

Case No. 2006-00308

Report

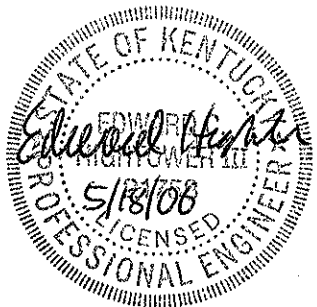
**Preliminary
Engineering Report**

**Estill County
Water District, KY**

April 2003
Revised May 2003
Revised May 2004
Revised January 2005

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SECTION 1
PURPOSE OF THE REPORT

During the past several years, the Estill County Water District (ECWD) has extended water service into many areas of the county. This report is an analysis of "Phase 9" of this effort. The waterlines discussed within this report are located in some of the more remote portions of Estill County. Many of these proposed waterlines are located along gravel roads.

Also a part of this phase, is the proposed construction of an elevated storage tank. This tank will replace the existing Wisemantown tank and will serve as an initial storage and distribution tank for the northern half of Estill County.

This project will also convert the existing system of meters to modern radio read meters. This system will allow the ECWD to operate much more efficiently.

Also included in this project will be the conversion of the ECWD to a radio read meter system. This will allow the water district to be able to read their meters much more efficiently than their present methods.

SECTION 2
SCOPE OF THE PROJECT

The proposed project is to include an elevated storage tank and water line extensions into the following areas:

- Division A: Storage Tank and Telemetry at Wisemantown
- Division B: Nolan Road (Crooked Creek)
- Division C: Upper Twin Creek (Wooly Ridge) Road
- Division D: Tommy Richards (Lincoln Farm) Road
- Division E: Winkler Cemetery Road
- Division F: Doe Creek Road
- Division G: Mountain Springs Road
- Division H: KY 1209
- Division I: KY 851 (Leighton Road)
- Division J: Ivory Hill Road
- Division K: Sang Branch
- Division L: Winding Star Road
- Division M: Chestnut Stand
- Division N: Lynch Road/Driprock Road
- Division O: Big Round Mountain Road
- Division P: Staton Road
- Division Q: Conversion to Radio Read Meters

SECTION 3
DESCRIPTION OF PROPOSED PROJECT

The description of the proposed project is as follows:

1. Division A: Storage Tank and Telemetry at Wisemantown

The construction will consist of a 250,000 gallon elevated storage tank and telemetry control system, and existing tank demolition at an estimated construction cost of \$602,125.

2. Division B: Nolan Road (Crooked Creek)

Proposed construction will consist of 0.75 miles of 3-inch PVC waterline along a gravel road to serve 7 potential customers at an estimated construction cost of \$26,920.

3. Division C: Upper Twin Creek (Woolly Ridge) Road

Proposed construction will consist of 0.50 miles of 3-inch PVC waterline along a gravel road to serve 5 potential customers at an estimated construction cost of \$20,030.

4. Division D: Tommy Richards (Lincoln Farm) Road

Proposed construction will consist of 1.0 miles of 3-inch PVC waterline along a gravel road to serve 3 potential customers at an estimated construction cost of \$30,610.

5. Division E: Winkler Cemetery Road

Proposed construction will consist of 0.7 miles of 3-inch PVC waterline along a gravel road to serve 5 potential customers at an estimated construction cost of \$30,000.

6. Division F: Doe Creek Road

Proposed construction will consist of 1.5 miles of 6-inch PVC waterline along KY 3325 and 1.25 miles of 3-inch PVC waterline along a gravel road to serve 5 potential customers at an estimated construction cost of \$114,460.

7. Division G: Mountain Springs Road

Proposed construction will consist of 1.5 miles of 3-inch PVC waterline along Mountain Springs Cemetery Road (gravel) to serve 6 potential customers at an estimated construction cost of \$58,850.

8. Division H: KY 1209

Proposed construction will consist of 3.2 miles of 6-inch PVC waterline along KY 1209 to serve 8 potential customers at an estimated construction cost of \$135,050.

9. Division I: KY 851 (Leighton Road)

Proposed construction will consist of 0.9 miles of 6-inch PVC waterline along KY 851 to serve 5 potential customers at an estimated construction cost of \$43,000.

10. Division J: Ivory Hill Road

Proposed construction will consist of 0.4 miles of 3-inch PVC waterline along Ivory Hill Church Road to serve 5 potential customers at an estimated construction cost of \$15,850.

11. Division K: Sang Branch

Proposed construction will consist of 1.5 miles of 3-inch PVC waterline along Sang Branch and Deer Lick to serve 4 potential customers at an estimated construction cost of \$48,900.

12. Division L: Winding Star Road

Proposed construction will consist of 0.5 miles of 3-inch PVC waterline along Winding Star Road to serve 1 potential customer at an estimated construction cost of \$14,300.

13. Division M: Chestnut Stand

Proposed construction will consist of 5.0 miles of 4-inch PVC waterline to serve a community of 15 potential customers at an estimated construction cost of \$162,100. Will require purchase of water to serve area from Powell's Valley Water District.

14. Division N: Lynch Road/Driprock Road

The proposed construction will consist of 2.0 miles of 3-inch waterline to serve 17 potential customers at an estimated construction cost of \$60,000. Will require purchase of water to serve area from Jackson County Water.

15. Division O: Big Round Mountain Road

The proposed construction will consist of extending a 3-inch waterline 0.9 miles to serve 5 potential customers at an approximate cost of \$38,000.

16. Division P: Staton Road

The proposed construction will consist of extending a 4-inch waterline a distance of approximately 2.0 miles to serve 5 potential customers at a cost of \$50,000.

17. Division Q: Conversion to Radio Read Meters

The project will consist of the conversion of approximately 3,500 existing meters to radio read meters and furnishing related data collection hardware and software at a cost of \$465,000.

SECTION 4
CUSTOMER SUBSCRIPTION CAMPAIGN

There are no subscription campaigns currently underway. The Estill County Water District is awaiting the results of this feasibility report and securing funding before signing any customers.

Tap fees for the proposed project will be \$350 for a 5/8-inch x 3/4-inch meter service.

Preliminary customer counts for the proposed project indicate that there are 96 potential customers.

With a total of 96 potential customers and an anticipated subscription rate of 75%, the aggregate total of deposits to the project would be \$25,200.

SECTION 5
WATER SUPPLY ALTERNATIVES

Information provided by Bluegrass Area Development District (BGADD), as well as discussions with local residents, indicates that there is a decreasing quality and quantity of groundwater available in Estill County which constitutes a serious problem to the health and general welfare of citizens not presently served by a potable water system. The high costs of drilling wells and installing individual treatment units for rural citizens is becoming increasingly prohibitive. A common problem for many individuals is the large capital investment of a well and treatment unit only to have the groundwater source fail. For those who cannot afford a treatment unit, the risks are great. With most wells that are able to provide water, the quality of that water is exceedingly poor.

With the proposed Phase 9 Water Project, a safe, reliable source of potable water should be provided to many citizens who are not presently served.

SECTION 6
ESTIMATED WATER USAGE

In May 2002, Estill County Water District (ECWD) was serving 3,430 customers. The utilities records indicate that approximately 196,975,500 gallons of water was purchased from June 2000 to June 2001 from the City of Irvine. Further, their records indicate that approximately 16% of the water purchased is lost due to line breaks and leakage. ECWD has an ongoing program to locate and repair leaks.

The Estill County District billing records indicate:

Average Monthly Water Usage

Residential = 4,000 gallon/month

In estimating usage, there are several groups of customers that must be discussed. These customers represent growth of the system that either has taken place or is imminent. Many of these new customers will be added through various construction projects, which are scheduled. For the most part, their estimated monthly usage will be less than the monthly usage of the existing customers. Typically, new customers will use less water than established customers. After the first 18-24 months, their usage should increase.

As previously stated, there are 96 potential residential customers in the proposed Phase 9 Water Project. With an assumed 75% subscriber rate, approximately 72 new residential customers will be served.

These new customers will be individually metered.

The estimated water use for the project is as follows:

Estimated Water Usage

72 Residential x 4,000 x 12 = 3,456,000 gallons

SECTION 7
DESIGN CRITERIA – HYDRAULIC CONSIDERATIONS

Hydraulic calculations are based on the Hazen and Williams formula. The economy and performance of PVC pipe has caused it to be the predominant material for water district pipelines. The relatively high flow coefficient of $C=140$ is a common value for PVC water systems and is therefore used in the design of this system.

Peak flows were used in determining line sizes. These values have proven to be slightly conservative in practice, but since their use leaves room for expansion, they are considered valid for design purposes. Additional future capacity is insured by designing a surplus of five gallons per minute into each dead end line.

In general, line sizes are sized to maintain a minimum of 30 psi at the service meter during peak flows. Individual pressure reducing valves will be furnished to customers in areas where main lined pressures exceed allowable pressure for individual services.

SECTION 8
OPINION OF CONSTRUCTION COSTS

The following is a breakdown of the preliminary opinion of construction costs:

Division A : Storage Tank and Telemetry at Wisemantown

<u>Item</u>	<u>Quantity</u>		<u>Price</u>	<u>Total</u>
1. 250,000 gallon elevated tank	1		492,125.00	492,125
2. Telemetry controls	1	EA	30,000.00	30,000
3. Existing tank demo	1	EA	50,000.00	50,000
4. Miscellaneous site work	1	EA	30,000.00	<u>30,000</u>
Total				\$602,125

Division B: Nolan Road (Crooked Creek)

<u>Item</u>	<u>Quantity</u>		<u>Price</u>	<u>Total</u>
1. Tie into existing line	1	EA	1,500.00	1,500
2. 3-inch SDR 17 PVC	3,960	LF	4.50	17,820
3. 3-inch gate valves	1	EA	400.00	400
4. Gravel at crossings	60	LF	15.00	900
5. Customer services	7	EA	600.00	4,200
6. Miscellaneous	1	LS		<u>2,100</u>
Total				\$26,920

Division C: Upper Twin Creek (Woolly Ridge) Road

<u>Item</u>	<u>Quantity</u>		<u>Price</u>	<u>Total</u>
1. Tie to existing line	1	EA	1,500.00	1,500
2. 3-inch SDR 17 PVC	2,640	LF	4.50	11,880
3. 3-inch gate valves	1	EA	400.00	400
4. Creek crossing with cap	50	LF	25.00	1,250
5. Customer services	5	EA	600.00	3,000
6. Miscellaneous	1	LS		<u>2,000</u>
Total				\$20,030

Division D: Tommy Richards (Lincoln Farm) Road

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Total</u>
1. Tie to existing line	1 EA	1,500.00	1,500
2. 3-inch SDR 17 PVC	5,280 LF	4.50	23,760
3. 3-inch gate valve	2 EA	400.00	800
4. Customer services	3 EA	600.00	1,800
5. Miscellaneous	1 LS		<u>2,750</u>
Total			\$30,610

Division E: Winkler Cemetery Road

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Total</u>
1. Tie to existing line	1 EA	1,500.00	1,500
2. 3-inch SDR 17 PVC	3,900 LF	4.50	17,550
3. 3-inch gate valves	2 EA	400.00	800
4. Road bore and casing	30 LF	100.00	3,000
5. Gravel at crossings	100 LF	15.00	1,500
6. Customer services	5 EA	600.00	3,000
7. Miscellaneous	1 LS		<u>2,650</u>
Total			\$30,000

Division F: KY 3325/Doe Creek Road

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Total</u>
1. Tie to existing line	1 EA	1,500.00	1,500
2. 6-inch SDR 17 PVC	7,920	8.00	63,360
3. 6-inch gate valves	2	500.00	1,000
4. 3-inch SDR 17 PVC	6,600	4.50	29,700
5. 3-inch gate valves	1	400.00	400
6. Road bore and casing	30 LF	100.00	3,000
7. Creek crossing	100 LF	25.00	2,500
8. Customer services	5 EA	600.00	3,000
9. Miscellaneous	1 LS		<u>10,000</u>
Total			\$114,460

Division G1: Mountain Springs Road

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Total</u>
1. Tie to existing line	1 EA	1,500.00	1,500
2. 3-inch SDR 17 PVC	7,900 LF	4.50	35,550
3. 3-inch gate valves	4 EA	400.00	1,600
4. Road bore and casing	40 LF	100.00	4,000
5. Customer services	6 EA	600.00	3,600
6. PRV valve	1 EA	8,000.00	8,000
7. Miscellaneous			<u>4,600</u>
Total			\$58,850

Division H: KY 1209

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Total</u>
1. Tie to existing line	1 EA	1,500.00	1,500
2. 4-inch SDR 17 PVC	17,000 EA	6.00	102,000
3. 4-inch gate valves	6 EA	500.00	3,000
4. Road bore and casing	80 LF	100.00	8,000
5. Creek crossing w/cap	30 LF	25.00	750
6. Customer services	8 EA	600.00	4,800
7. Miscellaneous			<u>15,000</u>
Total			\$135,050

Division I: Ky 851 (Leighton Road)

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Total</u>
1. Tie to existing line	1 EA	1,500.00	1,500
2. 4-inch SDR 17 PVC	4,750 LF	6.00	28,500
3. 4-inch gate valves	2 EA	500.00	1,000
4. Road bore and casing	40 LF	100.00	4,000
5. Customer services	5 EA	600.00	3,000
6. Miscellaneous			<u>5,000</u>
Total			\$43,000

Division J: Ivory Hill Road

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Total</u>
1. Tie to existing line	1 EA	1,500.00	1,500
2. 3-inch SDR 17 PVC	2,100 LF	4.50	9,450
3. 3-inch valves	1 EA	400.00	400
4. Customer services	5 EA	600.00	3,000
5. Miscellaneous			<u>1,500</u>
Total			\$15,850

Division K: Sang Branch

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Total</u>
1. Tie to existing line	1 EA	1,500.00	1,500
2. 3-inch SDR 17 PVC	7,900 LF	4.50	35,550
3. 3-inch gate valves	3 EA	400.00	1,200
4. Creek crossing	75 LF	50.00	3,750
5. Customer services	4 EA	600.00	2,400
6. Miscellaneous			<u>4,500</u>
Total			\$48,900

Division L: Winding Star Road

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Total</u>
1. Tie to existing line	1 EA	1,500.00	1,500
2. 3-inch SDR-21	2,650 LF	4.00	10,600
3. 3-inch gate valves	1 EA	400.00	400
4. Customer services	1 EA	600.00	600
5. Miscellaneous			<u>1,200</u>
Total			\$14,300

Division M: Chestnut Stand

<u>Item</u>	<u>Quantity</u>		<u>Price</u>	<u>Total</u>
1. Tie to existing line	1	EA	1,500.00	1,500
2. Master meter	1	EA	8,000.00	8,000
3. 4-inch SDR 21 PVC	25,000	LF	4.00	100,000
4. 4-inch gate valves	4	EA	400.00	1,600
5. Customer services	15	EA	600.00	9,000
6. Miscellaneous				10,000
7. Hydropneumatic pump station	1	EA	32,000	<u>32,000</u>
Total				\$162,100

Division N: Lynch Road/Drip Rock

<u>Item</u>	<u>Quantity</u>		<u>Price</u>	<u>Total</u>
1. Tie to existing line	1	EA	1,500.00	1,500
2. 3-inch SDR 21 PVC	12,000	LF	4.00	48,000
3. Customer services	14	EA	600.00	8,400
4. Miscellaneous				<u>2,100</u>
Total				\$60,000

Division O: Big Round Mountain Road

<u>Item</u>	<u>Quantity</u>		<u>Price</u>	<u>Total</u>
1. Tie to existing line	1	EA	1,500.00	1,500
2. 3-inch SDR 17 PVC	5,000	LF	4.50	22,500
3. 3-inch gate valve	1	EA	400.00	400
4. Customer services	5	EA	600.00	3,000
5. Gravel	200	LF	15.00	3,000
6. Miscellaneous				<u>7,600</u>
Total				\$38,000

Division P: Staton Road

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Total</u>
1. Tie to existing line	1 EA	1,500.00	1,500
2. 3-inch SDR 21PVC	10,000 LF	4.00	40,000
3. 3-inch valves	3 EA	400.00	1,200
4. Customer services	5 EA	600.00	3,000
5. Miscellaneous			<u>4,300</u>
Total			\$50,000

Division Q: Conversion to Radio Read Meters

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Total</u>
1. Converting existing meters	3,500 EA	120.00	420,000
2. Reading equipment	1 EA	20,000.00	20,000
3. Software			15,000
4. Miscellaneous			<u>10,000</u>
Total			\$465,000

TOTAL OPINION OF CONSTRUCTION COST **\$1,915,195**

SECTION 9
OPINION OF PROJECT COSTS

The total project cost, which consists of both construction and non-construction items, is presented as follows:

Estimated Construction Cost	\$1,915,195
Preliminary Engineering report	18,000
Basic Engineering (7.21 %)	138,350
Resident Observation (3.67 %)	70,500
Additional Engineering	40,000
Legal	10,000
Planning	10,000
Administration	50,000
Acquisition	30,000
Contingencies and Miscellaneous	<u>177,955</u>
Total	\$2,460,000

**SECTION 10
PROPOSED PROJECT FUNDING**

The proposed funding for the Estill County Water Distribution Project Phase 9 will be as follows:

ARC	\$350,000
RD Federal Loan	409,900
RD Federal Grant	1,074,900
Tobacco Development Fund State Grant	600,000
Local (Tap Fees)	<u>25,200</u>
Total	\$2,460,000