

**WESTERN MASON WATER DISTRICT
WATER SYSTEM IMPROVEMENTS
FINAL ENGINEERING REPORT**



***WESTERN MASON WATER DISTRICT
2573 Mary Ingles Highway
Dover, KY 41034
June 2020***



WESTERN MASON WATER DISTRICT FINAL ENGINEERING REPORT WATER SYSTEM IMPROVEMENTS

I. GENERAL

The Western Mason Water District (WMWD) was formed in 1958. The existing system consists of approximately 100 miles of water lines with four distribution water storage tanks, three booster pump stations, two well pump stations and one water treatment plant with a capacity of .75 MGD that serve approximately 1,157 customers in Mason County.

II. PROJECT PLANNING AREA

A. Location

The WMWD is located in Northern Kentucky in the City of Dover in Mason County. The WMWD serves the majority of western Mason County including the communities of Dover, Minerva and Germantown along with a few customers in Bracken County.

The topography of Mason County is rolling to hilly, with the area of lowest local relief being in the southern part of the county. The greatest local relief is in the vicinity of the Ohio Valley. Ridgetop elevations of 900 feet are common throughout the county. The highest elevation in the county, 1,000 feet, is found on a ridge 1.5 miles west of Mays Lick on the drainage divided between the Licking River and the North Fork of the Licking River. Elevations of communities within the WMWD service area include Dover at 520 feet, Germantown at 960 feet and Minerva at 940 feet.

B. Environmental Resources

The major environmental features within the proposed area feature a variety of landforms and topographic changes from extremely steep to relatively flat terrain. The gradual undulating terrain allows for potable water to be transported with limited booster stations. Water pressures range from 30 psi to over 185 psi in sections of the system. Many of the hollows are in floodplains in particular along the Ohio River along the northern boundary of the county. No known historic sites are noted in the planning area.

C. Growth Areas and Population Trends

The census information reviewed shows a slight decrease in the population projections over the next twenty years. Since the establishment of the WMWD the population of Mason County has continued to grow. The growth of the

Western Mason Water District's system can be attributed to numerous water distribution expansion projects. The population projections for Mason County are shown below.

	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>	<u>2040</u>
Population	17,106	17,074	16,941	16,725	16,448

III. EXISTING FACILITIES

A. Location Map

A map of the project showing the extent of the water system improvements is located at the end of this report.

B. History

The WMWD system was originally built in the late 1950's. The WMWD produces the majority of its water but does have emergency connections with the City of Maysville and the Bracken County Water District. Numerous water line extension projects have been developed over the past 50 years to establish the current WMWD customer base which serves approximately 97% of potential customers in the service area of western Mason County.

C. Condition of Facilities

WMWD currently produces an average of 250,000 gallons a day to serve its customers and a small portion of the customers within the eastern portion of the Bracken County Water District. The system is in good to fair condition and work continues to improve the older, undersized sections of the WMWD.

Several of the original transmission water mains that transport the majority of the WMWD water to its customers are undersized. During periods of peak demand WMWD can experience difficulty in keeping certain water storage tanks adequately supplied and customers can experience underserved water supply/pressure; in particular a main transmission main along Dover Minerva Road that feeds the southern portion of the system and ultimately the entire system.

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 WMWD has seen its operating expenses rise over the past several years. Electric costs and health insurance are the expenses that have seen the largest increase.

IV. NEED FOR THE PROJECT

A. Health and Safety

The proposed project will upgrade and replace approximately 11.3 miles of distribution mains that are predominantly of asbestos cement material, but also includes some PVC, ductile iron and cast iron. The project will also include replacing approximately 280 customer service meters with new radio read meters which will help to reduce operational expenses. Improving water turnover/water age by eliminating older, problematic distribution mains and removing dead ends by looping some of the existing water lines will improve the quality of water for residents in these particular areas and also provide alternatives for service during emergency outages.

Additionally, the project will include repairs and maintenance to the District's existing storage tanks to include installation of cathodic protection and other necessary repairs.

The project will also seek to perform repairs and improvements to the District's existing pump stations to include replacement of pumps, piping and installation of VFDs and potentially installing necessary appurtenances for generator connection and a new generator, if funding allows.

Many of the families within the project areas currently receive their potable water via asbestos cement distribution water mains. Due to the age and material of these mains, breaks are more common and have led to issues with continuity of service. This exposes some families to poor quality water and limits the amount of water available to them.

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

B. System O&M

By upgrading and replacing approximately 11.3 miles of distribution mains and installing VFDs to existing pump stations the WMWD will reduce their pumping costs and therefore reduce the amount of operation and maintenance budget required for the WMWD system. It will also enable the WMWD to transmit more water to its distribution system.

V. ALTERNATIVES CONSIDERED

Alternatives considered included replacing asbestos cement distribution mains with like size distribution mains but this does not provide WMWD with any

hydraulic improvements which in turn help to reduce operation and maintenance expenses. An additional alternative considered was to only replace the lines as they deteriorate to the point of failure. This is cost prohibitive for the WMWD and does not benefit the customers by providing a safe, dependable, high quality product.

VI. PROPOSED ALTERNATIVE

The proposed project is to upgrade, enlarge and replace approximately 11.3 miles of predominantly asbestos cement distribution mains and replace approximately 280 customer service meters. The upgrade of distribution mains occurs primarily in the central portion of the WMWD distribution system in the vicinity of the cities of Dover and Minerva. These upgrades allow for the WMWD to hydraulically flow water to all areas of their system in an efficient manner during normal operations and it also provides alternative feeds during emergency situations.

The areas in which distribution main sizes will be replaced and increased in size include Augusta Dover Road, located west, southwest of Dover, Augusta Minerva Road in an area just south of Dover to an area just south of Minerva, a majority of the water mains within the City of Dover, South Collins Road, located south, southeast of Dover, KY Highway 10, from the community of Fernleaf to KY Highway 9, Highway 435, a portion just west of Minerva, and Germantown Road, from Moyer Road to KY Highway 9. As previously discussed, these areas are primarily in the central portion of the WMWD distribution system and will allow the WMWD to flow water efficiently throughout all areas of its system.

The project will also include the replacement of approximately 280 customer service meters with radio read meters and the necessary computer software. The replacement of these meters will create efficiencies for the WMWD in reading meters, detecting leaks, and providing improved service to its customers.

Additionally, the project will include installation of VFDs at existing pump stations within the WMWD distribution system if funding is available. These pump stations include one located in Dover and one near Minerva. The installation of VFDs will allow WMWD to more efficiently pump water throughout its distribution system and in turn reduce operational costs. Installing necessary appurtenances for a generator connection, along with a new generator, at the stations will ensure continued operation of the system in emergency situations.

The project will also include repairs and maintenance to existing storage tanks throughout the system if funding is available. These repairs include, but are not limited to, installation of cathodic protection and potential repaint and touch up of necessary areas on the tanks. The WMWD currently operates four storage tanks located near Dover, Germantown, Minerva, and along KY Highway 9 known as

the Highland Heights Tank. These improvements will continue to ensure a safe supply of potable water to the District's customers.

Each of the items listed above will help to improve the overall service from a water quality and reliability standpoint to the WMWD customers.

A summary of the proposed project is as follows:

		Approximate Year in Service	Approximate Age (in years)
Upgrade and replacement of 11.3 miles of distribution main	Augusta Dover Road	1962	55
	Augusta Minerva Road	1962	55
	City of Dover	1962	55
	Highway 10	1962	55
	Highway 435	1962	55
	Germantown Road	1962	55
	South Collins Road	1984	33

Pump Station and Tank Improvements	Highland Heights Tank	1988	30
	Minerva Tank	1988	30
	Dover Tank	2008	10
	Germantown Tank	2008	10
	Well Pump #1	2008	10
	Well Pump #2	2008	10
	Dover Pump Station	2008	10
	Minerva Pump Station	2013	5

Hydraulically the project takes advantage of elevations to reduce long-term pumping costs while also improving water quality and maintaining adequate pressure in all areas of the distribution system.

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

It is expected that the WMWD 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. PROJECT BUDGET AND FINANCING

The project was advertised for construction bids on May 23, 2020 with a bid opening on June 4, 2020. There were two bidders for the Contract No. 1 – System Improvements Project.

The low bidder was B.P. Pipeline, LLC of Quincy, Kentucky with a low bid of \$1,463,491.00. Western Mason Water District staff have worked with B.P. Pipeline, LLC and has found them to be a responsible and responsive bidder and contractor. Therefore, a letter of recommendation was provided to the District.

The low bid was below the engineer's estimate for the project, therefore the District may look to add some items as detailed in this report to potentially include repairs and maintenance to the District's existing pump stations and/or storage tanks as progress is made on the project.

The funding available for the project consists of the following source:

Rural Development Loan	\$1,515,000
Rural Development Grant	<u>\$ 504,700</u>
TOTAL	\$2,019,700

The revised budget for the project is as follows:

Legal and Administrative	\$20,000
Planning and Study	\$20,000
Environmental	\$11,500
Rate Study	\$10,000
Easement Acquisition	\$18,000
Interim Financing	\$35,000
Basic Engineering Services	\$128,780
Construction Inspection	\$79,250
Construction	\$1,463,491
Owner Purchased Items	
New Customer Meters (280 Radio Read and computer software)	\$87,000
Contingencies	\$146,679
TOTAL	\$2,019,700

It is the recommendation of Bluegrass Engineering, PLLC to proceed to the construction phase of this project after submittal of Rural Development post bid documents and proceed with the pre-closing and pre-construction conferences.

VIII. PROPOSED PROJECT SCHEDULE

The proposed project schedule is:

1. Contract Award/Initiate Construction – September 2020
2. Substantial Completion – February 2020
3. Final Completion/Initiation of Operation – March 2020

ATTACHMENTS:

1. Rate Summary
2. Letter of Recommendation w/Bid Tabulations – System Improvements Project

NOTICE OF PROPOSED RATE CHANGE

In accordance with the requirements of the Kentucky Public Service Commission ("PSC") as set out in 807 KAR 5:069, Section 3, notice is hereby given to the customers of the Western Mason Water District ("District") of a change in water rates for users of the District's water system. The changes in water rates are required by the U.S. Department of Agriculture, acting through Rural Development ("RD") in connection with a loan by RD to the District in the principal amount of \$1,515,000 to be evidenced by the issuance by the District of its waterworks revenue bonds in such amount, which RD has agreed to purchase Provided the District meets certain conditions of RD, including revising the water rates as set forth below:

Current Monthly Water Rates

All Users

First 2,000 gallons and Minimum Bill	\$39.82
Next 8,000 gallons	\$ 5.79 per 1,000 gallons
Over 10,000 gallons	\$ 5.07 per 1,000 gallons
Bulk Sales: Loading Stations	\$ 6.10 per 1,000 gallons

Proposed Monthly Water Rates

All Users

	New Monthly Rate	Dollar Change	Percent Change
First 2,000 gallons	\$44.60	\$4.78	12%
Next 8,000 gallons	\$ 6.48	\$.69	12%
Over 10,000 gallons	\$ 5.68	\$.61	12%
Bulk Sales	\$ 6.83	\$.73	12%

The proposed monthly water rates shall be effective for water sold after the date of the final approving Order of the PSC, which Order is expected to be issued no later than 30 days of the filing of the Application. Based on a monthly usage of 5,000 gallons, the average bill of a Western Mason Water District customer would increase \$6.85 from \$57.19 to \$64.04 or 12%. The Application for approval of the rate change has been filed with the PSC and may be examined during normal business hours at the following locations: (i) Western Mason Water District Office, 2573 Mary Ingles Highway, Dover, Kentucky 41034; (ii) PSC, 211 Sower Boulevard, Frankfort, Kentucky, Monday through Friday, 8:00 a.m. to 4:30 p.m., E.T.; and (iii) via the PSC website at <http://psc.ky.gov>. Comments regarding the Application may be submitted to the PSC via its website or by mail to PSC, P.O. Box 615, Frankfort, Kentucky 40602.

The proposed rates are required under the terms of an agreement between the District and RD and KRS 278.023 does not grant the PSC any discretionary authority to modify or reject any portion of the agreement between the District and RD, or to defer the issuance of all necessary orders to implement the terms of the agreement. The RD loan proceeds will be used to finance the costs of the installation of approximately 20,000 LF of 8" water main, 16,000 LF of 6" water main, 21,000 LF of 4" water main, 6,000 LF of 3" water main and all related appurtenances. Signed: Larry Redden, Chairman, Western Mason Water District.



June 15, 2020

Mr. Larry Redden, Chairman
Western Mason Water District
P.O. Box 49
Dover, KY 41034

RE: Recommendation of Award
Contract No. 1 – Water System Improvements Project

Dear Mr. Redden:

Bids for the above referenced project were opened Thursday, June 4, 2020 at 2:00 pm (local time). The low bidder was B.P. Pipeline, LLC, Quincy, Kentucky with a bid of \$1,463,491.00. Bluegrass Engineering, PLLC has not worked with BP Pipeline, LLC on a project, however the District has previous experience with the contractor. Based upon review of the bid documents and the District's previous experiences with the low bidder, Bluegrass Engineering, PLLC would recommend to Western Mason Water District that B.P. Pipeline, LLC be awarded Contract No. 1 – Water System Improvements Project.

A copy of the certified bid tabulation is attached to this letter.

If you have any questions or need additional information please contact me at your earliest convenience.

Sincerely,

BLUEGRASS ENGINEERING, PLLC



Paul Reynolds
Project Manager

c: File w/enclosures

502.370.6551 • 222 East Main Street, Suite 1 • Georgetown, KY 40324

www.bluegrassengineering.net



BID TABULATION

CONTRACT NO. 1 - WATER SYSTEM IMPROVEMENTS PROJECT
 WESTERN MASON WATER DISTRICT
 DOVER, KENTUCKY
 BE PROJECT NO. 18028
 BID OPENING: Thursday, June 4, 2020 - 2:00 pm

BASE BID: Contract No. 1 - Water System Improvements Project				BP Pipeline Quincy, Kentucky		Tilton Excavating, LLC Mt. Olive, Kentucky		Average Bid Price	
Item No.	Description	Quantity	Unit	\$/unit	Bid Amount	\$/unit	Bid Amount	\$/unit	Bid Amount
1	8" PVC Water Main, Class 250	23,750	LF	\$ 16.50	\$ 391,875.00	\$ 18.75	\$ 397,812.50	\$ 16.63	\$ 394,843.75
2	8" PVC Water Main, Class 250	16,000	LF	\$ 15.50	\$ 248,000.00	\$ 14.25	\$ 213,750.00	\$ 14.88	\$ 233,125.00
3	8" D.I.P., Class 350	500	LF	\$ 35.00	\$ 17,500.00	\$ 36.00	\$ 18,000.00	\$ 35.50	\$ 17,750.00
4	8" D.I.P., Class 350	1,200	LF	\$ 30.00	\$ 36,000.00	\$ 31.00	\$ 37,200.00	\$ 30.50	\$ 36,600.00
5	4" PVC Water Main, Class 250	20,500	LF	\$ 12.00	\$ 246,000.00	\$ 12.50	\$ 256,250.00	\$ 12.25	\$ 251,125.00
6	3" PVC Water Main, Class 250	6,500	LF	\$ 11.00	\$ 71,500.00	\$ 12.00	\$ 78,000.00	\$ 11.50	\$ 74,750.00
7	2" PVC Water Main, Class 250	1,500	LF	\$ 11.46	\$ 17,190.00	\$ 11.00	\$ 16,500.00	\$ 11.23	\$ 16,845.00
8	Directional Drill, 4" HDPE Pipe	50	LF	\$ 60.00	\$ 3,000.00	\$ 40.00	\$ 2,000.00	\$ 50.00	\$ 2,500.00
9	Directional Drill, 6" HDPE Pipe	50	LF	\$ 65.00	\$ 3,250.00	\$ 60.00	\$ 3,000.00	\$ 72.50	\$ 3,625.00
10	Directional Drill, 8" HDPE Pipe	70	LF	\$ 110.00	\$ 7,700.00	\$ 75.00	\$ 5,250.00	\$ 92.50	\$ 6,475.00
11	Directional Drill, 10" HDPE Pipe	50	LF	\$ 140.00	\$ 7,000.00	\$ 75.00	\$ 3,750.00	\$ 107.50	\$ 5,375.00
12	Flushing Hydrant Assembly	12	EA	\$ 4,200.00	\$ 50,400.00	\$ 3,975.00	\$ 47,700.00	\$ 4,087.50	\$ 49,050.00
13	Underground Blow Off Assembly	9	EA	\$ 1,150.00	\$ 10,350.00	\$ 1,200.00	\$ 10,800.00	\$ 1,175.00	\$ 10,575.00
14	2" Underground Blow Off Hydrant Assembly	3	EA	\$ 920.00	\$ 2,760.00	\$ 1,200.00	\$ 3,600.00	\$ 1,060.00	\$ 3,180.00
15	New Customer Service	280	EA	\$ 706.00	\$ 198,000.00	\$ 1,182.00	\$ 325,360.00	\$ 931.00	\$ 260,880.00
16	Air Release Valve	5	EA	\$ 891.00	\$ 4,455.00	\$ 876.00	\$ 4,380.00	\$ 883.50	\$ 4,410.00
17	Open Cut w/PVC Casing Pipe	250	LF	\$ 14.48	\$ 3,620.00	\$ 75.00	\$ 18,750.00	\$ 44.74	\$ 11,185.00
18	Steel Casing, Bore & Jack	800	LF	\$ 110.00	\$ 88,000.00	\$ 100.00	\$ 80,000.00	\$ 130.00	\$ 104,000.00
19	Steel Casing, Open Cut	20	LF	\$ 120.00	\$ 2,400.00	\$ 100.00	\$ 2,000.00	\$ 110.00	\$ 2,200.00
20	Tapping Sleeve & Valve	9	EA	\$ 2,000.00	\$ 18,000.00	\$ 2,000.00	\$ 18,000.00	\$ 2,000.00	\$ 18,000.00
21	Connection to Existing W.M.	6	EA	\$ 2,000.00	\$ 12,000.00	\$ 2,500.00	\$ 15,000.00	\$ 2,250.00	\$ 13,500.00
22	Cut & Plug Existing W.M.	14	EA	\$ 500.00	\$ 7,000.00	\$ 500.00	\$ 7,000.00	\$ 500.00	\$ 7,000.00
23	8" Gate Valve & Box	9	EA	\$ 1,400.00	\$ 12,600.00	\$ 1,500.00	\$ 13,500.00	\$ 1,450.00	\$ 13,050.00
24	6" Gate Valve & Box	14	EA	\$ 1,200.00	\$ 16,800.00	\$ 1,200.00	\$ 16,800.00	\$ 1,200.00	\$ 16,800.00
25	4" Gate Valve & Box	8	EA	\$ 900.00	\$ 7,200.00	\$ 1,000.00	\$ 8,000.00	\$ 950.00	\$ 7,600.00
26	3" Gate Valve & Box	16	EA	\$ 700.00	\$ 11,200.00	\$ 850.00	\$ 13,600.00	\$ 775.00	\$ 12,400.00
27	2" Gate Valve & Box	4	EA	\$ 700.00	\$ 2,800.00	\$ 650.00	\$ 2,600.00	\$ 675.00	\$ 2,700.00
28	Additional Service Tubing	500	LF	\$ 15.00	\$ 7,500.00	\$ 7.00	\$ 3,500.00	\$ 11.00	\$ 5,500.00
TOTAL BASE BID AMOUNT - (ITEMS No. 1 - 28):					\$1,463,491.00		\$1,929,778.50		\$1,548,534.75

**Numbers in Red indicate errors in Contractor's Bid Amount Calculation*

The above is a true and complete tabulation of the bids received on Thursday, June 4, 2020 2:00 pm
 I certify that this is true and accurate tabulation of the bids

Bluegrass Engineering, PLLC

By: 
 Paul Reynolds
 Project Manager