

2021 WATER SYSTEM IMPROVEMENTS

WATER MAIN AND PUMP STATIONS

FINAL ENGINEERING REPORT

FOR

ROWAN WATER, INC.

JANUARY, 2023



222 East Main Street, Ste. 1 • Georgetown, KY 40324

SECTION 1 PROJECT PLANNING

1.01 LOCATION

Rowan Water, Inc. (RWI) is a water association that serves all of Rowan County, outside the city limits of Morehead, the northern portion of Elliott County, the western tip of Carter County, the northern edge of Morgan County and the southern portion of Fleming County.

This project is mostly defined with the replacement and relocation of the existing 4" water main at the intersection of KY 1274 and KY 519 due to the severe slippage of the existing ground. Other items include the installation of a new pump station on KY 32 in order to provide larger volumes of water to the suction side of the existing KY 32 pump station. Increased growth in this area has strained the volume/pressures on the suction side of the station. Also included, is a new pump station to replace the existing aged US 60 pump station and to relocate it in a more favorable location for RWI to access. New VFD's will be installed in the existing KY 32 station for smoother and more efficient operation.

1.02 ENVIRONMENTAL RESOURCES PRESENT

The major environmental features within the proposed area feature a minimum number of landforms and topographic changes as most of the areas are mountainous with flat areas along the streams in the individual hollows. Several of the hollows are in floodplains due to the numerous creeks located in the valleys. An environmental review will be required of the project.

1.03 POPULATION TRENDS

The 2010 population for Rowan County was 23,333. The Kentucky State Data Center projects the County population to grow continuously over the next thirty years. By 2040 the population is estimated to be 28,982. The projections from the Kentucky State Data Center for the next twenty years are:

2020	2025	2030	2035	2040
24,879	25,809	26,953	28,023	28,982

In 1987 RWI had a customer base of approximately 2,022 customers. The customers have grown to approximately 7300 today. The majority of the customers are residential with the balance being commercial customers. Rowan Water has two wholesale customers, Fleming County Water Association and the City of Olive Hill.



1.04 COMMUNITY ENGAGEMENT

Rowan Water, Inc. monthly board meetings are open to the public for open dialogue with the community. This project will also have an advertised public meeting that will encourage participation by the community for feedback on the project. This public meeting will be able to address concerns, funding and revenue strategies, and to address the needs of the project for public benefit.

SECTION 2 EXISTING FACILITIES

2.01 LOCATION

Rowan Water, Inc. is located in eastern Kentucky with the county seat being the City of Morehead. Mapping of the project showing the extent of the 2021 Water System Improvements is located at the end of this report (**Appendix A**).

2.02 HISTORY

RWI was established in 1968. Major expansions and renovations of its system were done in 1991, 1992, 1998, 2001, 2004, 2007, 2012, 2016, and 2018. RWI purchases one hundred percent of its water from the Morehead Utility Plant Board. All expansions and renovations were on its distribution system, including storage tanks and radio read meters.

2.03 CONDITION OF EXISTING FACILITIES

The existing system is in relatively good shape. More recently Rowan Water, Inc. replaced an aging standpipe tank on 3-C Trail with a new 150,000-gallon elevated tank. Rehabilitation work was also completed on the following tanks: Sawmill, Rock Fork, Pond Lick, Frank Johnson and Maxey Flats. A new pump station replaced an aging facility on 3-C Trail as well as updates to the Old Hilda and Sawmill pump stations. Therefore, most all of the water storage facilities and pump stations have been updated except for the US 60 and KY 32 stations. Most recently in 2020, RWI completed the 100 percent replacement of all their manual read meters with new radio read meters.

The pipe in the distribution system is in fairly good order as RWI reports a water loss of between 25 and 30 percent. This despite over 600 miles of water main in five counties serving more than 7,300 customers. Most of this pipe is in a mountainous and rocky terrain.

2.04 FINANCIAL STATUS OF ANY EXISTING FACILITIES

RWI submits an annual audit and PSC report to Rural Development and the Kentucky Public Service Commission.

Information regarding current rate structure, O&M cost, and user data will be compiled in the Summary Addendum to the PER.

2.05 WATER/ENERGY AUDITS

RWI has not had a water energy audit completed, but the recently built new pump station on 3-C Trail and the addition of Variable Frequency Drives to the existing Old Hilda and Sawmill pump stations and soon to be US 60 and KY 32 stations will continue to provide energy cost savings by the way the VFD's ramp up and down with the demand for service. The installation of drive-by meters has reduced the gasoline consumption and the wear and tear on all of the meter reading vehicles significantly.

SECTION 3 NEED FOR PROJECT

3.01 HEALTH, SANITATION, AND SECURITY

The need for this project is to address some pertinent concerns within the system that need to be addressed in short order. The 6000 LF water main relocation at the intersection of KY 1274 and KY 519 is a high priority as the hillside where the water main goes across country has been slipping for a few years, and all efforts to keep the line in service have been temporary in nature. The only solution to this problem is to relocate the water main around the slip. This will help to reduce the outages, and boil water advisories to this area of customers. The US 60 pump station replacement is needed as this pump station is aged and needs extensive rehabilitation. Since this station is located behind an existing house, it has been determined to move this station to a better location with more practical accessibility. The addition of a new pump station on KY 32 is to provide a greater volume of water to this area. The continued growth of customers in the Elliottville and 3-C Trail area has challenged RWI to keep the pressures above the minimum on the suction side of the KY 32 (Christy Creek) pump station. The addition of new VFD's to the existing KY 32 station will allow the station to run smoother as demands change and will be more energy efficient.

The proposed project will help to improve the overall service from a water quality and reliability standpoint to the Rowan Water, Inc. customers.

3.02 AGING INFRASTRUCTURE

With the exception of the KY 32 and US 60 pump stations, most all of the pump stations have been rehabilitated or updated in the last several years and the distribution system serves all of the customers in the county that are remotely feasible. The following tanks were rehabilitated in the 2016 project: Johnson, Maxey Flats, Rock Fork, Pond Lick, and Sawmill. The 3-C standpipe tank was replaced with a larger 150,000-gallon elevated tank in 2016 as well. The most recent project had RWI replacing all of the aged meters in the system with new radio read meters. The distribution system as a whole is in fairly good order with a few exceptions that will be taken care of with this new project.

3.03 REASONABLE GROWTH

Rowan Water has seen an approximate 260 percent growth in customers over the past 30 years. In the year 2020, Rowan Water, Inc. set over 140 new water meters, which is the most they had set in the past several years. With the population projected to continue to increase over the next 20 years, it is reasonable to expect that Rowan

Water's customer base will continue to increase and capital improvements to the system must be updated.

SECTION 4 ALTERNATIVES CONSIDERED

4.01 Description

Alternatives considered included using directional drill in the same location of the slip at the intersection of KY 1274 and KY 519 and attempt to get below the slippage. This would have entailed a geotechnical investigation and it was felt that due to the large trees that are toppling that this could be a dangerous proposition. It was determined the directional drill would be a riskier proposition, therefore the determination was made to relocate around the slip and install the new water main on the state right of way. The low-pressure issue on the suction side of the KY 32 pump station could have been addressed by enlarging the water main on KY 32 from a 8" water main to a 12" water main back to the master meter provided by the City of Morehead, but this would not be cost efficient.

4.02 Design Criteria

The design criteria that will be used on the project include hydraulic analysis of the existing system to determine that adequate pressures, and water loss are realized and analyzed throughout the distribution system along with examining flushing velocities. By properly sizing the distribution mains to be installed, RWI will provide improved service to its customer base while also maintaining potable water of high quality.

4.03 Map

Topo maps of the project, showing the water main relocation/replacement on KY 1274, KY 32 water main upgrade, location of the new US 60 booster pump station is located at the end of this report (**Appendix A**).

4.04 Environmental Impacts

An environmental report detailing the potential impacts of the project may be undertaken with this project. Once the report is finalized any potential impacts will be taken into consideration and any necessary remediation measures will be taken to avoid any negative impact to the environment.

4.05 Land Requirements

Land requirements associated with this project will include the need for easements and encroachment permits, both public and private, for the installation of the replacement water mains. In some areas the existing easements may be utilized. Those easements

and permits will be obtained prior to any construction beginning. The new US 60 pump station will be installed on new purchased property with the new 32 pump station located on property currently owned by Rowan Water, Inc.

4.06 Potential Construction Problems

Potential problems can occur anytime the replacement of existing water mains is undertaken. Working closely to existing water lines could cause some unexpected outages if RWI does not have command of where the existing line is located. These problems are considered during the design of the project and all precautions are taken to limit this potential risk.

4.07 Cost Estimates

A final project cost estimate is included at the end of this report (**Appendix B**).

SECTION 5 SELECTION OF AN ALTERNATIVE

5.01 Life Cycle Cost Analysis

In the selection of the preferred alternative for this project the life cycle cost of the materials to be utilized has been considered. The main material to be utilized is the water main. The water main will be of PVC material and the reconnected service line will be HDPE class 250 material. Recent studies estimate a service life of both the HDPE and the PVC up to one hundred years. In addition, the new pump station and the existing KY 32 pump station will utilize Variable Frequency Drives which should reduce electrical costs as much as thirty percent and also provide flexibility to the system if the storage tanks to which they pump, need to be removed from service for any reason. This length of service life and VFD's provides for lower operating and maintenance costs to be realized by RWI.

5.02 Non-Monetary Factors

The non-monetary factors considered are the ability to provide reliable service to the existing customer base. With the replacement water mains, the existing customer base will have improved service and a higher quality product due to the elimination of problematic water lines. The new pump station is desperately needed in this project to provide consistency and reliability to the entirety of the water distribution system.

SECTION 6 PROPOSED PROJECT (RECOMMENDED ALTERNATIVE)

6.01 Preliminary Project Design

The proposed project consists of a wide variety of capital improvements that will enhance the operation of Rowan Water, Inc. in the years to come. Approximately 6000 LF of new 4" PVC water main that will replace the problematic water main that is currently in a slip area. The new water main will be installed around the slip area so that this will no longer be a concern for RWI. Also included will be a new pump station that will be located at the Rowan Water office site that shall provide much needed volume to the Elliottville and 3-C area via the KY 32 (Christy Creek) pump station. This area has seen increased new services over the years and is now starting to expose lower pressure issues on the suction side of the station. The KY 32 station will also be updated with new Variable Frequency Drives (VFD's) to provide a more efficient mode of running these pumps and can be interacted to run at specific times. This will save RWI on the power costs to operate the pumps. In addition, this project will include the replacement of the US 60 pump station. The current station is aged and needs updating. Since it is currently located in the backyard of an existing property owner, RWI has chosen to build a new station in a location that is much more feasible for access.

6.02 Project Schedule

The proposed project schedule is:

1. Secure Letter of Conditions from USDA RD – June 22, 2022
2. Secure Land/Easement/Encroachment Permits – July 13, 2022
3. Division of Water Submittal – February 11, 2022
4. Advertise for Bids – December 8, 2022
5. Open Bids – December 20, 2022
6. Contract Award/Initiate Construction – March, 2023
7. Substantial Completion – September, 2023
8. Final Completion/Initiation of Operation – October, 2023

6.03 Permit Requirements

The project has all permits including Division of Water, KDOT Encroachment permits, Building and Housing, Floodplain permits, and environmental requirements

6.04 Total Project Cost Estimate (Per December 20, 2022 bids)

A final project cost estimate certified bid tab, and letter of recommendation are included at the end of this report (**Appendix B**).

6.05 Annual Operating Budget

A Summary Addendum will be prepared for the project which will examine Rowan Water’s current and future financial position. Included within the Summary Addendum will be an analysis of RWI’s current income, annual O & M costs, current and future debt repayments and current reserves. This Summary Addendum will propose a suggested rate for RWI in order to meet its current and future debt obligations.

SECTION 7 PROJECT BUDGET AND FUNDING

7.01 Bidding and Recommendations

The project was advertised on December 8, 2022 in the Rowan County News and construction bids were opened on Tuesday, December 20, 2022 at 10 am at the Rowan Water, Inc. office. Listed below is the pertinent information with regarding the bids for the various contracts:

<u>No. of Bidders</u>	<u>Plan Holders</u>	<u>Low Bidder</u>	<u>Amount</u>
1	6	G & W Construction, Inc.	\$1,560,530.00

The low bid came in over the engineer’s estimate by approximately 23 percent due to several factors, including the severe increase in pipe prices and other related materials that has affected the water industry over the past couple of years. Price increases due to the lack of chemicals and resin that are part of the manufacturing process, and the COVID 19 pandemic in general. Additionally, the pump station prices were high as electrical components have exponentially seen prices increase by almost fifty percent in the last two years.

The project budget was \$1,500,000 but as inflation began in January of 2021, Bluegrass Engineering knew it was going to be difficult to be within budget as construction item prices continued to rise at unprecedented levels. The bids came in \$356,530 over budget. In most situations where this has occurred in recent projects, the owner will choose to cut some bid items as well as request additional funding. However, on this project there are no items to cut as the 4” pipe has to be installed due to the slip area



that is causing havoc with the existing water main. In addition, the 10" PVC water main must also be installed due to the location of the new US 60 pump station and the higher pressures that will result on the discharge side of the pump station. Both pump stations must be installed as it is the centerpiece of the entire project.

Rowan Water, Inc. met at their regular board meeting on January, 2022 to discuss the bids and deem how best to move forward with the project. Rowan Water, Inc. made the following decisions:

1. Move forward with the project in its complete scope.
2. Request additional funding from Rural Development with a minimum of a 50 percent split with loan and grant funds.
3. The project will move forward to the contract signing once the required reviews have been completed by Rural Development and PSC.
4. The board will be asked to approve the Notice of Award so that G & W Construction can lock in their pipe prices to prevent any additional costs.

The funding for the project consists of the following:

Rural Development Loan	\$1,120,000
Rural Development Grant	<u>\$380,000</u>
Total	\$1,500,000

Requested Additional:

Rural Development Loan (50%)	\$178,500
Rural Development Grant (50%)	\$178,500
Total	\$1,857,000

The revised budget for this project is as follows:

Legal and Administrative	\$15,000
Interest on Interim Financing	\$25,000
Land, Easements	\$7,500
Preliminary Engineering Report	\$5,000
Summary Addendum	\$5,000
Environmental	\$5,000
Engineering Design and CA	\$74,000
Resident Inspection Services	\$48,000
Construction	\$1,560,530
Contingencies (6%)	<u>\$111,970</u>
TOTAL	\$1,857,000

It is the recommendation of Bluegrass Engineering, PLLC to proceed with the construction phase of the project, upon completion of the remaining Rural Development submittals and construction conferences.

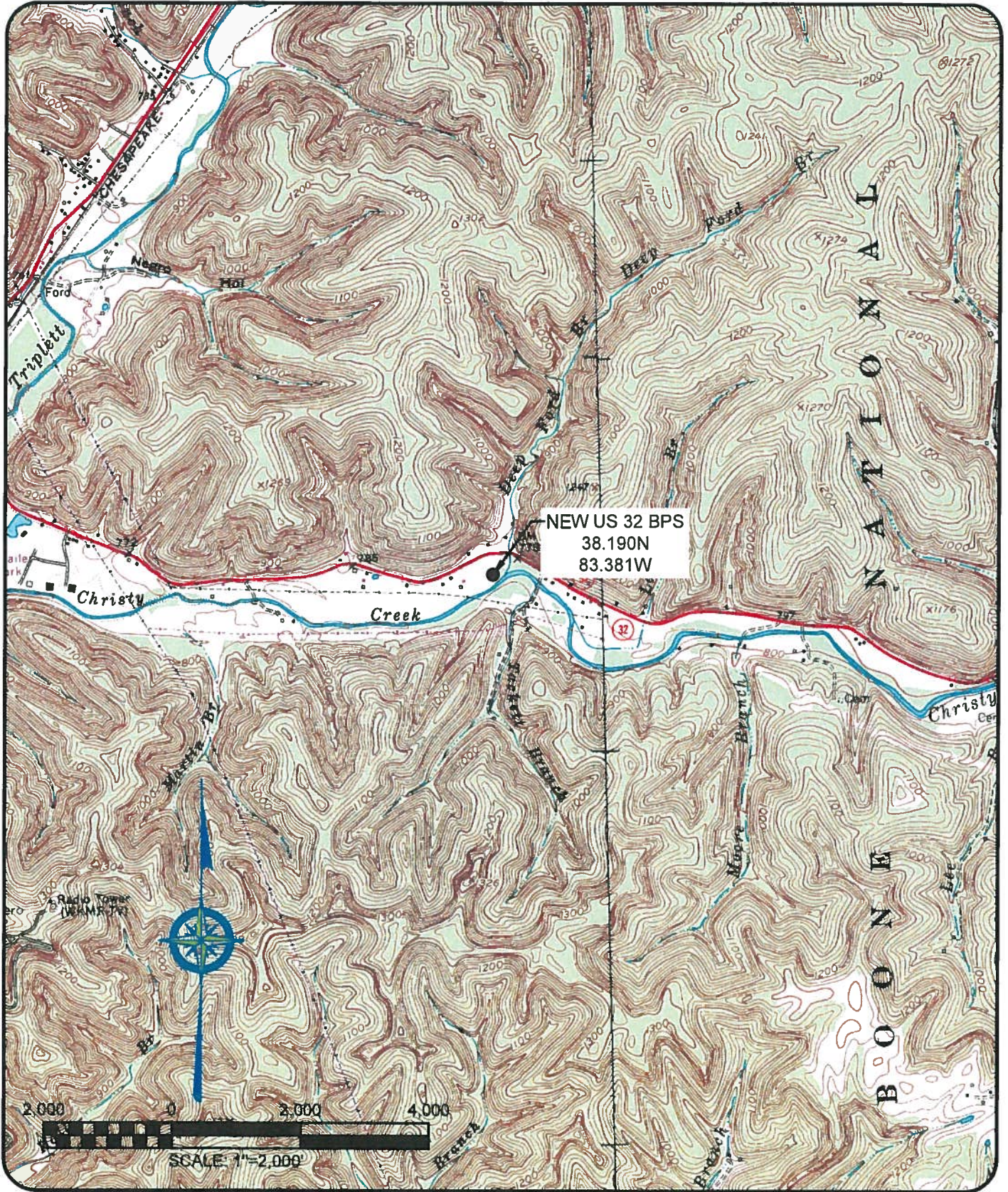
7.02 Annual Operating Costs and Proposed Rates

The proposed rates will allow Rowan Water, Inc. to fully fund the debt service for this project. The project will allow RWI to realize a reduction in annual operating costs over the cost of the loan. The replacement of old problematic water main and more efficient booster pump stations will see an increase in revenue and much lower water loss rate.

The combination of the proposed rates along with the operational efficiencies that are gained from this project will allow RWI to further strengthen their financial position over the course of the loan.

APPENDIX A PROJECT MAPPING



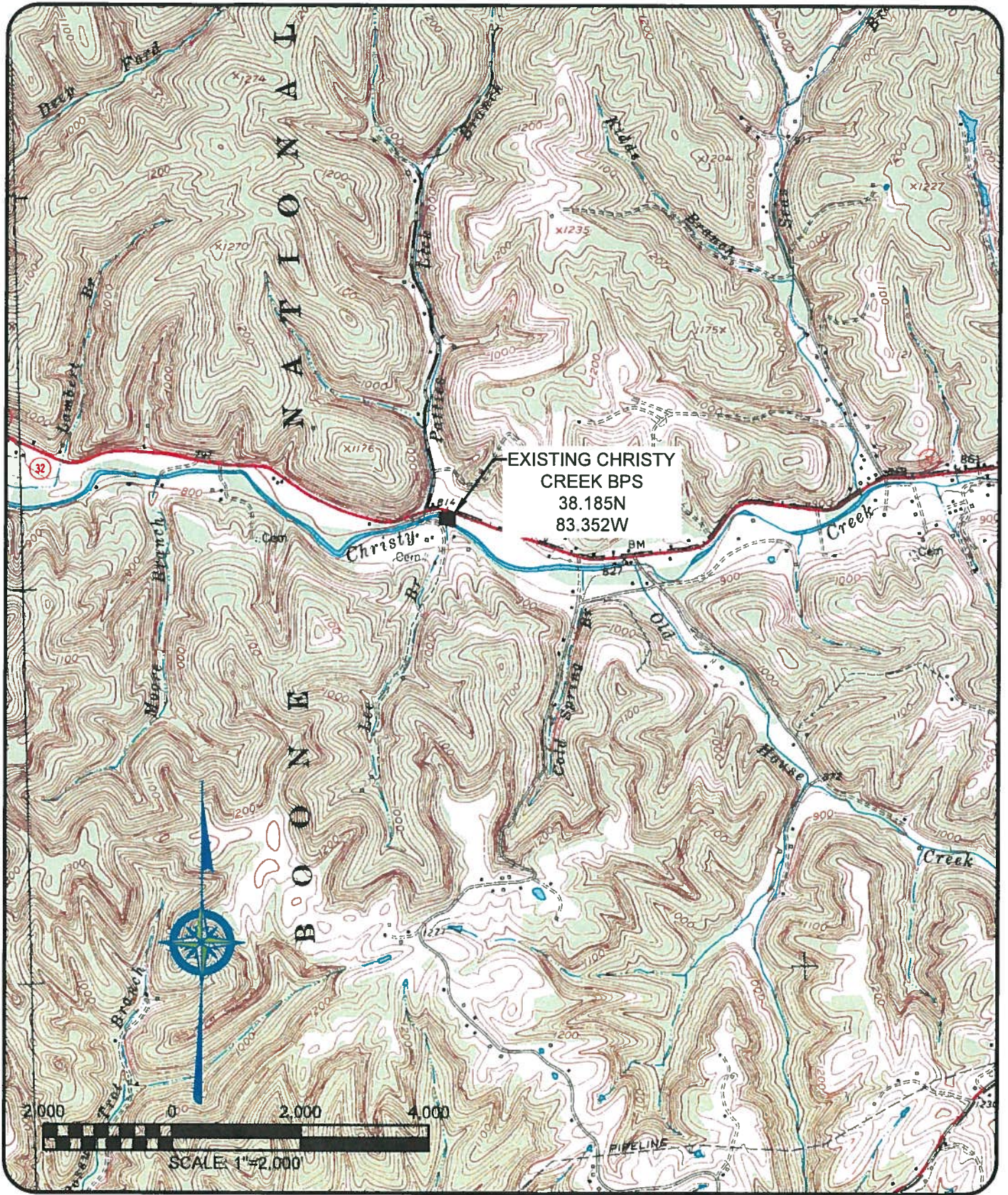


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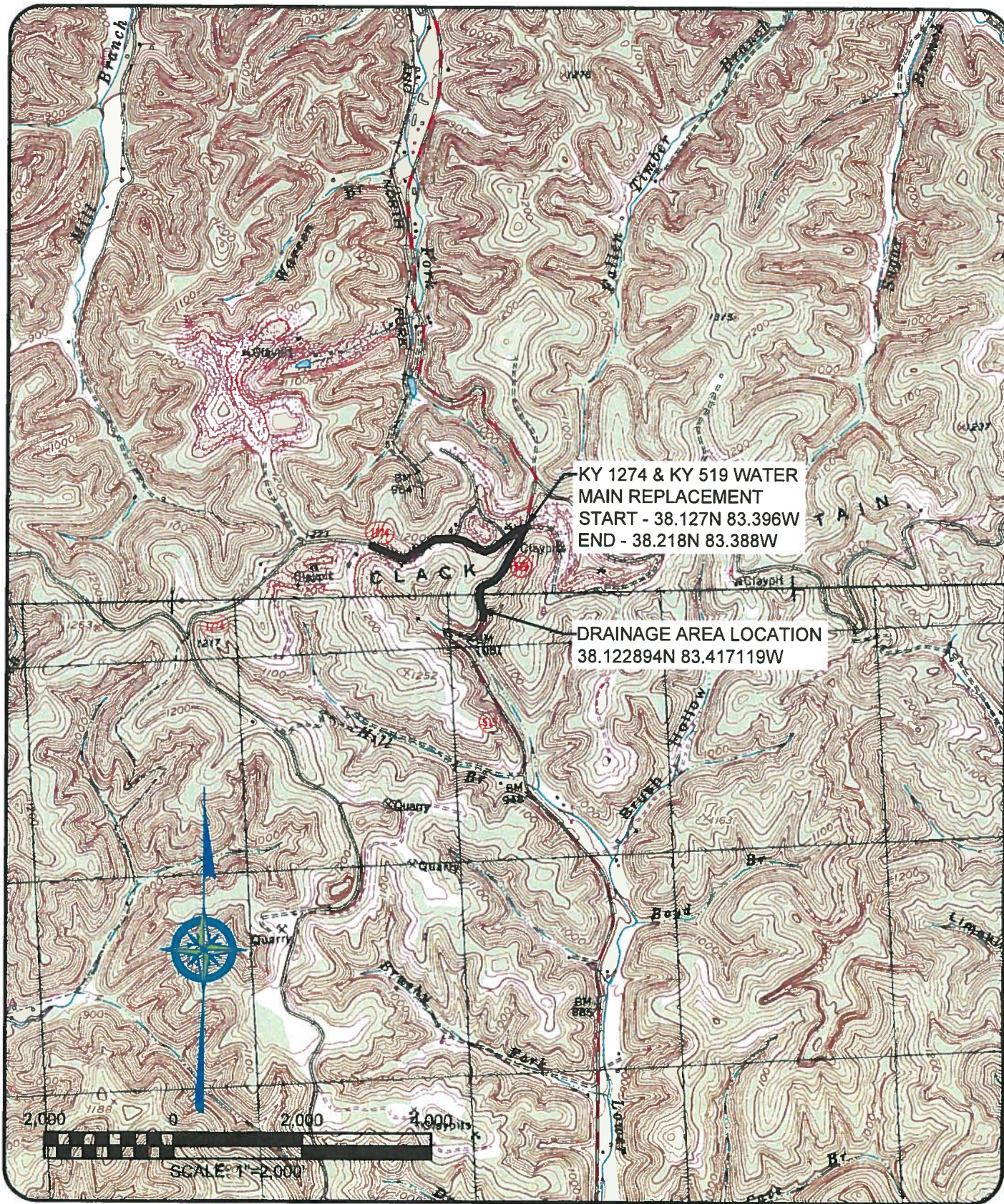
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IMPROVEMENTS
FOR
ROWAN WATER, INC.

Project No.	20020
Date	01/2021
Dwg. No.	3



2021 WATER SYSTEM
IMPROVEMENTS
FOR
ROWAN WATER, INC.

Project No. 2020
Date 01/2021
Dwg. No. 4



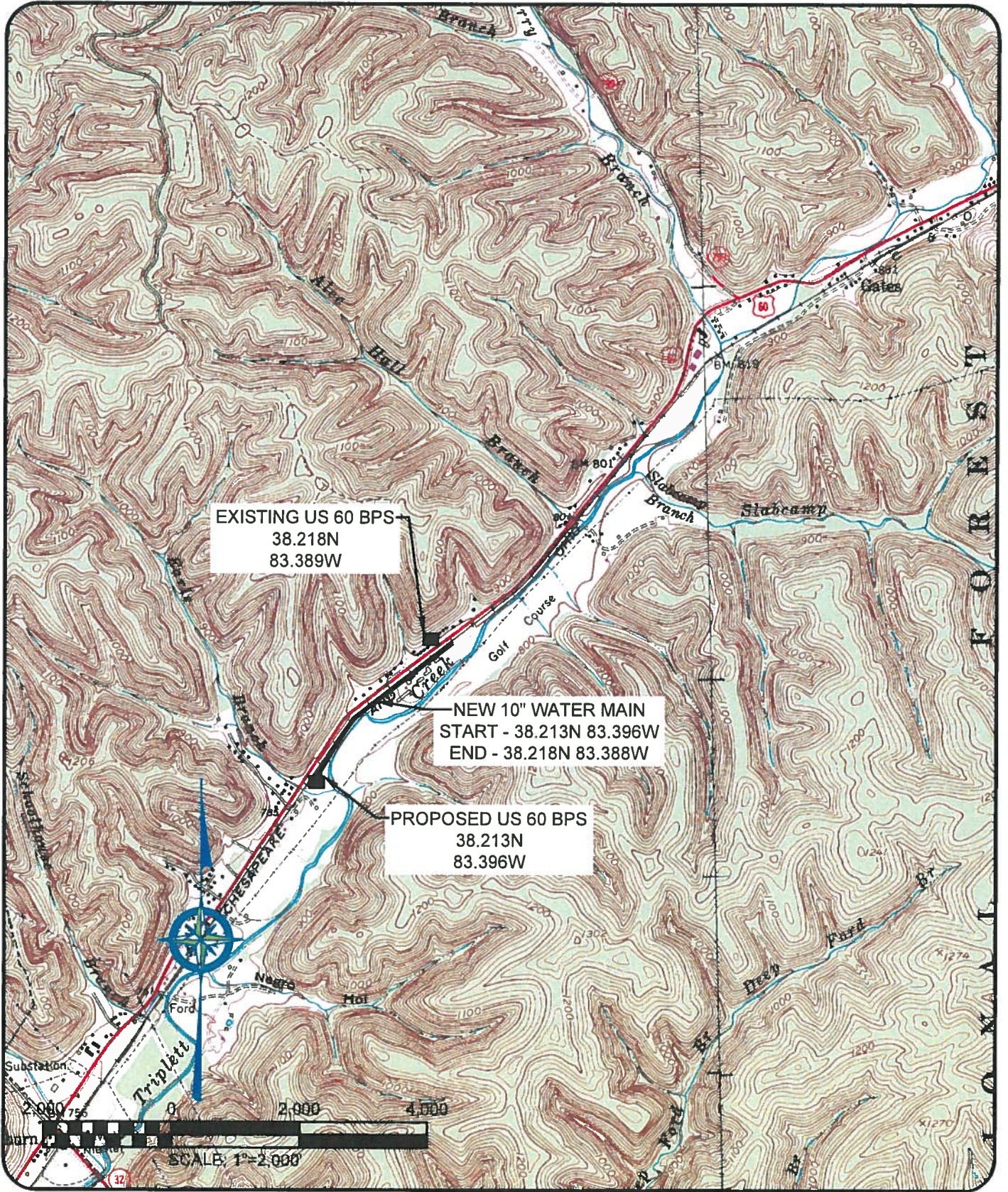
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2021 WATER SYSTEM
 IMPROVEMENTS
 FOR
 ROWAN WATER, INC.

Project No.
 2020

Date
 01/2021

Dwg. No.
 1



**2021 WATER SYSTEM
 IMPROVEMENTS**
 FOR
ROWAN WATER, INC.

Project No. 20020
Date 01/2021
Dwg. No. 2


**APPENDIX B COST ESTIMATE, CERTIFIED BID TABS, AND
RECOMMENDATION OF AWARD LETTERS**





BID TABULATION

2021 WATER SYSTEM IMPROVEMENTS
 ROWAN WATER, INC.
 MOREHEAD, KENTUCKY
 BE PROJECT NO. 20020
 BID OPENING: Tuesday, December 20, 2022 – 10:00 am

BASE BID: 2021 Water System Improvements Project				G & W Construction Company, Inc.	
Item No.	Description	Quantity	Unit	\$/unit	Bid Amount
1	4" PVC DR 18 Water Main	5,500	LF	\$ 21.10	\$ 116,050.00
2	6" PVC DR 14 Water Main	150	LF	\$ 45.00	\$ 6,750.00
3	8" PVC DR 14 Water Main	60	LF	\$ 69.00	\$ 4,140.00
4	10" PVC DR 14 Water Main	3,100	LF	\$ 71.60	\$ 221,960.00
5	4" Gate Valve and Box	1	EA	\$ 1,680.00	\$ 1,680.00
6	6" Gate Valve and Box in Existing Water Main	2	EA	\$ 2,130.00	\$ 4,260.00
7	10" Gate Valve and Box	1	EA	\$ 4,100.00	\$ 4,100.00
8	4" Tapping Sleeve and Valve	2	EA	\$ 2,660.00	\$ 5,320.00
9	6" Tapping Sleeve and Valve	2	EA	\$ 3,340.00	\$ 6,680.00
10	8" Tapping Sleeve and Valve	2	EA	\$ 4,520.00	\$ 9,040.00
11	10" Tapping Sleeve and Valve	1	EA	\$ 6,850.00	\$ 6,850.00
12	4" Blow Off Assembly	1	EA	\$ 2,580.00	\$ 2,580.00
13	4" Blow Off Assembly in Existing Water Main	1	EA	\$ 3,700.00	\$ 3,700.00
14	6" Blow Off Assembly in Existing Water Main	1	EA	\$ 4,400.00	\$ 4,400.00
15	Flushing Hydrant	1	EA	\$ 7,330.00	\$ 7,330.00
16	6" HDPE DR9 Directional Drill	700	LF	\$ 95.40	\$ 66,780.00
17	Cut and Plug Existing Water Main	7	EA	\$ 1,300.00	\$ 9,100.00
18	10" Steel Casing Bore and Jack	55	LF	\$ 160.00	\$ 8,800.00
19	10" PVC Casing Open Cut	70	LF	\$ 95.00	\$ 6,650.00
20	Reconnect Existing Meters to New Water Main	4	EA	\$ 890.00	\$ 3,560.00
21	New VFD's & Pumps for Existing Christy Creek BPS	1	LS	\$ 129,100.00	\$ 129,100.00
22	New KY 32 (Office) BPS and Appurtenances	1	LS	\$ 477,400.00	\$ 477,400.00
23	New US 60 BPS and Appurtenances	1	LS	\$ 445,000.00	\$ 445,000.00
24	Connection of US 60 Existing Water Main	1	LS	\$ 9,300.00	\$ 9,300.00
TOTAL BASE BID AMOUNT – (ITEMS No. 1 – 24):					\$1,560,530.00
<p>*Numbers in Red Indicate errors in Contractor's Bid Amount Calculation</p> <p>The above is a true and complete tabulation of the bids received on Tuesday December 20, 2022 10:00 am I certify that this is true and accurate tabulation of the bids</p> <p>Bluegrass Engineering, PLLC By  Riley Sumner Project Manager</p>					



December 22, 2022

Mr. Larry Johnson
Rowan Water, Inc.
1765 Christy Creek
Morehead, Kentucky 40351

Re: 2021 Water System Improvements
Recommendation of Award

Dear Mr. Johnson;

Bids for the above referenced project were opened on Tuesday, December 20, 2022 at 10 am EST at the Rowan Water, Inc. office. There were six (6) plan holders, but only one (1) bidder: G and W Construction, Morehead, Kentucky with a bid of \$1,560,530.00.

Since G & W Construction has completed several successful projects over the years with myself and Bluegrass Engineering, I would recommend that Rowan Water, Inc. accept the low bid of G and W Construction.

If you have any questions, please contact me at your convenience.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Riley Sumner', with a long horizontal flourish extending to the right.

Riley Sumner
Project Manager

C Teresa Shields, RD
File



Client: Rowan Water, Inc.
 Project: 2021 Water System Improvements
 Date: 12-22-2022 (Post Bid)

Construction Costs					
Item #	Description	Quantity	Unit	Estimated	Bid
1	Original Bid	1	LS	\$ 1,204,000	\$ 1,560,530
	Over Budget (23%)				\$ 356,530
	Subtotal				
	Contract Modifications with Change Orders				
	None				
	Request for Additional RD Funding				
	Loan (50%)			\$ 178,500	
	Grant (50%)			\$ 178,500	
	Subtotal			\$ 357,000	
	Original Funding				
	RD Loan - \$1,120,000				
	RD Grant - \$380,000				
	Total Funding - \$1,500,000				
	Additional Funding - \$357,000				
	Total Funding Required - \$1,857,000				
Total - Construction Cost					\$ 1,560,530
Non-Construction Costs					
Contingencies (6%)					\$ 111,970
Interest					\$ 25,000
Legal and Administrative Expenses					\$ 15,000
Land and Easements					\$ 7,500
Engineering Fees - Design					\$ 59,000
Construction Administration					\$ 15,000
Engineering Fees - Inspection					\$ 48,000
Engineering Fees - Additional Eng. Services					\$ 15,000
Total - Non-Construction Costs					\$ 296,470
Total - Project Costs					\$ 1,857,000