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SPRING 2020

RIVER RUN



G B R A . O R G



GBRA RIVER RUN
Spring 2020

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 GBRATX

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On the Cover: The Western Canyon Water Treatment Plant uses water from Canyon Reservoir to provide up to 10 million gallons of water per day of treated drinking water to area communities and water systems.

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Community plays an important role in every aspect of our lives. Our communities bring us together and unite us. Community serves as the foundation of the work we do every day. The Guadalupe-Blanco River Authority is proud to be part of strong communities across 10 counties, operating water and wastewater systems that serve more than 350,000 people daily.

During this ongoing public health situation, GBRA's operations have changed. Our office lobbies have closed to the public, employees are working remotely, and we have closed our parks, all in an effort to protect our customers and staff from the spread of coronavirus (COVID-19). While we are taking precautions to protect our staff, our water and wastewater treatment plants will continue to operate 24 hours a day, 7 days a week. Our operations staff are cross-trained and licensed at multiple facilities to provide safe and reliable treatment of water and wastewater.

With an eye toward the future, we are making progress to better support our growing communities.

What has not changed is our commitment to serve our customers' water and wastewater needs and ensure we are prepared to continue to meet those needs as they evolve.

Carrizo Groundwater Supply Project is well underway. With an anticipated annual output of 10 billion gallons of water per year, of which half is GBRA's portion, this project will be a crucial piece in providing future water to the quickly growing I-35 corridor between New Braunfels and Buda. In the meantime, we continue to expand our water and wastewater operation capacity through the addition of smaller plants and expansions at existing plants in our service area.

Progress is also being made toward identifying and funding a solution for the necessary repair of the hydroelectric dams that form the Guadalupe Valley Lakes. We continue to work collectively with the community, including the respective lake associations and two recently created water control and improvement districts by Lake McQueeney and Lake Dunlap, to ensure the long-term sustainability of the lakes.

GBRA employs a talented group of professionals and managers who live our mission of supporting responsible watershed protection and stewardship while providing quality operational service to our customers. Despite the uncertainty of the moment, as an organization we are steadfastly invested in the continued vitality and prosperity of our communities, and we will continue to make significant progress toward future-readiness. We continue to serve as trusted stewards operating on the leading edge of our industry.



Kevin Patteson
General Manager & CEO





Kevin Patteson, general manager & CEO, surveys a part of the Canyon Lake Gorge.

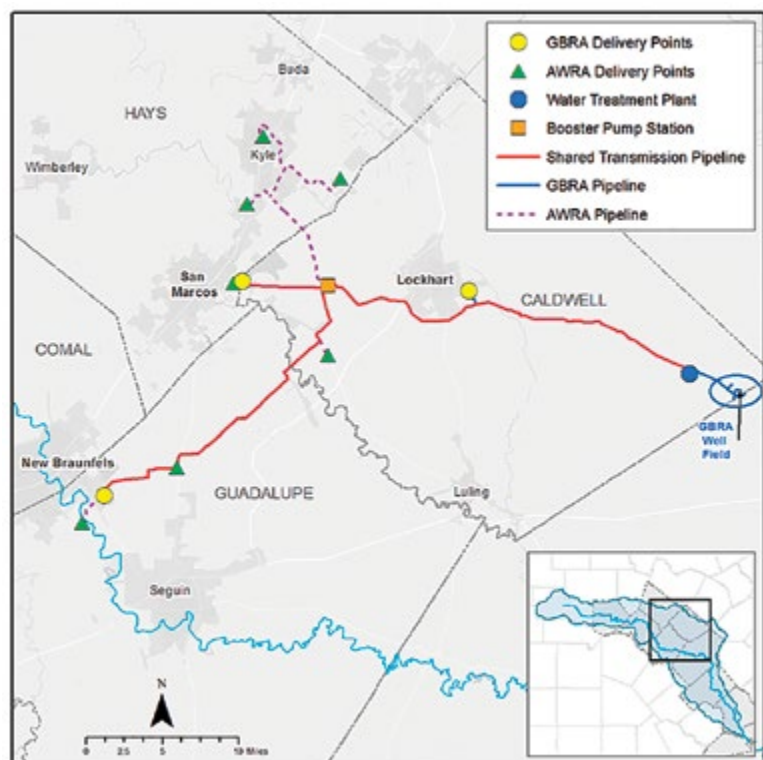
Securing Water for the Future

Charlie Hickman is eager to get his hands on a particular set of plans that have been in the works for about a year. Those engineering plans are for GBRA's nearly five-billion-gallon per year Carrizo Groundwater Supply Project, which will be a key component in supplying future water to a quickly growing I-35 corridor between New Braunfels and Buda.

"We are collaborating with Alliance Regional Water Authority on this project, which was jointly announced in 2018," Hickman, GBRA's executive manager of engineering said. "A project of this size involves multiple consulting engineers working together with GBRA and Alliance to develop plans and specifications for all of the infrastructure required. Through this process, we are making determinations on where facilities will be located and what the best options for pipeline routes will be. As the design progresses we'll also get a more refined cost estimate for completing the project."

GBRA and Alliance Water will each be producing 15,000 acre-feet per year of groundwater from the Carrizo Aquifer in Gonzales and Caldwell counties near Waelder, Texas. One acre-foot of water is equal to approximately 326,000 gallons. While each organization will construct their own well fields and associated piping, they will both transmit that water to a shared water treatment plant near the well fields. From there, high-quality drinking water will travel about 60 miles west through 24- to 48-inch transmission mains for consumption by cities in Hays, Caldwell, Comal, and Guadalupe counties. The estimate for the total combined cost for the project is approximately \$400 million, and each entity will be financing its share of this cost with low-interest Texas Water Development Board SWIFT loans.

Map of the Carrizo Water Supply Project serving cities in four counties within the Guadalupe River Basin.



"The major upside to developing a joint project is both entities will achieve a substantial savings by sharing the costs of water treatment, transmission line capacity and many other operational needs," Hickman explained. "GBRA alone is saving about \$52 million by jointly developing the infrastructure, and those dollar savings mean costs to our customers can be significantly reduced. We are always looking for ways to be efficient in our work and this partnership is a prime example of that."

Of GBRA's 15,000 acre-feet per year of water produced, the City of Lockhart will receive 3,000 acre-feet per year; 8,000 acre-feet per year will go to New Braunfels Utilities; and the remaining 4,000 acre-feet per year will go to the Goforth Special Utility District headquartered in Niederwald, Texas. Alliance Water will supply water to the cities of Buda, Kyle, and San Marcos, as well as to the Canyon Regional Water Authority. GBRA will be drilling seven, 1,300-foot deep wells to produce the water needed for its customers.



The Carrizo Water Supply Project will provide 5 billion gallons of water per year for future generations of South Central Texas.

The team has started the design for the well fields and collection piping. The engineering work for the wells is nearing completion, drilling of the first wells will get underway this summer, and the remainder of the project is estimated to be online by 2023. Alliance Water has already purchased the land for the treatment plant and has been working with landowners to secure easements for the 60-mile shared pipeline.

“Although the bulk of the work currently underway is related to the engineering design, GBRA has been busy accomplishing other aspects of the project,” Hickman noted. “We have met with our lease holders who will have wells on their property to let them know where we anticipate drilling our wells.”

“We have secured a permit amendment from the Gonzales County Underground Water Control District which allows us to minimize the infrastructure required for the project and optimize production from the wellfield,” Hickman continued. “We have been working with the City of San Marcos to design upgrades to the pump stations at the San Marcos Water Treatment Plant where all of the Goforth water will be delivered, and we have been collaborating with Alliance Water on

the routing for the main transmission pipeline and design of the water treatment plant. Additionally, we have collected some water quality samples which will help the designers of the water treatment plant in their work. Probably the highlight of all the early project work is that we have received environmental clearance to develop the wellfield and collection lines from the Texas Water Development Board and other reviewing agencies.”

The GBRA-Alliance Water team meets monthly to review overall progress, discuss options for improving the project, and ensure they agree on direction going forward.

“The areas we’ll be serving have experienced tremendous growth in recent years, and that growth is showing no signs of slowing down. We’re already thinking about the next source of supply that will be needed after the Carrizo Project is completed,” Hickman said. “With all that growth there is a significant demand for water in the near-term, and we feel very good about the Carrizo Project being able to meet those needs. This is a great source of water and we are able to collaborate with Alliance Water to save on development costs. Overall, it is a great solution for all associated stakeholders’ futures.”

San Marcos WTP is TOPs

The San Marcos Water Treatment Plant, managed by GBRA, was awarded its second five-year Texas Optimization Program (TOP) Award from the Texas Commission on Environmental Quality (TCEQ). The award is agency's way of recognizing the efforts organizations make to optimize the performance of their surface water treatment plants.

The SMWTP treats up to 21 million gallons of water per day (MGD). Currently, GBRA's customers are using about half of that capacity at 11-13 MGD. The plant gets its raw water through a 23-mile, 30-inch pipeline originating from the Guadalupe River. Once treated, the high-quality drinking water is distributed to all parts of Hays County up to the Travis County line to include the cities of San Marcos, Buda and Kyle. Additionally, a few smaller water companies receive water from the plant.





River water is mixed with a coagulant and allowed to settle or clarify in the plant's clarifiers before the filtration step is performed by eight sand and anthracite filters.



Aerial view of the San Marcos Water Treatment Plant.



Water clarifiers at the San Marcos Water Treatment Plant are used in the pretreatment of drinking water prior to further purification.



Settled water travels from the clarifiers to filters during the purification process at the San Marcos Water Treatment Plant.

GBRA Lab Key to Water Health

Over the course of a year, the GBRA water quality lab will analyze and report on more than 12,000 water and wastewater samples. Using the most current scientific analysis processes and equipment, the team of 10 environmental scientists ensure GBRA's mission of supporting responsible watershed protection and stewardship is always improving.

"You've heard the saying that 'numbers don't lie.' Essentially, that is what our lab's work is about. We generate the numbers from water and wastewater quality analyses that indicate the overall quality of the water in the Guadalupe and Blanco rivers watersheds," stated Kylie Gudgell, GBRA regional lab director. "We employ testing techniques that have been used for decades and some that are relatively new science. We are constantly looking for the best ways to gain the best data from our water and wastewater quality sampling because, in the end, those numbers are the keys to letting the public know about the overall health of the environment they live in."

Gudgell's focus on science gives you an indicator that water quality labs like GBRA's are heavily regulated and monitored. The GBRA lab is a certified drinking water laboratory, which has adopted the exacting standards of the National Environmental Laboratory Accreditation Program (NELAP). About 10 years ago, the Texas Commission on Environmental Quality (TCEQ), the State's environmental regulatory agency, adopted a position that only NELAP-certified labs would be able to submit official data to the State for permitting purposes.

With GBRA operating numerous water and wastewater plants throughout its service area, the lab stays busy each month helping the plant operators ensure their facilities meet all permit requirements. The lab analyzes the water samples, works with the plant operators on any follow up testing that might be required, and then reports results to TCEQ through its web portal.



A laboratory technician testing for Alkalinity in water samples.

A laboratory technician routinely testing for E.coli bacteria in river water.

The GBRA lab also provides TCEQ approved lab services for municipal and public water and wastewater systems.

In addition to all of the water quality testing and analysis, the lab does find time for the agency's water and wastewater plants, the lab does find time to help individual homeowners with questions they may have about private water wells.

"We do get questions from people who have purchased a home with a water well," Gudgell noted. "The first thing we advise is the water be tested for bacteria. The presence of coliform bacteria, specifically E. coli, in drinking water can cause all kinds of health problems like nausea, headaches, fever and even more serious issues. The second most important testing is for nitrates. Too many nitrates in the well water can be harmful to older people and children. Nitrates can reduce the amount of oxygen your blood can take up and use. In addition to the water sampling discussion, we also ask questions about the age of the home that can inform us to whether they might have older, lead or other metal pipes in their home's plumbing system. We can do the water quality tests for well owners and we only recover the costs we incur for that work. So, while this type of work is not on as grand of a scale as we do for other customers, this service is quite important because the health of a family is at stake."

Outside of completing the essential water and wastewater quality testing for GBRA's plants each month and handling questions from the public, Gudgell said the team likes to participate in special research projects. One such study they are currently involved in is with the Texas Institute for Applied Environmental Research. TIAER, created by the Texas Legislature in 1991, is based at Tarleton State University in Stephenville, Texas.



"This particular study with TIAER looks at the best way to measure chlorophyll-a occurring in lakes," Gudgell explained. "The concentration of chlorophyll-a in lake water relates to the amount of algae living in the water. Excessive algae not only gives water bodies an undesirable appearance but is also an indicator of nutrient levels and the overall quality of the water. We have been working on this project since last summer and Phase II will continue through spring 2020. There are a couple of ways to conduct chlorophyll-a testing and this project will help the industry determine the most precise testing process."

"While it's easy to get caught up in the analysis of numbers we do in the lab, we always try and keep in mind that our work goes directly to helping GBRA and other communities improve the ways we protect and improve the quality in streams, lakes and the bays. If the lab finds certain contaminants in surface water or groundwater, then other teams of environmental scientists and engineers can assess the origins of the problem and develop measurable means to address them. Additionally, the better the data we deliver, the better decisions policymakers can make. And all of that work only helps improve the quality of life for all Texans."

THE GV LAKES

Working Together to Find Solutions

The Guadalupe Valley Lakes have been the topic of debate over the past several years. At more than 90 years old, the four remaining dams on lakes McQueeney, Placid, Meadow and Gonzales have spillgates that are among the oldest of their kind remaining in operation. Finding a viable solution to ensure the long-term sustainability of the lakes will take all sides working together.

Safety has been and will continue to be the top priority for the Guadalupe-Blanco River Authority (GBRA). Having experienced two spillgate failures over the past three years – first at Lake Wood in 2016 and at Lake Dunlap this past May – the reality of the hazards posed by these dams cannot be ignored. Yet, completing the necessary replacement of the spillgates at all six dams has never been a feasible undertaking for GBRA alone.

That is why GBRA is working closely with each of the lake associations to identify a path forward. This is a complex task with no one-size-fits-all solution. GBRA must balance its desire to serve as a partner in this collective effort – supporting the communities surrounding the lakes although they are not our customers – with the needs of its more than 350,000 customers who benefit from GBRA's water and wastewater utility services.

Shortly after legal proceedings commenced in September 2019, all parties reached agreement on a temporary injunction prioritizing safety, preventing the lakes from dewatering, and allowing for continued collaboration on a solution. On November 15, 2019, an Independent Panel of Experts completed and filed its second of two assessments of the Guadalupe Valley Lakes, reinforcing the safety concerns surrounding the aging dams identifying and restricted areas on each lake. The assessments outlined prohibited and restricted areas on each lake that would remain closed to or allow for limited activity in order to ensure all recreationalists maintain a safe distance from the dams. GBRA is working in coordination with local law enforcement authorities to enforce these restrictions.



The dam at Lake Dunlap experienced a spillgate failure on May 14, 2019, due to the deterioration of the original structural steel components.



In the meantime, discussions continue. And, as a result there is a preliminary agreement in place between GBRA and the Lake Dunlap Water Control and Improvement District to fund the replacement of the spillgates at Lake Dunlap. While the solutions for identifying and funding the necessary spillgate replacements at the dams will be different for each of the six Guadalupe Valley Lakes, the agreement with PLDA serves as a roadmap for similar partnerships with the other lake associations.

As this process and dialogue continues, it is important to remember a few facts that cannot be negated. These dams are not flood control structures. The Guadalupe Valley Lakes were constructed for generation of electricity and do not serve as water storage for flood control or water supply. GBRA is not a taxing entity and does not receive any public funds for the maintenance and operations of the dams.

**Aerial view of
Lake McQueeney
Dam.**





Signage warning of the danger the aging dams pose is installed at all GV lakes dams.



The hydroelectric system powered by the dams has not generated sufficient revenue to cover the cost of its maintenance and operation for more than a decade. Historically, revenue generated from the sale of hydroelectric power exclusively covered these costs. However, deregulation of the state's electricity market in 2002 and the widespread availability and use of natural gas drove down electricity costs, eliminating GBRA's ability to generate sufficient revenue from the hydroelectric system.

GBRA continues to look for solutions that are not detrimental to its mission or its utility customers. The ability to move forward with the spillgate replacements is dependent on securing funding for these multi-years, multi-million dollar projects through local partnerships or other means.

A trial date is set for October 2020. For updates on this issue, please visit GVLakes.com.

CANYON LAKE GORGE

A Hike Through the History of Earth



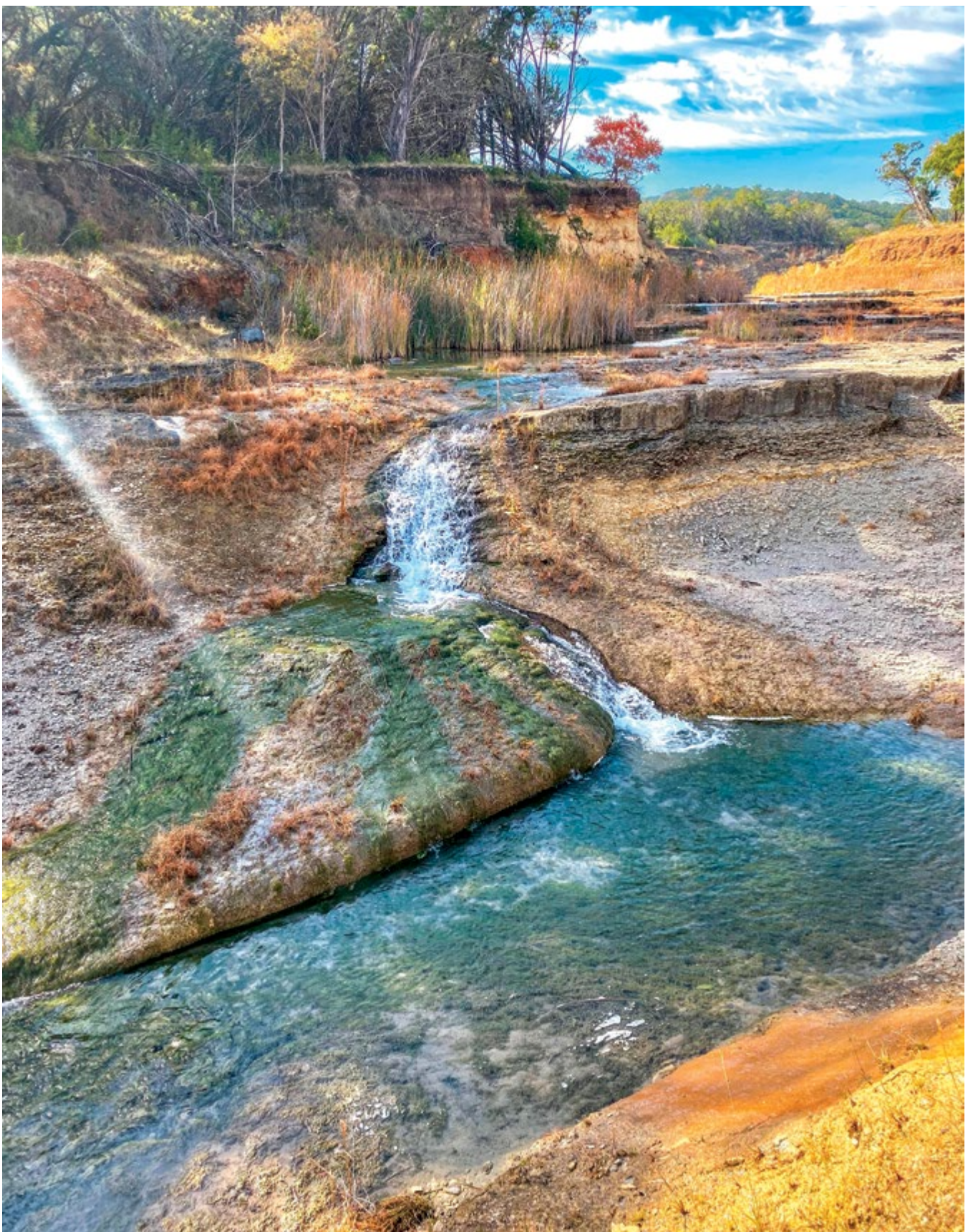
View of the Canyon Lake Dam spillway from the Gorge.

In the summer of 2002, a week of heavy rain pushed water levels at Canyon Lake to record levels. The floodwaters in the lake, the reservoir of Canyon Dam, coursed over the spillway for the first time in the dam's then 38-year history. And in an extraordinary demonstration of the power of water, the floodwaters carved a breathtaking 64-acre limestone canyon in only three days now known as the Canyon Lake Gorge.

The gorge, almost a mile and a half long and up to 45 feet deep, is a showcase for the history of earth. The U.S. Army Corps of Engineers leased the gorge to the Guadalupe-Blanco River Authority (GBRA) in 2005, and a master plan was adopted two years later to responsibly share the gorge's 110-million-year-old cretaceous limestone, fossils, and dinosaur footprints with the public.

Many of the goals in that master plan are completed or are underway. With the help of long-term partner Gorge Preservation Society (GPS), an all-volunteer nonprofit group dedicated to the promotion of the enjoyment, education, and preservation of Canyon Lake Gorge, GBRA continues the process of further developing more areas of the gorge for visitors and continuing the implementation of the master plan.





One of several pools of water within the Canyon Lake Gorge.

One of the first goals was to share the natural splendor of the gorge with the public. Almost 40,000 individuals have toured the gorge in the last 10 years. Currently, visitors must make a reservation for a guided three-hour tour. Soon, however, tourists will be able to take self-guided tours using an app on their smart phones without having to make a reservation. GBRA staff and GPS volunteers have cleared brush to create a two-mile-long trail along the upper North Rim overlooking the gorge. The addition of ADA accessibility to several overlooks along the path to accommodate wheelchairs, strollers, and provide a low-impact option for visitors, is being pursued.



Drawing of the Outdoor Lab that will serve as the visitors' center, gift shop and staging area for tours.

Interpretive and wayfinding signs will educate and direct visitors hiking the trail. Sign style and deliberate placement along the path will enhance and blend with the natural landscape. Safety fencing at each overlook node also will complement the terrain. GBRA expects to highlight these new features later this year, along with monument signage enhancing the gateway to the gorge.

Another project set to begin is the building of an Outdoor Lab. The 20' x 45' lab will be part visitors' center, gift shop and staging area for tours.

Covered patio areas around the structure will serve as a work area for volunteers, docents and guides, as well as host fifth grade outdoor classroom stations.

The Canyon Lake Gorge is a once in a lifetime opportunity to see the history of earth up close. The gorge is at 16029 S. Access Road in Canyon Lake. To schedule a tour, visit www.gbra.org/canyonlakegorge, or call 830-964-5424.

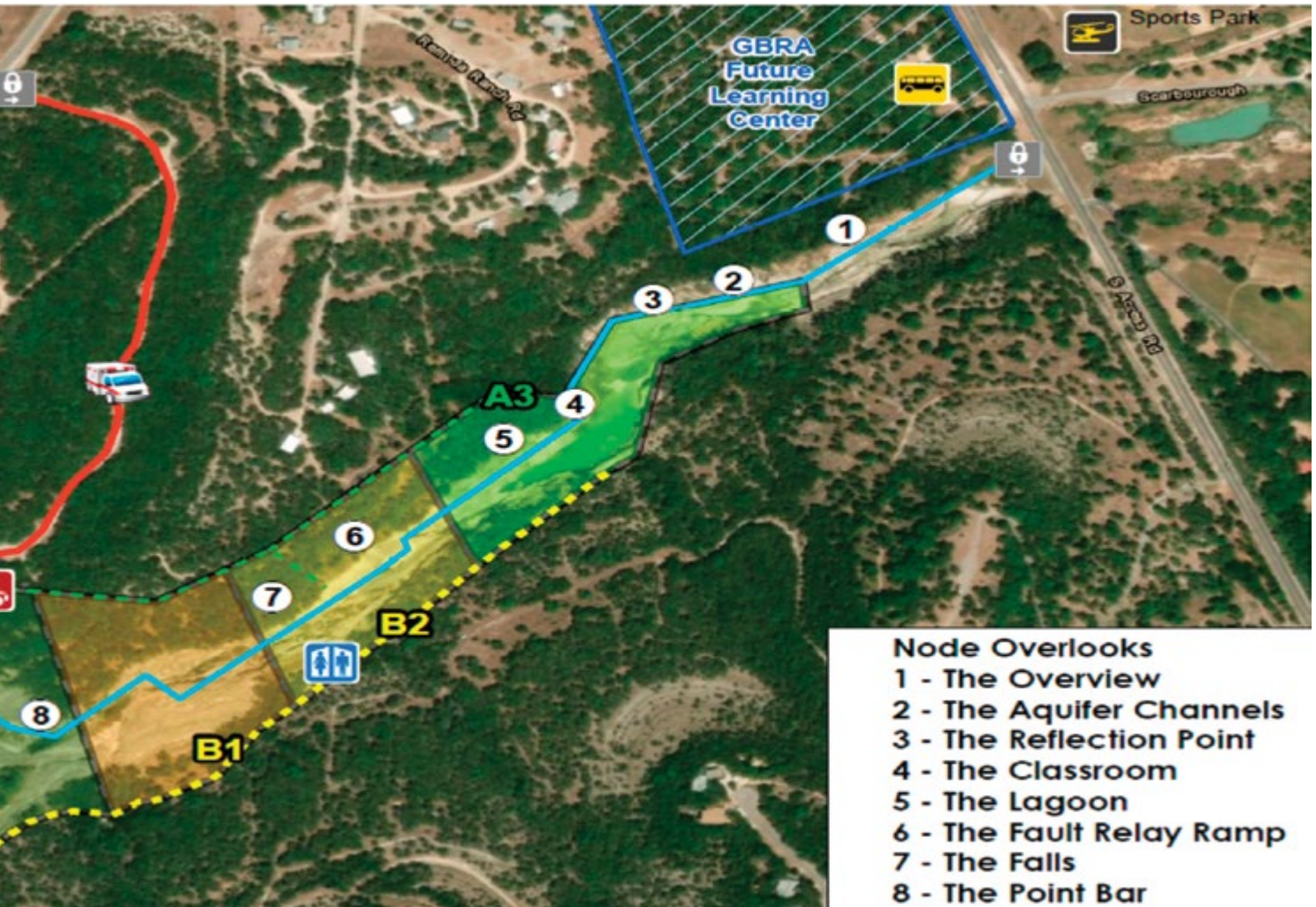


Blue Lagoon at the Canyon Lake Gorge.





Drawing of the park entry monument sign at the Canyon Lake Gorge.



Outdoor Classroom at the Gorge

The GBRA Outdoor Classroom at the Gorge is a unique opportunity for 5th grade students to experience earth science firsthand with trained GBRA naturalists. This full-day field trip is offered to students within the Guadalupe Valley Basin and surrounding area.



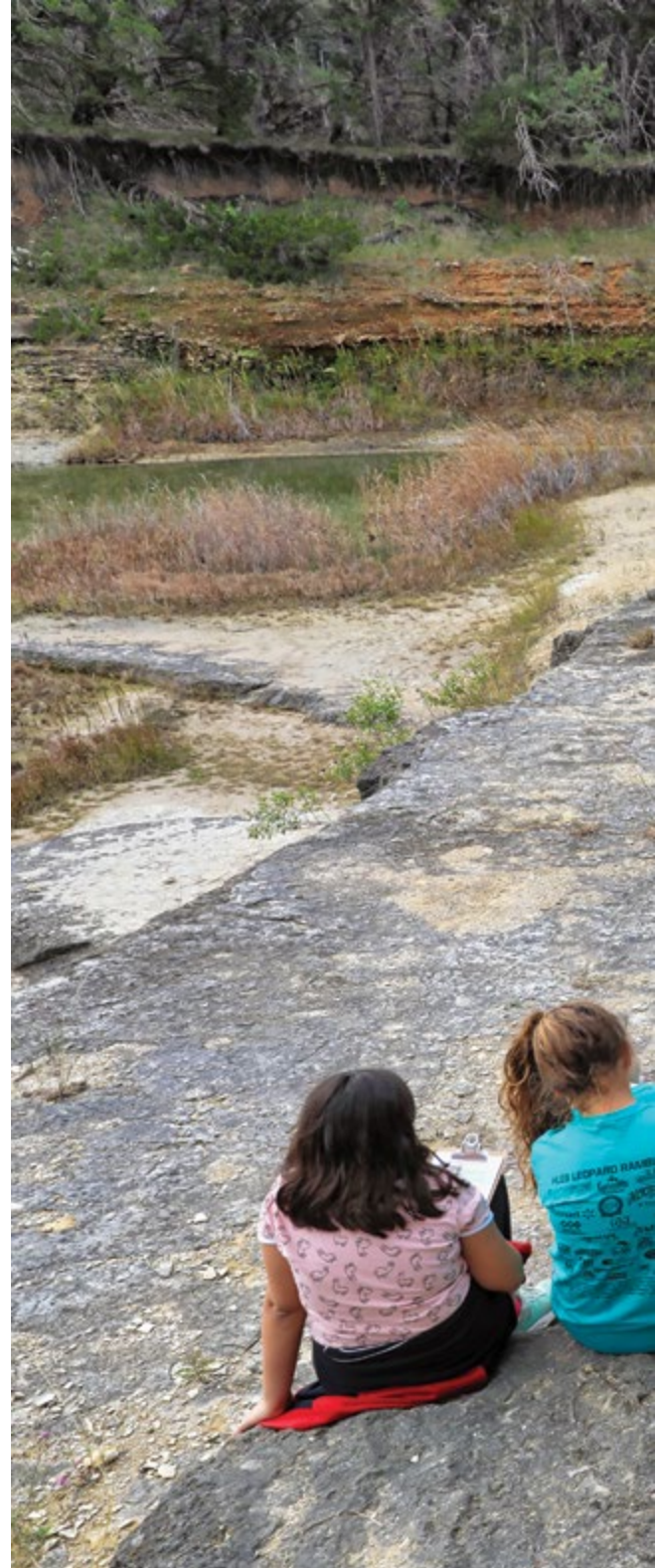
This year, there are 24 schools with over 2,300 elementary students registered to attend the outdoor classroom. The educational program complements the Texas Essential Knowledge and Skills (TEKS). The curriculum comprises six rotating stations at approximately 30 minutes each. The GBRA education department works with curriculum staff to target the district's educational needs. The instructive stations include:

- Central Texas geology
- Hydrology of ground and surface water
- Human impact on the environment
- Biological succession
- Introduction to Texas plants and animals

For more information about scheduling a school tour, visit canyongorgetours.com or call 830-964-5424.



Arlon Seay Elementary School, Comal ISD, students model landforms and observe how natural processes like weathering, erosion, and deposition occur after simulating precipitation.



Hoffman Elementary students learning about water and erosion as part of the Outdoor Classroom at the Gorge.



Quick Facts

Established by the Texas Legislature, the Guadalupe-Blanco River Authority (GBRA) was first created in 1933 under Section 59, Article 16 of the Constitution of Texas as a water conservation and reclamation district and a public corporation called the Guadalupe River Authority. In 1935, the authority was reauthorized by an act of the Texas Legislature (VCS Art. 8280-106) as the Guadalupe-Blanco River Authority.

GBRA provides stewardship for the water resources in a 10-county statutory district beginning near the headwaters of the Guadalupe and Blanco Rivers, ends at San Antonio Bay, and includes Kendall, Comal, Hays, Caldwell, Guadalupe, Gonzales, DeWitt, Victoria, Calhoun and Refugio counties.

Key Functions

GBRA's main functions are providing utility services and operations to communities and customers throughout the Guadalupe River Basin for the benefit of the environment and people. Specific utilities include development and sale of regional raw water supplies, public water-supply treatment and distribution, wastewater services collection and treatment, cooling reservoir operation, and hydroelectric power generation. Additionally, GBRA offers water and wastewater project planning and development, recreational opportunities, educational curriculum, laboratory services, and nonprofit support.

POPULATION OF DISTRICT:
785,227¹

AREA OF DISTRICT:
7,300 square miles

AVERAGE ANNUAL RAINFALL OF DISTRICT:
33.02 inches¹

NUMBER OF EMPLOYEES:
190

Offices

Administrative Office
Seguin, TX

**Buda Wastewater
Treatment Plant (WTP)**
Buda, TX

**Calhoun Canal, Port Lavaca WTP,
Calhoun County
Rural Water**
Port Lavaca, TX

Coletto Creek Park and Reservoir
Fannin, TX

**Hydroelectric Divisions,
Rural Utilities, Water Sales
and Laboratory**
Seguin, TX

Lake Wood Recreation Area
Gonzales, TX

**Lockhart Wastewater Reclamation
System and Lockhart WTP**
Lockhart, TX

Luling WTP
Luling, TX

San Marcos WTP
San Marcos, TX

**Western Canyon Division &
Canyon Lake Office**
Canyon Lake, TX

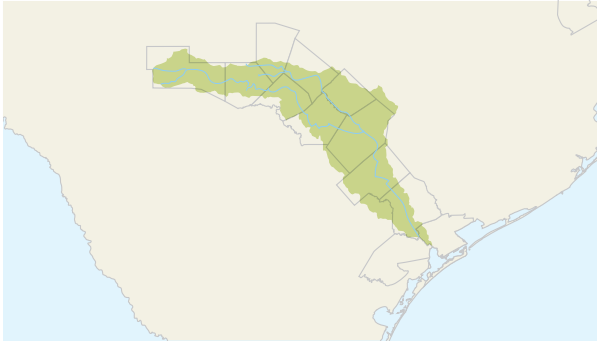
Mission Statement

The Guadalupe River Authority supports responsible watershed protection and stewardship, provides quality operational service and promotes conservation and educational opportunities in order to enhance quality of life for those we serve.



The Larremore Wastewater Treatment Plant can treat up to 1.1 million gallons of wastewater per day, and serves the city of Lockhart, TX.

GBRA Service Area Map



GBRA provides stewardship for the water resources in a 10-county statutory district beginning near the headwaters of the Guadalupe and Blanco Rivers, ends at San Antonio Bay, and includes Kendall, Comal, Hays, Caldwell, Guadalupe, Gonzales, DeWitt, Victoria, Calhoun and Refugio counties.

Rivers

GUADALUPE

Total River Miles: 431.6

Average Discharge: 1.42 million acre feet/year

BLANCO

Total River Miles: 89.8

Average Discharge: 110,100 acre feet/year

SAN MARCOS

Total River Miles: 74.2

Average Discharge: 259,400 acre feet/year

COMAL

Total River Miles: 2.0

Average Discharge: 219,800 acre feet/year

Dams and Reservoirs

CANYON

Conservation Pool

Capacity: 386,210 acre feet

Surface Area: 8,240 acres

Elevation: 909.0 feet mean sea level

Flood Control Pool

Capacity: 346,400 acre feet

Surface Area: 12,890 acres

Elevation: 943.0 feet mean sea level

COLETO CREEK

Capacity: 35,084 acre feet

Surface Area: 3,100 acres

Elevation: 98.0 feet mean sea level

DUNLAP

Capacity: 5,900 acre feet

Surface Area: 410 acres

MCQUEENEY

Capacity: 5,050 acre feet

Surface Area: 400 acres

LAKE PLACID (TP-4)

Capacity: 2,624 acre feet

Surface Area: 248 acres

MEADOW LAKE

Capacity: 1,550 acre feet

Surface Area: 153 acres

LAKE GONZALES (H-4)

Capacity: 6,500 acre feet

Surface Area: 696 acres

LAKE WOOD (H-5)

Capacity: 4,000 acre feet

Surface Area: 488 acres

LOWER GUADALUPE DIVERSION DAM

AND SALTWATER BARRIER

Capacity: 600 acre feet

Surface Area: 100 acres

The Lockhart Wastewater Treatment Plant can treat up to 1.5 million gallons of wastewater per day, utilizing an innovative carousel activated sludge process.





Water is released from Canyon Reservoir through a U.S. Army Corps of Engineers conduit.

Hydroelectric Generation

CANYON

Average Historical Annual Generation:
13,837,000 kWh

GUADALUPE VALLEY

Average Historical Annual Generation:
62,225,000 kWh

(Due to the inability to generate electricity at Lake Wood and Lake Dunlap, estimated production for FY 2020 is 27,824,000 kWh)

Water Treatment

Calhoun County Rural Water Supply Corporation
Coletto Creek Park Water System
Comal Trace Water Distribution System
Cordillera Water Distribution System
Johnson Ranch Water Distribution System
Lockhart Water Treatment Plant
Luling Water Treatment Plant
Port Lavaca Water Treatment Plant
San Marcos Water Treatment Plant
Western Canyon Regional Water Treatment Plant

Wastewater Treatment

Boerne ISD Wastewater Treatment Plant
Buda Wastewater Treatment Plant
Bulverde Singing Hills Wastewater Treatment Plant
Canyon Park Estates Wastewater Treatment Plant
Cordillera Wastewater Treatment Plant
Crestview Wastewater Treatment Plant
Johnson Ranch Wastewater Treatment Plant
Lockhart FM 20 Wastewater Treatment Plant
Lockhart Larremore Wastewater Treatment Plant
Park Village Wastewater Treatment Plant
4S Ranch Wastewater Treatment Plant
Shadow Creek Wastewater Treatment Plant
Stein Falls Wastewater Treatment Plant
Sunfield Wastewater Treatment Plant

¹ Texas Almanac and Bureau of Census



**GUADALUPE-BLANCO
RIVER AUTHORITY**

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