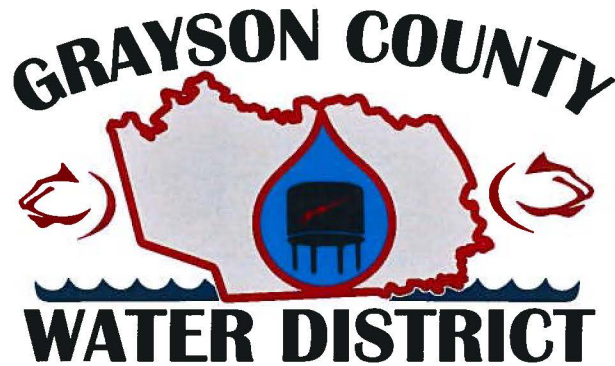


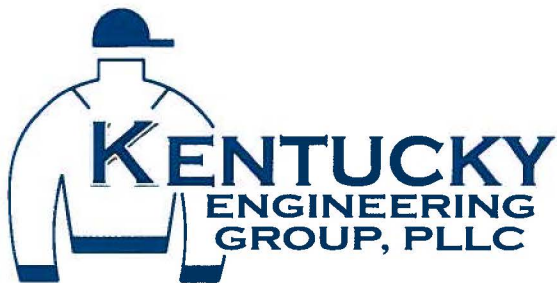
PRELIMINARY ENGINEERING REPORT

East – West Interconnect Project



Grayson County Water District

Leitchfield, Kentucky



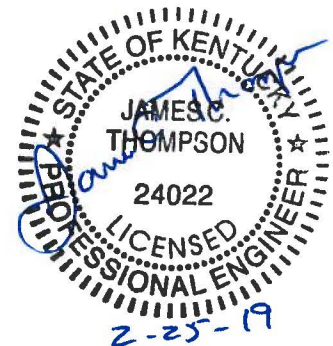
Kentucky Engineering Group, PLLC

P.O. Box 1034

Versailles, Kentucky 40383

February, 2019

KEG Project No. 18021



**GRAYSON COUNTY WATER DISTRICT
PRELIMINARY ENGINEERING REPORT
EAST/WEST INTERCONNECT PROJECT – PHASE I**

I. GENERAL

The Grayson County Water District (GCWD) was formed by a group of visionaries with the idea of safe affordable drinking water for the rural areas of Grayson County in 1969. Fiscal Court passed a resolution officially creating the Grayson County Water District and in 1974 the district began providing water to the county.

The early stages of the District were more centered on the nucleolus of the City of Leitchfield which was where the District purchased the water it delivered to its customers. The first lines had been placed east of Leitchfield to Clarkson and towards Big Clifty, west towards Millwood and south towards Shrewsbury. Early records show that at the close of the year 1976 the District had 357 services, and 22 miles of line. The average customer had grown to use 2,449 gallons of water each month at a cost of \$9.82. The Water District had assets of \$576,390.00 and annual sales of \$51,554.

Today the Water District has over 7,800 services, 563 miles of main water line, approximately 44 miles of service line, eight water storage tanks, seven booster pump stations, and 14 pressure regulator stations. The residential customer usage is now 3150 gallons per month at a cost of \$32.21. The Water District now has assets of \$22,882,081 and annual sales of \$3,460,578.00.

For more than thirty years the Water District purchased all its water from Leitchfield Utilities, with rapid growth and expansion it became necessary for the Water District to secure a larger water source and the decision was made to build a water treatment plant of their own. In early 2000, the Board began plans for a water plant and in July 2002 they began treating approximately 60% of the water needed for the customers of the Grayson County Water District. Contracts are still in place today with Leitchfield Utilities for up to 950,000 gallons of water per day, and the Water District has the ability to treat up to 2,100,000 gallons of water per day for a total available 3,050,000 gallons per day.

Today purchased water from Leitchfield Utilities serves GCWD's customers in the eastern part of Grayson County, Brandenburg Rd, and Annetta Rd. areas. The remaining areas of the County are served by its own plant. The Water District has an average daily consumption of 1,100,000 gallons per day and peak daily consumption of 1,800,000. The Water District also has connections with Butler County, Edmonson County, Ohio County and Hardin County Water District 2, for emergency back-up use. Approximately half of the current consumption, 550,000 to

900,000 gallons per day, is purchased from the Leitchfield Utilities and the rest is served by the District's own Water Treatment Plant.

II. PROJECT PLANNING AREA

A. Location

The GCWD is located in Central Kentucky in Grayson County. Except for the City of Leitchfield, the GCWD serves the majority of Grayson County. A map of the GCWD's service area is located at the end of this report.

"Grayson County occupies an upland area that includes parts of the Mississippian Plateaus Region west of the Dripping Springs Escarpment and the eastern edge of the Western Kentucky Coal Field. Much of the area is characterized by flat-topped, sandstone-capped ridges. This flat appearance is broken by occasional knobs and ridges rising above the general plateau level and valleys incised 150 to 200 feet into the upland. Karst features such as sinking streams, sinkholes, and springs are present locally in the eastern part of the county.

The highest elevations are found in the eastern part of the county, and the elevations of the upland ridges gradually decline to the west. The highest point in the county is on Buzzard Ridge, about 3 1/2 miles southwest of Millerstown, where an elevation of 963 feet is recorded. Slopes between streams and the adjacent plateau in the head waters areas are generally steep, in some places precipitous, reflecting resistant rock units capping the uplands.

The Rough River and its tributaries form the northern boundary of Grayson County. The lowest elevation is approximately 395 feet, at the point where the Rough River leaves the county. Rough River Lake, a flood-control facility on the Rough River, has a normal pool elevation of 495 feet and a flood-pool elevation of 524 feet.

Nolin Lake on the Nolin River marks part of the southern border of the county. It has a normal pool elevation of 515 feet and a flood-pool elevation of 560 feet. Leitchfield, the county seat, has an elevation at the courthouse of approximately 750 feet. The elevations of other communities are Big Clifty, 752 feet; Caneyville, 490 feet; Clarkson, 730 feet; Millerstown, 589 feet; Millwood, 673 feet; Peonia, 778 feet; Shrewsbury, 660 feet; and Spring Lick, 460 feet." *Information sourced from <http://www.uky.edu/KGS/water/library/gwatlas/Grayson/Topography.htm>*

B. Environmental Resources

The major components of this project involve crossing waterways maintained and governed by the United States Army Corp of Engineers. Through the permitting process it will be determined the most appropriate construction method to minimize any environmental impacts. 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 consistent increase in the population over the last forty years. Since the establishment of the GCWD, the population of Grayson County has continued to grow at roughly 1.12% per year, with the largest growth in the 1970s and 1990s. The GCWD has outpaced population growth with an average growth of 7.9% over roughly the same period. In large part by expanding the service area of the District through capital improvement projects. The population projections for Grayson County are shown below.

Population:

1970	1980	1990	2000	2010	2020* Est
16,445	20,854	21,050	24,053	25,746	28,800

III. EXISTING FACILITIES

A. Location Map

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

B. History

The GCWD system was originally formed in the mid 1970's. Originally GCWD purchased all its water from the City of Leitchfield, Kentucky. Numerous water line extension and infrastructure projects have been developed over the past 40 years to establish the current GCWD customer base which serves approximately 98% of Grayson County. This includes the construction of GCWD's own Water Treatment Plant facility capable of producing 2.1 MGD of treated water to its customers.

C. Condition of Facilities

GCWD currently purchases an average of 550,000 to 900,000 gallons a day from the Leitchfield Utilities. However, recent water quality issues with purchased water have been unsatisfactory and unacceptable. This has forced GCWD to investigate and pursue options on improving distribution of water from its own plant. The WTP has ample capacity to replace purchased water with the construction of key East/West interconnects with GCWD's 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. It is anticipated to raise water rates in association with this construction project.

As with most utilities across the country, the GCWD continues to see operating expenses rise. Major contributing factors include fuel and health insurance expenses. These tend to be the expenses that have seen the largest increase over recent years. Because the GCWD 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 consists of three (3) new interconnects, a (1) line extension and upgrade, and a (1) new master meter. The interconnects are necessary to allow GCWD to serve areas that are currently only fed by purchased water from Leitchfield Utilities. The areas included are Peter Cave, Lilac, and KY 259 South. It will also include a line extension and upsize from their Detention Center Tank and a new master meter vault in the Duff area of Grayson County. GCWD will be upgrading their raw water pumps to increase capacity to the WTP with their own budgeted capital improvement funds. The proposed project will improve the overall service and water quality to GCWD customers in the areas listed by providing water treated at GCWD's WTP.

B. System O&M

The proposed interconnects will allow water distribution from GCWD's Water Treatment Plant to areas currently served by Leitchfield Utilities and isolated geographically by Rough River Lake. GCWD is upsizing their raw water pumps to accommodate the increased production at the plant. The GCWD's plant has excess production capability currently. This project will allow GCWD to drastically reduce if not eliminate the need to purchase water from Leitchfield Utilities.

V. ALTERNATIVES CONSIDERED

The only alternative for the interconnect project is no change to the current distribution system. The areas currently served by Leitchfield Utilities are geographically isolated by Rough River Lake. Therefore, the only way to allow them to be served by GCWD's Water Treatment Plant is by construction of the new interconnecting lines.

VI. PROPOSED ALTERNATIVE

The proposed project consists of three (3) new interconnects, a (1) line extension and upgrade, and a (1) new master meter. The major components are listed below:

1. Interconnection of Peter Cave Road to Johnny Frank Rd.
2. Interconnection of Lilac Road to Peter Cave Road.
3. Interconnection of 259 South to McDonald Road.
4. Detention Center Tank line extension and expansion.
5. Master Meter at Duff Road and McDonald Road.

Mapping of these locations are included on attached exhibits to this report.

The interconnections will likely be either ball and socket ductile iron pipe sunken in place to cross sections of Rough River Lake or directionally drilled HDPE depending on permitting requirements and construction cost estimates. For initial budgeting purposes the project is being estimated with HDPE lines.

The total project cost is shown on the detailed Preliminary Project Cost Estimate located at the end of the report.

It is expected that the GCWA 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:

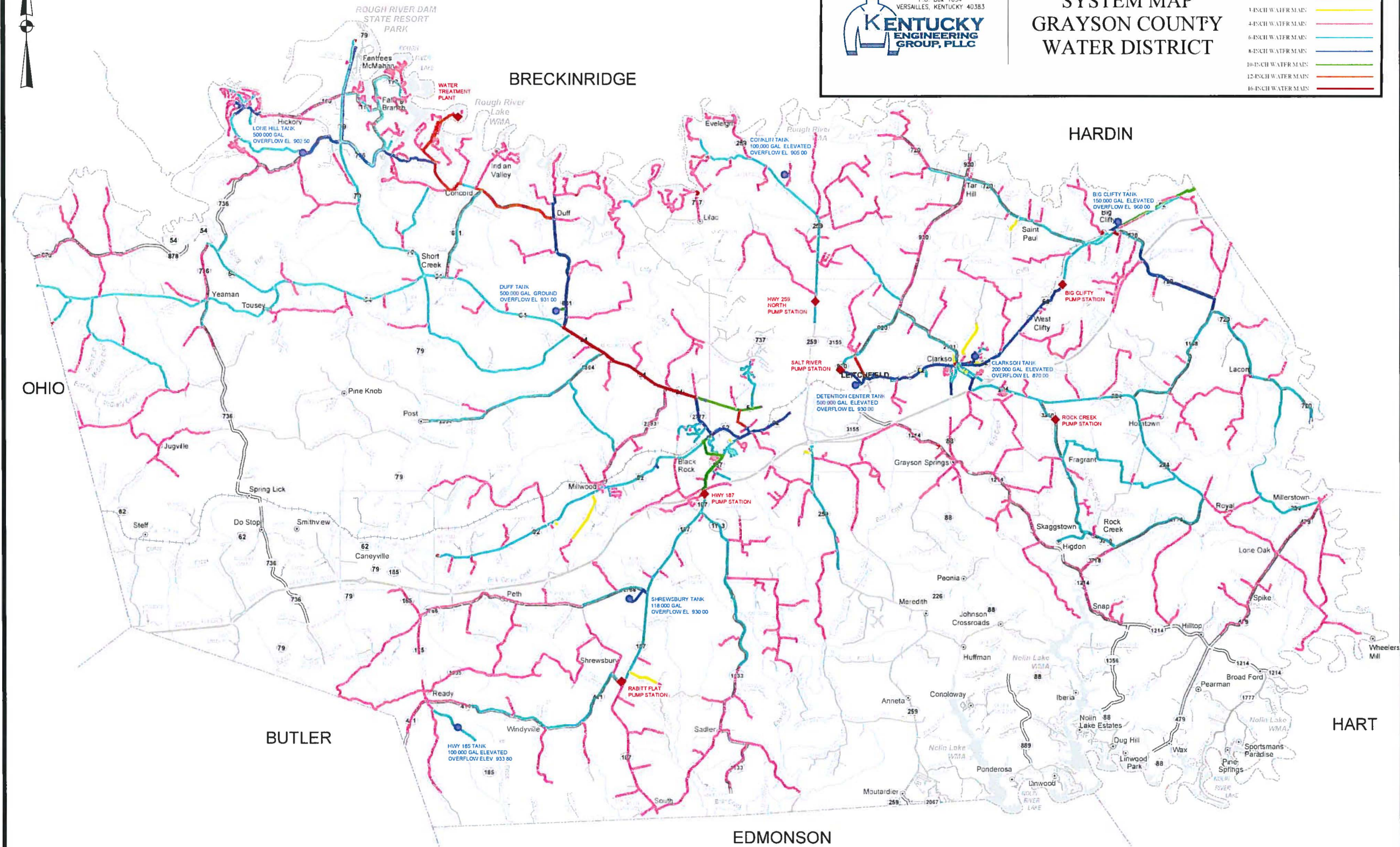
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|--|---------------------------------|
| 1. Secure Letter of Conditions from USDA RD | July 1 st , 2019 |
| 2. Division of Water Submittal | July 1 st , 2019 |
| 3. Secure Land/Easement/Encroachment Permits | November 1 st , 2019 |
| 4. Advertise for Bids | January 1 st , 2019 |
| 5. Contract Award/Initiate Construction | May 1 st , 2020 |
| 6. Substantial Completion | October 1 st , 2020 |
| 7. Final Completion/Initiation of Operation | November 1 st , 2020 |



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SYSTEM MAP GRAYSON COUNTY WATER DISTRICT

LEGEND	
2-4"CH WATER MAIN	Red line
4-6"CH WATER MAIN	Yellow line
6-8"CH WATER MAIN	Pink line
8-12"CH WATER MAIN	Light blue line
12-18"CH WATER MAIN	Blue line
18-24"CH WATER MAIN	Green line
24-36"CH WATER MAIN	Orange line
36-48"CH WATER MAIN	Dark red line



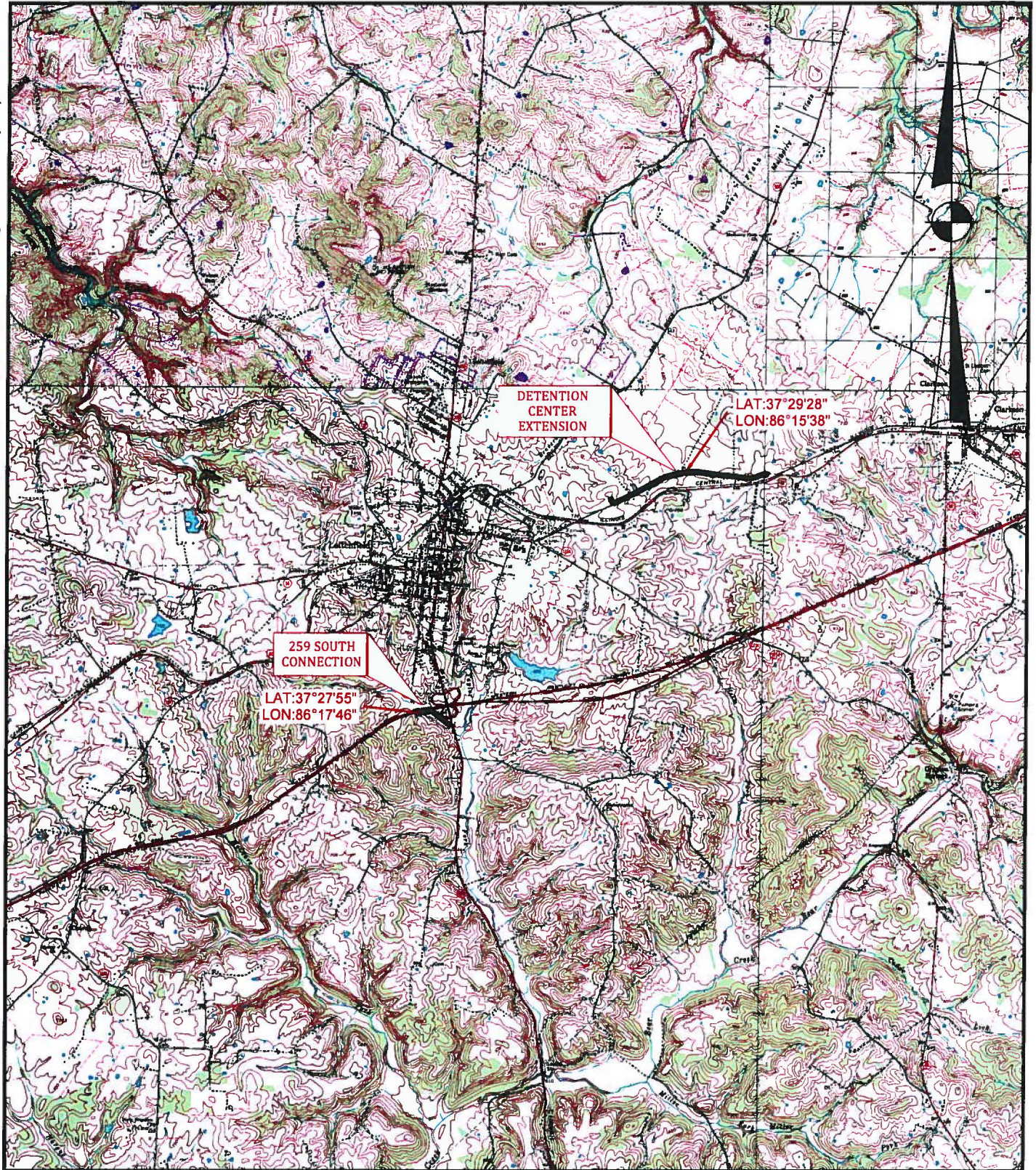


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ENGINEERING
GROUP, PLLC

PHASE I
EAST TO WEST CONNECTOR
FOR THE
GRAYSON COUNTY WATER ASSOCIATION
GRAYSON COUNTY, KENTUCKY

Project No.	18021
Date	NOV. 2018
Dwg. No.	
Sheet	1



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PHASE I
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Dwg. No.	
Sheet	2



Preliminary Project Cost Estimate

Project: GCWD - East/West Interconnect Project Phase I

Date: 10/18/18

Job No.: 18021

Revised: 02/19/19

Est. By: JCT/RCC/RET

ITEM NO.	SUMMARY OF:	QUANTITY			TOTAL COST
		NO. OF UNITS	UNIT MEAS.	COST PER UNIT	
Detention Center Extension					
	12" PVC Water Main	6,500	LF	\$ 22.00	\$ 143,000.00
	4" PVC Water Main	500	LF	\$ 15.00	\$ 7,500.00
	12" Bore across By-Pass	200	LF	\$ 350.00	\$ 70,000.00
	Connection to Existing Water Main	2	EA	\$ 2,500.00	\$ 5,000.00
Connect Peter Cave to Johnny Frank Rd.					
	8" HDPE Bore w/4" Carrier Pipe	600	LF	\$ 150.00	\$ 90,000.00
	4" PVC Water Main	400	LF	\$ 15.00	\$ 6,000.00
	Connection to Existing Water Main	2	EA	\$ 2,500.00	\$ 5,000.00
	By-Pass Meter for Leak Detection	1	EA	\$ 1,500.00	\$ 1,500.00
	Blowoff Assembly	1	EA	\$ 1,500.00	\$ 1,500.00
Connect Lilac to Peter Cave					
	8" HDPE Bore w/4" Carrier Pipe	350	LF	\$ 150.00	\$ 52,500.00
	4" PVC Water Main	1,000	LF	\$ 15.00	\$ 15,000.00
	Connection to Existing Water Main	2	EA	\$ 2,500.00	\$ 5,000.00
	By-Pass Meter for Leak Detection	1	EA	\$ 1,500.00	\$ 1,500.00
	Blowoff Assembly	1	EA	\$ 1,500.00	\$ 1,500.00
Connect 259 South to McDonald Road					
	12" Bore across Parkway	200	LF	\$ 350.00	\$ 70,000.00
	6" PVC Water Main	6,850	LF	\$ 20.00	\$ 137,000.00
	Connection to Existing Water Main	2	EA	\$ 2,500.00	\$ 5,000.00
	Master Meter	1	EA	\$ 15,000.00	\$ 15,000.00
	Flush Hydrant	2	EA	\$ 3,500.00	\$ 7,000.00
	Master Meter at Duff Rd./Johnny Frank Rd.	1	EA	\$ 15,000.00	\$ 15,000.00
SUBTOTAL AMOUNT					\$ 654,000.00
10% CONST. CONTINGENCY					
PLANNING					\$ 10,000.00
ENGINEERING DESIGN					\$ 62,600.00
RESIDENT INSPECTION					\$ 43,100.00
ADDITIONAL SERVICES (RATE STUDY, COE PERMIT)					\$ 20,000.00
LAND AND RIGHTS					\$ 8,000.00
ENVIRONMENTAL ASSESMENT					\$ 7,500.00
LEGAL AND ADMINISTRATION					\$ 5,000.00
TOTAL ESTIMATED CONSTRUCTION COST					\$ 810,200.00