ARCADIS

NBU® NEW BRAUNFELS UTILITIES

# 2023 WATER RESOURCES PLAN UPDATE

## Technical Memorandum

July 2023

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# Acronyms and Abbreviations

| | |
|---|---|
| AFY | Acre-Feet per Year |
| Arcadis | Arcadis U.S., Inc. |
| ASR | Aquifer Storage and Recovery |
| CNN | Certificate of Convenience and Necessity |
| COMM | Commercial |
| CY | Calendar Year |
| DOR | Drought of Record |
| FY | Fiscal Year |
| GBRA | Guadalupe-Blanco River Authority |
| GCWSP | Gonzales Carrizo Water Supply Project |
| GPCD | Gallons per Capita Per Day |
| CTGCD | Comal Trinity Groundwater Conservation District |
| ILI | Infrastructure Leakage Index |
| INST | Institutional |
| MF | Multi-family |
| MG | Million Gallons |
| MUD | Municipal Utility District |
| NBU | New Braunfels Utilities |
| NRW | Non-Revenue Water |
| RAC | Rate Advisory Committee |
| SF | Single Family |
| SWTP | Surface Water Treatment Plant |
| SWTP2 | Hueco Springs SWTP |
| TWDB | Texas Water Development Board |
| WLA | Water Loss Audit |
| WRP | Water Resources Plan |
| WTP | Water Treatment Plant |

# 1 Introduction and Background

In 2018, Arcadis U.S., Inc. (Arcadis) collaborated with New Braunfels Utilities (NBU) to develop an initial Water Resources Plan (WRP) which projected potable water demand through 2043 in the NBU service area, summarized existing water supply sources, and recommended potential additional water sources. This analysis projected that there was sufficient firm yield supply for only two years (until 2020) in a drought of record, and thus recommended an annual review of the water supply portfolio and demand. Changes to water supply sources, population and demand projection methodology, and ongoing conservation efforts were documented by Arcadis and NBU in supplemental WRP Update technical memorandums in 2019, 2020, 2021, and 2022. Since 2018, NBU has increased and diversified the firm yield supply. A new WRP is planned for 2024.

Ahead of the 2024 WRP, this 2023 WRP Update presents updated metrics and incorporates data through the end of calendar year (CY) 2022. This WRP Update includes the following:

- A summary of NBU's water supply portfolio, including the status of water resources planning initiatives underway (**Section 2**)
- Water usage trends (overall and by customer type) incorporating data through December 2022, including comparison of calculated values with projections from previous reports (**Section 3**)
- A summary of ongoing water resources planning activities (**Section 4**)
- An updated water resources action plan (**Section 5**)

# 2 Water Supply Portfolio Review

In 2021, NBU developed an updated water demand model, including evaluating projected demands in relation to existing and planned water supplies (**Figure 2-1)**. Projected five-year average demands were calculated assessing the following scenarios:

1. Scenario 1: Projected demands based on the CY 2020 demand.
2. Scenario 2: Projected demands based on change in demand as of CY 2020.
3. Scenario 3: Projected demands based on implementation of conservation efforts to meet NBU's Conservation goal.

Based on current projections (**Figure 2-1**), NBU will have enough supply to meet the current change in demand (Scenario 2) until CY 2042. If conservation efforts are achieved, NBU's supply will meet demand (Scenario 3) until CY 2063.

There have been no changes to NBU's current supplies since the 2021 WRP Update. Two new supplies are planned to come online in 2024. The Gonzales-Carrizo Water Supply Project (GCWSP) is expected to be online prior to the summer of 2024. The Trinity Membrane Water Treatment Plant is under construction and currently planned to come online in 2024.

A new metric has been identified to provide an understanding of how sufficiently the existing water supply meets the projected system water demand. *Duration of supply* refers to how long the firm yield water supply can meet the projected demand. **Figure 2-2** shows the calculated duration of supply. Acceptable duration of supply values will be discussed as part of the 2024 WRP to guide decision making.

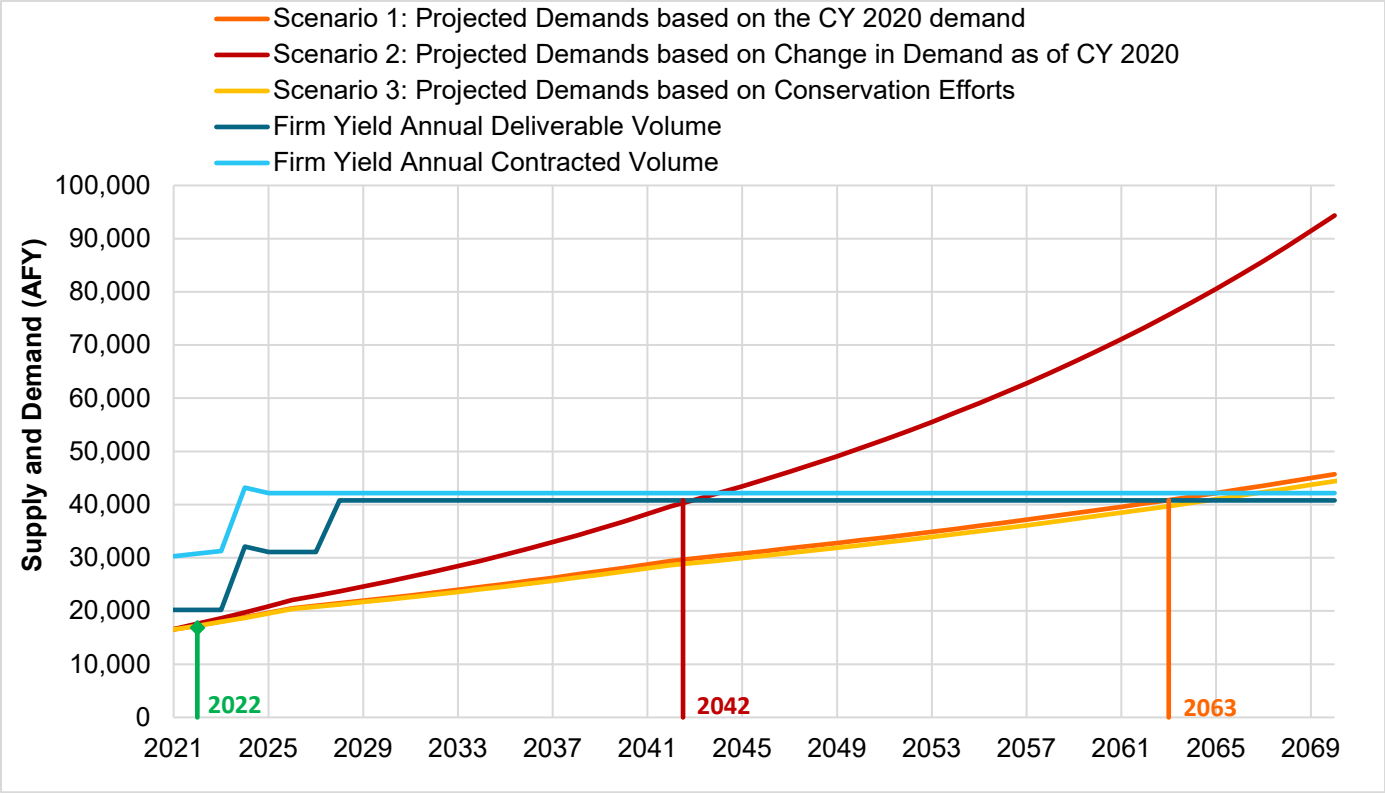



*Figure 2-1 Comparison of Projected Supply and Demand (reprinted from the 2021 WRP Update)*

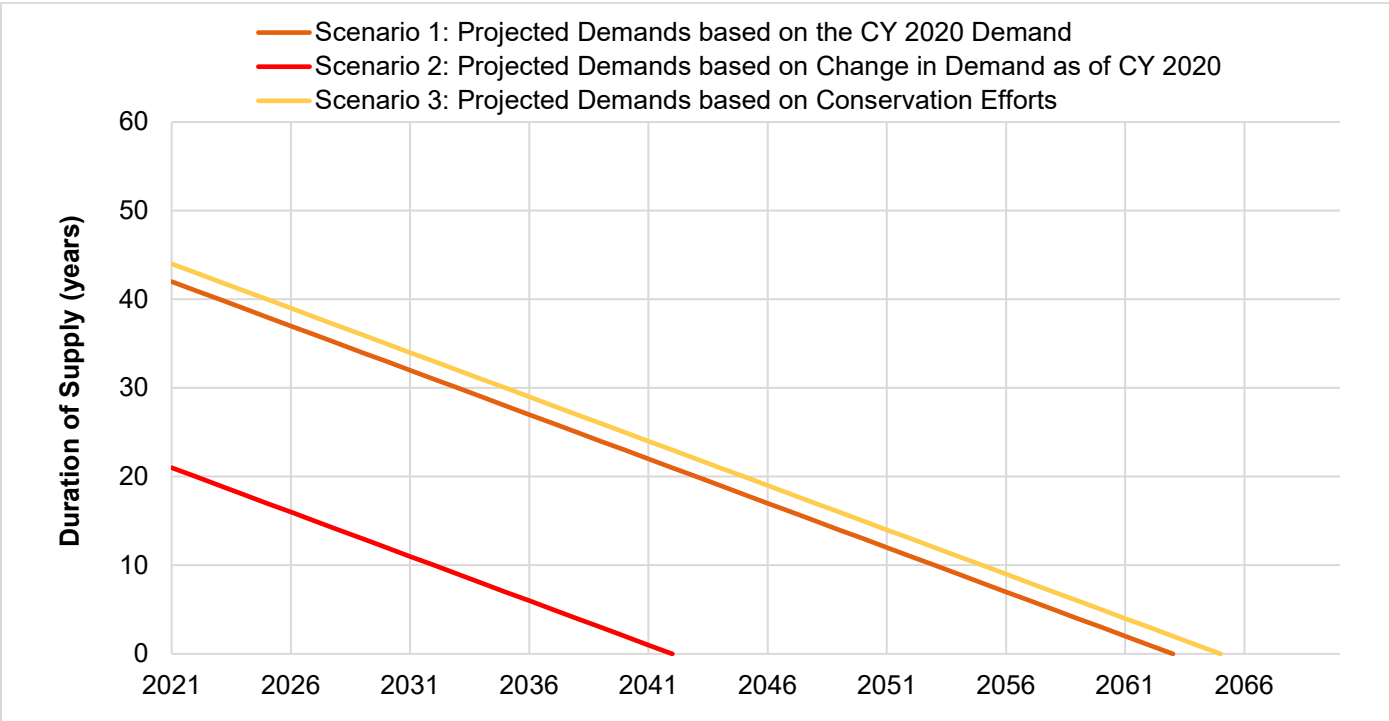



*Figure 2-2 Duration of Projected Supply*

# 3 Water Use Trends

System-wide demand has been steadily increasing due to the tremendous growth in population and businesses within NBU's service area. As will be described throughout this section, the increase in water use was impacted most by an increasing number of single-family (SF[1]) and commercial (COMM) customers (**Section 3.1**). There was also an increase in the per capita volume of water used compared to 2021, although the trend over the last five years has been a decreasing per capita volume of water used (**Section 3.2**). **Section 3.3** compares the 2022 data with values previously forecasted; actual population and demand increases were very near the projections.

## 3.1 Use per Customer Group

**Figure 3-1** shows total system demand since 2011 and the five-year linear trend line (2018-2022) for each customer group. The SF1 and COMM customer groups have been removed from **Figure 3-2** to allow for the details about the other customer groups to be clearly seen. System-wide water usage was lower in 2022 compared to 2021 across the multi-family (MF1, MF2, and MF3) and institutional (INST) customer groups. Examples of INST users include hospitals and city parks. SF1 and COMM groups used the most total water per group in 2022, and usage by these groups increased by 10% and 5%, respectively, from 2021 to 2022. However, the five-year (2018-2022) average water use trends suggest that CY 2021 water use may have been below the five-year trend for SF1 and SF2 users. Across this five-year period, total demand by SF1 and MF1 customers have had the greatest average increases, with COMM and MF3 also showing increased overall usage. There has been an average decrease in total usage across all customers in the SF2, MF2, and INST categories.

The most significant contributor to increased system demand is additional users, and in 2022, the number of households/accounts in the NBU service area continued to grow. The total number of households/accounts for each customer group is shown in **Figure 3-3** and **Figure 3-4.** Again, the second figure removes the customer group with the largest demand to allow for more detailed analysis of the remaining categories.

SF1 remains the most prevalent customer group, reflecting the large percentage of the service area that is residential. SF1 households had the greatest increase in 2021; 2,011 SF1 accounts were added this year, representing a 6% increase. MF3 also had a notable change with the addition of 412 units representing a 26% increase. The remaining customer categories remained relatively unchanged. The number of MF1 and COMM units increased by 51 units and 22 accounts (or 1% and 1%), respectively, in 2022. SF2 and INST accounts changed less than 1%.

[1] SF1 – connections serving a single-family home, sized less than or equal to 5/8-inch
SF2 – connections serving single-family homes, sized above 5/8-inch
MF1 – connections serving between 2 and 50 living units
MF2 – connections serving between 51 and 100 living units
MF3 – connections serving over 100 living units
INST – connections serving public and interdepartmental units
COMM – connections serving commercial units

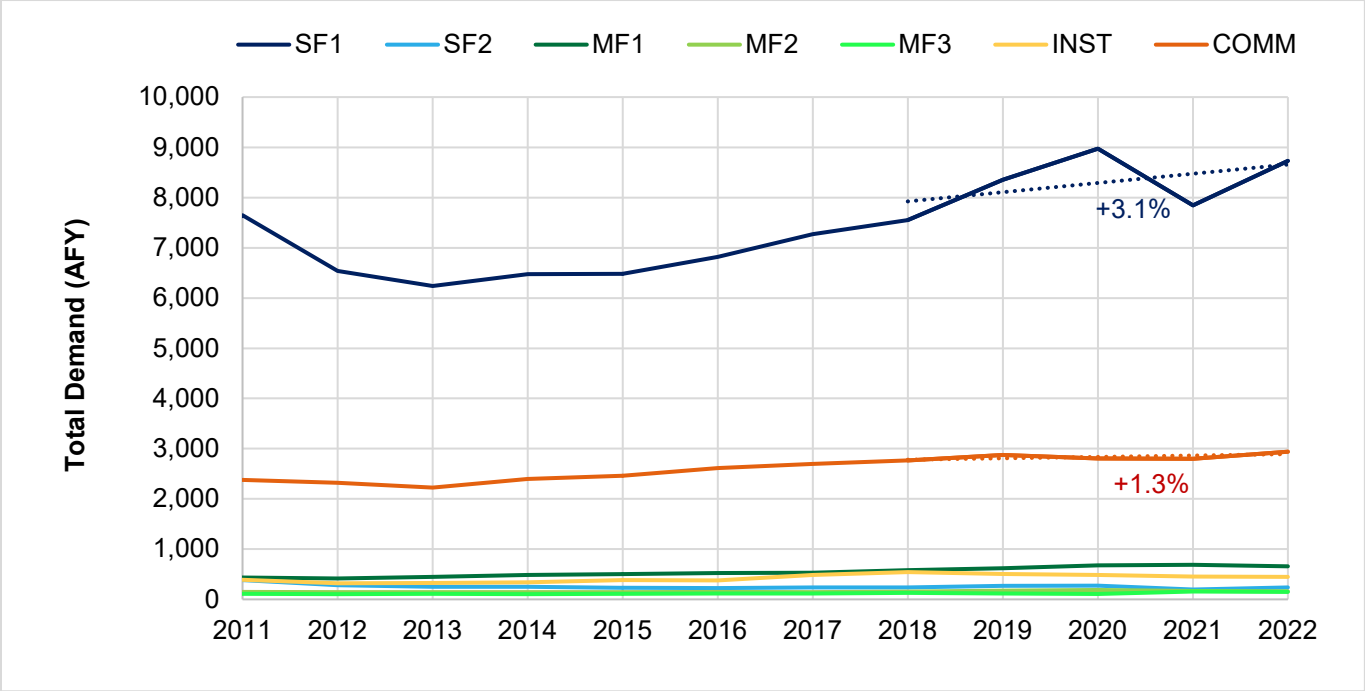



*Figure 3-1 Total Demand by Customer Group. Percentages shown are the average change from 2018 through 2022.*

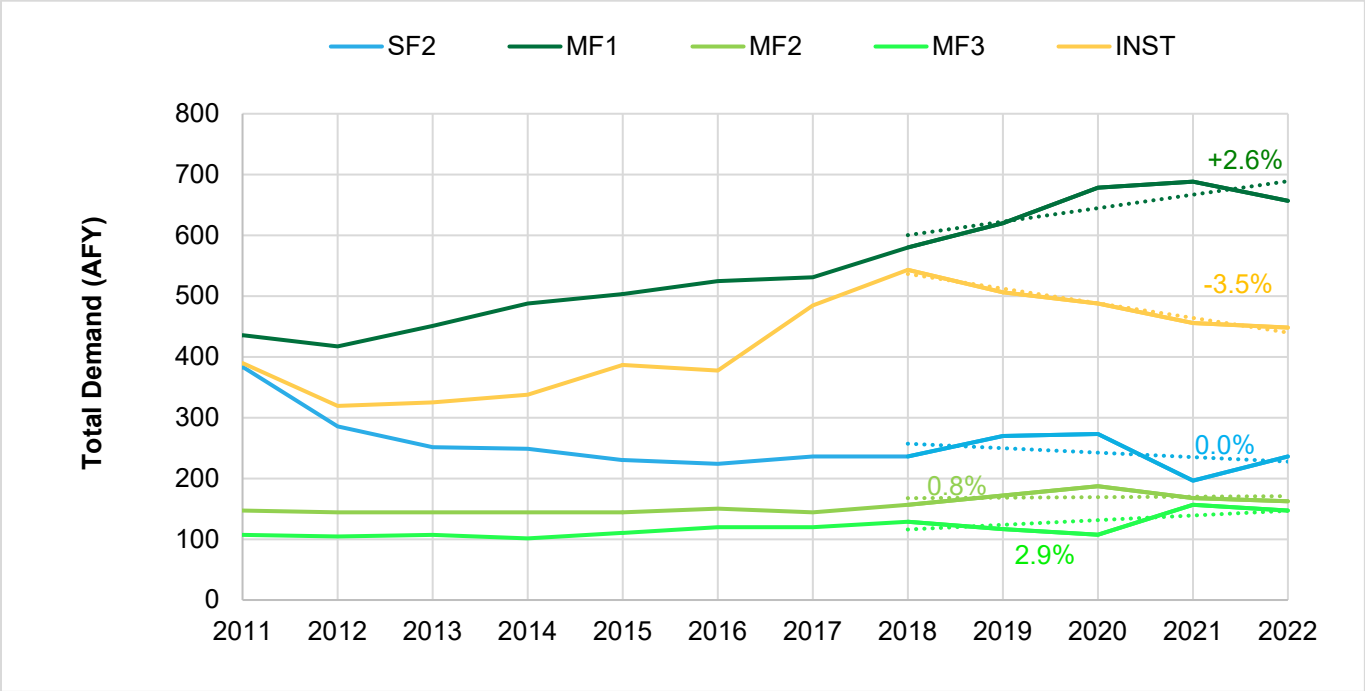



*Figure 3-2 Total Demand per Customer Group, Excluding SF1 and COMM. Percentages shown are the average change from 2018 through 2022.*

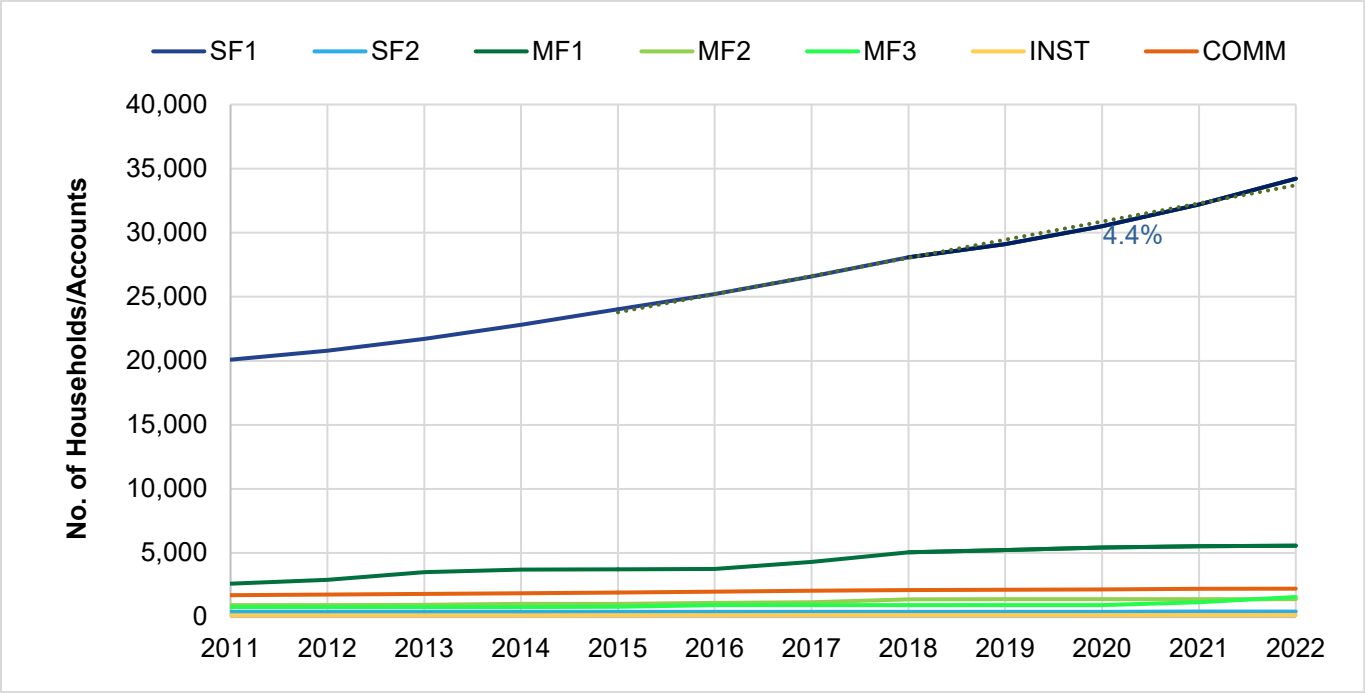



*Figure 3-3 Number of Households/Accounts by Customer Group. Percentages shown are the average change from 2018 through 2022.*

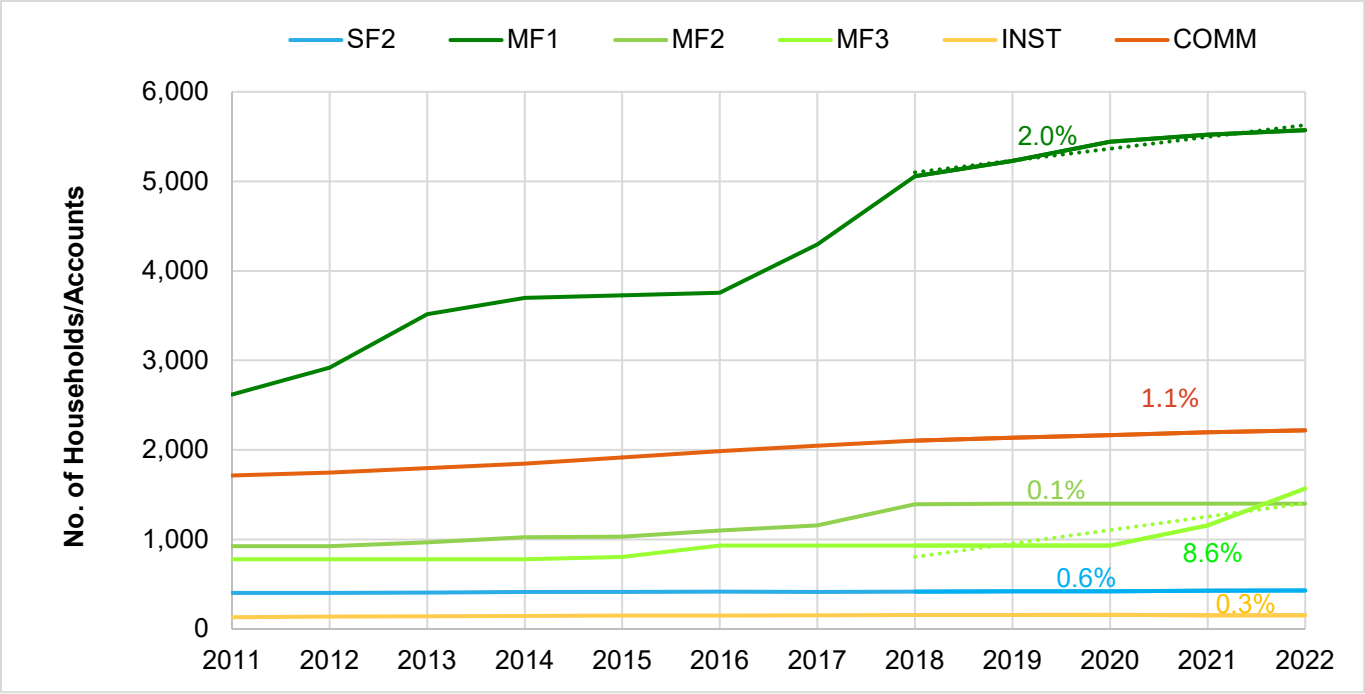



*Figure 3-4 Number of Households/Accounts by Customer Group Excluding SF1. Percentages shown are the average change from 2018 through 2022.*

Combining the total usage (**Figure 3-1** and **Figure 3-2**) and number of accounts per category (**Figure 3-3** and **Figure 3-4**) allows for analysis of usage per account. The 5-year summary of the number of accounts per customer group (**Table 3-1**) reflect the population increases seen by NBU. From CY 2021 to CY 2022, the average demand per account (e.g., total demand divided by number of households/accounts) decreased for MF (MF1, MF2, and MF3) and INST customer groups but showed an increase of 5%, 17%, and 4% across SF1, SF2, and COMM accounts, respectively. Although usage increased in some customer groups from CY 2021 to CY 2022, there remains an overall downward trend of average water usage when considering the last five years collectively. The average demand per account (**Figure 3-5** and **Figure 3-6**) examines each customer group's demand distribution per number of accounts.

*Table 3-1 Number of Accounts Per Customer Group*

| Customer Group | CY 2018 | CY 2019 | CY 2020 | CY2021 | CY 2022 |
|---|---|---|---|---|---|
| **SF1** | 28,077 | 29,110 | 30,508 | 32,203 | 34,214 |
| **SF2** | 417 | 420 | 422 | 428 | 430 |
| **MF1** | 5,058 | 5,229 | 5,442 | 5,521 | 5,572 |
| **MF2** | 1,393 | 1,400 | 1,400 | 1,400 | 1,400 |
| **MF3** | 932 | 932 | 932 | 1,157 | 1,569 |
| **COMM** | 2,103 | 2,138 | 2,166 | 2,197 | 2,219 |
| **INST** | 156 | 157 | 158 | 154 | 154 |

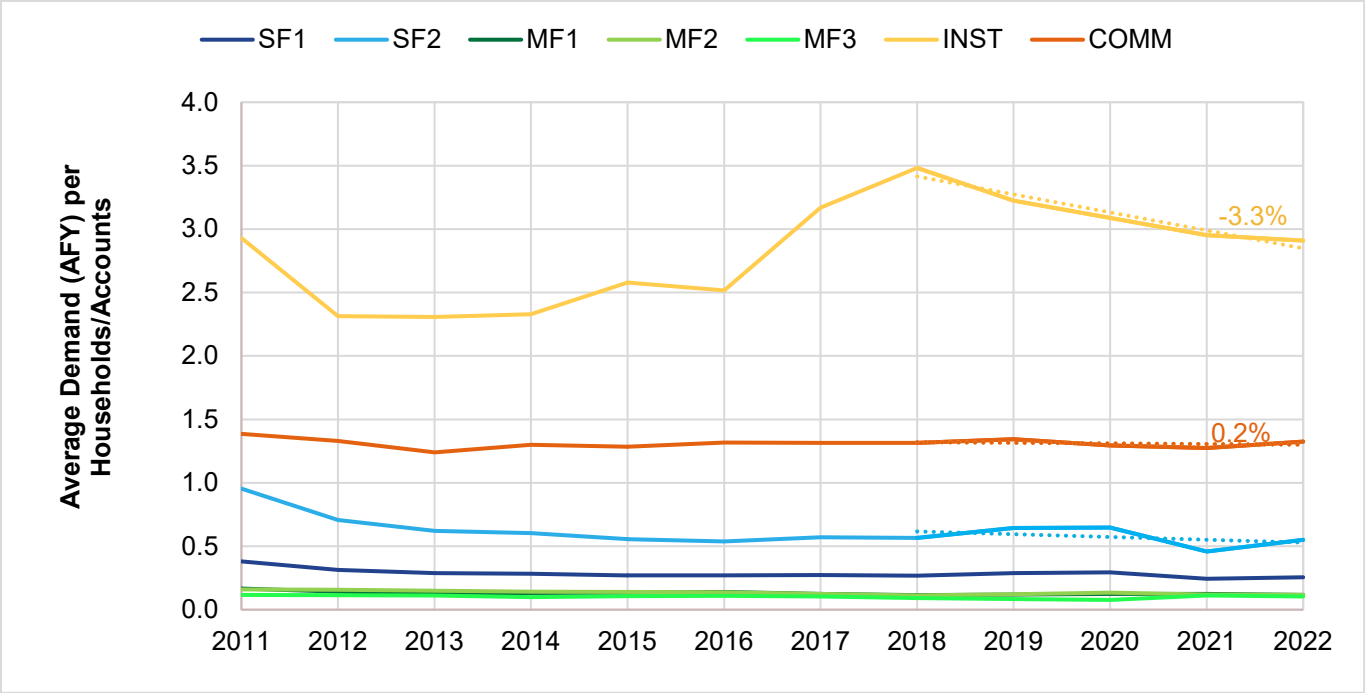



*Figure 3-5 Average Demand per Household/Account by Customer Group. Percentages shown are the average change from 2018 through 2022.*

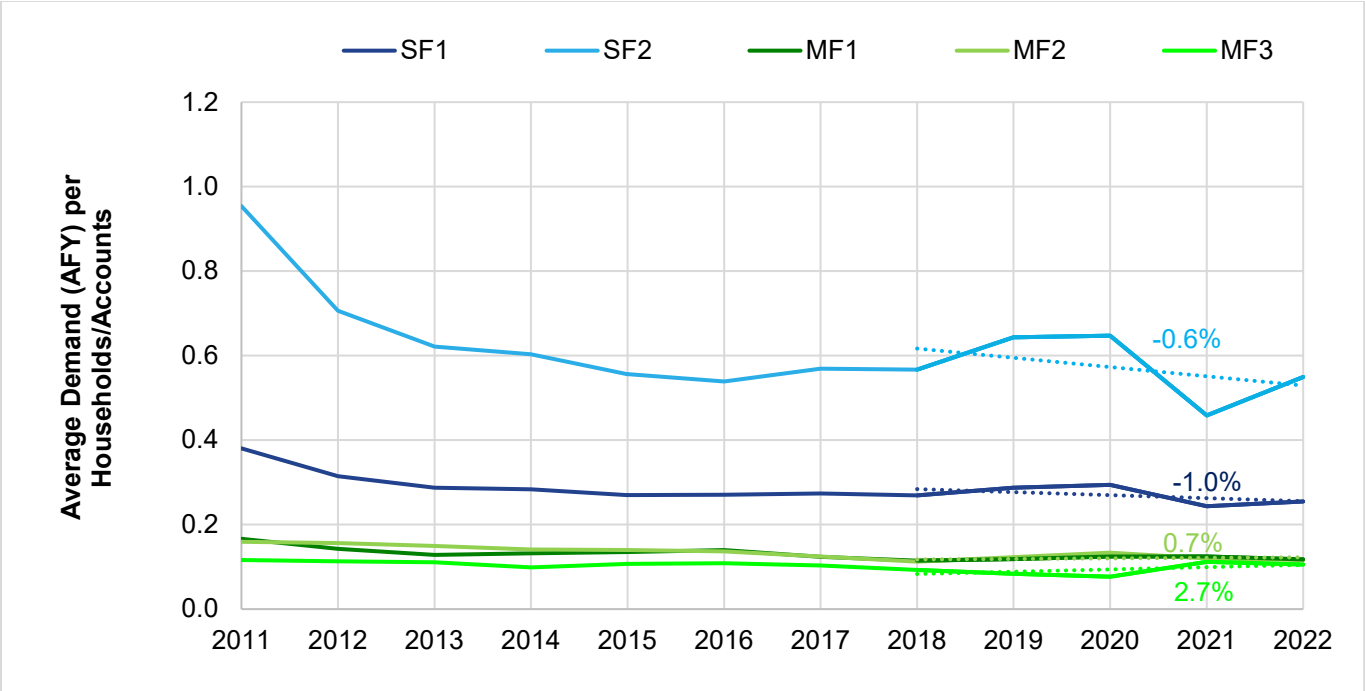



*Figure 3-6 Average Demand per Household/Account by SF and MF Customer Group. Percentages shown are the average change from 2018 through 2022.*

In one of the scenarios in NBU's 2021 Demand Projection Model, the percent change in demand over a five-year period is used to project how demand per household or account could continue to change in the future. For example, COMM group percent average usage per account over the last five years changed by 0.1%. Thus, the percent average usage per account was stable over this time. **Table 3-2** summarizes similar analysis of longer-term trends in how use has changed for each customer type. Positive changes (red) reflect an increase in usage per household or account. Negative changes (green) reflect a decrease in usage per household or account. Thus, these data show that for all other customer categories, except COMM, the average use per household or account over the last five years has been decreasing. This is the second consecutive year that the SF customer groups have demonstrated a five-year average percent decrease in demand after previously demonstrating a consistent increase in average use per household.

*Table 3-2 Historical Average Percent Change in Demand per Household/Account*

| Customer Group | Historical Average Percent Change in Demand per Household/Account | | | |
|---|---|---|---|---|
| | 2015 – 2019 | 2016 – 2020 | 2017 – 2021 | 2018-2022 |
| SF1 | +0.3% | +1.8% | -2.1% | -1.8% |
| SF2 | +1.6% | +3.2% | -4.5% | -2.5% |
| MF1 | -2.0% | +1.3% | -1.6% | -1.1% |
| MF2 | -0.6% | -0.6% | -3.0% | -1.8% |
| MF3 | -0.6% | -3.2% | -0.6% | -1.3% |
| COMM | +0.7% | +0.2% | -0.2% | +0.1% |
| INST | +7.4% | +4.4% | +1.7% | -1.9% |

## 3.2 Per Capita Demand

Source water per capita demand for CYs 2011-2022 is shown as blue dots in **Figure 3-7**[2]. Per capita demand is calculated by dividing system-wide demand by the service area population. Source water per capita demand compares the total volume of water sourced (i.e., includes production losses during treatment) with the service area population. These data show a consistent reduction in per capita demand until 2017. Per capita demand in 2021 and 2022 shows a return to lower per capita demand levels. Produced water per capita demand (purple dots in **Figure 3-7** based on values calculated in the Water Loss Audit [WLA] study) is the amount of treated water entering the distribution system divided by the service area population; produced water per capita demand does not account for water used during treatment. The produced water per capita demand follows a similar trend as the sourced water per capita demand but is slightly lower. Additionally, as NBU began recharging its aquifer storage and recovery (ASR) demonstration well in 2021, the per capita demand with the volume of water directed to ASR is also shown (yellow dots in **Figure 3-7**). For CY 2021 and CY 2022, ASR provided an additional per capita demand of 3 GPCD and 5 GPCD, respectively. Lastly, considering residential per capita demand separately (green dots in **Figure 3-7**), a consistent decrease has been observed since 2011 except for 2019 and 2020. The most recent two years have shown a further reduction in residential per capita demand (75 and 78 GPCD). While these trends demonstrate the great progress the community has made to improve water use

[2] The produced water per capita demands shown were calculated as part of the WLA study, subsequent to data submission to the Texas Water Development Board (TWDB), and thus, the per capita demand in the TWDB database is slightly different.

efficiency, to reduce the per capita demand further, additional conservation programs (in addition to those already operational) will be required.

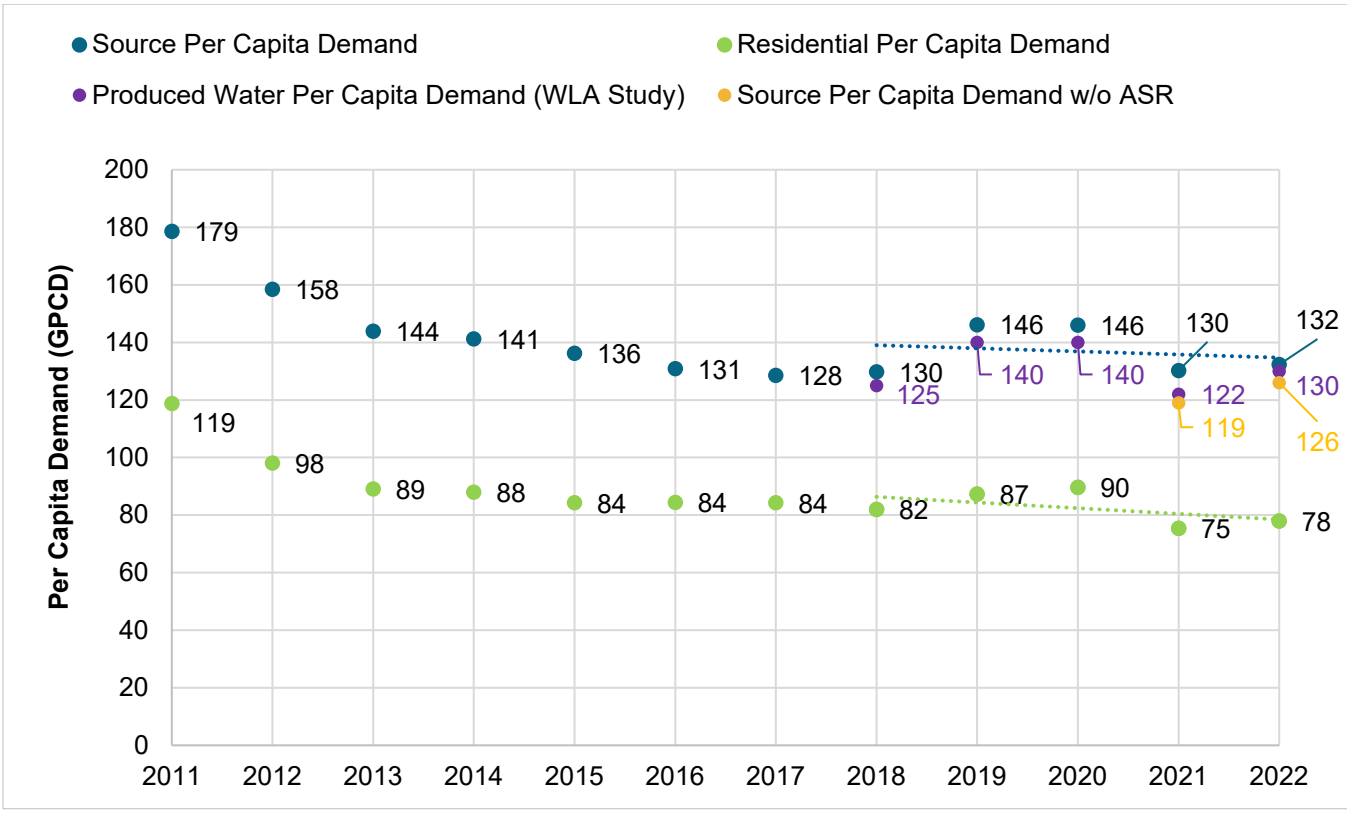



*Figure 3-7 NBU System Per Capita Demand*

## 3.3 Comparison with Forecasted Population and Demand

The population forecasted for CY 2022 by NBU's most recent demand model (2021 WRP Update) is less than 1% different than the actual population value calculated for NBU's service area in CY 2022 (**Table 3-3**). Additionally, the total water used was 2% to 4% lower than projected. As usage was less than projected, NBU's water supply portfolio is still anticipated to be sufficient through at least 2042 based on the 2021 demand model assumptions.

The Effective Utility Management Practices recommend updating water demand projections for water resources planning[3] at most every five years, as year-to-year usage is impacted by numerous factors (including average temperature, precipitation, and changes in customers) and thus annual changes are generally not considered indicative of trends anticipated long-term. The fact that values observed in 2022 are similar to previous projections confirms that projection updates are not currently recommended.

3 Although the 2022 WRP Update water demand projections are considered valid for long-term water supply planning purposes, NBU may require alternative projections for other internal planning processes (e.g., near-term revenue and budgeting purposes).

*Table 3-3 Comparison of Forecasted and Actual Population and Water Usage*

| | Value Forecasted[1] in 2021 WRP Update for CY 2022 | Actual Calculated Value for CY 2022 | Percent Difference of Actual Value vs. Forecasted Value |
|---|---|---|---|
| NBU Service Area Population | 112,857 | 113,712 | +0.8% |
| Total Water Use (MG) | 5,611 to 5,777 | 5,491 | -2% to -4% |

[1] Service area population and total water use forecasted values are depicted as the minimum and maximum ranges of Scenario 1: Five-Year Average with No Conservation Efforts Implemented and Scenario 3: Five-Year Average with Projected Values Based on Implementation of Conservation Efforts to Meet Goals.

# 4 CY 2022 Water Resources Planning Activities

Water resource planning is a priority for NBU to ensure the community is provided a continuous supply of safe, clean water to meet the demands of utility customers. In CY 2022, NBU continued multiple strategic water resources planning initiatives. An update on each of these is provided in **Table 4-1**. Although the conservation programs implemented to date have demonstrated an impact on water use, the demand projection scenarios continue to suggest a large opportunity for expanded conservation programs to be a key component in NBU's long-term water supply strategy.

*Table 4-1 Summary of 2022 Strategic Water Resources Planning Initiatives*

| 2022 Strategic Initiatives | Description of 2022 NBU Water Resource Planning Activities |
|---|---|
| Water Conservation | • Initiated an update to the NBU Water Conservation Plan.<br>• Continued managing multiple rebate programs, performing home and commercial performance assessments, providing continuous consumption alerts to customers, and providing targeted usage reports. For CY 2022, the estimated savings was 72 MG.<br>• Provided outreach and education on conservation in multiple formats including online, at community events, by mail, and in person; began providing outreach materials in multiple languages.<br>• Enforced the drought management plan.<br>• Completed recommendations for new rate structures, leveraging NBU's new Rate Advisory Committee (RAC). |
| Municipal Utility District (MUD) Policy | • Initiated the development of a MUD policy and an update of the service extension policy aimed at providing water service to new developments while protecting environmental resources, especially within the recharge and contributing zones of the Edwards Aquifer (collaboration with City of New Braunfels). |

| 2022 Strategic Initiatives | Description of 2022 NBU Water Resource Planning Activities |
|---|---|
| One Water | • Continued developing an interagency agreement between the City of New Braunfels, NBU, and the Guadalupe-Blanco River Authority (GBRA).<br>• Continued sharing project updates between agencies to identify opportunities for greater collaboration.<br>• Participated in the One Water Summit through the US Water Alliance.<br>• Established work group committees focused on (1) implementation of the interagency agreement, (2) implementation of projects, and (3) education and communications and began drafting charters for each committee. |
| Non-Revenue Water (NRW) | • Completed NRW desktop studies in July 2022, including review of water loss audits and a leakage component analysis.<br>• Continued use of satellite leak detection and expanded meter testing programs (savings calculations in progress for 2022).<br>• Completed a 2022 water loss audit and reviewed the Infrastructure Leakage Index (ILI) mid-year. |
| Aquifer Storage and Recovery (ASR) | • Completed demonstration well construction.<br>• Began aquifer recharge through the demonstration well and conducted initial cycle testing, including recovery of recharged water into the NBU distribution system. |

# 5 Water Resources Management FY 2024 Action Plan

Due to the significant work NBU conducted over the last five years to expand and diversify the water supply portfolio, as of CY 2025, there will be firm yield water supply that is projected to satisfy NBU's service area in a drought of record through at least 2042 and possibly through 2063. This accomplishment allows for refocusing investment on optimizing the resiliency and sustainability of existing water supplies (**Section 5.1 and 5.2**) and the efficiency of water usage (**Section 5.3**). Additionally, NBU recognizes that shifting to a One Water approach will result in more effective water resources management and a more sustainable and resilient water resources supply portfolio.

## 5.1 Continue Implementation of Water Supply Recommendations

Recommendations for continuing management of the existing water supplies are summarized in **Table 5-1** and recommendations regarding longer-term water supplies under consideration are summarized in **Table 5-2**.

*Table 5-1 Summary of Water Supply Recommendations for Existing Supplies*

| Water Supply | Recommendations |
|---|---|
| **All** | • Continue to pursue **Aquifer Storage & Recovery (ASR)** through testing of the first full-scale ASR well and construction of additional ASR wells. ASR provides a strategic water storage solution for NBU that would provide water to the community during a severe drought. ASR can also be leveraged to continue providing a continuous source of water supply during temporary water supply emergencies and to supplement other water supplies during peak use. Completion of this first ASR project will add resiliency to NBU's water supply portfolio.<br>• Stay actively involved in the **South-Central Texas Regional Water Planning Group** and the Group's regional planning process.<br>• Continue implementation of the **Water Supply Resiliency** Study action plan.<br>• Continue to lead and participate in regional One Water planning activities (https://headwatersatthecomal.com/onewater/) and incorporate One Water goals and strategies into water resources planning.<br>• Before new water sources are introduced into the NBU distribution system, conduct a blending study to evaluate the potential impacts of the new source(s) and the changes influenced by new blending ratios between different treated surface waters and groundwaters. Enhance monitoring when introducing a new supply. |
| **Surface Water** | • Proceed with the construction of the **Surface Water Treatment Plant (SWTP) expansion**, currently planned for substantial completion by June 1, 2028. Obtain approval of the design contract amendment by end of 2023 to allow for permitting and bidding ahead of a 2026 construction start date. Expanding the SWTP provides multiple benefits, which include: improving the reliability of the NBU run of river water rights; providing a means to more quickly build storage in an ASR wellfield; providing additional peaking capacity; and providing the ability to utilize additional Canyon Reservoir water.<br>• Begin negotiations with GBRA to establish the second SWTP diversion location and the maximum diversion rate for the second diversion location.<br>• Develop infrastructure to fully utilize surface water firm yield rights, including beginning initial environmental and land/easement acquisitions for the diversion pump station and raw water pipeline for the **Hueco Springs SWTP (SWTP No. 2)**. As this area is growing rapidly, acquiring land near-term will reduce future costs and ensure property acquisition does not delay construction when needed. Continue to periodically evaluate the need to begin design and construction. |

| Water Supply | Recommendations |
|---|---|
| **Groundwater** | • Complete the expansion of the **Trinity Wellfield and Membrane WTP**.<br>• Currently, there is no limitation on how much water NBU can produce from its **Trinity Aquifer** wells; however, the Comal Trinity Groundwater Conservation District (CTGCD) has begun to put rules in place to regulate water production in the Trinity Aquifer. Production limits have still not been imposed but may be imposed in the future. Increase involvement with the CTGCD to allow for closely monitoring and influencing the decision-making process moving forward. |
| **Purchased Water** | • Evaluate next steps for NBU as the **Seguin Interim** contract expires.<br>• Stay engaged in **GCWSP** project updates to assure that the project is operated and maintained as a valuable, long-term regional water supply source. |

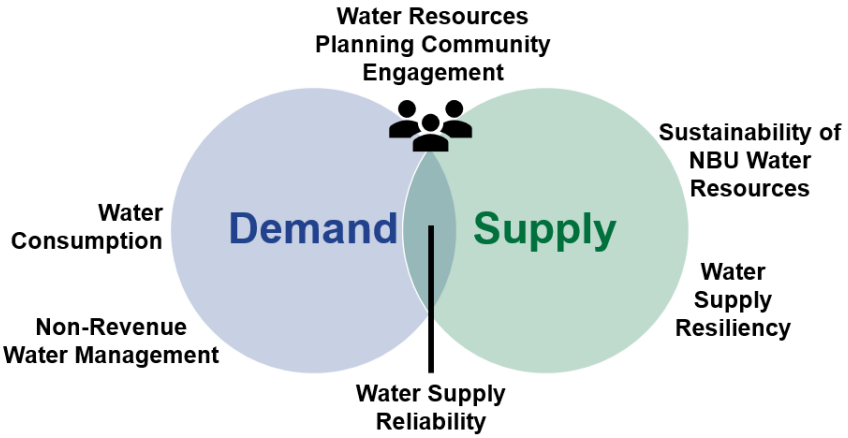
*Table 5-2 Summary of Water Supply Recommendations for Future Supplies*

| Water Supply | Recommendations |
|---|---|
| **GCWSP Phase 2** | • Consider whether NBU should pursue participation in the second phase of the GCWSP, which is anticipated to come online in the 2030s, including the potential for getting this water at a reduced rate early and storing it in ASR (NBU-owned or jointly owned) until needed. |
| **GBRA Lower-Basin project** | • Monitor the status of GBRA's Lower Basin off-channel reservoir project, and the availability of water from other GBRA projects. If GBRA implements the Lower Basin project in Calhoun County, NBU has the first right to refuse additional Canyon Reservoir water rights. During contract negotiations, consider delaying purchase of the water until SWTP No. 2 is constructed. |

## 5.2 Complete the New 2025-2030 Water Resources Plan

NBU's water resources outlook has changed significantly since development of the 2018 Water Resources Plan due to the addition of new water supplies. Thus, development of an updated WRP during FY 2024 is recommended with focus on the activities summarized in **Table 5-3**. As the existing water supply portfolio is projected to be sufficient for at least 19 years (**Section 2**) with recent trends (**Section 3.1**) aligning more closely with the projected scenario that would extend the existing water supply portfolio for 40 years, and as the current year demand is also less than that projected (**Section 3.3**), no updates to the demand projections are recommended for FY 2024.

*Table 5-3 Summary of Recommendations for the 2025-2030 Water Resources Plan*

| Component | Recommendations |
|---|---|
| **Goals and Metrics** | • As part of the FY 2022 visioning process, NBU drafted goals and metrics for six key components of water resources management (**Figure 5-1**). Refine and formalize the goals and metrics that will guide NBU's water management approach for the next five years for **providing a sustainable and resilient water supply**.<br>  <br><br>*Figure 5-1 Draft WRP Water Resources Management Components* |
| **Water Use Trends** | • Include discussion of the most recent water use trends. Complete a review of CY 2023 water use trends by customer group as well as on a per capita basis.<br>• Compare the actual vs. projected demand and population based on the FY 2021 WRP Update demand model. Continue evaluating the likelihood of each demand projection scenario.<br>• Repeat the comparison of growth in NBU's service area to prior growth observed in other rapidly growing communities of similar size along IH-35.<br>• Also consider community trends and changes that may impact water use. Consider new 2020 census data on vacancy rates and the numbers for people per household when available (currently projected for September 2024). Assess the impact of those changes on the calculated NBU service area population.<br>• Consider the potential impact of changes to the Certificate of Convenience and Necessity, service area extension, and/or MUD policies on the maximum buildout demand. |
| **Effective Water Management** | • As NBU will soon have an excess of supply for many years, focus evaluations on optimizing use of the existing water supply portfolio.<br>• Establish a standard operating procedure for evaluating the need for new water supplies. Define trigger values for acquiring new water supplies based on the duration of supply metric and a more holistic triple-bottom-line approach that defines how additional supplies will impact NBU positively (e.g., minimal to no financial losses, quality of water source and treatment required). |

| Component | Recommendations |
|---|---|
| | • Establish a standard operating procedure for evaluating the need for updates to the water demand projections. Define trigger values for updating the demand projections based on the new metrics as well as the deviation of actual values from those projected.<br>• Reconsider the planning time horizon that should be used for water resources planning. |
| **One Water** | • Align with the vision outlined by the One Water team "to ensure water remains a celebrated and protected feature of our community by collaboratively managing our water resources to safeguard watersheds, waterways and groundwater". A One Water Approach has been incorporated into the drafted goals, metrics, and actions by embracing a regional and watershed-wide approach, increasing community engagement, collaborating with the New Braunfels One Water team, evaluating alternative water supplies and increasing fit-for-purpose water use, including criteria considering environmental, social, and economic benefits when comparing alternatives, and through a strong emphasis on conservation and water resources protection.<br>• Create a more integrated water resources plan by documenting alternative water supplies, such as available wastewater flows or stormwater flows throughout the system and discussion of conservation strategies for reducing water demand. Include recommendations for pursuing a Bed and Banks permit to enable implementation of a reuse project in the future, should it be needed.<br>• Incorporate discussion of the watershed and consider impacts of each supply on the watershed.<br>• Include the One Water workgroup in the water resources planning process and allow them to provide input into the decision processes and supply evaluations. |
| **Implementation Progress and Action Plan** | • Review progress to date on existing water resources planning activities and the action plans from the NRW studies, water resiliency study, and water conservation plan.<br>• Develop a five-year action plan based on the goals and metrics and establish specific measures for progress on each action. Include task leaders as well as budgetary costs for each action to ensure appropriate investments are planned to realize the action plan.<br>• Increase community outreach and education by presenting the WRP to the NBU Board and City Council, providing the WRP to the One Water team for review and as updates, posting the WRP to the NBU website along with a graphical summary brochure, and advertising the WRP, such as on social media.<br>• Develop a proactive, and well thought-out, community engagement plan for water resources planning that is coordinated with the engagement program implemented by the New Braunfels One Water team. |

## 5.3 Increase Investment in Water Conservation

NBU has accomplished significant savings with the existing conservation programs; water savings due to conservation programs were estimated at 72 MG in 2022, largely due to continuous consumption alerts (satellite leak detection savings have not yet been finalized). However, NBU aims to improve water efficiency further to delay the need for additional water supplies and/or to allow for considering the sale or lease of existing supplies. Recommended actions to reach this goal include:

- **Continue existing conservation** measures (with re-evaluation, as appropriate), including strategies to reduce non-revenue water.
- **Complete the new 2024 – 2029 Water Conservation Plan** (under development by the NBU Conservation and Customer Solutions team), including evaluation of additional conservation strategies. Greater community-wide participation in conservation will also be required to reduce water use in New Braunfels long-term.
- **Increase investment** by allocating additional capital and operational resources and budgets toward new conservation programs to allow for implementation of the Water Conservation Plan recommendations.
- **Update the Drought Management Ordinance** to clarify language and review the drought stages relative to current knowledge and data.
- **Implement new data management and analytics solutions** to allow for accurately assessing progress toward achieving conservation goals and the success of conservation programs. More effective data analytics will leverage data and existing systems to their full potential, greatly improve confidence in the data and analyses being performed, increase access to the information needed for program tracking and decision making, support optimizing use of water supplies, and reduce the time NBU staff spend on data compilation and analysis.

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