

JUN 10 2011

Preliminary Engineering Report

Revised

**Browns Ridge Water Line Extension
Bourbon Elevated Tank and Pump Station
KY 80 Transmission Main and Denham**

Knob Pump Station

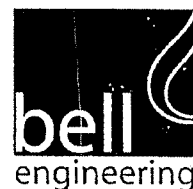
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Western Pulaski County Water District

Revised May 2011



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Preliminary Engineering Report
Browns Ridge Water Line Extension
Bourbon Pump Station and Water Line
KY 80 Transmission Main and Pump Station

I. Introduction

The Western Pulaski County Water District (WPCWD) desires to provide more reliable water service to the Southeastern pressure zone of the service area. The pump station and transmission main is undersized and in need of an upgrade. This part of the project is related to capacity and reliability which has an indirect effect on the health and safety of the customer base.

Water service is needed for the Brown's Ridge and Finley Owens Road section of WPCWD service area. There are currently approximately 46 customers in the Brown's Ridge and Finley Owens Road community of Western Pulaski County that do not have access to public water supplies. This part of the project is directly related to health and safety of the residents of Brown's Ridge that currently use wells or cisterns for their potable water source. The new water line on Hendricks Road will serve 3 new customers whose current water source is Fishing Creek.

The water line along KY 80 to the western part of the WPCWD distribution system is near capacity and an additional 10-inch water line is proposed to supplement the existing 8-inch waterline. A new pump station, which will draw from the new 10-inch water line along KY 80, is proposed that will fill the existing Denham Knob tank. The existing Denham Knob ground storage tank will not fill because of current system hydraulics.

II. Planning Area

The WPCWD service area is in South Western Pulaski County, and covers area that is generally south of the Louie B. Nunn Parkway. This project area is spread over the

southeastern and western most portions of the service area. The entire service area broken into pressure zones is shown on the service area map, as shown on the attached Map #1. System schematics were developed from information received from the Cumberland Valley Area Development District and further refined from discussions with the WPCWD staff.

III. Existing Facilities

The Western Pulaski service area is comprised of approximately 350 miles of 3 inch (155 miles), 4 inch (53 miles), 6 inch (121 miles), 8 inch (18 miles), and 10 inch (less than 1 mile) water lines. The WPCWD has five pump stations and six water storage tanks. The system is served from the City of Somerset through four master meters supplied from both the Somerset high and low level pressure zones. The system provides water service to approximately 8,500 customers.

The distribution system with water line sizes is shown on Map #2. The WPCWD is generally in good repair; however, some components were installed when the system was much smaller are in need of upgrading and others are showing signs of wear because of many years of use.

The WPCWD is currently in compliance with all Federal and State Regulations regarding the sanitary features of the distribution system. In addition the WPCWD is governed by the Public Service Commission, and they have no current violations of PSC regulations.

IV. Need for the Project

The pump station currently on the Southeastern pressure zone is undersized for the growing customer base in the pressure zone. During hot dry periods the pump station is unable to keep up with the demand and the elevated tank goes “dry” or nearly empty which leaves the customers in the pressure zone with low pressure and sometimes

completely without water. A new and larger pump station is needed to adequately serve the area. The water lines from the existing pump station are inadequate for the new Booster station, and will need to be upgraded. The new transmission main will consist of approximately 6,500 feet of 10 inch PVC pipe and associated appurtenances. This part of the project will improve water service to approximately 3,000 customers in the Southeastern section of the WPCWD service area. The location of the pump station and transmission main are shown on the attached Map #3.

New water service is needed for the Brown's Ridge and Finley Owens Road section of WPCWD service area. The Browns Ridge portion of the project will be served through a master meter from Russell County. The Browns Ridge and Finley Owens water line extensions are shown on maps 4 and 5 respectively.

The Hendricks Road area in the Northeastern section of the WPCWD service area is also in need of public water. There are three potential customers in the Hendricks Road areas that are currently using water from wells or cisterns. The water line extension will serve 3 additional customers. The Hendricks Road water line extension is shown on map #6.

System changes are proposed that will create a pressure zone north of the Louie B. Nunn Parkway that will be supplied by the Denham Knob tank. These changes will improve the reliability of the Northern portion of the WPCWD distribution system north of the Parkway. The water line is along KY 80 to the western part of the WPCWD distribution system is near capacity and an additional 10-inch water line is proposed to supplement the existing 8-inch waterline. A new pump station, which will draw from the new 10-inch water line along KY 80, is proposed that will fill the existing Denham knob tank. The existing Denham Knob ground storage tank will not fill because of current system hydraulics. The location of the KY 80 water line extension and Denham Knob pump station are shown in map # 7.

V. Alternatives

South Pressure Zone

Alternate 1: Increase the size of the existing pump station that currently supplies the South pressure zone of the service area

Alternative 2: Provide additional storage for the South Zone.

Alternative 3: Provide both additional storage and increase the size of the pumping station.

Browns Ridge and Finley Owens Road water line extensions

Alternative 1: Provide water service to this area from the Western Pulaski County Water District distribution system

Alternative 2: Provide water service to Brown's ridge from the Russell County Water and Sewer District distribution system

KY 80 water line and Denham Knob Pump Station

Alternative 1: Add a new water line along KY 80 from the Somerset High pressure Zone and add a pump station to fill the Denham Knob tank near the Denham Knob Tank on property owned by the WPCWD.

Alternative 2: Fill the Denham Knob tank from WPCWD Northeast pressure zone with a new pump station

VI. Proposed Project

New Bourbon Pump Station and Transmission Main

The pump station currently on the Southeastern pressure zone is currently undersized for the growing customer base in the pressure zone. During hot dry periods the pump station is unable to keep up with the demand and the elevated tank goes “dry” or nearly empty which leaves the customers in the pressure zone with low pressure and sometimes completely without water. A new and larger pump station is needed to adequately serve the area. The water lines from the existing pump station are inadequate for the new Booster station will need to be upgraded. The new water line will consist of approximately 6,500 feet of 10 inch PVC pipe and associated appurtenances. This part of the project will improve water service to approximately 3000 customers in the Southeastern section of the WPCWD service area. . The new pump station will have a capacity of 750 gpm at 185 feet total dynamic head. A map of the Browns Ridge water line is included as Map 3

Browns Ridge and Finley Owens Road Water Line Extensions

The new water main on Browns Ridge will serve approximately 40 unserved residences in the Browns Ridge section of Pulaski County. The Finley Owens Water line extension will connect to the Brown’s Ridge Extension and Service approximately 6 new customers. The new main will be supplied from the Russell County Water District through a master meter located near the Russell/Pulaski county line. Some new customers from Russell County may be included in the project if they choose to take the water service. The new water line will consist of approximately 11,000 feet of 6 inch PVC pipe and associated appurtenances. A map of the Browns Ridge and Finley Owens Water Line project is included as Map 4

KY 80 water line and Denham Knob Pump Station

The water line is along KY 80 to the western part of the WPCWD distribution system is near capacity and an additional 10-inch water line is proposed to supplement the existing 8-inch waterline. A new pump station, which will draw from the new 10-inch water line along KY 80, is proposed that will fill the existing Denham knob tank. The existing Denham Knob ground storage tank will not fill because of current system hydraulics.

VI Environmental Impacts

Environmental impacts are related to the construction of the elevated storage tank. The project was also been submitted to the Kentucky clearing house, which is designated as the single point of contact pursuant to Presidential Executive Order 12372 . The clearinghouse letter SAI# KY20100920-1565 is included in Appendix A.

VII Land Requirements

The project will be constructed on both County and state highway or on property already owned by the WPCWD. The new Denham Knob pump station will be constructed on land currently owned by the WPCWD.

VIII Construction problems

Construction problems are not anticipated for either the pump station, storage tank or the water lines.

IX Hydraulic Calculations

A KYPIPE 2000 model was developed from system schematics and discussions with system operators. Demand data was developed from meter books and their associated routes. Tank overflow elevations and pump station data was provided by the WPCWD. Hydraulic grades at master meters were established from an extensive hydraulic model developed by Bell Engineering for the City of Somerset. The results of the hydraulic model are available on request.

X Opinions of Probable Project Costs

Opinion of Probable Construction Costs

Opinions of probable construction costs are provided in the Table 1 below.
A detailed opinion of probable construction costs are listed in Appendix A.

Table 1

Item	Description	Size	Quantity	Total Cost
1	10 inch PVC Transmission Main to New Bourbon tank <i>Inner Loop</i>	10-inch	6,500 feet	\$314,000
2	PVC water line to Browns ridge	4-inch	16,000 feet	\$283,550
3	WL along KY 80 to Denham Pump Station	10-inch	8,200 feet	\$413,250
4	Finley Owens Road	3-inch	6,400 feet	\$65,425
5	Hendricks Road	3-inch	3,200	\$41,875
6	Bourbon pumping station	700 gpm	1	\$210,000
7	Denham pumping station	400 gpm	1	\$195,000
Subtotal				\$1,523,100
Preliminary Opinion of Probable Construction Costs				\$1,523,100

Opinion of Probable Projects Costs

Opinions of probable project costs are provided in the Table 2 below.

Table 2

Browns Ridge Water Line Extension and Bourbon Elevated Tank and Pump Station

Opinion of Probable Costs		
Total Project		
Administration		\$1,500
Legal		\$11,000
Land Appraisals, Easements		\$15,000
Planning--PER		\$7,500
Engineering Fees-Design and Construction		\$125,000
Engineering Fees-Inspection		\$77,000*
Interest During Construction		\$10,000
Construction		\$1,523,000
Contingencies		\$152,000
Total		\$1,922,000

*Calculated from RD Design and Inspection Fees

XI Annual Operating Budget

The annual operating budget will be included in the Summary Addendum.

XII. Conclusion and Recommendations

The distribution system upgrades listed in this reports will substantially increase the reliability and capacity of the WPCWD distribution system. The increased pumping capacity of the bourbon pump station and transmission main will double the capacity of the South pressure zone which is desperately needed during the summer months. The new pump station and transmission main along KY 80 will improve the reliability of the Northeastern and Northwestern pressure zone by allowing the use of the Denham Knob tank which has not been useful since it was constructed because of system hydraulics.

The water line extensions to the Browns Ridge, Finley Owens and Hendricks Road areas will supply water to approximately 49 households which do not currently have access to public water supplies. The Browns Ridge area will be supplied through a master meter from Russell County.