



Riverbend Water Resources District

Regional Water Resources: A Path Forward

Part I: Riverbend Compilation

(Working Document – Expected Adoption September 2018)

Part II: Regional Water Master Plan 2018

(Working Document – Expected Adoption September 2018)

Part III: Second Cost Estimates for Selected Alternatives

(Working Document – Expected Adoption September 2018)

Part IV: Water and Wastewater Rates Study (Pending)

**On behalf of Annona, Atlanta, Avery, Central Bowie County Water Supply Corporation*,
Clarksville*, DeKalb, Hooks, Leary, Maud, Nash, New Boston, Red Lick*, Redwater,
TexAmericas Center, Texarkana (Texas), and Wake Village**

**Non-Member Entities*

July 25, 2018

Riverbend Compilation

General

Riverbend Water Resources District (“Riverbend WRD”) is located in Bowie, Cass, and Red River Counties and is chartered by the Texas Legislature (2009) as a conservation and reclamation district created under and essential to accomplish the purposes of Section 59, Article XVI, Texas Constitution, as set forth in Title 6, Special District Local Laws Code, Subtitle L, Municipal Water Districts, Chapter 9601. Riverbend WRD’s statutory powers include the authority to acquire any and all storage rights and storage capacity in a reservoir or other water source inside or outside the boundaries of the district, and to acquire the right to take water from that reservoir or water source; subject to the rights or permits held by others. A primary responsibility of Riverbend WRD is to provide a sustainable water supply for user groups within the region.

Scope

Over the years, numerous preliminary studies have been conducted by Riverbend WRD and Texarkana Water Utilities to examine the viability of a new raw water intake at Wright Patman Lake coupled with a new raw water line to TexAmericas Center (“TAC”). Additionally, options were considered to evaluate the possibility of extending the life of the New Boston Road WTP, to build a new regional water treatment plant to replace the existing plant, or to build a new plant in combination with renovations at the existing plant. On the basis of these studies and through coordination with local stakeholders, Riverbend WRD determined that a regional review and evaluation was needed of the existing water supply; capital facilities production capacity; and the distribution, transportation, and connection of such water supplies around the region. The regional review and resulting plan was needed to assess and identify the necessary water resources and regional infrastructure essential to meeting the areas water demands for the next fifty years through 2070.

In March 2016, Riverbend WRD issued a formal request for qualifications from qualified engineers/planners to perform a water master plan and embarked on a local, bottom-up process to develop a Regional Water Master Plan for its Member Entities, as well as other surrounding entities, who wanted to participate in the development of a comprehensive plan. The plan would ultimately provide a business case for regional water supply, treatment, and transportation needs; recommend a preferred path forward; and demonstrate project feasibility to Riverbend WRD and its key stakeholders. It was also anticipated that the plan would provide sufficient technical and financial information to promote support for the regionalization of the water system under Riverbend WRD and to secure financing and/or funding from local, state, federal, and/or private entities.

In May 2016, Riverbend WRD contracted with Susan Roth Consulting, LLC which included support from Carollo Engineers, to perform services associated with the development of the Regional Water Master Plan. This included coordination of Riverbend WRD’s local efforts into

the regional and state water planning processes in coordination with the Texas Water Development Board and Texas Commission on Environmental Quality, as necessary. Work commenced immediately and in July of 2016, Riverbend WRD held its first Town Hall meeting in Texarkana, Texas to speak about the planning process. Over the course of two years, Riverbend WRD managed the process to develop a comprehensive, detailed effort resulting in the following: a summary of the Regional Water Master Plan (Attachment A); a recommended path forward for the region; a timeline of implementation; a set of detailed second cost estimates; and a conclusion.

Summary

The goal of the Regional Water Master Plan is four-fold: 1) examine current and future population projections and water demands; 2) analyze existing infrastructure to meet current and future water demands; 3) establish the possible alternatives for meeting the current and future water demands and then narrow those alternatives to the most viable options; and 4) provide cost estimates for implementing those viable options to determine overall regional cost-effectiveness. It is Riverbend WRD's intent to coordinate this goal with the state's water planning process, a cyclical five-year process which plans for the next fifty (50) years of future water demands. Texas is currently in its fifth planning cycle since 1997, when the Texas Legislature enacted Senate Bill 1 establishing a stakeholder driven, "bottom-up" process which heavily relies on input from local entities. The very Northeast Texas area of the state, including Riverbend WRD, has been included in the plan as Region D. It is noted that up until now, our area has failed to provide the entity specific information necessary to plan for and meet our own future water demands.

The completed Riverbend WRD Regional Water Master Plan 2018 provides the necessary, previously missing information, for both the municipal and industrial water needs for this growing, prosperous area that offers a gateway of opportunity for our region, the state, and the nation. The state and regional planning processes are underway. Our efforts via the development of this plan have coordinated well with the state planning process and resulted in new, more accurate numbers which reflect the true growing need for additional water supply. Going forward, Riverbend WRD's efforts remain focused on establishing current supplies, identifying the additional supplies necessary to meet future demands, and identify plans to implement projects that would satisfy those identified additional water supply demands.

Currently, Certificate of Adjudication 03-4836 is the only water right that provides authorization for City of Texarkana, TX to divert and use water for the regional supply of municipal and industrial purposes. The certificate provides for a total diversion and use of 180,000 ac-ft/yr, comprised of 45,000 ac-ft/yr for municipal use and 135,000 ac-ft/yr for industrial use. The Regional Water Master Plan projected that the Riverbend WRD 2070 maximum municipal demand would be 22.5 MGD (Table 3-3); while the industrial demand would be 120,000 ac-ft/yr for Graphic Packaging International ("GPI") in Cass County and 100,813 ac-ft/yr for TAC (Table 3-4) in Bowie County. Consequently, Riverbend WRD will need to acquire additional water supplies to meet those needs.

Recommended Path Forward ("RPF")

Using the information from the Riverbend WRD Regional Water Master Plan and its initial alternatives and cost estimates (see Chapter 7.0), Riverbend WRD refined those alternatives into

four phases to meet the projected municipal and industrial water demands for the area using a regionalized approach, as follows:

Riverbend WRD Recommended Path Forward 2018

Phase 1A

Raw Water Intake (60 MGD)
Raw Water Pump Station (Design 60 MGD, Build 30 MGD)
Raw Water Line to New Surface Water Treatment Plant (54 Inch)
Distribution Upgrades (Pipelines, Storage, and Pumping)

Phase 1B

New Surface Water Treatment Plant (25 MGD)
Distribution Upgrades (Pipelines, Storage and Pumping)

Phase 2A

Raw Water Pump Station Expansion (15 MGD)
Expansion of new Surface Water Treatment Plant (8.3 MGD Increments)
New Boston Road Water Treatment Plant Demolition
Distribution Upgrades (Pipelines, Storage and Pumping)

Phase 2B

Raw Water Pump Station Expansion (15 MGD)
Expansion of new Surface Water Treatment Plant (8.3 MGD Increments)
Distribution Upgrades (Pipelines, Storage and Pumping)
Possible Industrial Reuse Treatment Facility

Phase 3A

Raw Water Intake (Add'l 60 MGD)
Raw Water Pump Station Expansion (30 MGD)
Raw Water Parallel Pipeline (42 Inch)
Expansion of new Surface Water Treatment Plant (Up To 40MGD)
Distribution Upgrades (Pipelines, Storage and Pumping)

Phase 3B

Raw Water Pump Station Expansion (30 MGD)

Phase 4B (Timed with 1B)

Raw Water Pipeline from the GPI Intake (54 Inches)
Regional Surface Water Treatment Plant Cass County (2.5 MGD, Expandable)
Distribution Upgrades (Pipelines, Storage and Pumping)

At the completion of all phases, the regional water system will include a new raw water intake structure located in Wright Patman Lake, two 60 MGD raw water transmission pipelines for both industrial and domestic use, a 40 MGD drinking water treatment plant, and expansion and repair

of distribution pipelines to serve Riverbend WRD member cities. Construction of these items is planned in six phases: Phase 1A, 1B, 2A, 2B, 3A, and 3B. The phases are spread over time through 2060 to enable expansion to keep pace with the regions expected industrial and population growth. Phases 1A and 1B are expected to be performed in conjunction with one another, which will reliably supply drinking water for the customers of RWRD. This will provide flexibility for all project participants, as well as the opportunity for a phased construction approach to allow for ‘growth to pay for growth.’ This RPF also addresses the regulatory issues regarding the current alternative capacity requirement and water production limitations, which in turn has impacted the Member Entities’ ability to serve their growing population and expand their water CCN service areas.

The new raw water intake and conveyance system for delivery of raw water to TAC would be constructed initially with pre-design beginning immediately in 2019; with a goal of being operational by 2022 but no later than 2026, due to current contractual obligations. Pre-design for the new regional water treatment facility would begin in 2020; with a goal of being operation by 2025 but no later than 2030. At that time, municipal demands of the Member Entities presently met by the existing New Boston Road WTP would be transferred to the new regional WTP. The City of Texarkana’s (TX) municipal demands from the new WTP would be phased-in during the decommissioning process of the New Boston Road WTP.

The infrastructure proposed in Phases 1A and 1B, which includes utilizing existing distribution lines where feasible (i.e. existing pipeline along U.S. Highway 82), as well as planned upgrades, has a total projected construction cost of approximately \$124.3 million (and an additional \$65.1 million with new distribution lines) and total costs including engineer design, feasibility studies, legal, finance, bond issuance, power, and land acquisition, of approximately \$251.2 million based on an interest rate of 4.0 percent and a 30-year financing term. Operational and maintenance costs upon completion of Phases 1A and 1B are estimated at \$6.0 million annually with annual debt service of \$10.9 million. The project participants’ 2070 max daily demands were used as the basis for sizing the capacity of the intake structure, raw water conveyance system, water treatment plant and transmission lines; this infrastructure would be constructed in two separate phases. Average daily water demands were used to determine operational and maintenance costs.

The infrastructure proposed in Phase 4B involves constructing a new 2.5 MGD conventional surface water treatment plant in Cass County to serve the Cities of Atlanta, Domino, and Queen City, as well as the potable water needs of the GPI-Texarkana mill located nearby. This conventional package treatment plant would be sized for 2.5 MGD based on the permitted capacity of the existing GPI WTP. This new Cass County WTP would utilize the existing GPI intake; however, a new raw water pipeline would tie into the existing GPI raw water pipeline immediately upstream of the GPI pre-chlorination system due to the high concentration of chlorine injected at that point in the system. Raw and treated water lines would be constructed to ultimately tie into the existing distribution line that currently serves the City of Atlanta. This alternative has a total projected construction cost of approximately \$12.5 million (and an additional \$13.3 million with

a new distribution line) and total costs including engineer design, feasibility studies, legal, finance, bond issuance, power, and land acquisition, and of approximately \$34.2 million based on an interest rate of 4.0 percent and a 30-year financing term. Operational and maintenance costs upon completion of Phases 4B are estimated at \$1.1 million annually with annual debt service of \$1.5 million. Average daily water demands were used to determine operational and maintenance costs.

Timeline

In order for Riverbend WRD to meet the timelines to secure TWDB funding and complete environmental studies necessary to satisfy state and federal permitting requirements in advance, an implementation schedule is proposed for Phases 1A, 1B and 4B, as follows:

- **Year 2021:** Design of the New Raw Water Intake/Conveyance System completed. Implementation by the US Army Corps of Engineers of the Ultimate Rule Curve and water rights secured by Riverbend WRD from the TCEQ for any additional water available via the Ultimate Rule Curve.
- **Year 2022:** Delivery of raw water to the TAC footprint (Construction of New Raw Water Intake/Conveyance System completed); begin design of the New Water Treatment Plant (WTP).
- **Year 2023:** Begin construction of the New WTP; begin design of the Phase 4B Cass County New Regional WTP.
- **Year 2025:** Construction of the New WTP completed and online; Riverbend WRD Member Entities (Outside Texarkana, TX) served by new WTP; decommissioning process initiated for the New Boston Road WTP; approximately 50% of the City of Texarkana, Texas water demands served by the New WTP; begin construction of the Cass County New Regional WTP.
- **Year 2027:** Decommissioning process for the New Boston Road WTP complete; all Riverbend WRD Member Entities supplied by the New Water Treatment Plant and City of Texarkana, AR continues to be served by the Millwood WTP; Construction of the Cass County New Regional WTP completed and online.
- **Year 2035:** Construction of expansion of the New WTP (Phase 2 and beyond), as needed.

Second Cost Estimate

Once the above RPF was developed, Riverbend WRD acquired a second, more precise and detailed level of cost estimates. Riverbend WRD contracted separately with AECOM for these cost estimates, in coordination with the development of this Regional Water Master Plan. AECOM was given a very short timeline and very specific parameters for the development of the second round of cost estimates. Based on the above RPF, AECOM developed and presented a Class III Cost

Estimate for Alternative – 3A Modified and Alternate 4B for the development and expansion of water supply for Riverbend WRD. This Class III Cost Estimate is intended to provide estimated pricing in 2018 dollars for labor and construction of new water supplies for the future growth of communities and industries in Northeast Texas over the next 40 years. As laid out above, the estimate is subdivided into sequential segments or phases of construction, providing service capacity as needed to meet growing demands.

In general, opinions of probable construction costs are defined by several characteristics, including the level of project definition, the intended purpose of the estimate, the level of effort from the engineer, the methodology used, and the expected accuracy. The estimate performed by AECOM was a Class III Estimate, which is defined by the American Association of Cost Engineering and ASTM Standards International. The estimate is substantiated by preliminary engineering calculations and other stochastic methods, such as analysis of comparable construction projects and actual regional construction costs. Sketches of proposed systems were developed and then priced, and product manufacturers were contacted to receive budgetary quotes for manufactured components.

For all Class III Cost Estimates, various contingencies are included to accommodate for future unknowns. These contingencies accommodate for future market conditions or future unknowns of existing conditions. Of the two contingencies, market-based contingencies are more uncertain, especially as the timeline is projected farther out. Definition of work contingencies can be controlled by gathering more information about the project, such as performing geotechnical investigations, analyses of water quality data, or pipeline condition assessments. Additionally, advancing the project to detailed design will improve the accuracy of construction costs.

The detailed Class III Cost Estimate can be found as Part III of the overall Riverbend documents supporting the RPF for Regional Water Master Planning, which includes assumptions and reasoning for the pricing that was determined.

Remaining Challenges

Lastly, the viability of Wright Patman Lake as a reliable water resource for regional water user groups and for use by other potential corporate or water user entities for the planning period is a key factor. Riverbend WRD will need permits for additional water supplies to meet the future demands of the region. At this time, the additional water permits would be for industrial purposes. The most likely source of this water is Wright Patman Lake. It will be inevitable that securing the future water supplies will require a reauthorization of existing storage in Wright Patman Lake to water supply purposes. Other critical issues that must be addressed include the following:

- Implementing the Ultimate Rule Curve at Wright Patman Lake;
- Determining elevations and associated yields of Wright Patman Lake through an updated Water Availability Model;

- Addressing volumetric and sedimentation issues concerning Wright Patman Lake, including the production and evaluation of a new Volumetric and Sedimentation Study; and,
- Securing the required permits both state and federal for the necessary water supplies.

Additionally, this northeast region of Texas contains vast amounts of very valuable timberlands. These timberlands serve as an additional agricultural and/or industrial crop which provides very significant economic value to the region. It is key to the region that these timberlands be classified as a crop to help ensure their protection and sustainability. Including timberlands in the state water plan as a crop should be pursued.

Currently, Riverbend WRD is also conducting a Water and Wastewater Rate Study. Its pending results will help our region identify the best way to most cost effectively implement all of the necessary infrastructure. It is anticipated that once this rate study is complete, this document will be updated with those results.

Conclusion

Water remains to key component for our region to develop and grow. The limits are endless, but the region must plan today for the next generation and the generations after that. This vast future requires securing and procuring our natural resources for the benefit of our region. In order to continue to achieve these objectives in our regional water planning, these and other recommended paths forward should be periodically reviewed to adjust for new and growing demands.