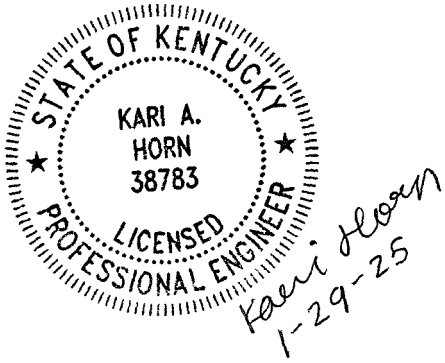
Preliminary Engineering Report

Meade County Water District 2023 Water System Improvements

Transmission Main and Pump Station Upgrades

Meade County, Kentucky

February 5, 2025



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1.0 Project Planning

1.1 Location

Meade County, Kentucky is a predominantly rural county located in north central Kentucky. Bordered by Breckinridge County to the southwest, Hardin County to the southeast and east, and the Ohio River to the north, the county covers roughly 19 square miles and has vast areas of hilly and rocky terrain and flat areas used agricultural development. Due to the varying terrain, three main population centers encompass much of the county population: Battletown-Payneville, Brandenburg, and Flaherty.

1.2 Environmental Resources Present

According to the National Environmental Policy Act (NEPA) review performed by the Environmental Protection Agency (EPA) for the project limits, no environmental concerns were identified within the project corridor.

1.3 Population Trends

According to US Census Data, the population in Meade County in 2000, 2010, and 2020 was 26,549, 28,602, and 30,003, respectively. Over the past 20 years, the county experienced a population growth of 12.2%. From 2010 to 2020, the population growth was 4.9%.

Future population trends utilized Census data and population projections, customer growth data, and available planning studies for the surrounding region. Based on growth estimates from the Kentucky State Data Center at the University of Louisville, the population is shown as slightly increasing until 2030 and decreasing thereafter. However, based on discussions with the State Data Center and others, it was believed that basing projected system demands based solely on Census Data and population estimates are problematic for the following reasons:

1. The State Data center estimates cannot account for large migration and growth from major industries such as the Ford BlueOvalSK facility currently under construction in Glendale, Kentucky. The ancillary residential, commercial, and industrial growth from this facility is anticipated to be large and rapid. Meade County will likely receive a sizeable portion of the growth in the surrounding region.
2. The rate of customer growth for the Meade County system has historically been outpacing population growth in the region. Based on customer counts between 2016-2021, Meade County has added at least 10 customers per month which equates to more than a 1.5% annual increase over 25 years.
3. Meade County has the potential to add additional wholesale customers within the next 25 years, such as Irvington or Brandenburg.

Based on the reasons above, a 1.0% annual population growth rate over the next 25 years is expected for the county. Extrapolating from the 2020 Census population total of the county, the 2050 population in the county is projected at 40,440 people.

1.4 Community Engagement

In order to publicly communicate current events within the Meade County Water District (MCWD), monthly public Board Meetings are held to discuss current items, future projects, and receive public input on issues water related within the county. Additionally, as part of this project, public meetings were held during the NEPA environmental review process.

2.0 Existing Facilities

2.1 Location Map

Appendix A provides an overall map and process flow diagram of the current Meade Co Water District System.

2.2 History

MCWD currently provides potable water to all of Meade County except for the City of Brandenburg (COB) and the City of Muldraugh by purchasing water from Hardin County District No.1 (HCWD1) via two interconnections on the southeast side of the county.

Previously, MCWD purchased water from COB. Purchasing of COB water ceased in 2018 due to a regional shift to chloramine disinfection. COB continued with older chlorine disinfection methods. HCWD1 now provides the sole source of water to the county. Two interconnections, KY313 interconnect and Sandridge Road interconnect, provide 1.1 million gallons per day (MGD) to MCWD.

The Sandridge Road interconnect provides flow to a small, isolated portion of the southeastern corner of the county. The rest of the county within the MCWD distribution system is fed from the KY313 interconnect. This interconnect is supplied from the HCWD1 Lincoln Trail Pressure Zone.

The current MCWD distribution system utilizes pump stations, water tanks, and transmission and distribution mains to provide water to their customers. Three tanks provide a total of 1.1 million gallons (MG) of water storage in the system. Table 1 below describes the tanks within the system.

Table 1: MCWD Tank Assets

Tank Asset	Year of Construction
Flaherty	2010
Garrett	2003
Payneville	2001

Two (2) active pump stations and one (1) inactive pump station are in the system. Table 2 below summarizes the pump stations within the system.

Table 2: MCWD Pump Station Assets

Pump Station Name	Date Constructed	Actively Used by MCWD?
Flaherty Pump Station	2018	Yes
Brandenburg Pump Station	1986	Yes
Payneville Pump Station	2000	No

A comprehensive distribution and transmission piping system provides water to all areas around the county. Table 3 below describes the characteristics of the system.

Table 3: MCWD Pipeline Assets

Size (Inches)	Length (Miles)	Material
2	4	PVC (Polyvinyl Chloride)
3	5	PVC
4	48	PVC
6	75	PVC/DI (Ductile Iron)
8	59	PVC/DI
10	10	PVC/DI
12	4.8	PVC

In the Winter of 2023, MCWD experienced a water emergency during a severe cold weather event. A combination of increased demand on the system, limited supply from HCWD1, and cold weather induced main breaks led to issues filling the three (3) tanks within the distribution system. This event exposed multiple areas of weakness within the MCWD system that could lead to other emergencies in the future.

2.3 Condition of Existing Facilities

MCWD has a variety of pipe types within the existing system including but not limited to PVC, DI, and Asbestos Cement (AC) material. Large portions of the current system are PVC pipe and have been replaced within the past 30 years. Within the Flaherty service area, AC pipe is prevalent and will require upgrading in the future. On average, the pipe system is in good condition except for a few areas of older pipelines.

The two (2) active pump stations within the MCWD system are in different conditions. The Flaherty Pump Station is in good condition but is nearing its maximum build-out. Therefore, minimal expansion of this pump station would be possible. The Brandenburg Pump Station has old pumps that are in fair condition and are still able to operate as needed. However, the pump station is currently used outside of its intended use. Therefore, the pumps are overworked and nearing the end of their useful life.

The three (3) water tanks located within the MCWD system are inspected on a five-to-ten-year cycle. Based on the last inspection, the Garrett and Payneville tanks were identified as tanks needing imminent repair. The Flaherty tank had issues identified and remediated in a previous project.

The previous inspection, conducted in 2022, of the Garrett Tank identified multiple issues on the exterior and interior of the tank. The interior of the tank was rated as “fair to poor” condition, and the exterior was rated as “good

condition". As a result, rehab of the tanks within three years of the inspection was recommended. For the Payneville Tank inspection, also conducted in 2022, the inspection recommended rehabilitation of the tanks within four years of the inspection. The interior of the tank was rated as "fair" condition, and the exterior was rated as "good" condition.

2.4 Financial Status of Existing Facilities

Based on financial statements and reports, MCWD are in an acceptable financial position. Currently, the main source of income for MCWD is from customer billings. Because of no capital improvement plan in place, MCWD relies on outstanding funding to supplement larger system improvements. The main expenses for the District are administrative costs and water purchasing. MCWD also has long-term debt from previously funded system improvements. The 2023 Audit of the MCWD financials is included in Appendix G.

Because of the lack of a capital improvement fund, MCWD operates based on billings from both their individual meter customers and wholesale customers. The current rate schedule for MCWD users is provided in Table 4 below.

Table 4: Current Rate Schedule

Usage Category	Rate	Unit
All Meter Sizes		
First 2,000 gallons	23.61	Minimum Bill
Next 5,000 gallons	0.01196	Per gallon
Next 10,000 gallons	0.01156	Per gallon
Next 20,000 gallons	0.01066	Per gallon
Over 37,000 gallons	0.00939	Per gallon
Wholesale Rates		
Doe Valley	0.00630	Per gallon
Otter Creek and Fort Knox	0.00645	Per gallon

Table 5 breaks down the monthly revenues collected by MCWD on a monthly and yearly basis. These statistics are supplied based on data from the 2023-2024 fiscal year.

Table 5: Monthly Customer Usage Breakdown

Usage Category	Average Customers	Tier-Revenue – Monthly	Tier Revenue – Yearly
All Meter Sizes			
Minimum Bill	--	$96,796	$1,161,555
First 2,000 gallons	1,940	$45,828	$549,938
Next 5,000 gallons	3,168	$64,009	$768,103
Next 10,000 gallons	442	$38,063	$456,756
Next 20,000 gallons	48	$11,280	$135,358
Over 37,000 gallons	11	$11,606	$139,271
Wholesale Rates			
Doe Valley	1	$27,917	$335,000
Otter Creek and Fort Knox	2	$1,958	$23,000

Table 6 below breaks out the annual O&M costs for MCWD in 2023 based on their 2023 Financial Audit.

Table 6: 2023 Annual O&M Costs

Operating Expense	Cost
Water Purchased	$1,431,969
Personnel	$384,035
Repairs and Maintenance	$77,723
Contractual Services	$59,890
Utilities	$69,645
Other	$266,862
Total Operating Expense	$2,290,124

MCWD carries $6,712,203 of long-term debt based on their 2023 Financial Audit. Table 7 shows a breakdown of these debts. A majority of long-term debts originate from funding of existing system improvements.

Table 7: Existing Debts

Bonds and Notes Outstanding	Starting Total	Date Granted	Payment End Year	Interest Rate	Current Balance
USDA, Rural Development Bond	$2,000,000	7/19/18	2056	2.75%	$1,839,000
USDA, Rural Development Bond	$2,506,170	10/25/21	2061	1.875%	$2,420,170
Kentucky Bond Corporation Bond	$2,070,000	4/21/21	2050	3.00%	$1,975,000
Kentucky Infrastructure Authority Loan*	$394,760	12/1/04	2024	3.00%	$25,822
Kentucky Infrastructure Authority Loan	$753,447	12/1/09	2029	3.00%	$274,854
Kentucky Rural Water Financial Corp. Bond*	$605,000	6/27/01	2024	5.27%	$4,000
Meade County Bank Note	$59,049	1/25/23	2025	5.15%	$32,737
Bond Premiums					$140,620
Totals					$6,712,203
Less: Current Portion of Debt					($251,852)
Long Term Debt					$6,460,351

*Paid off by MCWD as of December 31, 2024

MCWD has restricted cash for customer deposits, reserve and depreciation, construction, and debt service. Table 8 represents the restricted cash at the end of 2023.

Table 8: MCWD Restricted Cash

Restricted Cash Account	Amount
Construction	$391,940
Debt Service	$391,505
Reserve and Depreciation	$193,540
Total	$976,985

2.5 Water/Energy/Waste Audits

No water, energy, or waste audits have been conducted for MCWD.

3.0 Need For Project

3.1 Health, Sanitation, and Security

There are no health, sanitation, and security needs for this project.

3.2 Aging Infrastructure

A majority of the existing pipeline infrastructure is in good condition and is well within its useful life. The pump stations and storage tanks within the system are in a variety of conditions and reaching the end of their useful life. The Brandenburg Pump Station is in dire need of rehabilitation or replacement. No equipment within the pump station has been replaced in the previous 20 years. Regarding the storage tanks, both the Garrett Tank and Payneville Tank are exhibiting signs or corrosion and deterioration on the interior and exterior of the tank.

3.3 Reasonable Growth

Based on the population trends discussed in Section 1.3, Meade County has experienced significant population growth within the past 20 years and have aggressive future projections for population growth. Currently, the county has an average daily demand of 1.1 MGD. The projected average daily demand in 20 years would be 1.35 MGD. The projected maximum daily demand would be 2.0 MGD.

According to the Kentucky Division of Water, a water utility should be able to store 24 hours of water consumption in the event of an emergency. Using the projected average daily demand and the current storage volume within the system, MCWD would become vulnerable to failure in the future if another emergency condition occurs.

4.0 Alternatives Considered

The 2023 Water System Improvements project was broken into four (4) improvement elements addressing either conveyance capacity, pumping capacity, or storage improvements within the system. The four sections are listed below:

Element 1 – Improve Conveyance Capacity from Flaherty Tank to Garrett Tank,

Element 2 – Improve Pumping Capacity of the Flaherty Pump Station,

Element 3 – Improve Pumping Capacity of the Payneville Pump Station,

Element 4 – Improve Storage Capacity of Garrett and Payneville Tanks

4.1 Improvement Element 1, Alternative 1

4.1.1 Description

The Flaherty Transmission Main begins at the Flaherty Pump Station as a 12-inch main and continues along KY313 until the Flaherty Tank Site. Once near the tank site, the main reduces to 10-inch size. Between the Flaherty Tank Site and the KY313 and Brandenburg Road (KY144) intersection, the main switches between the east and west side of KY313. Once on KY144, the main reduces to an 8-inch size and is located on the east side of the road until the KY1238 intersection. The main is then located on the south side of KY1238 until it reaches the Garrett Tank Site. Throughout the entire alignment, the main is in KYTC right-of-way, County right-of-way, and easements. An overall map of the existing water main is in Appendix B.

The proposed improvements would install a new 16-inch water main between the Flaherty Tank Site and the Garrett Tank. The alignment of the water main along KY313 would be located on the west side of the road in both KYTC right-of-way and easement until it crosses to the north side of Brandenburg Road. Once the alignment crosses Brandenburg Road, it would cross KY313 to the east side via bore and jack and continue along in KY313 right-of-way until crossing KY1238. Once on KY1238, the water main alignment would be located on the north side of the road in right-of-way and easement. Once it reaches the Garrett Tank site, it would cross KY1238 and continue onto the property before tying into the existing 10-inch water main. A map of the 16-inch transmission main is in Appendix C.

Hydraulically, the installation of the new, redundant water main would increase the flow rate into the Garrett Tank from 61 GPM to 381 GPM.

Additional improvements include a four-inch water main relocation. The four-inch water main relocation is located on KY1238 near the Garrett

Tank. MCWD has experienced operational issues with maintenance on the existing line due to challenging topography and the location of existing appurtenances on the water main. Additionally, this is the only water main to serve multiple residential properties. With a history of leaks along the main, there is a lack of reliability to be able to serve MCWD customers. This project would relocate the four-inch main closer to the local road in a flatter area to allow MCWD more accessibility to their water main asset and away from suboptimal conditions. The new main would be reconnected to the existing eight-inch transmission main located along KY1238. A map of the four-inch relocation is in Appendix C.

4.1.2 Design Criteria

The design criteria for the pump station are derived mainly from the Kentucky Division of Water (KDOW) Recommended Standards for Water Works (2012) Manual. The criteria are listed below:

1. Maintain a minimum pressure of 20 pounds per square inch (psi) and a normal working pressure of at least 35 psi.
2. Valves should be spaced a minimum of one (1) mile apart in rural areas.
3. Distance between the water main and sewer crossings should be ten feet horizontally and 18 inches vertically.

4.1.3 Map

Overview maps of the proposed improvements are in Appendix C.

4.1.4 Environmental Impacts

On the Garrett Tank Site, tree removal would be required to install the new water main. However, the NEPA environmental review expressed no environmental hazards or concern within the site.

4.1.5 Land Requirements

Due to requirements from KYTC and locations of existing utilities, easements along the alignment route would be required. In total, ten (10) easements would be required. A majority would be located on properties with farmland or undeveloped land.

4.1.6 Potential Construction Problems

There are a variety of potential construction problems associated with the proposed alternative. First, rock excavation is expected along the project corridor; however, the quantity is unknown since no geotechnical investigation was performed. Additionally, multiple existing utilities including water, gas, and overhead and underground electric and telephone are parallel too and cross the proposed alignment. Therefore, the contractor will have to take extra care to not damage any existing utilities in the area.

Although the project corridor parallels existing roads, construction access could be a concern in some localized portions of the project due to significant grade changes between the road and location of the water main. Care would have to be taken by the contractor to plan out where and how they would access the site.

4.1.7 Sustainability Considerations

4.1.7.1 WATER AND ENERGY EFFICIENCY

New water main pipe would decrease the friction loss through the pipe compared to the existing water main. Therefore, the pumps at the Flaherty Pump Station would operate more efficiently due to less forces to overcome. A result of increased efficiency is decreased electrical load as the pumps would not have to operate for as much time.

4.1.8 Cost Estimates

The construction, non-construction, and O&M cost summaries are in Table 9. The total cost for this alternative would be $4,601,005. A breakdown of each estimate is in Appendix D.

Table 9: Improvement Element 1, Alternative 1 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$3,789,105
Non-Construction	$804,400
O&M	$7,500

4.2 Improvement Element 1, Alternative 2

4.2.1 Description

The Flaherty Transmission Main begins at the Flaherty Pump Station as a 12-inch main and continues along KY313 until the Flaherty Tank Site. Once near the tank site, the main reduces to 10-inch size. Between the Flaherty Tank Site and the KY313 and Brandenburg Road (KY144) intersection, the main switches between the east and west side of KY313. Once on KY144, the main reduces to an 8-inch size and is located on the east side of the road until the KY1238 intersection. The main is then located on the south side of KY1238 until it reaches the Garrett Tank Site. Throughout the entire alignment, the main is in KYTC right-of-way, County right-of-way, and easements. An overall map of the existing water main is in Appendix B.

The proposed improvements would install a new 16-inch water main between the Flaherty Tank Site and the Garrett Tank. The alignment of the new water main would follow the route for the existing Flaherty

Transmission Main. From the Flaherty Tank site to Brandenburg Road, the new alignment would be located on the west side of KY313 instead of the east side where the existing water main is located. The new water main would be located in both easement and right of way.

Along Brandenburg Road, the new alignment would be located on the west side of the road, opposite of the existing water main, primarily in easement. Once at KY1238, the alignment would cross to the north side of the road. It would continue along KY1238 on the north side of the road until it reaches the Garrett Tank Site.

In total, the 16-inch water main would be approximately 21,500 linear feet. The alignment would also include appurtenances such as valves, drains, and air release valves. A map of the 16-inch alignment is in Appendix C.

Hydraulically, the installation of the new, redundant water main would increase the flow rate into the Garrett Tank from 61 GPM to 381 GPM.

Additional improvements include a four-inch water main relocation and a six-inch water main extension. The four-inch water main relocation is located on KY1238 near the Garrett Tank. MCWD has experienced operational issues with maintenance on the existing line due to challenging topography and the location of existing appurtenances on the water main. Additionally, this is the only water main to serve multiple residential properties. With a history of leaks along the main, there is a lack of reliability to be able to serve MCWD customers. This project would relocate the four-inch main closer to the local road in a flatter area to allow MCWD more accessibility to their water main asset and away from suboptimal conditions. The new main would be reconnected to the existing eight-inch transmission main located along KY1238.

The six-inch water main extension would be located in both easement and KYTC right-of-way between US60 and KY1238 to the east of KY313. This line would be a “grid tie-in” to provide between water quality and eliminate a dead-end line within the system. Also, this section of road is a potential area for future development due to the vast farmland and open fields

Maps of the four-inch relocation and six-inch extension are in Appendix C.

4.2.2 Design Criteria

The design criteria for the pump station are derived mainly from the KDOW Recommended Standards for Water Works (2012) Manual. The criteria are listed below:

1. Maintain a minimum pressure of 20 psi and a normal working pressure of at least 35 psi.
2. Valves should be spaced a minimum of one (1) mile apart in rural areas.
3. Distance between the water main and sewer crossings should be ten feet horizontally and 18 inches vertically.

4.2.3 Map

Overview maps of the proposed improvements are in Appendix C.

4.2.4 Environmental Impacts

On the Garrett Tank Site, tree removal would be required to install the new water main. However, the NEPA environmental review expressed no environmental hazards or concern within the site.

4.2.5 Land Requirements

Due to requirements from KYTC and locations of existing utilities, easements along the alignment route would be required. In total, 43 easements would be required. Easements would be obtained from a variety of residential, commercial, and farm properties.

4.2.6 Potential Construction Problems

Construction along Brandenburg Road would present a variety of issues. First, field observations showed gas service in the front of every residential property along the road. These services, along with existing water services, would increase the contractor's risk in the area. Additionally, with a relatively small right-of-way, the proposed alignment would be closer to homes and infrastructure that would create more confined limits for the contractor compared to a normal operation. Lastly, the intersection of Brandenburg Road and KY1238 has commercial properties at each corner with small widths between the building and road. Therefore, construction through this area would be challenging and disruptive.

4.2.7 Sustainability Considerations

4.2.7.1 WATER AND ENERGY EFFICIENCY

New water main pipe would decrease the friction loss through the pipe compared to the existing water main. Therefore, the pumps at the Flaherty Pump Station would operate more efficiently due to less forces to overcome. A result of increased efficiency is decreased electrical load as the pumps would not have to operate for as much time.

4.2.8 Cost Estimates

The construction, non-construction, and O&M cost summaries are in Table 10. The total cost for this alternative would be $5,681,515. A breakdown of each estimate is in Appendix D.

Table 10: Improvement Element 1, Alternative 2 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$4,702,615
Non-Construction	$968,400
O&M	$10,500

4.3 Improvement Element 2, Alternative 1

4.3.1 Description

The current Flaherty Pump Station operates with an N+1 configuration with end suction, 60 horsepower (HP) centrifugal pumps both rated at 1000 GPM at 169 total dynamic head (TDH). The suction side of the pump station is fed by the KY313 interconnect. The discharge side of the pump station is the Flaherty Transmission main which send water to much of the MCWD system.

Proposed improvements at the Flaherty Pump Station included replacing the existing pumps, generator, and electrical equipment. The new 125 HP pumps would have an operating point of 1205 GPM at 237 TDH.

4.3.2 Design Criteria

The design criteria for the pump station are derived mainly from the KDOW Recommended Standards for Water Works (2012) Manual. The criteria are listed below:

1. Negative pressure would not be produced on the suction lines.
2. The automated shutoff or low-pressure controller would maintain at least 20 psi in the suction line under all operating conditions.
3. A bypass line is available in the system.
4. At least two pumps would be provided with capabilities that peak demand can be met with the largest pump out of service.

4.3.3 Map

A location map of the existing pump station is located in Appendix C.

4.3.4 Environmental Impacts

No environmental impacts are identified for this alternative.

4.3.5 Land Requirements

No additional properties or easements are required for this alternative.

4.3.6 Potential Construction Problems

The existing pump station is quickly approaching maximum buildout. Therefore, the work area is very confined to install new pumps. With a non-removable roof, the contractor would have to utilize the existing double doors for entry and exit to the pump station. Because of the limited access and confined work area, construction progress could be slower than expected.

4.3.7 Sustainability Considerations

4.3.7.1 WATER AND ENERGY EFFICIENCY

New pumps and electrical equipment should lead to better operational efficiency for the pump station. As a result, less energy will be used over time resulting in a more sustainable pump station.

4.3.8 Cost Estimates

The construction, non-construction, and O&M cost summaries are in Table 11. The total cost for this alternative would be $779,650. A breakdown of each estimate is in Appendix D.

Table 11: Improvement Element 2, Alternative 1 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$451,000
Non-Construction	$207,650
O&M	$121,000

4.4 Improvement Element 2, Alternative 2

4.4.1 Description

The current Flaherty Pump Station operates with an N+1 configuration with end suction, 60 horsepower (HP) centrifugal pumps both rated at 1000 GPM at 169 total dynamic head (TDH). The suction side of the pump station is fed by the KY313 interconnect. The discharge side of the pump station is the Flaherty Transmission main which feeds much of the MCWD system.

Because of the limited space within the existing Flaherty Pump Station, a new redundant pump station was proposed. A new packaged pump station would allow MCWD the ability to substantially increase pumping capacity immediately and plan for future upgrades to further enhance the pumping capacity into the system.

4.4.2 Design Criteria

The design criteria for the pump station are derived mainly from the KDOW Recommended Standards for Water Works (2012) Manual. The criteria are listed below:

1. Negative pressure would not be produced on the suction lines.
2. The automated shutoff or low-pressure controller would maintain at least 20 psi in the suction line under all operating conditions.
3. A bypass line is available in the system.
4. At least two pumps would be provided with capabilities that peak demand can be met with the largest pump out of service.

4.4.3 Map

A map of the proposed location of the pump station is in Appendix C.

4.4.4 Environmental Impacts

No environmental impacts are identified for this alternative.

4.4.5 Land Requirements

This alternative would require the acquisition of a neighboring property or a property within close proximity to the existing Flaherty Pump Station. Based on field observations, there is one property to the east that would be a candidate for the new site. However, the purchasing of this site would be dependent on the current owner's willingness to sell.

4.4.6 Potential Construction Problems

The size of the potential site would be limited due to the neighboring residential area to the south and east, KY 313 right of way to the north, and the existing Flaherty Pump Station to the west. Therefore, construction space for the new pump station would be small which would potentially increase the construction cost for contractors.

4.4.7 Sustainability Considerations

4.4.7.1 WATER AND ENERGY EFFICIENCY

The new, correctly sized pump station would provide a more energy efficient HVAC and electrical design. With a slightly larger building to accommodate the bigger pumps, the HVAC system can adequately cool the area and not lead to overheating the pump station. As a result, less energy may be used since the HVAC would not have as much strain as the current one on electrical loads.

4.4.8 Cost Estimates

The construction, non-construction, and O&M cost summaries are in Table 12. The total cost for this alternative would be $1,503,500. A breakdown of each estimate is in Appendix D.

Table 12: Improvement Element 2, Alternative 2 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$1,050,000
Non-Construction	$332,500
O&M	$121,000

4.5 Improvement Element 3, Alternative 1

4.5.1 Description

Fed by the Brandenburg Pump Station, the Payneville Tank experiences significant issues filling completely. Standard operation of the system currently sees almost constant drafting of the Payneville Tank. A solution for this issue is constructing a new pump station closer to the tank and adding two (2) control valves in strategic locations within the service area.

The Payneville Pump Station would be located along KY-144 approximately three (3) miles east of the existing Payneville Tank. Designed as a package pump station, the pump station would include 10” suction and discharge lines, two (2) 20 HP pumps each rated at 350 GPM at 125 TDH, generator, and electrical equipment. Also located at the site would be a bulk water filling station for MCWD customers. A pre-paid station would allow customers to fill personal tanks at cost per gallon structure.

In order for the Payneville Tank to perform better hydraulically with water quality and turnover, two (2) control valves would be located within the service area of the tank. The locations were selected based on eliminating recirculation of water while the pump station is operating. The two valves would be located on Midway Road (KY1239) near Sirocco Road and on New Highland Church Road near Battletown Road (KY228). The locations for the new pump station and two control valves are shown on a map in Appendix C.

4.5.2 Design Criteria

The design criteria for the pump station are derived mainly from the KDOW Recommended Standards for Water Works (2012) Manual. The criteria are listed below:

1. Negative pressure would not be produced on the suction lines.
2. The automated shutoff or low-pressure controller would maintain at least 20 psi in the suction line under all operating conditions.
3. A bypass line is available in the system.
4. At least two pumps would be provided with capabilities that peak demand can be met with the largest pump out of service.

The design criteria for the exterior improvements includes providing ample site security for the pump station for MCWD, adequate room for the water filling station customers to navigate the site, minimizing the quantity of earthmoving activities on the site, and designing a water filling station that is pre-paid and maintenance free.

4.5.3 Map

A location map of the new pump station and control valves is located in Appendix C.

4.5.4 Environmental Impacts

No environmental impacts are identified for this alternative.

4.5.5 Land Requirements

The proposed location for the Payneville Pump Station is located on an existing residential property. MCWD purchased the southeast corner of the property around December 2023 and currently owns the 0.50-acre site.

4.5.6 Potential Construction Problems

The proposed site for the Payneville Pump Station is the corner of a current residential property. However, there is no existing entrance for the new property location. Therefore, the new entrance will require an encroachment permit from Kentucky Transportation Cabinet (KYTC).

Also, the proposed location of the pump station has significant grade change from the road to the edge of the property. As a result, significant site grading would occur to bring the proposed grade closer to the road elevation. Close to the property are multiple sinkholes and drainage ditches. The contractor would have to closely monitor site conditions to ensure the sinkholes do not enlarge or significant water ponding occurs on site during construction.

4.5.7 Sustainability Considerations

4.5.7.1 WATER AND ENERGY EFFICIENCY

A new pump station closer to the Payneville Tank would reduce the electrical and HVAC demand at the Brandenburg pump station. By reducing the strain on the existing pumps, the heat loads on the pumps would be reduced. Therefore, the pump station could perform more efficiently.

4.5.8 Cost Estimates

The construction, non-construction, and O&M cost summaries are in Table 13. The total cost for this alternative would be $1,041,870. A breakdown of each estimate is in Appendix D.

Table 13: Improvement Element 3, Alternative 1 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$709,470
Non-Construction	$281,400
O&M	$51,000

4.6 Improvement Element 3, Alternative 2

4.6.1 Description

The Brandenburg Pump Station was originally designed to provide flows to the surrounding area via an interconnect with the City of Brandenburg. However, to better operate the overall system, MCWD currently uses the pump station to fill the Payneville Tank. Because the pump station is not adequately sized and located to fill the tank, the time to fill the tank is too long to meet the usage rates of the system. Additionally, the area around the Brandenburg Pump Station has many dead-end lines that service local roads and small neighborhoods. Therefore, pressures within the system around the tank are lower than desired and water quality is not to the highest standard.

A solution to the issue of improving storage capacity of the Payneville Tank is to rehabilitate the Brandenburg Pump Station. The current pump station has one pump operating at 452 GPM at 210 TDH. Because the pumps were not originally sized to operate as the fill pumps for the Payneville Tank, they would be upsized to provide increased flow to the system at the appropriate head conditions.

Additionally, the current site includes a bulk water filling station that is a cash-based payment system. This would be upgraded with credit card or pre-paid capabilities to allow for easier maintenance of the system by MCWD.

4.6.2 Design Criteria

The design criteria for the pump station are derived mainly from the KDOW Recommended Standards for Water Works (2012) Manual. The criteria are listed below:

1. Negative pressure would not be produced on the suction lines.
2. The automated shutoff or low-pressure controller would maintain at least 20 psi in the suction line under all operating conditions.
3. A bypass line is available in the system.
4. At least two pumps would be provided with capabilities that peak demand can be met with the largest pump out of service.

The design criteria for the exterior improvements includes providing adequate room for the water filling station customers to navigate the site and designing a water filling station that is pre-paid and maintenance free.

4.6.3 Map

A location map of the Brandenburg Pump Station is in Appendix C.

4.6.4 Environmental Impacts

No environmental impacts are identified for this alternative.

4.6.5 Land Requirements

No additional properties or easements are required for this alternative.

4.6.6 Potential Construction Problems

Because the existing pump station was not designed for larger pumps required for pumping to the Payneville Tank, space inside the pump station will be limited. The cost of construction could be elevated due to more confined working conditions.

4.6.7 Sustainability Considerations

No sustainable practices were considered for this alternative.

4.6.8 Cost Estimates

The construction, non-construction, and O&M cost summaries are in Table 14. The total cost for this alternative would be $578,550. A breakdown of each estimate is in Appendix D.

Table 14: Improvement Element 3, Alternative 2 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$357,000
Non-Construction	$163,550
O&M	$58,000

4.7 Improvement Element 4, Alternative 1

4.7.1 Description

Based off previous inspection recommendations, multiple improvements at the Garrett Tank would be proposed to extend the useful life and improve performance of the tank. For the interior of the tank, a full abrasive blast would be performed, and a new three-part coating system would be installed. On the exterior, spot repairs on corrosion areas would be performed, concrete support would be added to the six-inch overflow pipe, and dirt would be added below the riser foundation. Power washing of the exterior would also be performed to remove all loose material and debris.

The Payneville Tank would have similar improvements as the Garrett Tank. For the interior improvements, a full abrasive blast would be performed, and a new three-part coating system would be installed. On the exterior of the tank, spot repairs on corrosion areas would be performed, an antenna corral would be installed, the antennas would be relocated from the balcony handrail, and minor grading would be performed to improve site drainage.

4.7.2 Design Criteria

Improvements made to the tank would need to extend the useful life of the tanks by 20-25 years.

4.7.3 Map

A location map of the two (2) tanks is in Appendix C.

4.7.4 Environmental Impacts

No environmental impacts are identified for this alternative.

4.7.5 Land Requirements

No additional properties or easements are required for this alternative.

4.7.6 Potential Construction Problems

Because the storage tanks are elevated and are constantly filled with water, contractors would have to handle working within a confined space, isolating the tank from the water system, and determining the best approach to bring equipment to the top of the tanks. Additionally, MCWD will have to coordinate their operations to ensure the water system can operate correctly without the ability to use one or both tanks.

4.7.7 Sustainability Considerations

4.7.7.1 OTHER

Because the water tanks are exposed to the environment, all products used on the exterior of the tank are not hazardous to the surrounding environment. Additionally, by cleaning the exterior, unwanted bacteria, algae, and other organisms are not given an environment to grow.

4.7.8 Cost Estimates

The construction, non-construction, and O&M cost summaries are in Table 15. The total cost for this alternative would be $748,200. A breakdown of each estimate is in Appendix D.

Table 15: Improvement Element 4, Alternative 1 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$608,000
Non-Construction	$121,200
O&M	$19,000

4.8 Improvement Element 4, Alternative 2

4.8.1 Description

This alternative is described as “No Action”. The current MCWD tanks are performing to water quality standards and are providing adequate capacity compared to the design volumes. Additionally, the costs to construct new tanks at or near the sites of the current Garrett and Payneville Tank sites would be financially unfeasible. Because MCWD is still meeting their water quality limits and are able to continue using their tanks, no action would be a viable solution.

4.8.2 Design Criteria

No design criteria are included for this alternative.

4.8.3 Map

No map is included for this alternative.

4.8.4 Environmental Impacts

No environmental impacts are identified for this alternative.

4.8.5 Land Requirements

No additional properties or easements are required for this alternative.

4.8.6 Potential Construction Problems

No construction problems are expected for this alternative.

4.8.7 Sustainability Considerations

No sustainability practices were considered with this alternative.

4.8.8 Cost Estimates

The cost for this alternative would be $0.

5.0 Selection of Alternative

5.1 Life Cycle Cost Analysis

A summary table of the Life Cycle Cost Analysis for all alternatives is in Table 16. A detailed breakdown of each alternative is located in Appendix E.

Table 16: Life Cycle Cost Analysis Summary

Alternative	Net Present Value
Improvement Element 1, Alternative 1	$4,119,413
Improvement Element 1, Alternative 2	$5,157,075
Improvement Element 2, Alternative 1	$2,597,571
Improvement Element 2, Alternative 2	$3,226,295
Improvement Element 3, Alternative 1	$1,776,504
Improvement Element 3, Alternative 2	$1,412,054
Improvement Element 4, Alternative 1	$1,025,875

5.2 Non-Monetary Factors

Multiple non-monetary factors are influential in the comparison of each alternative. Table 17 provides a comparative analysis for each Improvement Element and Alternative.

Table 17: Non-Monetary Factors Comparison

Improvement Element 1	
	Non-Monetary Factor
Alternative 1	This alignment is near or on farmland for much of the length. Minor residential impacts are expected.
Alternative 2	A major portion of the project will be within dense residential areas. This would cause major disruption to the community and directly impact their day to day lives.
Improvement Element 2	
	Non-Monetary Factor
Alternative 1	No additional impacts would be made to the surrounding residential areas. All work is located within the existing MCWD property.
Alternative 2	A new pump station building would encroach further on the neighboring residential properties. A second pump station would lead to increased noise in the area and remove useable green space for the community.
Improvement Element 3	
	Non-Monetary Factor
Alternative 1	A new pump station and bulk water filling station would provide easier access for customers to fill up their water tanks compared to the existing water filling station. Additionally, the hydraulic performance of the MCWD system would improve drastically as the existing pump station would be used as it was intended.
Alternative 2	Reusing the Brandenburg Pump Station would continue hydraulic inefficiency within the MCWD system. Additionally, the water filling station location on site is not user friendly for the customers.
Improvement Element 4	
	Non-Monetary Factor
Alternative 1	A recoating of the water tanks improves the public image of the utility. By cleaning and recoating the tanks, it is a visual representation and reminder of MCWD delivering clean and safe drinking water to its customers.

6.0 Proposed Project (Recommended Alternative)

Based on the results of the life cycle cost analysis and the non-monetary factors of the project, the recommended alternative for the project includes the following improvement elements:

1. Improvement Element 1, Alternative 1
2. Improvement Element 2, Alternative 1
3. Improvement Element 3, Alternative 1
4. Improvement Element 4, Alternative 1

An overall map of the proposed improvement locations and proposed process flow diagram are in Appendix F.

6.1 Preliminary Project Design

The preliminary design of Improvement Element 1, Alternative 1 would include approximately 19,500 linear feet of 16-inch transmission main starting at the Flaherty Tank on KY 313 and ending at the Garrett Tank on KY 1238. The design would also feature multiple bore and jack installations under state roads, cross connections to the existing distribution system, and stub outs for future connections.

The preliminary design of Improvement Element 2, Alternative 1 would rehabilitate the existing Flaherty Pump Station with new, larger pumps and updated electrical equipment. The existing two (2) pumps inside the pump station would be upsized to two (2) 125 HP pumps. The electrical equipment including the generator, control panels, VFDs, and service drop from the electric utility would be upsized to meet the demand of the new pumps.

The preliminary design of Improvement Element 3, Alternative 1 would include a new packaged pump station with two (2) 20 HP pumps, 10-inch suction and discharge lines, and new electric service. Additional site improvements include mass site grading and a bulk water filling station for customers. Located along KY-144 near the Payneville Tank, a new entrance would be installed on the north side of the road.

The preliminary project design of Improvement Element 4, Alternative 1 would include the interior and exterior improvements for the Garrett and Payneville Tanks. On the interior, an abrasive blast and recoating would be applied. For the exterior, spot repairs on corrosion areas and other miscellaneous repairs and improvements would be completed.

6.2 Project Schedule

The proposed project schedule is in Table 18. These dates would change based on the approval of this report and acceptance of the required documentation within the Rural Development portal.

Table 18: Proposed Project Schedule

Project Milestone	Projected Date
Submittal of Required Documents	Beginning of March 2025
Preliminary Engineering Report Approval	Mid-February 2025
RD Approval of Required Documents	End of April 2025
Easement Acquisition	End of February 2025
Permit Approvals (KDOW, KYTC)	End of February 2025
Advertisement for Bid	Mid-May 2025
Loan Closing	End of June 2025
Contact Award	End of June 2025
Initiation of Construction	Early September 2025
Substantial Completion	Mid-July 2026
Final Completion	Mid-August 2026
Initiation of Operation	Mid-July 2026

6.3 Permit Requirements

Multiple permits would be required for the proposed project. The required permits are as follows:

1. Kentucky Division of Water (KDOW) Construction Application for Drinking Water Distribution (Form DW-1)
2. KYTC State Encroachment Permit

6.4 Sustainability Considerations

Although no direct sustainable practices are proposed with the project, a variety of indirect sustainability considerations were made regarding the project. First, newer, more efficient pumps were selected which will increase the efficiency of the system and decrease the electrical load needed. This would decrease energy costs and also lead to longer lifespans for the pumps. Additionally, new pipelines are constructed with more environmentally friendly materials compared to older pipes and can still last for up to 80 years underground. As a result, there is less impact to the ground around the pipe and less concern for unknown chemicals leaking into the environment.

6.5 Total Project Cost Estimate

Table 19 below summarizes the Engineer's Opinion of Probable Cost for the project including but not limited to construction, land and right-of-way purchasing, engineering, and equipment.

Table 19: Total Project Cost Estimate

Cost Classification		Engineer's Estimate
1	Administrative Expenses	$15,000
2	Legal Expenses	$32,000
3	Land, Appraisals, and Easements	$20,000
4	Relocation Expenses and Payments	
5	Planning	$45,000
6	Engineering Fees – Design	$338,500
7	Engineering Fees – Construction	$81,300
8	Engineering Fees – Inspection	$212,000
9	Engineering Fees – Other	$85,000
10	Construction	$5,536,000
11	Miscellaneous	$50,000
12	Contingencies	$560,000
	Total	$6,974,800

6.6 Annual Operating Budget

6.6.1 Income

Almost of the income taken in by MCWD is generated from customer billings. In order to meet the needed income to meet payments on existing and proposed debts, a rate increase is proposed. Table 20 below provides the proposed rate increase for MCWD customers.

Table 20: Proposed Rate Schedule

Usage Category	Rate	Unit
All Meter Sizes		
First 2,000 gallons	32.50	Minimum Bill
Next 5,000 gallons	0.013652	Per gallon
Next 10,000 gallons	0.013196	Per gallon
Next 20,000 gallons	0.012168	Per gallon
Over 37,000 gallons	0.010719	Per gallon
Wholesale Rates		
Doe Valley	0.007191	Per gallon
Otter Creek and Fort Knox	0.007363	Per gallon

Currently, MCWD serves 5,609 residential and commercial customers and three (3) wholesale customers. As a result of this project, no new customers are expected to be served directly. A few existing services will be transferred to the new transmission main. For the service area, overall water quality will be enhanced to all customers. Table 21 below shows projected income from existing customers for the first fiscal year after the completion of this project.

Table 21: Projected Income Based on Existing Customers

Usage Tier	Average Customer	Total Usage (gal)	Tier Rate ($/gal)	Total Revenue
0	186		32.50	$72,540
1 – 2,000 gal	1,754	22,670,265	32.50	$684,060
2,001 – 7,000 gal	3,168	142,618,548	0.013652	$1,947,028
7,001 – 17,000 gal	442	50,799,267	0.013196	$670,347
17,001 – 37,000 gal	48	13,546,207	0.012168	$164,830
37,001 – 1M+ gal	11	14,874,778	0.010719	$159,443
Wholesale Rates				
Doe Valley	1	72,000,000	0.007191	$517,752
Otter Creek and Fort Knox	2	4,500,000	0.007363	$33,134
Totals	5,612	321,009,065		$4,249,134

Using the 1.0% year over year population increase as described earlier, the revenue created by existing customers was updated to reflect the population growth experienced once this project is complete. Table 22 below provides of breakdown of the increased revenue.

Table 22: Projected Income Based on Proposed Customers

Usage Tier	Average Customer	Total Usage (gal)	Tier Rate ($/gal)	Total Revenue
0	188			$73,320
1 – 2,000 gal	1772	22,896,968		$691,080
2,001 – 7,000 gal	3200	144,044,733	0.013652	$1,966,499
7,001 – 17,000 gal	447	51,307,260	0.013196	$677,051
17,001 – 37,000 gal	49	13,681,669	0.012168	$166,479
37,001 – 1M+ gal	12	15,023,526	0.010719	$161,037
Wholesale Rates				
Doe Valley	1	72,000,000	0.007191	$517,752
Otter Creek and Fort Knox	2	4,500,000	0.007363	$33,134
Totals	5,612	323,454,156		$4,286,351

6.6.2 Annual O&M Costs

Compared to MCWD's existing O&M costs, the proposed costs after the improvements are installed would not be significantly more. Since most of the improvements are rehabs, or replacements, MCWD would expect to see only a slight increase in O&M costs. The following Table 23 provides a breakdown of the proposed O&M costs associated with the distribution system. This table is a direct comparison to the "Distribution" section of Table 6.

Table 23: Projected O&M Costs By Expense Category

O&M Expense Category	Yearly Cost
Water Purchased	$935,000
Personnel	$615,000
Repairs and Maintenance	$135,900
Contractual Services	$71,000
Utilities	$70,000
Other	$571,030
Total	$2,397,930

In comparison, the proposed O&M costs result in an increase of $107,806.

6.6.3 Debt Repayments

MCWD is current paying off multiple debts for previous project financing. Table 24 provides the annual requirements to amortize bonds outstanding as of December 31, 2023. Table 25 provides the annual requirements to amortize direct borrowing notes outstanding as of December 31, 2023.

Table 24: Existing Bonds Annual Repayments

Year Ending December 31,	Principle Payment	Interest Payment	Total Payment
2024	$153,408	$153,435	$306,843
2025	$151,408	$149,571	$300,979
2026	$158,408	$145,689	$304,097
2027	$160,408	$141,686	$302,094

Table 25: Existing Direct Borrowing Notes Annual Repayments

Year Ending December 31,	Principle Payment	Interest Payment	Total Payment
2024	$98,444	$9,493	$107,936
2025	$46,334	$6,657	$52,991
2026	$45,074	$5,324	$50,398
2027	$46,436	$3,961	$50,397

The sole source of funding for this project is the Rural Development Loan. Based off a $6,974,800 loan amount with a 4.00% interest rate over 40 years, Table 26 provides the annual interest and principal payments MCWD expects to pay on the loan.

Table 26: Proposed Financing Annual Repayments for RD Loan

Payment Year	Interest Payment	Principal Payment
2025	$280,992.00	$73,925.41
2026	$278,034.98	$76,882.43
2027	$274,959.69	$79,957.72
2028	$271,761.38	$83,156.03

6.6.4 Reserves

According to the 2023 Audit of MCWD, the District is required to keep reserves for three (3) bond resolutions. The type of reserve, required amount, and current balance are located in Table 27. All balances are current as of December 31, 2023.

Table 27: Reserve Accounts

Reserve Name	Current Balance	Required Balance
Depreciation Reserve Fund	$45,540	$45,540
Maintenance and Replacement Fund	$148,000	$148,000
Bond and Interest Sinking Fund	$391,505	$272,629

The MCWD system has short-lived assets mainly within the pump stations including the pumps and pump controls. The costs associated with service lines and meters and transmission main maintenance are provided within the annual operation and maintenance costs. Table 28 below provides a breakdown of each short-lived asset.

Table 28: Short Lived Assets

Short-Lived Asset	Useful Life	Replacement Cost	Annual Reserve
Flaherty Pump Station Rehab	10 Years	$100,000	$10,000
Payneville Pump Station Rehab	10 Years	$30,000	$3,000

MCWD will be required to fund a short-lived assets reserve account. The recommended annual payment into the account should total $13,333. The funds would be used by MCWD as needed to replace or add short-lived assets to the system.

7.0 Conclusion and Recommendations

The proposed project includes upsizing the existing Flaherty Pump Station and Flaherty Transmission Main. Additional improvements include a new pump station near the Payneville Tank and new control valves to facilitate water turnover within the Payneville Tank. In the future, additional projects should focus on additional interconnections with HCWD1 and upsizing storage within the system. MCWD should also consider system-wide upgrades to their SCADA system to improve operational efficiency. With the added infrastructure, being able to control and monitor the distribution system would be paramount. All these projects would provide more resiliency for the system and further reduce the system's vulnerability for failure.

8.0 Appendices

- Appendix A: Overall County Map and Existing Process Flow Diagram
- Appendix B: Existing Flaherty Transmission Main Alignment
- Appendix C: Improvement Element Location Maps
- Appendix D: Improvement Element Cost Estimates
- Appendix E: Life Cycle Cost Analysis
- Appendix F: Overall Proposed Improvement Maps and Proposed Process Flow Diagram
- Appendix G: Meade County Water District 2023 Financial Audit

Appendix A – Overall County Map and Existing Process Flow Diagram

Legend

PS Pump Stations

M Master Meter

Tanks

Waterlines

- 4
- 6
- 8
- 10
- 12
- 16

DATA SOURCE: Meade County Water District GIS

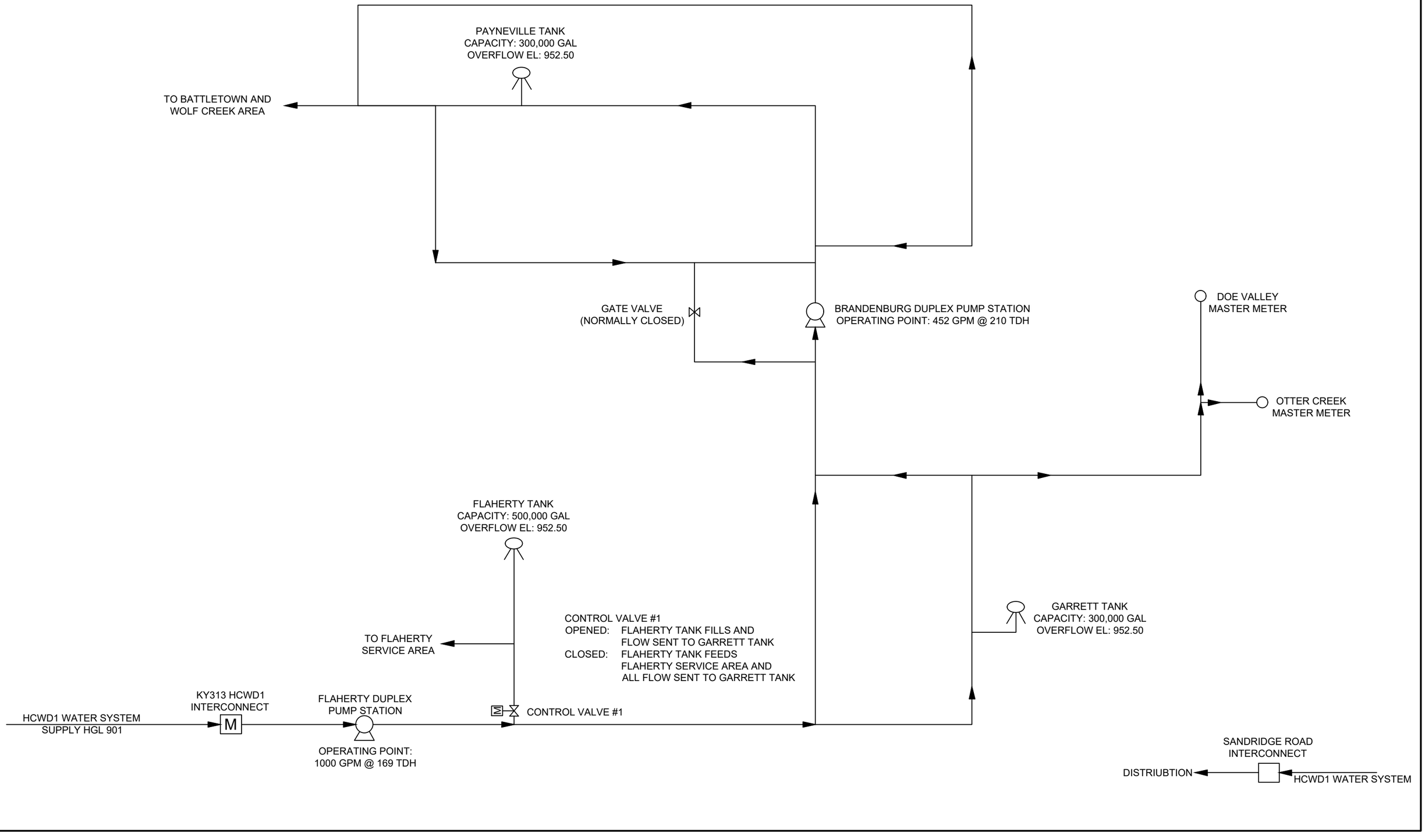
0 Miles 2.5

Alton
Wolf Creek
Beechland
Battletown
Titus
Lodale
Central
Rhodelia
Payneville
Sirocco
Brandenburg
Yellowbank Wildlife Management Area
Webster
Midway
Ekron
Muldraugh
Rome
Stephensport
Sample
Irvington
Basin Spring
Bewleyville
Radcliff
Big Spring
Fort K
Va

135
11
1230
60
144
376
79
448
1638
313
31W
259

Maxar, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA, USFWS

EXISTING MEADE COUNTY WATER DISTRICT DISTRIBUTION MAP



MEADE COUNTY WATER DISTRICT
EXISTING PROCESS FLOW DIAGRAM

Appendix B – Existing Flaherty Transmission Main

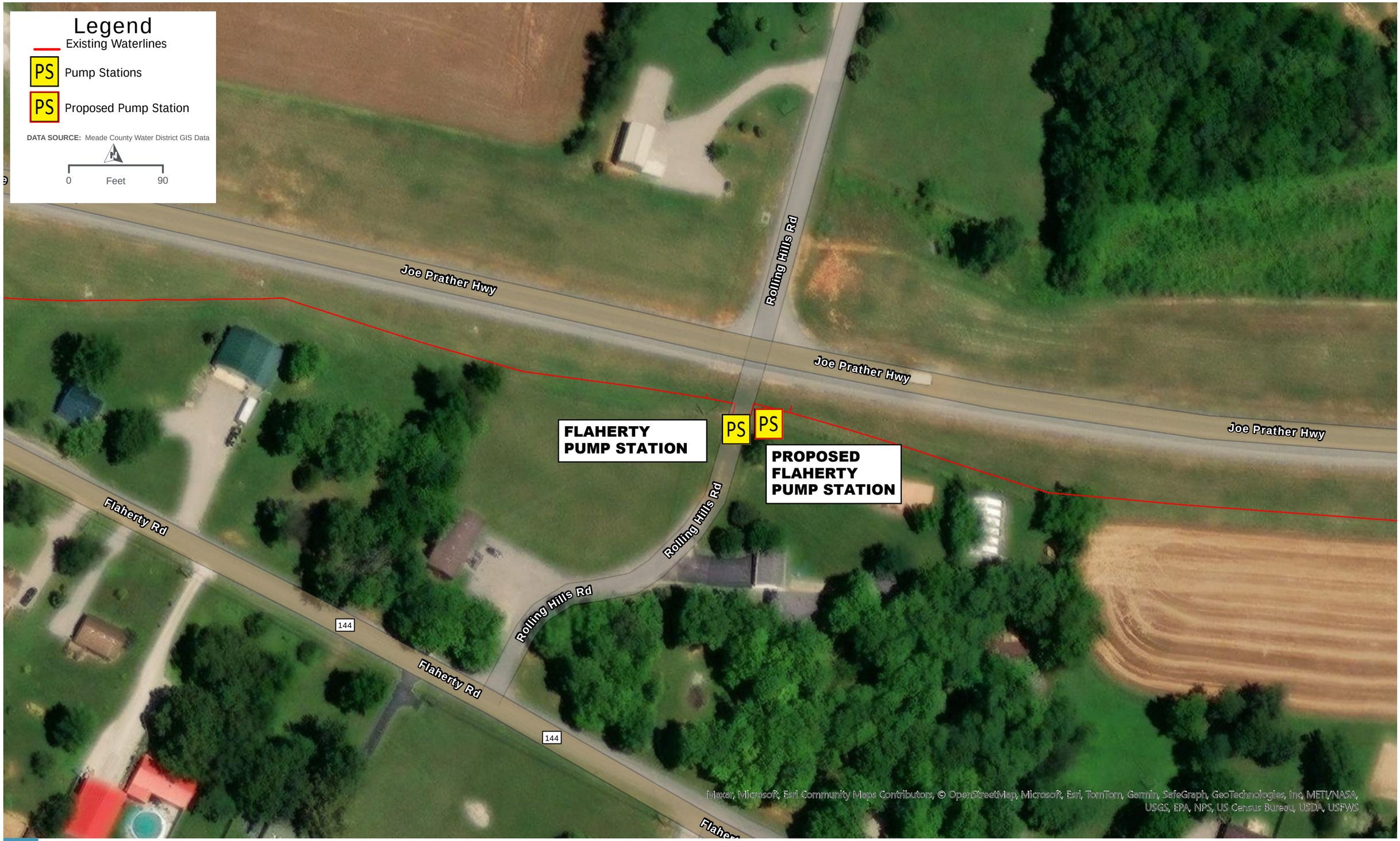
EXISTING FLAHERTY TRANSMISSION MAIN

Appendix C – Improvement Element Location Maps


Legend
Existing Waterlines
Tanks
MCWD-Water System Improvements
4" Relocation
DATA SOURCE: Meade County Water District GIS Data
N
0
Feet
2,000
GARRETT TANK
FLAHERTY TANK
Garrett
Hog Wallow
Garrett Rd
Brandenburg Rd
Prather Hwy
Payne Rd
Osborne Rd
Madison Ave
Scenic Dr
Thompson Ln N
Stanley Allen Dr
Sunset Dr
Hobbs Reesor Rd
Tiptop Rd
Robins Dr
Warren Ct
Old 60 Ln
Highway 60
Foushee Hill Rd
1238
Shawn Ln
Redmon Rd
Whelan Rd
Shot Hunt Rd
Swan Ln
Shircliffe Rd
Joe Prather Hwy
Stith Valley Rd
Black Jack Rd
Banks Rd
Snelling Rd
Big Spring Rd
Maxar, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

IMPROVEMENT ELEMENT 1: ALTERNATIVE 2 PROPOSED IMPROVEMENTS

IMPROVEMENT ELEMENT 2: ALTERNATIVE 1 PROPOSED IMPROVEMENTS



IMPROVEMENT ELEMENT 2: ALTERNATIVE 2 PROPOSED IMPROVEMENTS

IMPROVEMENT ELEMENT 3: ALTERNATIVE 1 PROPOSED IMPROVEMENTS

Legend

Existing Waterlines

PS Pump Stations

DATA SOURCE: Meade County Water District GIS Data

N

0 Feet 470

Burger King

Domino's

Big Lots

Advance Auto Parts

Bypass Rd

Broadway St

Bypass Rd

941

Cedar Hill Rd

Four Oaks Rd

Ruthie Ct

Shannon Ln

Miles Ln

Ghent Rd

448

PS

BRANDENBURG PUMP STATION

Shamrock Rd

Nelson Ln

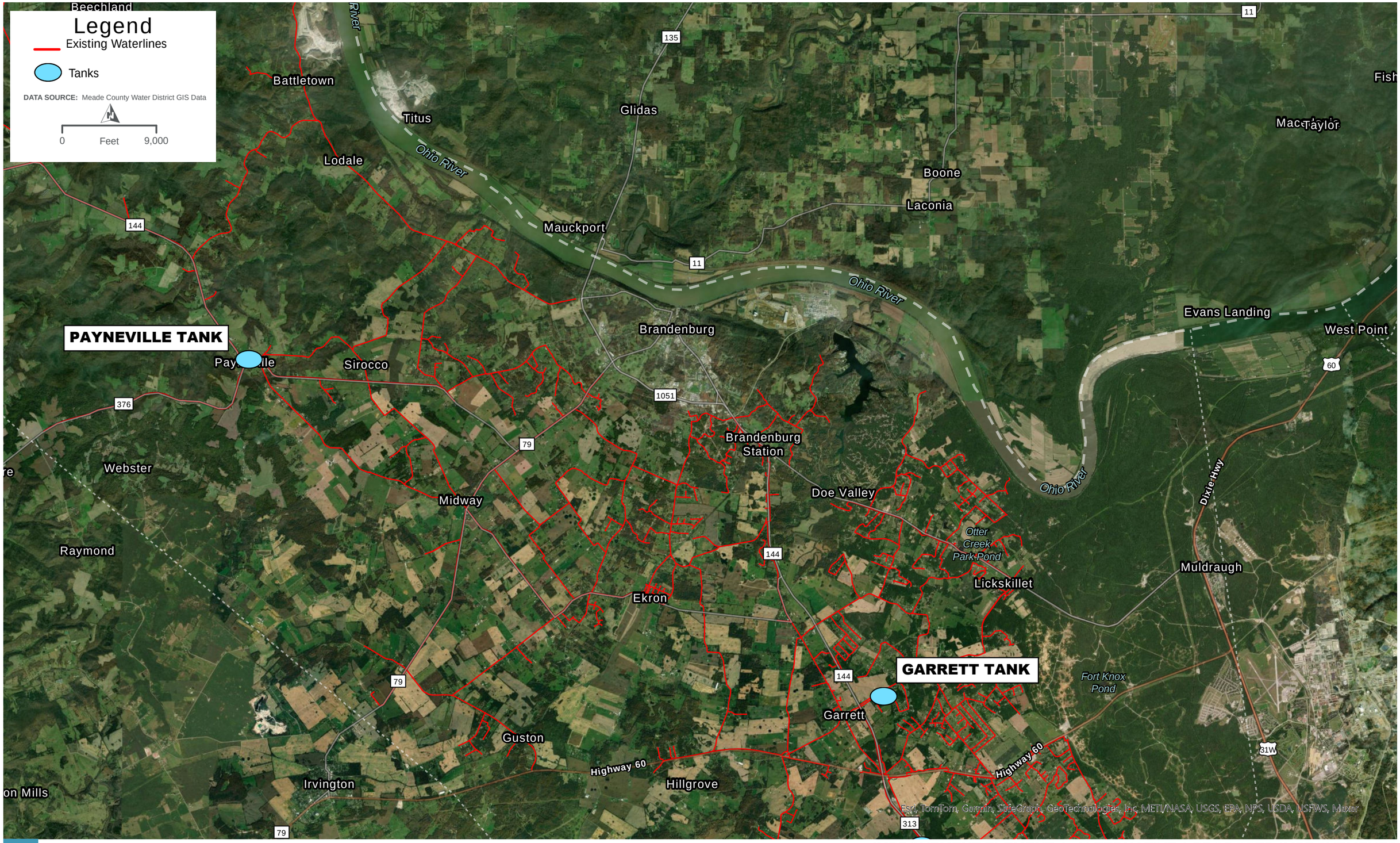
Old Ekron Rd

Quail Run Rd

Wise Rd

White Rose St

IMPROVEMENT ELEMENT 3: ALTERNATIVE 2 PROPOSED IMPROVEMENTS



IMPROVEMENT ELEMENT 4: ALTERNATIVE 1 PROPOSED IMPROVEMENTS

Appendix D – Improvement Element Cost Estimates

Improvement Element 1, Alternative 1 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
6" Water Main	82	LF	$ 60	$ 4,920
8" Water Main	84	LF	$ 80	$ 6,720
10" Water Main	17	LF	$ 90	$ 1,530
12" Water Main	52	LF	$ 105	$ 5,460
16" Water Main	19,480	LF	$ 135	$ 2,629,800
24" Steel Encasement - Bored	820	LF	$ 650	$ 533,000
24 Steel Casing - Open Cut	60	LF	$ 400	$ 24,000
6" MJ Gate Valve	2	EA	$ 1,525	$ 3,050
8" MJ Gate Valve	3	EA	$ 2,100	$ 6,300
10" MJ Gate Valve	1	EA	$ 3,125	$ 3,125
16" MJ Butterfly Valve	15	EA	$ 5,500	$ 82,500
Connect to Ex. 6" Water Main (Cut-in)	1	EA	$ 5,500	$ 5,500
Connect to Ex. 8" Water Main (Cut-in)	3	EA	$ 6,500	$ 19,500
8" Tapping Sleeve and Valve	1	EA	$ 3,750	$ 3,750
10" Tapping Sleeve and Valve	2	EA	$ 4,500	$ 9,000
12" Tapping Sleeve and Valve	1	EA	$ 5,750	$ 5,750
6" Fire Hydrant	6	EA	$ 3,850	$ 23,100
2" Air Release Valve	6	EA	$ 1,800	$ 10,800
Transfer Existing Water Service	4	EA	$ 3,500	$ 14,000
Install New Water Service	3	EA	$ 1,500	$ 4,500
Meter Relocate	2	EA	$ 2,500	$ 5,000
Reconfigure 8" Water Main	1	LS	$ 5,000	$ 5,000
Line C - Walnut Grove Road Reconnect	1	LS	$ 15,000	$ 15,000
Gravel Driveway Restoration	430	SY	$ 40	$ 17,200
Asphalt Driveway Restoration	160	SY	$ 60	$ 9,600
Site Restoration	36,000	SY	$ 0.75	$ 27,000
Mobilization	1	LS	$ 139,000	$ 139,000
Erosion Control	1	LS	$ 70,000	$ 70,000
Traffic Control	1	LS	$ 70,000	$ 70,000
Demobilization	1	LS	$ 35,000	$ 35,000
Total				$ 3,789,105
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ 16,000
Engineering - Design and Inspection				$ 220,000
Construction Contingency				$ 568,400
Total				$ 804,400
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 2,500
Pipeline and Meter Maintenance				$ 5,000
Total				$ 7,500
Total Alternative Cost				$ 4,601,005

Improvement Element 1, Alternative 2 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
6" Water Main	82	LF	$ 60	$ 4,920
6" Water Main - Extension	4,181	LF	$ 60	$ 250,860
8" Water Main	84	LF	$ 80	$ 6,720
10" Water Main	17	LF	$ 90	$ 1,530
12" Water Main	52	LF	$ 105	$ 5,460
16" Water Main	21,500	LF	$ 135	$ 2,902,500
24" Steel Encasement - Bored	820	LF	$ 650	$ 533,000
24 Steel Casing - Open Cut	60	LF	$ 400	$ 24,000
6" MJ Gate Valve	2	EA	$ 1,525	$ 3,050
8" MJ Gate Valve	3	EA	$ 2,100	$ 6,300
10" MJ Gate Valve	1	EA	$ 3,125	$ 3,125
16" MJ Butterfly Valve	26	EA	$ 5,500	$ 143,000
Connect to Ex. 6" Water Main (Cut-in)	1	EA	$ 5,500	$ 5,500
Connect to Ex. 8" Water Main (Cut-in)	3	EA	$ 6,500	$ 19,500
8" Tapping Sleeve and Valve	1	EA	$ 3,750	$ 3,750
10" Tapping Sleeve and Valve	2	EA	$ 4,500	$ 9,000
12" Tapping Sleeve and Valve	1	EA	$ 5,750	$ 5,750
6" Fire Hydrant	6	EA	$ 3,850	$ 23,100
2" Air Release Valve	6	EA	$ 1,800	$ 10,800
Transfer Existing Water Service	4	EA	$ 3,500	$ 14,000
Install New Water Service	3	EA	$ 1,500	$ 4,500
Meter Relocate	2	EA	$ 2,500	$ 5,000
Reconfigure 8" Water Main	1	LS	$ 5,000	$ 5,000
Line C - Walnut Grove Road Reconnect	1	LS	$ 15,000	$ 15,000
Gravel Driveway Restoration	2,725	SY	$ 40	$ 109,000
Asphalt Driveway Restoration	2,725	SY	$ 60	$ 163,500
Site Restoration	49,000	SY	$ 0.75	$ 36,750
Mobilization	1	LS	$ 173,000	$ 173,000
Erosion Control	1	LS	$ 86,000	$ 86,000
Traffic Control	1	LS	$ 86,000	$ 86,000
Demobilization	1	LS	$ 43,000	$ 43,000
			Total	$ 4,702,615
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ 43,000
Engineering - Design and Inspection				$ 220,000
Construction Contingency				$ 705,400
Total				$ 968,400
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 3,000
Pipeline and Meter Maintenance				$ 7,500
Total				$ 10,500
Total Alternative Cost				$ 5,681,515

Improvement Element 2, Alternative 1 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
125 HP Pump and Piping	2	EA	$ 115,000	$ 230,000
Electrical Upgrades	1	LS	$ 150,000	$ 150,000
Site Work	1	LS	$ 50,000	$ 50,000
Mobilization	1	LS	$ 17,000	$ 17,000
Demobilization	1	LS	$ 4,000	$ 4,000
Total				$ 451,000
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ -
Engineering - Design and Inspection				$ 140,000
Construction Contingency				$ 67,650
Total				$ 207,650
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 5,000
Energy Cost (Electrical)				$ 6,000
Short Lived Asset Maintenance/Replacement				$ 100,000
Miscellaneous				$ 10,000
Total				$ 121,000
Total Alternative Cost				$ 779,650

Improvement Element 2, Alternative 2 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
Package Booster Pump Station (125 HP)	1	LS	$ 750,000	$ 750,000
Electrical Upgrades	1	LS	$ 150,000	$ 150,000
Site Work	1	LS	$ 100,000	$ 100,000
Mobilization	1	LS	$ 40,000	$ 40,000
Demobilization	1	LS	$ 10,000	$ 10,000
Total				$ 1,050,000
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ 15,000
Engineering - Design and Inspection				$ 160,000
Construction Contingency				$ 157,500
Total				$ 332,500
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 5,000.00
Energy Cost (Electrical)				$ 6,000
Short Lived Asset Maintenance/Replacement				$ 100,000
Miscellaneous				$ 10,000
Total				$ 121,000
Total Alternative Cost				$ 1,503,500

Improvement Element 3, Alternative 1 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
Package Booster Pump Station (20 HP)	1	LS	$ 420,000	$ 420,000
Site Grading and Pavement	1	LS	$ 83,720	$ 83,720
Bulk Water Filling Station	1	LS	$ 100,000	$ 100,000
10" Water Main	150	LF	$ 125	$ 18,750
10" Gate Valve	3	EA	$ 14,000	$ 42,000
Tie-in to Existing Water Main	2	EA	$ 5,500	$ 11,000
Mobilization	1	LS	$ 27,000	$ 27,000
Demobilization	1	LS	$ 7,000	$ 7,000
Total				$ 709,470
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ 15,000
Engineering - Design and Inspection				$ 160,000
Construction Contingency				$ 106,400
Total				$ 281,400
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 5,000
Energy Cost (Electrical)				$ 4,000
Valve Maintenance				$ 2,000
Short Lived Asset Maintenance/Replacement				$ 30,000
Miscellaneous				$ 10,000
Total				$ 51,000
Total Alternative Cost				$ 1,041,870

Improvement Element 3, Alternative 2 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
Upgraded Pumps	2	EA	$ 110,000	$ 220,000
Site Grading and Pavement	1	LS	$ 20,000	$ 20,000
Bulk Water Filling Station	1	LS	$ 100,000	$ 100,000
Mobilization	1	LS	$ 14,000	$ 14,000
Demobilization	1	LS	$ 3,000	$ 3,000
Total				$ 357,000
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ -
Engineering - Design and Inspection				$ 110,000
Construction Contingency				$ 53,550
Total				$ 163,550
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 5,000
Energy Cost (Electrical)				$ 8,000
Short Lived Asset Maintenance/Replacement				$ 30,000
Miscellaneous				$ 15,000
Total				$ 58,000
Total Alternative Cost				$ 578,550

Improvement Element 4, Alternative 1 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
Garrett Tank Recoating and Repairs	1	LS	$ 275,000	$ 275,000
Payneville Tank Recoating and Repairs	1	LS	$ 300,000	$ 300,000
Mobilization	1	LS	$ 23,000	$ 23,000
Demobilization	1	LS	$ 10,000	$ 10,000
Total				$ 608,000
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ -
Engineering - Design and Inspection				$ 30,000
Construction Contingency				$ 91,200
Total				$ 121,200
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 4,000
Tank Inspection				$ 15,000
Total				$ 19,000
Total Alternative Cost				$ 748,200.00

Appendix E – Life Cycle Cost Analysis

Improvement Elements Life Cycle Cost Analysis

Discount Rate 2.20%
Life Cycle Period 20 years

Salvage Notes:
Transmission Mains and Appurtenances have an 80 year life
Pumps/Pump controls have a 10 year life
Buildings have a 50 year life
Tank Coating Systems have a 20 year useful life
All other items will assume a useful life <=20 years

Improvement Element 1, Alternative 1 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 4,593,505	$ 7,500	$ 918,526	$ 120,301	$ 594,393	$ 4,119,413

Improvement Element 1, Alternative 2 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 5,671,015	$ 10,500	$ 1,054,466	$ 168,422	$ 682,362	$ 5,157,075

Improvement Element 2, Alternative 1 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 658,650	$ 121,000	$ 3,000	$ 1,940,862	$ 1,941	$ 2,597,571

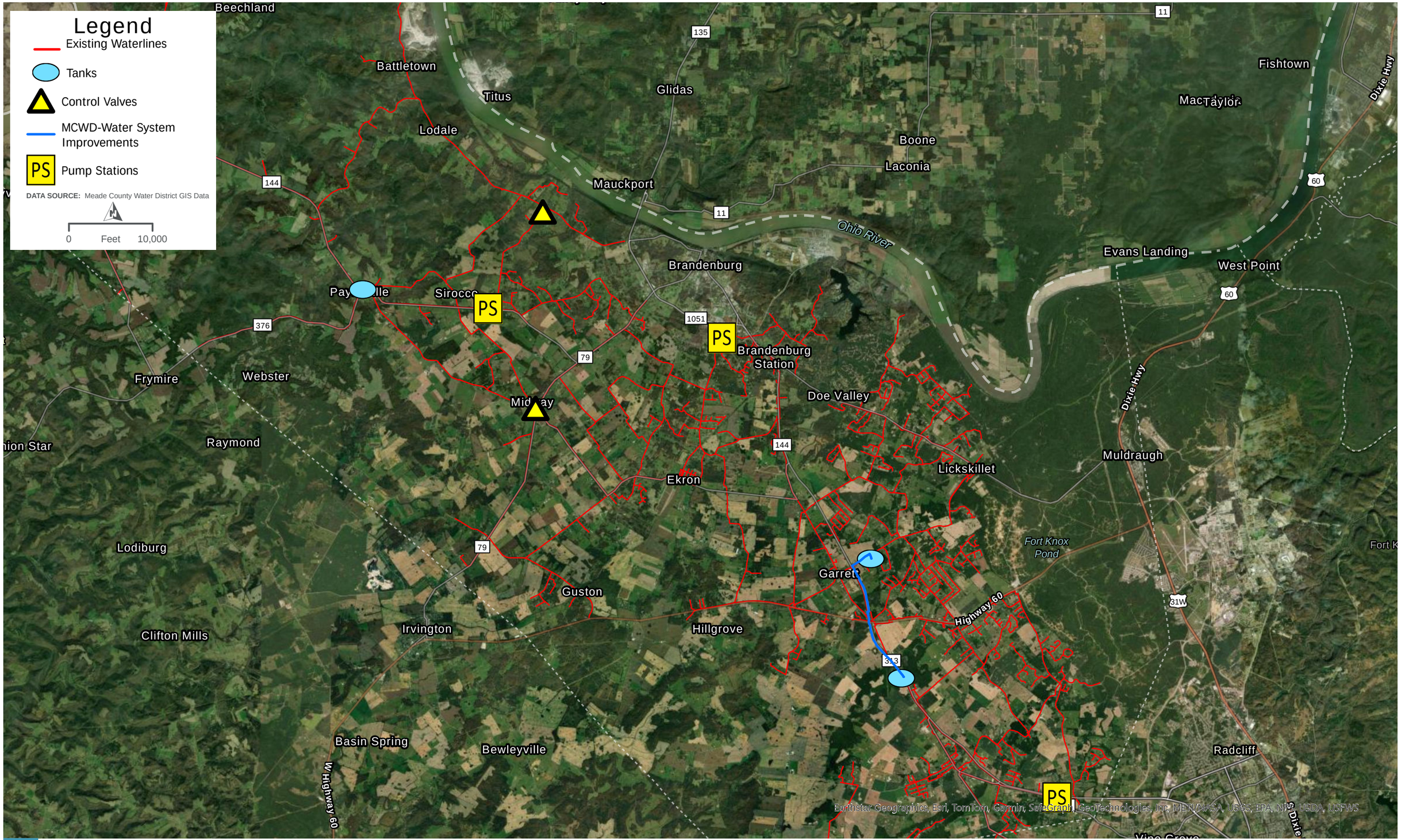
Improvement Element 2, Alternative 2 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 1,382,500	$ 121,000	$ 150,000	$ 1,940,862	$ 97,067	$ 3,226,295

Improvement Element 3, Alternative 1 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 990,870	$ 51,000	$ 49,938	$ 818,049	$ 32,315	$ 1,776,604

Improvement Element 3, Alternative 2 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 520,550	$ 58,000	$ 60,000	$ 930,331	$ 38,827	$ 1,412,054

Improvement Element 4, Alternative 1 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 729,200	$ 19,000	$ 12,500	$ 304,764	$ 8,089	$ 1,025,875

Appendix F – Overall Proposed Improvements Map and Proposed Process Flow Diagram



OVERALL MAP OF PROPOSED IMPROVEMENTS

PAYNEVILLE DUPLEX
PUMP STATION

PAYNEVILLE TANK
CAPACITY: 300,000 GAL
OVERFLOW EL: 952.50

OPERATING POINT: 350 GPM
HEAD: 125 TDH
HORSEPOWER: 20 HP

TO BATTLETOWN AND
WOLF CREEK AREA

CONTROL VALVE #2
(NEW HIGHLAND
CHURCH ROAD)

M

CONTROL VALVE #3
(MIDWAY ROAD)

GATE VALVE
(TO BE OPENED)

BRANDENBURG DUPLEX PUMP STATION
OPERATING POINT: 452 GPM @ 210 TDH

DOE VALLEY
MASTER METER

OTTER CREEK
MASTER METER

FLAHERTY TANK
CAPACITY: 500,000 GAL
OVERFLOW EL: 952.50

CONTROL VALVE #1
OPENED: FLAHERTY TANK FILLS AND
FLOW SENT TO GARRETT TANK
CLOSED: FLAHERTY TANK FEEDS
FLAHERTY SERVICE AREA AND
ALL FLOW SENT TO GARRETT TANK

TO FLAHERTY
SERVICE AREA

GARRETT TANK
CAPACITY: 300,000 GAL
OVERFLOW EL: 952.50

KY1238 FUTURE EXTENSION
CONNECTION

KY313 HCWD1
INTERCONNECT

HCWD1 WATER SYSTEM
SUPPLY HGL 901

M

FLAHERTY DUPLEX
PUMP STATION

CONTROL VALVE #1

OPERATING RANGE:
1,000 - 1,300 GPM
HEAD: 237 TDH
HORSEPOWER: 125 HP

BIG SPRING ROAD (KY333)
FUTURE EXTENSION
CONNECTION

KY313 FUTURE EXTENSION
CONNECTION

SANDRIDGE ROAD
INTERCONNECT

DISTRIUBTION

HCWD1 WATER SYSTEM

MEADE COUNTY WATER DISTRICT
PROPOSED PROCESS FLOW DIAGRAM

Appendix G – Meade County Water District 2023 Financial Audit

MEADE COUNTY WATER DISTRICT
Brandenburg, Kentucky

FINANCIAL STATEMENTS
December 31, 2023

C O N T E N T S

Members American Institute of Certified Public Accountants
and Kentucky Society of Certified Public Accountants

RFH
CPAs | Consultants

INDEPENDENT AUDITOR'S REPORT

The Board of Commissioners
Meade County Water District
Brandenburg, Kentucky

Report on the Audit of the Financial Statements

Opinion

We have audited the accompanying financial statements of the Meade County Water District (the District) as of and for the year ended December 31, 2023, and the related notes to the financial statements, which collectively comprise the District's basic financial statements as listed in the table of contents.

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the Meade County Water District, as of December 31, 2023, and the respective changes in financial position, and, where applicable, cash flows thereof for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the District and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the District's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditors' Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with generally accepted auditing standards and *Government Auditing Standards* will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with generally accepted auditing standards and *Government Auditing Standards*, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the District's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the pension and OPEB schedules on pages 23-26 be presented to supplement the basic financial statements. Such information is the responsibility of management and, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Management has omitted the Management Discussion and Analysis that accounting principles generally accepted in the United States of America requires to be presented to supplement the basic financial statements. Such missing information, although not a part of the basic financial statements, is required by the GASB, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. Our opinion on the basic financial statements is not affected by this missing information.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated March 27, 2024, on our consideration of the District's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the District's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the District's internal control over financial reporting and compliance.

RFH

RFH, PLLC
Lexington, Kentucky
March 27, 2024

MEADE COUNTY WATER DISTRICT
STATEMENT OF NET POSITION
December 31, 2023

ASSETS	
Current assets	
Cash and cash equivalents	$ 484,553
Accounts receivable, net	334,474
Prepaid insurance	10,696
Inventory	123,951
Total current assets	953,674
Noncurrent assets	
Restricted cash	976,985
Net OPEB asset	22,869
Regulatory asset - CERS OPEB	290,155
Regulatory asset - CERS Pension	1,106,555
Land	75,043
Construction in progress	156,540
Property, plant and equipment, net	15,000,400
Total noncurrent assets	17,628,547
Total assets	18,582,221
DEFERRED OUTFLOWS OF RESOURCES	
Deferred outflows - pension	127,921
Deferred outflows - OPEB	75,608
Total deferred outflows of resources	203,529
Total assets and deferred outflows of resources	$ 18,785,750
LIABILITIES	
Current liabilities	
Accounts payable	$ 144,584
Payroll and other taxes payable	16,720
Accrued vacation	19,717
Accrued interest	73,604
Other accrued liabilities	24,866
Customer deposits	57,000
Deferred grant revenue	391,940
Current portion of notes and bonds payable	251,852
Total current liabilities	980,283
Noncurrent liabilities	
Net pension liability	1,062,830
Notes and bonds payable, net of current portion	6,460,351
Total noncurrent liabilities	7,523,181
Total liabilities	8,503,464
DEFERRED INFLOWS OF RESOURCES	
Deferred inflows - pension	171,646
Deferred inflows - OPEB	388,632
Total deferred inflows of resources	560,278
NET POSITION	
Net investment in capital assets	8,519,780
Restricted net position	585,045
Unrestricted	617,183
Total net position	9,722,008
Total liabilities, deferred inflows of resources and net position	$ 18,785,750

The accompanying notes are an integral part of the financial statements.

MEADE COUNTY WATER DISTRICT
STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
for the year ended December 31, 2023

OPERATING INCOME	
Water sales	$ 3,424,589
Other revenue	103,238
Total operating income	3,527,827
OPERATING EXPENSES	
Water purchased	1,431,969
Distribution	
Personnel	384,035
Repairs and maintenance	77,723
Contractual services	59,890
Utilities	69,645
Other	266,862
Total distribution	858,155
Administrative and general	
Personnel	610,266
Repairs and maintenance	18,061
Contractual services	12,385
Utilities	4,247
Other	111,776
Total administrative and general	756,735
Depreciation	763,342
Total operating expense	3,810,201
OPERATING (LOSS)	(282,374)
Non-operating income (expense)	
Interest income	40,242
Gain on sale of capital assets	8,065
Interest expense	(155,949)
Total non-operating (expense)	(107,642)
(LOSS) BEFORE CAPITAL CONTRIBUTIONS	(390,016)
Capital contributions	
Tap fees	107,350
ARPA grant revenue	57,860
Total capital contributions	165,210
Change in net position	(224,806)
Net position, beginning of year	9,946,814
NET POSITION, END OF YEAR	$ 9,722,008

The accompanying notes are an integral part of the financial statements.

MEADE COUNTY WATER DISTRICT
STATEMENT OF CASH FLOWS
for the year ended December 31, 2023

CASH FLOWS FROM OPERATING ACTIVITIES	
Receipts from customers	$ 3,571,838
Payments to suppliers	(2,145,872)
Payments for employee services and benefits	(1,001,918)
Net cash and cash equivalents provided by operating activities	424,048
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES	
Principal payments on debt	(330,222)
Proceeds from issuance of debt	59,049
Acquisition and construction of capital assets	(350,240)
Capital contributions	107,350
Proceeds on sale of capital assets	52,014
Interest on long-term debt	(159,067)
Net cash and cash equivalents (used in) capital and related financing activities	(621,116)
CASH FLOWS FROM INVESTING ACTIVITIES	
Interest income	40,242
Net cash and cash equivalents provided by investing activities	40,242
NET (DECREASE) IN CASH AND CASH EQUIVALENTS	(156,826)
Cash and cash equivalents, beginning of year	1,618,364
CASH AND CASH EQUIVALENTS, END OF YEAR	$ 1,461,538
Reconciliation of operating (loss) to net cash and cash equivalents provided by operating activities:	
Operating (loss)	$ (282,374)
Noncash items included in operating income:	
Depreciation	763,342
Changes in assets and liabilities:	
(Increase) decrease in accounts receivables	45,552
(Increase) decrease in prepaid expenses	(2,521)
(Increase) decrease in inventory	(5,606)
Increase (decrease) in accounts payable	(85,187)
Increase (decrease) in payroll and other taxes payable	(7,380)
Increase (decrease) in customer deposits	(1,541)
Increase (decrease) in accrued vacation	(237)
Net cash and cash equivalents provided by operating activities	$ 424,048
Supplemental disclosure of cash flow information	
Components of cash on the Statement of Net Position	
Cash and cash equivalents	$ 484,553
Restricted cash	976,985
	$ 1,461,538
Non-cash capital and related financing activities	
Financed capital purchases	$ 59,554
Net change in capital assets payable	$ (50,200)

The accompanying notes are an integral part of the financial statements.

1. ORGANIZATION AND ACCOUNTING POLICIES

Meade County Water District (the District) was organized pursuant to the provisions of Kentucky Revised Statutes KRS 74.010 and KRS 44.020 in order to provide a water supply for the residents of Meade County, Kentucky.

The District's financial statements are prepared in accordance with accounting principles generally accepted in the United States of America (GAAP). The Governmental Accounting Standards Board (GASB) is responsible for establishing GAAP for state and local governments through its pronouncements set forth by the National Association of Regulatory Utility Commissioners and the guidance provided by the American Water Works Association in Water Utility Accounting and is regulated by the Kentucky Public Service Commission. The more significant accounting policies established in GAAP and used by the District are discussed below.

Reporting Entity

The District's financial statements include the operations of all entities for which the District exercises oversight responsibilities. Oversight responsibility includes, but is not limited to, financial interdependency, selection of the governing authority, designation of management, ability to significantly influence operations and accountability for fiscal matters. The only entity included in these financial statements are the general operations of Meade County Water District.

Basic Financial Statements

All activities of the District are accounted for within a single proprietary (enterprise) fund. The focus of proprietary fund measurement is upon determination of operating income, changes in net position, financial position, and cash flows. The GAAP applicable are those similar to businesses in the private sector. Enterprise funds are required to be used to account for operations for which a fee is charged to external users for goods or services and the activity is financed with debt that is solely secured by a pledge of the net revenues.

Basis of Accounting

Basis of accounting refers to the point at which revenues or expenses are recognized in the accounts and reported in the financial statements. It relates to the timing of the measurements made regardless of the measurement focus applied. The proprietary fund financial statements are presented on the accrual basis of accounting. Nonexchange revenues, including intergovernmental revenues and grants, are reported when all eligibility requirements have been met. Fees and charges and other exchange revenues are recognized when earned and expenses are recognized when incurred.

Financial Statement Amounts

Accounts Receivable - The allowance method is used to record uncollectible accounts. At December 31, 2023, accounts receivable was stated net of an allowance for uncollectible accounts of $36,000.

Inventory – The District's inventory is composed of equipment and supply-type items used for routine maintenance, repairs and new water lines. The inventory is stated at the lower of cost (first-in, first-out method) or market.

Capital assets - Capital assets in service and construction in progress are recorded at cost, if purchased or constructed. Assets acquired through contributions from developers or other customers are capitalized at their estimated fair market value, if available, or at engineers' estimated fair market value or cost to construct at the date of the contribution. Maintenance and repairs, which do not significantly extend the value or life of property, plant and equipment, are expensed as incurred.

1. ORGANIZATION AND ACCOUNTING POLICIES (CONTINUED)

Financial Statement Amounts (continued)

Assets are depreciated on the straight-line method. Depreciation is calculated using the following estimated useful lives:

	Years
Source of supply equipment	15-50
Water treatment plant	10-40
Transmission and distribution systems	10-75
Equipment	3-20
Structures and improvements, including buildings	10-50
Office furniture, equipment and vehicles	3-20
Meters and installation	10-40

Restricted Assets - Restricted assets consist of demand deposit savings accounts.

Cash Equivalents - For purposes of the statement of cash flows, the District considers all highly liquid debt instruments (including restricted assets) purchased with a maturity of three months or less to be cash equivalents. As of December 31, 2023, the District had cash equivalents of $204,449 in the form of money market funds and treasury bills with an original maturity date of three months or less.

Accrued Vacation - Accumulated vacation is recorded as an expense and a liability as the benefit is earned.

Claims and Judgments - These events and obligations are recorded on the accrual basis, when the event occurs and the obligation arises.

Revenues and Rate Structure - Revenues from water services are recognized on the accrual basis and as earned. Services are supplied to customers under a rate structure designed to produce revenues sufficient to provide for operating and maintenance costs, capital outlay, debt service, reserves and debt service coverage.

Capital Contributions - Contributions are recognized in the Statements of Revenues, Expenses and Changes in Net Position when earned. Contributions include capacity fees, capital grants, and other supplemental support by other utilities and industrial customers and federal, state and local grants in support of system improvements.

Long-term Obligations - Obligations are reported at face value, net of applicable premiums and discounts.

Operating Revenues and Expenses - The District distinguishes between operating and non-operating revenues and expenses. Operating revenues and expenses consist of charges for services and the costs of providing those services, including depreciation and excluding interest cost. All other revenues and expenses are reported as non-operating.

Use of Restricted Resources - When an expense is incurred that can be paid using either restricted or unrestricted resources (net position), the District's policy is first apply the expense toward restricted resources and then toward unrestricted resources.

Net Position - Net position is divided into three components:

a. Net investment in capital assets - consists of the historical cost of capital assets less accumulated depreciated and less any debt that remains outstanding that was used to finance those assets.

b. Restricted net position - consists of assets that are restricted by the District's creditors (for example, through debt covenants), by grantors (federal, state and local) and by other contributors.

c. Unrestricted - all other net position is reported in this category.

1. ORGANIZATION AND ACCOUNTING POLICIES (CONTINUED)

Financial Statement Amounts (continued)

Use of Estimates - The preparation of financial assets in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect reported amounts of assets, liabilities, designated net position, and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenditures during the reporting period. Actual results could differ from those estimates.

Pension and OPEB - For purposes of measuring the net pension and OPEB liabilities (assets), deferred outflows/inflows of resources, and regulatory assets, information about the fiduciary net position of the County Employees Retirement System (CERS) and additions to/deductions from CERS's fiduciary net position have been determined on the same basis as they are reported by CERS except that CERS's fiscal year end is June 30. For this purpose, plan contributions are recognized as of employer payroll paid dates and benefit payments and refunds are recognized when due and payable in accordance with the benefit terms. Investments are reported at fair value.

The District's rates are regulated by the Kentucky Public Service Commission. In accordance with GASB Statement No. 62, Paragraphs 476-500, Regulated Operations, which requires that the effects of the rate-making process be recorded in the financial statements, the District has elected to record a regulatory asset for the net pension and OPEB liabilities, deferred outflows of resources and deferred inflows of resources related to pensions and OPEB. Accordingly, the District recognizes the actuarially determined contribution as the current year pension and OPEB expense.

Change in Accounting Policy

Effective January 1, 2023, the District implemented Governmental Accounting Standards Board (GASB) Statement No. 96, *Subscription-based Information Technology Arrangements*. GASB Statement No. 96 requires recognition of a right-to-use subscription asset – an intangible asset – and a corresponding subscription liability for subscription-based information technology arrangements (SBITA) that were previously classified as operating expenses. It establishes uniform guidance for SBITA accounting based on the foundational principle that SBITA are financings of the right to use vendor-provided information technology assets. These changes had no effect on the financial statements.

Management’s Review of Subsequent Events

The District has evaluated and considered the need to recognize or disclose subsequent events through March 27, 2024 which represents the date that these financial statements were available to be issued. Subsequent events past this date, as they pertain to the year ended December 31, 2023, have not been evaluated by the District.

2. DEPOSITS

KRS 66.480 authorizes the District to invest in the following, including but not limited to, obligations of the United States and of its agencies and instrumentalities, obligations and contracts for future delivery or purchase of obligations backed by the full faith and credit of the United States, obligations of any corporation of the United States government, bonds or certificates of indebtedness of this state, and certificates of deposit issued by or other interest-bearing accounts of any bank or savings and loan institution which have a physical presence in Kentucky and are insured by the Federal Deposit Insurance Corporation (FDIC) or which are collateralized, to the extent uninsured, by any obligation permitted by KRS 41.240(4). The Statute also authorizes investment in mutual funds, exchange traded funds, individual equity securities and high-quality corporate bonds that are managed by a professional investment manager and subject to additional requirements outlined in KRS 66.480.

Custodial credit risk is the risk that, in the event of the failure of the counterparty, the District will not be able to recover the value of the investment or collateral securities that are in the possession of an outside party. In order to anticipate market changes and provide a level of security for all funds, the collateralization level shall be one hundred percent of the market value of the principal, plus accrued interest. The District maintains an account with a brokerage institution that holds cash equivalents in the District's name. The District's deposits and investments at December 31, 2023, were entirely covered by Federal Depository Insurance, Securities Investor Protection, or by collateral held by the custodial banks in the District's name. The bank balances of the District's deposits were $1,427,109 at December 31, 2023. As of December 31, 2023, $558,703 of the District's deposits were covered by Federal Depository Insurance and Securities Investor Protection, and $868,406 were covered by collateral held by the custodial banks in the District's name.

3. RESTRICTED CASH

The District has restricted cash for customer deposits, reserve and depreciation, construction and debt service. The following schedule represents restricted cash at December 31, 2023:

Restricted Balances

Construction	$ 391,940
Debt Service	391,505
Reserve & Depreciation	193,540
Totals	$ 976,985

4. CAPITAL ASSETS

The following is a summary of capital asset activity during the year ended December 31, 2023:

	Balance 12/31/2022	Additions	Disposals	Balance 12/31/2023
Capital assets not depreciated:				
Construction in progress	$ 50,200	$ 106,340	$ -	$ 156,540
Land and Land Rights	75,043	-	-	75,043
Totals	125,243	106,340	-	231,583
Capital assets being depreciated:				
Property, plant and equipment	26,582,002	245,090	(53,104)	26,773,988
Less: accumulated depreciation	11,018,212	763,342	(7,966)	11,773,588
Depreciable assets, net	15,563,790	(518,252)	(45,138)	15,000,400
Total capital assets, net	$ 15,689,033	$ (411,912)	$ (45,138)	$ 15,231,983

5. LONG-TERM DEBT

The following is a summary of the bonds and notes outstanding for the District for the year ended December 31, 2023:

Bonds and Notes

USDA, Rural Development Bond - $2,000,000, dated 7/19/18 with payments through 2056, bearing interest at a rate of 2.75%.	$ 1,839,000
USDA, Rural Development Bond - $2,506,170, dated 10/25/21 with payments through 2061, bearing interest at a rate of 1.875%.	2,420,170
Kentucky Bond Corporation Bond - $2,070,000, dated 4/21/21 with payments through 2050, bearing interest at a rate of 3.00%.	1,975,000
Kentucky Infrastructure Authority Loan - $394,760 dated 12/1/04 with payments through 2024, bearing interest at a rate of 3.00%.	25,822
Kentucky Infrastructure Authority Loan - $753,447 dated 12/1/09 with payments through 2029, bearing interest at a rate of 3.00%.	274,854
Kentucky Rural Water Finance Corp. Bond - $605,000, dated 6/27/01 with payments through 2024, bearing interest at 5.27%.	4,000
Meade County Bank Note - $59,049, dated 1/25/23 with payments through 2025, bearing interest at 5.15%.	32,737
Bond premiums	140,620
Totals	6,712,203
Less: current portion of debt	(251,852)
Long-term debt	$ 6,460,351

5. LONG-TERM DEBT (CONTINUED)

The annual requirements to amortize bonds outstanding as of December 31, 2023 are as follows:

Year Ending December 31,	Principle	Interest	Payment
2024	$ 153,408	$ 153,435	$ 306,843
2025	151,408	149,571	300,979
2026	158,408	145,689	304,097
2027	160,408	141,686	302,094
2028	161,908	137,642	299,550
2029-2033	865,542	623,037	1,488,579
2034-2038	861,542	516,827	1,378,369
2039-2043	978,042	402,899	1,380,941
2044-2048	1,122,542	270,655	1,393,197
2049-2053	863,908	141,187	1,005,095
2054-2058	643,500	53,373	696,873
2059-2061	258,173	7,292	265,465
	$ 6,378,789	$ 2,743,293	$ 9,122,082

The annual requirements to amortize direct borrowing notes outstanding as of December 31, 2023 are as follows:

Year Ending December 31,	Principle	Interest	Payment
2024	$ 98,444	$ 9,493	$ 107,936
2025	46,334	6,657	52,991
2026	45,074	5,324	50,398
2027	46,436	3,961	50,397
2028	47,840	2,558	50,398
2029	49,286	1,112	50,399
	$ 333,414	$ 29,105	$ 362,519

5. LONG-TERM DEBT (CONTINUED)

The following is a summary of changes in long-term debt and net pension and OPEB liability for the year ended December 31, 2023:

	December 31, 2022	Additions	Retirements	December 31, 2023	Due Within One Year
Net pension liability	$ 1,243,318	$ -	$ (180,488)	$ 1,062,830	$ -
Net OPEB liability	339,365	-	(339,365)	-	-
Bonds payable	6,570,698	-	(191,908)	6,378,790	153,408
Notes payable	412,678	59,049	(138,314)	333,413	98,444
Total	$ 8,566,059	$ 59,049	$ (850,075)	$ 7,775,033	$ 251,852

For the year ended December 31, 2023 the net OPEB liability is now presented as a net OPEB asset on the Statement of Net Position.

6. COMPLIANCE WITH BOND RESOLUTIONS

The bond resolutions require the District to maintain certain reserves as follows:

Depreciation Reserve Fund – This reserve is to receive a monthly transfer of $1,480 until a balance of $177,600 is accumulated for all bond issues. In addition, this reserve is to receive all proceeds collected from potential customers to aid construction of extensions and any insurance proceeds from property damage. Funds may be used only for the purpose of paying the cost of unusual or extraordinary maintenance and repairs not included in the budget and cost of constructing extensions or improvements to the system. The Reserve Fund balance totaled $45,540 at December 31, 2023. At December 31, 2023, the required balance in this reserve was $45,540.

Maintenance and Replacement Reserve – This reserve is to receive an amount equal to ten percent of the amount of loan payments until the amount on deposit is equal to five percent of the original principal amount of the loan. Funds may be used for extraordinary maintenance expenses related to the water tank painting project or for the costs of replacing worn or obsolete portions of the project. At December 31, 2023, the required balance in this reserve was $148,000, and the Maintenance and Replacement Reserve totaled $148,000.

Bond and Interest Sinking Fund – This reserve is to receive a monthly transfer of 1/12 of the next interest due and 1/12 of the next principal due. In addition, this reserve is to receive any excess revenues at the close of each year after provision of anticipated operating expenses for a two-month period. This reserve can only be used to pay debt service on the bond issues. The Bond and Interest Sinking Fund balance totaled $391,505 at December 31, 2023. At December 31, 2023, the required balance in this reserve was $272,629.

7. RETIREMENT PLAN

The Meade County Water District is a participating employer of the County Employees' Retirement System (CERS). Under the provisions of Kentucky Revised Statute 61.645, the Board of Trustees of Kentucky Public Pensions Authority administers the CERS. The plan issues publicly available financial statements which may be downloaded from the Kentucky Public Pensions Authority website.

Plan Description – CERS is a cost-sharing multiple-employer defined benefit pension plan that covers substantially all regular full-time members employed in positions of each participating county, city, and school board, and any additional eligible local agencies electing to participate in the System. The plan provides for retirement, disability, and death benefits to plan members. Retirement benefits may be extended to beneficiaries of plan members under certain circumstances. Cost-of-living (COLA) adjustments are provided at the discretion of state legislature.

Contributions – For the year ended December 31, 2023, plan members were required to contribute 5.00% of wages for non-hazardous job classifications. Employees hired after September 2008 are required to contribute an additional 1.00% to cover the cost of medical insurance that is provided through CERS. Participating employers are required to contribute at an actuarially determined rate. Per Kentucky Revised Statute Section 78.545 (33), normal contribution and past service contribution rates shall be determined by the Board on the basis of an annual valuation last proceeding the July 1 of a new biennium.

The Board may amend contribution rates as of the first day of July of the second year of a biennium, if it is determined on the basis of a subsequent actuarial valuation that amended contribution rates are necessary to satisfy requirements determined in accordance with actuarial basis adopted by the Board. For the year ended December 31, 2023, participating employers contributed 26.79% through June 30th and 23.34% thereafter, of each non-hazardous employee's wages, which is equal to the actuarially determined rate set by the Board. The contributions are allocated to both the pension and insurance trust. The insurance trust is more fully described in Note 8. Plan members contributed 23.40% through June 30th and 23.34% thereafter to the pension trust for non-hazardous job classifications for the year ended December 31, 2023. Administrative costs of Kentucky Public Pensions Authority are financed through employer contributions and investment earnings.

Plan members who began participating on, or after, January 1, 2014, are required to contribute to the Cash Balance Plan. The Cash Balance Plan is known as a hybrid plan because it has characteristics of both a defined benefit plan and a defined contribution plan. Members in the plan contribute a set percentage of their salary each month to their own account. Plan members contribute 5.00% of wages to their own account and 1.00% to the health insurance fund. The employer contribution rate is set annually by the Board based on an actuarial valuation. The employer contributes a set percentage of each member's salary. Each month, when employer contributions are received, an employer pay credit is deposited to the member's account. For non-hazardous members, their account is credited with a 4% employer pay credit. The employer pay credit represents a portion of the employer contribution.

The District contributed $142,340 for the year ended December 31, 2023, or 100% of the required contribution for non-hazardous job classifications.

Benefits – CERS provides retirement, health insurance, death and disability benefits to Plan employees and beneficiaries. Employees are vested in the plan after five years' service.

7. RETIREMENT PLAN (CONTINUED)

For retirement purposes, employees are grouped into three tiers based on hire date:

Tier 1	Participation date	Before September 1, 2008
	Unreduced retirement	27 years service or 65 years old and 4 years service
	Reduced retirement	At least 5 years service and 55 years old or 25 years service and any age
Tier 2	Participation date	September 1, 2008 - December 31, 2013
	Unreduced retirement	At least 5 years service and 65 years old or age 57+ and sum of service years plus age equal to 87+
	Reduced retirement	At least 10 years service and 60 years old
Tier 3	Participation date	After December 31, 2013
	Unreduced retirement	At least 5 years service and 65 years old or age 57+ and sum of service years plus age equal to 87+
	Reduced retirement	Not available

Cost of living adjustments are provided at the discretion of the General Assembly. Retirement is based on a factor of the number of years' service and hire date multiplied by the average of the highest five years' earnings. Reduced benefits are based on factors of both of these components. Participating employees become eligible to receive the health insurance benefit after at least 180 months of service. Death benefits are provided for both death after retirement and death prior to retirement. Death benefits after retirement are $5,000 in lump sum. Five years' service is required for death benefits prior to retirement and the employee must have suffered a duty-related death. The decedent's beneficiary will receive the higher of the normal death benefit and $10,000 plus 25% of the decedent's monthly final rate of pay and any dependent child will receive 10% of the decedent's monthly final rate of pay up to 40% for all dependent children. Five years' service is required for nonservice-related disability benefits.

Pension Liabilities, Expense, Deferred Outflows of Resources and Deferred Inflows of Resources – At December 31, 2023, the District reported a liability for its proportionate share of the total net pension liability of $1,062,830. The net pension liability was measured as of June 30, 2023, and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of June 30, 2022 and was rolled forward using generally accepted actuarial procedures. The District's proportion of the net pension liability was based on a projection of the District's long-term share of contributions to the pension plan relative to the projected contributions of all participating entities, actuarially determined. At June 30, 2023, the District's proportion was 0.016564 percent, which was a decrease of 0.000635 percent from its proportion measured as of June 30, 2022.

7. RETIREMENT PLAN (CONTINUED)

For the year ended December 31, 2023, the District would have recognized pension expense of $31,992; However, this expense was offset by increasing a regulatory asset described further in Note 12. During 2023, the District recognized the actuarially determined contribution of $142,340 as the current year pension expense. At December 31, 2023, the District reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual results	$ 55,021	$ 2,890
Changes of assumptions	-	97,410
Net difference between projected and actual earnings on Plan investments	-	14,496
Changes in proportion and differences between District contributions and proportionate share of contributions	778	56,850
District contributions subsequent to the measurement date	72,122	-
Total	$ 127,921	$ 171,646

The $72,122 of deferred outflows of resources resulting from the District's contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability in the year ending December 31, 2024. Other amounts reported as deferred outflows of resources and deferred inflows of resources as of December 31, 2023 will be recognized in pension expense as follows:

Year ending December 31,	
2024	$ (75,099)
2025	$ (54,185)
2026	$ 23,727
2027	$ (10,290)

Actuarial Assumptions – The total pension liability in the June 30, 2023, actuarial valuation was determined using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	2.50%
Salary increases	3.30% to 10.30%, varies by service
Investment rate of return	6.50%, net of Plan investment expense, including inflation

The mortality table used for active members was a Pub-2010 General Mortality table, projected with the ultimate rates from the MP-2014 mortality improvement scale using a base year of 2010. The mortality table used for healthy retired members was a system-specific mortality table based on mortality experience from 2013-2022, projected with the ultimate rates from MP-2020 mortality improvement scale using a base year of 2023. The mortality table used for the disabled members was PUB-2010 Disabled Mortality table, with rates multiplied by 150% for both male and female rates, projected with the ultimate rates from the MP-2020 mortality improvement scale using a base year of 2010.

The actuarial assumption used in the June 30, 2023, valuation was based on the results of an actuarial experience study for the period July 1, 2018 - June 30, 2022. The total pension liability was rolled-forward from the valuation date (June 30, 2022) to the plan's fiscal year ending June 30, 2023.

7. RETIREMENT PLAN (CONTINUED)

The long-term expected rate of return was determined by using a building-block method in which best estimate ranges of expected future real rate of returns are developed for each asset class. The ranges are combined by weighting the expected future real rate of return by the target asset allocation percentage. As of December 31, 2023, the target allocation and best estimates of nominal real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Equity	**60.00%**	
Public Equity	50.00%	5.90%
Private Equity	10.00%	11.73%
Fixed Income	**20.00%**	
Core Fixed Income	10.00%	2.45%
Specialty Credit	10.00%	3.65%
Cash	0.00%	1.39%
Inflation Protected	**20.00%**	
Real Estate	7.00%	4.99%
Real Return	13.00%	5.15%
Total	**100.00%**	**5.75%**
Long term inflation assumption		**2.50%**
Expected nominal return for portfolio		**8.25%**

Discount Rate – The discount rate used to measure the total pension liability was 6.50 percent. The projection of cash flows used to determine the discount rate assumed that local employers would contribute the actuarially determined contribution rate of projected compensation over the remaining closed 28-year amortization period of the unfunded actuarial accrued liability. The actuarial determined contribution rate is adjusted to reflect the phase in of anticipated gains on actuarial value of assets over the first four years of the projection period. The discount rate determination does not use a municipal bond rate.

Sensitivity of the District's Proportionate Share of the Net Pension Liability to Changes in the Discount Rate – The following presents the District's proportionate share of the net pension liability calculated using the discount rate of 6.50 percent, as well as what the District's proportionate share of the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (5.50 percent) or 1-percentage-point higher (7.50 percent) than the current rate:

	Discount rate	District's proportionate share of net pension liability
1% decrease	5.50%	$ 1,341,888
Current discount rate	6.50%	$ 1,062,830
1% increase	7.50%	$ 830,923

Payable to the Pension Plan – At December 31, 2023, the District reported a payable of $16,812 for the outstanding amount of contributions to the pension plan required for the year ended. The payable includes both the pension and insurance contribution allocation.

8. POSTEMPLOYMENT BENEFITS OTHER THAN PENSIONS (OPEB)

Plan Description – As more fully described in Note 7, the District participates in the County Employees' Retirement System (CERS). CERS is a cost-sharing multiple-employer defined benefit pension plan that covers substantially all regular full-time members employed in positions of each participating county, city, and school board, and any additional eligible local agencies electing to participate in the System. In addition to retirement benefits, the plan provides for health insurance benefits to plan members (other postemployment benefits or OPEB). OPEB benefits may be extended to beneficiaries of plan members under certain circumstances.

Contributions – As more fully described in Note 7, plan members contribute to CERS for non-hazardous job classifications. For the year ended December 31, 2023, the employer's contribution was 3.39% through June 30th and 0.00% thereafter to the insurance trust for non-hazardous job classifications. Employees hired after September 1, 2008, are required to contribute an additional 1% to cover the cost of medical insurance that is provided through CERS. Participating employers are required to contribute at an actuarially determined rate. Per Kentucky Revised Statute Section 78.545(33), normal contribution and past service contribution rates shall be determined by the Board on the basis of an annual valuation last proceeding the July 1 of a new biennium. The Board may amend contribution rates as of the first day of July of the second year of a biennium, if it is determined on the basis of a subsequent actuarial valuation that amended contribution rates are necessary to satisfy requirements determined in accordance with actuarial basis adopted by the Board. The contribution rates are equal to the actuarially determined rate set by the Board. Administrative costs of Kentucky Retirement System are financed through employer contributions and investment earnings.

For the year ended December 31, 2023, the District contributed $10,173, or 100% of the required contribution for non-hazardous job classifications.

Benefits – CERS provides health insurance benefits to Plan employees and beneficiaries.

For retirement purposes, employees are grouped into three tiers based on hire date:

Tier 1	Participation date	Before July 1, 2003
	Insurance eligibility	10 years of service credit required
	Benefit	Set percentage of single coverage health insurance based on service credit accrued at retirement
Tier 1	Participation date	Before September 1, 2008 but after July 1, 2003
	Insurance eligibility	10 years of service credit required
	Benefit	Set dollar amount based on service credit accrued, increased annually
Tier 2	Participation date	After September 1, 2008 and before December 31, 2013
	Insurance eligibility	15 years of service credit required
	Benefit	Set dollar amount based on service credit accrued, increased annually
Tier 3	Participation date	After December 31, 2013
	Insurance eligibility	15 years of service credit required
	Benefit	Set dollar amount based on service credit accrued, increased annually

OPEB Liabilities (Assets), Expense, Deferred Outflows of Resources and Deferred Inflows of Resources – At December 31, 2023, the District reported an asset for its proportionate share of the net OPEB asset of $22,869. The net OPEB asset was measured as of June 30, 2023, and the total OPEB asset used to calculate the net OPEB asset was determined by an actuarial valuation as of June 30, 2022 and was rolled forward using generally accepted actuarial procedures.

8. POSTEMPLOYMENT BENEFITS OTHER THAN PENSIONS (OPEB) (CONTINUED)

The District's proportion of the net OPEB asset was based on a projection of the District's long-term share of contributions to the OPEB plan relative to the projected contributions of all participating entities, actuarially determined. The District's proportionate share at June 30, 2023 was 0.016564 percent, which was a decrease of 0.000632 percent from its proportion measured as of June 30, 2022.

For the year ended December 31, 2023, the District would have recognized OPEB expense of $(48,212); However, this expense was offset by increasing a regulatory asset described further in Note 12. During 2023, the District recognized the actuarially determined contribution of $10,173 as the current year pension expense. At December 31, 2023, the District reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual results	$ 15,943	$ 324,719
Changes of assumptions	45,005	31,364
Net difference between projected and actual earnings on Plan investments	-	5,308
Changes in proportion and differences between District contributions and proportionate share of contributions	7,190	27,241
District contributions subsequent to the measurement date	7,470	-
Total	$ 75,608	$ 388,632

The $7,470 of deferred outflows of resources resulting from the District's contributions subsequent to the measurement date will be recognized as a reduction of the net OPEB liability in the year ending December 31, 2024. This includes an adjustment of $7,470 related to the implicit subsidy, which is required to be recognized as a deferred outflow of resources. Other amounts reported as deferred outflows of resources and deferred inflows of resources will be recognized in expense as follows:

Year ending December 31,	
2024	$ (77,367)
2025	$ (99,412)
2026	$ (78,615)
2027	$ (65,100)

8. POSTEMPLOYMENT BENEFITS OTHER THAN PENSIONS (OPEB) (CONTINUED)

Actuarial Assumptions – The total OPEB liability in the June 30, 2023, actuarial valuation was determined using the following actuarial assumptions, applied to all periods included in the measurement:

Non-hazardous	
Inflation	2.50%
Salary increases	3.30 to 10.30%, average, including inflation
Investment rate of return	6.50%, net of Plan investment expense, including inflation
Healthcare Trend Rates	
Pre – 65	Initial trend starting at 6.80% at January 1, 2025, and gradually decreasing to an ultimate trend rate of 4.05% over a period of 13 years.
Post – 65	Initial trend starting at 8.50% at January 1, 2025, then gradually decreasing to an ultimate trend rate of 4.05% over a period of 13 years.

The mortality table used for active members was a Pub-2010 General Mortality table, projected with the ultimate rates from the MP-2020 mortality improvement scale using a base year of 2010. The mortality table used for healthy retired members was a system-specific mortality table based on mortality experience from 2013-2022, projected with the ultimate rates from MP-2020 mortality improvement scale using a base year of 2023. The mortality table used for the disabled members was PUB-2010 Disabled Mortality table, with rates multiplied by 150% for both male and female rates, projected with the ultimate rates from the MP-2020 mortality improvement scale using a base year of 2010.

The actuarial assumption used in the June 30, 2023 valuation was based on the results of an actuarial experience study for the period July 1, 2018 - June 30, 2022. The total OPEB liability was rolled-forward from the valuation date (June 30, 2022) to the plan's fiscal year ending June 30, 2023.

The long-term expected rate of return was determined by using a building-block method in which best estimate ranges of expected future real rate of returns are developed for each asset class. The ranges are combined by weighting the expected future real rate of return by the target asset allocation percentage. The target allocation and best estimates of arithmetic real rate of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Equity	**60.00%**	
Public Equity	50.00%	5.90%
Private Equity	10.00%	11.73%
Fixed Income	**20.00%**	
Core Bonds	10.00%	2.45%
Specialty Credit/High Yield	10.00%	3.65%
Cash	0.00%	1.39%
Inflation Protected	**20.00%**	
Real Estate	7.00%	4.99%
Real Return	13.00%	5.15%
Total	**100.00%**	**5.75%**
Long term inflation assumption		**2.50%**
Expected nominal return for portfolio		**8.25%**

8. POSTEMPLOYMENT BENEFITS OTHER THAN PENSIONS (OPEB) (CONTINUED)

Discount Rate – The discount rate used to measure the total OPEB liability (asset) as of June 30, 2023 was 5.93% for non-hazardous classifications. The projection of cash flows used to determine the discount rate assumed that local employers would contribute the actuarially determined contribution rate of projected compensation over the remaining 22-year amortization period of the unfunded actuarial accrued liability. As of June 30, 2023, the discount rate determination used an expected rate of return of 6.50%, and a municipal bond rate of 3.86%, as reported in Fidelity Index's "20 –Year Municipal GO AA Index". However, the cost associated with the implicit employer subsidy was not included in the calculation of the System's actuarial determined contributions, and any cost associated with the implicit subsidy will not be paid out of the System's trusts. Therefore, the municipal bond rate was applied to future expected benefit payments associated with the implicit subsidy.

Sensitivity of the District's Proportionate Share of the Net OPEB Liability (Asset) to Changes in the Discount Rate – The following presents the District's proportionate share of the net OPEB liability calculated using the discount rate as well as what the District's proportionate share of the net OPEB liability would be if it were calculated using a discount rate that is 1-percentage-point lower or 1-percentage-point higher than the current rate:

	Discount rate	Proportionate share of net OPEB liability (asset)
1% decrease	4.93%	$ 42,917
Current discount rate	5.93%	$ (22,869)
1% increase	6.93%	$ (77,957)

Sensitivity of the District's Proportionate Share of the Net OPEB Liability (Asset) to Changes in the Healthcare Cost Trend Rate – The following presents the District's proportionate share of the net OPEB liability calculated using healthcare cost trend rates that are 1-percentage-point lower or 1-percentage-point higher than the current healthcare cost trend rates:

	Proportionate share of net OPEB liability (asset)
1% decrease	$ (73,300)
Current trend rate	$ (22,869)
1% increase	$ 39,080

OPEB plan fiduciary net position – Detailed information about the OPEB plan's fiduciary net position is available in the separately issued financial report.

9. CAPITAL CONTRIBUTIONS

The District received $107,350 of tap fees and recognized $57,860 of grant revenue that was used for capital projects for the year ended December 31, 2023.

10. RISK MANAGEMENT

The District is exposed to various risks of loss related to torts; theft of, damage to, and destruction of assets; errors and omissions; injuries to employees; and natural disasters. In addition to its general liability insurance, the District also carries commercial insurance for all other risks of loss such as worker's compensation and employee health and accident coverage. Settled claims resulting from these risks have not exceeded commercial insurance coverage in the past three years.

11. ECONOMIC DEPENDENCY

The District obtains a majority of its revenues from customers in Meade County, Kentucky. An economic downturn in the area could have a negative impact on the financial condition of the District.

12. ACCOUNTING FOR THE EFFECTS OF RATE REGULATION

The District is subject to the provisions of GASB Statement No. 62, Codification of Accounting and Financial Reporting Guidance in Pre-November 30, 1989, FASB and AICPA Pronouncements. This statement recognizes the economic ability of regulators, through the ratemaking process, to create future economic benefits and obligations affecting rate-regulating entities. Accordingly, the District records these future economic benefits and obligations as regulatory assets and regulatory liabilities.

Regulatory assets represent probable future revenues associated with previously incurred costs that are expected to be recovered from customers. Regulatory liabilities represent probable future reductions in revenues associated with amounts that are expected to be refunded to customers through the ratemaking process.

In order for the District to continue to apply the provisions of GASB Statement No. 62, it must continue to meet the following three criteria:

1 The entities' rates for regulated services provided to its customers must be established by an independent third-party regulator or its own governing board empowered by a statute to establish rates that bind customers;

2 The regulated rates must be designed to recover the specific entities cost of providing the regulated services;

3 In view of the demand for the regulated services and the level of competition, it is reasonable to assume that the rates set at levels that will recover the entities' cost can be charged to and collected from customers.

Based on the District's management evaluation of the three criteria discussed above in relation to its operations, and the effects of competition on its ability to recover its costs, the District believes that GASB Statement No. 62 applies and has elected to apply the guidance to its pension and OPEB liabilities. The District believes these liabilities will be recovered through rates charged to customers in future periods. As of December 31, 2023, the District had regulatory assets of $1,106,555 and $290,155, which equates to the net impact of pension and OPEB expense on the balance sheet.

REQUIRED SUPPLEMENTARY INFORMATION

MEADE COUNTY WATER DISTRICT
REQUIRED SUPPLEMENTARY SCHEDULE
PROPORTIONATE SHARE OF THE NET PENSION LIABILITY
Last Nine Fiscal Years

Reporting Year End (Measurement Date)	**December 31, 2015 (June 30, 2015)**	**December 31, 2016 (June 30, 2016)**	**December 31, 2017 (June 30, 2017)**	**December 31, 2018 (June 30, 2018)**	**December 31, 2019 (June 30, 2019)**	**December 31, 2020 (June 30, 2020)**	**December 31, 2021 (June 30, 2021)**	**December 31, 2022 (June 30, 2022)**	**December 31, 2023 (June 30, 2023)**
District's proportion of the net pension liability	0.018106%	0.018260%	0.017207%	0.016584%	0.016551%	0.017978%	0.018412%	0.017199%	0.016564%
District's proportionate share of the net pension liability (asset)	$ 778,456	$ 899,077	$ 1,007,179	$ 1,010,077	$ 1,164,321	$ 1,378,898	$ 1,173,909	$ 1,243,318	$ 1,062,830
District's covered employee payroll	$ 396,057	$ 408,472	$ 448,477	$ 429,772	$ 446,856	$ 460,508	$ 470,278	$ 505,510	$ 578,944
District's share of the net pension liability (asset) as a percentage of its covered employee payroll	196.55%	220.11%	224.58%	235.03%	260.56%	299.43%	249.62%	245.95%	183.58%
Plan fiduciary net position as a percentage of the total pension liability	59.97%	55.50%	53.30%	53.54%	50.45%	47.81%	57.33%	52.42%	57.48%

Notes:
The above schedule will present 10 years of historical data, once available.

MEADE COUNTY WATER DISTRICT
REQUIRED SUPPLEMENTARY SCHEDULE
CONTRIBUTIONS - PENSION
Last Nine Calendar Years

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contractually required employer contribution	$ 50,497	$ 50,732	$ 62,563	$ 62,231	$ 78,225	$ 91,620	$ 101,785	$ 122,683	$ 142,340
Contributions relative to contractually required employer contribution	50,497	50,732	62,563	62,231	78,225	91,620	101,785	122,683	142,340
Contribution deficiency (excess)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
District's covered employee payroll	$ 396,057	$ 408,472	$ 448,477	$ 429,772	$ 439,022	$ 474,719	$ 481,689	$ 530,964	$ 609,086
Employer contributions as a percentage of covered-employee payroll	12.75%	12.42%	13.95%	14.48%	17.82%	19.30%	21.13%	23.11%	23.37%

Notes:
The above schedule will present 10 years of historical data, once available.

MEADE COUNTY WATER DISTRICT
REQUIRED SUPPLEMENTARY SCHEDULE
PROPORTIONATE SHARE OF THE NET OPEB LIABILITY / (ASSET)
Last Six Fiscal Years

Reporting Year End (Measurement Date)	**December 31, 2018 (June 30, 2018)**	**December 31, 2019 (June 30, 2019)**	**December 31, 2020 (June 30, 2020)**	**December 31, 2021 (June 30, 2021)**	**December 31, 2022 (June 30, 2022)**	**December 31, 2023 (June 30, 2023)**
District's proportion of the net OPEB liability	0.016584%	0.016551%	0.017973%	0.018407%	0.017196%	0.016564%
District's proportionate share of the net OPEB liability (asset)	$ 294,441	$ 287,380	$ 433,993	$ 352,393	$ 339,365	$ (22,869)
District's covered employee payroll	$ 429,772	$ 446,856	$ 460,508	$ 470,278	$ 505,510	$ 578,944
District's share of the net OPEB liability (asset) as a percentage of its covered employee payroll	68.51%	64.31%	94.24%	74.93%	67.13%	-3.95%
Plan fiduciary net position as a percentage of the total OPEB liability (asset)	57.62%	60.44%	51.67%	62.91%	60.95%	104.23%

Notes:
The above schedule will present 10 years of historical data, once available.

MEADE COUNTY WATER DISTRICT
REQUIRED SUPPLEMENTARY SCHEDULE
CONTRIBUTIONS - OPEB
Last Nine Calendar Years

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contractually required employer contribution	$ 19,486	$ 18,953	$ 21,213	$ 20,199	$ 21,945	$ 22,597	$ 25,513	$ 19,966	$ 10,173
Contributions relative to contractually required employer contribution	19,486	18,953	21,213	20,199	21,945	22,597	25,513	19,966	10,173
Contribution deficiency (excess)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
District's covered employee payroll	$ 396,057	$ 408,472	$ 448,477	$ 429,772	$ 439,022	$ 474,719	$ 481,689	$ 530,964	$ 609,086
Employer contributions as a percentage of covered-employee payroll	4.92%	4.64%	4.73%	4.70%	5.00%	4.76%	5.30%	3.76%	1.67%

Notes:
The above schedule will present 10 years of historical data, once available.

1. GENERAL INFORMATION

Contributions

Contractually required employer contributions reported on the Schedule of Contributions - Pensions exclude the portion of contributions paid to CERS but allocated to the insurance fund of the CERS. The insurance contributions are reported on the Schedule of Contributions - OPEB.

Payroll

The District's covered payroll reported on the Schedule of Proportionate Share of the Net Pension Liability and the Schedule of Proportionate Share of the Net OPEB Liability is for the corresponding measurement date of the net liabilities and differs from the District's calendar year payroll as reported on the Schedule of Contributions for Pension and OPEB.

2. CHANGES OF ASSUMPTIONS

December 31, 2023 – Pension and OPEB

The following change in assumptions was made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2023, for pension:

- The rate of inflation was increased from 2.30% to 2.50%.
- The salary productivity assumption was reduced by .20%, resulting in no change in the salary increase assumption for long-service employees of 3.30% in the non-hazardous funds.
- The individual rates of salary increases were increased during the select period for the CERS funds.
- The investment return assumption was increased from 6.25% to 6.50%.
- The Tier 3 cash balance interest crediting rate assumption was increased to 6.75% for the CERS pension funds.

The following change in assumptions was made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2023, for OPEB:

- The rate of inflation was increased from 2.30% to 2.50%.
- The salary productivity assumption was reduced by .20%, resulting in no change in the salary increase assumption for long-service employees of 3.30% in the non-hazardous funds.
- The individual rates of salary increases were increased during the select period for the CERS funds.
- The investment return assumption was increased from 6.25% to 6.50%.
- The initial healthcare trend rate for pre-65 was changed from 6.20% to 6.8%. The initial healthcare trend rate for post-65 was changed from 9.00% to 8.50%.

December 31, 2022 – Pension and OPEB

The following change in assumptions was made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2022, for OPEB:

- The initial healthcare trend rate for pre-65 was changed from 6.30% to 6.20%. The initial healthcare trend rate for post-65 was changed from 6.30% to 9.00%.

There were no changes in assumptions made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2022, for pension.

2. CHANGES OF ASSUMPTIONS (CONTINUED)

December 31, 2021 – Pension and OPEB

The following change in assumptions was made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2021, for OPEB:

- The initial healthcare trend rate for pre-65 was changed from 6.40% to 6.30%. The initial healthcare trend rate for post-65 was changed from 2.90% to 6.30%.

There were no changes in assumptions made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2021, for pension.

December 31, 2020 – Pension and OPEB

The following change in assumptions was made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2020, for OPEB:

- The initial healthcare trend rate for pre-65 was changed from 7% to 6.40%. The initial healthcare trend rate for post-65 was changed from 5% to 2.90%, which increases to 6.30% in 2023.

There were no changes in assumptions made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2020, for pension.

December 31, 2019 – Pension and OPEB

The following changes in assumptions were made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2019, for both pension and OPEB:

- The assumed rate of salary increases was increased from 3.05% to 3.3% to 10.3% on average for non-hazardous and 3.05% to 3.55% to 19.05% on average for hazardous.

December 31, 2018 – Pension and OPEB

There were no changes in assumptions made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2018, for either pension or OPEB.

December 31, 2017 – Pension and OPEB

The following changes in assumptions were made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2017:

- The assumed rate of return was decreased from 7.5% to 6.25%.
- The assumed rate of inflation was reduced from 3.25% to 2.3%.
- Payroll growth assumption was reduced from 4% to 2%

December 31, 2016 – Pension and OPEB

There were no changes in assumptions made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2016, for either pension or OPEB.

2. CHANGES OF ASSUMPTIONS (CONTINUED)

December 31, 2015 – Pension

The following changes in assumptions were made by the Kentucky Legislature and reflected in the valuation performed as of June 30, 2015:

- The assumed rate of return was decreased from 7.75% to 7.5%.
- The assumed rate of inflation was reduced from 3.5% to 3.25%.
- The assumed rate of wage inflation was reduced from 1% to .75%.
- Payroll growth assumption was reduced from 4.5% to 4%.
- Mortality rates were based on the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (multiplied by 50% for males and 30% for females).
- For healthy retired members and beneficiaries, the mortality table used is the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (set back 1 year for females).
- For Disabled members, the RP-2000 Combined Disabled Mortality Table projected with Scale BB to 2013 (set back 4 years for males) is used for the period after disability retirement.
- The assumed rates of retirement, withdrawal, and disability were updated to reflect experience more accurately.

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INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

The Board of Commissioners
Meade County Water District
Brandenburg, Kentucky

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the Meade County Water District (the District), as of and for the year ended December 31, 2023, and the related notes to the financial statements, which collectively comprise the District's basic financial statements, and have issued our report thereon dated March 27, 2024.

Report on Internal Control over Financial Reporting

In planning and performing our audit of the financial statements, we considered the District's internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control. Accordingly, we do not express an opinion on the effectiveness of the District's internal control.

Our consideration of internal control was for the limited purpose described in the preceding paragraph and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies and therefore, material weaknesses or significant deficiencies may exist that were not identified. However, as described in the accompanying schedule of findings and questioned costs, we identified certain deficiencies in internal control that we consider to be material weaknesses and significant deficiencies.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected, on a timely basis. We consider the deficiencies described in the accompanying schedule of findings and questioned costs as items 2023-001, 2023-002, and 2023-003 to be material weaknesses.

A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance. We consider the deficiency described in the accompanying schedule of findings and questioned costs as item 2023-004 to be a significant deficiency.

Report on Compliance and Other Matters

As part of obtaining reasonable assurance about whether the District's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the financial statements. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Meade County Water District's Response to Findings

Government Auditing Standards requires the auditor to perform limited procedures on the District's response to the findings identified in our audit and described in the accompanying schedule of findings and questioned costs. The District's response was not subjected to the other auditing procedures applied in the audit of the financial statements and, accordingly, we express no opinion on the response.

Purpose of This Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

RFH

RFH, PLLC
Lexington, Kentucky
March 27, 2024

2023-001 – Internal Control Over Financial Reporting (Recurring) (Material Weakness)

Criteria: The District is required to have internal controls in place that enable it to prepare complete financial statements, including note disclosures, in compliance with generally accepted accounting principles.

Condition: Management engaged the auditor to draft financial statements, including the related notes to the financial statements. Management reviewed, approved and accepted responsibility for the adjustments and the financial statements prior to their issuance.

Cause: The District lacks personnel with the expertise to draft the financial statements, including related note disclosures, in conformity with generally accepted accounting principles.

Effect: Management engaged the auditor to draft financial statements, including the related notes to the financial statements. Management reviewed, approved and accepted responsibility for the financial statements prior to their issuance.

Recommendation: We recommend management review the costs and benefits involved to retain a consultant with the required expertise to prepare the financial statements on the accrual basis of accounting.

Response: The District hired an outside CPA, who is also a QuickBooks Pro Advisor, to assist in improving the needed internal controls.

2023-002 – Internal Control Over Period-end Financial Reporting (Recurring) (Material Weakness)

Criteria: The District is required to have internal controls over the period-end financial reporting process that enable the District to record and process year-end journal entries to produce financial records that are in accordance with generally accepted accounting principles.

Condition: During our audit, we identified material misstatements that were not identified by the District's internal controls over financial reporting.

Cause: The District failed to provide proper oversight over period-end financial reporting, which resulted in misstated accounting records prior to performance of the audit.

Effect: The District relied on auditor prepared accounting adjustments to ensure the financial records were properly stated in accordance with generally accepted accounting principles. There were several material adjustments that were necessary to properly record capital assets, accounts payable, accounts receivable, deferred revenue, debt and related income and expense. The District reviewed, approved and accepted responsibility for the accounting adjustments as the auditor cannot be a component of the District's internal controls.

Recommendation: We recommend management review the period-end financial reporting process and implement an additional analytical review and analysis and reconciliation of year end balances prior to the start of the audit. This additional oversight of the year-end financial records should ensure that any accounting errors are detected and corrected prior to the audit.

Response: The District hired an outside CPA, who is also a QuickBooks Pro Advisor, to assist in improving the needed internal controls.

2023-003 – Segregation of Duties (Recurring) (Significant Deficiency)

Criteria: The District should have proper segregation of duties or compensating controls to properly safeguard assets from misappropriation. The basic premise of segregation of duties is that no one employee should have access to both physical assets and the related accounting records or to all phases of a transaction. In addition, proper segregation of duties should include oversight of accounting activity by individuals with knowledge of internal controls and accounting regulations, who were not involved in the original transaction.

Condition: The District had one individual responsible for adjusting utility bills without a regular and formalized secondary approval. Monthly bank reconciliations were not regularly reviewed by an individual other than the preparer. Additionally, bank statement were not regularly reviewed before reconciliations were prepared by an individual other than the individual preparing the reconciliation. We also noted that payroll registers were not being regularly reviewed by an individual other than the preparer. The District also failed to provide sufficient compensating controls, for these incompatible duties.

Cause: The District does not have sufficient segregation of duties related to utility billing adjustments, bank reconciliations, and payroll review. Additionally, while improvements were made in 2023, the District did not provide regular, documented oversight to compensate for the lack of segregation of duties.

Effect: District personnel performed a variety of incompatible duties during 2023. The District did not provide regular, documented oversight related to monthly bank reconciliations, utility billing adjustments, or payroll processing.

Recommendation: We recommend the District separate duties where possible and implement compensating controls to address the lack of segregation of duties related to utility billing adjustments, monthly bank reconciliations, and payroll processing. Bank statements received in the mail should be opened and reviewed by someone other than the individual preparing the reconciliations regularly and the review should be documented. We also recommend the Board review the budget to actual reports and investigate unusual variances. Management and/or a member of the Board should review monthly bank reconciliations and bank statements should be received and reviewed by someone other than the individual preparing the reconciliation on a regular basis. The District should also have an individual outside of the utility billing function review and approve monthly utility billing adjustments on a regular basis and the review should be documented. Payroll registers should be reviewed regularly by an individual other than the person who prepared payroll, including review of pay rate changes, overtime and an overall reasonableness review, and the review should be documented.

Response: While the District acknowledges the short comings, it is our contention that strides were made in 2023 to improve controls and processes. The District has crossed trained employees in as many areas as possible, but with an office staff of four employees (three CSR's and one accounting specialist), it is difficult to sufficiently segregate duties. The District has contracted a CPA to assist with these and other duties and will work with them to find better ways to improve segregation of duties and internal controls.

PRIOR AUDIT FINDINGS

2022-001 – Internal Control Over Financial Reporting (Material Weakness)

Status: Repeated as Finding 2023-001.

2022-002 – Internal Control Over Period-end Financial Reporting (Material Weakness)

Status: Repeated as Finding 2023-002.

PRIOR AUDIT FINDINGS (CONTINUED)

2022-003 – Segregation of Duties (Material Weakness)

Status: Repeated as Finding 2023-003.

2022-004 – Capital Asset Accounting and Tracking (Significant Deficiency)

Status: Resolved.

2022-005 – Bank Reconciliation Preparation (Significant Deficiency)

Status: Resolved.

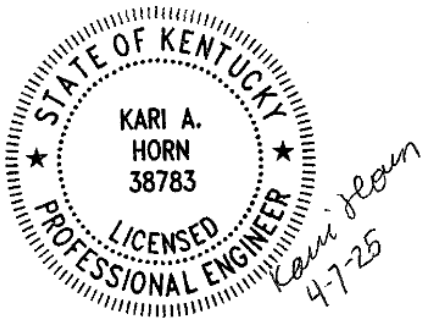
Addendum #1 to Preliminary Engineering Report

Meade County Water District 2023 Water System Improvements

Transmission Main and Pump Station Upgrades

Meade County, Kentucky

April 7, 2025



Purpose of Addendum

This Addendum modifies specific portions of the Preliminary Engineering Report (PER) dated January 30, 2025, and provides additional information to support these changes. Any information or sections not modified remains as is in the original PER.

Based on current market volatility and other considerations the total project cost was re-evaluated. Based on this re-evaluation additional funding for the project is necessary. The information provided below identifies the project elements and updated proposed project cost.

Improvement Element Cost Estimates

As part of the reevaluation, HDR examined each improvement element cost estimate to consider changes to material pricing based on the Build America Buy America Act (BABA), inflation, and market volatility. In total, each construction estimate was increased by 6% to account for these factors. The tables below show the revised estimates for each element. Appendix D is attached to provide a breakdown of each estimate.

Table 1: Improvement Element 1, Alternative 1 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$4,016,455
Non-Construction	$637,600
O&M	$7,500

Table 2: Improvement Element 1, Alternative 2 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$5,113,500
Non-Construction	$774,400
O&M	$10,500

Table 3: Improvement Element 2, Alternative 1 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$551,000
Non-Construction	$195,100
O&M	$121,000

Table 4: Improvement Element 2, Alternative 2 Cost Estimates Summary

Estimate Type	Total Cost

Construction	$1,139,000
Non-Construction	$288,900
O&M	$121,000

Table 5: Improvement Element 3, Alternative 1 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$770,650
Non-Construction	$252,100
O&M	$51,000

Table 6: Improvement Element 3, Alternative 2 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$378,000
Non-Construction	$147,800
O&M	$58,000

Table 7: Improvement Element 4, Alternative 1 Cost Estimates Summary

Estimate Type	Total Cost
Construction	$644,000
Non-Construction	$94,400
O&M	$19,000

Life Cycle Cost Analysis

Due to the revised costs for the improvement elements, the life cycle cost for each element changed. The revised table showing the new net present value of each element is below. Appendix E is attached which provides an updated breakdown of each analysis.

Table 8: Life Cycle Cost Analysis Summary

Alternative	Net Present Value
Improvement Element 1, Alternative 1	$4,178,289
Improvement Element 1, Alternative 2	$5,297,498
Improvement Element 2, Alternative 1	$2,685,021
Improvement Element 2, Alternative 2	$3,282,049
Improvement Element 3, Alternative 1	$1,808,484
Improvement Element 3, Alternative 2	$1,417,304
Improvement Element 4, Alternative 1	$1,035,075

Selection of Improvement Elements

Based on the analysis of the life cycle costs in this Addendum and the non-monetary factors discussed in the PER, the recommended alternatives for the project remained unchanged. The alternatives are as follows:

1. Improvement Element 1, Alternative 1
2. Improvement Element 2, Alternative 1
3. Improvement Element 3, Alternative 1
4. Improvement Element 4, Alternative 1

The proposed project cost will be increased due to the construction costs listed above and other non-construction factors that are described below.

Proposed Project Cost Modifications

The Total Project Cost Estimate is broken down by line item. The Construction line item is increased based on the reasons above. However, there are additional increases that were evaluated by HDR. The paragraphs below provide this justification.

Engineering Fees – Inspection: Based on the evaluation of the proposed improvements, there will be multiple bid packages with construction contracts of different durations. As such, the previous inspection budget should be increased to reflect this change.

Miscellaneous: During construction, interest for interim financing will be accrued and paid by MCWD. The original budget for this line item was low. The revised total will better encapsulate the required coverage needed.

Contingencies: The project contingency has been updated to reflect 10% of the construction cost. The contingency will cover unknown costs due to recent tariffs imposed by the government and additional market volatility.

Based on these reasons and the construction costs provided above, Table 19 is revised to the following below.

Table 9: Total Project Cost Estimate

Cost Classification		Engineer's Estimate
1	Administrative Expenses	$15,000
2	Legal Expenses	$32,000
3	Land, Appraisals, and Easements	$20,000
4	Relocation Expenses and Payments	
5	Planning	$45,000
6	Engineering Fees – Design	$338,500
7	Engineering Fees – Construction	$81,300
8	Engineering Fees – Inspection	$271,000
9	Engineering Fees – Other	$85,000
10	Construction	$5,983,000
11	Miscellaneous	$190,000
12	Contingencies	$598,300
	Total	$7,659,100

Because the overall proposed project cost is increased, the annual repayments on the loan will be revised. Table 26 below shows the proposed annual repayments.

Table 10: Proposed Financing Annual Repayments for RD Loan

Payment Year	Interest Payment	Principal Payment
2025	$306,364.00	$80,600.46
2026	$303,139.98	$83,824.48
2027	$299,787.00	$87,177.45
2028	$296,299.90	$90,664.55

Appendices

- Appendix D: Improvement Element Cost Estimates
- Appendix E: Life Cycle Cost Analysis

Appendix D – Improvement Element Cost Estimates

Improvement Element 1, Alternative 1 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
6" Water Main	82	LF	$ 95	$ 7,790
8" Water Main	84	LF	$ 105	$ 8,820
10" Water Main	17	LF	$ 110	$ 1,870
12" Water Main	52	LF	$ 125	$ 6,500
16" Water Main	19,480	LF	$ 145	$ 2,824,600
24" Steel Encasement - Bored	820	LF	$ 660	$ 541,200
24 Steel Casing - Open Cut	60	LF	$ 400	$ 24,000
6" MJ Gate Valve	2	EA	$ 1,525	$ 3,050
8" MJ Gate Valve	3	EA	$ 2,100	$ 6,300
10" MJ Gate Valve	1	EA	$ 3,125	$ 3,125
16" MJ Butterfly Valve	15	EA	$ 5,500	$ 82,500
Connect to Ex. 6" Water Main (Cut-in)	1	EA	$ 5,500	$ 5,500
Connect to Ex. 8" Water Main (Cut-in)	3	EA	$ 6,500	$ 19,500
8" Tapping Sleeve and Valve	1	EA	$ 3,750	$ 3,750
10" Tapping Sleeve and Valve	2	EA	$ 4,500	$ 9,000
12" Tapping Sleeve and Valve	1	EA	$ 5,750	$ 5,750
6" Fire Hydrant	6	EA	$ 3,850	$ 23,100
2" Air Release Valve	6	EA	$ 1,800	$ 10,800
Transfer Existing Water Service	4	EA	$ 3,500	$ 14,000
Install New Water Service	3	EA	$ 1,500	$ 4,500
Meter Relocate	2	EA	$ 2,500	$ 5,000
Reconfigure 8" Water Main	1	LS	$ 5,000	$ 5,000
Line C - Walnut Grove Road Reconnect	1	LS	$ 15,000	$ 15,000
Gravel Driveway Restoration	430	SY	$ 40	$ 17,200
Asphalt Driveway Restoration	160	SY	$ 60	$ 9,600
Site Restoration	36,000	SY	$ 0.75	$ 27,000
Mobilization	1	LS	$ 147,000	$ 147,000
Erosion Control	1	LS	$ 74,000	$ 74,000
Traffic Control	1	LS	$ 74,000	$ 74,000
Demobilization	1	LS	$ 37,000	$ 37,000
Total				$ 4,016,455
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ 16,000
Engineering - Design and Inspection				$ 220,000
Construction Contingency				$ 401,600
Total				$ 637,600
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 2,500
Pipeline and Meter Maintenance				$ 5,000
Total				$ 7,500
Total Alternative Cost				$ 4,661,555

Improvement Element 1, Alternative 2 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
6" Water Main	82	LF	$ 95	$ 7,790
6" Water Main - Extension	4,181	LF	$ 95	$ 397,195
8" Water Main	84	LF	$ 105	$ 8,820
10" Water Main	17	LF	$ 110	$ 1,870
12" Water Main	52	LF	$ 125	$ 6,500
16" Water Main	21,500	LF	$ 145	$ 3,117,500
24" Steel Encasement - Bored	820	LF	$ 660	$ 541,200
24 Steel Casing - Open Cut	60	LF	$ 400	$ 24,000
6" MJ Gate Valve	2	EA	$ 1,525	$ 3,050
8" MJ Gate Valve	3	EA	$ 2,100	$ 6,300
10" MJ Gate Valve	1	EA	$ 3,125	$ 3,125
16" MJ Butterfly Valve	26	EA	$ 5,500	$ 143,000
Connect to Ex. 6" Water Main (Cut-in)	1	EA	$ 5,500	$ 5,500
Connect to Ex. 8" Water Main (Cut-in)	3	EA	$ 6,500	$ 19,500
8" Tapping Sleeve and Valve	1	EA	$ 3,750	$ 3,750
10" Tapping Sleeve and Valve	2	EA	$ 4,500	$ 9,000
12" Tapping Sleeve and Valve	1	EA	$ 5,750	$ 5,750
6" Fire Hydrant	6	EA	$ 3,850	$ 23,100
2" Air Release Valve	6	EA	$ 1,800	$ 10,800
Transfer Existing Water Service	4	EA	$ 3,500	$ 14,000
Install New Water Service	3	EA	$ 1,500	$ 4,500
Meter Relocate	2	EA	$ 2,500	$ 5,000
Reconfigure 8" Water Main	1	LS	$ 5,000	$ 5,000
Line C - Walnut Grove Road Reconnect	1	LS	$ 15,000	$ 15,000
Gravel Driveway Restoration	2,725	SY	$ 40	$ 109,000
Asphalt Driveway Restoration	2,725	SY	$ 60	$ 163,500
Site Restoration	49,000	SY	$ 0.75	$ 36,750
Mobilization	1	LS	$ 188,000	$ 188,000
Erosion Control	1	LS	$ 94,000	$ 94,000
Traffic Control	1	LS	$ 94,000	$ 94,000
Demobilization	1	LS	$ 47,000	$ 47,000
			Total	$ 5,113,500
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ 43,000
Engineering - Design and Inspection				$ 220,000
Construction Contingency				$ 511,400
Total				$ 774,400
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 3,000
Pipeline and Meter Maintenance				$ 7,500
Total				$ 10,500
Total Alternative Cost				$ 5,898,400

Improvement Element 2, Alternative 1 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
125 HP Pump and Piping	2	EA	$ 150,000	$ 300,000
Electrical Upgrades	1	LS	$ 175,000	$ 175,000
Site Work	1	LS	$ 50,000	$ 50,000
Mobilization	1	LS	$ 21,000	$ 21,000
Demobilization	1	LS	$ 5,000	$ 5,000
Total				$ 551,000
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ -
Engineering - Design and Inspection				$ 140,000
Construction Contingency				$ 55,100
Total				$ 195,100
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 5,000
Energy Cost (Electrical)				$ 6,000
Short Lived Asset Maintenance/Replacement				$ 100,000
Miscellaneous				$ 10,000
Total				$ 121,000
Total Alternative Cost				$ 867,100

Improvement Element 2, Alternative 2 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
Package Booster Pump Station (125 HP)	1	LS	$ 810,000	$ 810,000
Electrical Upgrades	1	LS	$ 175,000	$ 175,000
Site Work	1	LS	$ 100,000	$ 100,000
Mobilization	1	LS	$ 43,000	$ 43,000
Demobilization	1	LS	$ 11,000	$ 11,000
Total				$ 1,139,000
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ 15,000
Engineering - Design and Inspection				$ 160,000
Construction Contingency				$ 113,900
Total				$ 288,900
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 5,000.00
Energy Cost (Electrical)				$ 6,000
Short Lived Asset Maintenance/Replacement				$ 100,000
Miscellaneous				$ 10,000
Total				$ 121,000
Total Alternative Cost				$ 1,548,900

Improvement Element 3, Alternative 1 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
Package Booster Pump Station (20 HP)	1	LS	$ 460,000	$ 460,000
Site Grading and Pavement	1	LS	$ 100,000	$ 100,000
Bulk Water Filling Station	1	LS	$ 100,000	$ 100,000
10" Water Main	150	LF	$ 135	$ 20,250
10" Gate Valve	3	EA	$ 14,000	$ 42,000
Tie-in to Existing Water Main	2	EA	$ 5,700	$ 11,400
Mobilization	1	LS	$ 29,000	$ 29,000
Demobilization	1	LS	$ 8,000	$ 8,000
Total				$ 770,650
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ 15,000
Engineering - Design and Inspection				$ 160,000
Construction Contingency				$ 77,100
Total				$ 252,100
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 5,000
Energy Cost (Electrical)				$ 4,000
Valve Maintenance				$ 2,000
Short Lived Asset Maintenance/Replacement				$ 30,000
Miscellaneous				$ 10,000
Total				$ 51,000
Total Alternative Cost				$ 1,073,750

Improvement Element 3, Alternative 2 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
Upgraded Pumps	2	EA	$ 120,000	$ 240,000
Site Grading and Pavement	1	LS	$ 20,000	$ 20,000
Bulk Water Filling Station	1	LS	$ 100,000	$ 100,000
Mobilization	1	LS	$ 14,000	$ 14,000
Demobilization	1	LS	$ 4,000	$ 4,000
Total				$ 378,000
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ -
Engineering - Design and Inspection				$ 110,000
Construction Contingency				$ 37,800
Total				$ 147,800
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 5,000
Energy Cost (Electrical)				$ 8,000
Short Lived Asset Maintenance/Replacement				$ 30,000
Miscellaneous				$ 15,000
Total				$ 58,000
Total Alternative Cost				$ 583,800

Improvement Element 4, Alternative 1 Cost Estimates				
Construction Cost Estimate				
Item	Quantity	Unit	Unit Cost	Total
Garrett Tank Recoating and Repairs	1	LS	$ 295,000	$ 295,000
Payneville Tank Recoating and Repairs	1	LS	$ 315,000	$ 315,000
Mobilization	1	LS	$ 24,000	$ 24,000
Demobilization	1	LS	$ 10,000	$ 10,000
Total				$ 644,000
Non-Construction Cost Estimate				
Item				Total Cost
Land, Appraisals, and Easements				$ -
Engineering - Design and Inspection				$ 30,000
Construction Contingency				$ 64,400
Total				$ 94,400
O&M Cost Estimate				
Item				Total Cost
Personnel				$ 4,000
Tank Inspection				$ 15,000
Total				$ 19,000
Total Alternative Cost				$ 757,400.00

Appendix E – Life Cycle Cost Analysis

Improvement Elements Life Cycle Cost Analysis

Discount Rate 2.20%
Life Cycle Period 20 years

Salvage Notes:
Transmission Mains and Appurtenances have an 80 year life
Pumps/Pump controls have a 10 year life
Buildings have a 50 year life
Tank Coating Systems have a 20 year useful life
All other items will assume a useful life <=20 years

Improvement Element 1, Alternative 1 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 4,654,055	$ 7,500	$ 921,114	$ 120,301	$ 596,067	$ 4,178,289

Improvement Element 1, Alternative 2 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 5,887,900	$ 10,500	$ 1,172,625	$ 168,422	$ 758,824	$ 5,297,498

Improvement Element 2, Alternative 1 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 746,100	$ 121,000	$ 3,000	$ 1,940,862	$ 1,941	$ 2,685,021

Improvement Element 2, Alternative 2 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 1,427,900	$ 121,000	$ 134,000	$ 1,940,862	$ 86,714	$ 3,282,049

Improvement Element 3, Alternative 1 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 1,022,750	$ 51,000	$ 49,938	$ 818,049	$ 32,315	$ 1,808,484

Improvement Element 3, Alternative 2 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 525,800	$ 58,000	$ 60,000	$ 930,331	$ 38,827	$ 1,417,304

Improvement Element 4, Alternative 1 Life Cycle Cost					
Capital Cost	O&M Cost	Salvage Value	O&M Present Worth	Salvage Cost Present Worth	Net Present Value
$ 738,400	$ 19,000	$ 12,500	$ 304,764	$ 8,089	$ 1,035,075