

APPENDIX 1

CLARK COUNTY POPULATION FORECAST AND ASSUMPTIONS USED IN 2021 WATER RESOURCE PLAN DEMAND PROJECTIONS

Year	Lower Demand Population ¹	Upper Demand Population ²
2021	2,417,000	2,438,000
2025	2,640,000	2,750,000
2030	2,859,000	3,087,000
2035	3,018,000	3,362,000
2040	3,138,000	3,591,000
2045	3,228,000	3,780,000
2050	3,296,000	3,936,000
2055	3,345,000	4,059,000
2060	3,383,000	4,158,000
2065	3,421,000	4,245,000
2070	3,459,000	4,320,000
2072	3,474,000	4,346,000

Endnotes:

- 1 "Population Forecasts: Long-Term Projections for Clark County, Nevada 2021–2060," June 2021, Center for Business and Economic Research at the University of Nevada, Las Vegas (projected through 2072).
- 2 Adjusted "Population Forecasts: Long-Term Projections for Clark County, Nevada 2020–2060," June 2021, Center for Business and Economic Research at the University of Nevada, Las Vegas (projected through 2072 with a 15 percent increase by 2041 and a 25 percent increase by 2072).

APPENDIX 2

Year	Lower Demand (86 GPCD Conservation goal)	Upper Demand (86 GPCD Conservation goal)	Upper Demand (98 GPCD Lower Conservation Scenario)
2021	291,000	294,000	296,000
2025	298,000	310,000	322,000
2030	295,000	318,000	345,000
2035	281,000	314,000	357,000
2040	293,000	335,000	376,000
2045	301,000	353,000	389,000
2050	307,000	367,000	399,000
2055	312,000	379,000	405,000
2060	316,000	388,000	415,000
2065	319,000	396,000	424,000
2070	323,000	403,000	431,000
2072	324,000	405,000	434,000

APPENDIX 3

IRPAC 2020 RECOMMENDATIONS

The SNWA Board of Directors established the 11-member Integrated Resource Planning Advisory Committee (IRPAC 2020) in 2019 to evaluate and develop recommendations on various issues critical to the SNWA’s mission. As detailed below, the committee’s deliberations resulted in 22 recommendations that were accepted by the SNWA Board of Directors in September 2020. Major topics include water resources, water conservation, facilities and rates.

GENERAL RECOMMENDATIONS

1. Work with community stakeholders to implement IRPAC recommendations.

MCCP AND FACILITIES

2. Maintain current asset management funding levels and practices to ensure reliable water treatment and transmission in Southern Nevada.
3. Pursue projects to meet Nevada’s Renewable Portfolio Standard.
4. Include the candidate projects presented to IRPAC 2020, totaling \$3.166 billion, in the SNWA’s Major Construction and Capital Plan (MCCP).

WATER RESOURCES

5. Pursue emerging water resource opportunities with Colorado River partners to increase Nevada’s water supplies, as presented to IRPAC on December 18, 2019.
6. Require out-of-valley development to return wastewater to Lake Mead and embed the principles of the SNWA’s Out-of-Valley Water Use Policy within municipal codes and Las Vegas Valley Water District (LVVWD) Service Rules.

CONSERVATION

7. Pursue changes necessary to achieve the SNWA’s current water conservation goal of a minimum of 105 GPCD by 2035 and further efforts to achieve additional conservation thereafter.
8. Reduce existing non-functional turf acreage by 50 percent by 2035.
9. Embed the principles of the SNWA’s Non-Functional Turf Resolution in municipal codes and LVVWD Service Rules.
10. Limit future installations of cool-season turf in public spaces and expedite the conversion of cool season turf to warm-season turf at existing public facilities.
11. Implement smart controller technology to automate landscape watering compliance and increase outreach and enforcement efforts.
12. Pursue implementation of advanced metering infrastructure and develop partnerships and programs to improve the speed of customer leak repairs.

13. Evaluate changes necessary to reduce current and future consumptive water losses associated with evaporative cooling technology.
14. Establish an efficiency review policy and process for new large water users to encourage efficient development and disincentivize consumptive use.
15. Continue to make investments that will maintain or improve the existing water loss rates among wholesale and retail water purveyors.
16. Continue outreach efforts to engage the public and effectuate the changes needed to meet the community's regional conservation goal.

FUNDING

17. Fund the MCCP with a combination of debt capital and pay-go to manage unrestricted reserve balances at adequate levels consistent with the Reserve Policy.
18. Implement a six-year annual increase to SNWA charges effective January 2022 to: 1) Phase-in an inflationary catch up, and 2) Adjust for subsequent annual inflation within the six-year period: – Increase the Connection Charge by 9.5% annually for six years effective Mar. 2022 – Increase the Infrastructure Charge by 4.6% annually for six years effective Jan. 2022 – Increase the Commodity Charge by 4.8% annually for six years effective Jan. 2022.
19. Implement an indexed rate component to the SNWA Infrastructure and Commodity charges annually, effective January 2028, and limit future increases to a floor of 1.5% and a ceiling of 4.5% each year. – Infrastructure Charge in accordance with Engineering News Record (ENR) index – Commodity Charge in accordance with the Consumer Price Index (CPI) Do not implement inflationary increases in a year in which the five-year forecast unrestricted reserve balance is projected to be greater than 150% of targeted reserve balances.
20. Implement an indexed rate component to the SNWA Connection Charge annually in accordance with the ENR index, effective March 2028.
21. Eliminate the \$16.1 million Connection Charge threshold, require SNWA Connection Charge revenues to fund the pay-go portion of capital expenditures and related debt service, and exclude from funding recurring operating expenses.
22. Provide IRPAC 2020 with an annual update of the funding model and convene the committee as necessary.

APPENDIX 4

WATER SUPPLY DETAIL

Figure A-1 from the Colorado River Basin Study illustrates the range of Colorado River inflows considered under observed hydrology and climate change projections, providing useful detail to compare the water supply conditions presented in Chapter 4. The graph on the left was developed using observed resampled average annual Colorado River natural flow at Lees Ferry. It shows the variability of future hydrology based on observed records, with a range of Colorado River inflow between approximately 13.7 MAFY and 16.3 MAFY. Mean inflow for the period of record at that time is approximately 15 MAFY.

The graph on the right considers how climate change might impact Colorado River inflows and flow variability. It was developed using Downscaled General Circulation Model (Downscaled GCM) projections and simulated hydrology, which project the climate will continue to warm in the future. The range of inflow for the Downscaled GCM projection is between approximately 10 MAFY and 17 MAFY. The mean inflow is approximately 13.7 MAFY.

The water supply conditions presented in Chapter 4 include one water supply condition within range of the average observed natural flows and two below the range of average observed natural flow. The water supply conditions are more closely aligned with Downscaled GCM projections, as two of the modeled water supply conditions are within the mid-range of the Downscaled GCM projections and one below of the range of the Downscaled GCM projections.

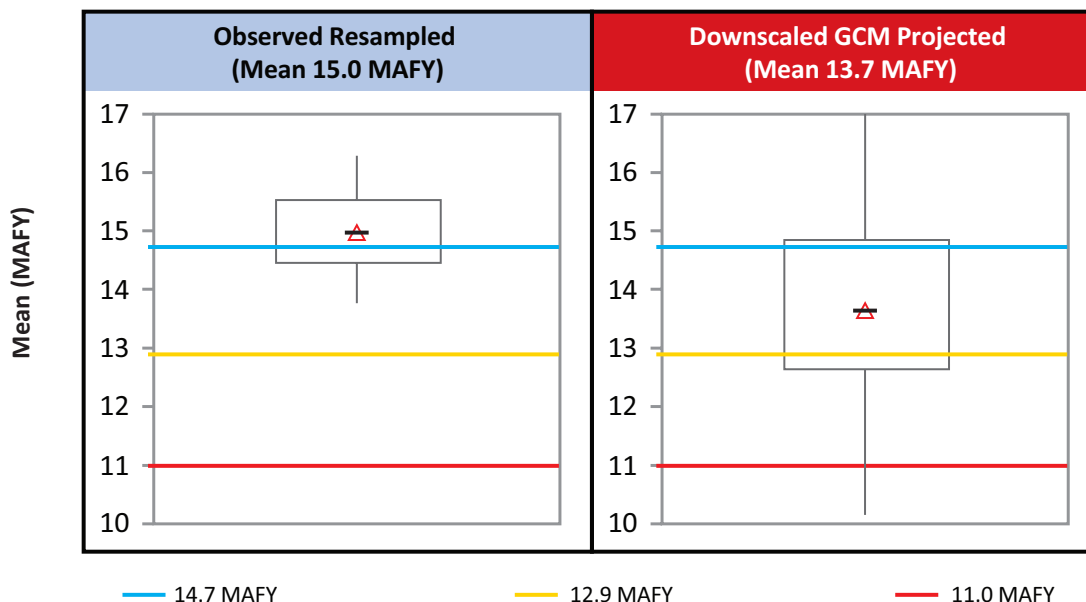


FIGURE A-1 Average Annual Colorado River Natural Flows at Lees Ferry in Million Acre-Feet per Year (MAFY)

ENDNOTES

- 1 "Colorado River Basin Water Supply and Demand Study Technical Report B – Water Supply Assessment," December 2012, U.S. Bureau of Reclamation.
- 2 The lower and upper borders of each box in the graph represent the 25th and 75th percentile values (lower quartile Q1 and upper quartile Q3). The band within each box denotes the median (dash) and the mean (triangle) values. The value

Q3-Q1 is the interquartile range or IQR. Thus, 50 percent of the values reside within the box and the IQR is the height of the box. The upper and lower vertical lines, or whiskers, cover the points outside of the box. Each of the whiskers covers 25 percent of the values. The colored lines in the graphs represent average annual flow for the water supply conditions used in Chapter 4.

APPENDIX 5

VOLUME BY STATE AND COUNTRY

The following table summarizes shortages, delivery reductions, DCP contributions and other water savings by volume under the 2007 Interim Guidelines, Minute 323, Lower Basin DCP and the Binational Water Scarcity Contingency Plan. Participants include Arizona (AZ), Nevada (NV), California (CA) and Mexico (MX). Volumes are represented in thousands of acre-feet (kaf).

Lake Mead Elevation (ft. above mean sea level)	2007 Interim Guidelines Shortages		Minute 323 Delivery Reductions	Total Combined Reductions	DCP Water Savings Contributions			Binational Water Scarcity Contingency Plan Savings	Combined Volumes by States and Country					
	AZ	NV	MX	Lower Basin & Mexico Total	AZ	NV	CA	MX	AZ Total	NV Total	CA Total	Lower Basin Total	MX Total	Lower Basin & Mexico Total
1,090>1,075	0	0	0	0	192	8	0	41	192	8	0	200	41	241
1,075>1,050	320	13	50	383	192	8	0	30	512	21	0	533	80	613
1,050>1,045	400	17	70	487	192	8	0	34	592	25	0	617	104	721
1,045>1,040	400	17	70	487	240	10	200	76	640	27	200	867	146	1,013
1,040>1,035	400	17	70	487	240	10	250	84	640	27	250	917	154	1,071
1,035>1,030	400	17	70	487	240	10	300	92	640	27	300	967	162	1,129
1,030-1,025	400	17	70	487	240	10	350	101	640	27	350	1,017	171	1,188
<1,025	480	20	125	625	240	10	350	150	720	30	350	1,100	275	1,375