

# 2017 MASTER PLAN – EXECUTIVE SUMMARY

## WELLBORN SPECIAL UTILITY DISTRICT



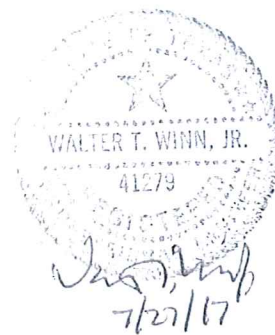
JULY 2017

Prepared by:

Winn Professional Engineers  
& Constructors,  
a CP&Y, Inc. Company

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**2017 MASTER PLAN**  
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## **EXECUTIVE SUMMARY**

In March 2017, the Wellborn Special Utility District (SUD) Board of Directors authorized Winn Professional Engineers and Constructors to perform an update of the comprehensive planning study, or Master Plan, for the District water system. This report represents the findings of that study.

### **A. EXISTING SYSTEM**

The Wellborn SUD system serves approximately 8,014 connections in Brazos and Robertson Counties. The system includes two physically disconnected distribution systems, the Wellborn System and the OSR System, and within these systems are subsystems, served by various sources of supply. A map of the system is shown in Drawing 1. A schematic diagram of the system is shown in Drawing 2.

The OSR System is served by two plants, the Black Jack Plant and the OSR Plant. The Black Jack Plant serves approximately 405 connections in the northern portion of the OSR System. Water supply for the plant is from a single well completed in the Simsboro Formation. The well capacity for the Black Jack Well (Well No. 1) is 2,000 gallons per minute (gpm), or 2.88 million gallons per day (MGD). The OSR Plant serves approximately 695 connections in the southern portion of the OSR System. Water supply for the plant is from a single well completed in the Simsboro Formation, and the excess supply delivered from the Black Jack Plant. The well capacity for the OSR Plant Well (Well No. 2) is 1,100 gpm, or 1.58 MGD.

Excess water supply from the OSR System is delivered to the City of Bryan, at the Mumford Road Delivery Point, at a maximum rate of 3 MGD, and to the City of College Station, at the Sandy Point Road Pump Station, at a maximum rate of 2 MGD, in accordance with the respective Wheeling Contracts. This water is wheeled through each respective distribution system and ultimately retrieved at connections between these systems and the Wellborn System. In addition to wheeling, the contract with the City of Bryan allows for the additional purchase of 3 MGD at the interconnect point.

The Wellborn System serves the remaining 6,914 connections from the Bird Pond Road Plant, the Harlan Road Surface Water Treatment Plant (SWTP), the Brushy Plant, an interconnect with the City of Bryan at the Jones Road Interconnect, and four interconnects with the City of College Station. Water supply for the Bird Pond Road Plant is by three wells in the Yegua-Jackson aquifer, Well No. 3, Well No. 4, and Well No. 5. The three wells can produce a maximum aggregated supplying capacity of 800 gpm, or 1.15 MGD, operating together. The design capacity for the SWTP is 2.016 MGD; however, the actual production rate is limited to approximately 1.3 MGD, or 900 gpm, due to constraints in the performance of the package filtration system. Water supply for the Brushy Plant is from a single well completed in the Simsboro Formation, and produces at a rate of 550 gpm, or 0.8 MGD. The Jones Road Interconnect has a single inline booster pump with a duty point of 1,950 gpm. Water produced from the Brushy Plant is combined with water from the City of Bryan, and pumped into the Wellborn distribution system. The pump allows for an additional 1,400 gpm, or 2 MGD, to be

taken from the City of Bryan. During peak demand periods, approximately 1 MGD total is delivered at the Foxfire Dr. and Rock Prairie Road Interconnects with the City of College Station, which has been wheeled from the OSR System.

## **B. WATER RIGHTS**

Wellborn SUD currently holds groundwater rights in the Simsboro Formation and in the Yegua-Jackson aquifer. There are three different wells in operation in the Simsboro Formation, the Brushy Plant Well, the Black Jack Well (Well No. 1), and the OSR Plant Well (Well No. 2). The wells are permitted by the Brazos Valley Groundwater Conservation District (BVGCD) for an aggregated capacity of 3,366.65 acre-feet per year (AF/Y). Based on BVGCD 2016 water production records, the three wells produced a total of 1,341.59 AF/Y, or 40% of the available water rights. There are also three different wells in operation in the Yegua-Jackson aquifer; all are located north of the Bird Pond Road Plant, and are referred to as Well No. 3, Well No. 4, and Well No. 5. The wells are also permitted by BVGCD, for an aggregated capacity of 1,132.81 AF/Y. Based on BVGCD 2016 water production records, the three wells produced a total of 888.8 AF/Y, or 78% of the available water rights. Wellborn SUD also holds surface water rights from the Navasota River. The SWTP is permitted by the Brazos River Authority (BRA) for a capacity of 4,000 AF/Y. Based on the Wellborn Monthly Operating Reports for 2015, the SWTP produced 910.21 AF/Y, or 23% of the available water rights. The available water rights are summarized in Table 2.

## **C. PROJECTION OF GROWTH**

WPEC utilized historical data on the number of connections served by Wellborn SUD to predict the general trend of future growth for each system. Wellborn SUD currently serves approximately 8,014 connections. Growth rates were evaluated and projected in three different areas of the Wellborn SUD system: the OSR System, the area of the Wellborn System previously purchased from Brushy WSC referred to as the Brushy System, and the remaining Wellborn System. Multiple regression analyses were performed with varying data sets from the 17 year historical data for connections served. By excluding the 2011 and 2012 data, the corresponding years of the OSR and Brushy System's purchase which caused a drastic spike in connection totals, the Wellborn SUD system has experienced a 5.5% yearly growth rate. This growth rate also closely matches the result of an analysis using only the most recent 4 years of connection data. The majority of this growth has occurred within the Wellborn System, while growth in the OSR and Brushy Systems has occurred at a much slower rate. After discussions with the Wellborn SUD staff, the updated historical trend of a 5.5% yearly growth rate was chosen to project future growth. The growth rate chosen for the Brushy System is 5 connections per year, the growth rate chosen for the OSR System is 10 connections per year until 2027 and then 30 connections per year from 2027 to 2040, and the remaining majority of growth was distributed within the Wellborn System. The projected number of connections for the year 2040 is 28,967. WPEC met with the Wellborn SUD staff to predict areas where the additional growth will occur in the future. In general, growth within the Wellborn System is attributed to available areas of land nearest to the surrounding College Station City Limits in the northern area of the system



first and then further out radially to the south as time progresses. Known tracts of land that are planned for development, or that neighbor existing developments, were identified, and projections were attributed accordingly. High density residential development zones were designated in areas which currently have, or are projected to have, sanitary sewer service available. Historical and projected growth are shown in Table 3 and Figure 1. The distribution of the growth or land use plan is shown in Drawing 3.

#### **D. ANALYSIS**

An evaluation of the existing system's ability to meet current demands and Texas Commission on Environmental Quality (TCEQ) requirements was performed using a computerized water distribution system analysis program entitled Pipe2016 KYnetic. In addition, a spreadsheet was developed to measure current water supply and plant capacities against TCEQ requirements. Maximum monthly water usage data was provided by Wellborn SUD staff for each system and high density residential areas within the Wellborn System. This data was used to adjust the TCEQ standard demand factor of 1.5 to fit the usage patterns for the systems. A KYnetic computer model and a capacities spreadsheet were developed for each of the following conditions: Existing; Projected Year 2022; Projected Year 2027; Projected Year 2032; Projected Year 2040. The results of these analyses and recommended improvements are described below.

#### **E. RESULTS AND RECOMMENDATIONS**

WPEC recommendations were developed from multiple iterations of water system modeling design scenarios, in conjunction with communications with Wellborn SUD, as described above. Factors such as cost, regulations, system growth, phasing, operation, value, and feasibility were used to develop a recommended program of prioritized improvements for the Wellborn SUD system. Projected system capacities for 2027 are shown in Table 4. Proposed improvements have been sized to meet the projected requirements for the year 2040 as shown in Drawing 4 and described below.

##### **1. EXISTING CONDITIONS**

Computer simulations made for existing conditions revealed that improvements to the existing system will be required to maintain a pressure of 35 psi throughout the distribution system under peak demand conditions. In addition, the Main System is deficient in high service pumping capacity, and is expected to become deficient in water supply capacity in 2018. The following improvements are recommended to correct all current system deficiencies:

##### **a) OSR System**

- Install approximately 2,800 linear feet (l.f.) of 10" diameter water line from the Black Jack Plant along FM 2549
- Install approximately 15,500 l.f. of 10" diameter water line along Old Hearne Rd.

##### **b) Wellborn System**

- Install approximately 1,500 l.f. of 6" diameter water line along River Place Ct.
- Tie-in 2" and 12" lines with a 6" diameter line at Rock Prairie Rd. and Robin Dr.
- Tie-in 1-1/2" and 14" lines with a 4" diameter line at FM 2154 and Barron Cut-Off Rd.
- Install Bird Pond Road Plant Interconnect with City of Bryan
- Install an additional 1,950 gpm High Service Pump at the Jones Road Interconnect

## **2. 2022 RECOMMENDATIONS**

The following improvements are recommended to be completed by 2022 in the Wellborn System:

- Install approximately 8,900 l.f. of 16" diameter water line along Dowling Rd.
- Install approximately 26,500 l.f. of 16" diameter water line along FM 2154
- Install approximately 3,000 l.f. of 20" diameter water line along Koppe Bridge Dr.
- Expand the SWTP to 3 MGD design capacity
- Install an additional 2,100 gpm high service pump at the SH 6 Plant

## **3. 2027 RECOMMENDATIONS**

The following improvements are recommended to be completed by 2027:

### **a) *OSR System***

- Install approximately 52,000 l.f. of 20" diameter water line as a supply line from the Mumford Road Delivery Point in the OSR System to the Jones Road Interconnect site in the Wellborn System
- Install approximately 18,300 l.f. of 20" diameter water line from the proposed Simsboro Well to the proposed OSR Supply Booster Pump Station
- Install a 3,000 gpm, or 4.32 MGD, Simsboro well near the Mumford Road Delivery or OSR Standpipe sites
- Install a 700 gpm, or 1 MGD, Carrizo well at the OSR Plant site
- Install a proposed OSR Supply Booster Pump Station at the OSR Standpipe site with a 500,000 gallon additional standpipe
- Install a booster pump at the Black Jack Plant
- Replace the high service pumps at the OSR Plant with pumps at 3,200 gpm each

### **b) *Wellborn System***

- Install approximately 33,600 l.f. of 12" diameter water line along Peach Creek Rd. and Rock Prairie Rd.
- Install a 1.5 million gallon elevated storage tank near the intersection of FM 2154 and Dickson Rd.

#### **4. 2032 RECOMMENDATIONS**

The following improvements are recommended to be completed by 2032 in the Wellborn System:

- Install approximately 14,600 l.f. of 16" diameter water line along FM 2154
- Install approximately 29,900 l.f. of 16" diameter water line along SH 6
- Install approximately 3,000 l.f. of 16" diameter water line along Arrington Rd.
- Expand the SWTP to 6 MGD design capacity
- Install an additional 2,100 gpm high service pump at the SH 6 Plant
- Combine the Bird Pond Road Plant and SWTP Pressure Planes
- Deliver water from the SWTP to Bird Pond Road Plant Wells #1 and #2 for Aquifer Storage and Recovery (ASR)

#### **5. 2040 RECOMMENDATIONS**

The following improvements are recommended to be completed by 2040 in the Wellborn System:

- Install approximately 20,600 l.f. of 8" diameter water line along FM 2154
- Install approximately 17,400 l.f. of 12" diameter water line along FM 159
- Install approximately 25,300 l.f. of 16" diameter water line along SH 6
- Expand the SWTP to 12 MGD design capacity
- Install 500,000 gallon ground storage tank and two 2,100 gpm high service pumps at the SH 6 Plant

#### **6. FIRE FLOW AND FUTURE DEVELOPER FUNDED RECOMMENDATIONS**

Improvements necessary for the applicable fire flow requirements and/or general land development in specific areas of the Wellborn SUD system are recommended. These proposed improvements can be delayed until the development is initiated and will likely be funded by developers. However, it may be Wellborn SUD's desire to install certain lines in anticipation of future development.

### **F. CONCLUSION**

WPEC recommends that Wellborn SUD begin to implement all proposed existing system improvements as resources become available. Those improvements include the OSR System 10" water lines, the Bird Pond Road Plant / City of Bryan Interconnect, and the additional Jones Road pump. All proposed prioritized improvements through 2040 and fire flow and future developer



funded improvements are shown in Drawing 5, and for planning purposes, a preliminary cost estimate for all proposed improvements through 2027 and for the fire flow and future developer funded improvements are shown in Table 6. Planning should begin for all 2022 recommended improvements to ensure construction is completed by 2022.