



Utility Safety & Design, Inc.
1018 Mt. Vernon Dr.
Shelbyville, KY 40065
(502) 513-5127
www.usdi.us

September 26, 2023

Mayor Eddie Brake
Drakesboro Natural Gas
City of Drakesboro
P.O. Box 129
Drakesboro, KY 42337

RE: Drakesboro Natural Gas Pipeline Excavation and Inspection_2023

Eddie,

At the request of Drakesboro Natural Gas and under the guidance of the Kentucky Public Service Commission pipeline safety division, USDI performed main inspections on a certain portion of the Drakesboro system to examine and assess the condition of the pipe along Highways 431 and 176. To follow is the report that summarizes the findings and recommendations of those direct examinations and inspections.

The excavations, direct examinations, and inspections were performed on August 2-11, 2023 and witnessed by Drakesboro personnel, as well as Kentucky Public Service Commission pipeline safety personnel.

Let me know if you have any questions or need any additional information.

Sincerely,

Jason Brangers, P.E.
Senior VP
Utility Safety and Design, Inc.

UNIONVILLE, MO
28847 US HWY 136
Unionville, MO 63565
(660) 947-3316

KIRKSVILLE, MO
210 N Elson St. Suite C
Kirksville, MO 63501
(660) 474-0079

OLNEY, IL
1927 Miller Drive
Olney, IL 62450
(618) 392-5502

WICHITA, KS
9540 W. Harry St.
Wichita, KS 67209
(316) 239-7313

BELLEVILLE, IL
9 Executive Woods Ct.
Belleville, IL 62226
(618) 277-1520

PRINCETON, MN
31481 125 1/2 ST NW
Princeton, MN 55371
(660) 474-0789

PITTSBORO, IN
7421 N. Co Rd. 225 E.
Pittsboro, IN 46167
(317) 417-3374

DRAKESBORO NATURAL GAS

MUNICIPAL DISTRIBUTION SYSTEM

Highways 431 and 176 Pipeline Inspection Project

Drakesboro, Kentucky

Prepared By:

Utility Safety and Design, Inc.

Table of Contents

1	Introduction	4
2	Background	4
3	Excavations	6
3.1	Dig #1- Highway 431	7
3.2	Dig #2- Highways 431 and 176.....	9
3.3	Dig #3- South of Cornette Street.....	11
3.4	Dig #4- Broad Street and Highway 431 (John Prine Ave).....	13
3.5	Dig #5- Highway 176 (near USPS)	15
4	Conclusion & Recommendations	17
5	Appendix A – Abacus Engineering and Surveying, Inc Letter	18
6	Appendix B – Main Inspection Records	20

1 INTRODUCTION

At the request of Drakesboro Natural Gas and under the guidance of the Kentucky Public Service Commission pipeline safety division, USDI performed main inspections on a certain portion of the Drakesboro system to examine and assess the condition of the pipe. USDI, along with Drakesboro personnel, excavated five (5) locations along two (2) segments of pipeline within the Drakesboro Natural Gas system. The excavations, direct examinations, and inspections were performed on August 2-11, 2023 and witnessed by Drakesboro personnel (Brian Jones and others), as well as Kentucky Public Service Commission pipeline safety personnel, including Mr. John Gallimore (Digs #1-5) and Ms. Melissa Holbrook (Dig #5). This report summarizes the findings of those direct examinations and inspections.

2 BACKGROUND

According to a letter dated February 18, 2020¹, from Abacus Engineering and Land Surveying, Inc. (Abacus) to Drakesboro, then mayor, Mike Jones, Abacus stated, in part, the following:

Abacus “conducted a review of the Drakesboro Gas Distribution System. Abacus has since identified the areas of most concern and can now make a recommendation for Phase I remediation on the portion of said gas main. The gas main along Kentucky Highway 431 (John Prine Avenue) has been found to present the largest threat to safety of the City of Drakesboro and its citizens. Therefore, we recommend Phase I replacement be considered as beginning immediately south of Gregory’s Recycling and proceed northward along Highway 431, crossing Kentucky Highway 176 (Mose Rager Boulevard), and continuing northward to the intersection of Highway 431 and Cornette Street.

Phase 1 will entail replacement of approximately 5,000 lineal feet of steel gas line with four-inch (4”) diameter polyethylene gas line. Of the total distance, 4,700 lineal feet will be replaced between the end points described above. The remaining 300 lineal feet of line will be placed westward along Highway 176 (Mose Rager Boulevard) beginning at the intersection of Highway 431 with Highway 176. This will end the gas line replacement and place the tie-in just prior to the United States Post Office.”

The letter did not, however, include any detail as to what the review entailed, how it was conducted, or why this section of pipe was identified as the area of most concern. Therefore, Drakesboro Natural Gas, in conjunction with and under the guidance of KY PSC pipeline safety staff, determined it was best to expose the pipeline to assess its condition before proceeding with a costly replacement. USDI was contracted to perform the direct examinations and

¹ Appendix A includes a copy of the Abacus letter

inspections of these pipelines through excavation of various, random locations spread throughout the identified 5,000 feet of main.

The overview map below shows the approximate location of the segments of pipe identified in the Abacus report. The red line depicts the ~4,700 feet of main situated along Highway 431 and the yellow line depicts the ~300 feet of main situated along Highway 176 (Mose Rager Boulevard). The locations of the five dig sites are depicted by the waypoint symbol and correspond to the following: Dig #1 – Green, Dig #2 – Cyan, Dig #3 – Yellow, Dig #4 – Red, Dig #5 – Brown.



Overview Map of Pipeline Segments and Dig Locations

3 EXCAVATIONS

At the request of Drakesboro Natural Gas and recommendation of the Kentucky Public Service Commission staff, USDI was contracted to perform main inspections on two (2) segments of pipeline within the Drakesboro Natural Gas system. The digs were completed from August 2-11, 2023 to evaluate the coating and condition of the pipe, as well as to verify the depth of the pipe. A hydro-vac and hand tools were used to excavate Digs #1-4 and a backhoe and hand tools to excavate Dig #5. Each of the five (5) locations was randomly selected in an effort to get a fair representation of the pipe and coating condition. At each location, the pipe was excavated, exposed, and the hole checked with a Combustible Gas Indicator (CGI) for the presence of gas prior to performing any assessment. No gas leaks were identified at any of the five dig sites. The exposed section was then cleaned, the coating inspected for disbondment, flaws, holidays, and/or damage, and bare pipe, if any, inspected for corrosion. To follow is a summary of the dig locations, inspections, and findings. The completed inspection forms for each dig/location can be found in Appendix B.

3.1 DIG #1- HIGHWAY 431

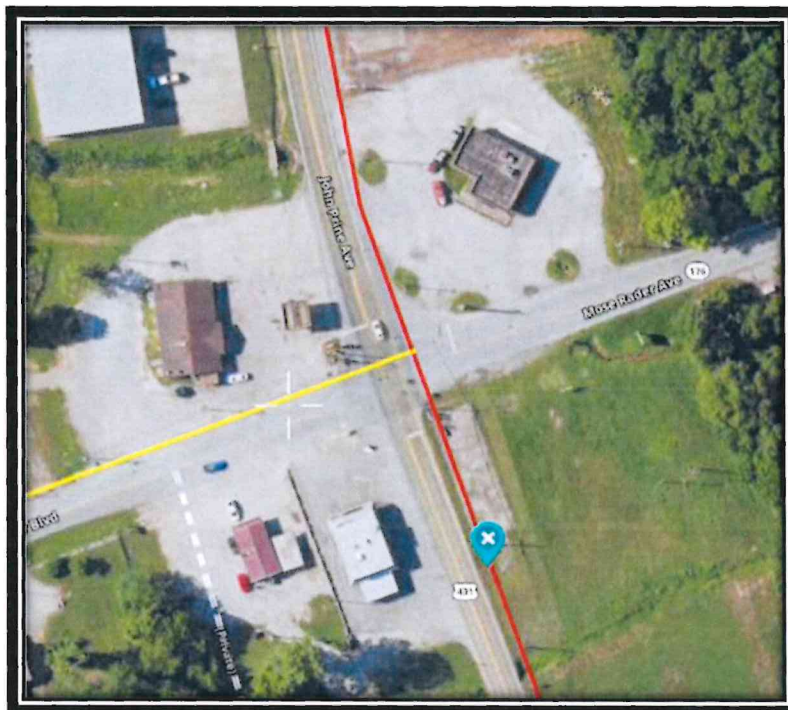
Location: Highway 431, Drakesboro, KY
Lat/Long: 37.21332, -87.04461
General: Dig #1 was located on the east side of Highway 431 near Gregory's Recycling, described in the Abacus report as the beginning of the identified segment.
Diameter: 4"
Coating: Coal Tar
Findings: The section of pipe exposed was about 12" in length and approximately 38" deep. The coating was in good condition, showed no signs of disbondment, and no holidays were observed. No other equipment, fittings, or welds were exposed at this location. No corrosion was identified on this section of pipe.





3.2 DIG #2- HIGHWAYS 431 AND 176

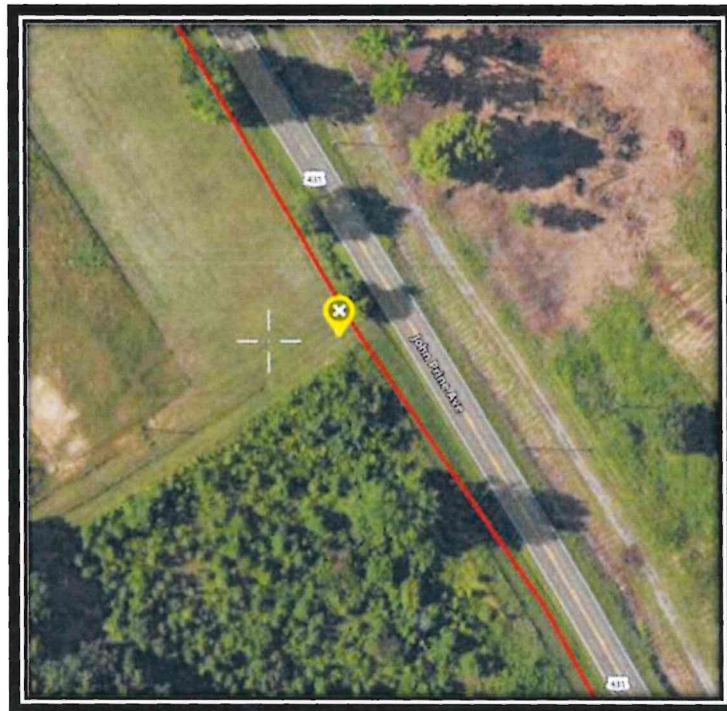
Location: Highways 431 and 176, Drakesboro, KY
Lat/Long: 37.21840, -87.04568
General: Dig #2 was located on the east side of Highway 431 across from Country Boy Liquors, approximately 150 feet south of the intersection of Highways 431 and 176.
Diameter: 4"
Coating: Coal Tar
Findings: The section of pipe exposed was about 18" in length and approximately 28" deep. The coating was in good condition and showed no signs of disbondment. One holiday (missing coating), approximately ½" x 1", was identified on the exposed pipe. The pipe surface was smooth and showed no indications of corrosion. No other equipment, fittings, or welds were exposed at this location. A pipe-to-soil reading of 0.923 Vdc taken directly on the pipe indicates it is adequately protected against corrosion. The holiday was cleaned and recoated with TapeCoat.





3.3 DIG #3- SOUTH OF CORNETTE STREET

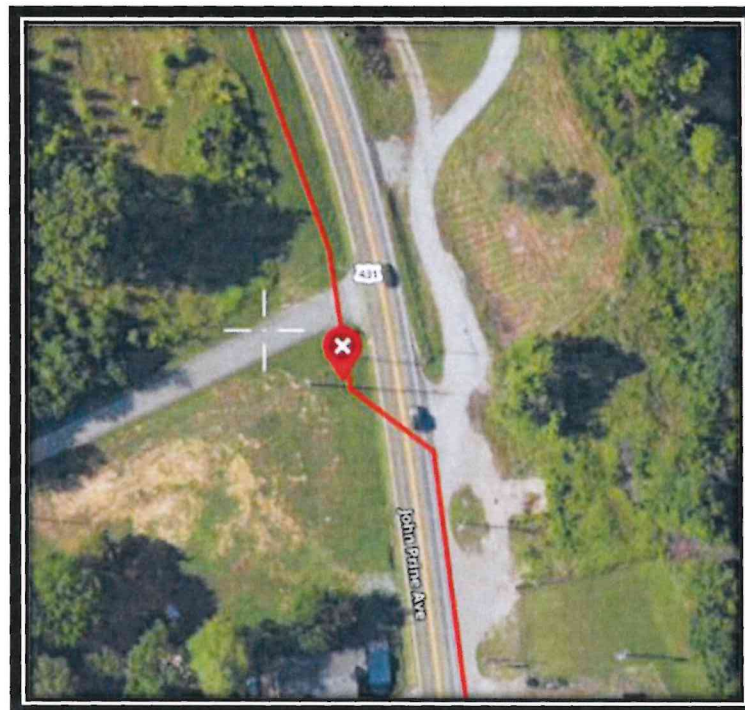
Location: South of Cornette Street, Drakesboro, KY
Lat/Long: 37.22276, -87.04782
General: Dig #3 was located on the west side of Highway 431, approximately 725 feet south and east of Cornette Street and near the end of the segment identified in the Abacus report.
Diameter: 2"
Coating: Coal Tar
Findings: The section of pipe exposed was about 14" in length and approximately 32" deep. The coating was in good condition, showed no signs of disbondment, and no holidays were observed. No other equipment, fittings, or welds were exposed at this location. No corrosion was identified on this section of pipe.





3.4 DIG #4- BROAD STREET AND HIGHWAY 431 (JOHN PRINE AVE)

Location: Broad Street, Drakesboro, KY
Lat/Long: 37.22066, -87.04647
General: Dig #4 was located near the intersection of Broad Street and Highway 431 (John Prine Ave). It was located south of Broad Street and West of Highway 431.
Diameter: 2"
Coating: Coal Tar
Findings: The section of pipe exposed was about 12" in length and approximately 32" deep. The coating was in good condition, showed no signs of disbondment, and no holidays were observed. No other equipment, fittings, or welds were exposed at this location. No corrosion was identified on this section of pipe.





3.5 DIG #5- HIGHWAY 176 (NEAR USPS)

Location: Highway 176, Drakesboro, KY

Lat/Long: 37.21865, -87.04656

General: Dig #5 was located on the north side of Highway 176 (Mose Rager Blvd) between Eagles Gas Station and the United States Post Office. It was described in the Abacus report as the remaining 300 lineal feet of line beginning at the intersection of Highway 431 with Highway 176.

Diameter: 4"

Coating: Coal Tar

Findings: The section of pipe exposed was about 36" in length and approximately 33" deep. The coating was in good condition, showed no signs of disbondment, and no holidays were observed. No other equipment, fittings, or welds were exposed at this location. No corrosion was identified on this section of pipe.





4 CONCLUSION & RECOMMENDATIONS

From August 2-11, 2023, USDI performed main inspections at five (5) locations along approximately 5,000 feet of pipe identified in the Abacus report, dated February 18, 2020, as the area of most concern. The dig locations were randomly selected along the mains in an effort to determine and assess the condition of the mains in question. While it is expected the five exposures are representative of the condition of the rest of these two mains, it should be noted that these exposures are the only areas that were physically excavated and examined. Therefore, we make no guarantee that the rest of the pipe is in the same, better, or worse condition. Following the inspection of the five locations, a review of compliance records, including leak and cathodic protection surveys, was conducted.

- Coating – the condition of the coating at each location was in good condition and shows no signs of disbondment or damage
- Holidays – one (1) holiday was identified at Dig #2, however, there was no identified corrosion or metal loss
- Leaks – No gas was detected in any of the five locations
- No other equipment, fittings, or welds were exposed at any of the five excavations
- Corrosion – no corrosion was identified at any of the five locations examined
- Leakage Surveys – records for the previous two (2) years were reviewed. No leaks were noted or documented on this section of pipe
- Cathodic Protection – records for the previous two (2) years were reviewed. No cp issues were noted or documented on this section of pipe.

Therefore, based on the observations made during the direct examinations of the five (5) main exposures and the review of previous compliance records (cp, leak, etc.) it is our recommendation that Drakesboro Natural Gas perform the following:

- Leakage Surveys – continue to perform annual leakage surveys, to include these sections of pipe, in accordance with its Operation, Maintenance, and Emergency Manual (OME)
- Cathodic Protection (CP) Surveys – continue to perform annual cathodic protection surveys, in accordance with its OME
- Patrols – continue to perform routine patrols, in accordance with its OME
- Main Inspections – perform inspections any time the main is exposed, in accordance with its OME
- Odorizer – maintain proper odor in the system, in accordance with its OME, to ensure the gas is readily detectable by a person with a normal sense of smell

5 APPENDIX A – ABACUS ENGINEERING AND SURVEYING, INC LETTER



P.O. Box 1164, Richmond, Kentucky 40476
236 Boggs Lane, Suite 4

"Surveys you can count on."

Abacus Engineering &
Land Surveying, Inc.
c/o: Dwayne Wheatley, PE, LS
236 Boggs Lane, Suite 4
Richmond, KY 40475

February 18, 2020

Mayor Mike Jones
P.O. Box 129
Drakesboro, KY 42337

RE: Drakesboro Gas Line Rehabilitation

Mayor Jones:

Recently Abacus Engineering & Land Surveying, Inc. (hereinafter Abacus) conducted a review of the Drakesboro Gas Distribution System. Abacus has since identified the areas of most concern and can now make a recommendation for Phase I remediation on the portion of said gas main. The gas main along Kentucky Highway 431 (John Prince Avenue) has been found to present the largest threat to the safety of the City of Drakesboro and its citizens. Therefore, we recommend Phase I replacement be considered as beginning immediately south of Gregory's Recycling and proceed northward along Highway 431, crossing Kentucky Highway 176 (Mose Rager Boulevard), and continuing northward to the intersection of Highway 431 and Cornette Street.

Phase I will entail replacement of approximately 5,000 lineal feet of steel gas line with four-inch (4") diameter polyethylene gas line. Of the total distance, 4,700 lineal feet will be replaced between the end points described above. The remaining 300 lineal feet of line will be placed westward along Highway 176 (Mose Rager Boulevard) beginning at the intersection of Highway 431 with Highway 176. This will end the gas line replacement and place the tie-in just prior to the United States Post Office.

We have estimated that the work involved for said remediation will involve, but not be limited to, the following materials/actions: a quantity of four, four-inch tie-ins with valves, 600 lineal feet of horizontal directional drilling to cross roadways, a quantity of six two-inch tie-ins with 250 lineal feet of line, and finally twenty service tie-ins split evenly between the long side and short side of the main line. Once the project begins in earnest, we may find that more work is required so all these estimates and the pricing shown below should be considered as preliminary and subject to change at any time during the completion of this project.

Preliminary Cost Estimate

ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL PRICE
1	4" DIA. POLYETHYLENE	5000	LINEAL FEET	\$47.72	\$238,596.46
2	4" DIA. TIE-IN	4	EACH	\$5,388.84	\$21,555.36
3	4" DIA. VALVE	4	EACH	\$643.60	\$2,574.40
4	4" DIA. HORZ. DIR. DRILL	600	LINEAL FEET	\$61.07	\$36,642.95
5	2" DIA. MAIN	250	LINEAL FEET	\$23.75	\$5,938.40
6	2" TDW TIE-IN	6	EACH	\$3,923.13	\$23,538.75
7	SERVICE LINE (LONG-SIDE)	27	EACH	\$2,408.00	\$65,016.00
8	SERVICE LINE (SHORT-SIDE)	19	EACH	\$1,350.80	\$25,665.20
9	CIVIL ENGINEERING DESIGN	1	EACH	\$35,000	\$35,000
10	KY DEPT OF TRANS. PERMITTING	1	EACH	\$10,000	\$10,000
11	CONSTRUCTION STAKE-OUT	1	EACH	\$15,000	\$15,000
12	CONSTRUCTION INSPECTION	1	EACH	\$30,000	\$30,000
			GRAND TOTAL		\$509,527.52

We look forward to working with you and the City of Drakesboro to bring this project to fruition and bring a sense of safety back to our town.


Sincerely, Dwayne Wheatley.

6 APPENDIX B – MAIN INSPECTION RECORDS



Main/Service Inspection Form-301

City/Company:	Drakesboro, KY	Date on Inspection:	August 2, 2023
Pipe Type:	Main	Service ID #:	N/A
Location of Installation:	Hwy 431 across from Gregorys Recycling		

Pipe Information

Pipe Manufacturer:	
Pipe Type/Size:	Steel 4"
Length of Pipe:	1 FT
Type of Joint:	N/A
Wall Thickness:	
Coating Type:	Tar Coat
Yield Strength:	
Lot Number:	
Manufacture Date:	

Inspection Checklist

Coating Condition:	Good		
Pipe to Soil Reading:	No	Reading:	VDC
Cathodic Protection:	Rectifier		
External Condition:	Smooth	Pit Depth:	IN
Internal Condition:		Pit Depth:	IN
# of Anodes Installed:	0		
Anode Type and Size:	/		
Anode Location:	N/A		
Depth of Cover:	38 IN		
Soil Condition:	Other		
Soil Packing:	Medium		
Moisture:	Dry		
Coupon Taken:	No		


Equipment Found Along Main or Service (Including; Valves, Fittings, Couplings, Taps, etc.)

Equipment	Make	Model	Size(s)	Description
-----------	------	-------	---------	-------------

Review

Other Structures in Area Endangering Pipeline? If Yes, specify utility, structure, clearance, etc.:	No, N/A		
Condition of Right of Way:	Clear		
Corrective Measures Taken (if needed):	N/A		
Other Remarks:			

**Inspected
By:
Signature:**

Jason Brangers	
	

Picture





Main/Service Inspection Form-301

City/Company:	Drakesboro, KY	Date on Inspection:	August 2, 2023
Pipe Type:	Main	Service ID #:	N/A
Location of Installation:	South of intersection Hwy 431 and 176		

Pipe Information

Pipe Manufacturer:	
Pipe Type/Size:	Steel 4"
Length of Pipe:	1 FT
Type of Joint:	N/A
Wall Thickness:	
Coating Type:	Tar Coat
Yield Strength:	
Lot Number:	
Manufacture Date:	

Inspection Checklist

Coating Condition:	Good, one holiday (1/2" x 1")		
Pipe to Soil Reading:	Yes	Reading:	0.923 VDC
Cathodic Protection:	Rectifier		
External Condition:	Smooth	Pit Depth:	IN
Internal Condition:		Pit Depth:	IN
# of Anodes Installed:	0		
Anode Type and Size:	/		
Anode Location:	N/A		
Depth of Cover:	28 IN		
Soil Condition:	Other		
Soil Packing:	Medium		
Moisture:	Dry		
Coupon Taken:	No		


Equipment Found Along Main or Service (Including; Valves, Fittings, Couplings, Taps, etc.)

Equipment	Make	Model	Size(s)	Description
-----------	------	-------	---------	-------------

Review

Other Structures in Area Endangering Pipeline? If Yes, specify utility, structure, clearance, etc.:	No, N/A		
Condition of Right of Way:	Clear		
Corrective Measures Taken (if needed):	Recoated holiday with tapecoat		
Other Remarks:			

**Inspected
By:
Signature:**

Jason Brangers	
	

Picture





Main/Service Inspection Form-301

City/Company:	Drakesboro, KY	Date on Inspection:	August 2, 2023
Pipe Type:	Main	Service ID #:	N/A
Location of Installation:	South of Cornette St, West of N John Prine Ave		

Pipe Information

Pipe Manufacturer:	
Pipe Type/Size:	Steel 2"
Length of Pipe:	1 FT
Type of Joint:	N/A
Wall Thickness:	
Coating Type:	Tar Coat
Yield Strength:	
Lot Number:	
Manufacture Date:	

Inspection Checklist

Coating Condition:	Good		
Pipe to Soil Reading:	No	Reading:	VDC
Cathodic Protection:	Rectifier		
External Condition:	Smooth	Pit Depth:	IN
Internal Condition:		Pit Depth:	IN
# of Anodes Installed:	0		
Anode Type and Size:	/		
Anode Location:	N/A		
Depth of Cover:	32 IN		
Soil Condition:	Clay		
Soil Packing:	Medium		
Moisture:	Damp		
Coupon Taken:	No		


Equipment Found Along Main or Service (Including; Valves, Fittings, Couplings, Taps, etc.)

Equipment	Make	Model	Size(s)	Description
-----------	------	-------	---------	-------------

Review

Other Structures in Area Endangering Pipeline? If Yes, specify utility, structure, clearance, etc.:	No, N/A		
Condition of Right of Way:	Clear		
Corrective Measures Taken (if needed):	N/A		
Other Remarks:			

**Inspected
By:
Signature:**

Jason Brangers	
	

Picture





Main/Service Inspection Form-301

City/Company:	Drakesboro, KY	Date on Inspection:	August 4, 2023
Pipe Type:	Main	Service ID #:	N/A
Location of Installation:	Broad St & N John Prine		

Pipe Information

Pipe Manufacturer:	
Pipe Type/Size:	Steel 2"
Length of Pipe:	1 FT
Type of Joint:	N/A
Wall Thickness:	
Coating Type:	Tar Coat
Yield Strength:	
Lot Number:	
Manufacture Date:	

Inspection Checklist

Coating Condition:	Good		
Pipe to Soil Reading:	No	Reading:	VDC
Cathodic Protection:	Rectifier		
External Condition:	Smooth	Pit Depth:	IN
Internal Condition:		Pit Depth:	IN
# of Anodes Installed:	0		
Anode Type and Size:	/		
Anode Location:	N/A		
Depth of Cover:	32 IN		
Soil Condition:	Clay		
Soil Packing:	Medium		
Moisture:	Damp		
Coupon Taken:	No		


Equipment Found Along Main or Service (Including: Valves, Fittings, Couplings, Taps, etc.)

Equipment	Make	Model	Size(s)	Description
-----------	------	-------	---------	-------------

Review

Other Structures in Area Endangering Pipeline? If Yes, specify utility, structure, clearance, etc.:	No, N/A		
Condition of Right of Way:	Clear		
Corrective Measures Taken (if needed):	N/A		
Other Remarks:			

**Inspected
By:
Signature:**

Jason Brangers	
	

Picture





Main/Service Inspection Form-301

City/Company: Date on Inspection:
 Pipe Type: Service ID #:
 Location of Installation:

Pipe Information

Pipe Manufacturer:
 Pipe Type/Size:
 Length of Pipe:
 Type of Joint:
 Wall Thickness:
 Coating Type:
 Yield Strength:
 Lot Number:
 Manufacture Date:

Inspection Checklist

Coating Condition:
 Pipe to Soil Reading: Reading:
 Cathodic Protection:
 External Condition: Pit Depth:
 Internal Condition: Pit Depth:
 # of Anodes Installed:
 Anode Type and Size:
 Anode Location:
 Depth of Cover:
 Soil Condition:
 Soil Packing:
 Moisture:
 Coupon Taken:

Equipment Found Along Main or Service (Including; Valves, Fittings, Couplings, Taps, etc.)

Equipment	Make	Model	Size(s)	Description

Review

Other Structures in Area Endangering Pipeline?
 If Yes, specify utility, structure, clearance, etc.:
 Condition of Right of Way:
 Corrective Measures Taken (if needed):
 Other Remarks:

**Inspected
By:
Signature:**

Jason Brangers	
