SNWA WATER RESOURCE PORTFOLIO

THIS CHAPTER DISCUSSES THE DIVERSE SET OF WATER RESOURCE OPTIONS ACQUIRED BY THE SNWA TO RELIABLY MEET THE COMMUNITY'S CURRENT AND FUTURE WATER RESOURCE NEEDS.

INTRODUCTION

Since 1991, SNWA has worked to establish and manage a flexible portfolio of water resources, an approach commonly used in resource planning. Having a portfolio of resources allows SNWA to assess its overall water resource options and to make appropriate decisions regarding which resources to develop and use when necessary. Key factors considered in determining acquisition, priority of development, and use include the availability, accessibility, cost and need of the resource. Water supply diversification is also an important consideration. Having a portfolio of resource options helps to offset risks typically associated with dependence on any single resource.

The SNWA's water resource portfolio, along with associated facility planning and permitting efforts, provides SNWA flexibility in adapting to changing supply and demand conditions, and helps ensure that community water demands can be met. Resources in the portfolio are described in consumptive net use volumes and are organized into three categories:

- Permanent Resources
- Temporary Resources
- Future Resources

PERMANENT RESOURCES

For the purpose of this plan, "Permanent Resources" are resources available for use over the 50-year planning horizon. These resources make up a base of supplies and can be used during any Colorado River operating condition, including shortage (subject to certain restrictions).

Permanent resources include Colorado River supplies (including return-flow credits); Tributary Conservation Intentionally Created Surplus (ICS) and Imported ICS; permitted groundwater rights in the Las Vegas Valley; and reclaimed water. Descriptions of these resources and details regarding their availability are discussed in the following section.

Colorado River—Nevada Basic Apportionment

Nevada's 300,000 AFY Colorado River apportionment continues to be Southern Nevada's largest and most critical permanent resource. Nevada's right to this water was established under the 1922 Colorado River Compact and the Boulder Canyon Project Act (BCPA), which together set forth where and how Colorado River water is used.

SNWA Contract. Section 5 of the BCPA requires entities wishing to divert Colorado River water within the states of Arizona, California and Nevada to have a contract with the Secretary of the Interior for that water. Early on, the agencies that would form the SNWA contracted for most of Nevada's Colorado River allocation.

With the creation of the SNWA in 1991, these agencies agreed to collaboratively manage Southern Nevada's current and future water resources, representing a significant shift in the overall management of the region's water supply. In the years that followed, SNWA determined that additional Colorado River water was available and contracted with the Secretary of the Interior in 1992 and 1994 to acquire these resources.[1] SNWA's total estimated Colorado River entitlement is 272,205 AFY of Nevada's 300,000 AFY allocation. Nevada's remaining apportionment is contracted to other users.[2] SNWA also holds contracts for any surplus Colorado River water available to Nevada.

Unused Apportionment. As part of its 1992 Colorado River contract, the SNWA has a right to the unused apportionment of other Nevada Colorado River contract holders. The SNWA anticipates some of this water will be available for use in the planning horizon, and plans to utilize this water if and when it is available.

SNWA may also choose to leave a portion of Nevada's unused allocation in Lake Mead to help alleviate the impacts of drought conditions and avoid critical Lake Mead elevations.

Return-Flow Credits. The BCPA defines all Colorado River apportionments in terms of "consumptive use." Consumptive use is defined as water diversions minus any water that is returned to the Colorado River. These returns are also referred to as "return-flow credits." With return-flow credits, Nevada can divert more than its 300,000 AFY apportionment, as long as there are sufficient flows returned to the Colorado River to ensure the consumptive or "net use" is no greater than 300,000 AFY.[3]

Return-flow credits constitute a significant portion of Southern Nevada's permanent Colorado River resource, expanding SNWA's Colorado River supply allocation by approximately 75 percent. Nevada's Colorado River return-flows consist mostly of highly-treated wastewater that is returned to Lake Mead via the Las Vegas Wash.

Flood Control Surplus. If Lake Mead is full or nearly full, the Secretary of the Interior can declare a flood control surplus, which allows the Lower Basin States to use Colorado River water in excess of their apportionment that would have been released to control potential flooding along the Colorado River system.[4]

Based on current Lake Mead water levels and climate variability in the Colorado River Basin, SNWA does not assume that flood control surplus water will be available during the planning horizon. However, SNWA will utilize this resource as a priority, when it is available.

Domestic Surplus. As discussed in Chapter 2, the Interim Guidelines defined both surpluses and shortages, and detailed provisions for water use during each condition. Under a "Domestic Surplus," SNWA is allowed to consumptively use up to 400,000 AFY of Colorado River water when Lake Mead is above 1,145 feet. The 2015 Water Resource Plan does not assume availability or use of domestic surplus water during the planning horizon. However, SNWA will utilize this resource as a priority, when it is available.

Intentionally Created Surplus

In 2007, as part of the Interim Guidelines, SNWA entered into a series of agreements that ensure the availability and delivery of water resources developed under provisions for Intentionally Created Surplus (ICS).[5] As discussed below, Tributary Conservation ICS and Imported ICS enable SNWA to develop some of its surface and groundwater rights that are located in Nevada, near the Colorado River. The SNWA may develop these rights as needed by allowing them to flow into Lake Mead in exchange for Tributary Conservation ICS and Imported ICS credits.

Tributary Conservation and Imported ICS credits can be used during the year created and under any operating condition, including shortage (taken as Developed Shortage Supply or "DSS" during a declared shortage).[6] As required by the Interim Guidelines, these resources are subject to a one-time deduction of five percent for the benefit of Lake Mead system storage. As discussed in the "Temporary Resources" section on the following pages, water that is not used in the year it is created is converted to Extraordinary Conservation ICS. When needed, the credits will be withdrawn as Colorado River water through SNWA facilities at Lake Mead. Resources that are diverted can be returned to the system for return-flow credits.

Tributary Conservation ICS. The SNWA is allowed to develop the portion of its Muddy and Virgin River surface water rights that have a priority date that precedes the BCPA (pre-1929 rights) as Tributary Conservation ICS. The SNWA can develop up to 50,000 AFY of Tributary Conservation ICS credits. To date, approximately 14,200 AFY of permanent rights have been acquired. In addition to its permanent rights, SNWA has acquired approximately 13,000 AFY of leased rights, with terms of use ranging from two to 20 years. The SNWA anticipates 30,000 AFY of Tributary Conservation ICS will be developed for use over the planning horizon.

Imported ICS. The SNWA may develop its Coyote Spring Valley groundwater rights as Imported ICS. These resources will be pumped from the aquifer and conveyed to Moapa Valley Water District and Muddy Valley Irrigation Company facilities via SNWA's 15-mile pipeline. Under various agreements, these entities will convey the water to the Muddy River, which flows into Lake Mead, for ICS credit.

Up to 15,000 AFY of water can be developed as Imported ICS. The SNWA has acquired 9,000 AFY of permitted groundwater rights in Coyote Spring Valley. The SNWA anticipates 9,000 AFY of Imported ICS will be developed as needed over the planning horizon.

Las Vegas Valley Groundwater Rights

All surface water and groundwater rights in the state of Nevada are administered by the Nevada State Engineer and fall under the purview of Nevada Water Law.[7]

Of the seven SNWA member agencies, the LVVWD and North Las Vegas have permanent groundwater rights totaling 40,629 and 6,201 AFY, respectively. These two entities operate about 100 permitted municipal wells in the Las Vegas Valley.

The municipal groundwater rights of the SNWA member agencies are among the most senior groundwater rights in the Las Vegas Valley. As such, these rights are protected even though new rights were granted to other users. Groundwater resources remain a critical component of the SNWA Resource Plan.

Water Reuse

The term water reuse generally means to recycle wastewater to support a secondary use. In Southern Nevada, nearly all water used indoors is recycled for either direct or indirect reuse. Direct reuse involves capturing, treating and reusing wastewater flows for non-potable uses such as golf course or park irrigation. Indirect reuse consists of recycling water by way of treatment and release to the Colorado River for return-flow credits.

The City of Boulder City, City of Las Vegas, Clark County Water Reclamation District, City of Henderson and City of North Las Vegas each operate wastewater treatment facilities that contribute to the region's direct and indirect reuse.

Approximately 22,000 AFY of water is directly reused in Southern Nevada for golf course irrigation, power plant cooling, sand and gravel operations, and municipally operated common area landscape irrigation. Indirect reuse accounts for return-flow credits associated with all SNWA Colorado River water resources.

While direct reuse of Colorado River water may have advantages over indirect reuse in terms of lower pumping cost, additional direct reuse does not extend Southern Nevada's Colorado River supply. This is because an increase in direct reuse will reduce the amount of water available for indirect reuse through return-flow credits by a similar amount.

The Colorado River Basin

Colorado River operations and water use are governed by a series of contracts, regulatory guidelines, federal laws, compacts, a treaty with Mexico, court decisions and decrees—collectively known as the "Law of the River." The 1922 Colorado River Compact divided the Colorado River Basin into two divisions—the Upper Division and the Lower Division, allocating 7.5 million acre-feet per year to each. As part of the Boulder Canyon Project Act and the 1948 Upper Colorado River Basin Compact, the Upper and Lower Divisions divided their respective share amongst individual states within each division. In addition, 1.5 MAFY was allocated to Mexico as part of a 1944 treaty.[8]

The Compact was forged in a time of abundance, during one of the wettest periods in recorded history. More recent reviews, modeling and studies of Colorado River flows have determined an imbalance in long-term Colorado River resources and future demands. State and federal partners agree that there is a strong potential for significant supply and demand challenges in coming decades, and are working together to offset potential water supply reductions.

Intentionally Created Surplus

The Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead (Interim Guidelines) were adopted in 2007 by the Secretary of the Interior. Among other things, the Interim Guidelines established requirements for the creation, delivery, and accounting for a new form of surplus called Intentionally Created Surplus (ICS).

ICS was instituted to encourage the efficient use and management of Colorado River water and to increase the water supply in Colorado River system reservoirs. The creation of ICS helps to reduce the likelihood, magnitude and duration of shortages in the Lower Basin.

Efforts to help stabilize Lake Mead water levels are of key importance to the SNWA—a new intake has been constructed and new pumping facilities are planned to allow for deeper water access in the event that SNWA's upper intakes become inoperable.

Map of Virgin/Muddy Rivers & Coyote Spring

As shown in Figure 3.1, approximately 40 percent of water used in the SNWA service area results in highly-treated wastewater. Of that, approximately 99 percent is recycled.

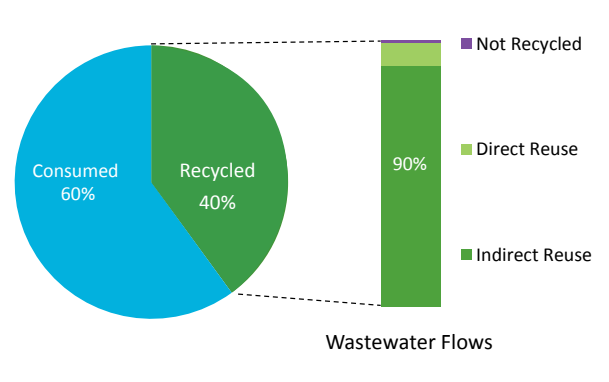

FIGURE 3.1 **SNWA Water Use and Recycling**

Reuse of In-State Groundwater Resources

The water resources described in this chapter have generally been quantified and discussed based on consumptive use volumes. Water accounting for return-flow credits, which extends SNWA's diversions of Colorado River water, includes provisions for the reuse of imported in-state groundwater resources. Under these provisions, in-state groundwater resources are similarly extended by approximately 75 percent.

TEMPORARY RESOURCES

Beginning in the early 1990s and continuing today, SNWA has worked closely with other basin states to maximize opportunities for flexible use of Colorado River water. Through local and interstate arrangements, SNWA has acquired a number of temporary resources that serve as an important management tool—these resources can be used to meet potential short-term gaps between supply and demand, serving as a bridge to meet demands while other future resources are being developed. In some cases, temporary resources can be used to offset reductions in permanent supplies due to shortages.

For the purpose of this plan, "Temporary Resources" are defined as banked resources. As part of its overall water resource strategy, SNWA reserves water in years when Nevada's Colorado River allocation exceeds the community's demands. These resources are "banked" for future use in the form of storage credits. The volume of storage credits can change over time based on continued storage and use of supplies. As discussed below, SNWA stores banked resources locally, as well as through banking agreements with other states.

Southern Nevada Water Bank

As of 2014, SNWA has accumulated approximately 337,000 acre-feet of water stored in the Las Vegas Valley aquifer for future use through an agreement with LVVWD. SNWA may recover water banked under this agreement in any water supply condition, including shortage. This plan assumes a maximum recovery rate of 20,000 AFY.[9]

California Water Bank

Between 2004 and 2012, SNWA entered into various agreements that allow it to store Nevada's unused Colorado River water in California. As of 2014, Nevada has banked more than 205,000 acre-feet of water in California. This plan assumes a recovery up to 30,000 AFY during normal and shortage conditions, subject to agreement terms.[10]

Arizona Water Bank

In 2013, SNWA approved an amendment to the 2001 water banking agreement with the Arizona Water Banking Authority.[11] Based on the amended agreement, SNWA stored approximately 601,000 acre-feet of Colorado River water underground in Arizona's aquifers for SNWA's future use. Additional water can be banked on a pay-as-you-go basis up to 1.25 million acre-feet.

For SNWA to recover this stored water, Arizona will utilize the banked water and forego use of a like amount of Colorado River water. The SNWA will then divert the water from facilities at Lake Mead. SNWA can recover up to 40,000 AFY during any water supply condition and may recover up to 60,000 AFY during a declared shortage.

Intentionally Created Surplus

The SNWA has participated in a number of efforts to expand its portfolio of temporary resources under provisions specified in the Interim Guidelines for Intentionally Created Surplus.

As discussed earlier in this chapter, the Interim Guidelines created several forms of Intentionally Created Surplus: Tributary Conservation ICS and Imported ICS (discussed under "Permanent Resources"), as well as System Efficiency ICS and Extraordinary Conservation ICS. In 2012, an additional form of ICS was created as part of an international pilot program, referenced here as Bi-National ICS.

System Efficiency ICS. In 2007, SNWA collaborated with the Department of the Interior and other project partners to fund construction of the Warren H. Brock Reservoir. This System Efficiency ICS project provides Southern Nevada with 400,000 acre-feet of ICS credits; no more than 40,000 acre-feet are available for consumptive use each year through 2036. These credits are stored in Lake Mead, helping to bolster Lake Mead water levels. System Efficiency ICS can not be used under a Colorado River shortage condition.

In 2009, Nevada also collaborated with municipal water agencies in California, Arizona and the U.S. Bureau of Reclamation in a pilot operation of the Yuma Desalting Plant. The plant was constructed in 1992 to treat brackish agricultural drainage water in the United States for delivery to Mexico as part of its treaty obligation. Flood damage in 1993 caused the facility to cease operations.

As part of the 2009 collaborations, the facility was operated at one-third capacity to collect data on operational viability for long-term use. In exchange for funding the pilot test, the states received System Efficiency ICS. SNWA's share was 3,050 acre-feet. These resources are temporarily stored in Lake Mead as System Efficiency ICS and can be used during normal operating conditions.

Extraordinary Conservation ICS. Tributary Conservation and Imported ICS credits are converted to Extraordinary Conservation ICS credits if they are not used in the year they are created. Under the Interim Guidelines, the SNWA can accumulate up to 300,000 acre-feet of credits. These ICS credits are banked in Lake Mead and are reduced by 3 percent each year to account for evaporation losses.

Unlike Tributary Conservation and Imported ICS, Extraordinary Conservation ICS is not available during declared shortages. As of 2014, SNWA has stored approximately 162,000 acre-feet of Extraordinary Conservation ICS credits. Due to restrictions during shortage, SNWA does not assume use of this resource during the planning horizon. However, the SNWA will utilize this resource as needed if and when it is available.

Recharge & Banking

Artificial Recharge Well

LVVWD began storing or "banking" water in the Las Vegas Valley in the late 1980s. In Southern Nevada, banking is accomplished through artificial recharge or in-lieu recharge.[12] Artificial recharge involves the direct injection of treated unused Colorado River water into the local groundwater aquifer; in-lieu recharge is accomplished by not pumping non-revocable groundwater rights to acquire storage credits that are available for future use.

The LVVWD recharge/recovery wells have a total injection capacity of over 100 million gallons per day making it the largest recharge program of its kind in the world. The SNWA administers the Las Vegas Valley Groundwater Management Program, which includes a program to purchase artificial recharge credits and ensure the associated volume remains in the aquifer to protect against unreasonable water level declines.[13]

Bi-National ICS. In 2012, the United States and Mexico established Minute 319 to the 1944 U.S./Mexico water treaty. The historic Minute 319 and related agreements define Colorado River deliveries to Mexico under both high- and low-reservoir conditions. It also allows Mexico to defer its Colorado River water deliveries and to store water in Lake Mead. The agreement helps to maintain Lake Mead water levels, delay potential shortages, and creates additional certainty for all water users particularly during shortages.

Minute 319 also allows the SNWA to invest in Mexico's infrastructure improvements in exchange for Bi-national ICS credits. This accord is part of a pilot program that also created a "pulse flow" to the Colorado River Delta in 2014. Before the expiration of the Minute, SNWA will obtain 23,750 acre-feet of Bi-National ICS; these credits cannot be used during shortage conditions.

FUTURE RESOURCES

For the purpose of this plan, "Future Resources" are defined as those resources expected to be available to SNWA at some point during the planning horizon. In some instances, water resources are quantified subject to water right permitting, while the availability and development of others requires further research and analysis.

Water resource conditions have changed significantly over the years for many of the western states, including Nevada. During that time, SNWA has worked to implement water resource strategies that maximize use of permanent and temporary resources, delaying the development of costly facilities that may not be needed in the future.

Development of the Future Resources discussed below will require additional environmental permitting as well as project design and construction of water delivery infrastructure. In some cases, litigation will be necessary. For planning purposes, SNWA estimates a 10-year lead time is needed from project authorization by its Board of Directors to first water delivery.

Desalination

The SNWA is engaged with other Colorado River Basin states and water users, the Bureau of Reclamation and the country of Mexico to actively explore and investigate potential seawater and brackish water desalination projects in the state of California and in the country of Mexico. One example includes ongoing exploration for operation of the Yuma Desalting Plant to treat brackish water. Another project being actively evaluated is a seawater desalination plant at Rosarito Beach in Mexico.

The latter was included as a potential Bi-national project under Minute 319 with Mexico.

In-State Groundwater

The SNWA has a number of groundwater permits and applications in southern and eastern Nevada based on applications filed by the LVVWD in 1989. Many of these applications have been permitted by the Nevada State Engineer in accordance with Nevada Water Law, while others require further review and analysis. Figure 3.2. depicts the hydrographic areas associated with these permits/applications. Below is a summary of each resource and its current standing.

Garnet and Hidden Valleys. The SNWA has permitted rights to 2,200 AFY of groundwater in Garnet and Hidden valleys. The majority of these rights have been leased to dry-cooled power plants located in Garnet Valley. The remaining resources are anticipated to be developed as needed within these valleys.[14]

Three Lakes Valley (North and South) and Tikaboo Valley (North and South). Between 2003 and 2006, the Nevada State Engineer issued a series of rulings granting SNWA rights to 10,605 AFY of groundwater in these basins. The SNWA is working to develop options for delivery of 8,018 AFY of the groundwater rights from Three Lakes Valley North and South and Tikaboo Valley South into the northwest portion of the Las Vegas Valley.

Indian Springs. The SNWA holds applications filed in 2004 for 16,000 AFY of groundwater in Indian Springs. The SNWA intends to pursue the development of these resources when needed to help meet long-term demands.

Delamar, Dry Lake, Cave and Spring Valleys. In 2012, the Nevada State Engineer issued a ruling on SNWA's 1989 groundwater applications in Spring, Delamar, Dry Lake and Cave valleys. The ruling granted SNWA 61,127 AFY from Spring Valley and 22,861 AFY from Delamar, Dry Lake and Cave valleys.

The 2012 ruling requires the 1989 groundwater permits in Spring Valley to be developed in three stages, limited to 38,000 AFY for the first eight years, 50,000 AFY for the next eight years, and 61,127 AFY in the years thereafter. In addition, SNWA committed to the U.S. Bureau of Land Management that groundwater development in Cave Valley would occur in three stages, limited to 2,600 AFY for the first five years, 3,900 AFY for the next five years,

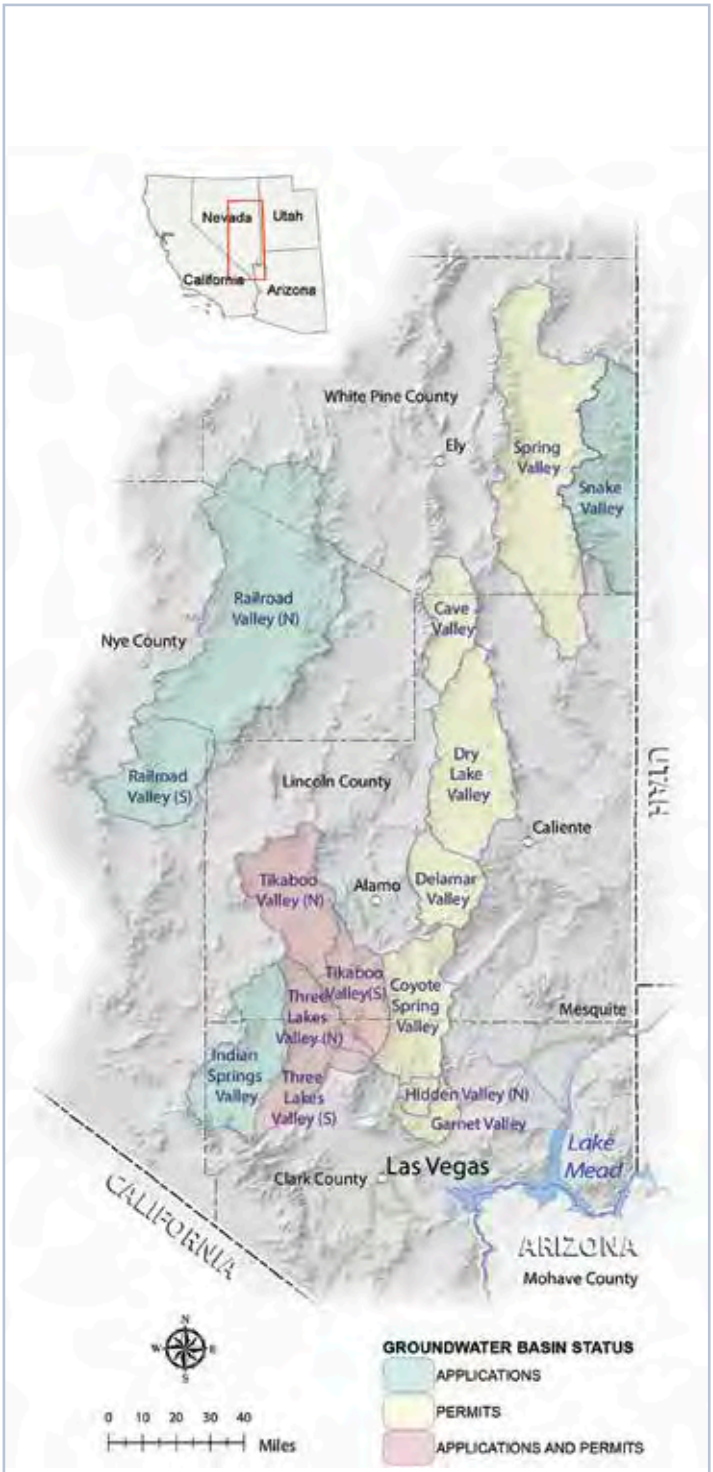

FIGURE 3.2 **In-State Groundwater Resources**

Nevada Water Law

Nevada water law is considered one of the most comprehensive water laws in the west.[15]

Unlike Colorado River water, which is managed by the U.S. Bureau of Reclamation, groundwater and surface water in Nevada (excluding the Colorado River) is administered and managed by the state. Nevada's first water law was passed in 1866 and has been amended many times since then.

The Nevada Division of Water Resources, also known as the Office of the State Engineer, regulates these supplies. The Office was created in 1903 to protect existing water rights and to bring about a better method for utilizing the state's water resources.

Today, Nevada water law serves the people of the state by providing the rules for acquiring and maintaining a water right, as well as guidelines for the State Engineer in managing the state's valuable water resources. Nevada water law follows the doctrine of prior appropriation, or "first in time, first in right"—meaning the first person to file on a water resource for beneficial use is typically considered first for a permanent right to water, subject to the Nevada State Engineer's determination of available appropriated water.

and 5,235 AFY in the years thereafter. Although the permits are subject to ongoing litigation, the SNWA continues to maintain its permitted rights and performs hydrologic and biologic monitoring to satisfy reporting requirements as set forth in State Engineer approved monitoring plans.

Additionally, SNWA also holds groundwater rights to more than 8,000 AFY in Spring Valley that were acquired through the acquisition of its Great Basin Ranch holdings (see Chapter 5).The SNWA intends to pursue development of these resources when needed to supply future demands.

Snake Valley. The SNWA currently holds applications for approximately 50,678 AFY in Snake Valley. The Lincoln County Conservation, Recreation, and Development Act of 2004 require the states of Nevada and Utah to reach an agreement regarding the division of water resources in Snake Valley, which is located in portions of both states. To date, an agreement has not been signed by Utah and SNWA's applications remain pending before the Nevada State Engineer. The SNWA intends to pursue development of these resources when needed to supply future demands.

Railroad Valley Groundwater. The SNWA holds applications filed in 1989 for 111,496 AFY of groundwater in Railroad Valley North and South. The SNWA intends to pursue development of these resources when needed to supply future demands.

Virgin River/Colorado River Augmentation

The SNWA was permitted 113,000 AFY of Virgin River water rights in 1994. Under an agreement, SNWA transferred 5,000 AFY to the Virgin Valley Water District. In accordance with the 2007 Seven States' Agreement, the SNWA has agreed to suspend development of these Virgin River surface water rights in exchange for agreement with the other Colorado River Basin states to cooperatively pursue the development of 75,000 AFY of permanent water supplies to augment the Colorado River for Nevada.[16]

Transfers/Exchanges

In concept, water transfers involve moving water resources from willing sellers to willing buyers. There are a variety of ways in which this can occur: interbasin, intrastate and interstate transfers.

Full-scale transfers and exchanges among Colorado River users could involve transfers/exchanges associated with participation in desalination or agricultural fallowing projects. While Colorado River transfers and exchanges

are an important future resource for Southern Nevada, they will require considerable discussion, agreements and potential regulations to implement. The SNWA continues to collaborate with other Colorado River users to evaluate the potential for future transfer and exchange projects.

WATER CONSERVATION

Water conservation is a resource. However, unlike typical "wet" resources, which are acquired and conveyed to meet demands, conservation reduces existing and future demands and extends available supplies.

The SNWA's comprehensive five-year water conservation plan details the community's water conservation goals and progress towards those goals over time.[17] It also includes a complete description of water conservation programs and projected water savings. The following provides a brief overview of how conservation is measured and implemented in Southern Nevada.

Measuring Water Conservation and Use

Gallons Per Capita Per Day (GPCD) is a metric used by many communities to measure water uses. It is also an effective tool to measure efficiency over time. GPCD varies across communities due to a number of factors, including differences in climate, demographics, water-use accounting practices and economic conditions. For planning purposes and to monitor conservation progress, GPCD is weather-normalized to account for weather variations that differ from the region's 30-year average. As shown in Figure 3.4 and at the recommendation of the SNWA's Integrated Resource Planning Advisory Committee, the SNWA calculates two variants of GPCD: Total System GPCD and Net GPCD.[18]

Total System GPCD: is calculated by dividing total water "delivered" (all sources) by total resident population served per day (water delivered/resident population/365 days = Total System GPCD). The SNWA uses Total System GPCD as a benchmark for setting conservation goals and measuring achievements.

Net GPCD: is calculated by dividing total water "consumed" (all sources) by total residential population served per day (water consumed/resident population/365 = Net GPCD). Net GPCD recognizes that not all delivered water is consumed; this is because SNWA recycles nearly all indoor water use, either through return-flow credits or direct reuse. Net GPCD more accurately reflects the community's use of water resources and provides a more comparable comparison to other communities.

Consumptive vs. Non-Consumptive Uses

Approximately 60 percent of all water delivered by SNWA is consumed, primarily for landscape irrigation and cooling. Unlike water used indoors, water used outdoors and for cooling is lost to the system as it cannot be treated and reused. As a result, outdoor uses continue to be a primary focus area for future conservation gains. Since 66 percent of all metered uses are by residential and common area use (Figure 3.3), this is the principal water use sector that is targeted for conservation actions.

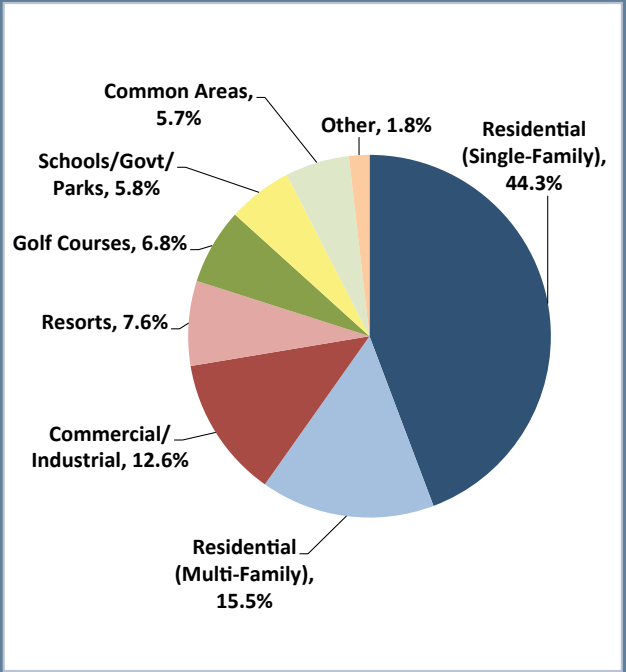

FIGURE 3.3 **Municipal Metered Use (2014)**

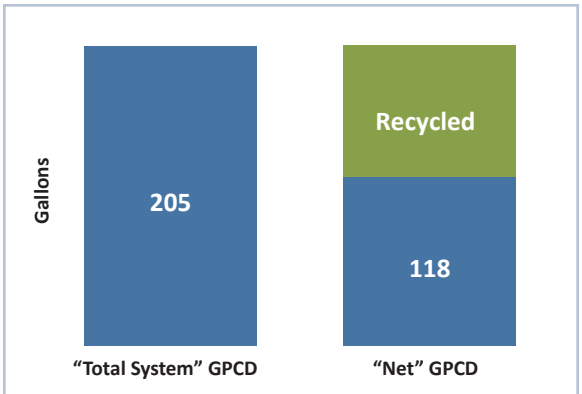

FIGURE 3.4 **SNWA 2014 GPCD**

Conservation Goals

Since its inception in 1991, SNWA and its member agencies have worked collaboratively to set and achieve aggressive water conservation goals. These efforts produced significant decreases in per person water use as shown in Figure 3.5. The community is currently ahead of schedule to achieve its water conservation goal of 199 Total System GPCD by 2035. As recommended by SNWA's 2014 Integrated Resource Planning Advisory Committee, a new conservation target will be evaluated after the current goal has been achieved.

While future conservation gains are expected to occur over the planning horizon, these gains are likely to be realized more slowly than in previous years as higher levels of efficiency—over and above what has already occurred—become more difficult to achieve. In the long-term there is also anticipated to be upward pressure on water use as a result of warming due to climate change.

Conservation Tools

The SNWA operates one of the largest and most aggressive water conservation programs in the nation. This program includes a combination of education, incentives, regulation and water pricing. Because the biggest potential for water savings comes from reductions in consumptive water demands, primarily in the form of outdoor water uses such as landscape irrigation, the majority of conservation tools are designed to achieve results in these areas.

- Education: Education is an integral element of SNWA's water conservation strategy. It includes both formal and informal education, from tips and tutorials to improve efficiency, to class offerings on water-smart landscaping practices for both resident and landscape professionals.

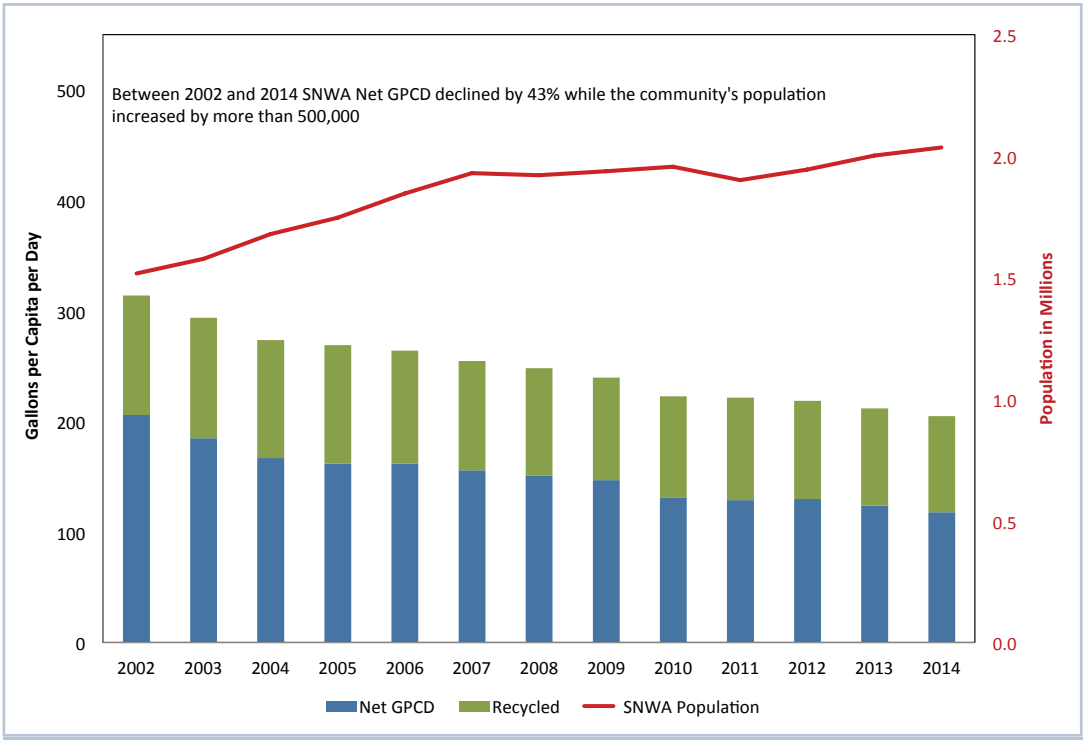

FIGURE 3.5 **Population & Per Capita Water Use**

- Incentives: The SNWA operates one of the largest incentive programs in the nation. Since 2000, SNWA has invested more than $200 million in incentive programs, reducing demand by more than 10 billion gallons annually.
- Regulation: Through collaboration, SNWA member agencies and Clark County have adopted a suite of land use codes, ordinances and water use policies to ensure more efficient use of water in Southern Nevada. These include time-of-day and day-of-week watering restrictions, water waste restrictions and limitations on the installation of new turf in residential and commercial development.
- Water Pricing: SNWA member agencies implement conservation rate structures that charge higher rates for water as use increases. These rate structures encourage efficiency, without jeopardizing water affordability for essential uses.

CHAPTER SUMMARY

A number of factors can influence the timing, use and availability of water resources. Having a diverse portfolio of resources allows SNWA to assess its overall water resource options and make appropriate decisions regarding which resources to bring online when necessary. This approach provides flexibility in adapting to changing supply and demand conditions, and helps ensure that community water demands can be met reliably.

The SNWA Water Resource Portfolio includes a mix of Permanent, Temporary and Future resources that will be used in tandem with continued conservation efforts to meet demands over the 50-year planning horizon. Some of these resources can be used under any Colorado River operating condition, while others are subject to limitations (such as staged pumping or restrictions during shortage).

To maximize the use and availability of existing supplies, SNWA continues to make water conservation a priority. The community is currently ahead of schedule to achieve its 199 Total System GPCD conservation goal by 2035 and will evaluate additional targets once the current goal is realized. In the meantime, SNWA continues to work with other Colorado River water users to pursue flexible use of Colorado River supplies, including augmentation and storage projects that are designed to increase supplies and bolster Lake Mead water levels. Together, these efforts will provide flexibility in meeting demands as described in Chapter 4.

ENDNOTES

1 "Contract with the Southern Nevada Water Authority, Nevada for the Delivery of Colorado River Water," effective March 2, 1992; between Secretary of Interior, Colorado River Commission and Southern Nevada Water Authority." The contract was amended in 1994: "Amended and Restated Contract with the Southern Nevada Water Authority, Nevada for the Delivery of Colorado River Water," effective November 17, 1994.

2 Nevada Colorado River consumptive use entitlement available for SNWA and the SNWA purveyor members is estimated to be 272,205 acre-feet/year with 27,795 acre-feet/year estimated to be allocated to Nevada non-SNWA contractors. "Listing of Individual Water Entitlements in the State of Nevada," listing as of January 2015, U.S. Bureau of Reclamation, http://www.usbr.gov/lc/region/g4000/contracts/entitlements/Nevada.pdf.

3 Nevada receives credits for Colorado River return flows from the Las Vegas Wash based upon a procedure originally agreed to by the U.S. Bureau of Reclamation (BOR) and the Colorado River Commission of Nevada in 1984. This procedure has been updated periodically through consultation with the BOR, SNWA and Colorado River Commission of Nevada; the most recent update in 2007 allows full consumptive use of groundwater imported to the Las Vegas Valley.

4 The 1964 Supreme Court Decree in Arizona v. California defines "surplus" as follows: "If sufficient mainstream water is available for release as determined by the Secretary, to satisfy annual consumptive use [in the lower Division states of Arizona, California and Nevada] in excess of 7,500,000 acre-feet, such excess consumptive use is surplus."

5 According to Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations of Lake Powell and Lake Mead (Interim Guidelines), Lower Basin States of Arizona, California and Nevada can create credits for Colorado River or non-Colorado River water that has been conserved by users in the Lower Basin (known as intentionally created surplus or ICS). ICS credits can be used in the year they are created or be stored in Lake Mead and made available for release from Lake Mead at a later time, subject to Operating (Shortage) conditions at the time of release.

6 "Developed Shortage Supply ("DSS")" shall mean water available for use by a contractor under the terms and conditions of a Delivery Agreement and Section 4 of Interim Guidelines in a Shortage Condition, under Article III(B)(3) of the Consolidated Decree. During a year when the Secretary has determined a shortage condition, the Secretary shall deliver Developed Shortage Supply (DDS) available in a contractor's DSS Account at the request of the contractor, subject to the provisions of Interim Guidelines' Section 4.C.

7 Nevada Revised Statutes, Chapters 532, 533, and 534.

8 The 1944 United States-Mexico Treaty for Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande. The treaty guarantees Mexico the delivery of 1.5 million AFY of Colorado River water plus 200,000 AFY of any surplus Colorado River water. In 1974, an international agreement interpreting the 1944 Treaty guaranteed Mexico water of the same quality as that being used in the United States.

9 "Cooperative Agreement for the Banking of Water in the Las Vegas Valley Groundwater Basin between the Southern Nevada Water Authority and the Las Vegas Valley Water District," effective February 21, 2006. The artificial recharge program in the Las Vegas Valley was initiated in 1987 by the Las Vegas Valley Water District.

10 "Second Amended Operational Agreement among the Metropolitan Water District of Southern California (Metropolitan), Colorado River Commission of Nevada and the Southern Nevada Water Authority (SNWA)," effective October 24, 2012 and "Storage and Interstate Release Agreement among the United States of America, the Metropolitan Water District of Southern California, the Southern Nevada Water Authority, and the Colorado River Commission of Nevada," effective October 27, 2004. The amount of developed and released water stored in Metropolitan's SNWA Interstate Account to SNWA depends on timing of SNWA's request and Colorado River operating conditions at the time of such request.

11 "Third Amended and Restated Agreement for Interstate Water Banking among the Arizona Water Banking Authority and the Southern Nevada Water Authority and the Colorado River Commission of Nevada," effective May 20, 2013 and "Storage and Interstate Release Agreement among the United States of America, the Arizona Water Banking Authority, the Southern Nevada Water Authority, and the Colorado River Commission of Nevada," effective December 18, 2002.

12 "In-Lieu Recharge Order," Order No. 1176, December 10, 2004, State of Nevada, Office of the Nevada State Engineer.

13 Las Vegas Valley Groundwater Management Program information is available at http://www.lasvegasgmp.com/html/.

14 SNWA has 2,200 AFY of groundwater permits in Garnet and Hidden valleys as a combined duty. SNWA is currently leasing a maximum of 1,450 AFY, not to exceed 13,000 acre-feet over any ten year rolling period, for power generation in Garnet Valley. The leases therefore commit 1,300 AFY over a ten year rolling period. The remaining 900 AFY has been made available to the City of North Las Vegas for use in Garnet Valley.

15 Nevada Revised Statutes, Chapters 532, 533 and 534.

16 "Agreement Concerning Colorado River Management and Operations," effective April 23, 2007; between Arizona Department of Water Resources, Colorado River Board of California, Colorado Water Conservation Board, Governor's Representative for the State of Colorado, Colorado River Commission of Nevada, Southern Nevada Water Authority, New Mexico Interstate Stream Commission, Utah Division of Water Resources, Utah Interstate Streams Commissioner, and Wyoming State Engineer.

17 "Southern Nevada Water Authority Water Conservation Plan, 2014-2018," 2014, SNWA.

18 "Integrated Resource Planning Advisory Committee Recommendations Report, Phase II Resources and Facilities," November 2014. IRPAC recommended presenting water use information to the SNWA Board of Directors and community in both gross [referred to in this Plan as Total System GPCD] and net terms for the purpose of: 1) more accurately communicating the water resource implications associated with various conservation measures; and 2) improving comparability of the community's water consumption with others (Recommendation No. 2).