### PRELIINARY ENGINEERING REPORT

### WATER SYSTEM IMPROVEMENTS PROJECT NORTH HOPKINS WATER PROJECT HOPKINS COUNTY, KENTUCKY



**Prepared By:** 



3 HMB CIRCLE FRANKFORT, KENTUCKY 502-695-9800 502-695-9810-FAX

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# I INTRODUCTION

This Preliminary Engineering Report will examine the proposed Water System Improvement Project for North Hopkins Water District (NHWD). NHWD is currently under an Agreed Order from the Division of Water for exceeding the maximum contaminant level (MCL) for Total Trihalomethane (TTHM). It has been determined the water purchased from the City of Madisonville is out of compliance when the District receives it. In an effort to remedy this situation, the District intends to connect to Webster County Water District's system. This project also include other improvements throughout their system. It is estimated that the proposed project will have a construction cost of \$880,000 and a project cost of \$1,140,000.

# II DESCRIPTION OF WATER DISTRICT

The NHWD was formed in 1980 to provide safe and reliable potable water to the residents of rural Hopkins County. The Board of Commissioners is made up of 3 members. Each of the commissioners is nominated by the Judge Executive of Hopkins County and must be approved by the Fiscal Court. These Commissioners transact and administer all business of the District at its office located at 316 Liberty Church Loop, Madisonville, Kentucky. The day to day work is handled by the Office Manager, System Manager and staff.

### III EXISTING WATER SYSTEM

NHWD provides reliable safe potable water service to approximately 1,295 customers of rural Hopkins County. The water system is comprised of approximately 157 miles of water line ranging in size from 2-inch to 8-inch, 3 booster pump stations and four (4) elevated water storage tanks with a combined capacity of 400,000 gallons. NHWD purchases all of its water from the City of Madisonville through a master meter located along Brown Road (KY 254). The District is required by contract to purchase three million gallons per month, but actually purchase eight to nine million gallons per month. The District is currently purchasing water from Madisonville at a rate of \$4.13/1,000 gallons.

# IV NEED FOR PROJECT

### A. Connection to Webster County Water District

NHWD is currently under an Agreed Order from the Division of Water (See Appendix A- Agreed Order) for exceeding the maximum contaminant level (MCL) for Total Trihalomethane (TTHM). As part of the remedial measures to correct this situation, NHWD is required to determine if the Disinfection By-Produces (DPBs) are being formed in their system or if the elevated DBPs are related to the water supplier. NHWD has been able to determine that water purchased from the City of Madisonville is already out of compliance for TTHM at the master meter and not being formed in their system.

In order to remedy this situation, NHWD, along with HMB Professional Engineers, Inc., met with Webster County Water District (WCWD) to discuss the possibility of purchasing water near the City of Slaughters (See Appendix B – Project Map). Information obtained from WCWD indicated the TTHM levels at the proposed connection point are well below the MCL. WCWD also indicated they had plenty of excess capacity. HMB, along with the help of NHWD, developed a KYPIPE Model of the water system. This Model was used to simulate the age of water purchased from the City of Madisonville versus the age of water purchased from WCWD. The Model was able to demonstrate the water from WCWD was newer, which should help with the TTHM levels.

B. Automated Meter Reading System

NHWD's entire distribution system is maintained by two full time employees and one part time employee. These three employees are also required to read all 1,295 water meters monthly. This task takes three employees approximately two and half days. With the installation of an automated meter reading (AMR) system, all water meters could be read in one day by one employee. An AMR system is also helpful in identifying water leaks on the customer side of the meter.

### C. Meter Vaults

NHWD's system is divided up into 3 different zones. Each zone contains at least one elevated water storage tank and one booster pump station. However, NHWD does not have the capability to measure the amount of water being supplied to each zone. With a system as large as NHWD's, this makes it very difficult to locate water line leaks. By installing a water meter at each of its pump stations, NHWD will be able to monitor each of the three zones (See Appendix C – Meter Vaults).

### V <u>THE PROPOSED PROJECT</u>

In order to correct the high levels of TTHM in the system, NHWD proposes to purchase water from WCWD along KY 41 near Slaughters. Water purchased from WCWD will be in compliance and should help NHWD not to exceed MCL levels for TTHM. The proposed connection will require a 225 gpm booster pump station, master meter and approximately 20,200 l.f. of 8-inch water line (See Appendix B – Project Map). NHWD also intends to install approximately 20 flushing hydrants or flushing assemblies throughout its system. With these additional flushing points, NHWD should be able to develop a flushing routine that will also help to reduce the levels of TTHM.

In an effort to run a more efficient system, NHWD proposes to install three meter vaults, one at each pump station site and replace its existing water meters with new automated meter reading system.

# VI <u>COST SUMMARY</u>

The estimated construction cost for the Water System Improvements Project is \$880,000 and is summarized in Table 1. The estimated project cost is \$1,140,000 and is summarized in Table 2.



Water/Wastewater Transportation Engineers Environmental Project: Date: 1/27/2017 Engineer: JR Page:

#### Table 1 Estimated Construction Cost for Connection to Webster County Water District At Slaughters Elmwood Road North Hopkins Water District

			Unit	
Item	Quantity	Unit	Price	Total
8" SDR-21 Water Line	20,200	L.F.	\$13.00	\$262,600
14" Road Bore	150	L.F.	\$100	\$15,000
8" Gate Valve	7	EA.	\$900	\$6,300
6" Gate Valve	2	EA.	\$700	\$1,400
Connection of Exist. System	2	EA.	\$2,000	\$4,000
Master Meter Vault	1	EA.	\$15,000	\$15,000
Pump Station *	1	EA.	\$125,000	\$125,000
Installation of Pump Station	1	EA.	\$25,000	
Telemetry	1	EA.	\$10,000	
Blowoff Hydrant	1	EA.	\$3,500	\$3,500
Crushed Stone	400	L.F.	\$5	\$2,000
Bit. Replacement	50	L.F.	\$50	\$2,500
Creek Crossings	100	L.F.	\$50	\$5,000
Meter Vault @ Existing Pump Station	3	EA.	\$15,000	\$45,000
Flushing Assembly w/wet tap	10	EA.	\$2,500	\$25,000
Hydrant Assembly w/wet tap	10	EA.	\$5,500	\$55,000
Water Meter	1,325	EA.	\$115	\$152,375
Itron Radio Read Head	1,325	EA.	\$75	\$99,375
Meter Reading Equip./Training/Software	1	EA.	\$25,000	\$25,000
		·····		
Total Estimated Construction Cost				\$879,050
			USE	\$880,000



Water/Wastewater Transportation Engineers Environmental Project: Date: 1/27/2017 Engineer: JR Page:

#### Table 2 Estimated Project Cost for Connection to Webster County Water District At Slaughters Elmwood Road North Hopkins Water District

Construction Cost Legal & Admin. Land & Rights Survey Engineering			\$880,000 \$15,000 \$5,000 \$2,000 \$130,600
	Preliminary Engineering Design/Bidding/CA Inspection *	\$10,000 \$79,600 \$41,000	
Interest During Construction RD Environmental by PADD Contingencies			\$10,000 \$1,000 \$96,400
TOTAL ESTIMATED PROJE	CT COST		\$1,140,000

\* Inspection fees do not include meter reading equipment, since NHWD will be doing the installation.

# VII <u>FUNDING</u>

Proposed funding for this project is being made available by the following:

# TABLE 3

### **PROPOSED FUNDING**

RUS Grant	\$285,000		
RUS Loan <sup>(1)</sup>	\$855,000		
TOTAL PROJECT FUNDING	\$1,140,000		

(1) 2.375% loan for 40 years with principal deferred for 2 years.

# VIII <u>RECOMMENDATIONS</u>

It is recommended that the project be funded by Rural Development and a Letter of Conditions be issued as soon as possible.

Prepared By:

HMB Professional Engineers, Inc.

Jeff Reynolds, P.E. Project Manager



PARAS

4/2/20

Appendix A

Agreed Order

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CHARLES G. SNAVELY SECRETARY

ENERGY AND ENVIRONMENT CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION DIVISION OF ENFORCEMENT 300 FAIR OAKS LANE FRANKFORT KENTUCKY 40601 www.kentuckv.dov

February 10, 2016

CERTIFIED MAIL No. 7010 0780 0001 1438 6781 Return Receipt Requested

Steve Oakley, Manager North Hopkins Water District 410 Liberty Church Loop Madisonville, Kentucky 42434-7724

> Re: Case No. AI No.: Al Name: Activity ID:

DOW 150209 33925 North Hopkins Water District DW ERF20150001 PWSID.KY0540138 Hopkins County

Dear Mr. Oakley:

Enclosed is the Agreed Order that was discussed at an administrative conference with the Division of Enforcement on December 4, 2015. If the terms are agreeable, please have the Order signed and return the entire original document to

Department for Environmental Protection

If the Division of Enforcement has not received an executed Agreed Order within fourteen (14) days of your receipt of this letter, we will assume that you wish the Cabinet to proceed with its legal remedies regarding the violations. If you have any questions, please contact me by telephone at (502) 564-2150, extension 3581.

Rely S. Bronall



#### COMMONWEALTH OF KENTUCKY ENERGY AND ENVIRONMENT CABINET DIVISION OF ENFORCEMENT CASE NO. DOW 150209

IN RE:

North Hopkins Water District 410 Liberty Church Loop Madisonville, Kentucky 42431-8558

Agency Interest No. 33925 Activity ID: DW ERF20150001

#### AGREED ORDER

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WHEREAS, the parties to this Agreed Order, the Energy and Environment Cabinet (hereinafter "Cabinet") and the North Hopkins Water District (hereinafter "Water District" or "Respondent"), state:

#### STATEMENTS OF FACT

1. The Cabinet is charged with the statutory duty of enforcing KRS Chapter 224, and the regulations promulgated pursuant thereto.

2. The Water District, a Kentucky municipal corporation established under KRS 74, owns and operates a public (community) water system, as that term is defined by 401 KAR 8:010 Section 1(10) and 40 CFR 141.2, whose principal office is located at 410 Liberty Church Loop, Madisonville, Kentucky in Hopkins County.

 The Water District's public water system has been assigned the identification number PWSID No. KY0540138 by the Cabinet's Division of Water.

4. On November 5, 2014, authorized representatives of the Cabinet identified the following violation of KRS Chapter 224, and the regulations promulgated pursuant thereto at the

facility described in paragraph 2 above:

401 KAR 8:510 Total Trihalomethane (TTHM) The public water system exceeded the maximum contaminate level (MCL) for locational running annual average (LRAA) of samples for the specific contaminant in compliance period July 1, 2014 through September 30, 2014, (Violation 2015 – 9477812).

5. On November 20, 2014, the Cabinet issued the Water District a Notice of Violation (ENV20140001) for the violation described in paragraph 4 above.

6. On November 6, 2014, authorized representatives of the Cabinet identified the following violation of KRS Chapter 224, and the regulations promulgated pursuant thereto at the facility described in paragraph 2 above:

401 KAR 8:510 Section 1(1) TTHM The public water system failed to submit Operational Evaluation Levels (OEL's) report for compliance period July 1, 2014, through September 30, 2014, (Violation 2015 – 9477813).

 On November 20, 2014, the Cabinet issued the Water District a Notice of Violation (ENV20140001) for the violation described in paragraph 6 above,

8. On February 5, 2015, authorized representatives of the Cabinet identified the following violation of KRS Chapter 224, and the regulations promulgated pursuant thereto at the facility described in paragraph 2 above:

• 401 KAR 8:510 TTHM The public water system exceeded the MCL for LRAA of samples for the specific contaminant in compliance period October 1, 2014, through December 31, 2014 (Violation 2015 – 9477814).

On March 1, 2015, the Cabinet issued the Water District a Notice of Violation

(ENV20150001) for the violation described in paragraph 8 above.

10. On May 11, 2015, authorized representatives of the Cabinet identified the following violation of KRS Chapter 224, and the regulations promulgated pursuant thereto at the facility described in paragraph 2 above:

• 401 KAR 8:510 TTHM The public water system exceeded the MCL for LRAA of samples for the specific contaminant in compliance period January 1, 2015, through March 31, 2015, (Violation 2015 – 9477815).

 On May 29, 2015, the Cabinet issued the Water District a Notice of Violation (ENV20150002) for the violation described in paragraph 10 above.

12. On July 7, 2015, authorized representatives of the Cabinet identified the following violation of KRS Chapter 224, and the regulations promulgated pursuant thereto at the facility described in paragraph 2 above:

• 401 KAR 8:070 The public water system failed to properly perform public notification of Violation 2015 – 9477814, (Violation 2015 – 9477816).

13. On July 28, 2015, the Cabinet issued the Water District a Notice of Violation (ENV20150003) for the violation described in paragraph 12 above.

14. On August 6, 2015, authorized representatives of the Cabinet identified the following violation of KRS Chapter 224, and the regulations promulgated pursuant thereto at the facility described in paragraph 2 above:

• 401 KAR 8:510 TTHM The public water system exceeded the MCL for LRAA of samples for the specific contaminant in compliance period April 1, 2015, through June 30, 2015, (Violation 2015 – 9477819).

15. On August 28, 2015, the Cabinet issued the Water District a Notice of Violation (ENV20150004) for the violation described in paragraph 14 above.

16. On July 31, 2015, authorized representatives of the Cabinet identified the following violation of KRS Chapter 224, and the regulations promulgated pursuant thereto at the facility described in paragraph 2 above:

• 401 KAR 8:020 Monthly Operating Report (MOR) The public water system failed to submit the MOR for the compliance period of June 1, 2015, through June 30, 2015, (Violation 2015 – 9477817).

17. On September 2, 2015, the Cabinet issued the Water District a Notice of Violation (ENV20150005) for the violation described in paragraph 16 above.

18. On July 31, 2015, authorized representatives of the Cabinet identified the following violation of KRS Chapter 224, and the regulations promulgated pursuant thereto at the facility described in paragraph 2 above:

• 401 KAR 8:150 Section 1 Chlorine The public water system failed to submit adequate sampling results to meet Chlorine summary requirements for the compliance period of June 2015, (Violation 2015 – 9477818).

19. On September 2, 2015, the Cabinet issued the Water District a Notice of Violation (ENV20150006) for the violation described in paragraph 18 above.

20. On November 9, 2015, authorized representatives of the Cabinet identified the following violation of KRS Chapter 224, and the regulations promulgated pursuant thereto at the facility described in paragraph 2 above:

401 KAR 8:510 TTHM The public water system exceeded the MCL for

LRAA of samples for the specific contaminant in compliance period July 1, 2015, through September 30, 2015, (Violation 2015 – 9477821).

21. On December 11, 2015, the Cabinet issued the Water District a Notice of Violation (ENV20150007) for the violation described in paragraph 20 above.

22. On July 1, 2015, authorized representatives of the Cabinet identified the following violation of KRS Chapter 224, and the regulations promulgated pursuant thereto at the facility described in paragraph 2 above:

• 401 KAR 8:075, Section 2 Consumer Confidence Rule (CCR) The public water system failed to prepare and submit to the Department a certification of distribution of the report that conforms to the requirements of 401 KAR 8:075 for the calendar year, (Violation 2015 – 9477820).

23. On December 11, 2015, the Cabinet issued the Water District a Notice of Violation (ENV20150008) for the violation described in paragraph 22 above.

24. The Water District admits all the violations described above and acknowledges that the facility was in violation of KRS Chapter 224, and the regulations promulgated pursuant thereto as set forth above.

NOW THEREFORE, in the interest of settling all civil claims and controversies involving the violations described above, the parties hereby consent to the entry of this Agreed Order and agree as follows:

#### REMEDIAL MEASURES

25. The Water District shall perform the following remedial measures by the dates specified herein:

The Water District shall determine if Disinfection By-Products (hereinafter "DBPs") are being formed in the distribution system or if DBP's are elevated at master meter by monitoring DBP levels at master meter as well as various sample sites throughout distribution system. The data collected from the DBP monitoring shall be submitted to the Cabinet within thirty (30) days of the execution of this Agreed Order. The Water District shall continue to conduct DBP monitoring at the plant tap and/or master meter during quarterly compliance monitoring, and submit the results as "special samples", for the duration of this Agreed Order;

b. Within ninety (90) days of execution of this Agreed Order, the Water District shall develop and submit a Corrective Action Plan (hereinafter "CAP") to the Cabinet for review and acceptance. The CAP shall be based on the data submitted in paragraph 13.a., above. The CAP shall outline the steps the Water District will take to return to and maintain compliance with DBP parameters, and shall include implementation dates for the corrective action to be taken and a date by which the facility will have been in compliance with DBP parameters for four (4) consecutive quarters. The CAP may be developed using the following guidelines:

i. If DBPs are formed in the distribution system, evaluate tank operations and system hydraulies to decrease water age;

ii. If DBPs are formed in the distribution system, evaluate the systems flushing plan;

If distribution system booster chlorination is practiced, determine if it contributes to clevated DBPs and whether the dosage is optimal;

iv. If purchased water contributes to elevated DBPs, determine if the noncompliance is related to the producer by monitoring at master meter or to practices within the out-ofcompliance distribution system:

v. If elevated DBP's are related to the producer, consider coordinating the flushing program with the producer and/or update the purchasing contract that will address the remedial measures needed to be taken by the producers to allow the purchaser to get back into compliance; and

vi. Consider the benefits of receiving Targeted Technical Assistance or a DBP Performance Base Training or a system hydraulic analysis;

c. If at any time either party determines it is necessary to amend the CAP in order to meet the goals or deadlines of the Agreed Order, the following will occur:

i. If the Cabinet requests an amendment of the CAP, then the Division of Enforcement (DENF) shall notify the Water District in writing that an amendment is necessary and will outline the reasons for the request. The Cabinet shall give the Water District thirty (30) days to amend their CAP and resubmit the CAP to DENF. Upon resubmittal, the Cabinet may, in whole or in part, (1) approve, (2) disapprove, or (3) provide comments to the Water District identifying the deficiencies. Upon such resubmittal, if any part of the CAP is disapproved, the Cabinet may deem the Water District to be out of compliance with this Agreed Order for failure to timely submit a CAP; and

If the Water District requests an amendment of the CAP, it shall notify the Cabinet in writing that an amendment request is forthcoming and shall outline the reasons why the amendment is necessary. The Water District shall then submit a draft amended CAP within thirty (30) days to the Cabinet. Upon review, the Cabinet may, in whole or in part. (1) approve or (2) disapprove, or (3) provide comments to the Water District Identifying the deficiencies. Upon

resubmittal, if any part of the CAP is disapproved, the Cabinet may deem the Water District to be out of compliance with this Agreed Order for failure to timely submit a CAP;

d. Until the Water District has demonstrated compliance for four (4) consecutive quarters, the Water District shall submit Quarterly Progress Reports to the Cabinet. The Quarterly Progress Reports shall include flushing program documentation, calculations of tank turnover levels, master meter DBP monitoring data and an update on the completion of corrective actions outlines in the CAP. The quarterly updates shall be due by the 15<sup>th</sup> day of the first month of each quarter;

e. The Water District shall complete all the corrective actions outlined in the CAP by the dates specified therein;

f. The Water District shall demonstrate compliance with DBP parameters for four (4) consecutive quarters by the date specified in the CAP or Amended CAP that has been approved by the Cabinet;

g. The Water District shall submit Operational Evaluation Level (OELs) reports within ninety (90) days from end of quarter when exceedance occurred;

h. The Water District shall immediately work with parent systems to develop and maintain a scheduled flushing plan that will be conducted consecutively to the parent system flush;

i. The Water District shall comply with 401 KAR 8:070 by properly performing all outstanding Public Notices (PN), and provide proof of PN and PN Certification Forms to the Division of Water within thirty (30) days of its entry into this Agreed Order;

j. The Water District shall comply with 401 KAR 8:020 by submitting MORs in accordance with the requirements of the regulation.

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The Water District shall comply with 401 KAR 8:150 Section 1 by submitting

chlorine sampling results for each compliance period as required by the regulation

1 The Water District shall comply with 401 KAR 8:075 Section 2 by submitting full, complete, and timely CCRs in accordance with the requirements of the regulation: and

j. All submittals required by the terms of this Agreed Order shall be submitted to: Director, Division of Enforcement, 300 Fair Oaks Lane, Frankfort, Kentucky 40601.

# PERFORMANCE/STIPULATED PENALTIES

26. The Water District shall pay the Cabinet a stipulated penalty in the amount of five hundred dollars (\$500.00) within thirty (30) days of receipt of written notice from the Cabinet, for each failure to comply with any remedial measure in paragraph 25 above. The Cabinet shall hold in abeyance any stipulated penalties for DBP MCL violations, for a period of four (4) quarters after the last quarter of non-compliance, resolved through this Agreed Order. This penalty is addition to, and not in lieu of, any other penalty that could be assessed. The stipulated penalties that would otherwise be paragraph 25. The Cabinet may, in its discretion, waive stipulated penalties that would otherwise be due. The stipulated penalty shall be due and owing within thirty (30) days after the Water District's receipt of written notification by the Cabinet to the Water District at its principle address.

27. If the Water District believes the request for payment of a performance/stipulated penalty is erroneous or contrary to law, the Water District may request a hearing in accordance with KRS 224 10-420(2). The request for hearing does not excuse timely payment of the penalty. If an order is entered pursuant to KRS 224.10-440 that excuses payment, the Cabinet will refund the payment. Failure to make timely payment shall constitute an additional violation

Payment of civil penalties shall be by cashier's check, certified check, or money

order, made payable to "Kentucky State Treasurer" and sent to the attention of the Director, Division of Enforcement, Department for Environmental Protection, 300 Fair Oaks Lane, Frankfort, Kentucky 40601. Note "Case No. DOW 150209" on the instrument of payment.

# MISCELLANEOUS PROVISIONS

29. This Agreed Order addresses only those violations specifically described above. Other than those matters resolved by entry of this Agreed Order nothing contained herein shall be construed to waive or to limit any remedy or cause of action by the Cabinet based on statutes or regulations under its jurisdiction and the Water District reserves its defenses thereto. The Cabinet expressly reserves its right at any time to issue administrative orders and to take any other action it deems necessary that is not inconsistent with this Agreed Order, including the right to order all necessary remedial measures, assess penalties for violations, or recover all response costs incurred, and the Water District reserves its defenses thereto.

30. This Agreed Order shall not prevent the Cabinet from issuing, reissuing, renewing, modifying, revoking, suspending, denying, terminating, or reopening any permit to the Water District. The Water District reserves its defenses thereto, except that the Water District shall not use this Agreed Order as a defense.

31. The Water District waives its right to any hearing on the matters admitted herein. However, failure by the Water District to comply strictly with any or all of the terms of this Agreed Order shall be grounds for the Cabinet to seek enforcement of this Agreed Order in Franklin Circuit Court and to pursue any other appropriate administrative or judicial action under KRS Chapter 224, and the regulations promulgated pursuant thereto. 32 The Agreed Order may not be amended except by a written order of the Cabinet's Secretary or his designee. The Water District may request an amendment by writing the Director of the Division of Enforcement at 300 Fair Oaks Lane, Frankfort, Kentucky 40601 and stating the reasons for the request. If granted, the amended Agreed Order shall not affect any provision of this Agreed Order unless expressly provided in the amended Agreed Order.

33. The Cabinet does not, by its consent to the entry of this Agreed Order, warrant or aver in any manner that the Water District's complete compliance with this Agreed Order will result in compliance with the provisions of KRS Chapter 224, and the regulations promulgated pursuant thereto. Notwithstanding the Cabinet's review and approval of any plans formulated pursuant to this Agreed Order, the Water District shall remain solely responsible for compliance with the terms of KRS Chapter 224, and the regulations promulgated pursuant thereto, this Agreed Order and any permit and compliance schedule requirements.

34. The Water District shall give notice of this Agreed Order to any purchaser, lessee or successor in interest prior to the transfer of ownership and/or operation of any part of its now-existing facility occurring prior to termination of this Agreed Order, shall notify the Cabinet that such notice has been given, and shall follow all statutory and regulatory requirements for a transfer. Whether or not a transfer takes place, the Water District shall remain fully responsible for payment of all civil penalties and for performance of all remedial measures identified in this Agreed Order.

35. The Cabinet agrees to allow the performance of the above-listed remedial measures and payment of civil penalties by the Water District to satisfy the Water District's obligations to the Cabinet generated by the violations described above.

# CASE NO. DOW 150209

2.12-16 Date

AGREED TO BY: allen = Rile ....

Norman D. Adams, Chairperson North Hopkins Water District

# APPROVAL RECOMMENDED BY:

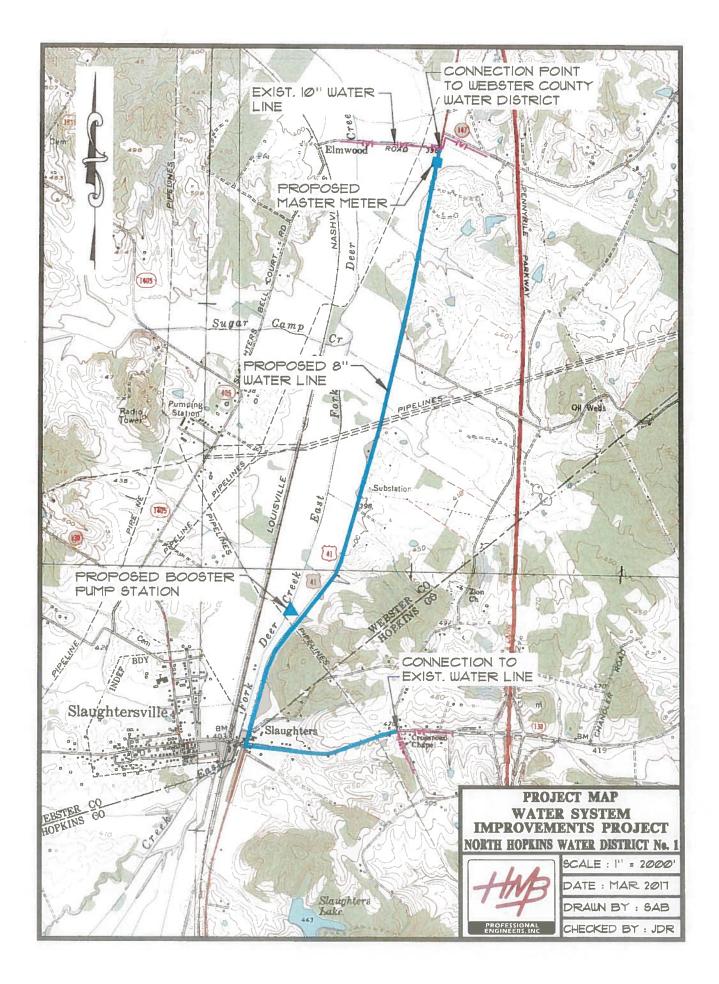
Jeffrey A. Cummins, Director Division of Enforcement

John G. Horne, II, General Counsel Energy and Environment Cabinet Dat

Date

Appendix B

Project Maps



Appendix C

Meter Vaults

