NEW BRAUNFELS UTILITIES

2025 WATER RESOURCES PLAN

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New Braunfels Utilities

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EXECUTIVE SUMMARY

New Braunfels Utilities (NBU) has been focusing on water resources planning and management, especially related to demand reduction and the development of new water supplies. Population and economic growth are increasing the need for water while the availability of high-quality, reliable water is being threatened and competition for such supplies is growing. Water resources planning is the basis for effectively balancing these elements and providing sufficient water for future generations, even during periods of severe drought.

This 2025 Water Resources Plan (WRP)[1] presents NBU's current and future water supply portfolio, historical and projected water demands, and water conservation progress to support decision making and ensure a resilient and sustainable water supply today and into the future. This WRP aligns with One Water New Braunfels priorities.

Progress Since the 2018 WRP

Since establishing the first WRP in 2018, NBU has rapidly integrated or brought online interim and long-term water supplies including purchased water from the City of Seguin and Green Valley Special Utility District (GVSUD), additional raw Canyon Reservoir water from the Guadalupe-Blanco River Authority (GBRA), and the Gonzales-Carrizo Water Supply Project (GCWSP). In addition, NBU is about to complete (in 2025) an expansion of the Trinity Aquifer wellfield and treatment plant that will double its capacity. These supply additions diversified and expanded NBU's firm deliverable water supply and, with the planned expansion of the Surface Water Treatment Plant (SWTP), will allow NBU to meet projected demand through the planning horizon (beyond 2075). Additionally, NBU's 2021 NBU Water Supply Resiliency Study concluded that, with these expansions, NBU's water supply is diverse, resilient and reliable. Meanwhile, NBU's per capita demand has decreased due to NBU's proactive conservation program, pricing signals as a result of rate structure changes, and service area changes such as higher-density developments that use less water for irrigation.

Current Water Supplies

NBU has a diverse inventory of water supply sources that will total 54,575 acre-feet per year (AFY) by the end of 2025, although some of these supplies are subject to curtailment during drought conditions. **Table ES - 1** summarizes NBU's existing authorizations and deliverable water volumes. The following key terms are used when discussing NBU's water supply.

- **Authorized Water:** The volume of water for which NBU has an existing contract, permit, or approval.
- **Firm Water:** The authorized volume with all curtailments applied; the amount that NBU could use during worst case drought conditions (worse than the drought of record [DOR]).

[1] Unless stated otherwise, all years in this WRP are calendar years (January to December).

- **Authorized Deliverable Water:** The volume of water that NBU can currently treat and distribute without drought restrictions in place.[2]
- **Firm Deliverable Water:** The volume of water that NBU can currently treat and distribute with the most stringent drought restrictions in place.[3]

Table ES - 1: 2025 Authorized, Firm, and Deliverable Water

Water Supply	Authorized (AFY)	Firm (AFY)	Authorized Deliverable (AFY)	Firm Deliverable (AFY)
Run-of-River (ROR) Water	6,952	0	8,967	8,400
Contracted Canyon Reservoir Water	18,070	12,649		
Edwards Aquifer Wells	9,269	5,190	9,269	5,190
Trinity Aquifer (including Copper Ridge)	8,784	8,784	8,784	8,184
GVSUD	1,000	1,000	1,000	1,000
Guadalupe-Blanco River Authority (GBRA)'s GCWSP	8,000	8,000	8,000	8,000
City of Seguin	2,500	2,500	0	0
Total	**54,575**	**38,123**	**36,020**	**30,774**

Demand Projections

Estimation of NBU's future water demand is based on projections in the number of customers served and the average water use per customer by account type. Billing data are broken down into the following account categories.

- SF1 – single-family accounts with meters sized at 5/8-inch
- SF2 – single-family accounts with meters sized above 5/8-inch
- MF1 – multi-family accounts serving between 2 and 50 living units / households
- MF2 – multi-family accounts serving between 51 and 100 living units / households
- MF3 – multi-family accounts serving over 100 living units / households
- INST – accounts serving public and institutional units

[2] For this analysis, authorized deliverable water accounts for the full design capacity of treatment plants.
[3] For this analysis, firm deliverable water accounts for the sustainable capacity of treatment plants.

- COMM – accounts serving commercial / business units

Average rates of change over the last ten years (2015 – 2024) informed selection of future growth rates. **Table ES - 2** presents the number of households / accounts in each category in 2024, as well as the average rate of change over the last 10 years.

Table ES - 2: Number of Households / Accounts per Customer Category and 10-Year Average Rate of Change

	SF1	SF2	MF1	MF2	MF3	INST	COMM	TOTAL ACCOUNTS
2024 Total	36,476	433	6,122	1,441	3,457	157	2,290	48,181
10-Year Average Rate of Change	4.8%	0.5%	2.8%	3.4%	11.6%	0.8%	2.2%	5.2%

In addition to the number of metered accounts, water demand is impacted by water use per customer type. **Table ES - 3** summarizes use per customer category from 2024, in average gallons per day (gpd), as well as the average change over the last 10 years. Water use has decreased for all residential customer categories. The increase in use per account for INST customers is likely due to changes in the types of customers that make up this category.

Table ES - 3: Water Use per Customer Category and 10-Year Average Rate of Change

	SF1	SF2	MF1	MF2	MF3	INST	COMM
3-year Average Use through 2024 (gpd)	216	456	101	97	73	2,452	1,157
2024 Average Use (gpd)	196	419	94	88	56	2,230	1,095
10-Year Average Rate of Change	-2.5	-2.5	-2.3%	-3.5%	-7.0%	+0.7%	-0.6%

Demand was projected for the next 50 years using a scenario-based approach. The scenario used for planning is based on conservative assumptions, including:

- usage per account remaining at its current 3-year average value shown in **Table ES - 3** (although it is likely to continue to decrease considering technological advantages, regulatory changes, and continued implementation of NBU's Conservation Plan and drought contingency measures),
- growth rate for all customer categories reducing by only 20% per decade (compared to reductions ranging from 40% to 60% for similar communities along the IH-35 corridor), and
- the fraction of nonrevenue water remaining at its current 3-year average of 19% (although it is likely to continue to decrease considering technological advantages and NBU's nonrevenue water reduction initiatives).

Figure ES-1 shows the estimated system demand over the next 50 years for this planning scenario. The rate of demand increase per year reduces in the early 2040s as the system buildout capacity[4] is reached in the residential customer categories. At the end of the 50-year planning period, total system demand is projected to be 31,295 AFY.

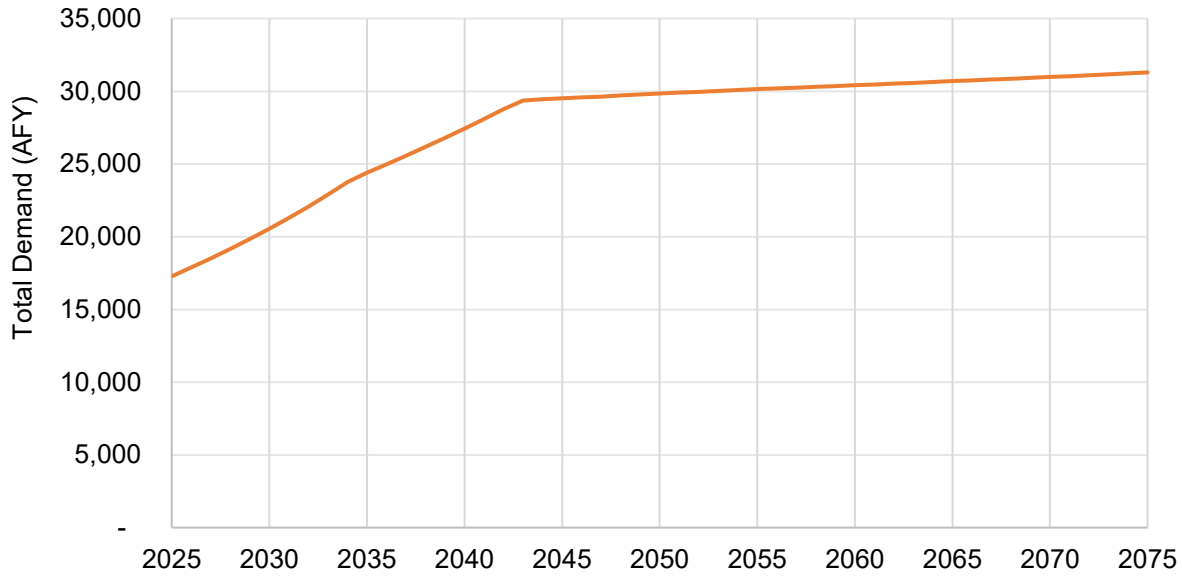

Figure ES-1: 50-Year Demand Projection

Evaluation of Future Supply and Projected Demand

Significant changes to NBU's water portfolio have occurred since the 2018 Water Resources Plan. In 2018, NBU only had 39,625 AFY of authorized water, with 19,223 AFY of that being firm deliverable. Since then, NBU has secured additional Canyon Reservoir raw water from GBRA and established contracts to purchase wholesale treated water from GBRA's GCWSP, GVSUD, and the City of Seguin. NBU will have 54,575 AFY of authorized water by the end of 2025 (when the Trinity Wellfield expansion is complete), with 38,123 AFY of that being firm, 36,020 AFY being authorized deliverable and 30,774 AFY being firm deliverable. The following projects in progress will provide additional supply or allow NBU to more fully utilize existing authorizations.

- Expansion of the existing SWTP, doubling its design capacity to 16 million gallons per day (MGD) (17,934 AFY) corresponding to a sustainable capacity of 15 MGD (16,800 AFY). Construction is scheduled to begin in 2026 and be completed by 2029.
- Aquifer Storage and Recovery (ASR) at the New Braunfels National Airport. If the ongoing demonstration project is successful, additional wells will be constructed to meet the target recovery capacity of 9 MGD with an aquifer storage capacity of approximately 5,800 acre-feet (AF) of recovered water.

[4] Based on draft buildout capacity by customer type shared by Freese and Nichols, Inc. in June 2025.

Figure ES-2 summarizes how NBU's water supplies have changed since 2020, and how ongoing supply projects will further increase the quantity of water that NBU is authorized to and can deliver. Beginning in 2038, with the additional water supply changes planned, NBU will have 51,075 AFY of authorized water, 34,023 AFY of firm supply, and 43,987 AFY of deliverable supply.

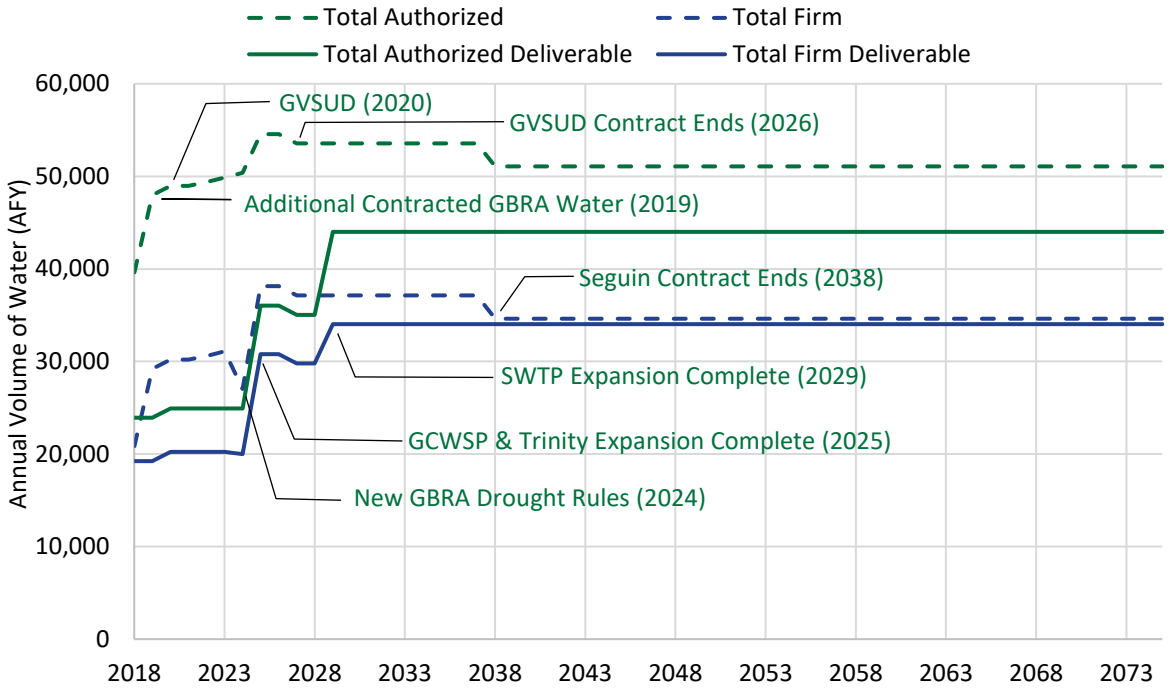

Figure ES-2: Supply Availability

Through its focus on and investment in water supplies and expanding infrastructure over the last five years, NBU's water portfolio is increasingly reliable and diverse. Existing supplies and ongoing projects are estimated to meet New Braunfels' water demands past the end of the 50-year planning period, as shown in **Figure ES-3**. Supplies will likely be sufficient for even longer, because:

- The firm deliverable quantities assume a worst case in which the most stringent water restrictions are all imposed for a full year.
- ASR and other optimized water management strategies will help utilize more of NBU's authorized water even during years with drought restrictions.
- Water use per customer is decreasing, on average, as a result of conservation strategies, technological advances, regulatory changes and increased population density.

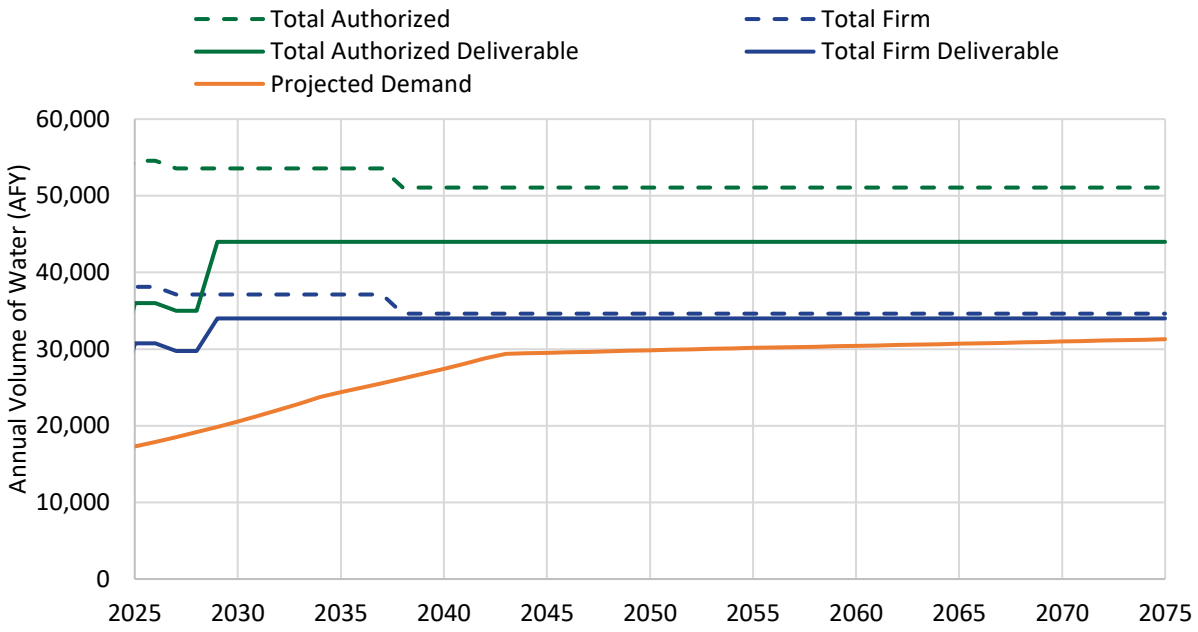

Figure ES-3: Future Supply vs. Demand

As the region continues to grow and reliable water sources are becoming harder to obtain, NBU continues to evaluate ways to improve its water supply reliability. During the planning process, NBU and Arcadis identified nine potential alternatives to further enhance NBU's water portfolio. A triple bottom line analysis was performed from a One Water perspective to support NBU's goals of financial, social, and environmental stewardship. Two of these alternatives are recommended to provide NBU with increased resiliency and reduce the risk of future unknowns, such as exceptional droughts and emerging contaminants:

1. Pursue a Bed and Banks permit to provide NBU control over NBU's groundwater-based return flows.
2. Plan for constructing a second SWTP in the south region of the NBU service area which would use both the existing raw water rights that exceed the capacity of the existing SWTP and any rights obtained through the Bed and Banks permit.

Conservation and Non-Revenue Water Programs

During the last six years, NBU has implemented 16 conservation strategies that have been estimated to save between 40 and 110 million gallons each year. It is expected that this will increase with the new strategies laid out in NBU's 2023 Water Conservation Plan. These improvements, along with broader trends such as increasing population density and regulatory changes, could result in water savings of 9,000 AFY or more (almost a third of total projected demand) by 2075, based on a second water demand scenario modeled by NBU.

Water Quality Considerations

Changes in supply water quality and blending within the distribution system can cause short-term and persistent system water quality issues including nitrification, corrosion, and microbial regrowth. When introducing new supplies into NBU's distribution system, it is of paramount importance to ensure that NBU's standards of water quality excellence are maintained. To minimize NBU's reliance on other entities, it is recommended that the following be completed prior to introduction of any new treated source into NBU's distribution system.

- Information Collection: collection of water quality data from new supply and increased distribution system water quality sampling
- Evaluation & Testing: desktop analysis of new supply water quality and blending, possible coupon study/ harvested pipe loop, pipe scale analysis, and biofilm analysis
- Planning and Source Introduction: slow initiation, increased water quality monitoring, and tracking of flows and blend ratios

Additionally, a robust monitoring program can provide valuable information on the impacts of system changes and can be leveraged before, during, and after introduction of a new supply. Increased sampling (both grab samples and real-time monitors) at each new point of entry, as well as blending zones within the distribution system, will allow for early detection of potential water quality issues. Additionally, distribution system monitoring and control plans (i.e., Nitrification Action Plan (NAP), Corrosion Control Plan, and Distribution System Monitoring Plan) should be updated to account for introduction of each new supply.

Key Conclusions

Significant conclusions reached during the preparation of this 2025 WRP include:

- By the end of 2025, NBU will have 54,575 AFY of water authorized for use during years when aquifer and reservoir levels and river flows are not in drought condition.
- Upon completion of ongoing water supply projects, 43,987 AFY will be deliverable based on current water authorizations, and pumping and treatment capacity.
- Approximately one third of this inventory can be curtailed during drought conditions. When completed, ASR can help utilize more authorizations by storing water during non-drought periods. With the SWTP expansion, NBU will have the capacity to treat and deliver all its firm surface water. However, 6.3 MGD of authorized surface water will remain undeliverable due to treatment capacity limitations.
- Based on a retrospective analysis, the estimated average annual volume that would have been available during the DOR was almost 40,000 AF. Not all of this water is currently deliverable.
- There were no years within the 75-year period evaluated in the retrospective analysis for which the worst case of maximum drought curtailments would have been imposed for the entire year.
- NBU is committed to water conservation and demand management. During the last five years, NBU's conservation strategies have been estimated to save between 40 and 110 MG per year.

- By 2075, the projected total annual water demand for the NBU system, with most residential customer categories having reached buildout, is 31,295 AFY.
- Continued conservation was projected, in one scenario, to reduce total water demands by around 9,000 AFY or around 30%. Actual changes over the next 50 years could result in even lower demands.
- Existing supplies and ongoing projects are estimated to meet New Braunfels' water demands past the end of the 50-year planning period even if supplies were to be curtailed by drought to the maximum extent stated in current permits and contracts.
- Based on a triple-bottom-line analysis, two future water supply options were found to strengthen NBU's diverse water supply portfolio and allow NBU to minimize its reliance on other entities for treated water.

Recommendations

NBU has successfully established a diverse water supply portfolio that meets the community's projected water demand beyond 2075 even during a period worse than the drought of record. Thus, NBU is not recommended to pursue new water supplies in the near future. However, NBU is recommended to pursue the following opportunities to increase supply resiliency, and thereby decrease risk of future unknown conditions:

- Collaborate with the City of New Braunfels as soon as possible on a policy to scrutinize large-quantity water users (e.g., data centers) which may be planning to move into the NBU service area.
- Complete the water supply projects currently underway, including the Trinity Aquifer MTP expansion and the SWTP expansion.
- Complete the ASR demonstration project and move forward with wellfield expansion. This includes permit approval from the Texas Commission on Environmental Quality (TCEQ) and Edwards Aquifer Authority (EAA) for full-scale operation of the ASR wellfield.
- Pursue a Bed and Banks permit as soon as appropriate. This permit secures NBU's right to return flow discharges and provides flexibility in the future should NBU determine a need for additional water supplies. Waiting until the San Antonio Water System obtains its final, unappealable Bed and Banks permit will provide a more predictable permitting process for NBU.
- Establish a timeline and triggers for evaluating potential locations for a future SWTP in the south region of the NBU distribution system. Suspend additional studies for the North SWTP site on Hueco Springs Road because this site would not be able to utilize any future Bed and Banks return flows and the site is also no longer located near anticipated future service area demands.
- Assess opportunities to secure additional Edwards Aquifer water rights. Edwards Aquifer water is still one of the cheapest available sources, and some utilities have been successful in obtaining rights from private EAA permit holders.
- Explore options for cancelling or offloading the water contracted from the City of Seguin, for which NBU is paying but is currently unable to use without significant additional capital investment.

- Do not pursue GBRA's WaterSECURE project at this time. Based on the triple-bottom-line analysis, this is not a recommended option for NBU due to the cost, lack of control by NBU, and the potential for environmental impacts such as very high electrical power demand.

In addition to maintaining NBU's diverse water supply portfolio, the following is a list of the major recommendations for improved water supply management:

- Increase investment in and enforcement of water conservation and demand management measures.
- Complete development of a more formal, but flexible, water management strategy including standard procedures for selecting which supplies to use in real time to maximize available withdrawals while minimizing cost and environmental impacts.
- Improve collection, analysis, and interdepartmental access to relevant account, billing, planning, and operations information. Automate annual reviews of supply and demand data and develop and track key performance indicators to measure success in water resources management.
- Conduct regular reviews of the WRP, water portfolio, and potential opportunities, including updating the triple bottom line evaluations, and performing annual reviews of supply availability and use, changes in customer accounts and demand by account type, and overall system demand to determine the timing for pursuit of an additional supply.
- Continue involvement with the Comal Trinity Groundwater Conservation District (CTGCD), and initiate involvement with other relevant GCDs to provide awareness of potential regulations, including those related to aquifer withdrawals, and to provide input in the decision-making process.
- Continue to monitor GBRA's ongoing Habitat Conservation Plan (HCP) process.
- As new water sources are being planned and before such sources are introduced into the NBU distribution system, or as adjustments are made to source supply blending ratios, perform relevant analysis and testing of these new supplies and determine the potential impacts of the new water quality and blending ratios within the distribution system. Regularly monitor water quality at points of entry and throughout the distribution system.
- Complete implementation of the Water Supply Resiliency Study recommendations.
- Stay informed on regional and national water supply advances, emerging technologies (e.g. technologies related to direct potable reuse and water-saving technologies for homes and businesses), and national trends for water use.

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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
ACS	American Community Survey
AF	acre-feet
AFY	acre-feet per year
Alliance Water	Alliance Regional Water Authority
ASR	Aquifer Storage and Recovery
AWWA	American Water Works Association
cfs	cubic feet per second
COA	Certificate of Adjudication
COMM	commercial
CPM	Critical Period Management
CREAT	Climate Resilience Evaluation and Awareness Tool
CTGCD	Comal Trinity Groundwater Conservation District
DBP	disinfection byproduct
DCP	Drought Contingency Plan
DIC	dissolved inorganic carbon
DOI	declaration of intent
DOR	drought-of-record
EAA	Edwards Aquifer Authority
EST	elevated storage tank
FNI	Freese and Nichols, Inc.
GBRA	Guadalupe-Blanco River Authority
GCD	Groundwater Conservation District
GCWSP	Gonzales Carrizo Water Supply Project
gpd	gallons per day
gpcd	gallons per capita per day
gpm	gallons per minute
GST	ground storage tank
GUDI	Groundwater Under the Direct Influence of Surface Water
GVSUD	Green Valley Special Utility District
H_2S	hydrogen sulfide gas

HAA	haloacetic acids
HAA5	group of five halo acetic acids
HCP	Habitat Conservation Plan
HH	Household
HSPS	high service pump station
INST	institution (public and interdepartmental)
IPR	indirect potable reuse
LCR	Lead and Copper Rule
LCRI	Lead and Copper Rule Improvements
LSI	Langelier Saturation Index
MF	multi-family
MG	million gallons
MGD	million gallons per day
msl	mean sea level
MTP	membrane treatment plant
NAP	Nitrification Action Plan
NBU	New Braunfels Utilities
NOAA	National Oceanic and Atmospheric Administration
NRW	Non-Revenue Water
O&M	operations and maintenance
POE	point(s) of entry
ROR	Run-of-river
SAWS	San Antonio Water System
SB3	Senate Bill 3
SDWA	Safe Drinking Water Act (Federal)
SF	single-family
SWTP	surface water treatment plant
TCEQ	Texas Commission on Environmental Quality
TDS	total dissolved solids
TOC	total organic carbon
TTHM	total trihalomethane
TWDB	Texas Water Development Board
UCMR	Unregulated Contaminant Monitoring Rule

USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WQP	water quality plan
WRF	water reclamation facility
WRP	Water Resources Plan
WTP	water treatment plant

ACKNOWLEDGEMENTS

As a result of more than three years of effort, this *2025 Water Resources Plan* reflects the commitment by New Braunfels Utilities to water stewardship and community resilience. This plan would not be possible without the collaboration, enthusiasm, and input from participants throughout the plan development process. Sincerest appreciation goes to the core water resources planning team listed here.

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1 INTRODUCTION AND BACKGROUND

1.1 WATER RESOURCES PLANNING

Traditionally, water utilities have focused their efforts on producing, treating, and delivering potable water to their customers, and meeting the increasing requirements of regulatory standards such as the federal Safe Drinking Water Act (SDWA). However, these fundamental tasks are increasingly supplemented by the need to focus on effective water resources planning and management. For New Braunfels Utilities (NBU), there is a growing focus on demand reduction and the development of new water supplies. Population and economic growth are increasing the need for water within NBU's service area. At the same time, the availability of high-quality, reliable water supplies is being threatened and competition for such supplies is growing. Increasing regional demand growth is putting additional stress on water supplies that have suffered from historical overuse. The possibility of longer and more intense drought periods could further threaten supply sustainability.

Water resources planning is the basis for effectively balancing these elements and providing sufficient water for future generations, even during periods of severe drought. This planning provides a variety of benefits including:

- Increased confidence in meeting future water demand
- Improved understanding of short- and long-term supply needs and opportunities, allowing for "right sizing" of the supply portfolio, resulting in:
    - Reduced costs through selection of the most appropriate alternatives for meeting water needs
    - Avoidance of the higher costs generally associated with "emergency" projects to ensure demands can be met
    - Avoidance of unnecessary supply contracts, infrastructure upgrades, etc.
    - Potential revenue through selling or leasing unneeded existing water rights
- Consistent, efficient, and data-driven decision making
- Holistic evaluation that aligns with One Water New Braunfels priorities

Water resources planning focuses on the balance between supply and demand. Future water demand is forecasted, and the quantity and reliability of existing water supplies is evaluated. Based on those conclusions, a utility's "water portfolio" can be evaluated and adjusted as appropriate, including through identification and evaluation of new supply options.

Water resources planning can be complicated because the process includes both the technical analysis of factors such as cost and water availability, and elements such as contractual, institutional, and risk factors. The water resources plans for different utilities are seldom alike. However, most plans have common elements: future water demand for the planning area is forecasted, and that demand is compared to the current supply. Assessment of the current water supply includes consideration of reliability and availability during periods of severe drought, as well as consideration of regulatory, contractual, sustainability, and climate factors that may impact the quantity of water available in the future.

The comparison of future demand and existing supply determines the volume of additional water needed. New water supply options can then be identified and evaluated using a ranking or rating system. The preferred water resources plan is one that balances sometimes conflicting factors such as cost and cost-effectiveness, capital cost and long-term operating and maintenance expenses, availability and reliability, water quality, environmental and permitting issues, public acceptance, community stewardship, and sustainability. Depending on the size, growth rate, and location of the utility and the quantity of water needed, identifying new water sources can be a challenge. In arid, fast-growing states like Texas, water supplies are becoming more expensive and time consuming to develop, and there is more competition for limited water resource options. Many utilities are faced with procuring water from distant sources and/or using water resources that require significant treatment. Traditional water supply sources such as surface reservoirs like Canyon Lake are now faced with environmental, land acquisition, and permitting constraints that increase the cost of water and the time it takes to complete supply projects.

This 2025 Water Resources Plan (WRP) [5] presents NBU's current water supply portfolio, historical and projected water demands, and recommendations regarding future water supply strategies to support decision making and ensure a resilient and sustainable water supply today and into the future. It is important to recognize that this water resources plan is a roadmap for determining and developing the water needed on an annual basis. As such, this plan is meant to support but not replace a water master plan that looks at instantaneous demands and pumping and storage requirements. It also does not replace a capital improvements plan that details costs and implementation of specific projects.

1.2 NEW BRAUNFELS UTILITIES

NBU is a municipally owned public utility responsible for water, wastewater, and electric service for residents of the City of New Braunfels, Texas. In 2024, NBU served over 45,000 households and over 2,400 institutional and business connections. The water system is rated as "Superior" by the Texas Commission on Environmental Quality (TCEQ) and includes the following major infrastructure:

- Over 700 miles of water mains ranging in diameter from 0.75 to 36 inches
- One 8.0 million gallons per day (MGD) surface water treatment plant (SWTP)
- Five active Edwards Aquifer groundwater wells
- Four active Trinity Aquifer groundwater wells with a membrane water treatment plant (MTP)
- 24 pump stations

Storage capacity of approximately 18.3 million gallons (MG) is provided in elevated and ground storage tanks. In the future, this storage is planned to be augmented by an Aquifer Storage and Recovery (ASR) wellfield currently in the pilot stage.

NBU has a diverse inventory of water supply sources which will total 54,575 acre-feet per year (AFY) by the end of 2025, outside of drought conditions. These sources, which will be discussed in more detail in **Section 2**, include:

- Run-of-river water (ROR) rights for raw surface water from the Guadalupe River, permitted by TCEQ (6,952 AFY)

[5] Unless stated otherwise, all years in this WRP are calendar years (January to December).

- Contracts with the Guadalupe-Blanco River Authority (GBRA) for stored raw surface water from Canyon Reservoir (18,070 AFY)
- Groundwater production permits for water from the Edwards Aquifer from the Edwards Aquifer Authority (EAA) (9,269 AFY)
- Groundwater wells in the Trinity Aquifer (8,400 AFY capacity of the Trinity Aquifer Wellfield)
- Purchased treated water under a contract with Green Valley Special Utility District (GVSUD) (1,000 AFY)
- Purchased treated groundwater from GBRA's Gonzales Carrizo Water Supply Project (GCWSP) (8,000 AFY)
- Purchased treated water under a contract with the City of Seguin (2,500 AFY, although the required infrastructure is not in place to use this water)

NBU also owns and operates four activated sludge water reclamation facilities (WRFs). These are the North Kuehler, South Kuehler, Gruene Road and McKenzie WRFs which have a combined treatment capacity of approximately 12.3 MGD. A portion of the Gruene Road WRF discharge is recycled for irrigation of a private development, and the treated effluent from the other plants is currently discharged to the Guadalupe River.

NBU serves most of New Braunfels within Comal County, with some customer service provided to the northern area of Guadalupe County. **Figure 1-1** shows the proposed NBU water service area, which was used for 2025 WRP calculations.

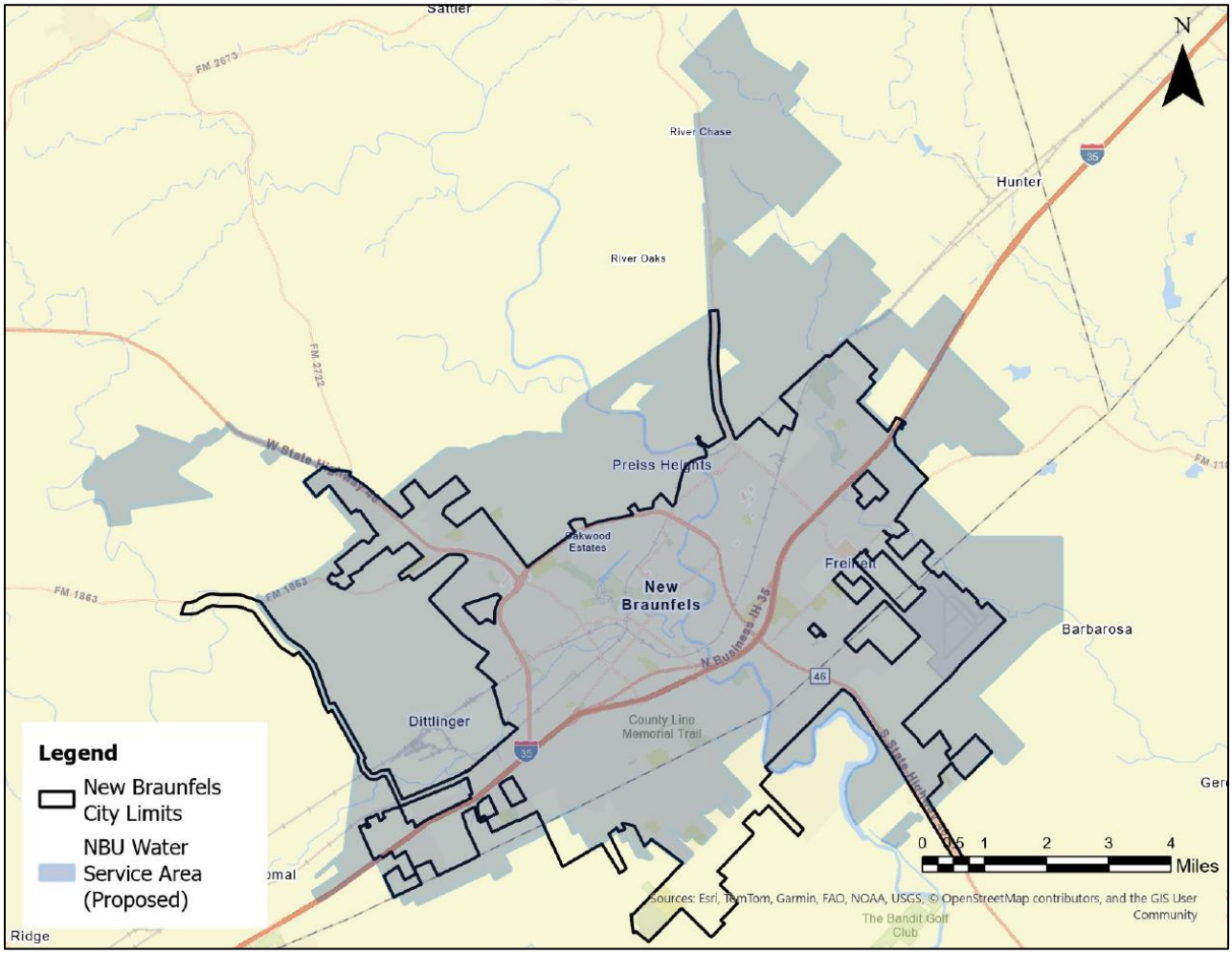


Figure 1-1: NBU Water Service Area Map

This 2025 WRP is aligned with NBU's mission, core values, and guiding principles. More specifically, this WRP:

- Serves as a strategic roadmap for building a resilient water supply for the future
- Supports NBU's commitment to be stewards of water resources through responsible management
- Furthers NBU's ability to continue providing excellent service to its customers, including through sound financial management that allows for competitive rates
- Enhances the quality of life in New Braunfels by providing the most essential public service: an assured water supply
- Reflects flexibility and innovation to address evolving challenges and opportunities and achieve continuous improvement
- Maintains the safety of the community by providing water for sanitary and health purposes
- Embodies a team effort in the development of the Plan

1.3 NBU ACCOMPLISHMENTS SINCE THE 2018 WATER RESOURCES PLAN

NBU published the first WRP in 2018. At that time, growth was anticipated to continue at a rate of 6% per year for at least another ten years before tapering down. However, per capita demand was already decreasing. From 2009 through 2016, NBU's per capita demand averaged 168 gallons per capita per day (gpcd). By 2016, the per capita demand had already decreased to 146 gpcd. Thus, as part of the 2018 WRP, NBU established a goal to achieve 125 gpcd by 2040, which was subsequently revised. Despite the planned per capita demand reduction, NBU's demand was still projected to exceed the firm yield supply (accounting for supply reductions during a drought) within two years. In response, NBU rapidly brought online interim and long-term water supplies, including:

Currently, NBU'S goal is to reach a 10-year average of 118 gpcd by 2040.

- Seguin Interim purchased water (brought online in 2019 and contracted in 2018),
- GVSUD Interim purchased water (brought online in 2020 and contracted in 2019),
- A Trinity Aquifer Wellfield and MTP expansion to double capacity (currently planned to be online in 2025),
- A regional treated water supply project, the GCWSP (currently planned to be online in 2025),
- Two contracts executed in 2019 for additional long-term Canyon Reservoir water, and
- A surface water treatment expansion project to allow for treating additional surface water (currently planned to be online in 2029),

These supply additions diversified and expanded NBU's firm deliverable water supply to meet demand through the current planning horizon (beyond 2075). Additionally, a 2021 NBU Water Supply Resiliency Study concluded that, with these additional supplies and expansions, NBU's water inventory is diverse, resilient and reliable, allowing for meeting demands even if a supply is offline. An implementation plan was developed to ensure this status is maintained as demand increases. Further, NBU has also completed steps in accordance with Senate Bill 3 (SB3) to implement alternative power solutions to continue to supply water during extended power outages beyond 24 hours.

Protecting the Edwards Aquifer

When NBU was assigned operation of the City's water system in 1959, the Edwards Aquifer (aquifer) was the City's sole water supply. The aquifer was the primary water supply for the region due to its large volume, accessibility, and high water quality. However, chronic overuse by its large number of usersplaced the long-term availability of the aquifer and associated springs at risk. In response, the EAA was created by the Texas Legislature in 1993 to protect this special resource. The aquifer's use is now highly regulated under EAA rules and a federally-approved Habitat Conservation Plan (HCP). NBU has diversified its water supply portfolio, and today, the Edwards Aquifer makes up only 22% of NBU's water supply portfolio.

NBU has also done significant work to improve the water demand projection model, including review of multiple demand scenarios (further discussed in **Section 4**) and calculation of historical and current NBU service area population and demand based on NBU billing data. **Table 1-1** compares the projections in the 2018 WRP for the year 2024 to the actual calculated values based on 2024 NBU billing data. Although the model used in the 2018 WRP was much simpler than the current model, it projected the population growth within 10% error and provided a conservative demand projection (with a 25% buffer) for planning.

Table 1-1: 2018 Projections Compared to Actual Data

	2018 WRP Model Projections for 2024	2024 Calculations based on NBU Data	Difference
Service Area Population	119,400	127,400	7%
Service Area Demand (AFY)	20,700	15,600	-25%

Based upon NBU's billing data, the actual per capita demand has decreased from an actual 130 gpcd in 2018 to 111 gpcd in 2024, thereby reducing system demand. This is partially due to economic changes such as new developments that are higher density and use less water for irrigation, but the reduction is also due to NBU's proactive water conservation program and pricing signals as a result of rate structure changes. NBU saved a total of 470 MG from 2018 through 2024 via Conservation Programs such as Rebates, Home and Commercial Performance Assessments, Continuous Consumption Alerts, and Asterra Satellite Leak Detection. One of NBUs most successful conservation programs has been the Asterra Satellite Leak Detection which alone has saved over 95 MG since 2018.

1.4 WATER SUPPLY RELIABILITY

Assuring a reliable supply of good quality water is the primary responsibility of water utilities. TCEQ rules found in Section 290.41(b) (30 TAC Part 1, Chapter 290, Subchapter D) require that ground and surface water sources of supply "…shall have a safe yield capable of supplying the maximum daily demands of a utility's distribution system during extended periods of peak demand usage and critical hydrologic conditions." This rule essentially requires a "firm" water supply, which Texas water resources planners define as water that would be available during a repeat of the drought-of-record (DOR). At the time of writing, the DOR in central Texas lasted from 1947 through 1957. In addition to periods of severe drought, NBU must have a reliable water supply to meet future growth.

For NBU, the two critical aspects of water resource reliability are:

- Water supply sources capable of meeting the utility's total annual water requirements, even during drought periods; and
- Production and distribution system facilities that can supply the peak day water demand.

This planning process included an assessment of demand and supply on an annual basis. Having a sufficient annual supply is important because most regulatory permits and water supply contracts authorize water use over a calendar year. Under such permits and contracts, water use must be stopped when the authorized volume of groundwater has been pumped or the authorized volume of surface water has been diverted. NBU's TCEQ-, GBRA- and EAA-related sources of supply are also subject to

stoppage or curtailment during periods of drought. The impact of these restrictions on NBU's annual supply is discussed in more detail in **Section 2**.

The current NBU sources provide water as needed to meet average day demand, with storage available for short peak-demand periods in elevated storage tanks (ESTs) and ground storage tanks (GSTs). NBU is currently pursuing ASR, which will allow for storage of water for longer periods. When fully developed, the ASR wellfield will improve reliability by allowing NBU to capture, treat, and store water during periods when surface water is available and when Edwards Aquifer water levels allow greater use of NBU's permitted groundwater supply. As described in **Section 2.4**, even during the DOR, there were periods of time when NBU could have diverted and stored surface water under its permits and contracts, providing additional supply that could be recovered (pumped) to meet demands even during drought conditions.

2 CURRENT WATER SUPPLIES

This section summarizes NBU's current water supplies, with the volumes and capacities presented based on contracts, permits, and infrastructure that will be in place at the end of 2025. The following key terms are used throughout this plan when discussing NBU's water supply. **Table 2-1** shows these four quantities for NBU's existing authorizations and infrastructure.

- **Authorized Water:** The volume of water for which NBU has an existing contract, permit, or approval to use. For water from the Trinity Aquifer, capacity is used as there are no associated permits for that supply.
- **Firm Water:** The authorized volume with all curtailments applied; the amount that NBU could use during worst case drought conditions (worse than the drought of record [DOR]).[6]
- **Authorized Deliverable Water:** The volume of water that NBU can treat and distribute without drought restrictions in place; the minimum of infrastructure capacity and volume of authorized water for each water supply.[7]
- **Firm Deliverable Water:** The volume of water that NBU can treat and distribute with the most stringent drought restrictions in place; the minimum of infrastructure capacity and firm water.[8]

Table 2-1: 2025 Authorized and Deliverable Water

Water Supply	Authorized (AFY)	Firm (AFY)	Authorized Deliverable (AFY)	Firm Deliverable (AFY)
ROR Rights for Guadalupe River Water from the Canyon Reservoir	6,952	0	8,967	8,400
Contracted Canyon Reservoir Water	18,070	12,649		
Edwards Aquifer Wells	9,269	5,190	9,269	5,190
Trinity Aquifer Wellfield (including Copper Ridge wells)	8,784	8,784	8,784	8,184
GVSUD Purchased Water	1,000	1,000	1,000	1,000
GCWSP Purchased Water	8,000	8,000	8,000	8,000
City of Seguin	2,500	2,500	0	0
Total	**54,575**	**38,123**	**36,020**	**30,774**

[6] NBU considers "firm water" to be water that cannot be curtailed given existing permit and contractual conditions. This is different from the state's use of the term to represent water that would be available during a repeat of the DOR. As will be described in **Section 2.4**, the DOR would not have triggered NBU's current most stringent water restrictions, and thus more water would have theoretically been available during a DOR than is presented as "firm" throughout this document.
[7] For this analysis, authorized deliverable water accounts for the full design capacity of treatment plants.
[8] For this analysis, authorized deliverable water accounts for the sustainable capacity of treatment plants.

2.1 SURFACE WATER

2.1.1 Water Rights Permits and Contracts

NBU is authorized to divert, treat, and use water from the Guadalupe River via two mechanisms:

- Certificates of adjudication (COAs), which are essentially permits issued by TCEQ for ROR water from the Guadalupe River
- Water supply contracts with GBRA for stored water released from Canyon Reservoir

Total authorizations available through these mechanisms are summarized in **Table 2-2.** Both authorizations have drought restrictions. ROR water is interruptible and 100% curtailable. Specifically, water is only available to NBU when the streamflow of the Guadalupe River equals or exceeds 113 cubic feet per second (cfs) at the United States Geological Survey (USGS) gauge 08168500. This gauge is located on the Guadalupe River upstream of the confluence of the Guadalupe River and Comal River at New Braunfels. Additionally, the total diversion rate cannot exceed the lesser of the flow of the Comal River at USGS gauge 08169000, or 30.15 cfs.

The water contracted from GBRA previously did not have mandatory drought curtailments. However, GBRA approved a new Drought Contingency Plan (DCP) in May 2024 that gives the GBRA Board more authority to restrict water use. Moving forward, contractual water supplied from Canyon Reservoir can be curtailed by 15% during a Stage 4 drought and by 30% during a Stage 5 drought. Applying a worst-case scenario in which the most stringent drought restrictions are imposed for the entire year yields a firm capacity of 12,649 AFY (11.3 MGD) as shown in **Table 2-2**.

Table 2-2: Surface Water Sources of Supply

COA / Contract	Purpose of Use	Permitted or Contracted Volume (AFY)
TCEQ / ROR		
18-823A / 3823A-400	Municipal	1,289
18-2824B / 3824B-403	Municipal	5,658
18-3830A / 18-3830A	Municipal	5
Subtotal		**6,952 (0 AFY firm)**
GBRA / Canyon Reservoir		
18-18-2074B	Municipal / Industrial	9,720
18-3863C and 18-2074E	Municipal / Industrial	2,850
18-2074E	Municipal / Industrial	5,500
Subtotal		**18,070 (12,649 AFY firm)**
Total Surface Water Authorizations		**25,022 (12,649 AFY firm)**

2.1.2 Existing Surface Water Treatment Plant

The ability of NBU to treat surface water to potable standards is currently limited by the production capacity of the existing SWTP. The Gruene Road SWTP has a rated capacity of 8 MGD and a sustainable capacity of 7.5 MGD, providing the ability to treat at most 8,400 AFY of water assuming the plant runs at full, sustainable capacity all year. The plant expansion in progress, described in **Section 5,** will double this sustainable capacity to 16,800 AFY.

Figure 2-1: SWTP Upflow Clarifiers

2.2 GROUNDWATER

2.2.1 Water Rights

Currently, NBU's direct groundwater supplies come from two sources: the Edwards Aquifer and the Trinity Aquifer. The Edwards Aquifer is one of the most regulated groundwater resources in Texas and NBU can only pump Edwards Aquifer water under permits issued by the EAA. **Table 2-3** summarizes NBU's existing permits for use of water from the Edwards Aquifer, which total 9,269 AFY (8.3 MGD). However, production of Edwards Aquifer water is subject to restrictions under EAA's Critical Period Management (CPM) rules. The volume of water NBU can pump from the Edwards Aquifer can be reduced by as much as 44% during drought conditions, resulting in a firm capacity of 5,190 AFY (4.9 MGD).

Table 2-3: NBU Permits from Edwards Aquifer Authority

Well Permit #	Old Permit #	Permit Type	Authorized Volume (AFY)
P100-697	CO 00112A	Municipal	48.0
P100-730	CO 00124	Municipal	5.028
P100-733	CO 00127	Municipal	30.684
P100-759	CO 00136	Municipal	9,127.233
P100-780	CO 00149	Municipal	23.271
P100-781	CO 00150	Municipal	35.769
Total			**9,269 (5,190 AFY firm)**

Use of water from the Trinity Aquifer is currently limited only by pumping capacity and aquifer conditions. In 2015 the 84th Texas Legislature created the Comal Trinity Groundwater Conservation District (GCD) to "…help Comal County residents conserve, preserve, recharge, protect, and prevent waste of groundwater from the Trinity Aquifer which underlies all of Comal County." However, at the time of writing there are no regulations limiting withdrawal of water from the Trinity Aquifer.

2.2.2 Groundwater Wells and Treatment

Although NBU has seven wells that are built to pump water from the Edwards Aquifer, only five wells are currently active. **Table 2-4** shows the rated and observed maximum production capacity of the active wells at the time of writing. Collectively, the production capacity exceeds NBU's permitted water, and thus NBU has adequate production capacity to use all of its authorized Edwards Aquifer water rights. The high-quality water from the five Edwards Aquifer wells requires only minimal treatment. At each groundwater well site, chloramines and fluoride are added before the water is conveyed to a storage tank or into the distribution system.

Figure 2-2: Edwards Well No. 3

Table 2-4: Edwards Aquifer Well Capacity

NBU Well Number	TCEQ Source ID	Name	Rated Production Capacity (MGD)	Observed Maximum Production Capacity (MGD)
Well 2	G0460001B	Klingemann B	1.73	3.50
Well 3	G0460001C	Klingemann C	3.96	5.00
Well 4	G0460001D	Beverly D	5.21	5.80
Well 5	G0460001E	Landa Park E	9.50	10.00
Well 6	G0460001F	Moss Rock F	3.97	3.80
Total	**-**	**-**	**24.37**	**28.10**

The Trinity Aquifer Wellfield currently has four wells and a MTP, with a total design capacity of 3.75 MGD. Three additional wells are under construction and expected to be complete in 2025. Though capacity will need to be confirmed upon final installation of the new pumps, they are expected to provide a combined 2,800 gallons per minute (gpm), or 4.03 MGD. Due to intermittent water quality problems including elevated levels of turbidity, aluminum, iron, total organic carbon (TOC), and pathogens following heavy rainfall events, water from the Trinity Aquifer is treated at a MTP. The capacity of the MTP, capable of treating the groundwater to regulatory water standards, is being increased as part of the wellfield expansion. The design capacity of the upgraded MTP will be 7.5 MGD (8,400 AFY), which is used as the delivery capacity for the Trinity Aquifer Wellfield throughout this plan.

Water from the Trinity Aquifer also serves residents of Copper Ridge Subdivision. In 2008, NBU entered into an agreement to assume responsibility for the operation and maintenance of two wells constructed for the subdivision. After the completion of 2018 Water Resources Plan, one of the wells was capped due to low production and substandard water quality. The remaining well remains in service, with a sustainable capacity of 0.34 million gallons per day (MGD), equivalent to 381 acre-feet per year (AFY). Currently, water treatment for this well is limited to addition of chloramines prior to distribution.

2.3 PURCHASED WATER

Since NBU's 2018 WRP, NBU has entered into three contracts to purchase wholesale treated water from adjacent water utilities. In February 2018, NBU entered into a water supply contract with GBRA for purchase of treated water from GBRA's Gonzales Carrizo [Aquifer] Water Supply Project (GCWSP). For this project, GBRA leased approximately 42,000 acres of land in Gonzales and Caldwell counties, which provides GBRA with the right to access the Carrizo Aquifer groundwater beneath the land. Alliance Regional Water Authority (Alliance Water) will operate groundwater treatment and transportation infrastructure to convey this water. For NBU, this purchased wholesale water will be transported via a 60-mile water main to the Weltner Pump Station, on the southern border of NBU's service area. Based on information from GBRA, a reliable supply of up to 8,000 AFY (7.14 MGD) should be available in late 2025.

NBU also entered into a contract with the City of Seguin effective July 1, 2018 to purchase 2,500 AFY of treated wholesale water. The current contract expires in 2038. NBU is responsible for constructing a water main to a delivery point to the south of the service area, as well as a pump station to convey the water. The infrastructure required to convey this water from the connection point into NBU's system is not in place, so NBU cannot currently utilize these rights. The water is a blend of treated surface and groundwater directly from Seguin's distribution system.

In 2020, NBU entered into a short-term contract with GVSUD to purchase 1,000 AFY of treated water to meet the needs of the Morningside Pressure Zone and supplement NBU's overall water supply portfolio until longer-term water supplies come online. The contract will expire on June 30, 2026, but this can remain an emergency connection long term and/or be extended.

2.4 RETROSPECTIVE ANALYSIS OF WATER SUPPLY AVAILABILITY

As part of the 2025 WRP development, NBU asked Arcadis to consider potential future climate conditions, permit and contractual limitations, and their impact on available water rights. Arcadis performed a retrospective analysis of historical aquifer and river flow data between 1950 and 2024, applying current contract and permit conditions and current water authorizations to consider the extent of curtailment that could have been imposed in each of these 75 years. This analysis assumed that NBU would withdraw from each source evenly across the year and not perform water management activities, such as ASR. For example, if conditions for curtailment were met for half of a year, it was assumed that NBU would only use half of its water rights that year. However, in reality NBU could withdraw more water during non-drought periods to still use the full authorized annual volume. Therefore, NBU could have withdrawn more water than is presented in this section.

2.4.1 Retrospective ROR Surface Water Availability

As described in **Section 2.1**, the 6,952 AFY of ROR water authorized under the TCEQ COAs is 100% curtailable when the streamflow of the Guadalupe River, as measured at the Common Street Bridge in New Braunfels, is below 113 cfs. **Figure 2-3** summarizes the number of days for each year between 1950 through 2024 for which flow was less than 113 cfs, and thus curtailment would have been triggered. The corresponding percentage of annual water rights that would have been curtailed is also shown. Note that this analysis does not incorporate the monthly required "declaration of intent" (DOI) with the TCEQ Watermaster to obtain approval for diversion but instead treats each day independently. Therefore,

available quantities may have been slightly different depending on when the days to declare intent aligned with drought levels.

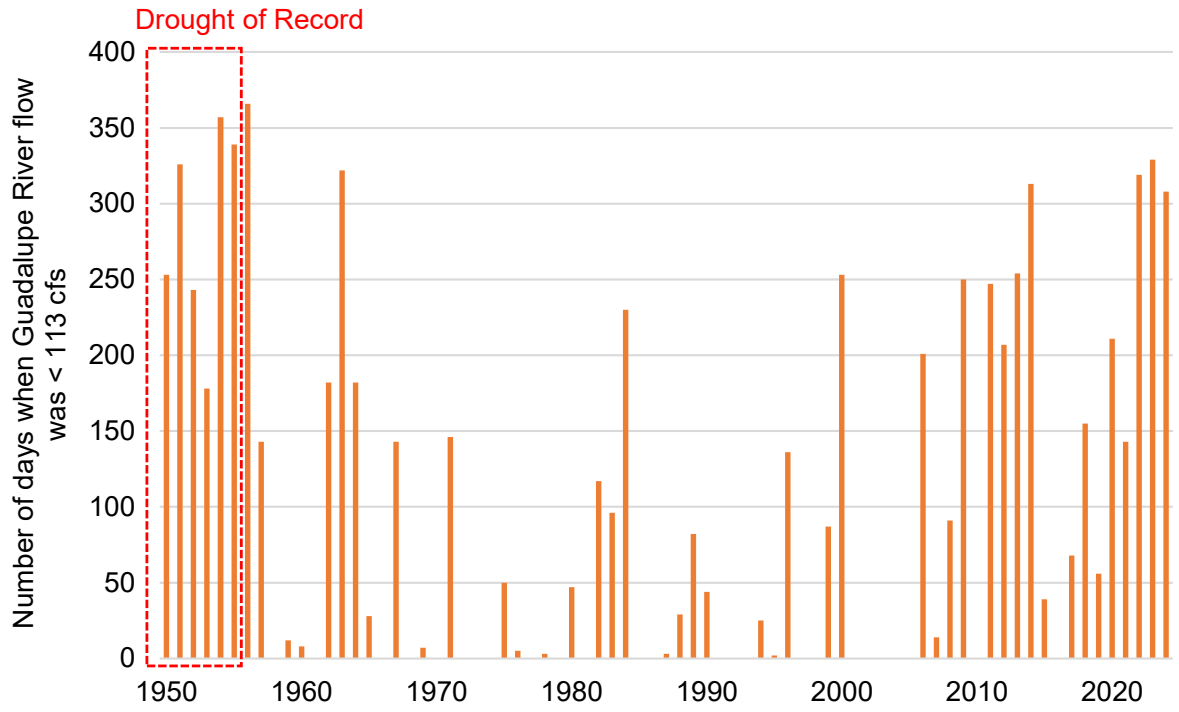


Figure 2-3: Number of Days that Conditions for Curtailment of ROR Rights Would Have Been Triggered between 1950 and 2024

NBU's full ROR water authorizations (6,952 AFY) would have been available for 25 years across this 75-year period (33%). There was only one year during this 75-year period for which conditions for curtailment were met every day so no ROR water could have been diverted; that year was 1956, which was the worst year of the DOR. Applying the assumption that NBU would withdraw the same amount of water each day, the average volume of ROR water available over this period was 5,011 AFY (72% of the full rights).

Figure 2-4 shows the percentage of years for which at least the listed volumes of water would have been available to NBU. As shown, at least 6,000 AF of NBU's ROR rights would have been available over half the time (52%). Conversely, in only nine of the years during this 75-year period (12%) would NBU have been only able to withdraw up to 2,000 AF of its ROR water given the assumptions of this analysis.

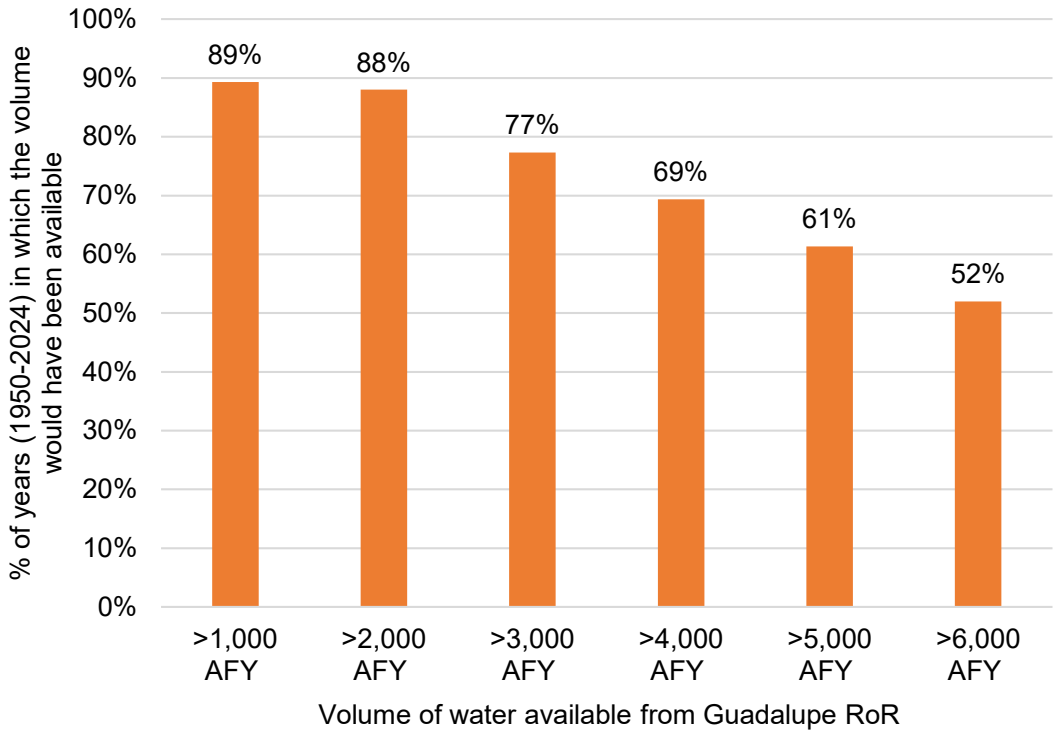


Figure 2-4: ROR Supply Availability Summary Considering Years 1950 – 2024

2.4.2 Retrospective Canyon Reservoir Surface Water Availability and Reliability

Figure 2-5 shows a TWDB graph of the Canyon Reservoir storage since it was constructed in 1964. The storage volume has been steadily decreasing since 2020. As of June 23, 2025, the reservoir was 47% full with a lake level of 878 feet mean sea level (msl). Following a significant upstream flood event, the lake level increased to elevation 892 feet msl (68% full), as of July 21, 2025. While none of NBU's contracted Canyon Reservoir water has been curtailed in the past, historical low conditions could result in restrictions moving forward, considering the GBRA's DCP.

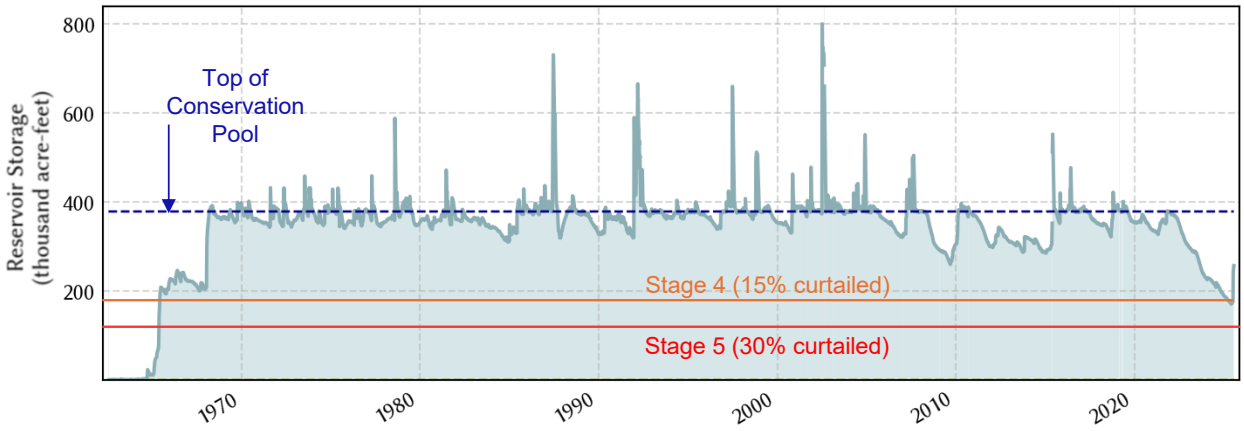


Figure 2-5: Canyon Reservoir Historical Storage Volume and Drought Restrictions (TWDB)

GBRA contracts water from Canyon Reservoir based on extensive hydrologic modeling over a 56-year period (1934-1989) including a repeat of the historic 1947-1957 DOR. The modeling allowed for lake level fluctuation over time, including during periods of moderate and severe drought. The modeling showed that the level of the reservoir would be below full (elevation 909 feet msl) about 50% of the time, and that the level would be below elevation 875 feet msl about 8% of the time. However, it is important to recognize that a water supply reservoir is permitted and operated to use its entire storage capacity; thus, it is expected to see lower reservoir storage during a drought.

GBRA amended its DCP Plan in May 2024 based on recent drought conditions. The amended plan authorized GBRA to initiate allocation of water supplies on a pro-rata basis in accordance with Texas Water Code Section 11.039. A curtailment of 15% of the contracted amount can be required during Stage 4 (reservoir level ≤ 880 feet msl) and a curtailment of 30% can be required during Stage 5 (reservoir level ≤ 865 feet msl). In the previous DCP, curtailments were voluntary on the part of GBRA's customers. Thus, NBU's 18,070 AFY of Canyon Reservoir contracted supply can now be curtailed under GBRA's DCP by 15% during a Stage 4 drought and by 30% during a Stage 5 drought. With the expanded SWTP, NBU can treat about 93% of the firm Canyon Reservoir rights. Thus, this would result in an 8% and 23% reduction, respectively, in NBU's Canyon Reservoir treated water supply.

If the drought beginning in 2020 is determined to be more severe and/or of longer duration than the 1950s DOR used for the most recent hydrologic simulations, the reservoir may not be able to supply the firm yield for some period of time. That cannot be confirmed until the drought is over and the reservoir re-fills. It is also possible that if, in the future, Canyon Reservoir cannot supply the contracted amounts to GBRA's customers, GBRA could amend the supply contracts, such as by implementing a proportional reduction among all customers. Thus, while the Canyon Reservoir currently remains a very reliable water supply for NBU, the volume of the Canyon Reservoir supply that is considered reliable during a severe drought could change based upon uncertain future climate conditions.

2.4.3 Retrospective Combined Surface Water Availability

Figure 2-6 shows the combined availability of surface water over this 75-year period, again with the worst-case drought curtailments imposed. NBU's full surface water authorizations (25,022 AFY) would have been available for 25 years across this 75-year period (33%). **Figure 2-7** summarizes the frequency for which various quantities would have been available. In over half of the years considered, at least 24,000 AFY of water was available, even after drought curtailments were imposed.

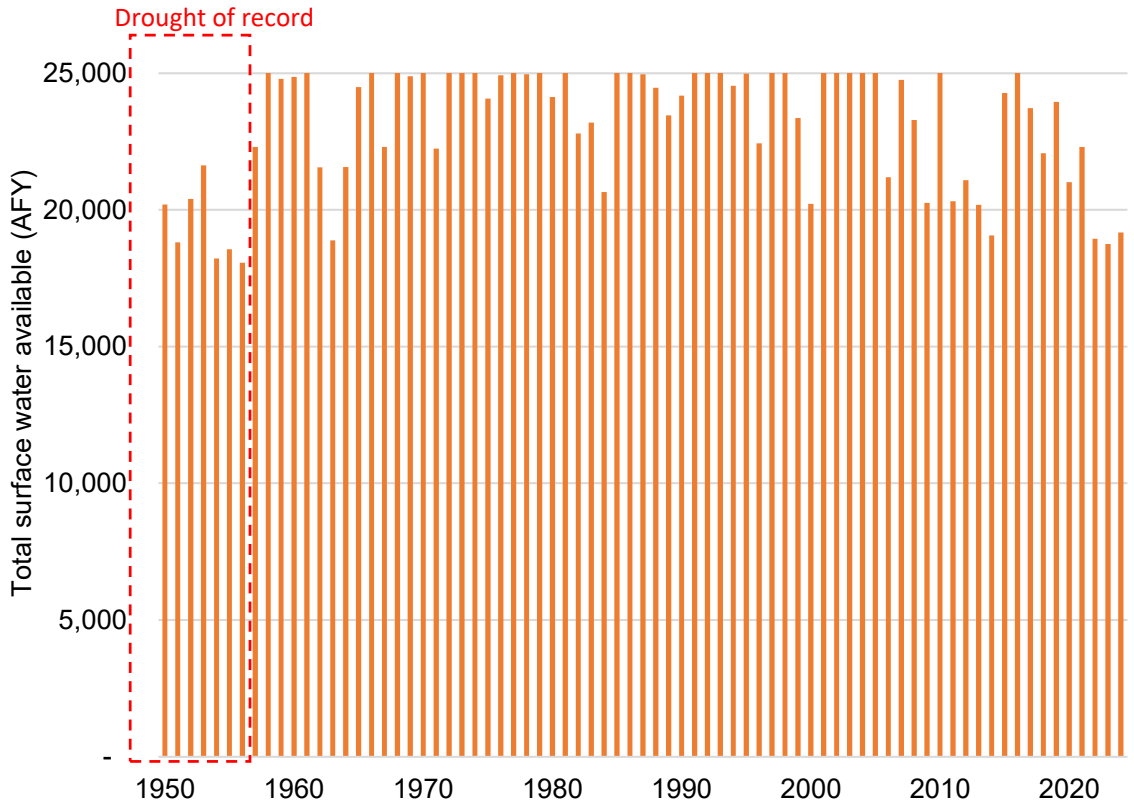


Figure 2-6: Total Historical Surface Water Availability Based on Current Curtailment Conditions

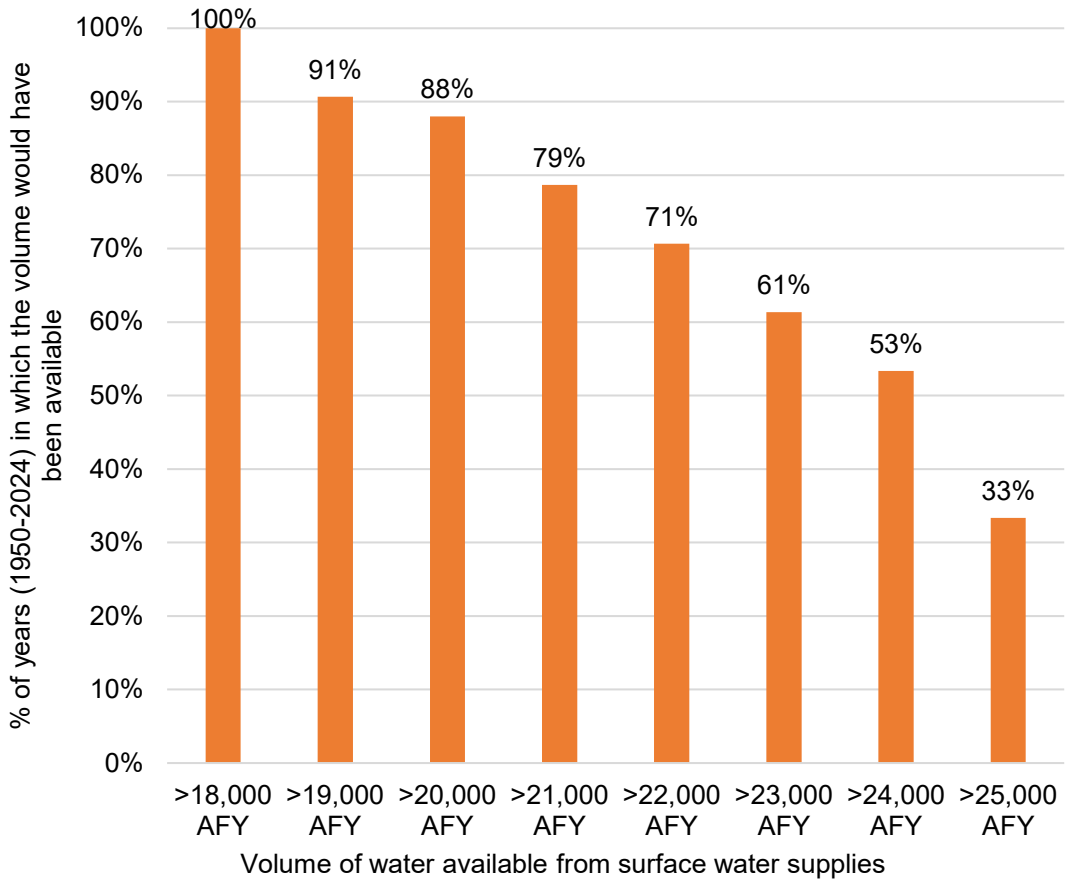


Figure 2-7: Surface Water Supply Availability Summary Considering Years 1950 - 2024

Key conclusions regarding NBU's surface water availability based on the assumptions in this analysis (which likely underestimate feasible annual withdrawals) include:

- NBU's full surface water authorizations (25,022 AFY) would have been available for 25 years of the 75-year period (33%).
- Applying the assumption that NBU would withdraw the same amount of water each day, the average volume of surface water available over this period would have been 23,081 AFY (92% of the full authorizations).
- Once the expansion is complete, the SWTP will have a design capacity of 16 MGD and a sustainable capacity of 15 MGD (16,800 AFY). **NBU's allowable surface water withdrawals would have surpassed 16,800 AFY (the volume of water NBU will have capacity to sustainably treat) in 100% of the years considered.**[9]

[9] This analysis does not consider other conditions that may limit treatment capacity such as floods and water quality events.

2.4.4 Retrospective Edwards Aquifer Groundwater Availability

As described in **Section 2.2**, NBU's access to its 9,269 AFY of Edwards Aquifer rights is subject to restrictions under the EAA's CPM rules. As shown in **Figure 2-8**, these restrictions can reduce the volume of water that can be pumped from the Edwards Aquifer by up to 44%.

Critical Period Stage	J-17 Index Well Level above mean sea level (amsl)	San Marcos Springs Flow cubic feet per second (cfs)	Comal Springs Flow cubic feet per second (cfs)	% of Water Reduction
No Stage indicates stable levels	660 feet or above	96 or above	225 or above	0%
Stage 1	less than 660 feet	less than 96	less than 225	20%
Stage 2	Less that 650 feet	less than 80	Less than 200	30%
Stage 3	Less than 640 feet	Not Applicable	Less than 150	35%
Stage 4	Less than 630 feet	Not Applicable	Less than 100	40%
Stage 5	Less than 625 feet	Not Applicable	Less than 45/40*	44%

*Stage 5 Comal Springs Flow - to enter this stage based on the springflow, the reading must be less than 45 cfs on a ten-day rolling average, or less than 40 cfs based on a three-day rolling average. To leave this stage, the ten-day rolling average must be 45 cfs or greater.

Figure 2-8: EAA Critical Stages and Water Reductions (edwardsaquifer.org)

Figure 2-9 summarizes average daily flow at Comal Springs between 1928 and August 2023. Comal Springs flow is only one of the triggers for curtailment of water use, but it is a useful indicator of the impact of drought periods. There are very few instances where this factor would have triggered Stage 5 restrictions (only during the DOR and in 1984), though conditions for Stages 1 and 2 have been frequently triggered. Peak flows have remained relatively consistent over this period, and there is no strong trend of consistent flow degradation. As of 7/28/25, spring flow was around 116 cfs following a significant upstream flood event.

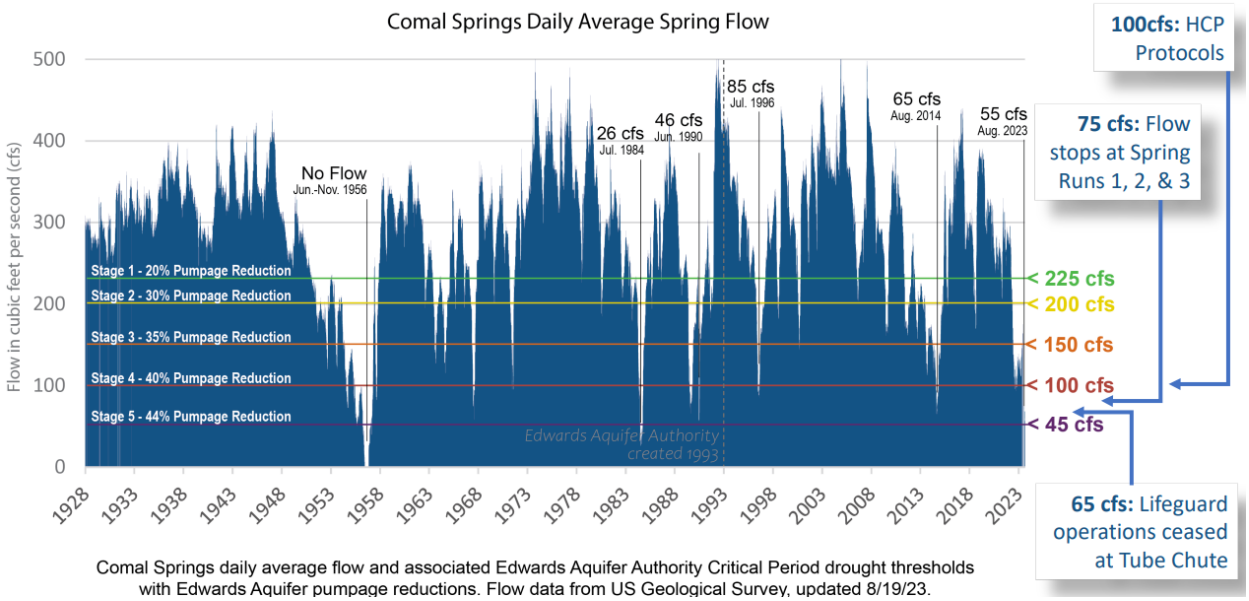


Figure 2-9: Comal Springs Daily Average Flow (USGS, 2024)

Figure 2-10 and **Figure 2-11** summarize results of the retrospective analysis of Edwards Aquifer water availability. The former figure shows the number of days per year for which any of NBU's Edwards Aquifer water rights would have been curtailed. The latter incorporates drought stages to estimate what percentage of NBU's rights would have been restricted for each year, assuming consistent withdrawal across the year.

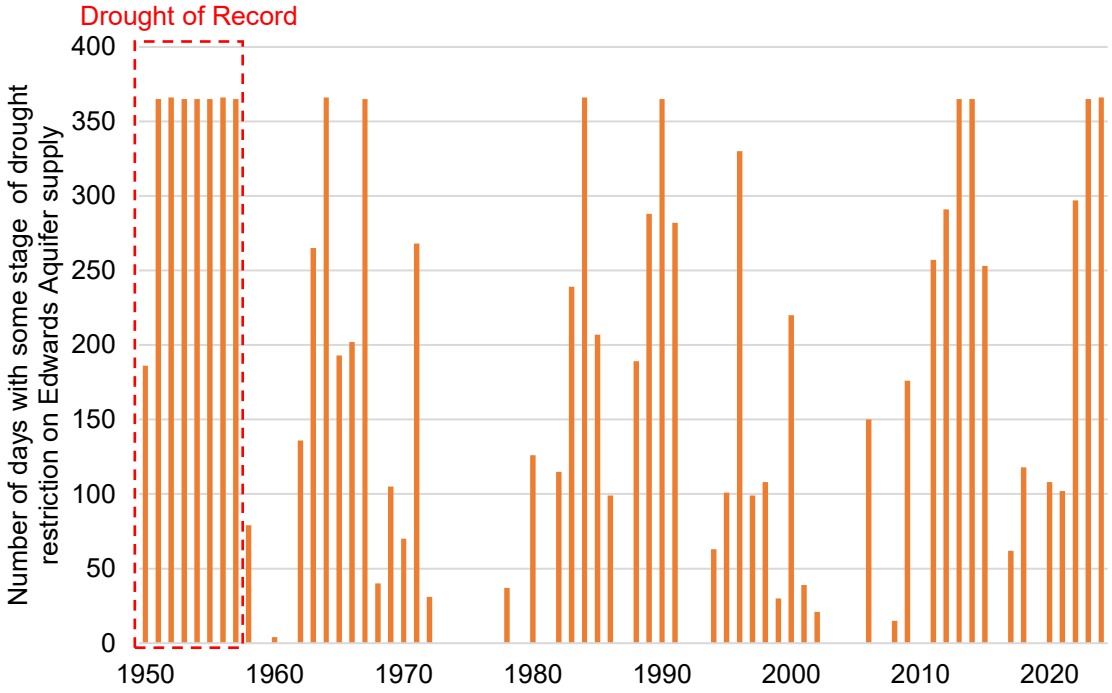


Figure 2-10: Calculated Days of Drought Restriction Based on EAA CPM Criteria

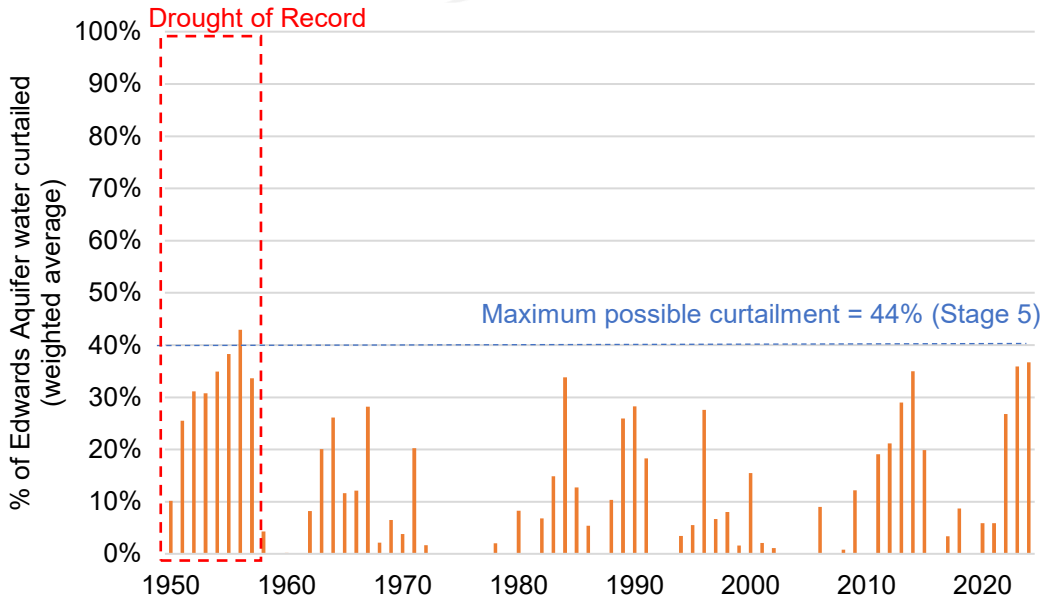


Figure 2-11: Calculated Percentage of NBU Rights That Would Have Been Curtailed Based on Current CPM Criteria

Figure 2-12 estimates the frequency for which various volumes of Edwards Aquifer water would have been available for NBU across the 75-year period analyzed. Over 6,000 AF of the total 9,269 AFY authorized would have been available in 95% of the years considered and over 8,000 AF would have been available in 65% of the years considered.

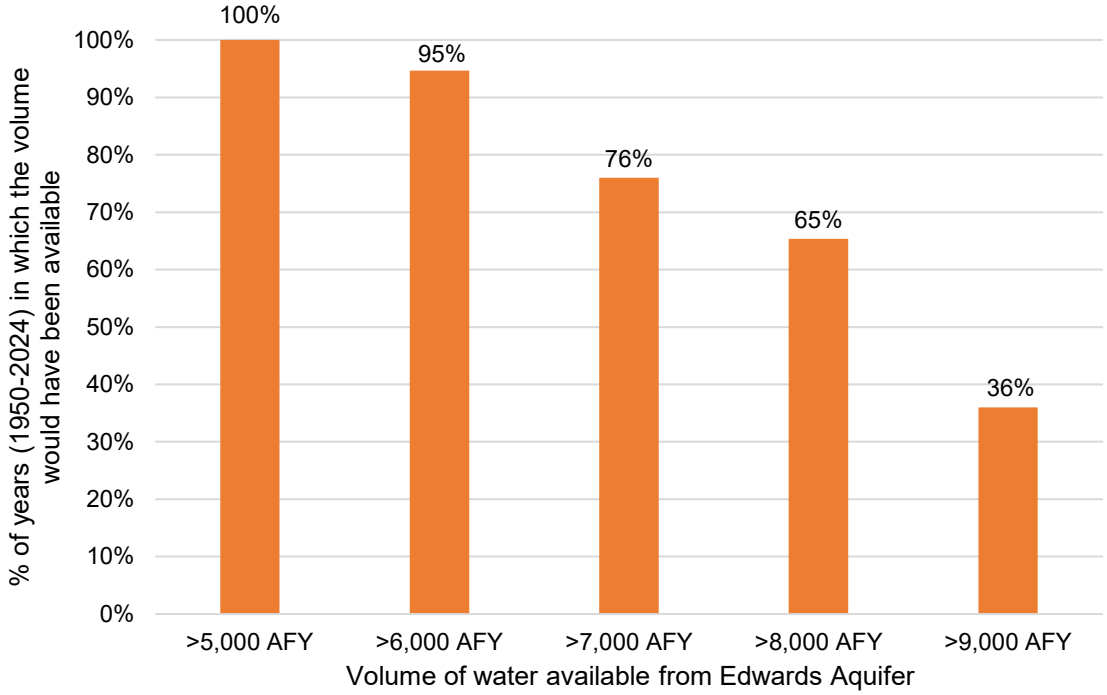


Figure 2-12: Edwards Aquifer Supply Availability Summary Considering Years 1950 – 2024

Key conclusions regarding NBU's Edwards Aquifer rights based on the assumptions in this analysis (which likely underestimate feasible annual withdrawals) include:

- NBU's full Edwards Aquifer authorizations (9,269 AFY) would have been available for 19 years across this 75-year period (25%).
- There were no years during this 75-year period in which the "worst case" restrictions of 44% of the annual total would have been imposed. The lowest availability was in 1956, during the DOR, during which there would have been 43% curtailment for the year.
- Considering the worst two years of the DOR (1954 and 1956) together, 61% (5,660 AFY) of NBU's Edwards Aquifer water rights would have been available.
- Applying the assumption that NBU would withdraw the same amount of water each day, the average volume of water available over this 75-year period would have been 8,186 AFY (88% of the full rights).

2.4.5 Retrospective Availability – Other

NBU's remaining water supplies do not have explicit drought curtailments. At the time of writing, there are no restrictions on water withdrawn from the Trinity Aquifer, so 100% availability is assumed. The GCWSP contracted water is subject to restrictions in GBRA's DCP. However, the 2024 DCP does not impose curtailments on GCWSP water, and so at the time of writing, these authorizations were assumed to be available despite any drought conditions for the purposes of water resources planning. NBU's contracts with GVSUD and the City of Seguin do not specify any conditions for curtailment, so 100% availability Was assumed for water resources planning. However, several of the supplies used by GVSUD and the City of Seguin (e.g., Guadalupe River, San Marcos River) have drought restrictions; therefore, it seems likely that the two utilities could struggle to deliver the full contracted amount during severe drought conditions and so NBU continues to plan for a buffer where more supply is available than is projected to be needed.

2.4.6 Retrospective Availability – All Water Supplies

Sections 2.4.1 through **2.4.5** presented a retrospective analysis of historical flow and water level from 1950 through 2024, considering each of NBU's current water sources independently. This section summarizes availability across NBU's full water portfolio. **Figure 2-13** shows how many days per year that *any* of NBU's supplies could have been curtailed based on historic data and criteria in place at the time of writing. **Figure 2-14** incorporates drought levels to estimate the volume of water that would have been available to NBU for each year of the 75-year period of analysis.

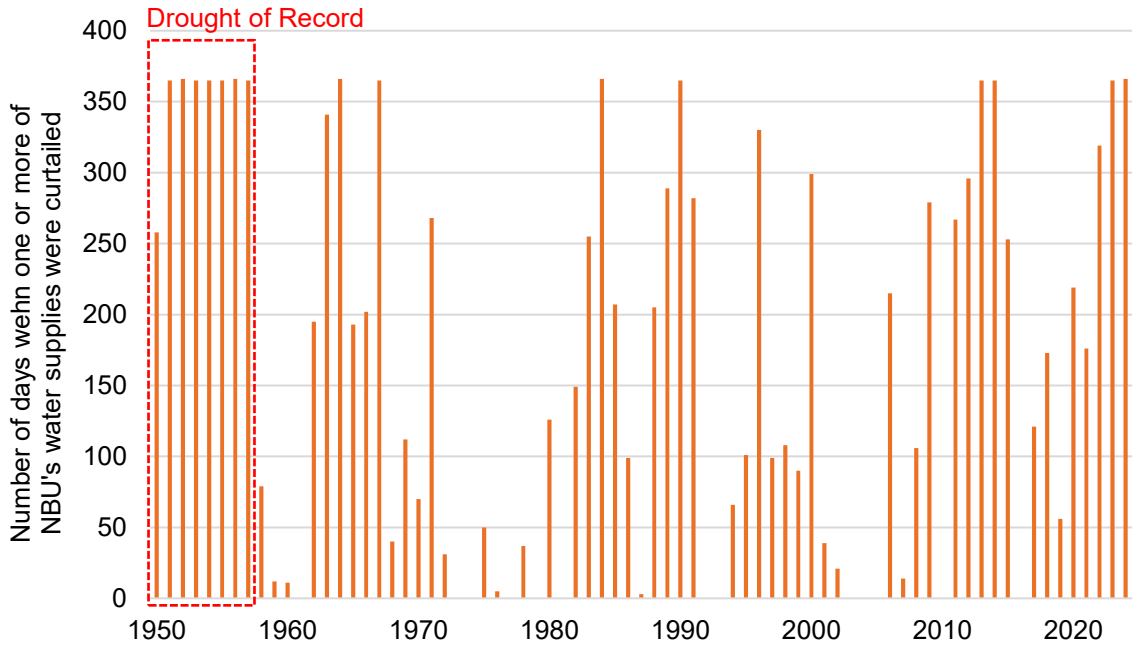


Figure 2-13: Calculated Days of Curtailment Based on Current NBU Water Supply Authorizations and Current Restrictions

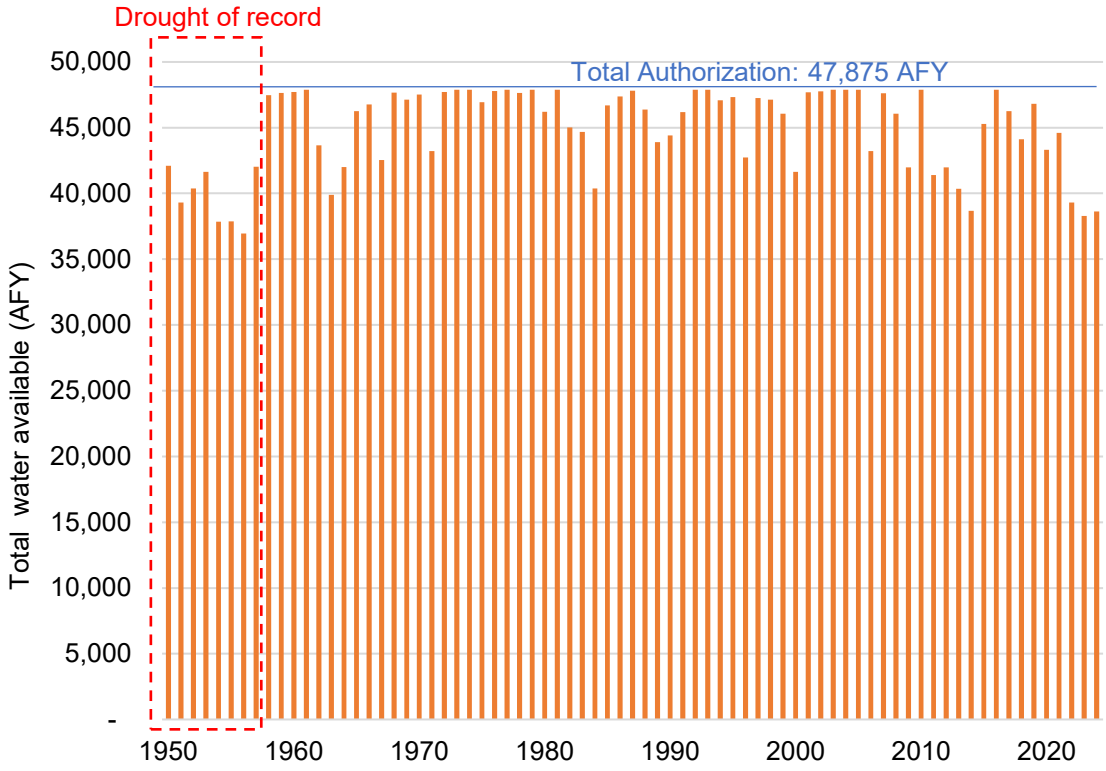


Figure 2-14: Total Water Available Across All Supplies Based on Current Authorizations and Current Restrictions

Figure 2-15 estimates the frequency for which various volumes of water would have been available for NBU across the 75-year period analyzed. Based on the assumptions of the analysis, at least 37,500 AFY of water would have been available in 74 out of 75 years (99%), and more than 47,500 AF would have been available in a third of the years considered.

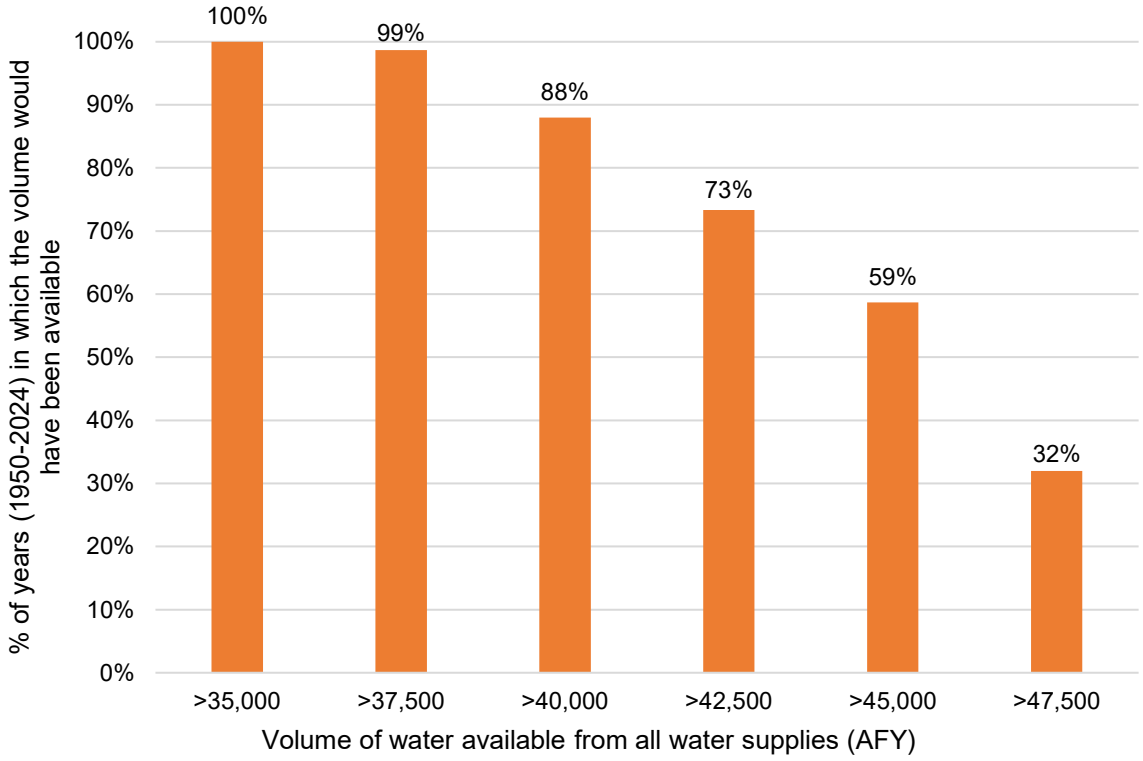


Figure 2-15: Availability of All Supplies Combined For Years 1950 – 2024 Considering Current Authorizations and Restrictions

Key conclusions applying the assumptions in this analysis include:

- NBU's current full water authorizations (47,875 AFY) would have been available for 13 years across this 75-year period (18%).
- There were no years over this 75-year period for which worst-case restrictions would have been applied for the full year.
- The lowest availability was in 1956, during the DOR, during which NBU would have been authorized to use 36,941 AF of water (77% of its full volume).
- Applying the assumption that NBU would withdraw the same amount of water each day, the average volume of water available over this 75-year period was 44,820 AF (94% of NBU's full authorizations).

The fact that maximum annual curtailments would *never* have been applied in the 75-year historic period considered in the retrospective analysis reveals why a management strategy like ASR can be so effective for NBU. With ASR, NBU will be able to withdraw and treat water during times when drought restrictions

are not in place and store for later recovery any water that is not immediately needed to meet system demand. Effective water management can also allow for reducing the use of vulnerable water supplies and reduce drought contingency impacts on the community.

2.4.7 Drought Frequency

In addition to this assessment of drought curtailments, various statistical analyses were performed on weather data over this same 75-year period. No trends in the frequency, duration, or magnitude of drought periods were identified. Consecutive years of drought of varying length and intensity recurred across the 75 years considered. Likewise, there were no clear trends in the onset of drought conditions. Across the full period assessed, there were multiple years in each decade for which drought conditions were already met in January.

Additional climate projection sources were reviewed including studies by the National Oceanic and Atmospheric Administration (NOAA), United States Environmental Protection Agency (USEPA), scientific articles, and various global and regional climate change organizations. Due to the unpredictability of changing weather conditions, no actionable outcomes were presented in those sources. For example, USEPA's Climate Resilience Evaluation and Awareness Tool (CREAT) projects that the change in annual precipitation in Comal County will be between -6.2% and +4.7% in 2035, and between -12.0% and +9.2% by 2060. This reveals a lack of certainty even as to whether precipitation will increase or decrease, and so future drought conditions were not included explicitly in evaluation of supply and demand.

3 SERVICE AREA POPULATION

Population estimates are imprecise by nature. First, the US Census Bureau only performs rigorous data collection every 10 years, with the published population data relying on self-reporting by a subset of citizens. Between these 10-year census periods, American Community Survey (ACS) population estimates are published based on far less information and are often inaccurate when compared to data from the subsequent census. Second, Census Bureau demographic information is published by city and county, though NBU's water service area does not align precisely with City of New Braunfels nor county boundaries. Therefore, while there is no rigorous way to estimate population within the service area, for NBU, the use of historical billing data may provide the most reliable estimate. However, City population numbers can provide insight into community growth trends, and thus the City's population trends were considered in this planning effort.

3.1 HISTORICAL POPULATION

Figure 3-1 shows historical population estimates for the City of New Braunfels (not the NBU service area specifically), based on US Census data collected every 10 years. In general, the rate of population growth (i.e., the slope of this line) increased each decade between 1990 and 2020.

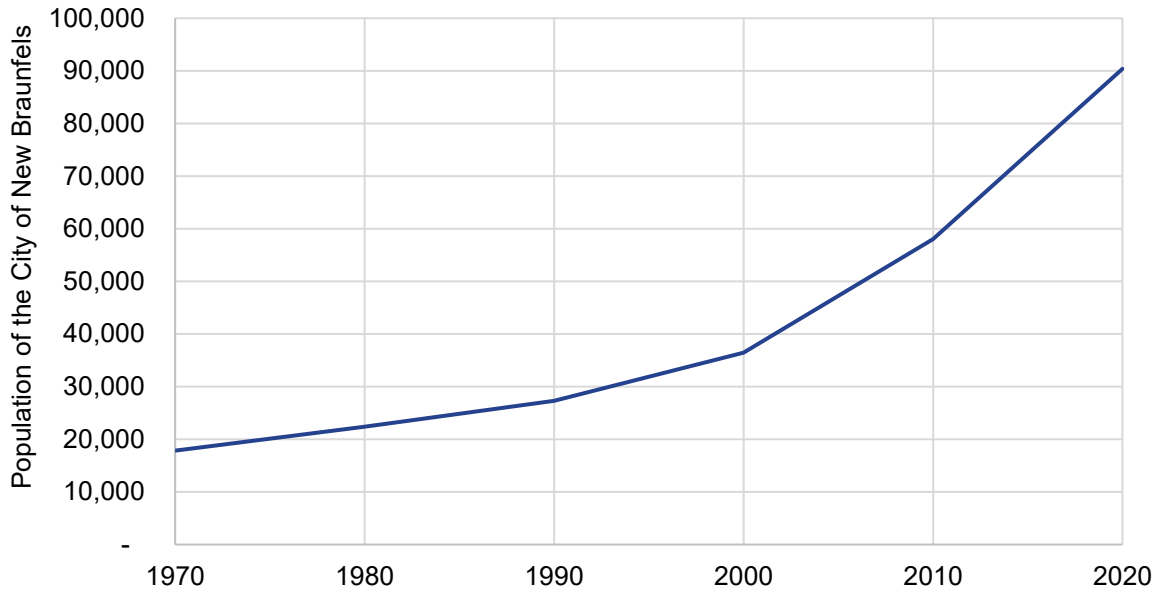


Figure 3-1: Historical City of New Braunfels Population, US Census Bureau Data

As census data do not reflect the NBU service area boundary, historical billing data were used to estimate historical population in the service area. NBU's billing database, NorthStar, was used to create a report showing account numbers, bill codes, addresses, and a "number of units" associated with each NBU account each month. These data are broken down into the following account types, which are used throughout this analysis.

- SF1 – single-family accounts with meters sized at 5/8-inch
- SF2 – single-family accounts with meters sized above 5/8-inch

- MF1 – multi-family accounts serving between 2 and 50 living units / households
- MF2 – multi-family accounts serving between 51 and 100 living units / households
- MF3 – multi-family accounts serving over 100 living units / households
- INST – accounts serving public and interdepartmental units; also referred to as institutional accounts
- COMM – accounts serving commercial / business units

These categories include both standard and irrigation meters (i.e., water use from irrigation meters associated with commercial accounts were included in the COMM account type). Irrigation data were not analyzed separately as not all customers have separate irrigation meters, and there were data quality issues associated with classification of irrigation meters in the datasets analyzed.

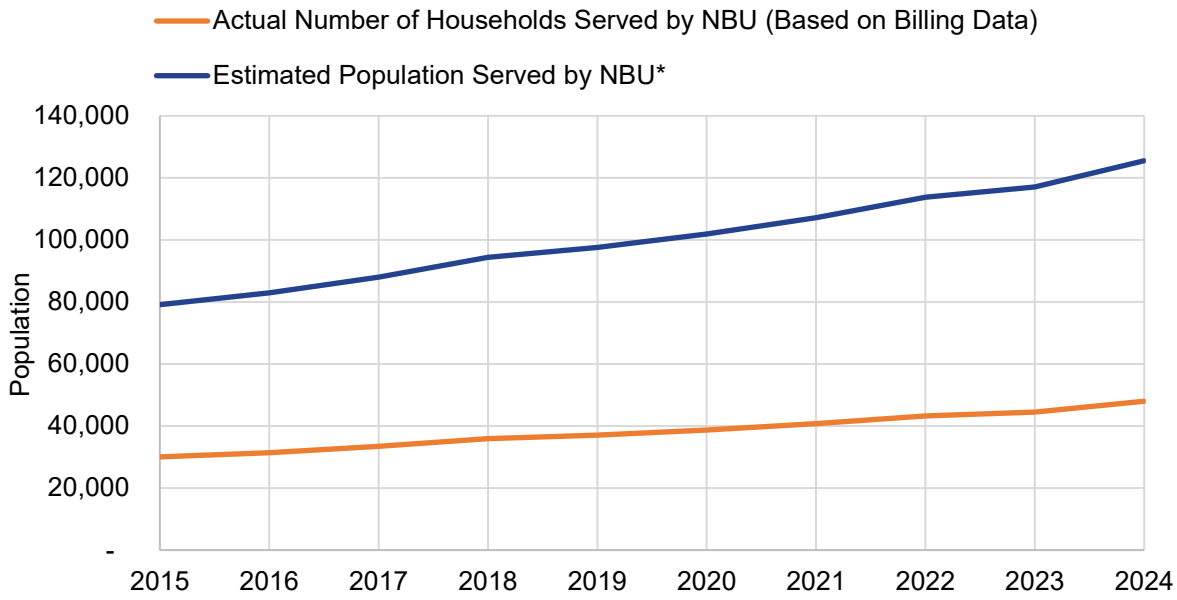
Historical service area population was calculated using **Equation 3-1.** It is based on the number of accounts of each type from NBU's billing data and incorporates the average people per household and vacancy rates for the City of New Braunfels, obtained from the 2020 census data. The number of households served by NBU for the last 10 years and the corresponding population estimate are summarized in **Figure 3-2**.

Equation 3-1: Historical Service Area Population

$$\text{Historical Service Area Population} = [((HH_{SF1} + HH_{SF2}) \text{ x } P_{SF}) \text{ x } (1 - V_{SF})] + [((HH_{MF1} + HH_{MF2} + HH_{MF3}) \text{ x } P_{MF}) \text{ x } (1 - V_{MF})]$$

- HH_{SF} – Number of SF1 and SF2 households, based on the unique number[10] of SF1 and SF2 accounts (categorized as such based on their bill codes)
- HH_{MF} – Number of MF1, MF2, and MF3 households, based on number of units associated with unique MF1, MF2, and MF3 accounts[10] (categorized as such based on their bill codes)
- P_{SF} – Number of people per owned unit[11] (2.77, based on City of New Braunfels 2020 Census data)
- P_{MF} – Number of people per rented unit[11] (2.29, based on City of New Braunfels 2020 Census data)
- V_{SF} – Vacancy rate of owned units (2.0%, based on City of New Braunfels 2020 Census data)
- V_{MF} – Vacancy rate of rented units (9.2%, based on City of New Braunfels 2020 Census data)

[10] Irrigation accounts and duplicate accounts were filtered out of the data.
[11] Although not all rented units are multifamily and not all owned units are single-family households, NBU considers this approximation appropriate.



*Based on number of households from billing data and number of people per household from Census Data

Figure 3-2: Calculated Historical NBU Service Area Population

3.2 POPULATION GROWTH

The rapid growth in New Braunfels in recent years makes it challenging to forecast future population growth. To derive reasonable estimates, Arcadis compared the City's recent population growth to historical trends seen in similar central Texas communities including Round Rock, Georgetown, Cedar Park, and San Marcos. As shown in **Figure 3-3,** these communities have experienced similar population growth rates. However, the increase in growth rate began about 10 years earlier for Round Rock than the other cities (the dashed line shifts Round Rock's population by 10 years to illustrate this correlation). Thus, the population trends seen throughout the last 20 years in Round Rock were selected as a reasonable model for how the City of New Braunfels may grow in the next several decades.

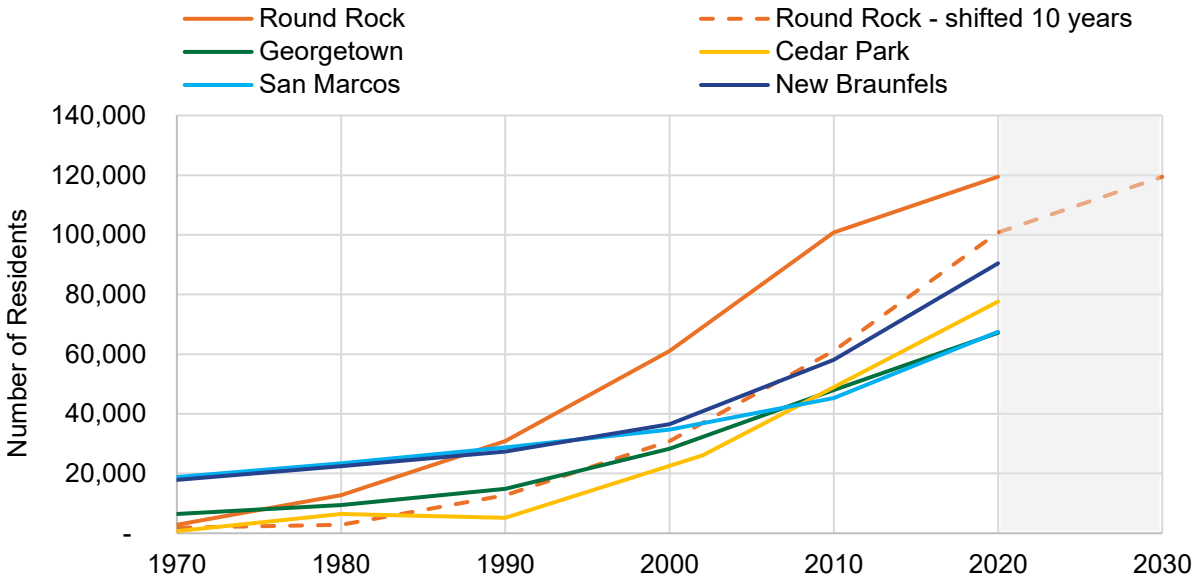


Figure 3-3: Population Growth in Central Texas Communities

Figure 3-3 and **Table 3-1** illustrate that the rate of growth for each community shown has begun to decrease, with lines becoming less steep in the last few years for Georgetown, Round Rock, Cedar Park, and New Braunfels. Therefore, as described in **Section 4**, modest decreases in the rate of percentage growth were applied for projecting future NBU water demands. As a comparison, the NBU service area has seen an average increase of 5.2% per year, for the past ten years (2014 to 2024), similar to the growth rate reported by the Census for the City of New Braunfels.

Table 3-1: Average Annual Rate of Growth by Decade for Central Texas Communities

Decade	Round Rock	New Braunfels	Georgetown	Cedar Park	San Marcos
1990 - 2000	7.1%	2.9%	6.7%	17.6%	1.9%
2000 - 2010	5.1%	4.8%	5.4%	6.5%	2.7%
2010 - 2020	1.7%	4.5%	3.4%	4.7%	4.2%

4 DEMAND PROJECTIONS

After analysis, research, and discussion, Arcadis and NBU developed a spreadsheet model to project NBU's water needs throughout the next 50 years. The methodology applied for this 2025 WRP is more detailed than the approach used in the 2018 WRP. Instead of applying an overall rate of change in system water demand, projections for the number of accounts and water use per account were developed for each customer type based on NBU's billing and water supply data. These demand projections were calculated based on NBU's service area, which was shown in **Figure 1-1.**

A variety of factors impact both area growth (the number and types of customers served) and "per account" water use. Therefore, demand projections should be regularly updated. It is recommended that the projections presented in this section be reviewed annually (e.g., should any significant service area changes occur) and updated in the next five years.

4.1 NBU'S HISTORICAL SERVICE AREA POPULATION AND WATER DEMAND TRENDS

NBU's historical service area population and water demand (expressed as total sourced water) are shown in **Figure 4-1**. While, historically, total sourced water and service area population have had similar rates of increase, the most recent two years show a decrease in total sourced water demand while there is an increase in service area population. This may be due to a variety of factors, including the recent drought and related watering restrictions, the recent surge in smaller lot size and multifamily complexes, and a substantial increase in high volume block rates (i.e., water rates for high volume users) over the last few years that was intended to send conservation signals to those using water in a discretionary fashion. Changing national water use trends also contribute to this decrease in sourced water demand. In fact, nationally, a decrease in water use per person has been observed since 2005 (Arcadis 2019). Further, The Water Research Foundation's *Residential End Uses of Water* project (2016) estimated that passive savings through water-saving appliances cause an ongoing average annual reduction of 0.63 gpd in per capita water usage nationally.

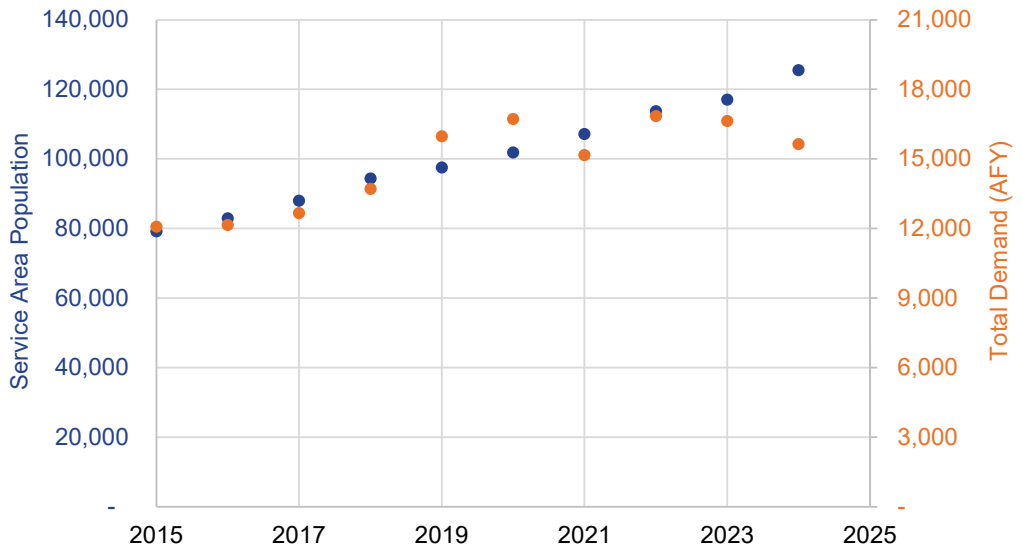


Figure 4-1: NBU's Historical Service Area Population (blue) and Water Demand (orange) Trend

4.2 PROJECTION METHODOLOGY

The number of customers served, and the water use by each account type form the basis for these demand projections. This provides more accuracy than population-based projections that use average water consumption per capita. As discussed above, population-based estimates tend to be imprecise, and population numbers are not accurately aligned with NBU's service area. More importantly, growth and demand by non-residential water users may not align proportionally to population. Current and historical account data per customer type are available, which allows for analysis across residential, institutional, and commercial customers.

For this analysis, the term "household" is used for residential accounts, and each unit within a multi-family complex is considered a household. The term "account" in tables and figures refers to institutional and commercial users. Irrigation data were included in usage totals for the associated customer type; not all customers have irrigation meters, and so that water use cannot be accurately analyzed separately. **Equation 4-1** summarizes how estimated system demands were projected. Additional details on the individual elements of these calculations are provided throughout this section.

Equation 4-1: Projected Demand

$$\text{Projected Demand} = \text{Billed Use} + \text{Unbilled Water}$$

$$= \frac{\sum_{\substack{\text{All customer} \\ \text{categories}}} (\text{Number of Households or Accounts} * \text{Usage Per account})}{1 - \text{NRW}}$$

where:

- Demand = the amount of water required from NBU's water supplies, excluding ASR
- Billed Use = total volume of water billed to customers, including standard and irrigation meters
- Unbilled Water = volume of non-revenue water (NRW), defined as the volume of water pumped minus billed use
- NRW = an assumed fraction of pumped water that is unbilled

Recent data, coupled with regional and national data (**Section 4.1**), suggest that NBU's significant trend of increasing population is unlikely to continue. Thus, NBU considered a range of future demand scenarios. Ultimately, NBU selected a conservative set of assumptions which were applied to the historical trends to develop a conservative demand scenario that was appropriate for water supply planning. While NBU's actual future demand will very likely be below the projection shown (refer to **Section 7.3** for additional discussion), this scenario provides several buffers or factors of safety to ensure NBU has sufficient water supply to not only meet future needs but also provide resiliency to the system (e.g., in the emergency scenario when a water supply is offline) and to increase confidence with respect to future unknowns, such as the impact of exceptional droughts. Thus, the selected **"Projected Demand Scenario"** includes the following conservative assumptions (detailed in the following sections):

- A modest reduction in the rate of growth for households/accounts is applied, when much greater reductions have been observed in communities similar to New Braunfels and are expected in the NBU service area (refer to **Section 4.3**), especially as the system approaches buildout (refer to

Section 4.3.2). The number of households/accounts increased based on these rates until a buildout capacity (**Section 4.3.2**) was reached for each customer category.

- Usage per account type continues at the 2022-2024 average rate indefinitely (**Section 4.4**), when NBU anticipates use rates to continue to decline as they have over the last 10 years. Trends that are anticipated to further drive down use include, but are not limited to:
    - Updates and enforcement of NBU's Drought Contingency Plan,
    - Implementation of NBU's Water Conservation Plan,
    - Technological advances, and
    - Social, political, regulatory, and generational changes.
- Nonrevenue water continues to remain a similar proportion of the total system demand (**Section 4.5**), even though NBU's active pursuit of NRW reduction strategies is anticipated to decrease NRW over time.

Different scenarios are appropriate for making different types of decisions. For conservation planning, NBU selected a second demand projection scenario where NBU's proactive conservation program is achieved. This scenario is discussed in **Section 7.3**.

4.3 HISTORICAL AND PROJECTED CUSTOMER ACCOUNTS

Figure 4-2 and **Figure 4-3** show the number of households and accounts served by NBU over the last 10 years (2015 – 2024). The abbreviations for the customer categories (e.g., SF1 and INST) are shown in **Section 3.1**. In general, the number of households and accounts has been consistently increasing, with the rate of change varying by customer type. The more abrupt changes in the MF2 and MF3 categories are because these represent larger, multi-family complexes with over 50 household units. Therefore, when a new development is complete, the number of household accounts increases by that larger number.

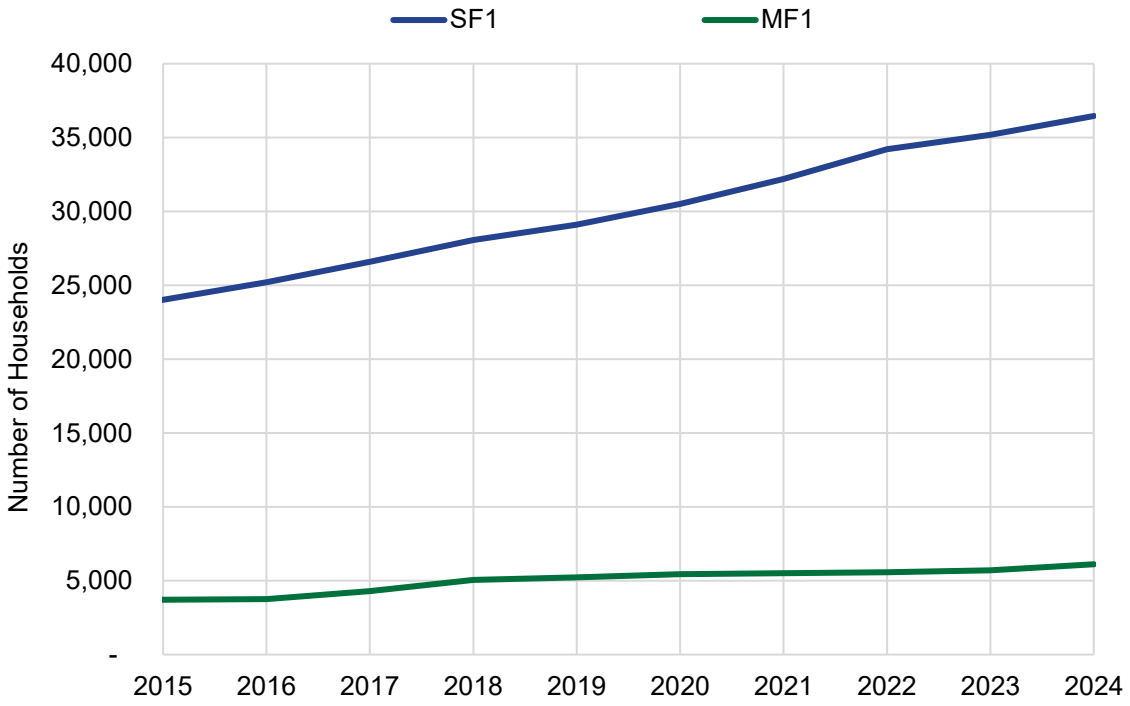


Figure 4-2: Number of SF1 and MF1 Households, 2015 – 2024

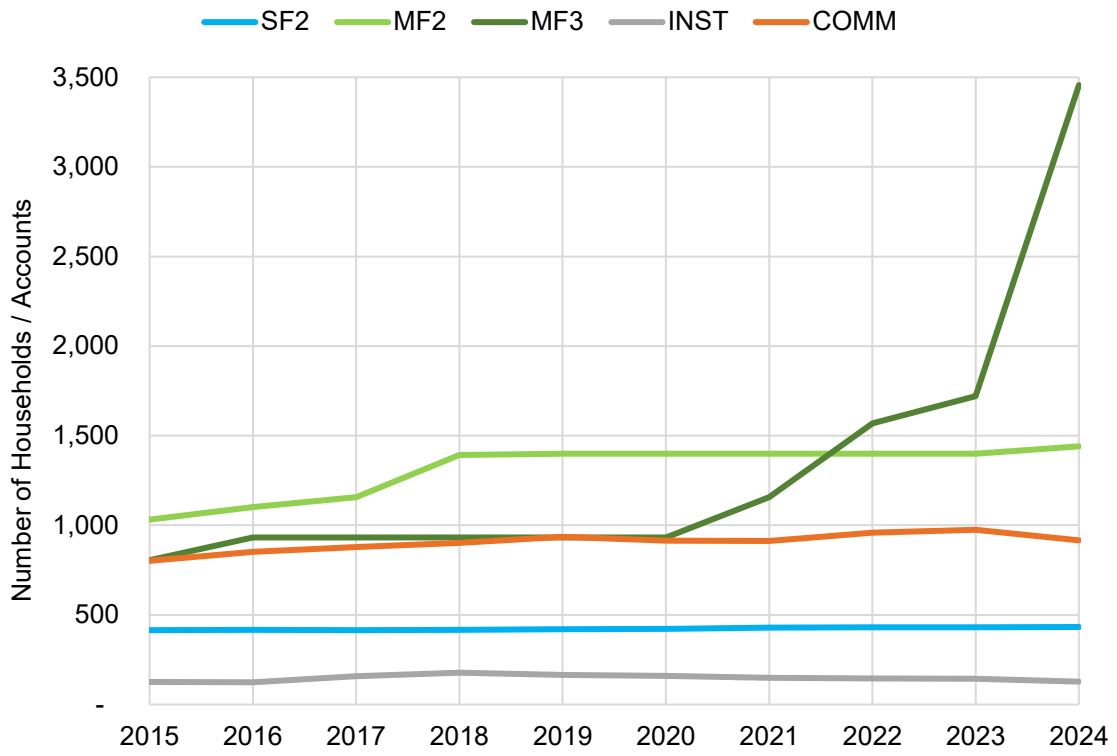


Figure 4-3: Number of SF2, MF2, and MF3 Households and INST and COMM Accounts, 2015 - 2024

Table 4-1 presents the household and account values for the last 10 years, from which demand projections were developed. Net growth at varied rates has occurred in all customer categories across this 10-year period. The MF3 category has experienced the greatest percentage growth, with most of that growth occurring over the last four years. The SF2 category has experienced the least growth, with only 19 new households over the last 10 years.

Table 4-1: Number of Households / Accounts per Customer Category and 10-Year Average Rate of Change

	SF1	SF2	MF1	MF2	MF3	INST	COMM	TOTAL ACCOUNTS
2015	24,024	414	3,727	1,031	805	150	1,916	30,228
2016	25,216	416	3,755	1,101	932	150	1,985	31,660
2017	26,591	415	4,294	1,156	932	153	2,048	33,633
2018	28,077	417	5,058	1,393	932	156	2,103	36,129
2019	29,110	420	5,229	1,400	932	157	2,138	37,340
2020	30,508	422	5,442	1,400	932	158	2,166	38,964
2021	32,203	428	5,521	1,400	1,158	154	2,197	40,984
2022	34,214	430	5,572	1,400	1,569	154	2,219	43,473
2023	35,201	431	5,713	1,400	1,721	156	2,242	44,745
2024	36,476	433	6,122	1,441	3,457	157	2,290	48,181
10-Year Average Rate of Change	**4.8%**	**0.5%**	**2.8%**	**3.4%**	**11.6%**	**0.8%**	**2.2%**	**5.2%**

4.3.1 Projected Customer Growth Rates

Though it is expected that New Braunfels will continue to grow, the current rate of growth will likely not continue indefinitely. As described in **Section 3.2**, the rate of growth for other similar Central Texas communities situated along the Interstate-35 corridor has decreased over the last five years. A decline in the pace of population growth in New Braunfels can be observed as well as the average rate of change in NBU's number of accounts over the last five years is lower than the 10-year averages for every customer category except MF3.

Average rates of change over the last ten years (2015 – 2024) were used to estimate future growth rates. Initially, the most recent 5-year period (2020 – 2024) was analyzed, but there were several anomalies that appeared to skew the data. For example, trends in two account types, which do not align with expected future growth, distorted the data: no new MF2 units were added between 2019 and 2023 and the number of institutional customers decreased over this same period. Data from 2020 and 2021 are believed to not be representative likely because altered social and business conditions related to the COVID-19 pandemic caused changes in property development and water use across the country.

The 10-year historical average rate of change per customer type was further reduced based on the trends observed for similarly situated communities along the IH-35 corridor, such as Round Rock and

Georgetown. It was noted in **Section 3.2** that the City of New Braunfels' growth has closely mimicked, but is approximately 10 years behind, the City of Round Rock; therefore, comparing growth in New Braunfels and Round Rock provides a useful model for projecting future demand for NBU's service area. Round Rock experienced an average of 7.1% annual growth between 1990 and 2000, decreasing to a 5.0% annual growth rate between 2000 and 2010 and 1.8% annual growth between 2010 and 2020.[12] These represent 29% and 64% decreases in the average rate of population growth over the last two decades. As further comparison, the average annual growth rate for Georgetown has been reduced by 37% (to 3.4%) over the last decade. If New Braunfels' growth continues to track with that of Round Rock (and Georgetown), it is reasonable to expect a continued slowing of growth for New Braunfels. Thus, a conservative growth rate reduction of 20% was included for water supply planning purposes. This 20% reduction in the growth rate was applied to the 3-year historical average in 2025 and again in 2035, 2045, and 2055 (**Table 4-2**).

Table 4-2: Annual Growth Rates Used to Project Number of Households / Accounts per Customer Type

Period	SF1	SF2	MF1	MF2	MF3	INST	COMM
2014 – 2024 (Historical)	4.8%	0.5%	2.8%	3.4%	11.6%	0.8%	2.2%
2025 - 2034	3.8%	0.4%	4.1%	2.8%	12.9%	0.6%	1.7%
2035 - 2044	3.1%	0.3%	3.3%	2.2%	10.3%	0.5%	1.4%
2045 - 2075	2.5%	0.3%	2.6%	1.8%	8.2%	0.4%	1.1%
2055- 2075	2.0%	0.2%	2.1%	1.4%	6.6%	0.3%	0.9%

4.3.2 Number of Customers at Service Area Buildout

Buildout values for each customer type, which were determined by Freese and Nichols, Inc. (FNI) as part of an ongoing NBU Master Plan Update (**Table 4-3**), were applied as the maximum number of accounts in each category. The number of households and accounts tapers off as buildout is reached in residential customer categories; the SF1 category reaches buildout in 2043 (see the significant slope change in **Figure 4-4**) and the MF1, MF2, and MF3 categories reach buildout in 2036, 2051, and 2035, respectively. SF2, INST and COMM are not projected to reach buildout within the 50-year planning period. These buildout capacities are based upon the NBU service area shown in **Figure 1-1** and upon current zoning, which may change as build-out is approached. Further, buildout is not likely to be abruptly met in any single year. Regardless, these projections provide a conservative approach for water supply planning that ensure supply is available ahead of when reaching buildout is anticipated for any given customer group. Regular 5-year demand model updates will incorporate any changes that have occurred in the service area and to planned zoning.

[12] These 10-year periods were chosen to align with the US Census because the intermediate yearly population estimates released by the Census Bureau are not based on rigorous data collection and are much less accurate.

Table 4-3: Buildout Number of Households / Accounts per Customer Type (Source: FNI)

SF1	SF2	MF1	MF2	MF3	INST	COMM
69,517	7,601	9,545	2,651	11,909	533	9,160

4.3.3 Projected Customer Accounts

Table 4-4 summarizes the current number of households and accounts, as well as the 2075 projections that are obtained by applying these growth rates. The estimated corresponding population is also included; the population was estimated using **Equation 3-1** from **Section 3.1**. **Figure 4-4** shows household and account projections across time.

Table 4-4: Current and Projected Number of Households / Accounts and Associated Population, 50-Year Projections

Year	Number of Households (SF1, SF2, MF1, MF2, and MF3)	Estimated Associated Population	Number of INST & COMM Accounts
2024 Actual Totals	~ 48,000	~ 125,000	~ 2,500
2075 Projection[1]	~ 94,000	~ 240,000	~ 4,400

1- based on Project Demand with Enhanced Conservation Scenario

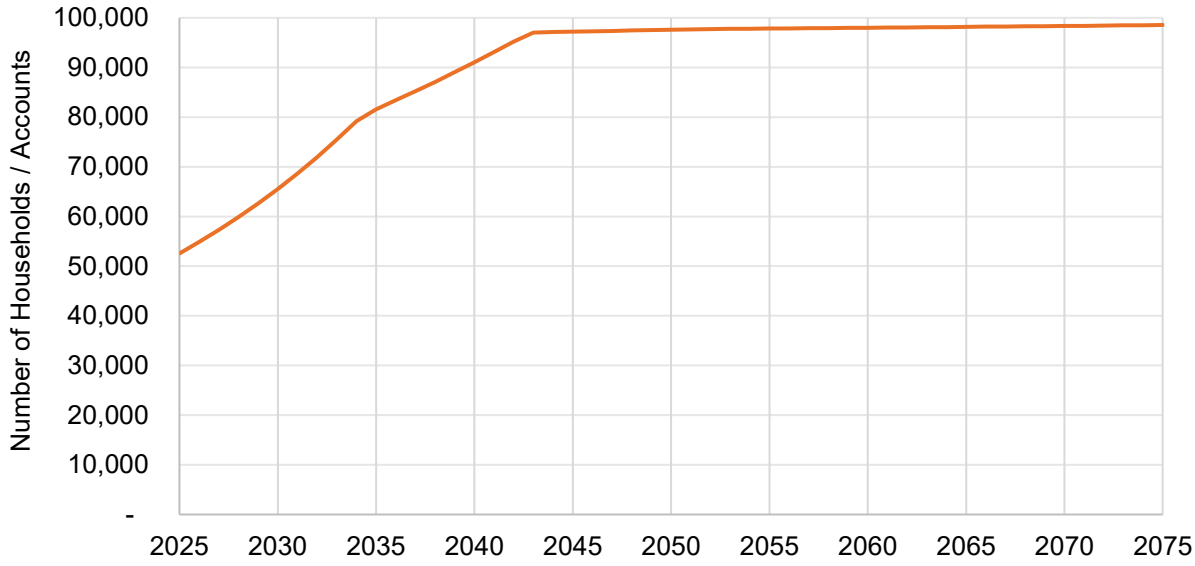


Figure 4-4: Projected Total Number of Households & COMM / INST Accounts, 50-Year Projections

4.4 HISTORICAL AND PROJECTED PER HOUSEHOLD / ACCOUNT USE

Per customer water use is an important metric for NBU. **Table 4-5** summarizes average historical use per customer category over the last 10 years, in gpd. Average use per household has decreased over the last

10 years for all residential customer types. The increase in use per account for INST and COMM customers over this period is likely due to changes in the types of customers that make up these categories.

Table 4-5: Historical Water Use Per Household / Account (gpd)

	SF1	SF2	MF1	MF2	MF3	INST	COMM
2015	241	496	121	125	123	2,301	1,147
2016	241	481	125	122	115	2,247	1,176
2017	244	508	110	111	115	2,829	1,175
2018	240	506	102	100	123	3,109	1,174
2019	256	574	106	110	112	2,879	1,199
2020	263	578	111	119	103	2,757	1,156
2021	217	409	111	107	121	2,636	1,138
2022	228	491	105	104	84	2,597	1,183
2023	223	458	103	98	78	2,529	1,191
2024	196	419	94	88	56	2,230	1,095
10-Year Average Rate of Change	**-2.5%**	**-2.5%**	**-2.3%**	**-3.5%**	**-7.0%**	**+0.7%**	**-0.6%**
3-Year Average Use (gpd)	**216**	**456**	**101**	**103**	**97**	**2,452**	**1,157**

When projecting future values for per account water use, the average from the most recent three years for each customer type was maintained indefinitely for water supply planning purposes. This avoids planning based on a single data point because the number of factors that impact these values naturally result in variability, often quite substantial, across years. These values will be revisited as new conservation measures are implemented.

4.5 NON-REVENUE WATER

The NRW factor of **Equation 4-1** compares the total volume of water pumped from NBU's sources (excluding ASR) to the volume billed over the same time (i.e., total consumption across all customer categories). **Table 4-6** shows that the historical proportion of total water use that was not captured by billed consumption increased approximately six years ago but has stayed steady since, ranging between 17 and 21%. Although NBU has ongoing, successful programs to reduce the NRW, for these demand projections, it was assumed that total water use would be 19% higher than the projected billed consumption, based on average NRW over the last three years.

Table 4-6: Historical Proportion of Total Water Use Not Billed Consumption

Year	Fraction of Total Water Use That is Not Billed Consumption
2015	0.13
2016	0.11
2017	0.09
2018	0.13
2019	0.19
2020	0.18
2021	0.17
2022	0.18
2023	0.18
2024	0.21
Average Based on Most Recent 3 Years	**0.19**

4.6 50-YEAR DEMAND PROJECTIONS

Figure 4-5 summarizes the projected demand over the next 50 years based on the methodology described in the previous sections. This reflects demand in terms of total sourced water, including water used in treatment and distribution. **Table 4-7** below lists the annual values at five-year intervals. There is an inflection point in 2043, where the slope of the line levels out to reflect a decreased rate of increase in system demand. This change occurs when the SF1 residential customer category reaches buildout. The MF1 and MF3 categories reached buildout earlier (**Section 4.3**), while SF2, INST and COMM are not projected to reach buildout within the 50-year planning period. Based on the conservative assumptions used in these projections, systemwide demand in 2075 (~31,000 AFY) would be about twice the current demand.

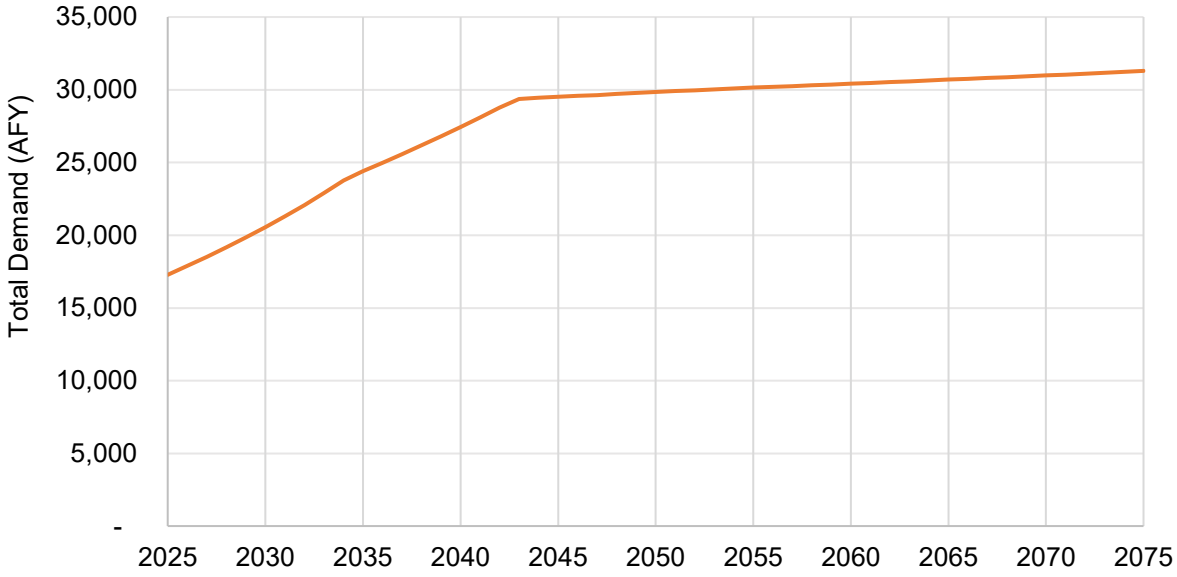


Figure 4-5: 50-Year Demand Projections

Table 4-7: 50-Year Demand Projections (AFY)

Year	Projected Demand for Water Supply Planning (AFY)	Year	Projected Demand for Water Supply Planning (AFY)
2024 (Historical)	15,600	2050	29,800
2025	17,300	2055	30,100
2030	20,500	2060	30,400
2035	24,400	2065	30,700
2040	27,400	2070	31,000
2045	29,500	2075	31,300

NBU's Water Conservation Goal

NBU previously established a systemwide goal of reducing 10-year average per capita demand to 118 gallons per capita per day (gpcd) by 2040. This goal is achieved by 2031 in this Projected Demand Scenario. In addition to conservation measures, this goal is largely achieved through projected customer growth (particularly higher growth in multi-family customers which use less water on average) that results in lower system per capita demand.

Actual demand in 2075 is anticipated to be below this projection for many reasons, including but not limited to:

- Updates to NBU's Drought Contingency Plan,
- Implementation of NBU's Water Conservation Plan (**Section 5**),
- Technological advances, such as more water efficient appliances, and
- Social, political, regulatory, and generational changes that are likely to occur over the next five decades.

However, this projection provides NBU with a conservative approach to decision-making to ensure that NBU's water supply portfolio remains diverse, resilient, and sufficient to meet both anticipated water needs as well as to overcome unknown future conditions.

Another way to consider future water demand is to calculate a potential service area demand at buildout. Based on the buildout number of accounts in **Table 4-3**, the 3-year historical average use per customer (**Table 4-5**), and the 3-year average fraction of total water use that is not billed consumption (**Table 4-6**), the projected demand at buildout was estimated as ~14,600 MG/yr or ~45,000 AFY (**Table 4-8**). However, this demand is not projected to occur until after 2075 and organic reductions in use anticipated over the next century are likely to reduce this value. Routine five-year updates of the demand model will increase the accuracy of these projections over time.

Table 4-8: Projected Demand at Buildout by Customer Category

Customer Category	SF1	SF2	MF1	MF2	MF3	INST	COMM
Number of households / accounts at buildout (source: FNI)	69,517	7,601	9,545	2,651	11,909	533	9,160
3-Year Average Daily Use per household / account, 2022 – 2024 (gpd)	216	456	101	103	97	2,452	1,157
Projected annual demand at buildout (MG/yr) per customer group	**5,477**	**1,265**	**351**	**93**	**316**	**477**	**3,867**
Projected annual NRW demand at buildout = 2,748 MG/yr							
Projected total annual demand at buildout including NRW = 14,593 MG/yr							

5 EVALUATION OF SUPPLY AND DEMAND

5.1 SUPPLY SUMMARY

Significant changes to NBU's water portfolio have occurred over the last five years since NBU's 2018 Water Resources Plan was written. NBU has secured additional Canyon Reservoir raw water and established contracts to purchase wholesale treated water from GBRA's GCWSP, GVSUD, and the City of Seguin (refer to **Section 2**). **Figure 5-1** summarizes how ongoing supply projects will further impact the quantity of water available. By 2030, NBU will have the authorizations and capacity to be able to produce 43,987 AFY (total authorized deliverable), with 34,023 AFY (total firm deliverable) available with the worst-case drought restrictions imposed.

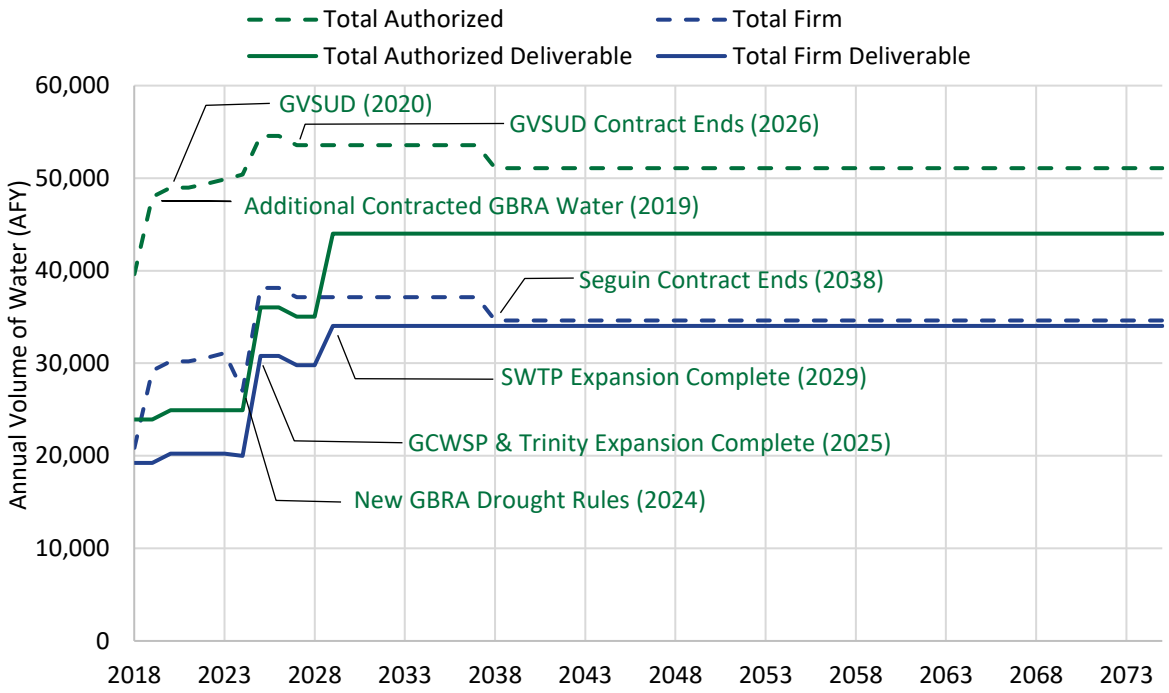


Figure 5-1: Supply Availability

5.2 DEMAND SUMMARY

As discussed previously in **Sections 3** and **4**, New Braunfels is one of the fastest growing communities in the nation; however, this rate of growth is anticipated to slow as buildout capacity for the service area is approached for each customer group and based on trends observed for similar communities along the IH-35 corridor. Annual water demand was projected to double over the next 50 years to ~31,000 AFY (**Figure 4-5**), assuming water use per customer remains at current levels, growth rates slow moderately, and the service area buildout capacity for each account type is not exceeded. Actual demand in 2075 is anticipated to be lower due to a number of factors, such as technological advances and changing national trends in water use. However, this projected demand scenario was used for water supply planning

purposes to provide a buffer to ensure additional supplies are online ahead of when they are needed, as well as account for potential future unknowns such as exceptional droughts and emerging contaminants.

5.3 COMPARISON OF SUPPLY AND DEMAND

Well-managed water utilities in arid areas like Texas predicate their planning on having a sufficient supply of water available upon which they can rely even during drought periods. Due to NBU's focus on and investment in water supplies and expanding infrastructure over the last seven years, NBU's water portfolio is increasingly reliable and diverse. Existing supplies and ongoing projects are estimated to meet New Braunfels' water demands through at least 2075, as shown in **Figure 5-2**. Supplies will likely be sufficient for even longer, including because:

- The firm deliverable quantities assume a worst case in which the most stringent water restrictions are all imposed for a full year. As noted in **Section 2.4.6,** a retrospective analysis showed that these maximum curtailments would not have happened even during the worst year of the DOR.
- Optimized water management strategies, such as ASR, will help utilize more of NBU's authorized water even during years with drought restrictions.
- The demand projection does not incorporate per household / account use reductions that are expected to occur both organically and as a result of NBU's proactive conservation program. As presented in **Section 4,** per user water demands have been decreasing over the last 10 years, and this is expected to continue with NBU's expanding water conservation program.

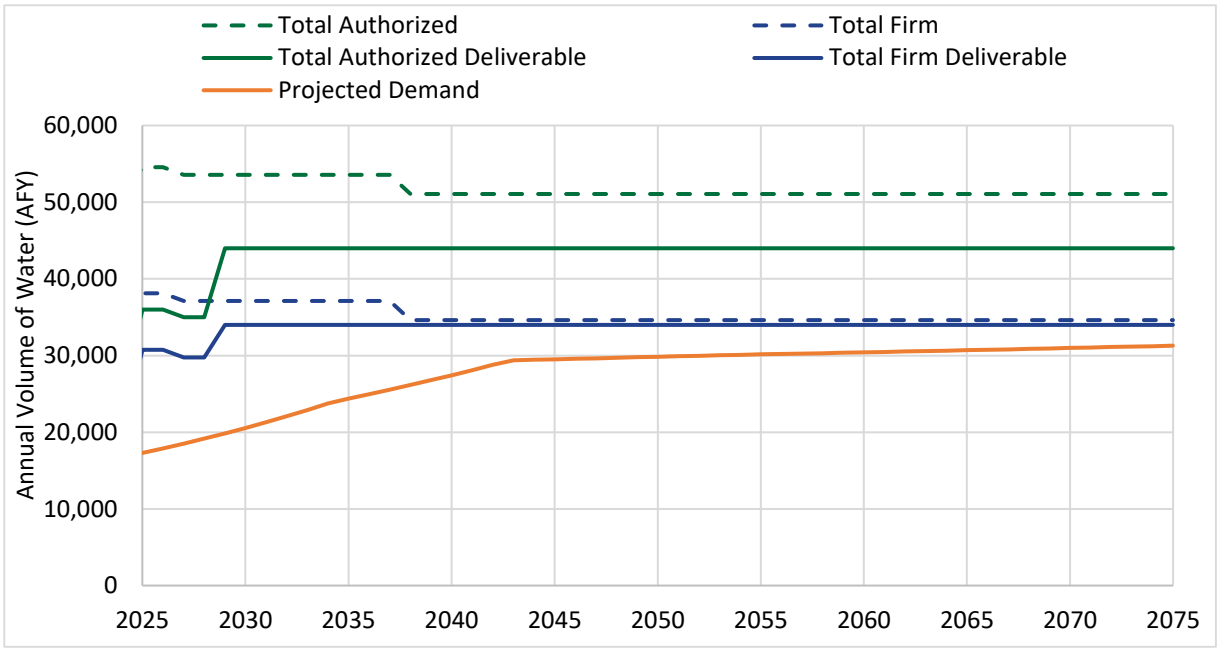


Figure 5-2: Future Supply vs. Projected Demand

6 WATER SUPPLY ALTERNATIVES

As the region continues to grow and reliable water sources are becoming harder to obtain, NBU continues to evaluate ways to improve its water supply reliability. This includes continuing conservation and demand management activities, considering new supplies and pursuing strategies such as the ASR program. **Section 6.1** describes additional water supply projects NBU considered as part of this Water Resources Plan. **Section 6.2** describes the triple bottom line evaluation that was performed to assess existing and alternative water supply sources from a One Water perspective to support NBU's goals of financial, social, and environmental stewardship. Nine potential new water supplies were evaluated. **Sections 6.3** and **6.4** then summarize two water supply projects NBU is recommended to proceed with pursuing: indirect potable reuse through a Bed and Banks permit and construction of a new SWTP on the South side of NBU's service area. Additionally, NBU is recommended to complete the full implementation of ASR at the New Braunfels National Airport (in progress).

6.1 POTENTIAL SUPPLY AND WATER MANAGEMENT PROJECTS

During the planning process, NBU and Arcadis identified nine potential water supply alternatives for further consideration, which are described below.

- **GBRA WaterSECURE.** To meet rapid growth and water demand in the middle and upper Guadalupe River Basin, GBRA is considering a large, complex treated water supply using various surface water diversion and storage rights. Project details have not been fully developed and the quantity of water that would be available to NBU is unknown. GBRA has tentatively assumed a supply for NBU in the range of 5,930 AFY to 8,070 AFY but the final volume will depend on design considerations and interest from other GBRA customers.
- **Additional Contracted Water Associated with the GBRA Lower Basin Project.** GBRA is constructing an off-channel reservoir in the lower Guadalupe River Basin to provide a firm supply of water to its municipal and industrial customers in Calhoun County. Though this project has been rolled into WaterSECURE, NBU has an existing contract that provides right of first refusal for 3,594 AFY of Canyon Reservoir water at this project's completion. GBRA is currently planning to complete this project around 2033-2034.
- **City of Seguin.** NBU entered into a contract with the City of Seguin effective July 1, 2018, to purchase 2,500 AFY of treated water, with contract expiration in 2038.
- **Indirect Potable Reuse (with a Bed and Banks Permit).** Indirect potable reuse (IPR) is the reuse of treated wastewater that has been discharged into an environmental buffer, such as a river or lake. A Bed and Banks permit would allow NBU to recover treated wastewater downstream for beneficial reuse. A TCEQ Bed and Banks permit was recently issued to San Antonio Water System (SAWS), giving SAWS credit for its discharged groundwater-based wastewater effluent and allowing it to extract water downstream of the discharge point. Two downstream entities have filed an appeal that is currently awaiting a hearing at the district court level. NBU could consider applying for a similar permit. The quantity would be determined during permit and contract negotiations but between 6,900 AFY and 11,000 AFY may be available.
- **Direct Potable Reuse.** In this source of supply, effluent from one or more existing WRFs would be purified to drinking water standards and delivered directly into NBU's distribution system or select customers. The yield of this option is dependent upon the volume of effluent available from the

WRF(s), which is expected to increase due to regional growth. Available quantities of reclaimed water may be between 5,600 AFY and 6,700 AFY.

- **Direct Non-Potable Reuse.** NBU could collaborate with the City or business users to deliver treated effluent from NBU WRFs to City of New Braunfels parks, schools, and select commercial and industrial users for irrigation purposes. A 2017 study, which considered potential irrigation users near WRFs as well as WRF effluent, estimated a potential delivery of up to 807 AFY.
- **North SWTP.** A North SWTP, also referred to as SWTP No. 2 or Hueco Springs Loop Road SWTP, has been discussed as an option for using more of NBU's GBRA's Canyon Reservoir water and/or Guadalupe River rights. NBU has purchased property to the north of NBU's service where this plant could be built. Previous studies considered up to a 10 MGD capacity, but final design would depend on water authorizations at the time of construction.
- **South SWTP.** Like a North SWTP, this project would allow NBU to use more of its surface water authorizations. A new SWTP in the south of the existing service area would be required to utilize any rights obtained through a Bed and Banks permit and would be desirable given recent and projected growth areas. Location selection and design capacity would be determined by water authorizations and growth patterns.
- **ASR at New SWTP.** The ASR water management strategy can help ensure all water rights can be used and to provide flexibility in water withdrawals. ASR could be considered at any new treatment facility, in addition to the ASR program planned at the New Braunfels National Airport.

6.2 SUPPLY EVALUATION

Despite having a water supply portfolio that is expected to provide for system demand through at least 2075, NBU continues to look for opportunities to improve resilience, be responsible stewards of the environment, support community goals, and be prudent in financial management. Proactive water resources planning also supports the One Water New Braunfels Roadmap, which includes an objective to "maximize environmental, social, and economic benefits to the greater New Braunfels area" by "prioritizing projects, programs and policies that consider and balance these goals."

To support decision making around water resources, a triple bottom line analysis was performed on both existing and potential supplies and water management projects. This included the nine new opportunities identified in **Section 6.1**. The triple bottom line approach incorporates costs as well as potential social and environmental impacts, as the cheapest option is not always the most practical or beneficial to short- and long-term sustainability. The assessment criteria and weighting, shown in **Table 6-1**, were developed with NBU over a series of workshops in 2023 and 2024.

Table 6-1: Triple Bottom Line Assessment Criteria

Criteria	Weight
ECONOMIC CRITERIA: BEING GOOD STEWARDS OF PUBLIC FUNDS	
Annualized capital and O&M costs per AF compared to other water supplies being considered	10%
Firm volume of water or additional capacity provided	8%
Ease of treatment, transmission, and operation relative to other supplies being considered	8%

Criteria	Weight
Time required for the supply to come online	8%
SOCIAL CRITERIA: BEING GOOD STEWARDS TOWARDS THE COMMUNITY	
Impact to customer groups or stakeholders	5%
Support of community's social goals	10%
Supply sustainability and resilience	10%
Regulatory, legal, or public acceptance complexities	8%
ENVIRONMENTAL CRITERIA: BEING GOOD STEWARDS OF REGIONAL NATURAL RESOURCES	
Impact on regional water resources	10%
Impact of the water supply and/or required construction activities on receiving water quality or terrestrial and aquatic habitats	15%
Power required for transmission, treatment, and distribution	8%

Based on this evaluation, NBU is recommended to proceed with two water supply alternatives: indirect potable reuse through a Bed and Banks permit and construction of a new SWTP on the South side of NBU's service area. These two projects are described in more detail in the next sections and will provide NBU with greater water supply resilience to overcome unknown future conditions and have greater ownership over NBU water resources in the future.

It is intended that this supply evaluation approach be applied to additional water supply opportunities in the future. It should also be updated as more information about supplies is obtained, such as when the capacities of the ASR wellfield and Trinity Aquifer Wellfield expansion are confirmed, and as GBRA provides additional detail on costs, timing, and available capacity of its Lower Basin and WaterSECURE projects.

6.3 INDIRECT POTABLE REUSE (WITH A BED AND BANKS PERMIT)

Indirect potable reuse is the use of treated wastewater effluent that has been discharged into an environmental buffer, such as a river or lake. De facto IPR, in which one community's discharged treated wastewater blends with upstream flow and is ultimately withdrawn by downstream communities for potable treatment, is common in surface water bodies. However, in Texas, entities can obtain a permit to divert effluent downstream for that entity's own use. For example, in early 2024 SAWS obtained a permit to retain ownership of its return flows derived from groundwater.[13] In other words, instead of its wastewater treatment plant effluent being lost to downstream users through de facto IPR, SAWS can now withdraw and reuse that water. IPR is generally a sustainable solution, as wastewater continues to be generated even during drought conditions and increases in quantity as regional growth occurs.

6.3.1 Supply Quantity and Permitting

Indirect potable reuse requires a Bed and Banks permit issued by TCEQ. TCEQ would determine the conditions of the permit, including the authorized maximum volume and rate of diversion. The average flow from the WRFs, attributable to groundwater withdrawals, determines an upper limit on potential

[13] SAWS permit is currently under appeal.

withdrawals under a Bed and Banks permit. The volume and rate permitted by TCEQ also considers the travel time and channel (carriage) losses between the WRF discharges and the point(s) of diversion. Based on a 2021 study by FNI, the combined permitted capacity of NBU's three WRFs is currently 12.3 MGD, with a projected combined flow of 15.7 MGD by 2045.

It is likely that only the groundwater-derived portion of the total discharges would be available under a Bed and Banks reuse permit, as that is water that NBU adds to the river which would otherwise not be part of the water body. Though NBU could potentially negotiate with GBRA to allow for use of GCWSP water for IPR, the analyses performed as part of this planning effort assumes that NBU would only pursue a permitted return flows volume equivalent to combined authorizations from the Trinity and Edwards Aquifers. In addition, a 50% rate of return of effluent flows is assumed to yield an estimated permitted quantity of 6,920 AFY (6.2 MGD). The SAWS permit does not contain any restrictions on withdrawals during drought conditions or based on river flows, so if NBU was permitted with the same conditions, the entirety of the 6,920 AFY would be firm.

6.3.2 Project Implementation

Withdrawal point(s) for water authorized through a Bed and Banks permit must be downstream of WRF effluent discharge point(s). The existing SWTP is only downstream of the Gruene WRF (the WRF with the lowest projected average flow by 2045) and, as noted in **Section 6.1,** the SWTP will not have the capacity to fully treat the raw water that is already authorized, even after expansion. Therefore, it is assumed that a new intake, pump station, and SWTP would be built downstream of the WRF(s) if a Bed and Banks permit is pursued.

The water authorized through a Bed and Banks permit would be diverted from the Guadalupe River, and it is assumed that treatment would be similar to that at the existing SWTP. Presumably, a high service pump station (HSPS) co-located at the new South SWTP would convey the treated water into the distribution system. No location has been identified for a South SWTP downstream of the WRFs, but its selection would consider proximity to the Guadalupe River, relationship to the WRFs, distance to the distribution system, and potential growth within the NBU service area.

Given the time required to complete the necessary studies, negotiate permit conditions with TCEQ, and address any legal challenges to NBU's permit – as well as design and construct a SWTP to treat the additional water authorizations, it is assumed that it may take 20 years to have this supply active from the time NBU decides to pursue it.

6.4 SOUTH SWTP

As described in **Section 6.1,** the existing SWTP will not have the capacity to fully treat the raw water that is already authorized, even after expansion. The expanded facility will have a capacity of 16 MGD, of which 15 MGD will be sustainable, whereas NBU currently has 22.3 MGD of surface water authorizations (ROR and Canyon Reservoir). Any additional surface water permits or contracts obtained, such as through a Bed and Banks permit or contracted water associated with the Lower Basin project, would leave even more authorized water undeliverable. In addition, having an additional SWTP would provide resilience against a natural disaster (e.g., flooding) or other threat to the current SWTP and allow for operational flexibility.

A location in the southern part of the service area (site yet to be identified) would provide the greatest benefits. In addition to helping to serve recent and projected growth areas, a site to the south,

downstream of the WRFs would be required if a Bed and Banks permit were obtained. Significant undeveloped land remains in this area, so NBU could presumably find a parcel to accommodate a larger SWTP and possibly an ASR wellfield (if studies conclude ASR is feasible).

6.4.1 Supply Quantity and Permitting

As noted previously, even with the ongoing SWTP expansion NBU will have approximately 6.3 MGD of authorized surface water that is undeliverable due to a lack of treatment capacity. Therefore, the triple bottom line analysis assumed that a new SWTP would allow for treatment of this full amount. Additional capacity could be added if additional surface water authorizations become available or to provide operational flexibility such that the existing SWTP does not need to operate at full capacity.

The TCEQ COAs and/or GBRA contracts would need to be amended to add a second point of diversion for a new SWTP. Any time a TCEQ water right is opened for amendment, TCEQ can modify the conditions. By adding a second diversion point to the COAs, NBU would invite the potential for more restrictive special conditions to be imposed, and there may also be opportunities for other water rights holders to object to the amendment and request a hearing. Therefore, it may be prudent for NBU to treat only its GBRA contracted water (which accounts for 72% of surface water authorizations) and any available return flows at the new SWTP.

6.4.2 Project Implementation

Potential locations for a new SWTP are likely to be isolated from existing facilities and infrastructure. Therefore, they would need an intake structure and pump station, pipeline to convey this raw water to the SWTP, a new treatment facility, and infrastructure to pump treated water into the distribution system. It is assumed that treatment processes would be very similar to that at the existing SWTP. Resizing of distribution system mains may be needed to accommodate the increased flow. Details including the location and sizing of intakes, treatment capacity, and conveyance and distribution infrastructure needed would be determined at the time of design based on water authorizations available. ASR could also be evaluated for the site selected.

7 CONSERVATION AND NON-REVENUE WATER PROGRAMS

In addition to proactively managing NBU's supply, NBU is also focused on decreasing demand. Steps along these lines are also being taken by other utilities in Central Texas, which are pursuing various strategies to increase water supply and decrease demand to ensure sufficient water supplies are available to support residential and business water needs for current and future generations. As local water resources are generally fully allocated, communities, including New Braunfels, must turn to expensive measures, such as importing new water supplies long distances, to increase the water supply available to residents. Therefore, water conservation and demand reduction are often the more economical and sustainable alternatives because they aim to proactively reduce the amount of new water required to meet customer needs. This less disruptive approach of meeting water needs through reduced demand provides additional benefits that strengthen the community and safeguard water resources. Water conservation:

- Reduces costs required to accommodate greater demand, thereby reducing future rate increases. Cost savings come from eliminating or delaying the need for additional supplies (which are increasingly expensive as availability decreases), reducing system operating costs, and avoiding additional infrastructure required to accommodate greater demand.
- Maintains compliance with the Texas Water Development Board (TWDB) and TCEQ water conservation and water loss guidelines.
- Increases watershed sustainability; reducing unnecessary usage helps ensure regional water sources remain healthy and reliable now and into the future.
- Reduces environmental impacts, including reducing the energy requirements associated with pumping and treating water.
- Preserves recreational flows, protects endangered species and local wildlife, and promotes biodiversity for future generations to enjoy by reducing reliance on the Edwards Aquifer and Guadalupe River.

7.1 NBU'S WATER CONSERVATION PROGRAM ACHIEVEMENTS

Since 2007, NBU has been proactively implementing water conservation programs. NBU has a dedicated water conservation team that directs these programs, which cover a range of conservation approaches including incentives, leak detection, ordinances, and community outreach and education. During the last seven years, NBU has implemented 16 conservation strategies that have been estimated to save between 40 and 110 MG per year as shown in **Figure 7-1.**

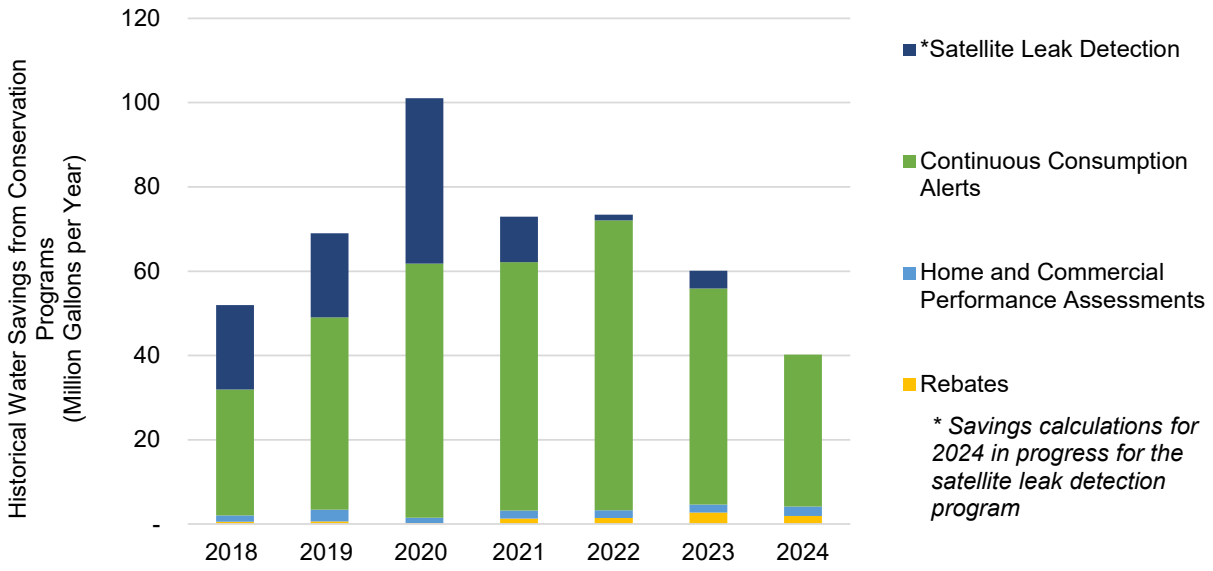


Figure 7-1: Estimated Savings from Water Conservation Programs

7.2 NBU'S WATER CONSERVATION PROGRAM LOOK AHEAD

However, to achieve additional benefits from conservation, NBU must increase investment in conservation programs and resources available to the community. Thus, NBU recently completed its 2024 Water Conservation Plan, which includes an action plan for new and expanded conservation strategies over the next five years to provide additional water savings. More than 50 potential conservation strategies were evaluated through a multi-phased screening process to prioritize applicability, diversification, effectiveness, resource requirements, potential water savings, and alignment with other utility priorities.

Table 7-1 summarizes the strategies that were selected for NBU's 5-year plan, which include some new strategies as well as improvements to existing programs. Almost all strategies address irrigation directly or indirectly. This factor was prioritized based on the analysis of historical water use data, which showed that on average irrigation accounts for approximately half of the water used by customers (for customers with separate potable and irrigation meters where data are available). In addition, irrigation for residential and commercial properties is not life sustaining, and there are low-impact approaches to reduce watering needs, including the use of native plants and rain barrels.

Some of the conservation strategies selected require water use reductions (e.g., ordinances and drought management plan requirements), whereas others provide support to or reward customers who choose to improve their water efficiency (e.g., irrigation assessments and rebates). Detailed information about the conservation programs, strategies, action plans, and timelines can be found in the 2024 Water Conservation Plan.

Table 7-1: Conservation Strategies for Implementation in 2024 – 2029

New Conservation Strategies	Expanded Conservation Strategies
• Irrigation System Inspection Program • Development of Ordinance Revisions • Water Conservation Education and Outreach Plan • Engagement of Local Officials and Community Stakeholders, including through One Water New Braunfels • Establishment of Water Conservation Partnerships with Local Trade Organizations • Improved Conservation Data Analytics and Visualization Capabilities	• Increased Investment in Asset Management • Drought Management Plan and Enforcement • Home and Commercial Irrigation Assessments with Rebates for Addressing Identified Issues • Water-Wise Landscape Rebates

7.3 PROJECTED DEMAND WITH ENHANCED CONSERVATION DEMAND SCENARIO

To understand the potential benefits of NBU's proactive conservation program, NBU modeled a second demand scenario. For this scenario, the same number of accounts were projected for each future year (**Section 4.3**) and the same proportion of non-revenue water was assumed (**Section 4.5**), but the use per household/account was reduced for residential users. To be conservative, for INST and COMM customer groups, the 3-year average use was maintained.

The 10-year average rate of change in use per account per year, shown in **Table 7-2** and based on the data in **Table 4-5**, was applied for SF and MF users. To be more conservative, a "floor" in gpd was applied for residential users, because there is a limit on how much use can be feasibly reduced. Various studies (Water Research Foundation 4309: *Residential End Uses of Water*, Bluefield Research Domestic Water Trends, and Arcadis 50L Home study) have concluded that 37 gpcd is an achievable goal based on existing technologies and aggressive water management strategies. Therefore, this lower bound of 37 gpcd was considered with the range of current usage by NBU customers to develop the minimum allowable daily use (in gpd) for each customer type shown in **Table 7-3**.

Table 7-2: 10-Year Average Rate of Change in Water Use Per Household / Account

SF1	SF2	MF1	MF2	MF3	INST	COMM
-2.5%	**-2.5%**	**-2.3%**	**-3.5%**	**-7.0%**	**+0.7%**	**-0.6%**

Table 7-3: Projected Per Household / Account Use (gpd), 50-Year Projections

	SF1	SF2	MF1	MF2	MF3	INST	COMM
Starting Value (2025) – 3-Year Historical Average	216	456	101	97	73	2,450	1,160
Minimum Allowable Daily Use	128		75			NA	
Projected Demand with Enhanced Conservation Scenario, 2050	128	128	75	75	75	2,450	1,160

Projected Demand with Enhanced Conservation, shown in **Figure 7-2,** begins decreasing around 2043 because the number of residential accounts is not increasing and the per household use continues to decrease. Projected demand for this enhanced conservation scenario starts increasing again after 2045 because per account water use by all residential customers, except SF2, reaches the lower bound for allowable water use, and thus, the reduction in demand no longer offsets the continued increase in the number of INST and COMM accounts. Due to the much slower historical rate of reduction in per account water use for SF2 customers, the SF2 customer group does not reach the lower bound for allowable water use until 2075; although water use by this group continues to decrease, the reduction does not offset the continued increase in the number of INST and COMM accounts. The lower bound for allowable daily use is achieved for all residential customers, including SF2, by the end of the 50-year planning horizon. By 2075, NBU is projected to be able to save approximately 9,000 AFY due to increased Conservation Demand. Thus, NBU's continued investment in water conservation programs is a critical component to maintaining NBU's water supply resiliency, minimizing the need to acquire more expensive new supplies, and reducing risk of future unknowns, such as emerging contaminants and exceptional droughts.

Likely, NBU will be able to achieve even greater savings as water-saving technology advances, NBU's service area shifts to more dense housing, and social, political, generational, and regulatory changes are implemented over the next half-century. For example, these projections do not assume any savings by existing or new commercial or institutional users over the next half-century. Thus, these values will be revisited as new conservation measures are implemented, and service area water use changes over time.

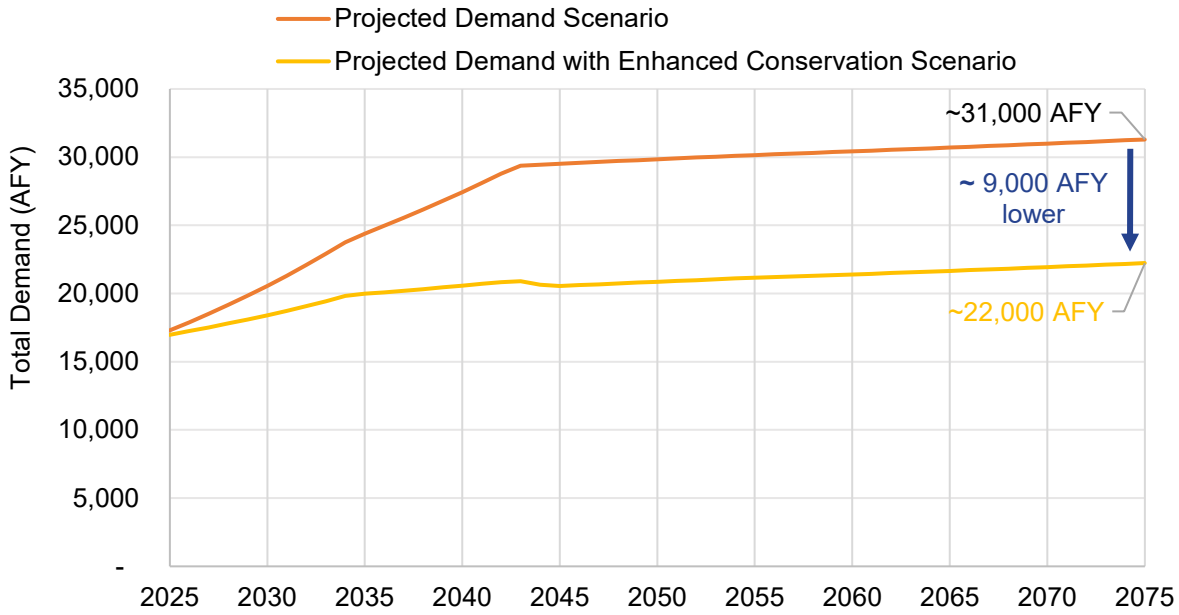


Figure 7-2: Projected Demand Savings from Water Efficiency

NBU's Water Conservation Goal

NBU previously established systemwide goal of reducing 10-year average per capita demand to 118 gpcd by 2040. This goal is achieved by 2030 in the Projected Demand with Enhanced Conservation scenario.

8 WATER QUALITY CONSIDERATIONS

When introducing new supplies into NBU's distribution system, it is of paramount importance to ensure that NBU's standards of water quality excellence are maintained. Adverse water quality impacts can occur with even seemingly inconsequential changes in water source or treatment. Introduction of a new source exhibiting different water quality characteristics than those of existing water has the potential to impact various parameters associated with water stability, corrosion control, maintenance of disinfectant residual, and nitrification. Unintended consequences can include, but are not limited to:

- Pipe corrosion and/or scale release
- Biological growth
- Development of unacceptable color, taste, or odor
- Difficulty maintaining a disinfectant residual
- Nitrification
- Corrosion potential and increased lead solubility
- Disinfection byproduct (DBP) formation

For example, shifts in pH can destabilize pipe scale, resulting in red, black, or other color-related water issues or increased concentrations of metals in water. Corrosion control is also important for limiting the growth of biofilms.

As described in **Section 6.1**, NBU's potential water supply projects represent a wide range of sources, some of which NBU will not control. For example, the GCWSP will be providing NBU with water from a new aquifer. NBU does not have control over the treatment of the purchased treated water, and there may be variability in the water characteristics and blends received.

This section describes recommendations for evaluating, planning, and onboarding new supplies. These will increase the likelihood that alignment with NBU drinking water standards will be maintained, protective pipe scale is not disturbed, and level of service is maintained whenever a new water supply is brought online. These recommendations include:

- Effective planning and onboarding for new water supplies
- Proactive monitoring
- Consistent communications
- Awareness and preparedness for changes in regulations or expectations

8.1 PLANNING FOR AND ONBOARDING WATER SUPPLIES

As mentioned previously, changes in supply water quality and blending within the distribution system can cause short-term and persistent system issues, including nitrification, biological regrowth, and increased lead solubility. **Figure 8-1** provides recommendations for activities to complete prior to the introduction of any new treated source into NBU's distribution system to minimize the risk of negative system impacts.

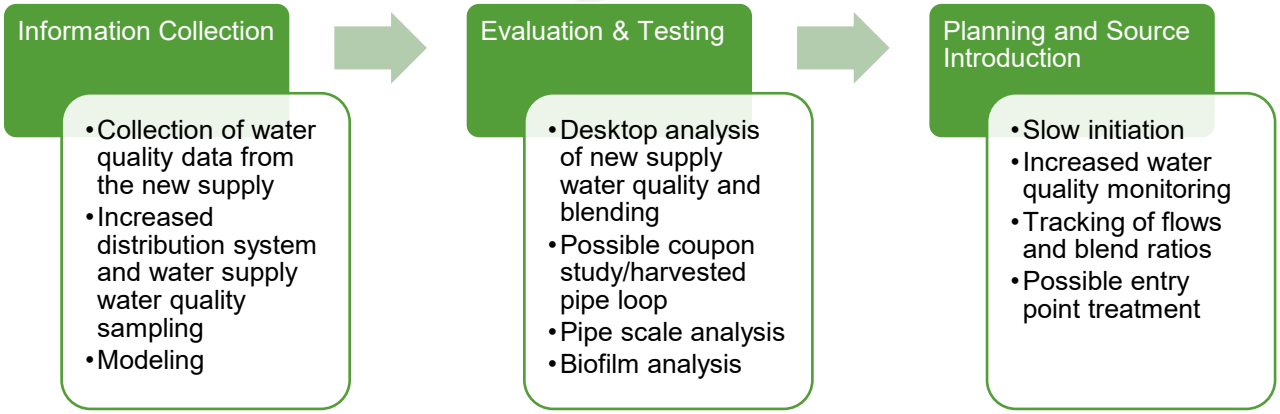


Figure 8-1: Process for Evaluating and Onboarding New Water Supplies

The approach begins with data collection. This includes compilation of water quality data from the potential supply. This can be achieved through data requests from other entities, including water suppliers, and/or sampling performed by NBU. In addition, increased sampling within NBU's distribution system will provide more complete information on the water quality conditions into which the source would be introduced. Typical water quality values and variability are important to consider.

The next step is evaluation and testing. This testing is used to collect additional data and provide insight into compatibility of new sources and potential impacts of blending. Evaluation of the water quality characteristics and variability is critical for each water source to ensure that all drinking water standards are met – both regulatory requirements and NBU goals from the most recent Water Quality Monitoring Plan (NBU, April 2021).

In addition to evaluating the quality of each new water source relative to NBU's water quality goals, it is critical to consider the compatibility of the new water with existing NBU supplies. Analysis should include consideration of expected blend ratios, impacts of changing proportions of various sources, and degree of deviation from historical blends. Calculation of corrosion indices is required for TCEQ corrosivity reports. In addition to corrosion indices, parameters of interest in assessing compatibility include, but are not limited to, lead and copper solubility, dissolved inorganic carbon (DIC), pH, alkalinity, chloride, sulfate, iron, manganese, calcium, free ammonia, and total dissolved solids (TDS), disinfectant types and levels, and disinfection byproducts.

The level of effort required for this varies. Additional studies beyond a desktop may be warranted with source changes, treatment changes, or changes in Water Quality Parameters (WQPs) and can take the form of solubility studies, flow-through studies (coupon or pipe loop with harvested pipe) or even full-scale demonstration tests. Like harvested pipe studies, coupon studies provide a relative comparison among testing conditions but are of a shorter duration than harvested pipe loop studies. The latter are useful when pipe scales may be impacted but take much longer to complete. In addition, it is essential to coordinate with and confirm that all TCEQ requirements have been met for any new point(s) of entry (POE).

Using this information, NBU can decide if the new supply is feasible and, if so, develop a plan for its introduction. This includes development of a plan for enhanced monitoring during startup to provide early awareness of potential water quality issues. The new supply is then gradually introduced into the distribution system, with treatment or operational adjustments made as needed based on the water quality data collected.

8.2 WATER QUALITY MONITORING

A robust monitoring program can provide valuable information on the impacts of system changes and can be leveraged before, during, and after introduction of a new supply. It is best practice to gradually bring supplies online, with enhanced monitoring used to understand the impacts and make adjustments, as needed. Ongoing monitoring is critical for maintaining distribution system water quality and for identifying upsets due to changes in source or water quality, thereby reducing the risk of unexpected water quality events. Proactive data collection and analysis can help minimize differences in water quality and prepare to rapidly adjust operations or treatment as needed.

Measuring additional parameters, adding monitoring locations, and increasing sampling frequency is generally valuable. Increased sampling at each new POE, as well as blending zones within the distribution system, will allow for early detection of potential water quality issues. Real-time water quality monitors can also be deployed at key points in the distribution systems such as intake / delivery points or blending zones. NBU staff then have continuous access to system water quality, and setpoint alerts can be established to provide notification of deviation from acceptable ranges.

In addition, NBU can request water quality data from the suppliers of purchased treated water. Data from suppliers or monitoring points along the distribution pathway can provide valuable data to allow NBU to prepare for changes in influent water quality. It is not uncommon for wholesale providers to provide relevant real-time data to entities that purchase their water.

Arcadis recommends that NBU update as soon as possible all distribution system monitoring and control plans (i.e., Nitrification Action Plan (NAP), Corrosion Control Plan, and Distribution System Monitoring Plan) to account for introduction of each new supply. These plans are intended to be living documents that should be reviewed and updated with the addition of any new water sources, and with any changes in treatment, as well as:

- Annually (to update baselines and goals),
- Following any changes in sampling frequencies or locations, based upon monitoring results, and
- Following any atypical water quality events.

8.3 SUPPLY-SPECIFIC WATER QUALITY CONSIDERATIONS

This section discusses water quality considerations for individual existing and potential supplies.

8.3.1 Purchased Treated Water from GCWSP

As noted in the *GBRA Mid-Basin Supply Project Study Technical Memorandum No. 6 Surface Water and Groundwater Quality Analysis* (Freese and Nichols and HDR 2013), “there is very limited and sporadic water quality data for the northern portions of Gonzales County”. Sources of Carrizo Aquifer water quality include an American Water Works Association (AWWA) study conducted in 2010 and documented in the following publication – *East Meets West: Treatment and Blending Considerations in Using Carrizo-Wilcox Groundwater in Central Texas* (AWWA, Texas Section 2010). Water quality concerns that emerged from limited data collected by various agencies in the vicinity of, and considered to be representative of, groundwater quality near the planned wellfield generally yielded the same concerns: elevated iron and manganese, low pH, and negative Langelier Saturation Index (LSI). The data reviewed for the AWWA publication included information from TWDB, whose database includes 300 wells across the entire

Carrizo and Wilcox aquifers, but very few in the vicinity of the proposed GBRA Carrizo wellfield. *GBRA Mid-Basin Supply Project Study Technical Memorandum No. 9, Treatment Process and Site Selection Criteria* (Freese and Nichols 2013) proposed required treatment and broad goals for treated Carrizo groundwater.

More recent data (2019) collected from two wellfields in east Caldwell County that will feed the Alliance Water WTP were analyzed to determine the general water quality characteristics and to estimate corrosivity of the raw water supply. Groundwater originating from those two wellfields will be treated at the Alliance Water WTP with sodium permanganate to oxidize iron and manganese, carbon dioxide and lime slurry to adjust pH and raise alkalinity, filtration, and disinfection before conveyance to NBU. A corrosivity report based on these data and analyses was submitted for the Alliance Water phase 1B WTP and approved by TCEQ (Walker Partners 2021). The report described the desktop analysis and anticipated finished water quality.

A corrosivity engineering report was prepared for NBU in alignment with TCEQ requirements for the commissioning of a new treated potable water source (Arcadis 2023). Results from this desktop analysis showed that blending the GCWSP source water was considered slightly corrosive overall using TCEQ's corrosivity criteria for blends at 10°C, but non-corrosive for blend scenarios analyzed at 25°C. These desktop analysis results will be verified after the Alliance Water WTP is in full operation and regular delivery to the NBU system has begun. Because the calculations were based upon limited data, these expectations need to be confirmed. Results of the desktop analysis will be updated and verified once routine delivery of the GCWSP water to NBU's system has begun. A blending study completed earlier provided a more comprehensive analysis of potential water quality concerns (Arcadis 2022). Recommendations in that study included preparing an updated blending study using actual finished water from the new plant treating the GCWSP source and evaluating the potential for elevated DBP levels.

8.3.2 Trinity Aquifer Wellfield Expansion

Water quality sampling and analyses documented in the *Trinity Wellfield Membrane Treatment Plant-Final Preliminary Engineering Report* (Freese and Nichols, 2017) illustrate that Trinity Aquifer water quality is highly variable, particularly following heavy rainfall and periods of drought. Further, water from the Trinity Aquifer Wellfield contains elevated levels of turbidity, aluminum, iron, TOC, and pathogens following rain events of sufficient duration and intensity to generate flow in the Dry Comal Creek. The extreme variations in water quality have historically been linked to weather patterns, making it more difficult to predict in advance.

Water quality analyses used in classifying the Trinity Aquifer source as Groundwater Under the Direct Influence of Surface Water (GUDI) led to the decision to install treatment with direct membrane filtration. Additional treatment includes application of a coagulant ahead of the membranes, along with chlorine for oxidation of hydrogen sulfide. Both chlorine and ammonia will be applied post-membrane for disinfection. Regular monitoring should be performed to verify water quality with the new wells and MTP expansion.

Corrosion indices for finished water produced at NBU's existing SWTP and for Edwards Aquifer and Trinity Aquifer well water were calculated for NBU's Temporary Membrane System Project and presented in a technical memorandum to TCEQ (Freese and Nichols 2017). Data used for that memorandum showed that the water qualities are similar, which is expected as the expansion will treat water from the same wellfield using the same treatment processes as the water already distributed into NBU's distribution system from this site.

8.3.3 ASR

Treated water from NBU's distribution system is pumped underground and stored until needed. The recovered water needs only to be re-treated with chloramines prior to distribution. Online monitors linked to SCADA and operational flexibility with chemical dosing both will both help with potential future situations where the beginning of pumping water from the ASR wellfield to the distribution system may be just a few days following the end of recharge and normal ammonia attenuation during aquifer storage may not have gone to completion.

Developing ASR capacity in successive steps will provide confidence that TDS and hydrogen sulfide gas (H_2S) concerns can be overcome through development of an adequate storage volume, and that the target duration of ASR recovery with acceptable water quality can be achieved. Developing ASR storage using the full thickness of the Edwards Aquifer will provide higher production flow rates for individual wells and more rapid freshening of the aquifer around each ASR well. Monitoring during and after commissioning of the ASR wellfield will facilitate proper operation and treatment given the variables that can impact the quality of withdrawn water.

8.3.4 Purchased Treated Water from GVSUD and the City of Seguin

GVSUD and the City of Seguin pull water from multiple sources. NBU has no control over nor advance knowledge of the instantaneous water quality that will be received other than that it should meet regulatory requirements. Therefore, water quality can change based on source characteristics as well as blending at any given time. New distribution system monitoring locations at and close to the purchased treated water points of entry should be considered; online monitors would provide an early warning system for water quality changes.

8.4 COMMUNICATIONS

In addition to performing its own monitoring, there is value in NBU collaborating with and maintaining an active dialogue with the wholesale entities supplying water. Ongoing communication is important to stay aware of source water changes, provide input into treated water quality goals, obtain updated water quality information, and understand progress toward optimizing treatment (e.g., DBP formation for supplies where treated water travels some distance to NBU's delivery point). In addition, wholesale providers should be willing to share water quality data with NBU, such as the data that GBRA collects along the conveyance pathway from their WTP to NBU's delivery point. Both the communication and upstream data can help NBU prepare for any changes in supply water quality.

8.5 LOOK AHEAD

There are always contaminants or classes of contaminants on the regulatory horizon, and it is important for NBU to continue to be forward looking to identify and plan for future drinking water regulations that have the potential to impact both treatment facilities and the distribution system. This includes monitoring contaminants that may be on the regulatory horizon and participating in Unregulated Contaminant Monitoring Rule (UCMR) sampling as requested. Continuing to track all UCMR results for the system and comparing the results to potential future regulatory and industry-recommended (e.g., health advisory) limits will provide advanced knowledge to aid in decision-making. Any contaminants measured at concentrations near these limits should be evaluated for potential treatment needs.

Note that NBU's Water Quality Monitoring Plan is due to be updated in late 2025, and the updates should incorporate any applicable requirements from the Lead and Copper Rule Improvements (LCRI) regulation finalized in October 2024. Referenced concentrations in the existing plan are based on a limited dataset over two years, ending in 2019, and should be updated as additional datasets become available. These goals should also be considered for each new water source as part of a blending study, as the new source comes online, and continually as NBU reviews water quality data collected.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 CONCLUSIONS

The following summary presents key conclusions drawn from the development of the 2025 WRP:

- NBU has established a diverse portfolio of water resources that includes groundwater, surface water, and purchased treated water. By the end of 2025, NBU will have 54,575 AFY of water authorized for use under normal hydrologic conditions, when aquifer and reservoir levels and river flows are not in drought condition.
- Upon completion of ongoing water supply projects, 43,987 AFY will be deliverable based on water authorizations and pumping and treatment capacity. However, an additional 9,588 AFY of authorized supply will remain unusable in the near term. This limitation is largely due to the existing SWTP lacking sufficient capacity to treat the full volume of authorized water from Canyon Reservoir and the ROR source, as well as the absence of infrastructure needed to access water from the City of Seguin.
- Approximately one third of NBU's inventory can be curtailed during drought conditions. With the maximum drought restrictions imposed across a full year, NBU will be authorized to withdraw and use 34,023 AFY once ongoing supply projects are complete. The planned expansion of the SWTP will ultimately enable NBU to treat and deliver all water volumes for which it holds firm authorizations.
- In planning for long-term water supply reliability, NBU has adopted the approach common among well-managed utilities in arid regions, basing needs on a repeat of the worst conditions experienced during the DOR. Based on a retrospective analysis which included the Trinity Aquifer Wellfield expansion and current permit and contractual restrictions, the estimated volume that would have been available during a repeat of the worst year of the DOR is approximately 37,000 AF. The estimated average annual volume that would have been available across the DOR was almost 40,000 AF, though not all of that volume is currently deliverable.
- Notably, the analysis found no instance during the 75-year period reviewed in which the most extreme drought restrictions were enforced for an entire year. This means that with strategic water management, such as drawing from the most restricted sources when they are briefly available and utilizing ASR, NBU could have exceeded the estimated available volumes.
- NBU remains strongly committed to water conservation and demand management. During the last five years, NBU's conservation strategies have been credited with saving between 40 and 110 MG per year. NBU's 2024 Water Conservation Plan includes an action plan for new and expanded conservation strategies over the next five years, with a goal of reducing 10-year average per capita demand to 118 gpcd by 2040, which represents a 9% reduction over its current 10-year average per capita demand.
- Looking ahead to 2075, water demand projections vary depending on the scenario. Under NBU's projected demand scenario, assuming most residential categories are fully built out, growth slows across all customer classes, current usage rates remain steady, and conservation targets are exceeded, the total annual demand is forecasted to reach approximately 31,000 AFY. In a more aggressive conservation scenario, where demand per account continues to decline in residential

and multifamily categories based on recent trends until reaching a theoretical minimum or "floor," the projected 2075 demand is approximately 22,000 AFY. It is likely that future advances in water-saving technologies, combined with shifting societal and political attitudes around water use, could drive demand even lower than these projections.

- Throughout this planning process, NBU evaluated a range of supply and management strategies for enhancing its available water. An initial screening led to a detailed evaluation of nine alternatives using a triple bottom line framework that aligns with NBU's commitment to stewardship and the principles of One Water. Two of these alternatives would further diversify the water supply and reduce reliance on third-party providers of treated water. While NBU's current and planned supplies are sufficient to meet projected demands through and beyond 2075, these options will remain under consideration to strengthen long-term resilience and reduce vulnerability to future uncertainties.

9.2 WATER SUPPLY PORTFOLIO RECOMMENDATIONS

NBU has successfully established a diverse water supply portfolio that meets the community's projected water demand beyond 2075 even during a period worse than the drought of record. Thus, NBU is not recommended to pursue new water supplies in the near future. However, NBU is recommended to pursue the following opportunities to increase supply resiliency, and thereby decrease risk of future unknown conditions:

- Complete the water supply projects underway, including the Trinity Aquifer Membrane Treatment Plant expansion and the Surface Water Treatment Plant expansion. These two supply projects are assumed as part of NBU's water supply beginning in 2025 and 2029, respectively.
- Complete the ASR demonstration project and move forward with wellfield expansion. This program provides water storage to allow NBU to more efficiently utilize existing water supply rights, provide continuous service during emergencies (e.g., if a whole supply should go offline unexpectedly), and increase flexibility during droughts as well as year-round (e.g., by optimizing water quality in the distribution system). Continue coordination and easement acquisition with the City of New Braunfels, and coordination with EAA. As needed, obtain approvals from regulatory agencies, including TCEQ and EAA the full-scale operation of the first ASR well and construction of additional ASR wells. Continue coordination with the City of New Braunfels, as well as EAA.
- Pursue a Bed and Banks permit as soon as possible. This permit secures NBU's right to return flow discharges and provides flexibility in the future should NBU determine a need for additional water supplies. Waiting until the SAWS Bed and Banks permit is final and unappealable will provide a more predictable permitting process, although the timeline for the finalization of the SAWS permit is currently unknown.
- Establish a timeline and triggers for evaluating potential locations for a future SWTP in the south region of the NBU distribution system. It was estimated that the proposed South SWTP could be planned, designed, and constructed in 20 years, and so, aside from pursuing the Bed and Banks permit and evaluating whether early procurement of property or easements would be beneficial, there is no need to take further action unless and until a potential shortage is expected within 20-30 years. Additionally, suspend additional studies for the North SWTP site on Hueco Springs Road, as this site would not be able to use any future Bed and Banks permitted water and is also no longer located near anticipated future service area demands.

- Assess opportunities to acquire additional Edwards Aquifer water rights. Requests for Competitive Sealed Proposals could be used to gauge availability and interest.
- Explore options for the water contracted from the City of Seguin. NBU expressed that it is unlikely that Seguin will renew the contract when it expires in 2038, and the infrastructure required to use the water could not be completed in time to justify the cost. Opportunities to consider should include cancellation of the contract or sale or lease of the rights.
- Based on the triple-bottom-line analysis, the GBRA's WaterSECURE project is not a recommended option for NBU due to the cost, lack of control by NBU, and environmental impacts. However, NBU should stay in regular communication with GBRA and monitor the status of the WaterSECURE and Lower Basin off-channel reservoir projects. Although the Lower Basin project has been rolled into WaterSECURE, NBU has the right of first refusal to contract for additional water from Canyon Reservoir as it becomes available.

This analysis showed that existing and in progress supplies and infrastructure will be able to supply NBU's demand through at least 2075. Therefore, aside from the opportunities listed above which may not be available in the future, no additional activities to increase supply or deliverable volume are needed at present. By continuing to monitor supply and demand trends and conducting five-year WRP updates, NBU will have adequate advance notice before additional action is needed.

9.3 WATER MANAGEMENT RECOMMENDATIONS

In addition to maintaining NBU's diverse water supply portfolio, the following is a list of the major recommendations for water supply management coming out of this water resources planning process. NBU is recommended to:

- As soon as possible, collaborate with the City of New Braunfels on a policy to scrutinize future large-quantity water users (e.g., data centers) which are considering moving into the NBU service area. Significant water demand by new large-volume users is not considered in the current projections. Modeling other utilities, this could include establishing a maximum water use per customer and/or disallowing evaporative cooling.
- Complete the development of a more formal, but flexible, water management strategy for NBU's supplies in order to maximize the annual volume that can be withdrawn, minimize supply costs, better manage distribution system water quality, and support water supply conservation plans. Proactive water management is particularly relevant given the major changes underway for NBU's water portfolio (i.e., new drought restrictions imposed on the Canyon Reservoir water, GCWSP coming online, the ability to withdraw and treat more Trinity Aquifer water, ASR implementation, and the SWTP expansion). A water management strategy should include standard procedures for selecting which supplies to withdraw in real time. These procedures could prioritize maximizing available withdrawals while minimizing environmental impacts. For example, NBU could pull from the most vulnerable supplies when aquifer levels or river flows allow.
- Improve data management, including collection, analysis, and interdepartmental access to relevant account, billing, planning, and operations information. Data quality issues, especially around customer characteristics and use, were encountered during this planning process that can impact decision making. Begin collecting information on supply availability and use. Automate annual

reviews of supply and demand data and develop and track key performance indicators to measure success in water resources management.

- Assign responsibility for regular reviews of the WRP, water portfolio, and potential opportunities. Activities should include updating the triple bottom line evaluations as new information is available and performing annual reviews of supply availability and use, changes in customer accounts and demand by account type, and overall system demand. These reviews will allow NBU to determine the timing for pursuit of an additional supply.
- Continue involvement with the Comal Trinity Groundwater Conservation District (CTGCD) and other relevant GCDs to provide awareness of potential regulations, including those related to aquifer withdrawal, and to provide input into the decision-making process.
- Continue monitoring of and involvement in GBRA's ongoing basin-wide HCP process.
- As new water sources are being planned and before such sources are introduced into the NBU distribution system, review the water quality recommendations in **Section 8**. Perform relevant analysis and testing of these new supplies and determine the potential impacts of the new water quality and blending ratios within the distribution system.
- Regularly monitor water quality throughout the distribution system, especially as new supplies are added. Consider online water quality monitors at POEs and in the distribution system to provide real-time awareness of blending and potential issues.
- Increase investment in and enforcement of water conservation and demand management measures. In addition to the activities outlined in NBU's 2024 Water Conservation Plan and NBU's Drought Contingency Plan (under revision), consider incentives for customers implementing on-site (decentralized) water reuse.
- Complete implementation of the Water Supply Resiliency Study recommendations, including continued coordination with NBU's wholesale suppliers to optimize cost savings and operational predictability.
- Stay informed on regional and national water use trends and water supply advances including emerging technologies such as those related to direct potable reuse and water-saving technologies for homes and businesses. Stay involved in and informed on the activities of local and regional water supply entities, including the South Central Texas Regional Water Planning Group and EAA.

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