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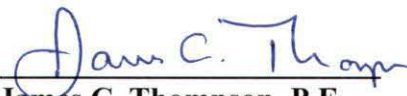
PUBLIC SERVICE  
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**Preliminary Engineering Report  
Rattlesnake Ridge Water District  
2016 Water System Improvements  
October 2018**

prepared by:



Submitted By:

  
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# **RATTLESNAKE RIDGE WATER DISTRICT**

## **PRELIMINARY ENGINEERING REPORT**

### **PROJECT PLANNING**

Rattlesnake Ridge Water District is located in northeastern Kentucky in Carter County. Its territory includes portions of Carter, Elliot, Lawrence, Lewis, and Morgan Counties. The District was organized in 1961 but did not commence operations until 1983. It currently serves approximately 4,029 customers.

RRWD's service area is a rural area with scattered residences, some agriculture, and state park land.

The calculated population based on the 2010 Census and the number of customers in each county was 10,054. The Kentucky State Data Center currently projects that all five counties will lose population over the next 35 years. The table below shows the total number of customers by county and the estimate of county population served by Rattlesnake Ridge.

County	Total Population	No. Customers	Population Served
Carter	27,720	2,558	6,421
Elliott	7,852	1,049	2,570
Lawrence	15,860	398	1,003
Lewis	13,870	0	0
Morgan	13,923	24	60
TOTALS:	79,225	4,029	10,054

### **EXISTING FACILITIES**

Rattlesnake Ridge has a water treatment plant and a distribution system. The source of water is Grayson Lake. It also purchases a small amount of water from the City of Grayson.

The distribution system consists of eleven storage tanks with a combined capacity of 1,046,000 gallons; 700 miles of 8", 6", 4", 2", and 1.5" PVC water mains and 1.3 miles of ductile iron water mains, and ten booster pump stations.

The District does have an extremely high water loss. Currently the estimated water loss is 53 percent.

The financial status of the District is reasonable. They do have a positive cash flow if depreciation is taken out of the calculations. Preliminary calculations point to the need to make an adjustment to rates in order to maintain debt coverage ratios and to cover more of depreciation. By covering depreciation all or at least in part, the District will be in a more healthy position to do improvement projects in the future in house without the need to borrow money.

### **NEED FOR PROJECT**

The 2016 Water System Improvements project is primarily an upgrade project, necessary to keep facilities of the District in good operating condition for the foreseeable future.

## **ALTERNATIVES CONSIDERED**

Alternatives considered include:

- For the new water storage tank – construct a ground storage and a larger pump station. For the rehab of two existing tanks; defer rehab and wait until they are beyond repair and replace.
- For the water line replacement - replace with a different material; however PVC pipe is proposed and that is less expensive than ductile iron pipe.
- For the remaining activities the main alternative is to do nothing but this would not enable the District to provide quality service now and into the future.

## **SELECTED ALTERNATIVE**

The project selected includes numerous items necessary to improve conditions in the distribution system and at the water treatment facility. The improvements include:

- Purchase an existing facility and retrofit as office building. Move office to new location.
- Purchase portable generator to use throughout the system in times of power failures
- Upgrade the Diamond Ridge pump station
- Install a new PRV station at Huff Run Road
- Upgrade the WTP SCADA system
- Construct new 250,000 gallon elevated storage tank
- Construct new pump station on KY 504
- Replace approximately 16,368 LF of the water main along KY 7 to Glen Lawson Road
- Rehab Diamond Ridge, Gregoryville No.2, and Route 7 storage tanks
- Demolition of two KY 504 standpipe storage tanks
- Install cover over WTP sludge pile or purchase dewatering sludge container
- Various Line extensions

## **PROPOSED PROJECT**

The proposed project includes multiple items. Included in the project are repainting and rehab of three storage tanks; the Diamond Ridge, Gregoryville No.2, and Route 7 tanks. Water lines will be extended on the following roads: Hardy Branch, Hamilton Branch A & B, Bells Trace/Knotty Poplar, Parker Hollow Road, Dehart Road, Ison Creek, Glen Lawson off KY 504, Cave Branch, Sutton Road, Carter Ford Road, and KY 409.

The District proposes to purchase an existing facility and retrofit for a new office. Its existing office is in poor condition with minimal parking. Other improvements proposed are the purchase of a portable generator that can be moved to any of the pump stations in the system during emergency power outages, upgrade of the Diamond Ridge pump station, install a new PRV station at Huff Run Road, upgrade the WTP SCADA system, construct a new 250,000 gallon elevated storage tank and new pump station on KY 504, replace the main line along KY 504, from KY 7 to Glen Lawson Road – as the existing main is insufficient for the current demand, rehabilitate the Diamond Ridge, Gregoryville No.2, and Route 7 storage tanks, demolition of two tanks on KY 504, and construction of a cover over the backwash sludge pile at the WTP, or purchase of a sludge container filter

# **RATTLESNAKE RIDGE WATER DISTRICT**

## **PRELIMINARY ENGINEERING REPORT – SECOND REVISION**

### **OCTOBER 2018**

#### **SELECTED ALTERNATIVE**

Originally the selected alternative included the extension of water lines along the following roads:

Hardy Branch, Hamilton Branch A & B, Bells Trace/Knotty Poplar, Parker Hollow Road, Dehart Road, Ison Creek, Glen Lawson off KY 504, Cave Branch, Sutton Road, Carter Ford Road, and KY 409.

However, the District did not receive any signers on: Hamilton Branch A&B, Bells Trace/Knotty Poplar, Sutton Road, Carter Ford Road, and KY 409. Because there were no signers, the District elected to take these lines out of the project.

The District added one line – Brownie Cox Road and the replacement of the Big Run pump station to the project after deleting the lines with no signers.

All other items included in the selective alternative remained the same. The project selected includes numerous items necessary to improve conditions in the distribution system and at the water treatment facility. The improvements include:

1. Purchase an existing facility and retrofit as office building. Move office to new location.
2. Purchase portable generator to use throughout the system in times of power failures
3. Upgrade the Diamond Ridge pump station
4. Install a new PRV station at Huff Run Road
5. Upgrade the WTP SCADA system
6. Construct new 100,000 gallon and 75,000-gallon elevated storage tanks
7. Upgrade KY 504 pump station
8. Rehab Diamond Ridge, Gregoryville No.2, and Route 7 storage tanks
9. Demolition of two KY 504 standpipe storage tanks
10. Purchase Equipment – front end loader and side/side
11. New RTU at Diamond Ridge PS/Tank and 504 Tanks
12. Upgrade motors and drives at Rattlesnake Ridge Pump station
13. Replace Big Run Pump Station
14. Various Line extensions along Hardy Branch, Parker Hollow Road, Dehart Road, Ison Creek, Glen Lawson Road, Cave Road, and Brownie Cox Road

It was determined at the time that the lines on the seven roads could be deleted and the one line on Brownie Cox Road and the replacement of the Big Run Pump Station be added for no additional funding.

Should additional funds become available after bidding, the District has identified the following improvements to also be constructed:

1. New Pump Station in the Willard Area to address low pressure issues
2. Waterline extensions on Dudley Ridge, Blaines Trace, Lick Branch and Lick Creek

The proposed schedule is:

1. Submit plans and specifications to DOW and RD for Approval – May, 2016
2. Land/easement/encroachment permits secured – July, 2016
3. Advertisement for Bids –August, 2016
4. Loan Closing – November, 2016
5. Contract Award – November, 2016
6. Initiation of Construction – December, 2016
7. Substantial Completion – September, 2017
8. Final Completion and initiation of operation –October, 2017

Total project cost is shown on the detailed engineer estimate located at the end of the report.

### **Annual Operating Costs**

Per the 2014 audit, the District had income of \$2,430,991; the majority of this income was from water sales - \$2,414,671 while the balance was for service charges and other revenue.

The District's operating expenses totaled \$2,542,810 (depreciation was \$965,502 of this amount) for the same period. They had interest expense; bond principal payments, and note payments of \$291,270, \$321,396, and \$89,609 respectively.

For the year 2014 they had positive cash flow. However, the most glaring problem is that the District has not funded its Sinking Fund nor its Depreciation Fund as required by previous RD bond issues. The Sinking Fund is under funded by \$332,310 and the Depreciation Fund by \$221,245. Although the 2015 audit isn't available at this date, Kentucky Engineering Group has been assured by Rural Development

This proposed project will increase their annual debt payment by approximately \$165,000 per year. It is anticipated that a rate increase will be required to ensure that the District covers all expenses, brings its Reserve requirements up over a period of years, contributes the monthly Reserve requirements, and maintains at least a 1.2 debt coverage ratio. It is also expected that the District will cover a portion of its depreciation expense so that it has adequate revenues to do future maintenance in house or at least without incurring additional debt.

The exact amount of the rate increase will be detailed in the Summary Addendum submitted with this Preliminary Engineering Report or shortly thereafter.

### **ATTACHMENTS:**

Location Maps

Preliminary Cost Estimate