**	**366,223**	**434,605**	**500,587**	**530,064**	**573,637**	**659,780**	**717,151**	**774,671**	**831,940**
	California												
	Riverside County	2.5	0	0	0	0	0	0	57,856	220,578	328,951	442,781	559,785
	Imperial County	2.5	0	0	0	0	0	0	20,024	76,341	113,848	185,884	302,888
	Subtotal California Irrigation	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**77,880**	**296,919**	**442,799**	**628,665**	**862,672**
	Nevada												
	None	**None**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

[1]Combined irrigation and domestic entitlement where domestic use is contractually subordinated to irrigation.
[2]Combined irrigation and domestic entitlement where priority of domestic and irrigation uses may be subject to an annual determination that varies based on the water supply conditions.
[3]This user also holds a PPR entitlement, which is not impacted at these levels of shortages and it was not included here.
[4]The first increment of shortage volumes required by Action Alternative 1 is satisfied by 2019 DCP contributions. In some elevation tiers, the 2019 DCP contributions for California exceed the 2024 shortage volume under Action Alternative 1, which follows the priority system. In these instances, the shortage allocation model for the No Action Alternative will show higher shortages to California than the shortage allocation model for Action Alternative 1.
Note: PPR entitlements are not impacted at these levels of shortage.
Note: Orange highlights indicate the level at which available water for a user under this priority is reduced to zero.
Disclaimer: These modeling results (for Action Alternative 1) should only be used to compare the relative magnitude of effects reasonably expected to occur under the alternatives evaluated in this SEIS. Modeling assumptions should not be taken as agency position with respect to contract or statutory interpretation, and they are not intended to limit Secretarial discretion with respect to current or future policy. This model is not a substitute for the annual process of reviewing water orders and determining which can be filled, and it cannot replicate the precision required of that process.

Under the assumptions of the Action Alternative 1 Shortage Allocation Model, as shown in **Table D-16** below, the only domestic use entitlements that are not modeled to be potentially fully reduced are:

- Arizona third priority water delivered to seven cities through the CAP in accordance with the 1988 Salt River Pima-Maricopa Indian Community Water Rights Settlement Agreement
- Department of the Army's Arizona third priority water entitlement for Yuma Proving Ground
- Arizona second priority entitlements for Cibola, Imperial, and Havasu National Wildlife Refuges, Davis Dam, and Lake Mead National Recreation Area
- Uses in Nevada by the second through eighth priorities
- Domestic use PPRs (with the possible exception of California)

Table D-16
Action Alternative 1 Shortage Allocation Model Domestic Summary

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for Action Alternative 1 (AF)									
Arizona			400,000	1,066,000	1,234,000	1,734,000	2,083,000	2,250,000	2,500,000	3,000,000	3,333,000	3,667,000	4,000,000
Priority	Entitlement Holder	County											
4(i)	Arizona State Land Department	Yuma County	0	0	0	47	51	51	51	51	51	51	51
4(i)	Arizona State Parks Board - Windsor Beach	Mohave County	0	0	0	9	9	9	9	9	9	9	9
4(i)	B&F Investment, LLC	La Paz County	0	0	0	4	4	4	4	4	4	4	4
4(i)	Bullhead City	Mohave County	0	4,351	5,422	8,608	8,650	8,650	8,650	8,650	8,650	8,650	8,650
4(i)	Bullhead City (Mohave County Water Authority (MCWA) Subcontract)	Mohave County	0	0	0	0	0	0	0	0	0	0	0
4(i)	Bullhead City (MCWA Subcontract)	Mohave County	0	0	0	0	0	0	0	0	0	0	0
4(i)	Bureau of Land Management (diversion estimated)	La Paz County	0	0	0	875	892	892	892	892	892	892	892
4(i)	Crystal Beach Water Conservation District	Mohave County	0	37	46	73	73	73	73	73	73	73	73
4(i)	Desert Lawn Memorial Park Association, Inc.	Yuma County	0	0	0	0	0	0	0	0	0	0	0
4(i)	Ehrenburg Improvement District	La Paz County	0	10	66	230	232	232	232	232	232	232	232
4(i)	EPCOR Water Arizona Inc.[1]	Mohave County	0	140	270	657	662	662	662	662	662	662	662
4(i)	Fisher's Landing Water and Sewer Works, L.L.C.	Yuma County	0	0	0	7	7	7	7	7	7	7	7
4(i)	Frontier Communications West Coast Inc.	La Paz County	0	1	1	1	1	1	1	1	1	1	1
4(i)	Gold Dome Mining Corporation	Yuma County	0	0	0	0	0	0	0	0	0	0	0
4(i)	Gold Standard Mines Corp.	Mohave County	0	0	0	0	0	0	0	0	0	0	0
4(i)	Golden Shores Water Conservation District	Mohave County	0	0	0	284	290	290	290	290	290	290	290
4(i)	Hillcrest Water Company	La Paz County	0	0	1	18	18	18	18	18	18	18	18
4(i)	Lake Havasu City	Mohave County	0	2,989	4,239	7,960	8,009	8,009	8,009	8,009	8,009	8,009	8,009
4(i)	Lake Havasu City (MCWA Subcontract)	Mohave County	0	0	0	0	0	0	0	0	0	0	0
4(i)	Lake Havasu City (MCWA Subcontract)	Mohave County	0	0	0	0	0	0	0	0	0	0	0
4(i)	La Paz County	La Paz County	0	0	0	0	0	0	0	0	0	0	0
4(i)	McAlister Family Trust	Mohave County	0	0	0	7	7	7	7	7	7	7	7
4(i)	Mohave Valley Irrigation and Drainage District (MCWA Subcontract)	Mohave County	0	390	461	672	675	675	675	675	675	675	675
4(i)	Mohave Water Conservation District	Mohave County	0	300	427	804	809	809	809	809	809	809	809
4(i)	Mohave Water Conservation District (MCWA Subcontract)	Mohave County	0	0	0	0	0	0	0	0	0	0	0
4(i)	Parker, Town of[1]	La Paz County	0	0	0	87	90	90	90	90	90	90	90
4(i)	Quartzsite, Town of	La Paz County	0	0	0	0	0	0	0	0	0	0	0
4(i)	Roy, Estates of Anna R. and Edward P.	Yuma County	0	0	0	0	0	0	0	0	0	0	0
4(i)	Shepard Water Company, Incorporated	Yuma County	0	4	8	18	18	18	18	18	18	18	18
4(i)	Somerton, City of	Yuma County	0	0	0	0	0	0	0	0	0	0	0
4(i)	Springs Del Sol Domestic Water Improvement District	La Paz County	0	0	0	2	2	2	2	2	2	2	2
4(i)	TV Marble Canyon AZ, LLC	Coconino County	0	0	0	9	9	9	9	9	9	9	9
CAP Indian	Scottsdale (Yavapai Prescott Indian Tribe Allocation)	Maricopa County	0	169	263	500	500	500	500	500	500	500	500
CAP M&I	ASARCO	Pima County	0	9,249	12,574	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
CAP M&I	Avondale	Maricopa County	0	2,385	3,243	5,416	5,416	5,416	5,416	5,416	5,416	5,416	5,416
CAP M&I	Arizona State Land Department (AZSLD)	Maricopa County	0	2,290	3,114	5,200	5,200	5,200	5,200	5,200	5,200	5,200	5,200

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for Action Alternative 1 (AF)										
CAP M&I	Arizona Water Company, Casa Grande	Pinal County	0	3,913	5,320	8,884	8,884	8,884	8,884	8,884	8,884	8,884	8,884
CAP M&I	Arizona Water Company, Coolidge	Pinal County	0	881	1,198	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
CAP M&I	Arizona Water Company, Superstition	Pinal County	0	2,768	3,763	6,285	6,285	6,285	6,285	6,285	6,285	6,285	6,285
CAP M&I	Arizona Water Company, White Tank	Maricopa County	0	426	580	968	968	968	968	968	968	968	968
CAP M&I	Buckeye	Maricopa County	0	98	134	223	223	223	223	223	223	223	223
CAP M&I	Central Arizona Groundwater Replenishment District (CAGRD)	Maricopa County	0	2,830	3,848	6,426	6,426	6,426	6,426	6,426	6,426	6,426	6,426
CAP M&I	Carefree Water Company	Maricopa County	0	390	531	886	886	886	886	886	886	886	886
CAP M&I	Cave Creek	Maricopa County	0	1,148	1,560	2,606	2,606	2,606	2,606	2,606	2,606	2,606	2,606
CAP M&I	Chandler	Maricopa County	0	3,811	5,182	8,654	8,654	8,654	8,654	8,654	8,654	8,654	8,654
CAP M&I	Chaparral City Water Company	Maricopa County	0	3,924	5,335	8,909	8,909	8,909	8,909	8,909	8,909	8,909	8,909
CAP M&I	Circle City	Maricopa County	0	0	0	0	0	0	0	0	0	0	0
CAP M&I	El Mirage	Maricopa County	0	224	304	508	508	508	508	508	508	508	508
CAP M&I	Eloy	Pinal County	0	956	1,300	2,171	2,171	2,171	2,171	2,171	2,171	2,171	2,171
CAP M&I	EPCOR, Agua Fria	Maricopa County	0	4,885	6,642	11,093	11,093	11,093	11,093	11,093	11,093	11,093	11,093
CAP M&I	EPCOR, Paradise Valley	Maricopa County	0	1,423	1,935	3,231	3,231	3,231	3,231	3,231	3,231	3,231	3,231
CAP M&I	EPCOR, Sun City	Maricopa County	0	1,845	2,508	4,189	4,189	4,189	4,189	4,189	4,189	4,189	4,189
CAP M&I	EPCOR, Sun City West	Maricopa County	0	1,045	1,420	2,372	2,372	2,372	2,372	2,372	2,372	2,372	2,372
CAP M&I	Florence	Pinal County	0	902	1,226	2,048	2,048	2,048	2,048	2,048	2,048	2,048	2,048
CAP M&I	Freeport-Miami	Gila County	0	1,280	1,740	2,906	2,906	2,906	2,906	2,906	2,906	2,906	2,906
CAP M&I	Flowing Wells Irrigation District (FWID)	Pima County	0	1,257	1,709	2,854	2,854	2,854	2,854	2,854	2,854	2,854	2,854
CAP M&I	Gilbert	Maricopa County	0	3,186	4,332	7,235	7,235	7,235	7,235	7,235	7,235	7,235	7,235
CAP M&I	Glendale	Maricopa County	0	7,591	10,321	17,236	17,236	17,236	17,236	17,236	17,236	17,236	17,236
CAP M&I	Goodyear	Maricopa County	0	4,731	6,432	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742
CAP M&I	Greater Tonopah, Water Utility	Maricopa County	0	28	38	64	64	64	64	64	64	64	64
CAP M&I	Green Valley Community Water Company	Pima County	0	0	0	0	0	0	0	0	0	0	0
CAP M&I	Green Valley Domestic Water Improvement District	Pima County	0	0	0	0	0	0	0	0	0	0	0
CAP M&I	Marana	Pima County	0	1,029	1,399	2,336	2,336	2,336	2,336	2,336	2,336	2,336	2,336
CAP M&I	Maricopa County Parks & Recreation	Maricopa County	0	293	398	665	665	665	665	665	665	665	665
CAP M&I	Mesa	Maricopa County	0	19,159	26,049	43,503	43,503	43,503	43,503	43,503	43,503	43,503	43,503
CAP M&I	Metropolitan Domestic Water Improvement District (Includes ICS Creation)	Pima County	0	5,928	8,060	13,460	13,460	13,460	13,460	13,460	13,460	13,460	13,460
CAP M&I	Oro Valley	Pima County	0	4,538	6,170	10,305	10,305	10,305	10,305	10,305	10,305	10,305	10,305
CAP M&I	Peoria	Maricopa County	0	11,944	16,240	27,121	27,121	27,121	27,121	27,121	27,121	27,121	27,121
CAP M&I	Phoenix	Maricopa County	0	53,819	73,174	122,204	122,204	122,204	122,204	122,204	122,204	122,204	122,204
CAP M&I	Pine	Gila County	0	0	0	0	0	0	0	0	0	0	0
CAP M&I	Queen Creek	Maricopa County	0	218	296	495	495	495	495	495	495	495	495
CAP M&I	Rio Verde Utilities	Maricopa County	0	358	486	812	812	812	812	812	812	812	812
CAP M&I	San Tan Irrigation District	Maricopa County	0	0	0	0	0	0	0	0	0	0	0
CAP M&I	Scottsdale	Maricopa County	0	23,258	31,622	52,810	52,810	52,810	52,810	52,810	52,810	52,810	52,810
CAP M&I	Spanish Trail Water Company	Pima County	0	1,338	1,819	3,037	3,037	3,037	3,037	3,037	3,037	3,037	3,037
CAP M&I	Surprise	Maricopa County	0	4,514	6,137	10,249	10,249	10,249	10,249	10,249	10,249	10,249	10,249
CAP M&I	Tempe	Maricopa County	0	1,900	2,584	4,315	4,315	4,315	4,315	4,315	4,315	4,315	4,315
CAP M&I	Tonopah	Maricopa County	0	0	0	0	0	0	0	0	0	0	0
CAP M&I	Tonto Hills Domestic Water Improvement District	Maricopa County	0	31	43	71	71	71	71	71	71	71	71
CAP M&I	Tucson	Pima County	0	63,503	86,339	144,191	144,191	144,191	144,191	144,191	144,191	144,191	144,191
CAP M&I	Vail Water Company	Pima County	0	818	1,112	1,857	1,857	1,857	1,857	1,857	1,857	1,857	1,857

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for Action Alternative 1 (AF)									
CAP M&I	Water Utilities Community Facilities District, Apache Junction	Pinal County	0	1,286	1,748	2,919	2,919	2,919	2,919	2,919	2,919	2,919
CAP NIA-A	Phoenix	Maricopa County	9,826	37,280	37,280	37,280	37,280	37,280	37,280	37,280	37,280	37,280
CAP NIA-A	Chandler	Maricopa County	1,034	3,924	3,924	3,924	3,924	3,924	3,924	3,924	3,924	3,924
CAP NIA-A	Gilbert	Maricopa County	405	1,537	1,537	1,537	1,537	1,537	1,537	1,537	1,537	1,537
CAP NIA-A	Glendale	Maricopa County	180	682	682	682	682	682	682	682	682	682
CAP NIA-A	Mesa	Maricopa County	1,463	5,551	5,551	5,551	5,551	5,551	5,551	5,551	5,551	5,551
CAP NIA-A	Scottsdale	Maricopa County	871	3,306	3,306	3,306	3,306	3,306	3,306	3,306	3,306	3,306
CAP NIA-A	Tempe	Maricopa County	6	23	23	23	23	23	23	23	23	23
CAP NIA-B	Buckeye	Maricopa County	2,786	2,786	2,786	2,786	2,786	2,786	2,786	2,786	2,786	2,786
CAP NIA-B	Central Arizona Groundwater Replenishment District (CAGRD)	Maricopa County	18,185	18,185	18,185	18,185	18,185	18,185	18,185	18,185	18,185	18,185
CAP NIA-B	Carefree Water Company	Maricopa County	112	112	112	112	112	112	112	112	112	112
CAP NIA-B	Cave Creek	Maricopa County	386	386	386	386	386	386	386	386	386	386
CAP NIA-B	El Mirage	Maricopa County	1,318	1,318	1,318	1,318	1,318	1,318	1,318	1,318	1,318	1,318
CAP NIA-B	EPCOR, San Tan (ST)	Pinal County	3,217	3,217	3,217	3,217	3,217	3,217	3,217	3,217	3,217	3,217
CAP NIA-B	Freeport	Pima County	5,678	5,678	5,678	5,678	5,678	5,678	5,678	5,678	5,678	5,678
CAP NIA-B	Gilbert	Maricopa County	1,832	1,832	1,832	1,832	1,832	1,832	1,832	1,832	1,832	1,832
CAP NIA-B	Marana	Pima County	515	515	515	515	515	515	515	515	515	515
CAP NIA-B	Queen Creek	Maricopa County	4,162	4,162	4,162	4,162	4,162	4,162	4,162	4,162	4,162	4,162
CAP NIA-B	Resolution Copper	Maricopa County	2,238	2,238	2,238	2,238	2,238	2,238	2,238	2,238	2,238	2,238
CAP NIA-B	Rosemont Copper	Pima County	1,124	1,124	1,124	1,124	1,124	1,124	1,124	1,124	1,124	1,124
CAP NIA-B	SRP	Maricopa County	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160
CAP NIA-B	Water Utilities Community Facilities District, Apache Junction	Pinal County	817	817	817	817	817	817	817	817	817	817
3	City of Yuma[1]	Yuma County	0	0	0	13,511	13,511	13,511	13,511	13,511	13,511	13,511
3	Union Pacific Railroad (formerly Southern Pacific Co.)	Yuma County	0	0	0	29	29	29	29	29	29	29
3	Kaman, Inc.	Yuma County	0	0	0	0	0	0	0	0	0	0
3	Department of the Navy, MCAS	Yuma County	0	0	0	1,239	1,239	1,239	1,239	1,239	1,239	1,239
3	City of Yuma (cemetery)	Yuma County	0	0	0	0	0	0	0	0	0	0
3	Yuma Mesa Fruit Growers Association	Yuma County	0	0	0	0	0	0	0	0	0	0
3	Desert Lawn Memorial Park Association	Yuma County	0	0	0	23	23	23	23	23	23	23
3	Chandler (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	646	1,079	1,272	1,561	2,138	2,523	2,909	3,294
3	Gilbert (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	1,021	1,705	2,010	2,467	3,380	3,988	4,598	5,206
3	Glendale (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	453	756	892	1,094	1,499	1,769	2,040	2,310
3	Mesa (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	417	696	820	1,007	1,380	1,628	1,877	2,125
3	Phoenix (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	755	1,261	1,486	1,824	2,499	2,949	3,400	3,850
3	Scottsdale (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	15	25	30	36	50	59	68	77
3	Tempe (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	15	25	30	36	50	59	68	77
3	Department of the Army - Yuma Proving Ground	Yuma County	0	0	0	0	0	0	0	0	0	24	125
3	Yuma Union High School District	Yuma County	0	0	0	117	117	117	117	117	117	117	117
2	Cibola National Wildlife Refuge	La Paz County	0	0	0	0	0	0	554	2,665	4,071	5,482	6,888
2	Lake Mead National Recreation Area	Mohave County	0	0	0	64	93	106	125	164	189	215	240
2	Bureau of Reclamation - Davis Dam	Mohave County	0	0	0	0	0	0	0	0	0	0	0
2	Imperial National Wildlife Refuge	La Paz County	0	0	0	0	0	0	0	0	0	0	0
2	Havasu Lake National Wildlife Refuge	Mohave County	0	0	0	0	0	0	0	0	0	0	0

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for Action Alternative 1 (AF)									
		Subtotal	**58,316**	**362,624**	**457,998**	**720,464**	**722,856**	**723,861**	**725,920**	**731,041**	**734,452**	**737,896**	**741,409**
California[2]													
Priority	**Entitlement Holder**	**County**											
4	Metropolitan Water District of Southern California (MWD) (4)	Los Angeles, Orange, San Diego, Riverside, and San Bernardino	0	0	0	0	261,593	389,176	444,352	444,352	444,352	444,352	444,352
3	MWD Diversions from QSA (3a from IID and CVWD)		0	0	0	0	0	0	57,936	220,880	329,400	398,700	398,700
		Subtotal	**0**	**0**	**0**	**0**	**261,593**	**389,176**	**502,287**	**665,231**	**773,752**	**843,052**	**843,052**
Nevada													
Priority	**Entitlement Holder**	**County**											
8 – Balance & Surplus	Southern Nevada Water Authority (SNWA)	Clark	16,000	42,640	49,360	69,360	83,320	90,000	93,975	93,975	93,975	93,975	93,975
8	Big Bend Water District	Clark	0	0	0	0	0	0	188	813	1,229	1,646	2,062
8	Robert B. Griffith Project	Clark	0	0	0	0	0	0	5,836	25,212	38,116	51,059	63,963
7	Southern Nevada Water Authority (Formerly Boy Scouts of America)	Clark	0	0	0	0	0	0	0	0	0	0	0
7	Bureau of Reclamation (includes Sportsman Park)	Clark	0	0	0	0	0	0	0	0	0	0	0
7	Nevada Dept. of Wildlife (formerly NV Dept of Game & Fish)	Clark	0	0	0	0	0	0	0	0	0	0	0
7	U.S. Air Force (4,000af) (Delivery from SNWA)	Clark	0	0	0	0	0	0	0	0	0	0	0
6	Las Vegas Valley Water District	Clark	0	0	0	0	0	0	0	0	0	0	0
5	Lakeview Company (Hacienda Casino)	Clark	0	0	0	0	0	0	0	0	0	0	0
5	Pacific Coast Building Products, Inc. (PABCO)	Clark	0	0	0	0	0	0	0	0	0	0	0
4	Basic Water Company (formerly Basic Management, Inc.)	Clark	0	0	0	0	0	0	0	0	0	0	0
4	City of Henderson	Clark	0	0	0	0	0	0	0	0	0	0	0
4	Southern Nevada Water Authority (From Basic Water Company)	Clark	0	0	0	0	0	0	0	0	0	0	0
3	Boulder City	Clark	0	0	0	0	0	0	0	0	0	0	0
2	Lake Mead National Recreation Area, Executive Order No. 5339	Clark	0	0	0	0	0	0	0	0	0	0	0
		Subtotal	**16,000**	**42,640**	**49,360**	**69,360**	**83,320**	**90,000**	**100,000**	**120,000**	**133,320**	**146,680**	**160,000**
		Total	**74,316**	**405,264**	**507,358**	**789,824**	**1,067,769**	**1,203,037**	**1,330,841**	**1,519,634**	**1,645,370**	**1,731,784**	**1,748,616**
Summary by County													
	Arizona	**# of Entitlement Holders /County**											
	Coconino County	1	0	0	0	9	9	9	9	9	9	9	9
	Gila County	2	0	1,280	1,740	2,906	2,906	2,906	2,906	2,906	2,906	2,906	2,906
	La Paz County	11	0	11	67	1,217	1,239	1,239	1,793	3,904	5,310	6,721	8,127
	Maricopa County	55	46,965	243,406	300,231	447,506	449,732	450,724	452,210	455,181	457,160	459,145	461,124
	Mohave County	18	0	8,208	10,865	19,138	19,277	19,290	19,309	19,348	19,373	19,399	19,425
	Pima County	13	7,317	94,976	126,499	206,357	206,357	206,357	206,357	206,357	206,357	206,357	206,357
	Pinal County	8	4,034	14,739	18,589	28,341	28,341	28,341	28,341	28,341	28,341	28,341	28,341
	Yuma County	16	0	4	8	14,991	14,995	14,995	14,995	14,995	14,995	15,019	15,120
	Subtotal Arizona Domestic	**124**	**58,316**	**362,624**	**457,998**	**720,464**	**722,856**	**723,861**	**725,920**	**731,041**	**734,452**	**737,896**	**741,409**

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for Action Alternative 1 (AF)										
	California												
	Los Angeles, Orange, San Diego, Riverside, and San Bernardino	6	0	0	0	0	261,593	389,176	502,287	665,231	773,752	843,052	843,052
	Subtotal California Domestic	**6**	**0**	**0**	**0**	**0**	**261,593**	**389,176**	**502,287**	**665,231**	**773,752**	**843,052**	**843,052**
	Nevada												
	Clark	15	16,000	42,640	49,360	69,360	83,320	90,000	100,000	120,000	133,320	146,680	160,000
	Subtotal Nevada Domestic	**15**	**16,000**	**42,640**	**49,360**	**69,360**	**83,320**	**90,000**	**100,000**	**120,000**	**133,320**	**146,680**	**160,000**

[1]This user also holds a PPR entitlement, which is not impacted at these levels of shortages and was not included here.

[2]The first increment of shortage volumes required by Action Alternative 1 is satisfied by 2019 DCP contributions. In some elevation tiers, the 2019 DCP contributions for California exceed the 2024 shortage volume under Action Alternative 1, which follows the priority system. In these instances, the shortage allocation model for the No Action Alternative will show higher shortages to California than the shortage allocation model for Action Alternative 1.

Note: PPRs are not impacted at these levels of shortage.

Note: Orange highlights indicate the level at which available water for a user under this priority is reduced to zero.

Disclaimer: These modeling results (for Action Alternative 1) should only be used to compare the relative magnitude of effects reasonably expected to occur under the alternatives evaluated in this SEIS. Modeling assumptions should not be taken as agency position with respect to contract or statutory interpretation, and they are not intended to limit Secretarial discretion with respect to current or future policy. This model is not a substitute for the annual process of reviewing water orders and determining which can be filled, and it cannot replicate the precision required of that process.

D.3.4 Relationship between CRMMS and the Action Alternative 1 Shortage Allocation Model

The Colorado River Mid-term Modeling System (CRMMS) was used to model a variety of river and reservoir parameters in the Colorado River Basin, including shortage amounts, reservoir elevations, and river flows (Appendix C). The Action Alternative 1 Shortage Allocation Model provides a more detailed allocation of shortages to entitlement holders in the Lower Division States, specifically within Arizona. In CRMMS, Arizona second and third priority users are lumped together and assumed to be coequal and other groups of small users are represented as a single point of diversion. The Action Alternative 1 Shortage Allocation Model provides detail on the users in various priority groups and models some sub-priority groups in accordance with entitlement-specific terms and conditions[15].

The Action Alternative 1 Shortage Allocation Model does not account for the use of Intentionally Created Surplus (ICS) to meet DCP contributions, and it models DCP contributions as shortages to Lower Division States and users; those contributions are assumed to partially or fully satisfy the volumes of shortage assigned to each Lower Division State according to the inter-state assumptions about priority in the Action Alternative 1 Shortage Allocation Model. CRMMS can model conversion of Extraordinary Conversion ICS to DCP ICS for purposes of meeting DCP contributions without reducing diversions in a specific year. The Action Alternative 1 Shortage Allocation Model does not model ICS conversions to meet DCP contributions, and it does not reflect CVWD's agreement to provide 7 percent of California's DCP contributions.

In CRMMS, when Lake Mead is projected to decline to dead pool (elevation 895 feet) and all downstream water demands cannot be met, water users are modeled to be shorted "hydrologically", i.e., upstream users access water before downstream users. In this case, system shortages are reported as a total for the entire Lower Basin because there are no explicit assumptions made in CRMMS associated with how these shortages are distributed in the Lower Basin. The Action Alternative 1 Shortage Allocation Model does not attempt to represent the effect of potential system shortages and how these shortages might be distributed should such conditions occur.

Furthermore, the distribution of shortage within each state according to the Shortage Allocation Model is slightly different than CRMMS, because CRMMS uses projected water depletion schedules for distributing the available water supply to individual users in Arizona, California, and Nevada. For the first year of the model run, water depletion schedules use water orders that reflect the current year's actual shortage conditions, DCP contributions, and other signed system conservation agreements. For the remaining years in the model run, default water depletion schedules reflect "normal" schedules, and they represent near-term historical trends in water use. For California and Nevada, the Shortage Allocation Model assumes entitlement holders in these states are using their full entitlements and distributions available water on that basis. For Arizona, the methods for distributing available water vary between priorities in the Action Alternative 1 Shortage Allocation Model, but they are not based on CRMMS schedules.

[15] Internet website: https://www.usbr.gov/lc/region/g4000/contracts/entitlements.html.

The significant difference between CRMMS and the Action Alternative 1 Shortage Allocation Model relates to where Stage 1 shortage transitions to Stage 2 as described in **Section D.3.1.1**, and how DCP contributions apply within the Action Alternative 1 Shortage Allocation Model. At a total shortage of 1,734,000 AF, associated with elevations of 1,045 to 1,040 feet above mean sea level in Lake Mead, the Action Alternative 1 Shortage Allocation Model is operating under Stage 1 shortage distribution assumptions and assigning no shortage to California. The 1,734,000 af level of shortage is within Stage 2 in CRMMS according to its projected water depletion schedules as described in the previous paragraph, meaning CRMMS is assigning shortage to California. Additionally, at this Lake Mead elevation tier, CRMMS reflects the State of California's DCP contribution of 200,000 AF, which is not derived from the priority system assumptions of the Action Alternative 1 Shortage Allocation Model, and it is not reflected in that model. This results in a persistent difference in shortage volumes attributed to the State of California between the two modeling approaches. Accordingly, shortage to PPRs within California would be triggered even earlier in CRMMS and reach deeper levels than in the Action Alternative 1 Shortage Allocation Model. (See **Section D.3.5** below for a discussion of an alternative approach that would address this outcome.)

D.3.5 Alternative Approach to the Action Alternative 1 Shortage Allocation Model

The approach used in the Action Alternative 1 Shortage Allocation Model to distribute shortages among the Lower Division States is consistent with the 2007 FEIS. In 2007, the Shortage Allocation Model did not consider shortages larger than 2.5 maf (including Mexico), which was not significant enough to impact PPRs. At deeper shortage volumes such as 4.0 maf, the distribution of water among the Lower Division States using the 2007 methodology is not projected to provide sufficient water to fill all PPRs in the State of California (see **Table D-13** – Action Alternative 1 Shortage Allocation Model Regional Summary). This analysis does not invoke a reduction to PPRs according to the fill order provided below in **Table D-17** (bottom up), interpreted from Paragraph 5 of the Appendix to the Consolidated Decree, and it assumes no further shortage would be applied to California after its first priority is fully reduced.

Table D-17
Present Perfected Right Summary and Assumed Fill Order

Entitlements

Arizona, California, and Nevada Summary	CU Equivalent (AF)	Diversion (AF)
Arizona Total	567,499	1,077,971
California Total	2,694,276	3,019,573
Nevada Total	8,697	13,034
Total	3,270,473	4,110,578

Entitlement Holders	CU Equivalent (AF)†	Diversion (AF)	PPR No.	Date	State	Category	Cumulative Consumptive Use Equivalent (AF)
Lake Mead National Recreation Area (Overton Area, EO 5105)	300	500	82	1929	NV	Federal Establishments & Water Projects	3,270,473
Molina	64	318	15	1928	AZ	Miscellaneous	3,270,173
Sonny Gowan (Grannis)	108	180	32	1928	CA	Miscellaneous	3,270,109
Diehl*	0.6	1	59	1928	CA	Miscellaneous	3,270,001
Stallard*	0.6	1	66	1928	CA	Miscellaneous	3,270,000
Estrada*	0.6	1	77	1928	CA	Miscellaneous	3,269,999
Corrington*	0.6	1	79	1928	CA	Miscellaneous	3,269,999
Tolliver*	0.6	1	80	1928	CA	Miscellaneous	3,269,998
Randolph*	0.6	1	65	1926	CA	Miscellaneous	3,269,998
Keefe*	0.6	1	67	1926	CA	Miscellaneous	3,269,997
Sturges (Gila Monster Farms, Inc.)	436	780	16	1925	AZ	Miscellaneous	3,269,996
Chagnon	72	120	41	1925	CA	Miscellaneous	3,269,560
Faubion*	0.6	1	48	1925	CA	Miscellaneous	3,269,488
Earle*	0.6	1	58	1925	CA	Miscellaneous	3,269,487
Whittle*	0.6	1	78	1925	CA	Miscellaneous	3,269,487
Beauchamp*	0.6	1	51	1924	CA	Miscellaneous	3,269,486
McGee*	0.6	1	63	1924	CA	Miscellaneous	3,269,486
Stallard*	0.6	1	64	1924	CA	Miscellaneous	3,269,485
Hadlock*	0.6	1	72	1924	CA	Miscellaneous	3,269,484
Stephenson	137	240	30	1923	CA	Miscellaneous	3,269,484
Draper, G.*	0.6	1	46	1923	CA	Miscellaneous	3,269,347
Dudley*	0.6	1	49	1922	CA	Miscellaneous	3,269,346
Colorado River Sportsmen's League	58	96	36	1921	CA	Miscellaneous	3,269,346
Andrade	37	66	38	1921	CA	Miscellaneous	3,269,288
Conger*	0.6	1	45	1921	CA	Miscellaneous	3,269,251
Vaulin*	0.6	1	70	1920	CA	Miscellaneous	3,269,251
Salisbury*	0.6	1	71	1920	CA	Miscellaneous	3,269,250
McDonough*	0.6	1	47	1919	CA	Miscellaneous	3,269,249
Cate*	0.6	1	62	1919	CA	Miscellaneous	3,269,249
Milpitas	65	108	34	1918	CA	Miscellaneous	3,269,248
Yuma Auxiliary Project, Unit B	4,176	6,800	5	1905	AZ	Federal Establishments & Water Projects*	3,269,183
North Gila Valley Unit, Yuma Mesa Division, Gila Project	4,959	24,500	6	1905	AZ	Federal Establishments & Water Projects*	3,265,007

Entitlement Holders	CU Equivalent (AF)†	Diversion (AF)	PPR No.	Date	State	Category	Cumulative Consumptive Use Equivalent (AF)
Reservation Division/Yuma Project (non-Indian portion)	18,599	38,270	28	1905	CA	Federal Establishments & Water Projects*	3,260,049
Valley Division, Yuma Project (Yuma County Water Users' Association)	180,834	254,200	4	1901	AZ	Federal Establishments & Water Projects*	3,241,450
Imperial Irrigation District & CVWD lands	2,485,000	2,600,000	27	1901	CA	Federal Establishments & Water Projects*	3,060,615
Palo Verde Irrigation District	100,231	219,780	26	1877	CA	Federal Establishments & Water Projects*	575,615
Cocopah Indian Reservation	4,941	7,681	1	1917	AZ	Indian Reservations	475,384
Schneider*	0.6	1	56	1917	CA	Miscellaneous	470,443
Douglas*	0.6	1	50	1916	CA	Miscellaneous	470,442
Clark*	0.6	1	52	1916	CA	Miscellaneous	470,442
Graham*	0.6	1	61	1916	CA	Miscellaneous	470,441
Powers	624	960	7	1915	AZ	Miscellaneous	470,441
United States (Cocopah Indian Tribe)	733	1,140	8	1915	AZ	Miscellaneous	469,817
Lawrence	72	120	42	1915	CA	Miscellaneous	469,083
Lawrence*	0.6	1	53	1915	CA	Miscellaneous	469,011
Milpitas	41	69	37	1914	CA	Miscellaneous	469,011
Graham, J.*	0.6	1	54	1914	CA	Miscellaneous	468,969
Morgan	90	150	33	1913	CA	Miscellaneous	468,969
Zozaya (MVIDD)	389	720	17	1912	AZ	Miscellaneous	468,879
Reid*	0.6	1	60	1912	CA	Miscellaneous	468,490
Fitz*	0.6	1	75	1912	CA	Miscellaneous	468,489
EPCOR CSA #2 (Formerly Brooke Water Company) (Graham)	241	360	9	1910	AZ	Miscellaneous	468,489
Geiger*	0.6	1	55	1910	CA	Miscellaneous	468,248
Williams*	0.6	1	76	1909	CA	Miscellaneous	468,247
Chemehuevi Indian Reservation	6,091	11,340	22	1907	CA	Indian Reservations	468,246
Parker, City of	400	630	20	1905	AZ	Miscellaneous	462,155
Cooper	36	60	40	1905	CA	Miscellaneous	461,755
Reynolds	22	36	39	1904	CA	Miscellaneous	461,719
Ferguson, C.*	0.6	1	68	1903	CA	Miscellaneous	461,698
Ferguson, W.*	0.6	1	69	1903	CA	Miscellaneous	461,697
Streeter*	0.6	1	73	1903	CA	Miscellaneous	461,696
Draper, J.*	0.6	1	74	1903	CA	Miscellaneous	461,696
Hulet (MVIDD)	648	1,080	10	1902	AZ	Miscellaneous	461,695
Hurschler (First American Title Insurance Agency of Mohave, Inc.) (MVIDD)	567	1,050	11	1902	AZ	Miscellaneous	461,047
Miller (MVIDD)	130	240	12	1902	AZ	Miscellaneous	460,480
McKellips and Granite Reef Farms (MVIDD)	437	810	13	1902	AZ	Miscellaneous	460,351
Sherrill & Lafollette (MVIDD)	583	1,080	14	1902	AZ	Miscellaneous	459,913
Swan (MVIDD)	518	960	18	1902	AZ	Miscellaneous	459,330
Phillips, Milton and Jean	25	42	19	1900	AZ	Miscellaneous	458,812
Atchison, Topeka, and Santa Fe Railway Co.	273	1,260	44	1896	CA	Miscellaneous	458,786
Martinez*	0.6	1	57	1895	CA	Miscellaneous	458,513
Yuma, City of	1,478	2,333	21	1893	AZ	Miscellaneous	458,513
Mendivil (Picacho Development Corp. and CA Dept. of Parks and Rec.)	72	120	31	1893	CA	Miscellaneous	457,035
Fort Mojave Indian Reservation	40,806	75,566	3	1890	AZ	Indian Reservations	456,963
Fort Mojave Indian Reservation	15,103	27,969	3	1890	AZ	Indian Reservations	416,157
Fort Mojave Indian Reservation	8,995	16,720	25	1890	CA	Indian Reservations	401,054

Entitlement Holders	CU Equivalent (AF)†	Diversion (AF)	PPR No.	Date	State	Category	Cumulative Consumptive Use Equivalent (AF)
Fort Mojave Indian Reservation	8,397	12,534	81	1890	NV	Indian Reservations	392,059
Simons	36	60	35	1889	CA	Miscellaneous	383,662
City of Needles	950	1,500	43	1885	CA	Miscellaneous	383,626
Fort Yuma Indian Reservation	39,594	71,616	23	1884	CA	Indian Reservations	382,676
Fort Yuma Indian Reservation	4,039	6,350	3a	1884	AZ	Indian Reservations	343,081
Colorado River Indian Reservation	3,417	5,860	24	1876	CA	Indian Reservations	339,043
Colorado River Indian Reservation	23,966	51,986	2	1874	AZ	Indian Reservations	335,626
Colorado River Indian Reservation	23,463	40,241	24	1874	CA	Indian Reservations	311,660
Colorado River Indian Reservation	116,179	252,016	2	1873	AZ	Indian Reservations	288,198
Colorado River Indian Reservation	6,265	10,745	24	1873	CA	Indian Reservations	172,018
Colorado River Indian Reservation	165,222	358,400	2	1865	AZ	Indian Reservations	165,753
Yuma Associates LTD and Winterhaven Water District (formerly Wavers)	531	780	29	1856	CA	Miscellaneous	531
Total	**3,270,473**	**4,110,578**					

†Calculated consumptive use equivalents in italics (factor of .6 were given by the Court; for IID/CVWD, 115,000af of return flow; all others according to their CU/diversion ratio from Reclamation's *Colorado River Accounting and Water Use Report: Arizona, California, and Nevada*).

*Fill order reflects paragraph (5) of the Appendix to the 2006 Consolidated Decree in Arizona v. California: "In the event of a determination of insufficient mainstream water to satisfy present perfected rights pursuant to Article II(B)(3) of this decree, the Secretary of the Interior shall, before providing for the satisfaction of any of the other present perfected rights except for those listed herein as "MISCELLANEOUS PRESENT PERFECTED RIGHTS" (rights numbered 7–21 and 29–80 below) in the order of their priority dates without regard to state lines, first provide for the satisfaction in full of all rights of the Chemehuevi Indian Reservation, Cocopah Indian Reservation, Fort Yuma Indian Reservation, Colorado River Indian Reservation, and the Fort Mojave Indian Reservation as set forth in Article II(D)(1)–(5) of this decree...".

As set forth in the Consolidated Decree, the PPR priority system is administered without regard to state lines. To ensure that PPRs can be satisfied (or reduced) in the prescribed order as a Basin-wide senior priority group, an alternate approach to distributing shortage among the Lower Division States could be employed as described in this section and as shown in **Table D-18**. Instead of setting the entire volume of each state's apportionment as coequal to the others, only state apportionments in excess of PPRs are treated as coequal (but maintaining the assumption that Arizona bears California's share of shortage until the Arizona fourth priority is exhausted). In developing the Stage 1 and Stage 2 percentages for the sharing of shortage among the Lower Division States, the consumptive use (or equivalent) of PPR entitlements would be removed from the apportionment volumes in each ratio, as detailed below. In this alternate approach, the Stage 2 distribution of water among the Lower Division States would end at the volume of total shortage where reductions to PPRs are necessary and all non-PPR entitlements have been fully reduced in each state; at that point, water available to each state would equal the consumptive use (or equivalent) of PPRs within the state. The distribution of water among PPRs might be thought of as a Stage 3, where water available to each state would be an aggregation of the PPR volumes within the state that could be filled at a given level of shortage.

The Stage 1 shortage sharing percentages based on the alternative approach are computed as follows:

- Nevada bears a reduction of about 7.0 percent of the total Lower Division States shortage volume, computed as a ratio of Nevada's apportionment less PPR consumptive use (or equivalent) entitlements within Nevada to the sum of the apportionments of the Lower Division States less all PPR consumptive use (or equivalent) entitlements
    - (300,000 af – 8,697 af) / (7,500,000 af – 3,270,473 af) = 6.89 percent
- Arizona bears a reduction of about 93 percent of the total Lower Division States shortage volume, computed as a ratio of Arizona's and California's apportionments less PPR consumptive use (or equivalent) in both states to the sum of the apportionments of the Lower Division States less all PPR consumptive use (or equivalent) entitlements
    - (2,800,000 af – 567,499 af + 4,400,000 af – 2,694,276 af) / (7,500,000 af – 3,270,473 af) = 93.11 percent

Table D-18
Alternative Approach to Stage 1 State Distribution Under Action Alternative 1 Shortage Allocation Model

"Stage 1" Shortage Distribution	Arizona	California	Nevada	Subtotals
Ratio of Post-PPR Apportionment to All Post-PPR Apportionments	= (2,800,000-567,499)/(7,500,000-3,270,473) or 52.78%	= (4,400,000-2,694,276)/(7,500,000-3,270,473) or 40.33%	= (300,000-8,697)/(7,500,000-3,270,473) or 6.89%	
Percentage Assignment of Shortage	93.11%	0.00%	6.89%	

Distribution of Available Water Until Arizona Fourth Priority is Eliminated (Based on Sum of P4 Volumes Under Contract)

Lower Division States Supply (AF)	Shortage Volume (AF)	AZ Shortage Volume (AF)	Water Available to AZ (AF)	CA Shortage Volume (AF)	Water Available to CA (AF)	NV Shortage Volume (AF)	Water Available to NV (AF)	Total Shortage to US States (AF)	Percentage Reduction to US States
7,500,000	-	-	2,800,000	-	4,400,000	-	300,000	-	0.00%
7,400,000	(100,000)	(93,113)	2,706,887	-	4,400,000	(6,887)	293,113	(100,000)	-1.33%
7,300,000	(200,000)	(186,225)	2,613,775	-	4,400,000	(13,775)	286,225	(200,000)	-2.67%
7,200,000	(300,000)	(279,338)	2,520,662	-	4,400,000	(20,662)	279,338	(300,000)	-4.00%
7,100,000	(400,000)	(372,451)	2,427,549	-	4,400,000	(27,549)	272,451	(400,000)	-5.33%
7,000,000	(500,000)	(465,563)	2,334,437	-	4,400,000	(34,437)	265,563	(500,000)	-6.67%
6,900,000	(600,000)	(558,676)	2,241,324	-	4,400,000	(41,324)	258,676	(600,000)	-8.00%
6,800,000	(700,000)	(651,789)	2,148,211	-	4,400,000	(48,211)	251,789	(700,000)	-9.33%
6,700,000	(800,000)	(744,901)	2,055,099	-	4,400,000	(55,099)	244,901	(800,000)	-10.67%
6,600,000	(900,000)	(838,014)	1,961,986	-	4,400,000	(61,986)	238,014	(900,000)	-12.00%
6,500,000	(1,000,000)	(931,126)	1,868,874	-	4,400,000	(68,874)	231,126	(1,000,000)	-13.33%
6,434,000	(1,066,000)	(992,581)	1,807,419	-	4,400,000	(73,419)	226,581	(1,066,000)	-14.21%
6,400,000	(1,100,000)	(1,024,239)	1,775,761	-	4,400,000	(75,761)	224,239	(1,100,000)	-14.67%
6,300,000	(1,200,000)	(1,117,352)	1,682,648	-	4,400,000	(82,648)	217,352	(1,200,000)	-16.00%
6,266,000	(1,234,000)	(1,149,010)	1,650,990	-	4,400,000	(84,990)	215,010	(1,234,000)	-16.45%
6,200,000	(1,300,000)	(1,210,464)	1,589,536	-	4,400,000	(89,536)	210,464	(1,300,000)	-17.33%
6,100,000	(1,400,000)	(1,303,577)	1,496,423	-	4,400,000	(96,423)	203,577	(1,400,000)	-18.67%
6,000,000	(1,500,000)	(1,396,690)	1,403,310	-	4,400,000	(103,310)	196,690	(1,500,000)	-20.00%
5,900,000	(1,600,000)	(1,489,802)	1,310,198	-	4,400,000	(110,198)	189,802	(1,600,000)	-21.33%
5,800,000	(1,700,000)	(1,582,915)	1,217,085	-	4,400,000	(117,085)	182,915	(1,700,000)	-22.67%
5,766,000	(1,734,000)	(1,614,573)	1,185,427	-	4,400,000	(119,427)	180,573	(1,734,000)	-23.12%
5,705,440	(1,794,560)	(1,670,962)	1,129,038	-	4,400,000	(123,598)	176,402	(1,794,560)	-23.93%

As in the original Shortage Allocation Model, after deliveries to the fourth priority entitlements within Arizona are expected to be reduced to zero, additional reductions are applied to Arizona, California, and Nevada. This Stage 2 shortage is the amount of additional shortage above the Stage 1 shortage volume, and the additional shortage is distributed according to the Stage 2 ratios.

The Stage 2 shortage sharing percentages are computed as follows, with the PPR volumes the same as in the Stage 1 ratios. (See **Table D-19** below for the full numeric computation and results.)

- Nevada bears about 7.0 percent of the Stage 2 shortage in addition to its Stage 1 shortage, computed as a ratio of Nevada's apportionment less PPRs less the amount of shortage applied to Nevada under Stage 1, over the sum of the apportionments of the Lower Division States less PPRs less the total amount shorted to users under Stage 1
    - (0.3 maf – NV PPRs – Nevada Stage 1 shortage) / (7.5 maf – total PPRs – total Stage 1 shortage) = 6.89 percent
- Arizona bears about 23 percent of the Stage 2 shortage in addition to its Stage 1 shortage, computed as a ratio of Arizona's apportionment less PPRs less the amount of shortage applied to Arizona under Stage 1, over the sum of the apportionments of the Lower Division States less PPRs less the total amount shorted to users under Stage 1
    - (2.8 maf – AZ PPRs – Arizona Stage 1 shortage) / (7.5 maf – total PPRs – total Stage 1 shortage) = 23.06 percent
- California bears about 70 percent of the Stage 2 shortage, computed as a ratio of California's apportionment less PPRs, over the sum of the apportionments of the Lower Division States less PPRs less the total amount shorted to users under Stage 1
    - (4.4 maf – CA PPRs) / (7.5 maf – total PPRs – total Stage 1 shortage) = 70.05 percent

Table D-19
Alternative Approach to Stage 2 State Distribution Under Action Alternative 1 Shortage Allocation Model

"Stage 2" Shortage Distribution	Arizona	California	Nevada	Subtotals
Ratio of Curtailed Post-PPR Apportionment to Remainder	= (2,800,000-567,499-1,670,962)/(7,500,000- 3,270,473-1,794,560) or 23.06%	= (4,400,000-2,694,276)/(7,500,000-3,270,473-1,794,560) or 70.05%	= (300,000-8,697-123,598)/(7,500,000-3,270,473-1,794,560) or 6.89%	
Percentage Assignment of Shortage	23.06%	70.05%	6.89%	

Distribution of Available Water After Arizona Fourth Priority is Eliminated (Based on Sum of P4 Volumes Under Contract), but Before PPR Reductions Begin

Lower Division States Supply (AF)	Shortage Volume in Addition to Stage 1 Shortage (AF)	AZ Shortage Volume in Addition to Stage 1 Shortage (AF)	Water Available to AZ (AF)	CA Shortage Volume in Addition to Stage 1 Shortage (AF)	Water Available to CA (AF)	NV Shortage Volume in Addition to Stage 1 Shortage (AF)	Water Available to NV (AF)	Total Shortage to US States (AF)	Percentage Reduction to US States
5,700,000	(5,440)	(1,255)	1,127,783	(3,811)	4,396,189	(375)	176,028	(1,800,000)	-24.00%
5,600,000	(105,440)	(24,316)	1,104,722	(73,862)	4,326,138	(7,262)	169,140	(1,900,000)	-25.33%
5,500,000	(205,440)	(47,377)	1,081,661	(143,913)	4,256,087	(14,149)	162,253	(2,000,000)	-26.67%
5,417,000	(288,440)	(66,518)	1,062,520	(202,056)	4,197,944	(19,866)	156,536	(2,083,000)	-27.77%
5,300,000	(405,440)	(93,500)	1,035,538	(284,016)	4,115,984	(27,924)	148,478	(2,200,000)	-29.33%
5,250,000	(455,440)	(105,031)	1,024,007	(319,041)	4,080,959	(31,368)	145,035	(2,250,000)	-30.00%
5,200,000	(505,440)	(116,562)	1,012,476	(354,067)	4,045,933	(34,811)	141,591	(2,300,000)	-30.67%
5,100,000	(605,440)	(139,623)	989,415	(424,118)	3,975,882	(41,699)	134,703	(2,400,000)	-32.00%
5,000,000	(705,440)	(162,685)	966,353	(494,169)	3,905,831	(48,586)	127,816	(2,500,000)	-33.33%
4,900,000	(805,440)	(185,746)	943,292	(564,221)	3,835,779	(55,474)	120,929	(2,600,000)	-34.67%
4,800,000	(905,440)	(208,808)	920,230	(634,272)	3,765,728	(62,361)	114,041	(2,700,000)	-36.00%
4,700,000	(1,005,440)	(231,869)	897,169	(704,323)	3,695,677	(69,248)	107,154	(2,800,000)	-37.33%
4,600,000	(1,105,440)	(254,930)	874,108	(774,374)	3,625,626	(76,136)	100,267	(2,900,000)	-38.67%
4,500,000	(1,205,440)	(277,992)	851,046	(844,425)	3,555,575	(83,023)	93,379	(3,000,000)	-40.00%
4,400,000	(1,305,440)	(301,053)	827,985	(914,477)	3,485,523	(89,910)	86,492	(3,100,000)	-41.33%
4,300,000	(1,405,440)	(324,115)	804,923	(984,528)	3,415,472	(96,798)	79,605	(3,200,000)	-42.67%
4,200,000	(1,505,440)	(347,176)	781,862	(1,054,579)	3,345,421	(103,685)	72,717	(3,300,000)	-44.00%
4,167,000	(1,538,440)	(354,787)	774,251	(1,077,696)	3,322,304	(105,958)	70,444	(3,333,000)	-44.44%
4,100,000	(1,605,440)	(370,238)	758,800	(1,124,630)	3,275,370	(110,572)	65,830	(3,400,000)	-45.33%
4,000,000	(1,705,440)	(393,299)	735,739	(1,194,681)	3,205,319	(117,460)	58,943	(3,500,000)	-46.67%
3,900,000	(1,805,440)	(416,361)	712,677	(1,264,733)	3,135,267	(124,347)	52,055	(3,600,000)	-48.00%
3,833,000	(1,872,440)	(431,812)	697,226	(1,311,667)	3,088,333	(128,962)	47,441	(3,667,000)	-48.89%

Lower Division States Supply (AF)	Shortage Volume in Addition to Stage 1 Shortage (AF)	AZ Shortage Volume in Addition to Stage 1 Shortage (AF)	Water Available to AZ (AF)	CA Shortage Volume in Addition to Stage 1 Shortage (AF)	Water Available to CA (AF)	NV Shortage Volume in Addition to Stage 1 Shortage (AF)	Water Available to NV (AF)	Total Shortage to US States (AF)	Percentage Reduction to US States
3,800,000	(1,905,440)	(439,422)	689,616	(1,334,784)	3,065,216	(131,234)	45,168	(3,700,000)	-49.33%
3,700,000	(2,005,440)	(462,483)	666,555	(1,404,835)	2,995,165	(138,122)	38,280	(3,800,000)	-50.67%
3,600,000	(2,105,440)	(485,545)	643,493	(1,474,886)	2,925,114	(145,009)	31,393	(3,900,000)	-52.00%
3,500,000	(2,205,440)	(508,606)	620,432	(1,544,937)	2,855,063	(151,897)	24,506	(4,000,000)	-53.33%
3,400,000	(2,305,440)	(531,668)	597,370	(1,614,989)	2,785,011	(158,784)	17,618	(4,100,000)	-54.67%
3,270,473	(2,434,967)	(561,539)	567,499	(1,705,724)	2,694,276	(167,705)	8,697	(4,229,527)	-56.39%

This alternative approach to the Action Alternative 1 Shortage Allocation Model represents one possible method for distributing deep shortages among the Lower Division States in a way that does not reduce PPR water deliveries in one state while fulfilling non-PPR water deliveries in another state. This alternative approach would rapidly increase shortage impacts to Nevada in comparison to the modeled Action Alternative 1 because Nevada has only two PPRs totaling 8,697 af on a consumptive use equivalent basis.

Table D-20 below summarizes the distribution of shortage and available water to the Lower Division States in Stage 1 and Stage 2, in 100,000 af increments, under the alternative approach to the Action Alternative 1 Shortage Allocation Model.

Table D-20
Detailed Distribution (in AF) by State Under Alternative Approach to Action Alternative 1 Shortage Allocation Model

Total Lower Division States Shortage Volumes (AF)	Arizona Shortage Volume (AF)	Arizona Available Water (AF)	California Shortage Volume (AF)	California Available Water (AF)	Nevada Shortage Volume (AF)	Nevada Available Water (AF)
-	-	2,800,000	-	4,400,000	-	300,000
(100,000)	(93,113)	2,706,887	-	4,400,000	(6,887)	293,113
(200,000)	(186,225)	2,613,775	-	4,400,000	(13,775)	286,225
(300,000)	(279,338)	2,520,662	-	4,400,000	(20,662)	279,338
(400,000)	(372,451)	2,427,549	-	4,400,000	(27,549)	272,451
(500,000)	(465,563)	2,334,437	-	4,400,000	(34,437)	265,563
(600,000)	(558,676)	2,241,324	-	4,400,000	(41,324)	258,676
(700,000)	(651,789)	2,148,211	-	4,400,000	(48,211)	251,789
(800,000)	(744,901)	2,055,099	-	4,400,000	(55,099)	244,901
(900,000)	(838,014)	1,961,986	-	4,400,000	(61,986)	238,014
(1,000,000)	(931,126)	1,868,874	-	4,400,000	(68,874)	231,126
(1,066,000)	(992,581)	1,807,419	-	4,400,000	(73,419)	226,581
(1,100,000)	(1,024,239)	1,775,761	-	4,400,000	(75,761)	224,239
(1,200,000)	(1,117,352)	1,682,648	-	4,400,000	(82,648)	217,352
(1,234,000)	(1,149,010)	1,650,990	-	4,400,000	(84,990)	215,010
(1,300,000)	(1,210,464)	1,589,536	-	4,400,000	(89,536)	210,464
(1,400,000)	(1,303,577)	1,496,423	-	4,400,000	(96,423)	203,577
(1,500,000)	(1,396,690)	1,403,310	-	4,400,000	(103,310)	196,690
(1,600,000)	(1,489,802)	1,310,198	-	4,400,000	(110,198)	189,802
(1,700,000)	(1,582,915)	1,217,085	-	4,400,000	(117,085)	182,915
(1,734,000)	(1,614,573)	1,185,427	-	4,400,000	(119,427)	180,573
(1,794,560)	(1,670,962)	1,129,038	-	4,400,000	(123,598)	176,402
(1,800,000)	(1,672,217)	1,127,783	(3,811)	4,396,189	(123,972)	176,028
(1,900,000)	(1,695,278)	1,104,722	(73,862)	4,326,138	(130,860)	169,140
(2,000,000)	(1,718,339)	1,081,661	(143,913)	4,256,087	(137,747)	162,253
(2,083,000)	(1,737,480)	1,062,520	(202,056)	4,197,944	(143,464)	156,536
(2,200,000)	(1,764,462)	1,035,538	(284,016)	4,115,984	(151,522)	148,478
(2,250,000)	(1,775,993)	1,024,007	(319,041)	4,080,959	(154,965)	145,035
(2,300,000)	(1,787,524)	1,012,476	(354,067)	4,045,933	(158,409)	141,591
(2,400,000)	(1,810,585)	989,415	(424,118)	3,975,882	(165,297)	134,703
(2,500,000)	(1,833,647)	966,353	(494,169)	3,905,831	(172,184)	127,816
(2,600,000)	(1,856,708)	943,292	(564,221)	3,835,779	(179,071)	120,929
(2,700,000)	(1,879,770)	920,230	(634,272)	3,765,728	(185,959)	114,041
(2,800,000)	(1,902,831)	897,169	(704,323)	3,695,677	(192,846)	107,154
(2,900,000)	(1,925,892)	874,108	(774,374)	3,625,626	(199,733)	100,267
(3,000,000)	(1,948,954)	851,046	(844,425)	3,555,575	(206,621)	93,379

Total Lower Division States Shortage Volumes (AF)	Arizona Shortage Volume (AF)	Arizona Available Water (AF)	California Shortage Volume (AF)	California Available Water (AF)	Nevada Shortage Volume (AF)	Nevada Available Water (AF)
(3,100,000)	(1,972,015)	827,985	(914,477)	3,485,523	(213,508)	86,492
(3,200,000)	(1,995,077)	804,923	(984,528)	3,415,472	(220,395)	79,605
(3,300,000)	(2,018,138)	781,862	(1,054,579)	3,345,421	(227,283)	72,717
(3,333,000)	(2,025,749)	774,251	(1,077,696)	3,322,304	(229,556)	70,444
(3,400,000)	(2,041,200)	758,800	(1,124,630)	3,275,370	(234,170)	65,830
(3,500,000)	(2,064,261)	735,739	(1,194,681)	3,205,319	(241,057)	58,943
(3,600,000)	(2,087,323)	712,677	(1,264,733)	3,135,267	(247,945)	52,055
(3,667,000)	(2,102,774)	697,226	(1,311,667)	3,088,333	(252,559)	47,441
(3,700,000)	(2,110,384)	689,616	(1,334,784)	3,065,216	(254,832)	45,168
(3,800,000)	(2,133,445)	666,555	(1,404,835)	2,995,165	(261,720)	38,280
(3,900,000)	(2,156,507)	643,493	(1,474,886)	2,925,114	(268,607)	31,393
(4,000,000)	(2,179,568)	620,432	(1,544,937)	2,855,063	(275,494)	24,506
(4,100,000)	(2,202,630)	597,370	(1,614,989)	2,785,011	(282,382)	17,618
(4,229,527)	(2,232,501)	567,499	(1,705,724)	2,694,276	(291,303)	8,697

Appendix C (CRMMS) includes a section summarizing results of the hydrologic modeling associated with this alternative approach.

D.4 Action Alternative 2 Shortage Allocation Model

The discrete volumes (in AF) of total shortage to the Lower Division States considered in Action Alternative 2 are the same as those under Action Alternative 1:

- 400,000
- 1,066,000
- 1,234,000
- 1,734,000
- 2,083,000
- 2,250,000
- 2,500,000
- 3,000,000
- 3,333,000
- 3,667,000
- 4,000,000

Under Action Alternative 2, shortage volumes in excess of the 2007 Record of Decision (ROD) for the adoption of Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead ROD and 2019 DCP volumes are not distributed based on priority, but rather on a proportional basis (i.e., at the same percentage reduction from each user's 2021 consumptive use) across all lower Colorado River mainstream water users. As discussed in this section, the Action Alternative 2 Shortage Allocation Model was developed as a set of Microsoft Excel worksheets that simulate shortage allocations and adjust deliveries of Colorado River water to mainstream water users pro-rata on the basis of Calendar Year 2021 consumptive use, including participation in conservation programs. Specific assumptions for Action Alternative 2 were made to facilitate analysis of the full range of potential impacts, and they are not intended to represent current or future policy with respect to shortage sharing. The Action Alternative 2 Shortage Allocation Model is not designed to replicate some of the annual processes that must be undertaken in determining the quantity of water that can be approved for diversion by specific users.

D.4.1 Distribution Among Water Users

In contrast to the Action Alternative 1 Shortage Allocation Model, in which total volumes of shortage were distributed among the Lower Division States independent of existing commitments under the 2007 Interim Guidelines and 2019 DCP, the Action Alternative 2 Shortage Allocation Model assigns the responsibility for existing commitments to certain water users; credits those commitments against the total shortage volume; and distributes the remaining additional shortage among those and other water users. The range of additional shortages analyzed in the Action Alternative 2 Shortage Allocation Model is shown in **Table D-21** below. The percentages are calculated by dividing the total additional shortage to the Lower Division States by 7,500,000 af.

Table D-21
Shortage Volumes (in AF) Analyzed in the Action Alternative 2 Shortage Allocation Model

Range of Analyzed Volumes of Total Shortage to Lower Division States (AF)	Range of Analyzed Volumes of Total Additional Shortage to Lower Division States (AF)	Percentage Reductions to Each Water User's 2021 Adjusted Consumptive Use
400,000	200,000	2.67%
1,066,000	533,000	7.11%
1,234,000	617,000	8.23%
1,734,000	867,000	11.56%
2,083,000	983,000	13.11%
2,083,000	1,066,000	14.21%
2,083,000	1,116,000	14.88%
2,083,000	1,166,000	15.55%
2,250,000	1,283,000	17.11%
2,500,000	1,483,000	19.77%
3,000,000	1,900,000	25.33%
3,333,000	2,233,000	29.77%
3,667,000	2,567,000	34.23%
4,000,000	2,900,000	38.67%

The Action Alternative 2 Shortage Allocation Model reflects aspects of priority among the Lower Division States in its attribution of 2007 Interim Guidelines shortages and required DCP contributions, but total shortages assigned to each Lower Division State in the Action Alternative 2 Shortage Allocation Model are an aggregation of shortage volumes assigned to individual water users within each state according to the assumptions described in the following section.

D.4.1.1 Assumptions

Existing volumes of shortage and contributions required by the 2007 Interim Guidelines and DCP were attributed to the primary junior priority diverter in each state. In California and Nevada, 2007 Interim Guidelines' shortages and DCP contributions were attributed to MWD[16] and SNWA,

[16] Notwithstanding Coachella Valley Water District's 7 percent contribution pursuant to May 20, 2019 Drought Contingency Plan Implementation Agreement Between Metropolitan Water District of Southern California and Coachella Valley Water District.

respectively. In Arizona, shortages and contributions were administered in 2022 and 2023 as being shared between CAP and other Arizona fourth priority water users, but the burden of wet water reductions was borne solely by CAP. The Action Alternative 2 Shortage Allocation Model does not incorporate the Arizona Shortage Sharing Recommendation or other priority system-based modeling for non-CAP fourth priority water users, and it assumes the burden of the existing commitments continues to be borne by CAP.

Consumptive use data for the distribution of additional shortages were derived from the 2021 *Colorado River Accounting and Water Use Report: Arizona, California, and Nevada*[17]. Water used to generate system conservation and intentionally created surplus was added to each user's 2021 actual use to determine an adjusted consumptive use.

The 2021 adjusted consumptive use forms the baseline against which additional shortages are assessed for each water user. Each water user's percentage share of the additional shortage to the Lower Division States (after existing commitments have been subtracted from the total shortage) was calculated as the ratio of their 2021 adjusted consumptive use to the total Lower Basin consumptive use of 7.5 maf. Those percentages were multiplied by the volume of additional shortage to the Lower Division States to determine the volume of additional shortage assigned each water user. PPRs are included in the distribution of shortages in the Action Alternative 2 Shortage Allocation Model.

For the purpose of comparing the impacts of alternatives considered in this Draft SEIS, DCP contributions are assumed to represent reductions in deliveries, although parties retain flexibility in how to meet those contribution commitments.

At a given level of additional shortage, as a consequence of how that shortage is distributed as described above, all water users bear the same percentage reduction from their 2021 adjusted consumptive use (as shown in the third column in **Table D-21** above). CAP, MWD, and SNWA are assigned a pro-rata share of additional shortage on the same basis as other water users, but they are also assigned the existing commitments on behalf of each Lower Division State, for a total percentage reduction that would be greater for these water users than for others.

Reclamation's mainstream water accounting data do not itemize water use by contractors and subcontractors within CAP; that record is created and maintained by the project operator, CAWCD. The Action Alternative 2 Shortage Allocation Model distributes shortages calculated at the CAP level, as described above, among CAP contractors and subcontractors according to the internal CAP priority system. Arizona third priority water delivered through the CAP is assumed to be made available first, then the other priorities are satisfied (as described for the Action Alternative 1 Shortage Allocation Model in **Section D.3.2.5.4**) from Available CAP Supply. In the Action Alternative 2 Shortage Allocation Model, available CAP supply is calculated as 2021 adjusted consumptive use at the mainstream point of diversion minus:

[17] Internet website: https://www.usbr.gov/lc/region/g4000/4200Rpts/DecreeRpt/2021/2021.pdf. This dataset reflects known users of lower Colorado River water as of 2021, not entitlement holders as in the Alternative 1 and No Action Shortage Allocation Models.

- 75,000 af of CAP main system losses
- 809 af of other use in Arizona
- 68,400 af of priority three water delivered via CAP, and
- a variable quantity of 2007 Interim Guidelines' shortages, DCP contributions, and additional shortage volumes depending on Lake Mead elevation.

D.4.2 Shortage Allocation Model Results

The tables in this section summarize the results of the Action Alternative 2 Shortage Allocation Model over a range of total shortages to the Lower Division States between 400,000 AFY and 4,000,000 AFY, with the total additional shortages from this Draft SEIS ranging from 200,000 AFY to 2,900,000 AFY.

The regional summary, **Table D-22**, shows the aggregated shortage for each state by type of use, while individual water users are listed on the irrigation, domestic, and Tribal summary tables[18] that follow. Shortages by irrigation, domestic, and Tribal uses were aggregated by county for the analysis of general socioeconomic effects, including implications for Indian Trust Assets and environmental justice.

Also summarized in the table below, shortage is more broadly distributed under the assumptions of Action Alternative 2, including to PPRs that are not characterized in the Action Alternative 1 Shortage Allocation Model as being subject to the volumes of shortage under analysis.

[18] As in the Action Alternative 1 Shortage Allocation Model, individual water users are assigned to one predominant type of use.

Table D-22
Action Alternative 2 Shortage Allocation Model Regional Summary

Summary of Shortage Impacts by State		Range of Analyzed Volumes for Action Alternative 2 (AF)													
Range of Analyzed Volumes of Total Shortage to Lower Division States:		**400,000**	**1,066,000**	**1,234,000**	**1,734,000**	**2,083,000**	**2,083,000**	**2,083,000**	**2,083,000**	**2,250,000**	**2,500,000**	**3,000,000**	**3,333,000**	**3,667,000**	**4,000,000**
Range of Analyzed Volumes of Total Additional Shortage to Lower Division States:		**200,000**	**533,000**	**617,000**	**867,000**	**983,000**	**1,066,000**	**1,116,000**	**1,166,000**	**1,283,000**	**1,483,000**	**1,900,000**	**2,233,000**	**2,567,000**	**2,900,000**
Percentage Reductions to Each Water User's 2021 Adjusted Consumptive Use:		**2.67%**	**7.11%**	**8.23%**	**11.56%**	**13.11%**	**14.21%**	**14.88%**	**15.55%**	**17.11%**	**19.77%**	**25.33%**	**29.77%**	**34.23%**	**38.67%**
Arizona Shortage	Irrigation[1]	256,590	382,819	390,887	420,840	429,640	435,715	441,984	448,253	466,282	481,479	528,216	556,731	595,447	633,840
	Domestic[1]	1,402	131,899	198,120	261,644	330,406	293,925	300,453	306,980	320,155	352,442	460,377	512,128	557,710	603,284
	Tribal[1]	8,675	196,269	233,339	281,195	326,941	308,333	314,203	320,073	332,550	359,732	440,740	484,794	525,190	565,543
	Subtotal	**266,667**	**710,987**	**822,347**	**963,680**	**1,086,987**	**1,037,973**	**1,056,640**	**1,075,307**	**1,118,987**	**1,193,653**	**1,429,333**	**1,553,653**	**1,678,347**	**1,802,667**
California Shortage	Irrigation	91,233	243,135	281,452	395,493	448,408	486,269	509,077	531,886	585,257	676,489	866,709	1,018,611	1,170,969	1,322,871
	Domestic[1]	25,827	68,829	79,676	311,960	476,939	487,658	444,114	400,571	465,680	541,507	595,356	638,358	681,489	724,491
	Tribal	274	730	845	1,187	1,346	1,460	1,528	1,597	1,757	2,031	2,602	3,058	3,515	3,971
	Subtotal	**117,333**	**312,693**	**361,973**	**708,640**	**926,693**	**975,387**	**954,720**	**934,053**	**1,052,693**	**1,220,027**	**1,464,667**	**1,660,027**	**1,855,973**	**2,051,333**
Nevada Shortage	Irrigation	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Domestic[1]	15,919	42,104	49,430	61,329	68,922	69,208	71,188	73,168	77,800	85,719	105,230	118,415	131,640	144,825
	Tribal	81	216	250	351	398	432	452	472	520	601	770	905	1,040	1,175
	Subtotal	**16,000**	**42,320**	**49,680**	**61,680**	**69,320**	**69,640**	**71,640**	**73,640**	**78,320**	**86,320**	**106,000**	**119,320**	**132,680**	**146,000**
	Total	**400,000**	**1,066,000**	**1,234,000**	**1,734,000**	**2,083,000**	**2,083,000**	**2,083,000**	**2,083,000**	**2,250,000**	**2,500,000**	**3,000,000**	**3,333,000**	**3,667,000**	**4,000,000**

[1] 2007 Interim Guidelines' shortages, DCP contributions, and additional reductions are distributed among irrigation, domestic, and Tribal users as part of the CAP priority system. In California and Nevada, 2007 Interim Guidelines shortages and DCP contributions are attributed to the junior priority domestic diverter.

Disclaimer: These modeling results (for Action Alternative 2) should only be used to compare the relative magnitude of effects reasonably expected to occur under the alternatives evaluated in this SEIS. Modeling assumptions should not be taken as agency position with respect to contract or statutory interpretation, and they are not intended to limit Secretarial discretion with respect to current or future policy. This model is not a substitute for the annual process of reviewing water orders and determining which can be filled, and they cannot replicate the precision required for that process.

Table D-23 below summarizes the shortage impacts to Tribes according to the Action Alternative 2 Shortage Allocation Model. More Tribal entitlements are impacted to some degree, but fewer are reduced to zero in comparison to Action Alternative 1.

Table D-23
Action Alternative 2 Shortage Allocation Model Tribal Summary

Summary of Consumptive Use Impacts to Tribes and Communities			**Range of Analyzed Volumes for Action Alternative 2 (AF)**												
Range of Analyzed Volumes of Total Shortage to Lower Division States:			**1,066,000**	**1,234,000**	**1,734,000**	**2,083,000**	**2,083,000**	**2,083,000**	**2,083,000**	**2,250,000**	**2,500,000**	**3,000,000**	**3,333,000**	**3,667,000**	**4,000,000**
Range of Analyzed Volumes of Total Additional Shortage to Lower Division States:			**533,000**	**617,000**	**867,000**	**983,000**	**1,066,000**	**1,116,000**	**1,166,000**	**1,283,000**	**1,483,000**	**1,900,000**	**2,233,000**	**2,567,000**	**2,900,000**
Percentage Reductions to Each Water User's 2021 Adjusted Consumptive Use:			**7.11%**	**8.23%**	**11.56%**	**13.11%**	**14.21%**	**14.88%**	**15.55%**	**17.11%**	**19.77%**	**25.33%**	**29.77%**	**34.23%**	**38.67%**
Arizona															
Entitlement Holder	**% Distribution of Additional Shortage**	**County**													
Fort Mojave Indian Reservation, AZ[2]	0.51005333%	Mohave County	2,719	3,147	4,422	5,014	5,437	5,692	5,947	6,544	7,564	9,691	11,389	13,093	14,792
Colorado River Indian Reservation, AZ[2]	3.73616000%	La Paz County	19,914	23,052	32,393	36,726	39,827	41,696	43,564	47,935	55,407	70,987	83,428	95,907	108,349
Fort Yuma Indian Reservation[2]	0.02204000%	Yuma County	117	136	191	217	235	246	257	283	327	419	492	566	639
Cocopah Indian Reservation[2]	0.01670667%	Yuma County	89	103	145	164	178	186	195	214	248	317	373	429	484
PPR No. 7 -Cocopah[2]	0.00452000%	Yuma County	24	28	39	44	48	50	53	58	67	86	101	116	131
Hopi Tribe[2]	0.04793333%	La Paz County	255	296	416	471	511	535	559	615	711	911	1,070	1,230	1,390
Gila River Indian Community[2]	N/A: CAP Indian Priority	Maricopa and Pinal County	23,378	45,411	63,865	84,165	73,092	74,938	76,783	80,474	89,701	121,074	135,837	148,755	161,673
Tohono O'odham Nation (Schuk Toak & San Xavier Districts)[2]	N/A: CAP Indian Priority	Pima County	0	546	5,262	10,449	7,619	8,091	8,563	9,506	11,864	19,880	23,653	26,954	30,255
White Mountain Apache Tribe	N/A: CAP Indian Priority	Apache, Gila, and Navajo	0	0	0	0	0	0	0	0	0	0	0	0	0
Ak-Chin Indian Community[2]	N/A: CAP Indian Priority	Pinal County	0	6,588	13,133	20,334	16,406	17,061	17,716	19,025	22,298	33,426	38,662	43,244	47,827
Fort McDowell Yavapai Nation	N/A: CAP Indian Priority	Maricopa County	0	263	2,538	5,040	3,675	3,903	4,130	4,585	5,722	9,589	11,409	13,001	14,594
Pascua Yaqui Tribe	N/A: CAP Indian Priority	Pima County	0	7	70	138	101	107	113	126	157	263	313	357	400
San Carlos Apache Tribe	N/A: CAP Indian Priority	Gila County	0	449	2,000	3,706	2,776	2,931	3,086	3,396	4,171	6,807	8,048	9,133	10,219

Summary of Consumptive Use Impacts to Tribes and Communities			**Range of Analyzed Volumes for Action Alternative 2 (AF)**											
Salt River Pima-Maricopa Indian Community	N/A: CAP Indian Priority	Maricopa County	0	1,503	2,996	4,639	3,743	3,892	4,041	4,340	5,087	7,625	8,820	9,865	10,911
Tohono O'odham Nation Sif Oidak District	N/A: CAP Indian Priority	Pinal County	0	0	0	0	0	0	0	0	0	0	0	0	0
Tonto Apache Tribe	N/A: CAP Indian Priority	Gila County	0	0	0	0	0	0	0	0	0	0	0	0	0
Yavapai Apache Nation	N/A: CAP Indian Priority	Gila County	0	0	0	0	0	0	0	0	0	0	0	0	0
San Carlos Apache Tribe	N/A: CAP M&I Priority	Gila County	973	3,010	4,926	7,033	5,884	6,075	6,267	6,650	7,608	10,865	12,398	13,739	15,080
Tohono O'odham Nation (Schuk Toak & San Xavier Districts)	N/A: CAP NIA-A Priority	Pima County	28,200	28,200	28,200	28,200	28,200	28,200	28,200	28,200	28,200	28,200	28,200	28,200	28,200
Gila River Indian Community	N/A: CAP NIA-A Priority	Maricopa and Pinal County	120,600	120,600	120,600	120,600	120,600	120,600	120,600	120,600	120,600	120,600	120,600	120,600	120,600
White Mountain Apache Tribe	N/A: CAP NIA-B Priority	Apache, Gila, and Navajo	0	0	0	0	0	0	0	0	0	0	0	0	0
Ak-Chin Indian Community[2]	N/A: Arizona P3 in CAP	Pinal County	0	0	0	0	0	0	0	0	0	0	0	0	0
		Subtotal	**196,269**	**233,339**	**281,195**	**326,941**	**308,333**	**314,203**	**320,073**	**332,550**	**359,732**	**440,740**	**484,794**	**525,190**	**565,543**
California															
Entitlement Holder	**% Distribution of Additional Shortage**	**County**													
Fort Mojave Indian Reservation, CA[2]	0.09389%	San Bernardino County	500	579	814	923	1,001	1,048	1,095	1,205	1,392	1,784	2,097	2,410	2,723
Chemehuevi Indian Reservation[2]	0.00251%	San Bernardino County	13	15	22	25	27	28	29	32	37	48	56	64	73
Colorado River Indian Reservation, CA[2]	0.00945%	San Bernardino, Riverside	50	58	82	93	101	105	110	121	140	180	211	243	274
Fort Yuma Indian Reservation - All Ranches[1,2]	0.03109%	Imperial County	166	192	270	306	331	347	363	399	461	591	694	798	902
		Subtotal	**730**	**845**	**1,187**	**1,346**	**1,460**	**1,528**	**1,597**	**1,757**	**2,031**	**2,602**	**3,058**	**3,515**	**3,971**
Nevada															
Entitlement Holder	**% Distribution of Additional Shortage**	**County**													
Fort Mojave Indian Tribe[2]	0.04052%	Clark	216	250	351	398	432	452	472	520	601	770	905	1,040	1,175

Summary of Consumptive Use Impacts to Tribes and Communities			Range of Analyzed Volumes for Action Alternative 2 (AF)												
		Subtotal	**216**	**250**	**351**	**398**	**432**	**452**	**472**	**520**	**601**	**770**	**905**	**1,040**	**1,175**
		Total	**197,215**	**234,434**	**282,734**	**328,685**	**310,225**	**316,184**	**322,142**	**334,827**	**362,363**	**444,112**	**488,757**	**529,746**	**570,689**
Arizona															
Coconino County		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gila County		4	973	3,460	6,926	10,739	8,659	9,006	9,353	10,046	11,779	17,672	20,445	22,872	25,299
La Paz County		2	20,169	23,348	32,808	37,198	40,338	42,230	44,123	48,550	56,118	71,898	84,499	97,138	109,739
Maricopa County		2	43,193	51,569	60,874	71,108	65,526	66,456	67,387	69,247	73,900	89,717	97,160	103,673	110,186
Mohave County		1	2,719	3,147	4,422	5,014	5,437	5,692	5,947	6,544	7,564	9,691	11,389	13,093	14,792
Pima County		3	28,200	28,753	33,531	38,787	35,920	36,398	36,876	37,831	40,220	48,343	52,166	55,510	58,855
Pinal County		2	100,785	122,795	142,259	163,669	151,991	153,937	155,884	159,777	169,509	202,597	218,168	231,793	245,418
Yuma County		3	231	267	375	425	461	483	504	555	642	822	966	1,111	1,255
Apache County		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Navajo County		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal Arizona Tribal		**6**	**196,269**	**233,339**	**281,195**	**326,941**	**308,333**	**314,203**	**320,073**	**332,550**	**359,732**	**440,740**	**484,794**	**525,190**	**565,543**
California															
San Bernardino County		2.5	539	624	877	994	1078	1129	1179	1297	1500	1921	2258	2596	2933
Riverside County		0.50	25	29	41	46	50	53	55	61	70	90	106	121	137
Imperial County		0	166	192	270	306	331	347	363	399	461	591	694	798	902
Subtotal California Tribal		**3**	**730**	**845**	**1187**	**1346**	**1460**	**1528**	**1597**	**1757**	**2031**	**2602**	**3058**	**3515**	**3971**
Nevada															
Clark		1	216	250	351	398	432	452	472	520	601	770	905	1040	1175
Subtotal Nevada Tribal		**1**	**216**	**250**	**351**	**398**	**432**	**452**	**472**	**520**	**601**	**770**	**905**	**1040**	**1175**

Note: Reductions and contributions were administered in 2022 and 2023 as shared between the CAP and other Arizona Fourth Priority water users, but the burden of wet water reductions was borne solely by CAP. This Action Alternative 2 as currently modeled does not incorporate the shortage sharing recommendation or other priority system-based modeling for non-CAP Fourth Priority water users, and it assumes the burden of the existing wet water reductions.

Note: Orange highlights indicate the level at which available water for a user under this priority is reduced to zero.

[1] Other use by the Fort Yuma Indian Reservation in California is accounted for under the Yuma Project Reservation Division line in the irrigation summary.

[2] Denotes full or substantial use in Tribal agricultural operations, which may or may not be impacted according to the terms of related agreements.

Disclaimer: These modeling results (for Action Alternative 2) should only be used to compare the relative magnitude of effects reasonably expected to occur under the alternatives evaluated in this SEIS. Modeling assumptions should not be taken as agency position with respect to contract or statutory interpretation, and they are not intended to limit Secretarial discretion with respect to current or future policy. This model is not a substitute for the annual process of reviewing water orders and determining which can be filled, and it cannot replicate the precision required for that process.

Table D-24 below summarizes the shortage impacts to irrigation according to the Action Alternative 2 Shortage Allocation Model. More irrigation entitlements are impacted to some degree in comparison to Action Alternative 1, but the only irrigation uses that are fully reduced are those associated with contracts for Arizona fifth and sixth priority and unused[19] water within CAP and CAP excess contracts.

Table D-24
Action Alternative 2 Shortage Allocation Model Irrigation Summary

Summary of Consumptive Use Impacts to Irrigation			Range of Analyzed Volumes (AF)												
Range of Analyzed Volumes of Total Shortage to Lower Division States:			400,000	1,066,000	1,234,000	1,734,000	2,083,000	2,083,000	2,083,000	2,083,000	2,250,000	2,500,000	3,000,000	3,333,000	3,667,000	4,000,000
Range of Analyzed Volumes of Total Additional Shortage to Lower Division States:			200,000	533,000	617,000	867,000	983,000	1,066,000	1,116,000	1,166,000	1,283,000	1,483,000	1,900,000	2,233,000	2,567,000	2,900,000
Percentage Reductions to Each Water User's 2021 Adjusted Consumptive Use:			2.67%	7.11%	8.23%	11.56%	13.11%	14.21%	14.88%	15.55%	17.11%	19.77%	25.33%	29.77%	34.23%	38.67%
Arizona																
Water User	**% Distribution of Additional Shortage**	**County**														
GM Gabrych Family (fka Jack Rayner Jr.)	0.03865333%	La Paz County	77	206	238	335	380	412	431	451	496	573	734	863	992	1,121
Arizona State Land Department (agricultural)	0.02018667%	Yuma County	40	108	125	175	198	215	225	235	259	299	384	451	518	585
North Baja Pipeline (TransCanada)[2]	0.00262667%	La Paz County	5	14	16	23	26	28	29	31	34	39	50	59	67	76
Cibola Island[3]	0.00998667%	La Paz County	20	53	62	87	98	106	111	116	128	148	190	223	256	290
JRJ Partners LLC (Bard Date Gardens)	0.00882667%	Yuma County	18	47	54	77	87	94	99	103	113	131	168	197	227	256
Cha Cha (Glen Curtis Citrus)	0.01169333%	Yuma County	23	62	72	101	115	125	130	136	150	173	222	261	300	339
Russell Youmans (Beattie Farms Southwest)	0.00780000%	Yuma County	16	42	48	68	77	83	87	91	100	116	148	174	200	226
BLM-L. Pratt[3]	0.00000000%	Yuma County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ott Family (frmly George Ogram)	0.00301333%	Yuma County	6	16	19	26	30	32	34	35	39	45	57	67	77	87
Ogram Boys' Enterprises	0.00790667%	Yuma County	16	42	49	69	78	84	88	92	101	117	150	177	203	229
BLM-Monte Lee (frmly Amigo Farms)[3]	0.00246667%	Yuma County	5	13	15	21	24	26	28	29	32	37	47	55	63	72
Armon Curtis (fmrly Curry Family Limited)	0.00216000%	Yuma County	4	12	13	19	21	23	24	25	28	32	41	48	55	63

[19] Under Article 3.(b) of the 1985 Contract Between the United States and the Ak-Chin Indian Community to Provide Permanent Water and Settle Interim Water Rights, in any year in which sufficient surface water is available, the Secretary shall deliver certain additional water to the Ak-Chin Indian Community. Such water is assumed to be available if there is unused CAP water, after CAP orders under contracts and subcontracts are fulfilled; it is not itemized, but there is only unused water projected to be available at the 200,000 af level of additional shortage in the Action Alternative 2 Shortage Allocation Model.

Summary of Consumptive Use Impacts to Irrigation			Range of Analyzed Volumes (AF)													
R. Griffin (outside PPR No. 7 boundary)[3]	0.00041333%	Yuma County	1	2	3	4	4	4	5	5	5	6	8	9	11	12
Power (outside PPR No. 7 boundary)[3]	0.00226667%	Yuma County	5	12	14	20	22	24	25	26	29	34	43	51	58	66
PPR No. 7 -Griffin Family Ltd.	0.00029333%	Yuma County	1	2	2	3	3	3	3	3	4	4	6	7	8	9
PPR No. 7 -Griffin Ranches	0.00130667%	Yuma County	3	7	8	11	13	14	15	15	17	19	25	29	34	38
PPR No. 7 -Milton Phillips	0.00060000%	Yuma County	1	3	4	5	6	6	7	7	8	9	11	13	15	17
Gary Pasquinelli	0.00226667%	Yuma County	5	12	14	20	22	24	25	26	29	34	43	51	58	66
Arizona State Land Department (agricultural)	0.08109333%	Yuma County	162	432	500	703	797	864	905	946	1,040	1,203	1,541	1,811	2,082	2,352
Mohave Valley IDD[2]	0.24958667%	Mohave County	499	1,330	1,540	2,164	2,453	2,661	2,785	2,910	3,202	3,701	4,742	5,573	6,407	7,238
Mohave County Water Authority - Use by MVIDD (5-07-30-W0320)	0.00900000%	Mohave County	18	48	56	78	88	96	100	105	115	133	171	201	231	261
Arizona Game & Fish	0.03402667%	La Paz County	68	181	210	295	334	363	380	397	437	505	647	760	873	987
Cibola Valley IDD[2]	0.07926667%	La Paz County	159	422	489	687	779	845	885	924	1,017	1,176	1,506	1,770	2,035	2,299
Red River Land Co.	0.00284000%	La Paz County	6	15	18	25	28	30	32	33	36	42	54	63	73	82
Western Water LLC	0.00085333%	La Paz County	2	5	5	7	8	9	10	10	11	13	16	19	22	25
GSC Farms, LLC	0.02777333%	La Paz County	56	148	171	241	273	296	310	324	356	412	528	620	713	805
Gila Monster Farms	0.05914667%	Yuma County	118	315	365	513	581	631	660	690	759	877	1,124	1,321	1,518	1,715
Wellton Mohawk IDD[1]	3.49492000%	Yuma County	6,990	18,628	21,564	30,301	34,355	37,256	39,003	40,751	44,840	51,830	66,403	78,042	89,715	101,353
University of Arizona	0.01298667%	Yuma County	26	69	80	113	128	138	145	151	167	193	247	290	333	377
North Gila Valley Irrigation District[1]	0.11838667%	Yuma County	237	631	730	1,026	1,164	1,262	1,321	1,380	1,519	1,756	2,249	2,644	3,039	3,433
Yuma Irrigation District[1]	0.50062667%	Yuma County	1,001	2,668	3,089	4,340	4,921	5,337	5,587	5,837	6,423	7,424	9,512	11,179	12,851	14,518
Yuma Mesa IDD[1]	1.67529333%	Yuma County	3,351	8,929	10,337	14,525	16,468	17,859	18,696	19,534	21,494	24,845	31,831	37,409	43,005	48,584
Unit B IDD	0.21761333%	Yuma County	435	1,160	1,343	1,887	2,139	2,320	2,429	2,537	2,792	3,227	4,135	4,859	5,586	6,311
Yuma County Water Users' Association[2]	3.34032000%	Yuma County	6,681	17,804	20,610	28,961	32,835	35,608	37,278	38,948	42,856	49,537	63,466	74,589	85,746	96,869
5th and 6th Priority Contracts, and CAP Agricultural and Other Excess	All remaining	Maricopa, Pinal, and Pima Counties	236,537	329,379	329,026	333,913	331,082	328,836	330,092	331,348	337,645	332,791	337,718	332,846	338,074	343,080
		Subtotal	**256,590**	**382,819**	**390,887**	**420,840**	**429,640**	**435,715**	**441,984**	**448,253**	**466,282**	**481,479**	**528,216**	**556,731**	**595,447**	**633,840**
California																
Water User	**% Distribution of Additional Shortage**	**County**														
CA Pumpers Davis to Parker	0.00543%	San Bernardino County	11	29	33	47	53	58	61	63	70	80	103	121	139	157
Palo Verde Irrigation District	5.64652%	Riverside, Imperial	11,293	30,096	34,839	48,955	55,505	60,192	63,015	65,838	72,445	83,738	107,284	126,087	144,946	163,749
Yuma Project Reservation Division	0.57755%	Imperial County	1,155	3,078	3,563	5,007	5,677	6,157	6,445	6,734	7,410	8,565	10,973	12,897	14,826	16,749

Summary of Consumptive Use Impacts to Irrigation			Range of Analyzed Volumes (AF)													
Yuma Island Pumpers[3]	0.02153%	Imperial County	43	115	133	187	212	230	240	251	276	319	409	481	553	624
Imperial Irrigation District	34.47317%	Imperial County	68,946	183,742	212,699	298,882	338,871	367,484	384,721	401,957	442,291	511,237	654,990	769,786	884,926	999,722
Coachella Valley Water District	4.89205%	Riverside County	9,784	26,075	30,184	42,414	48,089	52,149	54,595	57,041	62,765	72,549	92,949	109,240	125,579	141,870
		Subtotal	**91,233**	**243,135**	**281,452**	**395,493**	**448,408**	**486,269**	**509,077**	**531,886**	**585,257**	**676,489**	**866,709**	**1,018,611**	**1,170,969**	**1,322,871**
Nevada																
Water User	**% Distribution of Additional Shortage**	**County**														
None		None	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0
		Subtotal	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		Total	**347,822**	**625,953**	**672,340**	**816,333**	**878,048**	**921,984**	**951,062**	**980,139**	**1,051,538**	**1,157,968**	**1,394,925**	**1,575,342**	**1,766,416**	**1,956,711**
Summary by County																
Arizona		**# of entitlement holders/county**														
Coconino County		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
La Paz County		8	392	1,045	1,209	1,700	1,927	2,090	2,188	2,286	2,515	2,907	3,725	4,377	5,032	5,685
Mohave County		2	517	1,378	1,595	2,242	2,542	2,757	2,886	3,015	3,318	3,835	4,913	5,774	6,638	7,499
Yuma County		24	19,143	51,017	59,057	82,986	94,089	102,033	106,819	111,605	122,803	141,947	181,860	213,734	245,703	277,576
Pima County		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pinal County		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maricopa County		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal Arizona Irrigation		**34**	**20,052**	**53,440**	**61,862**	**86,927**	**98,558**	**106,879**	**111,892**	**116,905**	**128,636**	**148,689**	**190,498**	**223,885**	**257,373**	**290,760**
California																
San Bernardino County		1	11	29	33	47	53	58	61	63	70	80	103	121	139	157
Riverside County		1	9,784	26,075	30,184	42,414	48,089	52,149	54,595	57,041	62,765	72,549	92,949	109,240	125,579	141,870
Imperial County		3	70,145	186,935	216,396	304,076	344,760	373,870	391,406	408,942	449,977	520,122	666,373	783,163	900,305	1,017,095
Subtotal California Irrigation		**4**	**79,939**	**213,039**	**246,613**	**346,538**	**392,902**	**426,077**	**446,062**	**466,047**	**512,812**	**592,751**	**759,425**	**892,524**	**1,026,023**	**1,159,122**
Nevada																
None		None	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Reductions and contributions were administered in 2022 and 2023 as shared between the CAP and other Arizona Fourth Priority water users, but the burden of wet water reductions was borne solely by CAP. This Alternative 2, as currently modeled, does not incorporate the shortage sharing recommendation or other priority system-based modeling for non-CAP Fourth Priority water users and assumes the burden of the existing wet water reductions continues to be borne by CAP.

Note: Orange highlights indicate the level at which available water for a user under this priority is reduced to zero.

[1]Combined irrigation and domestic entitlement where domestic use is contractually subordinated to irrigation.

[2]Combined irrigation and domestic entitlement where priority of domestic and irrigation uses may be subject to an annual determination that varies based on the water supply conditions.

[3]User that does not appear in Action Alternative 1 analysis, which is based on entitlements.

Disclaimer: These modeling results (for Action Alternative 2) should only be used to compare the relative magnitude of effects reasonably expected to occur under the alternatives evaluated in this SEIS. Modeling assumptions should not be taken as agency position with respect to contract or statutory interpretation, and they are not intended to limit Secretarial discretion with respect to current or future policy. This model is not a substitute for the annual process of reviewing water orders and determining which can be filled, and it cannot replicate the precision required for that process.

Table D-25 below summarizes the shortage impacts to domestic uses according to the Action Alternative 2 Shortage Allocation Model. Within the CAP, NIA priority contractors and subcontractors are potentially fully reduced according to the modeling assumptions for the CAP priority system, but the Indian and M&I Priorities receive a partial supply even at the deepest modeled shortage level and Arizona priority three water delivered through the CAP is not reduced.

Table D-25
Action Alternative 2 Shortage Allocation Model Domestic Summary

Summary of Consumptive Use Impacts to Domestic Uses			**Range of Analyzed Volumes (AF)**												
Range of Analyzed Volumes of Total Shortage to Lower Division States:			**400,000**	**1,066,000**	**1,234,000**	**1,734,000**	**2,083,000**	**2,083,000**	**2,083,000**	**2,083,000**	**2,250,000**	**2,500,000**	**3,000,000**	**3,333,000**	**3,667,000**	**4,000,000**
Range of Analyzed Volumes of Total Additional Shortage to Lower Division States:			**200,000**	**533,000**	**617,000**	**867,000**	**983,000**	**1,066,000**	**1,116,000**	**1,166,000**	**1,283,000**	**1,483,000**	**1,900,000**	**2,233,000**	**2,567,000**	**2,900,000**
Percentage Reductions to Each Water User's 2021 Adjusted Consumptive Use:			**2.67%**	**7.11%**	**8.23%**	**11.56%**	**13.11%**	**14.21%**	**14.88%**	**15.55%**	**17.11%**	**19.77%**	**25.33%**	**29.77%**	**34.23%**	**38.67%**
Arizona																
Water User	**% Distribution of Additional Shortage**	**County**														
Marble Canyon Company	0.00012%	Coconino County	0	1	1	1	1	1	1	1	2	2	2	3	3	3
McAlister Family Trust	0.00009%	Mohave County	0	0	1	1	1	1	1	1	1	1	2	2	2	3
Crystal Beach Water Conservation District	0.00097%	Mohave County	2	5	6	8	10	10	11	11	12	14	18	22	25	28
EPCOR CSA No. 1 (frmrly Arizona-American Water Company)	0.00768%	Mohave County	15	41	47	67	75	82	86	90	99	114	146	171	197	223
Arizona State Parks (Windsor Beach)	0.00012%	Mohave County	0	1	1	1	1	1	1	1	2	2	2	3	3	3
Hillcrest Water Company	0.00024%	La Paz County	0	1	1	2	2	3	3	3	3	4	5	5	6	7
Springs Del Sol	0.00003%	La Paz County	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Arizona State Land Department (domestic)	0.00068%	Yuma County	1	4	4	6	7	7	8	8	9	10	13	15	17	20
B&F Investment	0.00005%	La Paz County	0	0	0	0	1	1	1	1	1	1	1	1	1	2
BLM Permittees (LHFO & YFO)	0.00860%	La Paz County	17	46	53	75	85	92	96	100	110	128	163	192	221	249
Fisher's Landing	0.00009%	Yuma County	0	0	1	1	1	1	1	1	1	1	2	2	2	3
Shepard Water Company	0.00024%	Yuma County	0	1	1	2	2	3	3	3	3	4	5	5	6	7

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes (AF)												
BLM Permittees (YFO)	0.00083%	Yuma County	2	4	5	7	8	9	9	10	11	12	16	18	21	24
Arizona Public Service Company. (Yucca Power Plant)	0.00000%	Yuma County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lake Mead National Recreation Area, AZ Temple Bar	0.00107%	Mohave County	2	6	7	9	10	11	12	12	14	16	20	24	27	31
Lake Mead National Recreation Area, AZ Lake Mohave	0.00301%	Mohave County	6	16	19	26	30	32	34	35	39	45	57	67	77	87
Bureau of Reclamation - Davis Dam	0.00001%	Mohave County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bullhead City	0.11533%	Mohave County	231	615	712	1,000	1,134	1,229	1,287	1,345	1,480	1,710	2,191	2,575	2,961	3,345
Mohave Water Conservation District	0.01079%	Mohave County	22	57	67	94	106	115	120	126	138	160	205	241	277	313
EPCOR CSA No. 2 (frmrly Brooke Water LLC)	0.00436%	La Paz County	9	23	27	38	43	46	49	51	56	65	83	97	112	126
Mohave County Water - Use by AZGFC (04-XX-30-W0431)	0.00000%	Mohave County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Golden Shores Water Conservation District	0.00387%	Mohave County	8	21	24	34	38	41	43	45	50	57	73	86	99	112
Havasu National Wildlife Refuge	0.05161%	Mohave County	103	275	318	447	507	550	576	602	662	765	981	1,153	1,325	1,497
Lake Havasu City	0.10679%	Mohave County	214	569	659	926	1,050	1,138	1,192	1,245	1,370	1,584	2,029	2,385	2,741	3,097
Town of Parker	0.00497%	La Paz County	10	27	31	43	49	53	56	58	64	74	94	111	128	144
Ehrenberg Improvement District	0.00309%	La Paz County	6	16	19	27	30	33	35	36	40	46	59	69	79	90
Cibola National Wildlife Refuge	0.13979%	La Paz County	280	745	862	1,212	1,374	1,490	1,560	1,630	1,793	2,073	2,656	3,121	3,588	4,054
Imperial National Wildlife Refuge	0.03125%	La Paz County	63	167	193	271	307	333	349	364	401	463	594	698	802	906
US Army - Yuma Proving Grounds	0.00513%	Yuma County	10	27	32	45	50	55	57	60	66	76	98	115	132	149
City of Yuma	0.18015%	Yuma County	360	960	1,112	1,562	1,771	1,920	2,010	2,101	2,311	2,672	3,423	4,023	4,624	5,224
US Marine Corps Air Station Yuma	0.01652%	Yuma County	33	88	102	143	162	176	184	193	212	245	314	369	424	479
Union Pacific Railroad	0.00039%	Yuma County	1	2	2	3	4	4	4	5	5	6	7	9	10	11
Yuma Union High School District	0.00156%	Yuma County	3	8	10	14	15	17	17	18	20	23	30	35	40	45

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes (AF)													
Desert Lawn Memorial Park	0.00031%	Yuma County	1	2	2	3	3	3	3	4	4	5	6	7	8	9
Bureau of Reclamation - Yuma Area Office	0.00127%	Yuma County	3	7	8	11	12	14	14	15	16	19	24	28	33	37
Scottsdale (Yavapai Prescott Indian Tribe Allocation)	N/A: CAP Indian	Maricopa County	0	0	7	70	138	101	107	113	126	157	263	313	357	400
ASARCO	N/A: CAP M&I	Pima County	0	1,126	3,484	5,701	8,140	6,810	7,031	7,253	7,696	8,805	12,574	14,348	15,900	17,452
Avondale	N/A: CAP M&I	Maricopa County	0	290	898	1,470	2,099	1,756	1,813	1,871	1,985	2,271	3,243	3,700	4,101	4,501
Arizona State Land Department (AZSLD)	N/A: CAP M&I	Maricopa County	0	279	863	1,412	2,016	1,686	1,741	1,796	1,906	2,180	3,114	3,553	3,937	4,322
Arizona Water Company, Casa Grande	N/A: CAP M&I	Pinal County	0	476	1,474	2,412	3,444	2,881	2,975	3,068	3,256	3,725	5,320	6,070	6,727	7,383
Arizona Water Company, Coolidge	N/A: CAP M&I	Pinal County	0	107	332	543	775	649	670	691	733	839	1,198	1,366	1,514	1,662
Arizona Water Company, Superstition	N/A: CAP M&I	Pinal County	0	337	1,043	1,706	2,436	2,038	2,104	2,171	2,303	2,635	3,763	4,294	4,759	5,223
Arizona Water Company, White Tank	N/A: CAP M&I	Maricopa County	0	52	161	263	375	314	324	334	355	406	580	661	733	804
Buckeye	N/A: CAP M&I	Maricopa County	0	12	37	61	86	72	75	77	82	94	134	152	169	185
Central Arizona Groundwater Replenishment District (CAGRD)	N/A: CAP M&I	Maricopa County	0	344	1,066	1,744	2,491	2,084	2,152	2,219	2,355	2,694	3,848	4,391	4,865	5,340
Carefree Water Company	N/A: CAP M&I	Maricopa County	0	47	147	241	343	287	297	306	325	371	531	605	671	736
Cave Creek	N/A: CAP M&I	Maricopa County	0	140	432	707	1,010	845	873	900	955	1,093	1,560	1,781	1,973	2,166
Chandler	N/A: CAP M&I	Maricopa County	0	464	1,436	2,349	3,354	2,806	2,898	2,989	3,172	3,629	5,182	5,913	6,552	7,192
Chaparral City Water Company	N/A: CAP M&I	Maricopa County	0	478	1,478	2,419	3,453	2,889	2,983	3,077	3,265	3,735	5,335	6,087	6,746	7,404
Circle City	N/A: CAP M&I	Maricopa County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
El Mirage	N/A: CAP M&I	Maricopa County	0	27	84	138	197	165	170	175	186	213	304	347	385	422
Eloy	N/A: CAP M&I	Pinal County	0	116	360	589	842	704	727	750	796	910	1,300	1,483	1,644	1,804
EPCOR, Agua Fria	N/A: CAP M&I	Maricopa County	0	595	1,840	3,011	4,300	3,597	3,714	3,831	4,066	4,651	6,642	7,579	8,399	9,219
EPCOR, Paradise Valley	N/A: CAP M&I	Maricopa County	0	173	536	877	1,252	1,048	1,082	1,116	1,184	1,355	1,935	2,208	2,446	2,685
EPCOR, Sun City	N/A: CAP M&I	Maricopa County	0	225	695	1,137	1,624	1,358	1,403	1,447	1,535	1,756	2,508	2,862	3,172	3,481

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes (AF)													
EPCOR, Sun City West	N/A: CAP M&I	Maricopa County	0	127	393	644	919	769	794	819	869	995	1,420	1,621	1,796	1,971
Florence	N/A: CAP M&I	Pinal County	0	110	340	556	794	664	686	707	751	859	1,226	1,399	1,551	1,702
Freeport-Miami	N/A: CAP M&I	Gila County	0	156	482	789	1,126	942	973	1,004	1,065	1,218	1,740	1,986	2,200	2,415
Flowing Wells Irrigation District (FWID)	N/A: CAP M&I	Pima County	0	153	473	775	1,106	925	956	986	1,046	1,197	1,709	1,950	2,161	2,372
Gilbert	N/A: CAP M&I	Maricopa County	0	388	1,200	1,964	2,804	2,346	2,422	2,499	2,652	3,034	4,332	4,943	5,478	6,013
Glendale	N/A: CAP M&I	Maricopa County	0	924	2,859	4,679	6,681	5,589	5,771	5,953	6,317	7,227	10,321	11,776	13,050	14,324
Goodyear	N/A: CAP M&I	Maricopa County	0	576	1,782	2,916	4,164	3,483	3,597	3,710	3,937	4,504	6,432	7,339	8,133	8,927
Greater Tonopah, Water Utility	N/A: CAP M&I	Maricopa County	0	3	11	17	25	21	21	22	23	27	38	44	48	53
Green Valley Community Water Company	N/A: CAP M&I	Pima County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Valley Domestic Water Improvement District	N/A: CAP M&I	Pima County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marana	N/A: CAP M&I	Pima County	0	125	388	634	905	757	782	807	856	979	1,399	1,596	1,769	1,941
Maricopa County Parks & Recreation	N/A: CAP M&I	Maricopa County	0	36	110	181	258	216	223	230	244	279	398	454	504	553
Mesa	N/A: CAP M&I	Maricopa County	0	2,332	7,217	11,810	16,862	14,106	14,566	15,025	15,944	18,240	26,049	29,723	32,939	36,154
Metropolitan Domestic Water Improvement District (Includes ICS Creation)	N/A: CAP M&I	Pima County	0	722	2,233	3,654	5,217	4,365	4,507	4,649	4,933	5,644	8,060	9,197	10,191	11,186
Oro Valley	N/A: CAP M&I	Pima County	0	552	1,709	2,798	3,994	3,342	3,450	3,559	3,777	4,321	6,170	7,041	7,803	8,564
Peoria	N/A: CAP M&I	Maricopa County	0	1,454	4,499	7,363	10,513	8,794	9,081	9,367	9,940	11,372	16,240	18,530	20,535	22,539
Phoenix	N/A: CAP M&I	Maricopa County	0	6,551	20,272	33,175	47,368	39,626	40,917	42,207	44,788	51,239	73,174	83,496	92,528	101,560
Pine	N/A: CAP M&I	Gila County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Queen Creek	N/A: CAP M&I	Maricopa County	0	27	82	134	192	161	166	171	181	208	296	338	375	411
Rio Verde Utilities	N/A: CAP M&I	Maricopa County	0	44	135	220	315	263	272	280	298	340	486	555	615	675
San Tan Irrigation District	N/A: CAP M&I	Maricopa County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scottsdale	N/A: CAP M&I	Maricopa County	0	2,831	8,761	14,336	20,470	17,124	17,682	18,240	19,355	22,143	31,622	36,082	39,985	43,889
Spanish Trail Water Company	N/A: CAP M&I	Pima County	0	163	504	824	1,177	985	1,017	1,049	1,113	1,273	1,819	2,075	2,299	2,524
Surprise	N/A: CAP M&I	Maricopa County	0	549	1,700	2,782	3,973	3,323	3,432	3,540	3,756	4,297	6,137	7,003	7,760	8,518

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes (AF)												
Tempe	N/A: CAP M&I	Maricopa County	0	231	716	1,171	1,673	1,399	1,445	1,490	1,581	1,809	2,584	2,948	3,267	3,586
Tonopah	N/A: CAP M&I	Maricopa County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tonto Hills Domestic Water Improvement District	N/A: CAP M&I	Maricopa County	0	4	12	19	28	23	24	25	26	30	43	49	54	59
Tucson	N/A: CAP M&I	Pima County	0	7,729	23,920	39,144	55,891	46,756	48,278	49,801	52,846	60,458	86,339	98,518	109,175	119,832
Vail Water Company	N/A: CAP M&I	Pima County	0	100	308	504	720	602	622	641	681	779	1,112	1,269	1,406	1,543
Water Utilities Community Facilities District, Apache Junction	N/A: CAP M&I	Pinal County	0	156	484	792	1,131	947	977	1,008	1,070	1,224	1,748	1,994	2,210	2,426
Phoenix	N/A: CAP NIA-A	Maricopa County	0	37,280	37,280	37,280	37,280	37,280	37,280	37,280	37,280	37,280	37,280	37,280	37,280	37,280
Chandler	N/A: CAP NIA-A	Maricopa County	0	3,924	3,924	3,924	3,924	3,924	3,924	3,924	3,924	3,924	3,924	3,924	3,924	3,924
Gilbert	N/A: CAP NIA-A	Maricopa County	0	1,537	1,537	1,537	1,537	1,537	1,537	1,537	1,537	1,537	1,537	1,537	1,537	1,537
Glendale	N/A: CAP NIA-A	Maricopa County	0	682	682	682	682	682	682	682	682	682	682	682	682	682
Mesa	N/A: CAP NIA-A	Maricopa County	0	5,551	5,551	5,551	5,551	5,551	5,551	5,551	5,551	5,551	5,551	5,551	5,551	5,551
Scottsdale	N/A: CAP NIA-A	Maricopa County	0	3,306	3,306	3,306	3,306	3,306	3,306	3,306	3,306	3,306	3,306	3,306	3,306	3,306
Tempe	N/A: CAP NIA-A	Maricopa County	0	23	23	23	23	23	23	23	23	23	23	23	23	23
Buckeye	N/A: CAP NIA-B	Maricopa County	0	2,786	2,786	2,786	2,786	2,786	2,786	2,786	2,786	2,786	2,786	2,786	2,786	2,786
Central Arizona Groundwater Replenishment District (CAGRD)	N/A: CAP NIA-B	Maricopa County	0	18,185	18,185	18,185	18,185	18,185	18,185	18,185	18,185	18,185	18,185	18,185	18,185	18,185
Carefree Water Company	N/A: CAP NIA-B	Maricopa County	0	112	112	112	112	112	112	112	112	112	112	112	112	112
Cave Creek	N/A: CAP NIA-B	Maricopa County	0	386	386	386	386	386	386	386	386	386	386	386	386	386
El Mirage	N/A: CAP NIA-B	Maricopa County	0	1,318	1,318	1,318	1,318	1,318	1,318	1,318	1,318	1,318	1,318	1,318	1,318	1,318
EPCOR, San Tan (ST)	N/A: CAP NIA-B	Pinal County	0	3,217	3,217	3,217	3,217	3,217	3,217	3,217	3,217	3,217	3,217	3,217	3,217	3,217
Freeport	N/A: CAP NIA-B	Pima County	0	5,678	5,678	5,678	5,678	5,678	5,678	5,678	5,678	5,678	5,678	5,678	5,678	5,678
Gilbert	N/A: CAP NIA-B	Maricopa County	0	1,832	1,832	1,832	1,832	1,832	1,832	1,832	1,832	1,832	1,832	1,832	1,832	1,832
Marana	N/A: CAP NIA-B	Pima County	0	515	515	515	515	515	515	515	515	515	515	515	515	515
Queen Creek	N/A: CAP NIA-B	Maricopa County	0	4,162	4,162	4,162	4,162	4,162	4,162	4,162	4,162	4,162	4,162	4,162	4,162	4,162
Resolution Copper	N/A: CAP NIA-B	Maricopa County	0	2,238	2,238	2,238	2,238	2,238	2,238	2,238	2,238	2,238	2,238	2,238	2,238	2,238

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes (AF)													
Rosemont Copper	N/A: CAP NIA-B	Pima County	0	1,124	1,124	1,124	1,124	1,124	1,124	1,124	1,124	1,124	1,124	1,124	1,124	1,124
SRP	N/A: CAP NIA-B	Maricopa County	0	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160
Water Utilities Community Facilities District, Apache Junction	N/A: CAP NIA-B	Pinal County	0	817	817	817	817	817	817	817	817	817	817	817	817	817
Chandler (Salt River Pima-Maricopa Exchange)	N/A: Arizona P3 in CAP	Maricopa County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gilbert (Salt River Pima-Maricopa Exchange)	N/A: Arizona P3 in CAP	Maricopa County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glendale (Salt River Pima-Maricopa Exchange)	N/A: Arizona P3 in CAP	Maricopa County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mesa (Salt River Pima-Maricopa Exchange)	N/A: Arizona P3 in CAP	Maricopa County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phoenix (Salt River Pima-Maricopa Exchange)	N/A: Arizona P3 in CAP	Maricopa County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scottsdale (Salt River Pima-Maricopa Exchange)	N/A: Arizona P3 in CAP	Maricopa County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tempe (Salt River Pima-Maricopa Exchange)	N/A: Arizona P3 in CAP	Maricopa County	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Subtotal	**1,402**	**131,899**	**198,120**	**261,644**	**330,406**	**293,925**	**300,453**	**306,980**	**320,155**	**352,442**	**460,377**	**512,128**	**557,710**	**603,284**
California																
Water User	**% Distribution of Additional Shortage**	**County**														
The Metropolitan Water District of Southern California	12.89337%	Los Angeles, Orange, San Diego, Riverside, and San Bernardino	25,787	68,722	79,552	111,786	126,742	137,443	143,890	150,337	165,422	191,209	244,974	287,909	330,973	373,908
Interim Guidelines Reductions and DCP Contributions	N/A	Los Angeles, Orange, San Diego, Riverside, and San Bernardino	0	0	0	200,000	350,000	350,000	300,000	250,000	300,000	350,000	350,000	350,000	350,000	350,000
City of Needles (includes LCWSP use)	0.01753%	San Bernardino County	35	93	108	152	172	187	196	204	225	260	333	392	450	508
City of Winterhaven	0.00065%	Imperial County	1	3	4	6	6	7	7	8	8	10	12	15	17	19

Summary of Consumptive Use Impacts to Domestic Uses			**Range of Analyzed Volumes (AF)**													
CA Pumpers Parker to Imperial Above Imperial Dam	0.00191%	San Bernardino, Riverside, and Imperial	4	10	12	17	19	20	21	22	24	28	36	43	49	55
		Subtotal	**25,827**	**68,829**	**79,676**	**311,960**	**476,939**	**487,658**	**444,114**	**400,571**	**465,680**	**541,507**	**595,356**	**638,358**	**681,489**	**724,491**
Nevada																
Water User	**% Distribution of Additional Shortage**	**County**														
Robert B. Griffith Water Project (SNWS)	3.68200%	Clark	7,364	19,625	22,718	31,923	36,194	39,250	41,091	42,932	47,240	54,604	69,958	82,219	94,517	106,778
Interim Guidelines Reductions and DCP Contributions	N/A	Clark	8,000	21,000	25,000	27,000	30,000	27,000	27,000	27,000	27,000	27,000	30,000	30,000	30,000	30,000
Lake Mead NRA, NV - Diversions from Lake Mead	0.00451%	Clark	9	24	28	39	44	48	50	53	58	67	86	101	116	131
Lake Mead NRA, NV - Diversions from Lake Mohave	0.00256%	Clark	5	14	16	22	25	27	29	30	33	38	49	57	66	74
Basic Management Inc.	0.06099%	Clark	122	325	376	529	599	650	681	711	782	904	1,159	1,362	1,566	1,769
City of Henderson (BMI Delivery)	0.17677%	Clark	354	942	1,091	1,533	1,738	1,884	1,973	2,061	2,268	2,622	3,359	3,947	4,538	5,126
Nevada Department of Wildlife	0.00016%	Clark	0	1	1	1	2	2	2	2	2	2	3	4	4	5
Pacific Coast Building Products Inc.	0.01236%	Clark	25	66	76	107	121	132	138	144	159	183	235	276	317	358
Boulder Canyon Project	0.00031%	Clark	1	2	2	3	3	3	3	4	4	5	6	7	8	9
Big Bend Water District	0.01983%	Clark	40	106	122	172	195	211	221	231	254	294	377	443	509	575
		Subtotal	**15,919**	**42,104**	**49,430**	**61,329**	**68,922**	**69,208**	**71,188**	**73,168**	**77,800**	**85,719**	**105,230**	**118,415**	**131,640**	**144,825**
		Total	**43,148**	**242,832**	**327,226**	**634,933**	**876,267**	**850,791**	**815,755**	**780,719**	**863,635**	**979,668**	**1,160,963**	**1,268,901**	**1,370,838**	**1,472,600**
Summary by County		**# of Entitlement Holders/County**														
Arizona																
Coconino County		1	0	1	1	1	1	1	1	1	2	2	2	3	3	3
Gila County		0	0	156	482	789	1,126	942	973	1,004	1,065	1,218	1,740	1,986	2,200	2,415
La Paz County		9	385	1,025	1,187	1,668	1,891	2,051	2,147	2,243	2,468	2,853	3,655	4,296	4,939	5,579
Maricopa County		0	0	104,683	144,911	182,794	224,465	201,735	205,524	209,312	216,888	235,830	300,231	330,537	357,055	383,573
Mohave County		13	603	1,606	1,859	2,613	2,962	3,212	3,363	3,514	3,866	4,469	5,726	6,729	7,736	8,739

Summary of Consumptive Use Impacts to Domestic Uses		Range of Analyzed Volumes (AF)													
Pima County	0	0	17,986	40,336	61,351	84,468	71,859	73,960	76,062	80,265	90,772	126,499	143,311	158,022	172,732
Pinal County	0	0	5,337	8,066	10,633	13,456	11,916	12,173	12,429	12,942	14,226	18,589	20,642	22,438	24,235
Yuma County	12	414	1,104	1,278	1,796	2,036	2,208	2,312	2,415	2,658	3,072	3,936	4,626	5,318	6,008
Subtotal Arizona Domestic	**35**	**1,402**	**131,899**	**198,120**	**261,644**	**330,406**	**293,925**	**300,453**	**306,980**	**320,155**	**352,442**	**460,377**	**512,128**	**557,710**	**603,284**
California															
MWD Service Area (Los Angeles, Orange, San Diego, Riverside, and San Bernardino)	1	25,787	68,722	79,552	311,786	476,742	487,443	443,890	400,337	465,422	541,209	594,974	637,909	680,973	723,908
San Bernardino County	1	35	93	108	152	172	187	196	204	225	260	333	392	450	508
Riverside County	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Imperial County	1	1	3	4	6	6	7	7	8	8	10	12	15	17	19
Subtotal California Domestic	**4**	**25,823**	**68,819**	**79,664**	**311,943**	**476,921**	**487,637**	**444,093**	**400,549**	**465,655**	**541,478**	**595,320**	**638,315**	**681,440**	**724,435**
Nevada															
Clark	10	15,919	42,104	49,430	61,329	68,922	69,208	71,188	73,168	77,800	85,719	105,230	118,415	131,640	144,825
Subtotal Nevada Domestic	**10**	**15,919**	**42,104**	**49,430**	**61,329**	**68,922**	**69,208**	**71,188**	**73,168**	**77,800**	**85,719**	**105,230**	**118,415**	**131,640**	**144,825**

Note: Reductions and contributions were administered in 2022 and 2023 as shared between the CAP and other Arizona Fourth Priority water users, but the burden of wet water reductions was borne solely by CAP. This Action Alternative 2 as currently modeled does not incorporate the shortage sharing recommendation or other priority system-based modeling for non-CAP Fourth Priority water users, and it assumes the burden of the existing wet water reductions continues to be borne by CAP.

Note: Orange highlights indicate the level at which available water for a user under this priority is reduced to zero.

Disclaimer: These modeling results (for Action Alternative 2) should only be used to compare the relative magnitude of effects reasonably expected to occur under the alternatives evaluated in this SEIS. Modeling assumptions should not be taken as agency position with respect to contract or statutory interpretation, and they are not intended to limit Secretarial discretion with respect to current or future policy. This model is not a substitute for the annual process of reviewing water orders and determining which can be filled, and it cannot replicate the precision required for that process.

D.4.3 Relationship between CRMMS and Action Alternative 2 Shortage Allocation Model

(See **Section D.3.4** for a discussion on the relationship between CRMMS and the Action Alternative 1 Shortage Allocation Model.) That discussion is largely applicable to differences between CRMMS and the Action Alternative 2 Shortage Allocation Model, except where noted below.

CRMMS modeling and the Action Alternative 2 Shortage Allocation Model are based on the same set of water users – those identified in the Water Accounting Report.

The same percentages calculated for distribution of additional shortage to each water user in the Action Alternative 2 Shortage Allocation Model were used in CRMMS modeling.

CRMMS lumps certain water users into groups by geography, and only some of those groups (including the CAP) were further itemized for the Action Alternative 2 Shortage Allocation Model.

There is no distinction between Stage 1 and Stage 2 shortages for Action Alternative 2 in CRMMS or the Shortage Allocation Model.

D.5 No Action Alternative Shortage Allocation Model

The No Action Alternative describes the continued implementation of existing agreements that control operations of Glen Canyon and Hoover Dams. These include the 2007 Interim Guidelines for the remainder of the interim period (through the 2026 operating year) and the 2019 DCP. The Shortage Allocation Model for the No Action Alternative is a set of Microsoft Excel worksheets that simulate shortages and distribute available water first among the Lower Division States based on the 2007 ROD and 2019 DCP and then among the entitlement holders within each state based on priority.

The discrete volumes of total shortage to the Lower Division States considered in the No Action Alternative Shortage Allocation Model comprise the 2007 Interim Guidelines shortage reductions and 2019 DCP water savings contributions, based on Lake Mead elevations. These volumes (in AF) are:

- 200,000
- 533,000
- 617,000
- 867,000
- 917,000
- 967,000
- 1,017,000
- 1,100,000

D.5.1 Distribution Among States

The Shortage Allocation Model for the No Action Alternative distributes shortages among states based on state reductions specified in the 2007 Interim Guidelines. As in the 2007 Shortage Allocation Model and the Action Alternative 1 Shortage Allocation Model, shortages to the Lower Division States are characterized by two stages, Stage 1 and Stage 2. In Stage 1, shortages are imposed only upon Arizona (96 percent) and Nevada (4 percent) and continue until the deliveries to

the post–1968 water entitlement holders in Arizona (including the CAP) are reduced to zero. (See **Section D.3.1.1** for additional details on the Stage 1 calculations, but note that the output from the No Action Shortage Allocation Model calculations for Arizona and Nevada are rounded to the nearest thousand acre-feet so that the volumes align with the 2007 ROD.) The maximum shortage volume simulated in the No Action Shortage Allocation Model does not exceed Stage 1 shortage amounts (deliveries to the post-1968 water entitlement holders in Arizona were not reduced to zero).

The Shortage Allocation Model for the No Action Alternative also simulated water savings contributions that were distributed among states as agreed to in the 2019 DCP. For the purpose of comparing the impacts of alternatives considered in this Draft SEIS, DCP contributions are assumed to represent reductions in deliveries, although parties retain flexibility in how to meet those contribution commitments.

At some Lake Mead elevation tiers, the 2019 DCP contributions for California exceed the 2024 shortage volume assigned to California in the Action Alternative 1 Shortage Allocation Model, which represents an interpretation of the priority system. In these instances, the No Action Alternative Shortage Allocation Model will show greater volumes of shortage to California than the Action Alternative 1 Shortage Allocation Model. **Table D-26** below displays the No Action Alternative Shortage Allocation Model's state distribution, which comprises shortages in accordance with the 2007 Interim Guidelines and contributions in accordance with the 2019 DCP.

Table D-26
State Distribution from the No Action Alternative Shortage Allocation Model

"Stage 1" Shortage Distribution	Arizona	California	Nevada	Total
Ratio of Apportionment to Total	=2,800,000/9,000,000 or 37.33%	=4,400,000/7,500,000 or 58.67%	=300,000/7,500,000 or 4%	
Percentage Assignment of Shortage	96.00%	0.00%	4.00%	

Distribution of Available Water Until Arizona Fourth Priority is Eliminated (Threshold Approximated)

Lower Division States Supply (AF)	Lower Division States Shortage Volume (including DCP) (AF)	AZ Shortage Volume (AF)	Water Available to AZ (AF)	CA Shortage Volume (AF)	Water Available to CA (AF)	NV Shortage Volume (AF)	Water Available to NV (AF)	Lower Division States Shortage Volume (AF)
7,300,000	(200,000)	(192,000)	2,608,000	-	4,400,000	(8,000)	292,000	(200,000)
6,967,000	(533,000)	(512,000)	2,288,000	-	4,400,000	(21,000)	279,000	(533,000)
6,883,000	(617,000)	(592,000)	2,208,000	-	4,400,000	(25,000)	275,000	(617,000)
6,633,000	(867,000)	(640,000)	2,160,000	(200,000)	4,200,000	(27,000)	273,000	(867,000)
6,583,000	(917,000)	(640,000)	2,160,000	(250,000)	4,150,000	(27,000)	273,000	(917,000)
6,533,000	(967,000)	(640,000)	2,160,000	(300,000)	4,100,000	(27,000)	273,000	(967,000)
6,483,000	(1,017,000)	(640,000)	2,160,000	(350,000)	4,050,000	(27,000)	273,000	(1,017,000)
6,400,000	(1,100,000)	(720,000)	2,080,000	(350,000)	4,050,000	(30,000)	270,000	(1,100,000)

Note: No "Stage 2" needed in No Action Alternative Analysis, since Arizona Fourth Priority is not eliminated at these shortage levels.

The results of these assumptions are summarized in **Table D-27** below, showing a distribution of shortage among the Lower Division States (which consists of both 2007 Interim Guidelines reductions and 2019 DCP water savings contributions) and corresponding volumes of water available to each Lower Division State.

Table D-27
Summary of Shortage Volumes by Lower Division State Under the No Action Alternative Shortage Allocation Model

Total Lower Division States Shortage Volumes (AF)	Arizona Shortage Volume (AF)	Arizona Available Water (AF)	California Shortage Volume (AF)	California Available Water (AF)	Nevada Shortage Volume (AF)	Nevada Available Water (AF)
(200,000)	(192,000)	2,608,000	-	4,400,000	(8,000)	292,000
(533,000)	(512,000)	2,288,000	-	4,400,000	(21,000)	279,000
(617,000)	(592,000)	2,208,000	-	4,400,000	(25,000)	275,000
(867,000)	(640,000)	2,160,000	(200,000)	4,200,000	(27,000)	273,000
(917,000)	(640,000)	2,160,000	(250,000)	4,150,000	(27,000)	273,000
(967,000)	(640,000)	2,160,000	(300,000)	4,100,000	(27,000)	273,000
(1,017,000)	(640,000)	2,160,000	(350,000)	4,050,000	(27,000)	273,000
(1,100,000)	(720,000)	2,080,000	(350,000)	4,050,000	(30,000)	270,000

D.5.2 Distribution Within States

The No Action Alternative Shortage Allocation Model distributes shortages within states using the same assumptions about intra-state priority systems that are described in detail for the Action Alternative 1 Shortage Allocation Model, with the difference being the magnitude of shortages that are distributed. (See **Section D.3.2** for a description of the assumptions for distributing shortage within states in the Action Alternative 1 Shortage Allocation Model, which also apply to the No Action Alternative Shortage Allocation Model.[20])

D.5.3 Shortage Allocation Model Results

The tables in this section summarize the results of the No Action Alternative Shortage Allocation Model over the range of total shortages to the Lower Division States that comprise the 2007 Interim Guidelines shortage reductions and 2019 DCP water savings contributions.

Table D-28 below summarizes the shortage attributed to each priority within the Lower Division States in the No Action Alternative Shortage Allocation Model. Contracts for Arizona fifth and sixth priority and unused water within CAP, and CAP excess contracts, are immediately impacted and potentially fully reduced. The only other priority group potentially fully reduced under the No Action Alternative Shortage Allocation Model is CAP NIA Priority, although other priorities are impacted to some degree. These results do not reflect the increased risk of Lake Mead's elevation falling to dead pool under the No Action Alternative in comparison to either of the action alternatives.

[20] As the Action Alternative 1 Shortage Allocation Model distributed total volumes of shortage according to priority without distinguishing between shortages and DCP contributions, this attributes California DCP contributions to MWD, notwithstanding Coachella Valley Water District's 7 percent contribution pursuant to May 20, 2019 DCP Implementation Agreement Between Metropolitan Water District of Southern California and Coachella Valley Water District.

Table D-28
No Action Alternative Shortage Allocation Model Regional Summary

Summary of Shortage Impacts by State and Priority		Range of Analyzed Volumes of Total Shortage to Lower Division States (AF)							
		200,000	**533,000**	**617,000**	**867,000**	**917,000**	**967,000**	**1,017,000**	**1,100,000**
Arizona	**Priority**								
	5th, 6th, and CAP Agricultural and Other Excess	192,000	294,465	335,708	338,687	338,687	338,687	338,687	330,681
	4th Priority i (Mainstream)	0	0	0	0	0	0	0	18,520
	4th Priority ii (CAP)[1]								
	NIA Priority	0	217,535	245,633	245,633	245,633	245,633	245,633	245,633
	M&I Priority	0	0	0	32,302	32,302	32,302	32,302	80,877
	Indian Priority	0	0	10,659	23,378	23,378	23,378	23,378	44,289
	2nd & 3rd Priorities	0	0	0	0	0	0	0	0
	1st Priority (Present Perfected Rights)	0	0	0	0	0	0	0	0
	Subtotal	**192,000**	**512,000**	**592,000**	**640,000**	**640,000**	**640,000**	**640,000**	**720,000**
California	**Priority**								
	4th Priority (MWD)	0	0	0	200,000	250,000	300,000	350,000	350,000
	3rd Priority (IID, CVWD, PVID, QSA Diversions by MWD)	0	0	0	0	0	0	0	0
	2nd Priority (Yuma Project Reservation Division)	0	0	0	0	0	0	0	0
	1st Priority (PVID)	0	0	0	0	0	0	0	0
	Present Perfected Rights (PPRs)	0	0	0	0	0	0	0	0
	Subtotal	**0**	**0**	**0**	**200,000**	**250,000**	**300,000**	**350,000**	**350,000**

Summary of Shortage Impacts by State and Priority		Range of Analyzed Volumes of Total Shortage to Lower Division States (AF)							
Nevada	**Priority**								
	8th Priority (SNWA - Balance & Unused)	8,000	21,000	25,000	27,000	27,000	27,000	27,000	30,000
	8th Priority (SNWA & Big Bend)	0	0	0	0	0	0	0	0
	7th Priority (Boy Scouts, Reclamation, NV Dept. of Wildlife)	0	0	0	0	0	0	0	0
	6th Priority (Las Vegas Valley Water District)	0	0	0	0	0	0	0	0
	5th Priority (PABCO & Lakeview Co.)	0	0	0	0	0	0	0	0
	4th Priority (Henderson & Basic Management)	0	0	0	0	0	0	0	0
	3rd Priority (Boulder City)	0	0	0	0	0	0	0	0
	2nd Priority (Lake Mead National Rec. Area)	0	0	0	0	0	0	0	0
	1st Priority (PPRs: LMNRA & Fort Mojave Indian Reservation)	0	0	0	0	0	0	0	0
	Subtotal	**8,000**	**21,000**	**25,000**	**27,000**	**27,000**	**27,000**	**27,000**	**30,000**
	Total	**200,000**	**533,000**	**617,000**	**867,000**	**917,000**	**967,000**	**1,017,000**	**1,100,000**

Note: This analysis does not reflect an operational estimate of when water may cease to be physically available to certain users.
Note: Orange highlights indicate the level at which available water for a priority is reduced to zero.
[1]Agricultural and other CAP excess contracts do not confer a Colorado River water entitlement, and it cannot be exercised under any of the scenarios modeled here.
Disclaimer: These modeling results for the No Action Alternative should only be used to compare the relative magnitude of effects reasonably expected to occur under the alternatives evaluated in this SEIS. Modeling assumptions should not be taken as agency position with respect to contract or statutory interpretation, and they are not intended to limit Secretarial discretion with respect to current or future policy. This model is not a substitute for the annual process of reviewing water orders and determining which can be filled, and it cannot replicate the precision required for that process.

Table D-29 below summarizes the shortage impacts to Tribes according to the No Action Alternative Shortage Allocation Model. Tribal entitlements within the Arizona fourth priority are potentially impacted, and CAP NIA Priority entitlements are potentially fully reduced.

Table D-29
No Action Alternative Shortage Allocation Model Tribal Summary

Summary of Consumptive Use Impacts to Tribal Allocations			Range of Analyzed Volumes of Total Shortage to Lower Division States (AF)							
Arizona			200,000	533,000	617,000	867,000	917,000	967,000	1,017,000	1,100,000
Priority	**Entitlement Holder**	**County**								
4(i)	Hopi Tribe[1]	La Paz County	0	0	0	0	0	0	0	1,164
4(i)	Cocopah Indian Reservation[2]	Yuma County	0	0	0	0	0	0	0	0
CAP Indian Priority	Gila River Indian Community[1]	Maricopa and Pinal Counties	0	0	10,659	23,378	23,378	23,378	23,378	39,517
CAP Indian Priority	Tohono O'odham Nation (Schuk Toak & San Xavier Districts)[1]	Pima County	0	0	0	0	0	0	0	0
CAP Indian Priority	White Mountain Apache Tribe	Apache, Gila, and Navajo Counties	0	0	0	0	0	0	0	0
CAP Indian Priority	Ak-Chin Indian Community[1]	Pinal County	0	0	0	0	0	0	0	3,744
CAP Indian Priority	Fort McDowell Yavapai Nation	Maricopa County	0	0	0	0	0	0	0	0
CAP Indian Priority	Pascua Yaqui Tribe	Pima County	0	0	0	0	0	0	0	0
CAP Indian Priority	San Carlos Apache Tribe	Gila County	0	0	0	0	0	0	0	173
CAP Indian Priority	Salt River Pima-Maricopa Indian Community	Maricopa County	0	0	0	0	0	0	0	854
CAP Indian Priority	Tohono O'odham Nation Sif Oidak District	Pinal County	0	0	0	0	0	0	0	0
CAP Indian Priority	Tonto Apache Tribe	Gila County	0	0	0	0	0	0	0	0
CAP Indian Priority	Yavapai Apache Nation	Gila County	0	0	0	0	0	0	0	0
CAP M&I Priority	San Carlos Apache Tribe	Gila County	0	0	0	973	973	973	973	2,435
CAP NIA-A Priority	Tohono O'odham Nation (Schuk Toak & San Xavier Districts)	Pima County	0	24,260	28,200	28,200	28,200	28,200	28,200	28,200
CAP NIA-A Priority	Gila River Indian Community	Maricopa and Pinal County	0	103,750	120,600	120,600	120,600	120,600	120,600	120,600
CAP NIA-B Priority	White Mountain Apache Tribe	Apache, Gila, and Navajo Counties	0	0	0	0	0	0	0	0
3	Ak-Chin Indian Community[1]	Pinal County	0	0	0	0	0	0	0	0

Summary of Consumptive Use Impacts to Tribal Allocations			Range of Analyzed Volumes of Total Shortage to Lower Division States (AF)							
1 (PPR)	Cocopah Indian Reservation[1]	Yuma County	0	0	0	0	0	0	0	0
1 (PPR)	United States (Cocopah Indian Tribe)[1]	Yuma County	0	0	0	0	0	0	0	0
1 (PPR)	Fort Mojave Indian Reservation[1]	Mohave County	0	0	0	0	0	0	0	0
1 (PPR)	Fort Yuma Indian Reservation[1]	Yuma County	0	0	0	0	0	0	0	0
1 (PPR)	Colorado River Indian Reservation[1]	La Paz County	0	0	0	0	0	0	0	0
		Subtotal	**0**	**128,010**	**159,459**	**173,151**	**173,151**	**173,151**	**173,151**	**196,688**
California										
Priority	**Entitlement Holder**	**County**								
PPR	Chemehuevi Indian Reservation[1]	San Bernardino	0	0	0	0	0	0	0	0
PPR	Fort Mojave Indian Reservation[1]	San Bernardino	0	0	0	0	0	0	0	0
PPR	Fort Yuma Indian Reservation[1]	Imperial	0	0	0	0	0	0	0	0
PPR	Colorado River Indian Reservation[1]	San Bernardino, Riverside	0	0	0	0	0	0	0	0
		Subtotal	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Nevada										
Priority	**Entitlement Holder**	**County**								
1 (PPR)	Fort Mojave Indian Reservation[1]	Clark	0	0	0	0	0	0	0	0
		Subtotal	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		Total	**0**	**128,010**	**159,459**	**173,151**	**173,151**	**173,151**	**173,151**	**196,688**
Summary by County										
	Arizona	**# of Entitlement Holders /County**								
	Coconino County	0	0	0	0	0	0	0	0	0
	Gila County	4.33	0	0	0	973	973	973	973	2,609
	La Paz County	2	0	0	0	0	0	0	0	1,164
	Maricopa County	2.3	0	31,125	39,378	43,193	43,193	43,193	43,193	48,889
	Mohave County	1	0	0	0	0	0	0	0	0
	Pima County	3	0	24,260	28,200	28,200	28,200	28,200	28,200	28,200
	Pinal County	3.70	0	72,625	91,881	100,785	100,785	100,785	100,785	115,826

Summary of Consumptive Use Impacts to Tribal Allocations			Range of Analyzed Volumes of Total Shortage to Lower Division States (AF)							
	Yuma County	4	0	0	0	0	0	0	0	0
	Apache County	0.33	0	0	0	0	0	0	0	0
	Navajo County	0.33	0	0	0	0	0	0	0	0
	Subtotal Arizona Tribal	**21**	**0**	**128,010**	**159,459**	**173,151**	**173,151**	**173,151**	**173,151**	**196,688**
	California									
	San Bernardino	2.5	0	0	0	0	0	0	0	0
	Riverside	0.50	0	0	0	0	0	0	0	0
	Imperial	1	0	0	0	0	0	0	0	0
	Subtotal California Tribal	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Nevada									
	Clark	1	0	0	0	0	0	0	0	0
	Subtotal Nevada Tribal	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: PPRs are included here to provide a complete list of tribal entitlements, but they are not impacted at the evaluated levels of shortage.
Note: Orange highlights indicate the level at which available water for a user under this priority is reduced to zero.
Note: This preliminary analysis attributes shortage to the base allocation or entitlement according to its priority. The ultimate impacts, both financial and in terms of the lost productive value of water, are diverse according to their varied uses and compensation structures under a large body of exchanges, leases, and other federal and non-federal arrangements and commitments. This distribution of shortage to the base allocation only provides the initial necessary information to assess impacts in detail as part of administering the related contracts; actual water orders received each year will affect those impacts.
Note: This analysis does not reflect an operational estimate of when water may cease to be physically available to certain users.
[1]Denotes full or substantial use in Tribal agricultural operations, which may or may not be impacted according to the terms of related agreements.
[2]This user also holds a PPR entitlement, which is not impacted at these levels of shortages.

Table D-30 below summarizes the shortage impacts to irrigation according to the No Action Alternative Shortage Allocation Model. Contracts for Arizona fifth and sixth priority and unused[21] water within CAP, and CAP excess contracts, are immediately impacted and potentially fully reduced, but other irrigation entitlements are only potentially impacted at the deepest levels of shortage.

Table D-30
No Action Alternative Shortage Allocation Model Irrigation Summary

Summary of Consumptive Use Impacts to Irrigation			Range of Analyzed Volumes of Total Shortage to Lower Division States (AF)							
Arizona			200,000	533,000	617,000	867,000	917,000	967,000	1,017,000	1,100,000
Priority	Entitlement Holder	County								
All Other	5th and 6th Priority Contracts, and CAP Agricultural and Other Excess	Maricopa, Pinal, and Pima Counties	192,000	294,465	335,708	338,687	338,687	338,687	338,687	330,681
4(i)	Arizona Game and Fish Commission	La Paz County	0	0	0	0	0	0	0	772
4(i)	Arizona State Land Department	Yuma County	0	0	0	0	0	0	0	1,545
4(i)	Beattie Farms, Southwest	Yuma County	0	0	0	0	0	0	0	138
4(i)	Bishop, Alfred F. and Erma Jean Family Trust	La Paz County	0	0	0	0	0	0	0	0
4(i)	Cathcart, Bruce Y. and Lora M. and James Y. and Maria E.	La Paz County	0	0	0	0	0	0	0	7
4(i)	ChaCha, LLC	Yuma County	0	0	0	0	0	0	0	31
4(i)	Cibola Sportsman's Club, Inc.	La Paz County	0	0	0	0	0	0	0	43
4(i)	Cibola Valley Irrigation and Drainage District[2]	La Paz County	0	0	0	0	0	0	0	2,027
4(i)	Curtis, Armon	Yuma County	0	0	0	0	0	0	0	41
4(i)	Gila Monster Farms, Inc.[3]	Yuma County	0	0	0	0	0	0	0	0
4(i)	GM Gabrych Family Limited Partnership	La Paz County	0	0	0	0	0	0	0	1,087
4(i)	GSC Farm, LLC	La Paz County	0	0	0	0	0	0	0	793
4(i)	JRJ Partners, L.L.C.	Yuma County	0	0	0	0	0	0	0	227
4(i)	Mohave Valley Irrigation and Drainage District[2,3]	Mohave County	0	0	0	0	0	0	0	6,992
4(i)	North Baja Pipeline, LLC[2]	La Paz County	0	0	0	0	0	0	0	4
4(i)	Ogram Boys Enterprises, Inc.	Yuma County	0	0	0	0	0	0	0	221

[21] Under Article 3.(b) of the 1985 Contract Between the United States and the Ak-Chin Indian Community to Provide Permanent Water and Settle Interim Water Rights, in any year in which sufficient surface water is available, the Secretary shall deliver certain additional water to the Ak-Chin Indian Community. Such water is assumed to be available if there is unused CAP water, after CAP orders under contracts and subcontracts are fulfilled; it is not itemized, but there is only unused water projected to be available at the 200,000 af level of total shortage in the No Action Shortage Allocation Model.

Summary of Consumptive Use Impacts to Irrigation			Range of Analyzed Volumes of Total Shortage to Lower Division States (AF)							
4(i)	Ott, Larry and Gina, and Lee C. and Candace M.	Yuma County	0	0	0	0	0	0	0	33
4(i)	Pasquinelli, Gary J. and Barbara J.	Yuma County	0	0	0	0	0	0	0	0
4(i)	Red River Land Company, LLC	La Paz County	0	0	0	0	0	0	0	80
4(i)	Western Water, LLC	La Paz County	0	0	0	0	0	0	0	0
3	Sturges, Harold	Yuma County	0	0	0	0	0	0	0	0
3	Sturges, Irma	Yuma County	0	0	0	0	0	0	0	0
3	Yuma Mesa Irrigation & Drainage District (10,000af M&I)[1]	Yuma County	0	0	0	0	0	0	0	0
3	Yuma Irrigation District (5,000af M&I)[1]	Yuma County	0	0	0	0	0	0	0	0
3	North Gila Valley Irrigation District (2,500af M&I)[1,3]	Yuma County	0	0	0	0	0	0	0	0
3	Wellton-Mohawk Irrigation and Drainage District (12,000af M&I)[1]	Yuma County	0	0	0	0	0	0	0	0
3	Gila Monster Farms (formerly Sturges)[3]	Yuma County	0	0	0	0	0	0	0	0
3	Yuma County Water Users' Association (14,701af M&I includes YAO's 489.95af conversion)[2,3]	Yuma County	0	0	0	0	0	0	0	0
3	University of Arizona	Yuma County	0	0	0	0	0	0	0	0
3	Camille Allec, Jr. (Formerly Yuma Mesa Grapefruit Company)	Yuma County	0	0	0	0	0	0	0	0
3	Unit B Irrigation & Drainage District[3]	Yuma County	0	0	0	0	0	0	0	0
		Subtotal	**192,000**	**294,465**	**335,708**	**338,687**	**338,687**	**338,687**	**338,687**	**344,722**
California										
3	Palo Verde Irrigation District (3b) - Lower Palo Verde Mesa Lands	Riverside County	0	0	0	0	0	0	0	0
3	Coachella Valley Water District (CVWD) (3a)	Riverside County	0	0	0	0	0	0	0	0
3	Imperial Irrigation District (IID) (3a)	Imperial County	0	0	0	0	0	0	0	0
2	Yuma Project, Reservation Division4 (Bard Unit Only - Indian Unit Under PPRs)	Imperial County	0	0	0	0	0	0	0	0
1	Palo Verde Irrigation District - Valley Lands	Riverside, Imperial	0	0	0	0	0	0	0	0
		Subtotal	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Summary of Consumptive Use Impacts to Irrigation			Range of Analyzed Volumes of Total Shortage to Lower Division States (AF)							
Nevada										
None	None		0	0	0	0	0	0	0	0
		Subtotal	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		Total	**192,000**	**294,465**	**335,708**	**338,687**	**338,687**	**338,687**	**338,687**	**344,722**
Summary by County										
	Arizona	**# of Entitlement Holders /County**								
	Coconino County	0	0	0	0	0	0	0	0	0
	La Paz County	10	0	0	0	0	0	0	0	4,813
	Mohave County	1	0	0	0	0	0	0	0	6,992
	Yuma County	20	0	0	0	0	0	0	0	2,236
	Pima County	0.2	38,400	58,893	67,142	67,737	67,737	67,737	67,737	66,136
	Pinal County	0.5	96,000	147,233	167,854	169,344	169,344	169,344	169,344	165,340
	Maricopa County	0.3	57,600	88,340	100,712	101,606	101,606	101,606	101,606	99,204
	Subtotal Arizona Irrigation	31	192,000	294,465	335,708	338,687	338,687	338,687	338,687	344,722
	California									
	Riverside County	2.5	0	0	0	0	0	0	0	0
	Imperial County	2.5	0	0	0	0	0	0	0	0
	Subtotal California Irrigation	5	0	0	0	0	0	0	0	0
	Nevada									
	None	None	0	0	0	0	0	0	0	0

[1]Combined irrigation and domestic entitlement where domestic use is contractually subordinated to irrigation.
[2]Combined irrigation and domestic entitlement where priority of domestic and irrigation uses may be subject to an annual determination that varies based on the water supply conditions.
[3]This user also holds a PPR entitlement, which is not impacted at these levels of shortages and it was not included here.
Note: PPR entitlements are not impacted at these levels of shortage.
Note: Orange highlights indicate the level at which available water for a user under this priority is reduced to zero.
Note: This analysis does not reflect an operational estimate of when water may cease to be physically available to certain users.
Disclaimer: These modeling results for the No Action Alternative should only be used to compare the relative magnitude of effects reasonably expected to occur under the alternatives evaluated in this SEIS. Modeling assumptions should not be taken as agency position with respect to contract or statutory interpretation, and they are not intended to limit Secretarial discretion with respect to current or future policy. This model is not a substitute for the annual process of reviewing water orders and determining which can be filled, and it cannot replicate the precision required for that process.

Table D-31 below summarizes the shortage impacts to domestic use according to the No Action Alternative Shortage Allocation Model. Within the Arizona P4(i), certain domestic users may be impacted at the deepest level of modeled shortage. CAP M&I Priority uses are potentially impacted, and CAP NIA Priority uses are potentially fully reduced. Domestic impacts within California and Nevada are limited to MWD and SNWA, respectively.

Table D-31
No Action Alternative Shortage Allocation Model Domestic Summary

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for the No Action Alternative (AF)							
Arizona			200,000	533,000	617,000	867,000	917,000	967,000	1,017,000	1,100,000
Priority	Entitlement Holder	County								
4(i)	Arizona State Land Department	Yuma County	0	0	0	0	0	0	0	0
4(i)	Arizona State Parks Board - Windsor Beach	Mohave County	0	0	0	0	0	0	0	0
4(i)	B&F Investment, LLC	La Paz County	0	0	0	0	0	0	0	0
4(i)	Bullhead City	Mohave County	0	0	0	0	0	0	0	2,337
4(i)	Bullhead City (Mohave County Water Authority (MCWA) Subcontract)	Mohave County	0	0	0	0	0	0	0	0
4(i)	Bullhead City (MCWA Subcontract)	Mohave County	0	0	0	0	0	0	0	0
4(i)	Bureau of Land Management (diversion estimated)	La Paz County	0	0	0	0	0	0	0	0
4(i)	Crystal Beach Water Conservation District	Mohave County	0	0	0	0	0	0	0	20
4(i)	Desert Lawn Memorial Park Association, Inc.	Yuma County	0	0	0	0	0	0	0	0
4(i)	Ehrenburg Improvement District	La Paz County	0	0	0	0	0	0	0	0
4(i)	EPCOR Water Arizona Inc.[1]	Mohave County	0	0	0	0	0	0	0	0
4(i)	Fisher's Landing Water and Sewer Works, L.L.C.	Yuma County	0	0	0	0	0	0	0	0
4(i)	Frontier Communications West Coast Inc.	La Paz County	0	0	0	0	0	0	0	1
4(i)	Gold Dome Mining Corporation	Yuma County	0	0	0	0	0	0	0	0
4(i)	Gold Standard Mines Corp.	Mohave County	0	0	0	0	0	0	0	0
4(i)	Golden Shores Water Conservation District	Mohave County	0	0	0	0	0	0	0	0

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for the No Action Alternative (AF)							
4(i)	Hillcrest Water Company	La Paz County	0	0	0	0	0	0	0	0
4(i)	Lake Havasu City	Mohave County	0	0	0	0	0	0	0	638
4(i)	Lake Havasu City (MCWA Subcontract)	Mohave County	0	0	0	0	0	0	0	0
4(i)	Lake Havasu City (MCWA Subcontract)	Mohave County	0	0	0	0	0	0	0	0
4(i)	La Paz County	La Paz County	0	0	0	0	0	0	0	0
4(i)	McAlister Family Trust	Mohave County	0	0	0	0	0	0	0	0
4(i)	Mohave Valley Irrigation and Drainage District (MCWA Subcontract)	Mohave County	0	0	0	0	0	0	0	257
4(i)	Mohave Water Conservation District	Mohave County	0	0	0	0	0	0	0	62
4(i)	Mohave Water Conservation District (MCWA Subcontract)	Mohave County	0	0	0	0	0	0	0	0
4(i)	Parker, Town of[1]	La Paz County	0	0	0	0	0	0	0	0
4(i)	Quartzsite, Town of	La Paz County	0	0	0	0	0	0	0	0
4(i)	Roy, Estates of Anna R. and Edward P.	Yuma County	0	0	0	0	0	0	0	0
4(i)	Shepard Water Company, Incorporated	Yuma County	0	0	0	0	0	0	0	0
4(i)	Somerton, City of	Yuma County	0	0	0	0	0	0	0	0
4(i)	Springs Del Sol Domestic Water Improvement District	La Paz County	0	0	0	0	0	0	0	0
4(i)	TV Marble Canyon AZ, LLC	Coconino County	0	0	0	0	0	0	0	0
CAP Indian	Scottsdale (Yavapai Prescott Indian Tribe Allocation)	Maricopa County	0	0	0	0	0	0	0	0
CAP M&I	ASARCO	Pima County	0	0	0	1,126	1,126	1,126	1,126	2,818
CAP M&I	Avondale	Maricopa County	0	0	0	290	290	290	290	727
CAP M&I	Arizona State Land Department (AZSLD)	Maricopa County	0	0	0	279	279	279	279	698
CAP M&I	Arizona Water Company, Casa Grande	Pinal County	0	0	0	476	476	476	476	1,192
CAP M&I	Arizona Water Company, Coolidge	Pinal County	0	0	0	107	107	107	107	268
CAP M&I	Arizona Water Company, Superstition	Pinal County	0	0	0	337	337	337	337	844

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for the No Action Alternative (AF)							
CAP M&I	Arizona Water Company, White Tank	Maricopa County	0	0	0	52	52	52	52	130
CAP M&I	Buckeye	Maricopa County	0	0	0	12	12	12	12	30
CAP M&I	Central Arizona Groundwater Replenishment District (CAGRD)	Maricopa County	0	0	0	344	344	344	344	862
CAP M&I	Carefree Water Company	Maricopa County	0	0	0	47	47	47	47	119
CAP M&I	Cave Creek	Maricopa County	0	0	0	140	140	140	140	350
CAP M&I	Chandler	Maricopa County	0	0	0	464	464	464	464	1,161
CAP M&I	Chaparral City Water Company	Maricopa County	0	0	0	478	478	478	478	1,196
CAP M&I	Circle City	Maricopa County	0	0	0	0	0	0	0	0
CAP M&I	El Mirage	Maricopa County	0	0	0	27	27	27	27	68
CAP M&I	Eloy	Pinal County	0	0	0	116	116	116	116	291
CAP M&I	EPCOR, Agua Fria	Maricopa County	0	0	0	595	595	595	595	1,489
CAP M&I	EPCOR, Paradise Valley	Maricopa County	0	0	0	173	173	173	173	434
CAP M&I	EPCOR, Sun City	Maricopa County	0	0	0	225	225	225	225	562
CAP M&I	EPCOR, Sun City West	Maricopa County	0	0	0	127	127	127	127	318
CAP M&I	Florence	Pinal County	0	0	0	110	110	110	110	275
CAP M&I	Freeport-Miami	Gila County	0	0	0	156	156	156	156	390
CAP M&I	Flowing Wells Irrigation District (FWID)	Pima County	0	0	0	153	153	153	153	383
CAP M&I	Gilbert	Maricopa County	0	0	0	388	388	388	388	971
CAP M&I	Glendale	Maricopa County	0	0	0	924	924	924	924	2,313
CAP M&I	Goodyear	Maricopa County	0	0	0	576	576	576	576	1,442
CAP M&I	Greater Tonopah, Water Utility	Maricopa County	0	0	0	3	3	3	3	9
CAP M&I	Green Valley Community Water Company	Pima County	0	0	0	0	0	0	0	0
CAP M&I	Green Valley Domestic Water Improvement District	Pima County	0	0	0	0	0	0	0	0
CAP M&I	Marana	Pima County	0	0	0	125	125	125	125	314
CAP M&I	Maricopa County Parks & Recreation	Maricopa County	0	0	0	36	36	36	36	89
CAP M&I	Mesa	Maricopa County	0	0	0	2,332	2,332	2,332	2,332	5,839
CAP M&I	Metropolitan Domestic Water Improvement District (Includes ICS Creation)	Pima County	0	0	0	722	722	722	722	1,807
CAP M&I	Oro Valley	Pima County	0	0	0	552	552	552	552	1,383
CAP M&I	Peoria	Maricopa County	0	0	0	1,454	1,454	1,454	1,454	3,640

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for the No Action Alternative (AF)							
CAP M&I	Phoenix	Maricopa County	0	0	0	6,551	6,551	6,551	6,551	16,401
CAP M&I	Pine	Gila County	0	0	0	0	0	0	0	0
CAP M&I	Queen Creek	Maricopa County	0	0	0	27	27	27	27	66
CAP M&I	Rio Verde Utilities	Maricopa County	0	0	0	44	44	44	44	109
CAP M&I	San Tan Irrigation District	Maricopa County	0	0	0	0	0	0	0	0
CAP M&I	Scottsdale	Maricopa County	0	0	0	2,831	2,831	2,831	2,831	7,088
CAP M&I	Spanish Trail Water Company	Pima County	0	0	0	163	163	163	163	408
CAP M&I	Surprise	Maricopa County	0	0	0	549	549	549	549	1,376
CAP M&I	Tempe	Maricopa County	0	0	0	231	231	231	231	579
CAP M&I	Tonopah	Maricopa County	0	0	0	0	0	0	0	0
CAP M&I	Tonto Hills Domestic Water Improvement District	Maricopa County	0	0	0	4	4	4	4	10
CAP M&I	Tucson	Pima County	0	0	0	7,729	7,729	7,729	7,729	19,352
CAP M&I	Vail Water Company	Pima County	0	0	0	100	100	100	100	249
CAP M&I	Water Utilities Community Facilities District, Apache Junction	Pinal County	0	0	0	156	156	156	156	392
CAP NIA-A	Phoenix	Maricopa County	0	32,071	37,280	37,280	37,280	37,280	37,280	37,280
CAP NIA-A	Chandler	Maricopa County	0	3,376	3,924	3,924	3,924	3,924	3,924	3,924
CAP NIA-A	Gilbert	Maricopa County	0	1,322	1,537	1,537	1,537	1,537	1,537	1,537
CAP NIA-A	Glendale	Maricopa County	0	587	682	682	682	682	682	682
CAP NIA-A	Mesa	Maricopa County	0	4,775	5,551	5,551	5,551	5,551	5,551	5,551
CAP NIA-A	Scottsdale	Maricopa County	0	2,844	3,306	3,306	3,306	3,306	3,306	3,306
CAP NIA-A	Tempe	Maricopa County	0	20	23	23	23	23	23	23
CAP NIA-B	Buckeye	Maricopa County	0	2,786	2,786	2,786	2,786	2,786	2,786	2,786
CAP NIA-B	Central Arizona Groundwater Replenishment District (CAGRD)	Maricopa County	0	18,185	18,185	18,185	18,185	18,185	18,185	18,185
CAP NIA-B	Carefree Water Company	Maricopa County	0	112	112	112	112	112	112	112
CAP NIA-B	Cave Creek	Maricopa County	0	386	386	386	386	386	386	386
CAP NIA-B	El Mirage	Maricopa County	0	1,318	1,318	1,318	1,318	1,318	1,318	1,318
CAP NIA-B	EPCOR, San Tan (ST)	Pinal County	0	3,217	3,217	3,217	3,217	3,217	3,217	3,217
CAP NIA-B	Freeport	Pima County	0	5,678	5,678	5,678	5,678	5,678	5,678	5,678
CAP NIA-B	Gilbert	Maricopa County	0	1,832	1,832	1,832	1,832	1,832	1,832	1,832
CAP NIA-B	Marana	Pima County	0	515	515	515	515	515	515	515
CAP NIA-B	Queen Creek	Maricopa County	0	4,162	4,162	4,162	4,162	4,162	4,162	4,162
CAP NIA-B	Resolution Copper	Maricopa County	0	2,238	2,238	2,238	2,238	2,238	2,238	2,238
CAP NIA-B	Rosemont Copper	Pima County	0	1,124	1,124	1,124	1,124	1,124	1,124	1,124

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for the No Action Alternative (AF)							
CAP NIA-B	SRP	Maricopa County	0	2,160	2,160	2,160	2,160	2,160	2,160	2,160
CAP NIA-B	Water Utilities Community Facilities District, Apache Junction	Pinal County	0	817	817	817	817	817	817	817
3	City of Yuma[1]	Yuma County	0	0	0	0	0	0	0	0
3	Union Pacific Railroad (formerly Southern Pacific Co.)	Yuma County	0	0	0	0	0	0	0	0
3	Kaman, Inc.	Yuma County	0	0	0	0	0	0	0	0
3	Department of the Navy, MCAS	Yuma County	0	0	0	0	0	0	0	0
3	City of Yuma (cemetery)	Yuma County	0	0	0	0	0	0	0	0
3	Yuma Mesa Fruit Growers' Association	Yuma County	0	0	0	0	0	0	0	0
3	Desert Lawn Memorial Park Association	Yuma County	0	0	0	0	0	0	0	0
3	Chandler (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	0	0	0	0	0
3	Gilbert (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	0	0	0	0	0
3	Glendale (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	0	0	0	0	0
3	Mesa (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	0	0	0	0	0
3	Phoenix (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	0	0	0	0	0
3	Scottsdale (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	0	0	0	0	0
3	Tempe (Salt River Pima-Maricopa Exchange)	Maricopa County	0	0	0	0	0	0	0	0
3	Department of the Army - Yuma Proving Ground	Yuma County	0	0	0	0	0	0	0	0
3	Yuma Union High School District	Yuma County	0	0	0	0	0	0	0	0
2	Cibola National Wildlife Refuge	La Paz County	0	0	0	0	0	0	0	0
2	Lake Mead National Recreation Area	Mohave County	0	0	0	0	0	0	0	0
2	Bureau of Reclamation - Davis Dam	Mohave County	0	0	0	0	0	0	0	0

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for the No Action Alternative (AF)							
2	Imperial National Wildlife Refuge	La Paz County	0	0	0	0	0	0	0	0
2	Havasu Lake National Wildlife Refuge	Mohave County	0	0	0	0	0	0	0	0
		Subtotal	**0**	**89,525**	**96,833**	**128,162**	**128,162**	**128,162**	**128,162**	**178,590**
California										
Priority	**Entitlement Holder**	**County**								
4	Metropolitan Water District of Southern California (MWD) (4)	Los Angeles, Orange, San Diego, Riverside, San Bernardino	0	0	0	200,000	250,000	300,000	350,000	350,000
3	MWD Diversions from QSA (3a from IID and CVWD)		0	0	0	0	0	0	0	0
		Subtotal	**0**	**0**	**0**	**200,000**	**250,000**	**300,000**	**350,000**	**350,000**
Nevada										
Priority	**Entitlement Holder**	**County**								
8 - Balance & Surplus	Southern Nevada Water Authority (SNWA)	Clark	8,000	21,000	25,000	27,000	27,000	27,000	27,000	30,000
8	Big Bend Water District	Clark	0	0	0	0	0	0	0	0
8	Robert B. Griffith Project	Clark	0	0	0	0	0	0	0	0
7	Southern Nevada Water Authority (Formerly Boy Scouts of America)	Clark	0	0	0	0	0	0	0	0
7	Bureau of Reclamation (includes Sportsman Park)	Clark	0	0	0	0	0	0	0	0
7	Nevada Dept. of Wildlife (formerly NV Dept of Game & Fish)	Clark	0	0	0	0	0	0	0	0
7	US Air Force (4,000af) (Delivery from SNWA)	Clark	0	0	0	0	0	0	0	0
6	Las Vegas Valley Water District	Clark	0	0	0	0	0	0	0	0
5	Lakeview Company (Hacienda Casino)	Clark	0	0	0	0	0	0	0	0
5	Pacific Coast Building Products, Inc. (PABCO)	Clark	0	0	0	0	0	0	0	0
4	Basic Water Company (formerly Basic Management, Inc.)	Clark	0	0	0	0	0	0	0	0
4	City of Henderson	Clark	0	0	0	0	0	0	0	0

Summary of Consumptive Use Impacts to Domestic Uses			Range of Analyzed Volumes of Total Shortage to Lower Division States for the No Action Alternative (AF)							
4	Southern Nevada Water Authority (From Basic Water Company)	Clark	0	0	0	0	0	0	0	0
3	Boulder City	Clark	0	0	0	0	0	0	0	0
2	Lake Mead National Recreation Area4, Executive Order No. 5339	Clark	0	0	0	0	0	0	0	0
		Subtotal	**8,000**	**21,000**	**25,000**	**27,000**	**27,000**	**27,000**	**27,000**	**30,000**
		Total	**8,000**	**110,525**	**121,833**	**355,162**	**405,162**	**455,162**	**505,162**	**558,590**
Summary by County										
	Arizona	**# of Entitlement Holders /County**								
	Coconino County	1	0	0	0	0	0	0	0	0
	Gila County	2	0	0	0	156	156	156	156	390
	La Paz County	11	0	0	0	0	0	0	0	1
	Maricopa County	55	0	78,174	85,482	104,683	104,683	104,683	104,683	133,558
	Mohave County	18	0	0	0	0	0	0	0	3,314
	Pima County	13	0	7,317	7,317	17,986	17,986	17,986	17,986	34,031
	Pinal County	8	0	4,034	4,034	5,337	5,337	5,337	5,337	7,296
	Yuma County	16	0	0	0	0	0	0	0	0
	Subtotal Arizona Domestic	**124**	**0**	**89,525**	**96,833**	**128,162**	**128,162**	**128,162**	**128,162**	**178,590**
	California									
	Los Angeles, Orange, San Diego, Riverside, San Bernardino	6	0	0	0	200,000	250,000	300,000	350,000	350,000
	Subtotal California Domestic	**6**	**0**	**0**	**0**	**200,000**	**250,000**	**300,000**	**350,000**	**350,000**
	Nevada									
	Clark	15	8,000	21,000	25,000	27,000	27,000	27,000	27,000	30,000
	Subtotal Nevada Domestic	**15**	**8,000**	**21,000**	**25,000**	**27,000**	**27,000**	**27,000**	**27,000**	**30,000**

[1]This user also holds a PPR entitlement, which is not impacted at these levels of shortages and it was not included here.

Note: PPRs are not impacted at these levels of shortage.

Note: Orange highlights indicate the level at which available water for a user under this priority is reduced to zero.

Note: This analysis does not reflect an operational estimate of when water may cease to be physically available to certain users.

Disclaimer: These modeling results for the No Action Alternative should only be used to compare the relative magnitude of effects reasonably expected to occur under the alternatives evaluated in this SEIS. Modeling assumptions should not be taken as agency position with respect to contract or statutory interpretation, and they are not intended to limit Secretarial discretion with respect to current or future policy. This model is not a substitute for the annual process of reviewing water orders and determining which can be filled, and it cannot replicate the precision required for that process.

D.5.4 Relationship between CRMMS and No Action Alternative Shortage Allocation Model

(See **Section D.3.4** for a discussion on the relationship between CRMMS and the Action Alternative 1 Shortage Allocation Model.) That discussion is largely applicable to differences between CRMMS and the No Action Alternative Shortage Allocation Model, except that the distinction between Stage 1 and Stage 2 is mooted by the limited volumes of shortage under consideration in the No Action Alternative and the fact that participation by California in shortages analyzed under the No Action Alternative is volumetrically defined only by the 2019 DCP. Accordingly, the results of CRMMS and the No Action Alternative Shortage Allocation Model are expected to be more consistent.

While CRMMS is able to model system shortages as a Lower Basin volume, the shortage allocations models do not attempt to represent the effect of potential system shortages and how these shortages might be distributed should such conditions occur. This is of particular importance in the No Action Alternative where system shortages may be more likely under low flow hydrologic scenarios.

Attachment D-1

Reclamation's September 14, 2022 letter notifying interested parties of a Tier 2 Shortage Condition and required DCP contributions in calendar year 2023

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United States Department of the Interior

BUREAU OF RECLAMATION
P.O. Box 61470
Boulder City, NV 89006-1470

IN REPLY REFER TO:
LCB-4200
2.2.4.23

Subject: Notification of Tier 2 Shortage Condition and Drought Continency Plan (DCP) Contributions for the Lower Colorado River in Calendar Year (CY) 2023

Dear Interested Party:

On December 13, 2007, the Secretary of the Interior signed the Record of Decision for *Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead* (2007 Interim Guidelines), which, among other things, identified operational strategies for managing the reservoirs of the Colorado River System under drought and low reservoir conditions. In accordance with the process set forth in the 2007 Interim Guidelines, the Secretary uses the August 24-Month Study projections for the following January 1 system storage and reservoir water surface elevations to determine Lake Mead operations for the following CY. In accordance with the 2007 Interim Guidelines, the Annual Operating Plan for Colorado River Reservoirs for CY 2023 will document the Secretary's determination, which affects the volume of mainstream Colorado River water available for use in CY 2023 within the Lower Division States of Arizona, California, and Nevada.

On August 16, 2022, the Bureau of Reclamation released its Colorado River Basin August 2022 24-Month Study, which projects Lake Mead's January 1, 2023, operating determination elevation to be 1,047.61 feet.[1] Following the release of the August 2022 24-Month Study, Reclamation announced that Lake Mead and the lower Colorado River will operate in a Tier 2 Shortage Condition in CY 2023, consistent with Section XI.G.2.D.1.b of the 2007 Interim Guidelines and in accordance with Article III(3)(c) of the *Criteria For Coordinated Long-Range Operation of Colorado River Reservoirs* and Article II(B)(3) of the 2006 Consolidated Decree of the United States Supreme Court in *Arizona* v. *California*. In addition, the *Lower Basin Drought Contingency Plan Agreement* (LB DCP Agreement) dated May 20, 2019, will also govern the operation of Lake Mead for CY 2023. The projected operation determination elevation of 1,047.61 feet is within the DCP elevation band of 1,045 and 1,050 feet and reflects what is commonly referred to a "Tier 2a" Shortage Condition.

In accordance with the 2007 Interim Guidelines and the LB DCP Agreement, the Tier 2a Shortage Condition results in the following mandatory shortage reductions and DCP Contributions in CY 2023:

[1]The CY 2023 operating determination elevation of 1,047.61 feet was calculated by taking Lake Mead's projected end of CY 2022 physical elevation of 1,040.78 feet, as reported in the August 2022 24-Month Study, and adding 480,000 acre-feet (AF) of water held back in Lake Powell to Lake Mead's capacity to maintain operational neutrality. For more information: https://www.usbr.gov/lc/region/g4000/24mo/.

- Arizona: a shortage reduction of 400,000 AF and DCP Contributions of 192,000 AF, for a total reduction of 592,000 AF, which is approximately 21 percent of the state's annual basic apportionment of 2.8 million AF of Colorado River water.
- Nevada: a shortage reduction of 17,000 AF and DCP Contributions of 8,000 AF, for a total reduction of 25,000 AF, which is 8 percent of the state's annual basic apportionment of 300,000 AF of Colorado River water.
- California: There is no shortage reduction or DCP Contributions required for California in CY 2023.

Additionally, in accordance with Minute 323 to the 1944 Water Treaty,[2] Mexico's Colorado River water delivery will be reduced in the amount of 70,000 AF and Mexico will contribute 34,000 AF of Mexico's Recoverable Water Savings to the Binational Water Scarcity Contingency Plan,[3] for a total Colorado River water delivery reduction of 104,000 AF, which is approximately 7 percent of Mexico's annual allotment of 1.5 million AF of Colorado River water.

Arizona Operations in CY 2023

In accordance with Section XI.G.2.D.1.b of the 2007 Interim Guidelines, 2.4 million AF is apportioned for consumptive use in the state of Arizona in CY 2023 (a reduction of 400,000 AF from its 2.8 million AF basic apportionment). Additionally, in accordance with Section III.B.1.a of Exhibit 1 to the LB DCP Agreement,[4] the state of Arizona will be required to make DCP Contributions in the total amount of 192,000 AF in CY 2023. Consistent with the Arizona mainstream Colorado River water priority system, there are no reductions to the water supply available to first, second and third priority entitlement holders for CY 2023.

Reclamation will implement the state of Arizona's August 6, 2009,[5] Arizona Shortage Sharing Recommendation and the "pool" approach described by letter dated January 25, 2021,[6] to distribute the available Arizona fourth priority Colorado River water supply. Consistent with the Arizona mainstream Colorado River water priority system, the pool approach recognizes that the fourth priority Colorado River water entitlements of the "on-river" mainstream users and the Central Arizona Project (CAP) are co-equal. The Arizona fourth priority Colorado River water available supply for CY 2023 is 1,078,962 AF,[7] which will be shared between the on-river mainstream entitlement holders and CAP. Reclamation anticipates that the available fourth priority supply will be sufficient to satisfy all on-river mainstream water orders, and is coordinating with the Central Arizona Water Conservation District on the distribution of available water supply within the CAP.

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[2] Referring to *Extension of Cooperative Measures and Adoption of a Binational Water Scarcity Contingency Plan in the Colorado River Basin*. Available at: https://www.ibwc.gov/Files/Minutes/Min323.pdf.

[3] The implementing details of Mexico's Binational Water Scarcity Contingency Plan are provided in the *Joint Report of the Principal Engineers with the Implementing Details of the Binational Water Scarcity Contingency Plan in Colorado River Basin*. Available at: https://www.ibwc.gov/Files/joint_report_min323_bi_water_scarcity_contingency_plan_final.pdf.

[4] Referring to *Lower Basin Drought Contingency Operations*. Available at: https://www.usbr.gov/lc/region/g4000/dcpdocs/Attachment-B-Exhibit-1-LB-Drought-Operations.pdf.

[5] Available at: https://new.azwater.gov/sites/default/files/8-6-2009_ADWR_Shortage_%20ecommendation.pdf.

[6] Available at: https://new.azwater.gov/sites/default/files/01.25.21_ADWR_CAWCD_shortage_recommendationLetter.pdf.

[7] Calculated as Arizona's 2.8 million AF basic apportionment, less the average historical consumptive use by Arizona first, second, and third priority users (1,129,038 AF), less the required shortage reduction (400,000 AF), less the required DCP Contributions (192,000 AF). The average historical consumptive use by Arizona first, second, and third priority users is based on the four highest years of consumptive use during the five-year period from 2017-2021.

No unused Arizona mainstream water entitlement will be available for use by Arizona fifth priority mainstream water entitlement holders.

California Operations in CY 2023

In accordance with Section XI.G.2.D.1.b of the 2007 Interim Guidelines, 4.4 million AF is apportioned for consumptive use in the state of California in CY 2023 (no reduction from its basic apportionment). In accordance with Section III.B of Exhibit 1 to the LB DCP Agreement, the state of California is not required to make DCP Contributions in CY 2023.

Nevada Operations in CY 2023

In accordance with Section XI.G.2.D.1.b of the 2007 Interim Guidelines, 283,000 AF is apportioned for consumptive use in the state of Nevada in CY 2023 (a reduction of 17,000 AF from its 300,000 AF basic apportionment). Additionally, in accordance with Section III.B.2.a of Exhibit 1 to the LB DCP Agreement, the state of Nevada is required to make DCP Contributions in the total amount of 8,000 AF in CY 2023. The Southern Nevada Water Authority (SNWA) is the junior priority entitlement holder in the state of Nevada and SNWA and its member agencies hold entitlements of 276,000 AF per year of the state of Nevada's annual 300,000 AF basic apportionment. Pursuant to its cooperative agreement among its member agencies, as amended, SNWA may implement a shortage plan among its member agencies and can coordinate with them to absorb Colorado River water use reductions. SNWA does not, however, anticipate a need for shared reductions in Colorado River water deliveries in CY 2023 because Nevada's total annual consumptive use is anticipated to be lower than the reduced quantity of Colorado River water that will be available in CY 2023.

Lower Colorado River Basin-wide Considerations

Given the projections that Lake Mead's elevation will continue to decline in CY 2023, Reclamation encourages all Colorado River entitlement holders to prudently manage the use of available water supplies. Additionally, Reclamation would like to highlight that, in accordance with the *Inadvertent Overrun and Payback Policy*,[8] **accumulations of inadvertent overruns are not permitted in CY 2023 and are suspended as long as a Shortage Condition is in in effect**. To assist entitlement holders in monitoring their Colorado River water use to ensure they remain within available quantities, Reclamation will project diversions and consumptive use of Colorado River water during CY 2023 and will make these projections available daily on Reclamation's website.[9] Reclamation encourages Colorado River water entitlement holders to use the projections to adjust diversions to remain within their Reclamation-approved annual Colorado River water order.

[8] Available at: https://www.usbr.gov/lc/region/g4000/IOPP.pdf.
[9] Available at: https://www.usbr.gov/lc/region/g4000/hourly/forecast.pdf.

My staff will continue to monitor Colorado River hydrology and water use. We are available to work with you before and during shortage operations. Should you have questions, please contact Daniel A. Bunk, Chief, Boulder Canyon Operations Office, at (702) 293-8013 or dbunk@usbr.gov. Individuals in the United States, who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunication relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

Sincerely,

JACKLYNN GOULD

Digitally signed by JACKLYNN GOULD
Date: 2022.09.14 13:54:52 -07'00'

Jacklynn L. Gould, P.E.
Regional Director

Attachment D-2

Reclamation's September 28, 2022 letter to the Central Arizona Water Conservation District announcing the calendar year 2023 Available CAP Supply

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United States Department of the Interior

BUREAU OF RECLAMATION
P.O. Box 61470
Boulder City, NV 89006-1470

IN REPLY REFER TO:
PXAO-3000
2.2.4.21

VIA ELECTRONIC MAIL ONLY

Theodore C. Cooke
General Manager
Central Arizona Water Conservation District
23636 North 7th Street
Phoenix, AZ 85024

Subject: Calendar Year (CY) 2023 Announcement of Available Central Arizona Project (CAP) Supply

Dear Theodore C. Cooke:

As the Regional Director of the Lower Colorado Basin Region of the Bureau of Reclamation, who is delegated the authority and responsibility of the Secretary of the Interior, the "water master" on the lower Colorado River and the "Contracting Officer" for CAP contracts, I am hereby announcing the Available CAP Supply for the upcoming CY in accordance with contractual commitments. The Available CAP Supply for CY 2023 is 940,836 acre-feet (AF).

As you know, the Colorado River is the primary source of CAP water. Therefore, the Available CAP Supply for CY 2023 is primarily determined by and is subject to the availability of Colorado River water in CY 2023. The Secretary determines the water supply condition on the lower Colorado River for the upcoming year in accordance with the Consolidated Decree in *Arizona* v. *California* 547 U.S. 150 (2006), the *Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968 (Public Law 90-537)* as amended, and the procedures set forth in the *Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operation for Lake Powell and Lake Mead* (2007 Guidelines) and the Lower Basin Drought Contingency Plan Agreement (LB DCP Agreement).

In its letter dated September 14, 2022 (enclosed), Reclamation announced that Lake Mead and the lower Colorado River will operate in a Tier 2a Shortage Condition in CY 2023 with Drought Contingency Plan (DCP) Contributions required, reducing the volume of Colorado River water available to the state of Arizona by 592,000 AF. As noted in the September 14th letter's overview of Arizona operations in CY 2023, the Arizona fourth priority Colorado River water available supply for CY 2023 is 1,078,962 AF on a consumptive use (CU) basis. Of that

amount, 106,318 AF,[1] on a diversion basis, will be available for distribution among mainstream fourth priority or "P4(i)" entitlement holders for use in CY 2023 in accordance with the state of Arizona's August 6, 2009,[2] Arizona Shortage Sharing Recommendation and the "pool" approach described by letter dated January 25, 2021.[3] The remainder is available for diversion as fourth priority water by CAP to fulfill CAP contracts and subcontracts.

Contract No. 14-06-W-245, Amendment No. 2, Between the United States and the Central Arizona Water Conservation District for the Delivery of Water and Repayment of Costs of the Central Arizona Project, dated November 30, 2007, defines Available CAP Supply as "... for any given Year all Fourth Priority Water available for delivery through the Central Arizona Project, water available from CAP dams and reservoirs other than Modified Roosevelt Dam, and return flows captured by the Secretary for CAP use." Available CAP Supply, as calculated below for CY 2023, will be used in contractual determinations related to a CAP Time of Shortage and the distribution of water among CAP contractors and subcontractors.

Determinant of Available CAP Supply	**AF of CU for CY 2023**
Fourth Priority Supply	1,078,962
Minus P4(i) Available Supply (CU Equivalent of 106,318 AF)	- 65,917
Minus Other Use in Arizona[4]	- 809
Equals Fourth Priority Water Available to CAP Contractors and Subcontractors at the CAP Point of Diversion	**= 1,012,236**
Minus CAP System Loss Associated with Fourth Priority CAP Project Water	- 71,400
Plus Water Available from CAP Dams and Reservoirs other than Modified Roosevelt Dam	+ 0
Plus Return Flows Captured by the Secretary for CAP Use	+ 0
Equals Available CAP Supply	**= 940,836**

The Available CAP Supply is the amount of fourth priority water that Reclamation estimates will be available and can be committed for delivery to CAP contractors and subcontractors in CY 2023. However, the Central Arizona Water Conservation District must adjust its CY 2023 CAP Colorado River water diversion as needed to remain within the diversion volume approved by Reclamation that reflects uses by higher priority Colorado River water entitlement holders as they occur during CY 2023. As Reclamation works throughout the basin to adapt to these unprecedented drought conditions, the Lower Colorado Basin Regional Office and the Phoenix Area Office are committed to ongoing coordination with CAP stakeholders.

[1] The P4(i) pool will receive 9.85% of the Arizona fourth priority Colorado River water available for CY 2023, calculated as 164,652 AF divided by the difference between Arizona's 2,800,000 AF basic apportionment and the average historical consumptive use by Arizona first, second, and third priority users (1,129,038 AF). The average historical consumptive use by Arizona first, second, and third priority users is based on the four highest years of consumptive use during the five-year period from 2017-2021.

[2] Available at: https://new.azwater.gov/sites/default/files/8-6-2009_ADWR_Shortage_%20ecommendation.pdf.

[3] Available at: https://new.azwater.gov/sites/default/files/01.25.21_ADWR_CAWCD_shortage_recommendationLetter.pdf.

[4] Three-year average of consumptive use on Cibola Island and outside Present Perfected Right No. 7

Should you have questions, please contact Alexander B. Smith, Deputy Area Manager, Phoenix Area Office, at (623) 773-6215 or alexandersmith@usbr.gov. Individuals in the United States, who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunication relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

Sincerely,

Acting for STACY WADE

Digitally signed by STACY WADE
Date: 2022.09.28 09:44:46 -07'00'

Jacklynn L. Gould, P.E.
Regional Director

Enclosure

cc: Thomas Buschatzke
Director
Arizona Department of Water Resources
1110 W. Washington Street, Suite 310
Phoenix, AZ 85007

Attachment D-3

Exhibit 5.3.4.1 to the Tohono O'odham Settlement Agreement, *Secretary's Approach for Determining the Amount of Water Available to the Nation During a Time of Shortage Under 1980 Contract*

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EXHIBIT 5.3.4.1

SECRETARY'S SHORTAGE SHARING APPROACH

UNDER THE 1980 CONTRACT

Secretary's Approach for Determining
The Amount of Water Available to the Nation
During a Time of Shortage Under 1980 Contract

If the Available CAP Supply is insufficient to fill all orders for CAP water, the Secretary shall take the following steps, in succession, as necessary to match the available supply with orders for the delivery of CAP water in each of the categories described below:

1. First, miscellaneous uses of CAP water are reduced, pro rata. If, after eliminating all miscellaneous uses of CAP water, there is still insufficient available CAP water to meet outstanding orders for the delivery of CAP water, the Secretary shall take the following measure.

2. Uses of CAP NIA Priority Water are reduced, pro rata. If, after eliminating all uses of CAP NIA Priority Water, there is still insufficient available CAP water to meet outstanding orders for delivery of CAP water, then the Secretary shall take the following measure.

3. Uses of CAP M&I Priority Water in excess of 510,000 acre-feet are reduced, pro rata. If, after eliminating all uses of CAP M&I Priority Water in excess of 510,000 acre-feet, there is still insufficient available CAP water to meet outstanding orders for delivery of CAP water, then the Secretary shall take the following measure.

4. If the preceding reductions do not bring CAP water orders in line with the Available CAP Supply, uses of CAP Indian Priority Water in excess of 291,574 acre-feet are reduced, in accordance with the Secretarial Decision published in the Federal Register on March 24, 1983.

5. If the preceding reductions do not bring CAP water orders in line with the Available CAP Supply, the available CAP water supply will be allocated between users of CAP Indian Priority Water and users of CAP M&I Priority Water on a 36.37518 and 63.62482 percentage basis, respectively.

6. If step 5 is implemented, the amount of water available for the Nation shall be determined by multiplying the amount of CAP Indian Priority Water by the ratio of the amount of water delivered pursuant to the Nation's CAP Water Delivery Contract in the latest non-shortage Year relative to the total quantity of water delivered to all CAP Contracts for Indian Priority Water in that same Year.