Case No. 2019-00246

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PUBLIC SERVICE COMMISSION

McCREARY COUNTY WATER DISTRICT

WATER & SEWER SYSTEM IMPROVEMENTS

PRELIMINARY ENGINEERING REPORT

McCREARY COUNTY WATER DISTRICT

19 Crit King Road

Whitley City, KY 42653

January 2018

KENTUCKY ENGINEERING GROUP, PLLC

McCREARY COUNTY WATER DISTRICT
PRELIMINARY ENGINEERING REPORT
WATER & SEWER SYSTEM IMPROVEMENTS

I. GENERAL

The McCreary County Water District (MCWD) was formed in 1962. The existing water system consists of two water treatment plants and approximately 350 miles of water lines with 13 functioning water storage tanks and 7 booster pump stations that serve approximately 6,156 customers in McCreary County. The existing sewer system consists of one wastewater treatment plant, 15 sewage pumping stations and approximately 21,000 feet of sewer lines that serve nearly 1,200 customers.

II. PROJECT PLANNING AREA

A. Location

The MCWD is located in South Central Kentucky in McCreary County. The MCWD serves the majority of McCreary County.

The topography of McCreary County is a dissected upland with hilly to mountainous topography. The topography becomes more rugged near the deep valleys of the Cumberland River, which marks the northeastern boundary. Cliff lined gorges and ridges are present throughout the area. Resistant rock formations have produced such scenic features as chimney rocks, natural arches, precipitous cliffs, and waterfalls. Only the occasional flat-topped ridge or valley flat interrupt the general rugged topography.

B. Environmental Resources

The major environmental features in the area are primarily hilly to mountainous terrain. The hilly terrain is the reason for numerous water storage tanks and pump stations. Water pressures range from below 30 psi to over 200 psi in sections of the system. Many of the hollows are in floodplains in particular along the Cumberland River. No known historic sites are noted in the planning area.

C. Growth Areas and Population Trends

A quick review of the census information shows a fairly significant decrease in the population over the next twenty years. Since the establishment of the MCWD the population of McCreary County has continued to grow until recent years. The water system has had rapid growth over the past 20 years because of numerous line

extension projects. The population projections for McCreary County are shown below.

	2010	2020	2030	2040
Population	18,306	17,840	17,320	16,486

III. EXISTING FACILITIES

A. Location Map

A map showing the extent of the water system improvements is located at the end of this report. For purposes of this report the wastewater treatment plant is the only sewer system feature indicated on the map.

B. History

The MCWD system was originally built in 1962. The MCWD produces all of its own water via two separate water treatment plants. Numerous water line extension projects have been developed over the past 40 years to establish the current MCWD customer base which serves approximately 95% of McCreary County. The MCWD Wastewater Treatment Plant was constructed in 2002.

C. Condition of Facilities

MCWD currently produces an average of 2.0 million gallons a day (MGD) total from its two water treatment plants. The system is in good to fair condition and work continues to improve the older, undersized sections of the MCWD.

Several of the original transmission watermains that transport the majority of the MCWD water to its customers are undersized. During periods of peak demand MCWD struggles to keep certain water storage tanks adequately supplied and several customers experience underserved water supply/pressure; in particular the western portion of the system which has experienced substantial growth over the years. In addition to the undersized water transmission mains, the Wolfe Ridge Pump Station and Rattlesnake Ridge Pump Station serving the western portion of the system is undersized and out served their useful life.

The wastewater treatment plant (wwtp) is currently rated for 0.9 MGD. The plant is relatively new and overall in good working condition. The chemical feed area of the wwtp is crowded with inadequate containment for both the caustic and polyaluminum chemical storage tanks.

D. Financial Status

Annual audits will be submitted to Rural Development as required by the RD bond issue. A customer breakdown will be provided in the Summary Addendum.

As with the majority of utilities across the country, the MCWD has seen its operating expenses rise over the past several years. Fuel and health insurance are the expenses that have seen the largest increase. Because the MCWD covers a vast geographic area, the fuel cost has had a tremendous impact on cash flow.

IV. NEED FOR THE PROJECT

A. Health and Safety

The proposed project to upgrade the transmission main will help to improve overall water quality for residents in these particular areas.

Inadequate water supply/pressure exposes some families to poor quality water and limits the amount of water available to them. Other residents in the areas covered by this project have petitioned the MCWD for water service but until the transmission main is upgraded, these residents cannot be provided with safe/reliable drinking water.

The proposed project will help to improve the overall service from a water quality and reliability standpoint to the MCWD customers.

Improvements to the chemical storage facility at the wwtp will address regulatory compliance and operator safety.

B. System O&M

Upgrading transmission mains will reduce the amount of operation and maintenance budget required for the MCWD system. It will also enable the MCWD to transmit more water to its distribution system.

V. ALTERNATIVES CONSIDERED

The only alternative considered for the transmission mains upgrade was to construct new lines to neighboring utilities which would be prohibitively expensive. The MCWD was originally developed with its water treatment plants being the sole, centrally located water source for the water system. Any project that attempts to contradict that original concept will have a significant financial impact on the MCWD.

VI. PROPOSED ALTERNATIVE

The proposed project is to upgrade the transmission mains that serves the western portion (Stearns to Smithtown) of the MCWD system. The majority of these transmission mains are undersized for the volume of water that needs to be transported through this area. The mains are located along KY 92 and KY 791.

A second segment of this project is to reconnect existing water service meters to recently installed water lines. There were not enough funds available in the budget at the completion of the water line projects to reconnect the existing water service meters to the new water main. Reconnecting the meters will allow the MCWD to eliminate the old water lines that have long plagued the MCWD with numerous line breaks. This portion of the project will only be completed should funds be available at the completion of the project described in the first paragraph.

The water that feeds to the Skullbone Water Storage Tank serves the customers in that area simultaneously. The project will provide a direct feed of water to the Skullbone Tank and by installing a couple of valves the water will then serve the customers in the area. As a result, better turnover in the water storage tank will improve water quality to those customers it serves.

Due to the location of the existing Wolfe Ridge Pump Station the pump station experiences hydraulic low suction pressure shutdowns. The pump station is old, dilapidated and not very accessible for the numerous maintenance issues it has caused MCWD over the years. Building a new pump station at a more accessible site but very near the same location as the existing pump station will provide MCWD with improved supervision and future maintenance opportunities to the station as well as hydraulic performance to function in the capacity the station was meant to serve. Upgrading the pumps at the existing Rattlesnake Ridge Pump Station will provide adequate water to the western portion of the system and improve overall water quality.

Each of the items listed above will help to improve the overall service from a water quality and reliability standpoint to the MCWD customers. Hydraulically the project takes advantage of existing water storage tank elevations with larger diameter water mains to transport water and improve pressure/reliability to underserved areas.

The chemical storage facility at the wwtp does not meet current regulatory standards for containment. Access to the storage area and the chemical feed equipment is limited thus jeopardizing safety for the plant operators. The proposed project will provide new chemical tanks with proper containment in a smaller footprint which will organize the facility in such a manner that will allow operators easier access and a safer working environment.

An exhibit of the project area and the total project cost is shown on the detailed engineer estimate located at the end of the report.

It is expected that the MCWD will institute a rate increase with this project. The proposed rates and additional financial data will be presented in the Summary Addendum to the Preliminary Engineering Report that follows this report.

VII. PROPOSED PROJECT SCHEDULE

The proposed project schedule is:

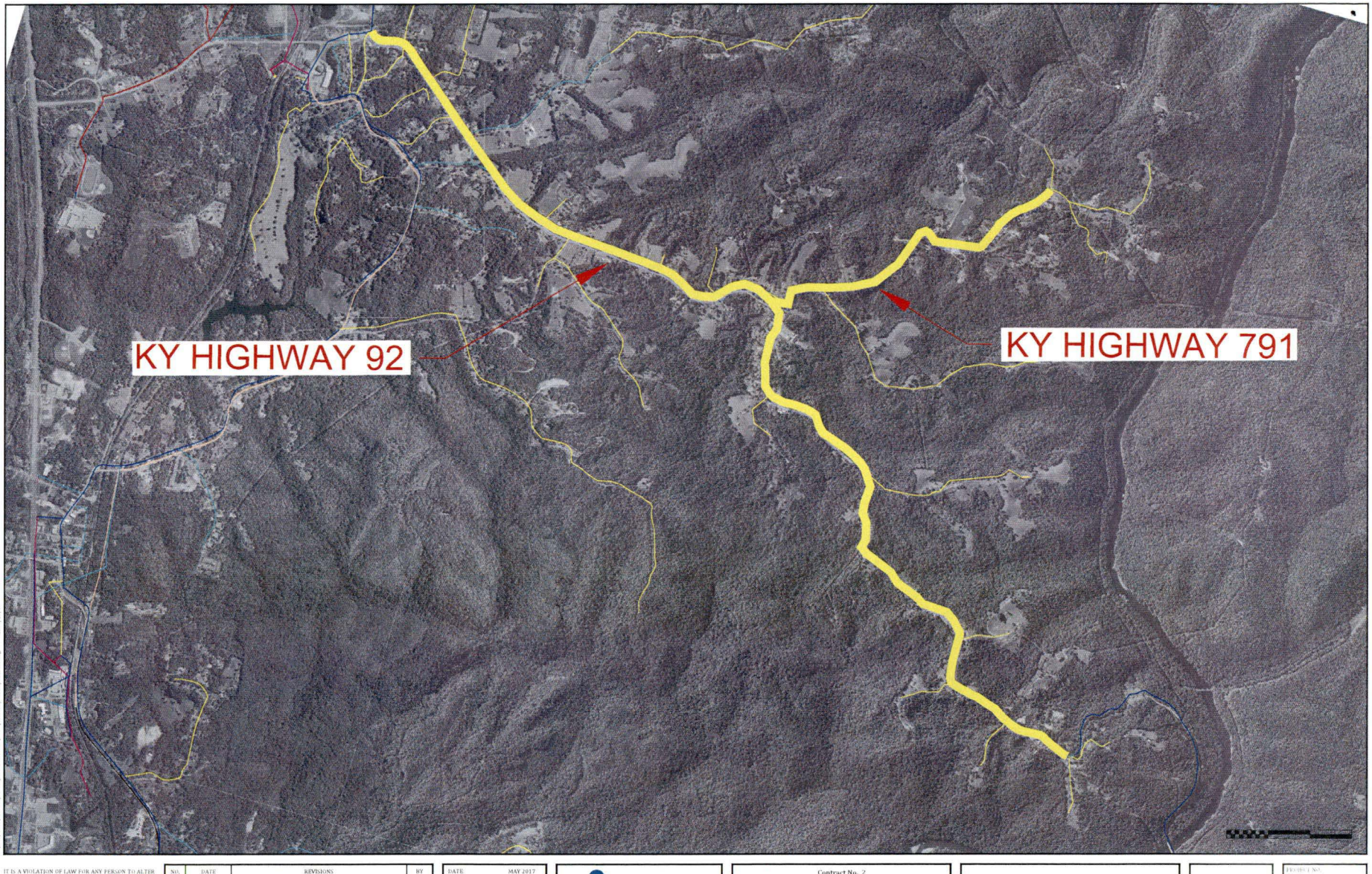
1. Secure Letter of Conditions from USDA RD – April 2018
2. Secure Land/Easement/Encroachment Permits – May 2018
3. Division of Water Submittal – April 2018
4. Advertise for Bids – May 2018
5. Contract Award/Initiate Construction – August 2018
6. Substantial Completion – March 2019
7. Final Completion/Initiation of Operation – April 2019

KENTUCKY ENGINEERING GROUP, PLLC

Preliminary Project Cost Estimate

Project : Stearns to Smithtown Water System Improvements
Date : **Job No. :**
Revised : 08/09/18 **Est. By:** RCC

ITEM NO.	SUMMARY OF: McCreary County Water District Water System Improvements	QUANTITY NO. OF UNITS	UNIT MEAS.	COST PER UNIT		TOTAL COST
1	8" PVC Water Main Class 250 SDR 17	16,700	LF	$ 35.00		$ 584,500.00
2	6" PVC Water Main Class 250 SDR 17	5,100	LF	$ 30.00		$ 153,000.00
3	4" PVC Water Main Class 250 SDR 17	7,200	LF	$ 24.00		$ 172,800.00
4	2" PVC Water Main Class 250 SDR 17	1,600	LF	$ 18.00		$ 28,800.00
5	Directional Bored 12" HDPE Casing w/8" HDPE Carrier Pipe	1,800	LF	$ 185.00		$ 333,000.00
6	Directional Bored 8" HDPE Casing w/6" HDPE Carrier Pipe	400	LF	$ 140.00		$ 56,000.00
7	Directional Bored 6" HDPE Casing w/4" HDPE Carrier Pipe	500	LF	$ 100.00		$ 50,000.00
8	Highway Bore with 8" Steel Casing Pipe	900	LF	$ 100.00		$ 90,000.00
9	8" G.V. & Box	7	EA	$ 2,500.00		$ 17,500.00
10	6" G.V. & Box	1	EA	$ 2,000.00		$ 2,000.00
11	4" G.V. & Box	6	EA	$ 800.00		$ 4,800.00
12	2" G.V. & Box	26	EA	$ 500.00		$ 13,000.00
13	8" Tapping Sleeve and Valve	1	EA	$ 3,500.00		$ 3,500.00
14	4" Tapping Sleeve and Valve	6	EA	$ 2,500.00		$ 15,000.00
15	Connection to Existing W.M. (Dry Connection)	28	EA	$ 1,500.00		$ 42,000.00
16	Flushing Hydrant Assembly	15	EA	$ 3,500.00		$ 52,500.00
17	Air Release Valve	3	EA	$ 2,300.00		$ 6,900.00
18	Reconnect Ex Meter to New/Ex W.M. w/ New Srv. Line	142	EA	$ 500.00		$ 71,000.00
19	3/4" Additional Service Line	2,400	LF	$ 12.00		$ 28,800.00
20	Cut and Plug Existing Water Main	26	EA	$ 500.00		$ 13,000.00
23	WWTP Chemical Building Improvements	1	LS	$ 50,000.00		$ 50,000.00
	SUBTOTAL AMOUNT					**$ 1,788,100.00**
	10% CONST. CONTINGENCY					**$ 179,000.00**
	PRELIMINARY ENGINEERING DESIGN					**$ 10,000.00**
	ENGINEERING DESIGN		**7.90%**			**$ 141,300.00**
	RESIDENT INSPECTION		**4.81%**			**$ 86,000.00**
	ENVIRONMENTAL ASSESMENT					**$ 5,000.00**
	INTERIM FINANCE					**$ 45,000.00**
	LEGAL AND ADMINISTRATION					**$ 10,000.00**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 2,264,400.00**



F:\PROJECTS\McCreary County Water District\DWG\McCreary County Exhibit.dwg REV: 7/27/17

NO.	DATE	REVISIONS	BY

DATE:	MAY 2017
PROJECT MGR:	RCC
DRAWN BY:	JAH
CHECKED BY:	RCC
SCALE:	AS NOTED

P.O. Box 1034
VERSAILLES, KENTUCKY 40383
KENTUCKY ENGINEERING GROUP, PLLC

Contract No. 2

STEARNS TO SMITHTOWN
WATER SYSTEM IMPROVEMENTS
for the
MCCREARY COUNTY WATER DISTRICT
Whitley City, Kentucky

AERIAL PLAN
STEARNS TO SMITHTOWN

PROJECT NO.: XXXXX

SHEET NO.: XX