

ORIGINAL



COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF)	
BIG RIVERS ELECTRIC CORPORATION)	Case No.
FOR A CERTIFICATE OF PUBLIC)	
CONVENIENCE AND NECESSITY TO)	
CONSTRUCT A 161 KV TRANSMISSION LINE)	2022-00012
IN HENDERSON COUNTY, KENTUCKY)	

VERIFIED APPLICATION

And

APPLICATION EXHIBITS

FILED: February 10, 2022

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CONSTRUCT A 161 KV TRANSMISSION LINE)
IN HENDERSON COUNTY, KENTUCKY)

Case No.
2022-00012

VERIFICATION

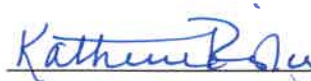
I, Christopher S. Bradley, Vice President System Operations for Big Rivers Electric Corporation, verify, state, and affirm that I have read the foregoing Application and that the statements contained therein are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.



Christopher S. Bradley

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

SUBSCRIBED AND SWORN TO before me by Christopher S. Bradley on this
the 10th day of February, 2022.



Notary Public, Ky. State at Large

My Commission Expires October 31, 2024

Notary ID: KYN216841

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IN HENDERSON COUNTY, KENTUCKY)	

VERIFIED APPLICATION

1. Big Rivers Electric Corporation (“*Big Rivers*” or the “*Company*”) submits this application (the “*Application*”) pursuant to KRS 278.020(2), 807 KAR 5:001 Sections 15 and 19, and 807 KAR 5:120, seeking (i) a certificate of public convenience and necessity (“*CPCN*”) to construct a 7.1 mile long, 161 kilovolt (“*kV*”) transmission line in Henderson County, Kentucky and (ii) a finding that no CPCN is required for the construction of a new switching station and substation associated with the new transmission line, or alternatively, a CPCN for any of the projects for which the Kentucky Public Service Commission (the “*Commission*”) determines require a CPCN. In support of its Application, Big Rivers states as follows:

1 **INTRODUCTION**

2 2. As discussed in the Direct Testimony of Christopher S. Bradley,
3 attached hereto as Exhibit A and incorporated herein by reference, Big Rivers
4 proposes to construct the three transmission projects listed below to increase
5 reliability in the Henderson County area and to serve anticipated load growth in
6 the area including the new Pratt Industry (KY) LLC (“Pratt”) paper mill that will
7 be constructed in Henderson County.

- 8 • Project A A 7.1 mile, 161 kV transmission line will be added from the
9 proposed South Henderson Switching Station, Project B below, to the
10 proposed Henderson Paper Mill Substation, Project C below. This line will
11 be built over new right-of-way.
- 12 • Project B A greenfield 161 kV switching station, the South Henderson
13 Switching Station, will be built on Toy Anthoston Road in Henderson
14 County, Kentucky.
- 15 • Project C A greenfield 161 kV substation, the Henderson Paper Mill
16 Substation, will be built adjacent to and will serve as the delivery point for
17 the new Pratt paper mill at 5908 KY-425, Henderson, Kentucky.

18 All proposed facilities will be located in Henderson County, Kentucky. 807 KAR
19 5:120 Sections 2(1)(b); 807 KAR 5:001 Section 15(2)(c).

20 3. As the wholesale supplier for Kenergy Corp. (“Kenergy”), one of Big
21 Rivers’ three distribution cooperative members (the “Members”), Big Rivers is
22 obligated to provide Kenergy with adequate voltage levels and acceptable facility

1 loadings under all normal and single contingency conditions. The proposed
2 construction projects are needed to enable Big Rivers to fulfill that obligation in
3 light of projected load growth in Henderson County, including the new \$500
4 million paper mill that Pratt will build in Henderson, and other load growth that
5 is likely in the area, including growth as a result of the new Pratt facility. Pratt
6 projects that the new paper mill will contribute to approximately 700 construction
7 jobs and create 320 full-time jobs. The proposed projects will also provide Big
8 Rivers the ability to enhance reliability to existing retail members served by
9 Kenergy. 807 KAR 5:120 Section 2(1)(b); 807 KAR 5:001 Section 15(2)(c).

10 4. Due to the length and voltage of the Project A transmission line,
11 KRS 278.020 requires Big Rivers to obtain a CPCN for its construction.

12 5. Big Rivers does not believe the other projects require a CPCN, and
13 Big Rivers is seeking a finding from the Commission that no CPCN is required for
14 those two projects. The authority of the Commission to issue such a finding is
15 found in 807 KAR 5:001 Section 19. 807 KAR 5:120 Section 2(1)(a); 807 KAR
16 5:001 Section 14(1).

17 6. If the Commission disagrees that no CPCN is required, then Big
18 Rivers requests in the alternative that the Commission grant a CPCN for any of
19 the projects that the Commission determines require a CPCN. The authority of
20 the Commission to grant CPCNs is found in KRS 278.020. 807 KAR 5:120 Section
21 21(1)(a); 807 KAR 5:001 Section 14(1).

1 **FILING REQUIREMENTS**

2 7. The Applicant, Big Rivers, is a rural electric cooperative corporation
3 organized pursuant to KRS Chapter 279. Its full name is Big Rivers Electric
4 Corporation. Big Rivers' mailing address is P.O. Box 24, Henderson, Kentucky
5 42419-0024, and its street address is 201 Third Street, Henderson, Kentucky
6 42420. Big Rivers' address for electronic mail service is regulatory@bigrivers.com.
7 807 KAR 5:120 Section 2(1)(a); 807 KAR 5:001 Section 14(1).

8 8. Big Rivers owns generating assets and purchases, transmits, and
9 sells electricity at wholesale. Its principal purpose is to provide the wholesale
10 electricity requirement of its three distribution cooperative Members: Jackson
11 Purchase, Kenergy Corp., and Meade County Rural Electric Cooperative
12 Corporation. The Members in turn provide retail electric service to over 119,600
13 consumer/retail members located in 22 western Kentucky counties: Ballard,
14 Breckenridge, Caldwell, Carlisle, Crittenden, Daviess, Graves, Grayson, Hancock,
15 Hardin, Henderson, Hopkins, Livingston, Lyon, Marshall, McCracken, Mclean,
16 Meade, Muhlenberg, Ohio, Union and Webster.

17 9. Big Rivers was incorporated in the Commonwealth of Kentucky on
18 June 14, 1961, and hereby attests that it is currently in good standing in
19 Kentucky. 807 KAR 5:120 Section 2(1)(a); 807 KAR 5:001 Section 14(2).

20 10. A table of each regulatory requirement for filing, cross-referenced to
21 the location in this Application where the requirement is satisfied, is attached
22 hereto as Exhibit B.

1 **DESCRIPTION OF THE PROJECTS**

2 11. The proposed route map, with a scale of one inch equals 1000 feet,
3 showing the location of the proposed construction, is attached hereto as Exhibit C.
4 807 KAR 5:120 Section 2(2)(a).

5 12. The proposed construction projects are required for the public
6 convenience and necessity. The additional transmission facilities will allow
7 acceptable service to be provided to Kenergy in light of expected load growth in its
8 service territory due to the new paper mill as well as other growth that is likely to
9 result from such a large economic development project. The new construction will
10 also enhance reliability for existing retail members. Additionally, Big Rivers
11 anticipates a return on its investment as a result of the new construction being
12 included in the rates for transmission service under Big Rivers' Open Access
13 Transmission Tariff that could serve as an offset to future rate increases for Big
14 Rivers' Members. 807 KAR 5:120 Section 2(1)(b); 807 KAR 5:001 Section 15(2)(a).

15 13. The transmission line project that is the subject of this application
16 (Project A) will be constructed on new right-of-way. The evaluation of this route
17 and the reasons supporting the selection of this route are discussed in the routing
18 study attached hereto as Exhibit D. The proposed line is the preferred route
19 selected by the routing study.

20 14. Big Rivers considered alternative routes for the construction of the
21 Project A transmission line. The reasons these routes were not selected are
22 discussed in the routing study. These alternate routes are depicted on the

1 alternate route map attached hereto as Exhibit E. 807 KAR 5:120 Section
2 (2)(2)(c). In accordance with the Commission’s COVID-related Orders in Case No.
3 2020-00085, Big Rivers is not filing paper copies of the application exhibits
4 including the maps.

5 15. The proposed transmission line will typically be constructed using H-
6 frame structures and three-pole dead-end angle structures. Conventional
7 construction equipment will be used to frame and install the poles. The electrical
8 conductors will then be strung, dead-ended, and clipped-in using conventional
9 equipment and processes. Sketches of proposed typical structures are attached
10 here to as Exhibit F. 807 KAR 5:120 Sections 2(1)(b), (2)(b); 807 KAR 5:001
11 Section 15(2)(c).

12 16. Big Rivers will initially fund the proposed projects with general cash
13 reserves, but it continues to investigate the best source of financing for the
14 construction costs. As necessary under KRS 278.300, Big Rivers will seek
15 approval of financing related to the projects’ cost in a subsequent proceeding. 807
16 KAR 5:001 Section 15(2)(e).

17 17. The total estimated cost of the projects is \$20,200,000, including
18 capitalized interest and estimated purchase prices for right-of-way and land. The
19 estimated construction cost of Project A is \$9,375,000. Project B’s estimated
20 construction cost is \$6,070,000. Project C’s estimated construction cost is
21 \$4,755,000.

22

1 18. The estimated cost of operation of the new construction, including
2 the cost of taxes and operation and maintenance expenses, based on historical
3 averages, is approximately \$46,590 per year for the Project A transmission line
4 and \$220,474 for Project B and Project C, combined. The construction of these
5 projects by Big Rivers does not involve sufficient capital outlay to materially
6 affect the existing financial condition of Big Rivers. 807 KAR 5:120 Section
7 2(1)(b), (7); 807 KAR 5:001 Section 15(2)(f).

8 19. Big Rivers has not yet obtained any permits for the proposed
9 construction, but any permits from public authorities required for the
10 construction will be obtained prior to commencing construction. 807 KAR 5:120
11 Section 2(1)(b); 807 KAR 5:001 Section 15(2)(b).

12 20. The proposed construction will not compete with any other public
13 utilities, corporations, or persons. 807 KAR 5:120 Section 2(1)(b); 807 KAR 5:001
14 Section 15(2)(c).

15 **NOTICE OF PROPOSED CONSTRUCTION**

16 21. Big Rivers has sent by first-class mail to each property owner over
17 whose property the transmission line circuit is proposed to cross, addressed to the
18 property owner at the owner's address as indicated by the county property
19 valuation administrator records, or has hand-delivered, notice of the proposed
20 construction stating:

21 a. The Commission case number under which this Application will be
22 processed and a map showing the proposed route of the line;

1 Application and the accompanying testimony. Big Rivers further requests the
2 authority to move the location of the line up to 500 feet on either side of the
3 centerline shown on the maps filed with this Application to account for
4 unexpected conditions that could be discovered during the construction process.

5 25. Additionally, Big Rivers requests a finding from the Commission,
6 pursuant to 807 KAR 5:001 Section 19 that the Project B South Henderson
7 Switching Station, and the Project C Paper Mill Substation are ordinary
8 extensions in the usual course of business that do not require a CPCN under KRS
9 278.020(1)(a)(2). 807 KAR 5:001 Section 15(3) provides:

10 A certificate of public convenience and necessity shall not be required
11 for extensions that do not create wasteful duplication of plant,
12 equipment, property, or facilities, or conflict with the existing
13 certificates or service of other utilities operating in the same area and
14 under the jurisdiction of the [C]ommission that are in the general or
15 contiguous area in which the utility renders service, and that do not
16 involve sufficient capital outlay to materially affect the existing
17 financial condition of the utility involve, or will not result in increased
18 charges to customers.

19 As discussed above and in the testimony attached to this Application, Projects B
20 and C satisfy these criteria, and therefore do not require a CPCN. If the
21 Commission disagrees, Big Rivers requests in the alternative that the Commission
22 grant CPCNs for Projects B and Project C and grant Big Rivers the flexibility to
23 move the switching station and substation from the location shown on the maps
24 provided with this Application so long as the switching station and substation are
25 not moved onto property owned by a different property owner.

26

1 WHEREFORE, Big Rivers respectfully requests that the Commission issue
2 an order granting it the relief requested in this Application, and all other relief to
3 which it may be entitled.

4 On this the 10th day of February, 2022.

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Respectfully submitted,

/s/ Senthia Santana

Senthia Santana
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*Counsel for Big Rivers Electric
Corporation*



COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

**ELECTRONIC APPLICATION OF
BIG RIVERS ELECTRIC CORPORATION
FOR A CERTIFICATE OF PUBLIC
CONVENIENCE AND NECESSITY TO
CONSTRUCT A 161 KV TRANSMISSION LINE IN
HENDERSON COUNTY, KENTUCKY**

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**Case No.
2022-00012**

DIRECT TESTIMONY

OF

CHRISTOPHER S. BRADLEY

ON BEHALF OF

BIG RIVERS ELECTRIC CORPORATION

Filed: February 10, 2022

**Case No. 2022-000012
Application Exhibit A
Direct Testimony of Christopher S. Bradley**

**DIRECT TESTIMONY
OF
CHRISTOPHER S. BRADLEY**

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DIRECT TESTIMONY
OF
CHRISTOPHER S. BRADLEY

I. INTRODUCTION

Q. Please state your name, business address and occupation.

A. My name is Christopher S. Bradley. My business address is 201 Third Street, Henderson, Kentucky 42420. I am the Vice President System Operations for Big Rivers Electric Corporation (“*Big Rivers*” or the “Company”).

Q. Please summarize your education and professional experience.

A. I am a graduate of University of Evansville, where I received an undergraduate degree in electrical engineering and a graduate degree in Engineering Management. I have worked in the electric industry for thirty-two years, holding various management positions at Big Rivers since 1989. I have served as Senior System Planning Engineer; System Planning and Reliability Compliance Supervisor; Manger Energy Control and Compliance; Director Energy Control & Compliance; and Director of Transmission System, before assuming the position of Vice President System Operations in December 2021.

1 **Q. Have you previously testified before the Kentucky Public Service**
2 **Commission (“Commission”)?**

3 A. Yes. I have testified and sponsored responses to information requests in
4 Case No. 2020-00299, *In the Matter of: Electronic 2020 Integrated Resource*
5 *Plan of Big Rivers Electric Corporation*. I have also sponsored responses to
6 information requests in other cases before the Commission including Case
7 No. 2012-00555;¹ Case No. 2013-00199;² Case No. 2014-00166;³ Case No.
8 2014-00455;⁴ and Case No. 2021-00058.⁵

9
10 **II. BACKGROUND**

11 **Q. What is the purpose of your testimony in this proceeding?**

12 A. I am filing this testimony in support of Big Rivers’ application (“*Application*”)
13 for the necessary authority to construct certain transmission system
14 improvements necessary to provide wholesale electric service to Kenergy

¹ *In the Matter of: An Examination of the Application of the Fuel Adjustment Clause of Big Rivers Electric Corporation from November 1, 2010 through October 31, 2012*, P.S.C. Case No. 2012-00555.

² *In the Matter of: Application of Big Rivers Electric Corporation for a General Adjustment in Rates*, P.S.C. Case No. 2013-00199.

³ *In the Matter of: 2014 Integrated Resource Plan of Big Rivers Electric Corporation Case*, P.S.C. Case No. 2014-00166.

⁴ *In the Matter of: An Examination of the Application of the Fuel Adjustment Clause of Big Rivers Electric Corporation from November 1, 2012 through October 31, 2014*, P.S.C. Case No. 2014-00455.

⁵ *In the Matter of: An Examination of the Application of the Fuel Adjustment Clause of Big Rivers Electric Corporation from November 1, 2018 through October 31, 2020*, P.S.C. Case No. 21-00058.

1 Corp. (“*Kenergy*”) to improve reliability in the area and to respond to load
2 growth resulting from Pratt Industry (KY) LLC’s (“*Pratt*”) future facility to be
3 located in Henderson County, Kentucky (the “*Pratt Paper Mill*”).
4

5 **III. NEED FOR THE TRANSMISSION SYSTEM IMPROVEMENTS**

6 **Q. Please describe the proposed transmission system improvements.**

7 A. Big Rivers proposes to construct the following three transmission system
8 improvements:

- 9 • Project A consists of the construction of a 7.1 mile, 161 kV
10 transmission line from the proposed South Henderson Switching Station,
11 Project B, to be located on Toy Anthoston Road in Henderson County,
12 Kentucky, to the proposed Henderson Paper Mill Substation, Project C. The
13 route for the proposed line will require new right-of-way and will parallel
14 existing transmission lines and Kentucky Highway 425. Project A will also
15 require the re-routing and re-termination of three (3) existing 161 kV lines
16 (Big Rivers’ Henderson, Reid, and HMP&L 4 lines) into the switching station.
- 17 • Project B consists of the construction of a 161 kV switching station, the
18 South Henderson Switching Station. The switching station would re-
19 terminate the existing 161 kV lines that are connected at the Reid-
20 Henderson-HMP&L 4 Tap that serves the Big Rivers Reid, Big Rivers
21 Henderson County, and HMP&L 4 Substations. The switching station

1 improves reliability to these existing substations by breaking up the existing
2 3-terminal configuration such that any transmission line fault would be
3 isolated to the faulted line segment while maintaining service to the other
4 line segments serving those substations. In addition, the switching station
5 will be constructed on an expandable footprint to allow for future 161 kV and
6 69 kV facilities that will enhance 69 kV reliability and capacity for this
7 service territory. It will also provide a 161 kV line terminal for new
8 transmission service to the Pratt Paper Mill.

- 9 • Project C consists of the construction of a 161/12.47 kV substation, the
10 Henderson Paper Mill Substation, to be located at 5908 KY-425, Henderson,
11 Kentucky. The substation will be equipped with (2) transformers, (2) 161 kV
12 breakers, (2) 13 kV breakers, metering equipment, and a protective relaying
13 and control house.

14 Big Rivers is requesting a certificate of public convenience and
15 necessity (“*CPCN*”) for the Project A transmission line and a finding that no
16 *CPCN* is required for Project B or Project C. However, if the Commission
17 determines that a *CPCN* is required for Project B and/or Project C, Big Rivers
18 requests in the alternative that the Commission grant a *CPCN* for any
19 project for which the Commission determines a *CPCN* is required.

20

1 **Q. Are any interstate benefits expected to be achieved by the**
2 **construction projects?**

3 A. Yes. The construction projects are needed not only to serve the new Pratt
4 Paper Mill, but they will also enable Big Rivers and Kenergy to provide
5 electric service to other new and expanded loads in the Henderson County
6 area, as well as provide the ability to enhance reliability to existing members.
7 Because of the size of the Pratt facility and the number of jobs Pratt
8 anticipates creating, additional load growth in the area is a given. The
9 construction projects will additionally strengthen the transmission system.

10

11 **Q. Why does Big Rivers believe no CPCN is required projects B and C?**

12 A. The projects do not require a CPCN because 1) they do not create any
13 wasteful duplication of plant, equipment, property, or facilities; 2) the
14 construction does not compete with facilities of existing public utilities; and 3)
15 the investment required is insufficient to cause a material financial impact to
16 Big Rivers and will not result in increased electric service rates to retail
17 customers on the Big Rivers system.⁶ The total estimated construction costs
18 for the Projects B and C combined (\$10,825,000) is 1.19% of Big Rivers' net

⁶ See KRS 278.020(1) and 807 KAR 5:001, Section 9(3). *See also In the Matter of: Electronic Application of Big Rivers Electric Corporation for a Certificate of Public Convenience and Necessity to Construct a 161 kV Transmission Line In McCracken County, Kentucky*, P.S.C. Case No. 2021-00275, Order (Jan. 14, 2022) at pages 11-12 (finding that the related substation projects did not require CPCNs).

1 utility plant. As of December 31, 2021, Big Rivers' net utility plant is
2 estimated at \$907,987,686. The estimated construction cost of Project B⁷ is
3 0.67% of net utility plant and Project C⁸ is 0.52%.

4 Additionally, Big Rivers anticipates a return of the construction costs
5 as I discuss below.

6

7 **Q. What is the estimated construction cost for the projects?**

8 A. Big Rivers estimates that the total construction cost for the Project A
9 transmission line will be \$9,375,000. The estimated construction cost for
10 Project B is \$6,070,000 and for Project C is \$4,755,000.

11

12 **Q. Will Big Rivers finance the construction costs?**

13 A. Big Rivers will initially fund the proposed projects with general cash
14 reserves, but continues to investigate the best source of financing for the
15 construction costs.

16

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⁷ Project B's estimated cost = \$6,070,000

⁸ Project C's estimated cost = \$4,755,000

1 **Q. How will Big Rivers recover the construction cost?**

2 A. The construction costs will be an input into the MISO Attachment O formula
3 rate for transmission service on Big Rivers' system under MISO's Open
4 Access Transmission Tariff.

5

6 **IV. CONCLUSION**

7 **Q. What action by the Commission does Big Rivers seek in this
8 proceeding?**

9 A. Big Rivers requests that the Commission find that the public convenience
10 and necessity require the construction by Big Rivers of the Project A
11 transmission line and issue a CPCN for that project. Big Rivers requests
12 that the Commission find that Projects B and C are ordinary extensions of
13 existing systems in the usual course of business for which no CPCN is
14 required. Alternatively, Big Rivers requests a CPCN for any of the projects
15 that the Commission determines require a CPCN. Additionally, Big Rivers
16 requests the flexibility to move the Project A transmission line up to 500 feet
17 in either direction of the centerline shown on the route maps filed with Big
18 Rivers' Application, and should the Commission determine that a CPCN is
19 required for the Project B switching station, Big Rivers requests the
20 flexibility to move the Project B switching station from the location shown on
21 the maps provided with this Application so long as the switching station is
22 not moved onto property owned by a different property owner, to account for

1 unexpected conditions that could be discovered during the construction
2 process.

3 **Q. Does this conclude your testimony?**

4 **A. Yes.**

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IN HENDERSON COUNTY, KENTUCKY)

Case No.
2022-00012

VERIFICATION

I, Christopher S. Bradley, verify, state, and affirm that I prepared or supervised the preparation of the Direct Testimony filed with this Verification, and that testimony is true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.



Christopher S. Bradley

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

SUBSCRIBED AND SWORN TO before me by Christopher S. Bradley on this
the 10th day of February, 2022.



Notary Public, Ky. State at Large

My Commission Expires October 31, 2024

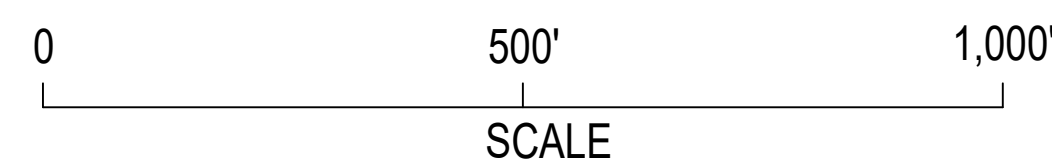
Notary ID: KYNP16841

REFERENCES FOR COMPLIANCE WITH STATUTORY AND REGULATORY FILING REQUIREMENTS
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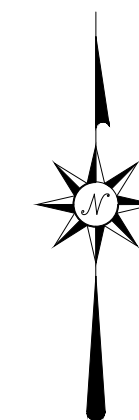
Law / Regulation	Filing Requirement	Location in Application
	CPCN	
807 KAR 5:120 Section 1	Notice of intent to file application.	Filed on January 10, 2022.
807 KAR 5:120 Section 2(1)	All documents and information required by: <p style="margin-left: 40px;">(a) 807 KAR 5:001 Section 14, except the applicant shall file an original and six copies of the application;</p> <p style="margin-left: 40px;">and</p> <p style="margin-left: 40px;">(b) 807 KAR 5:001 Section 15(2)(a) through (c) and (e) through (f).</p>	See below
807 KAR 5:120 Section 2(2)(a)	Three (3) maps of suitable scale, but no less than one (1) inch equals 1,000 feet for the project proposed. (a) The map detail shall show the location of the proposed transmission line centerline and right of way, and boundaries of each property crossed by the transmission line right of way as indicated on the property valuation administrator's maps, modified as required.	Exhibits C, Application ¶ 11
807 KAR 5:120 Section 2(2)(b)	Sketches of proposed typical transmission line support structures shall also be provided.	Exhibit F, Application ¶ 15
807 KAR 5:120 Section 2(2)(c)	A separate map of the same scale shall show any alternative routes that were considered;	Exhibit E, Application ¶ 14
807 KAR 5:120 Section 2(3)	A verified statement that, according to county property valuation administrator records, each property owner over whose property the transmission line right-of-way is proposed to cross has been sent by first-class mail, addressed to the property owner at the owner's address as indicated by the county property valuation administrator records, or hand delivered regulatory notice.	Application ¶ 21

807 KAR 5:120 Section 2(4)	A sample copy of each notice provided to a property owner.	Exhibit G, Application ¶ 22
807 KAR 5:120 Section 2(4)	A list of the names and addresses of the property owners to whom the notice has been sent.	Exhibit H, Application ¶ 22
807 KAR 5:120 Section 2(5)	A statement that a notice of intent was published	Application ¶ 23
807 KAR 5:120 Section 2(6)	A copy of the newspaper notice	Exhibit I
807 KAR 5:120 Section 2(7)	A statement as to whether the project involves sufficient capital outlay to materially affect the existing financial condition of the utility involved	Application ¶ 18
807 KAR 5:001 Section 14(1)	The full name, mailing address, and electronic mail address of the Applicant	Application ¶¶ 1 and 7
807 KAR 5:001 Section 14(1)	A request for the order, authorization, permission or certificate desired	Application ¶¶ 1, 4-6, 25-26, and Page 10
807 KAR 5:001 Section 14(1)	A reference to the particular provision of law authorizing the relief requested	Application ¶¶ 1, 4, 5, 24-25
807 KAR 5:001 Section 14(1)	The facts on which the application is based	Application ¶¶ 2-3, 11-20; Exhibit A (Bradley Testimony)
807 KAR 5:001 Section 14(2)	State and date of incorporation; attest to good standing in state	Application ¶ 9
807 KAR 5:001 Section 15(2)(a)	The facts relied upon to show that the proposed construction or extension is or will be required by public convenience or necessity.	Application ¶ 12; Exhibit A (Bradley Testimony)

807 KAR 5:001 Section 15(2)(b)	Copies of franchises or permits, if any, from the proper public authority for the proposed construction or extension, if not previously filed with the commission.	Application ¶ 19
807 KAR 5:001 Section 15(2)(c)	A full description of the proposed location, route, or routes of the proposed construction or extension, including a description of the manner of the construction and the names of all public utilities, corporations, or person with whom the proposed construction or extension is likely to compete.	Application ¶ 20; Exhibit D
807 KAR 5:001 Section 15(2)(e)	The manner in detail in which the applicant proposes to finance the proposed construction or extension.	Application ¶ 16
807 KAR 5:001 Section 15(2)(f)	An estimated annual cost of operation after the proposed facilities are placed into service.	Application ¶ 18
Law / Regulation	Filing Requirement	Location in Application
	DECLARATORY ORDER	
807 KAR 5:001 Section 19(2)	An application for declaratory order shall: (a) be in writing; (b) contain a complete, accurate, and concise statement of facts upon which the application is based; (c) fully disclose the applicant's interest; (d) identify all statutes, administrative regulations, and orders to which the application relates; and (e) state the applicant's proposed resolution or conclusion	The Application is in writing.
807 KAR 5:001 Section 19(6)	Applications for declaratory orders shall be supported by affidavit or shall be verified.	The Application is verified.



PRELIMINARY FOR BID FOR CONSTRUCTION FOR RECORD "AS BUILT" REFERENCE




LEGEND

- ROAD
- RAILROAD
- - - EXISTING T-LINE
- - - PROPOSED T-LINE
- EXISTING POLE
- PROPOSED POLE
- PROPOSED DOWNGWY
- - - EXISTING EASEMENT
- - - PROPOSED EASEMENT
- - - PROPERTY LINE
- - - 500' CENTERLINE OFFSET

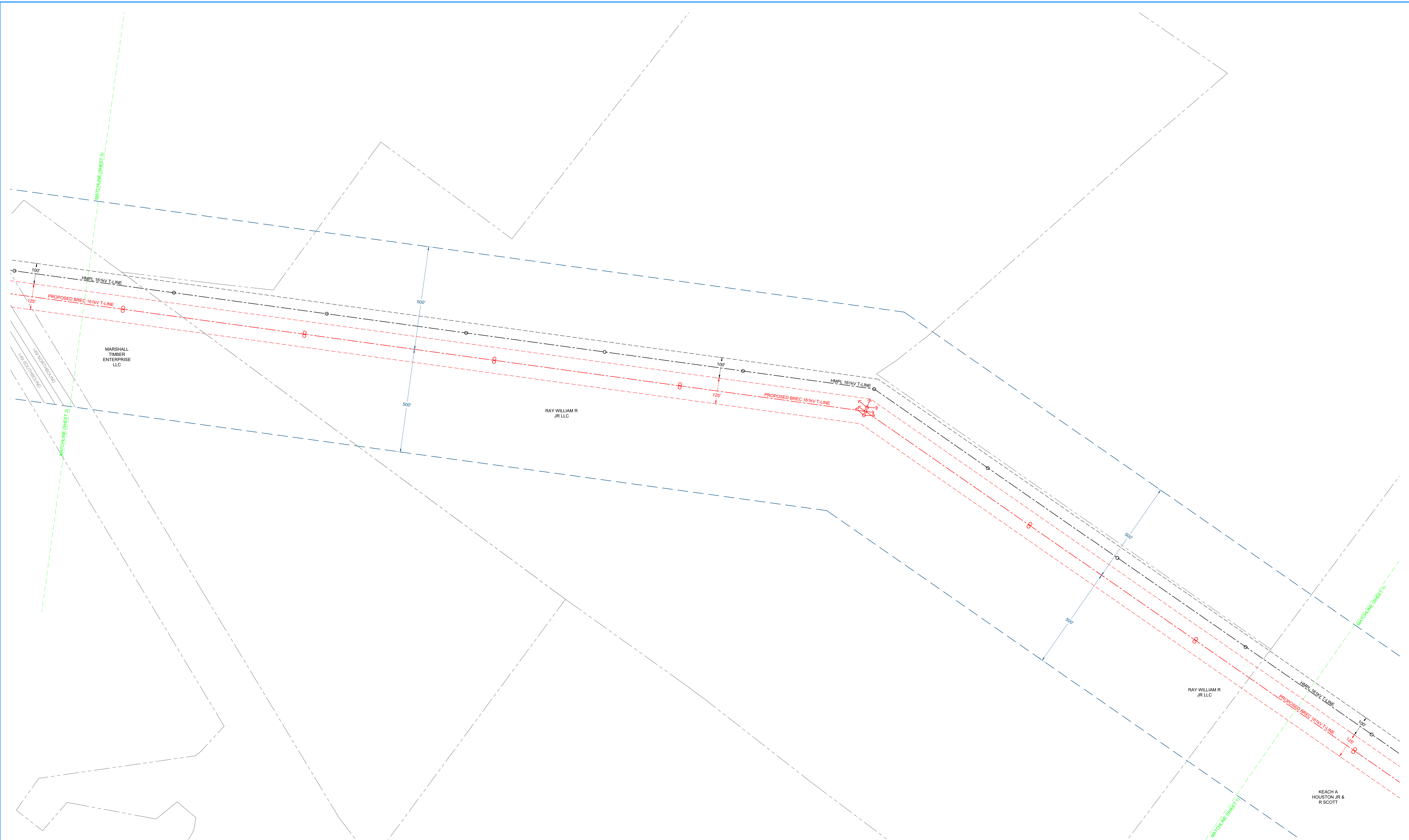
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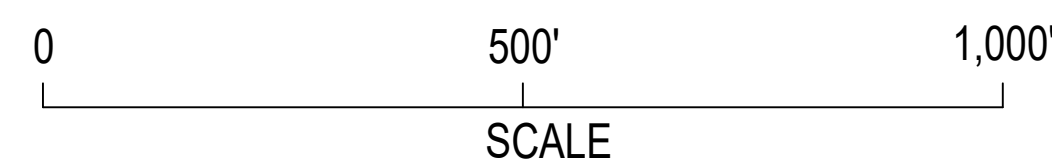


**SOUTH HENDERSON - HENDERSON PAPER MILL
 161KV TRANSMISSION LINE
 CENTERLINE & EASEMENT BOUNDARIES**

DRAWING REVIEW	DATE
ENGINEER ABG (P&D ENGINEERS)	01-10-2022
DRAWN	SHEET 1 of 6



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- FOR RECORD
- *AS BUILT
- REFERENCE

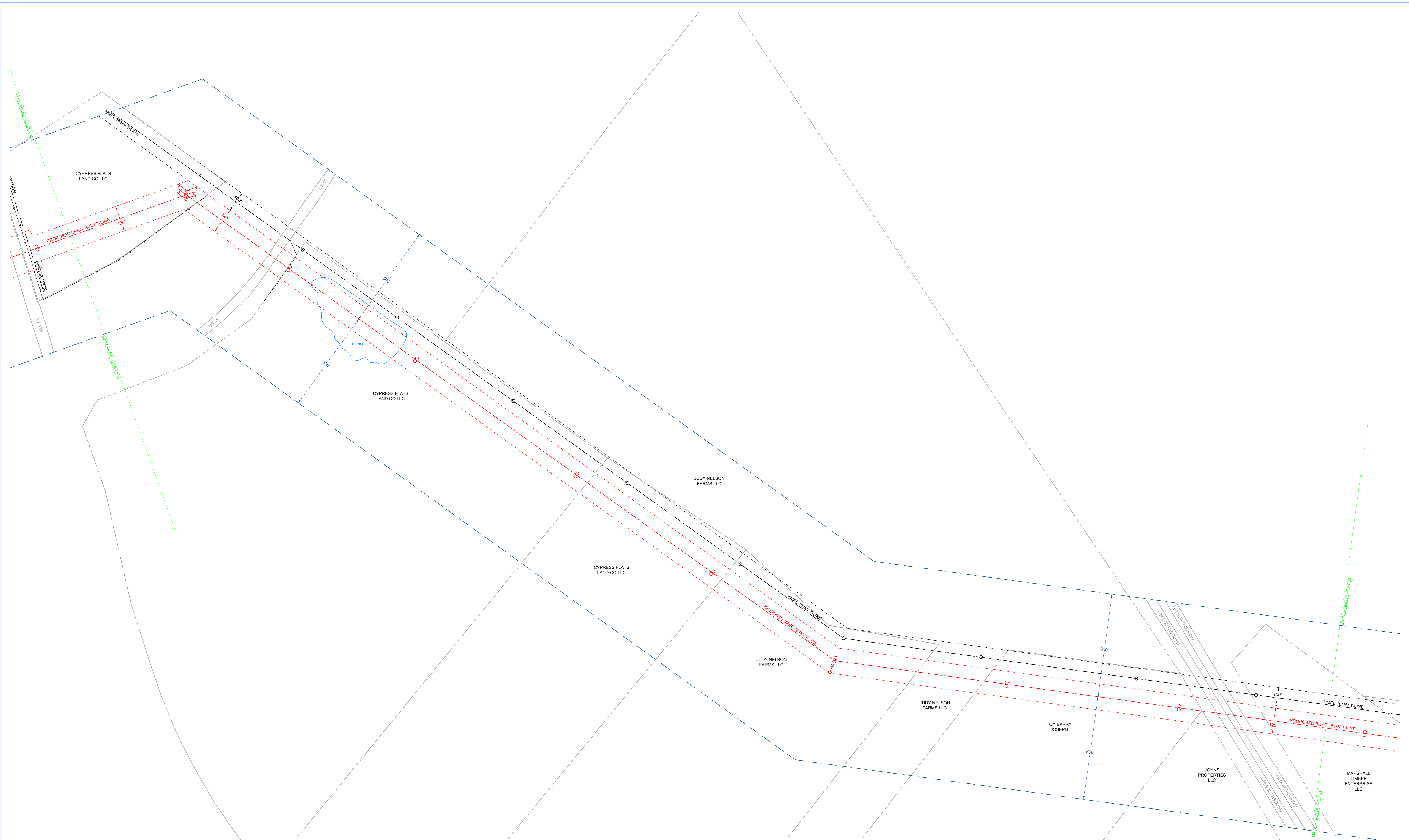


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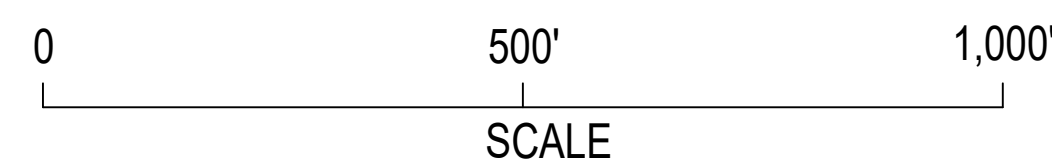
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- EXISTING EASEMENT
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SHEET 2 of 6	



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- FOR CONSTRUCTION
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- "AS BUILT"
- REFERENCE



LEGEND

- ROAD
- RAILROAD
- - - EXISTING T-LINE
- - - PROPOSED T-LINE
- o EXISTING POLE
- o PROPOSED POLE
- PROPOSED DOWNGUY
- - - EXISTING EASEMENT
- - - PROPOSED EASEMENT
- - - PROPERTY LINE
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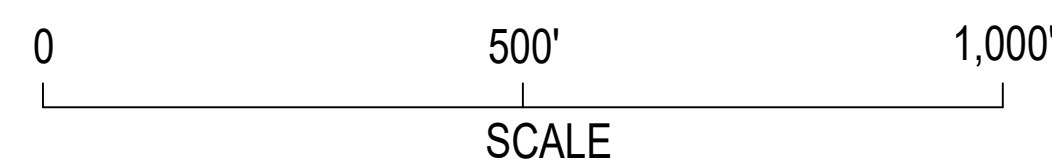
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**SOUTH HENDERSON - HENDERSON PAPER MILL
 161kV TRANSMISSION LINE
 CENTERLINE & EASEMENT BOUNDARIES**

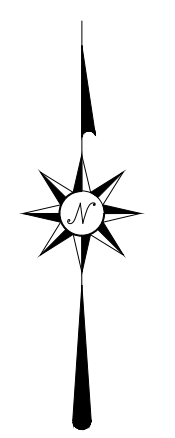
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- PRELIMINARY
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- FOR CONSTRUCTION
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- "AS BUILT"
- REFERENCE



LEGEND

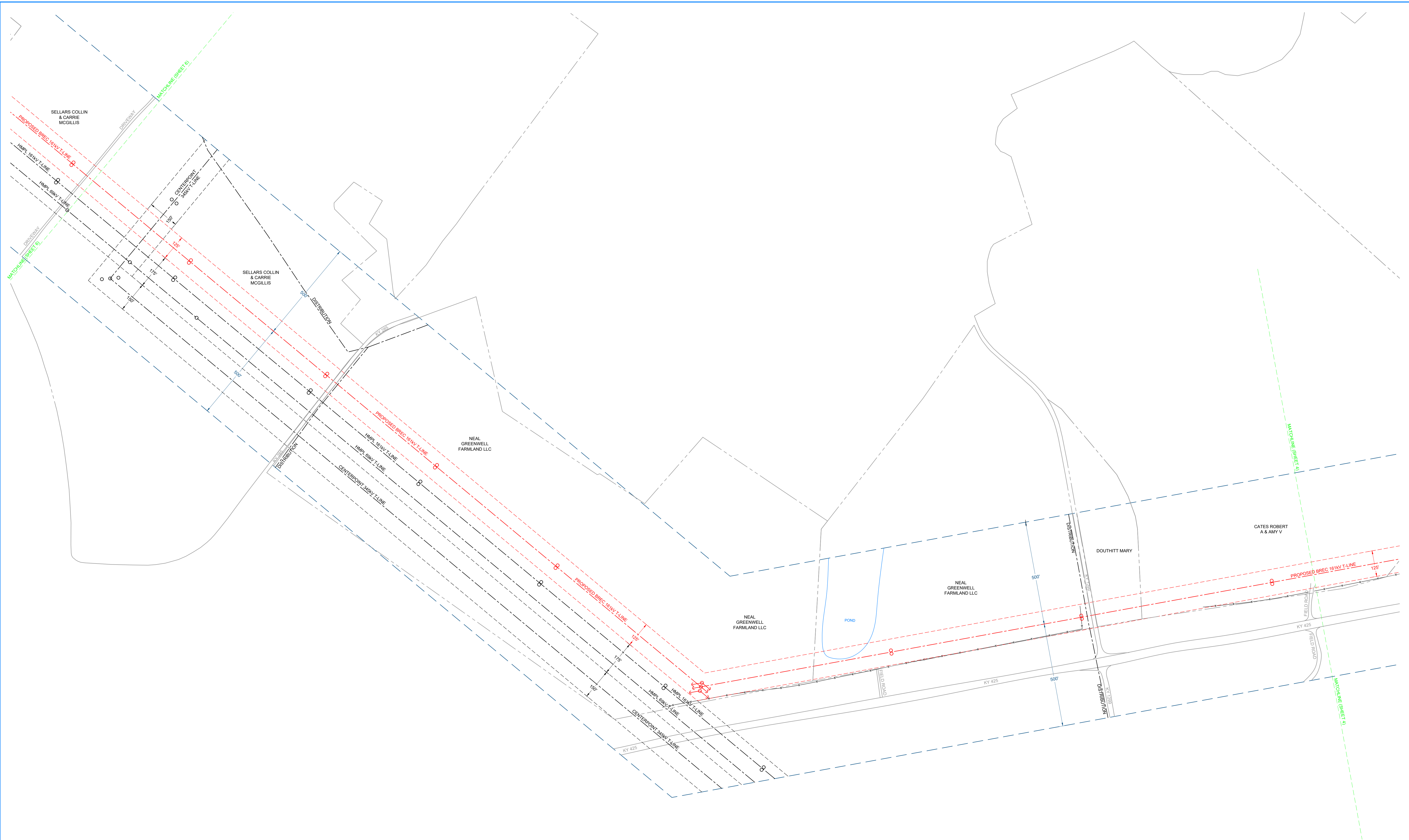
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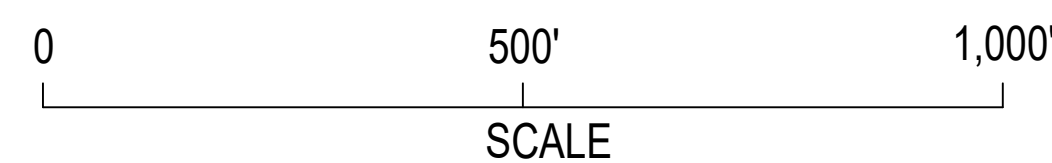


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 161KV TRANSMISSION LINE
 CENTERLINE & EASEMENT BOUNDARIES**

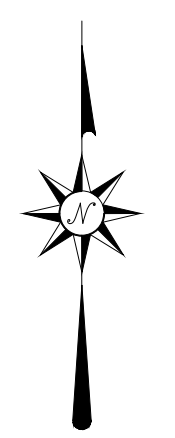
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- PRELIMINARY
- FOR BID
- FOR CONSTRUCTION
- FOR RECORD
- "AS BUILT"
- REFERENCE



LEGEND

- ROAD
- RAILROAD
- - - EXISTING T-LINE
- - - PROPOSED T-LINE
- o EXISTING POLE
- o PROPOSED POLE
- PROPOSED DOWNGUY
- - - EXISTING EASEMENT
- - - PROPOSED EASEMENT
- - - PROPERTY LINE
- - - 500' CENTERLINE OFFSET

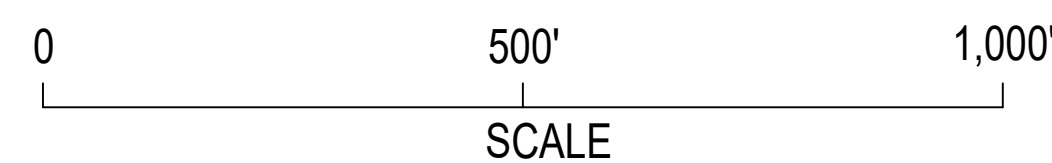
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**SOUTH HENDERSON - HENDERSON PAPER MILL
 161KV TRANSMISSION LINE
 CENTERLINE & EASEMENT BOUNDARIES**

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- PRELIMINARY
- FOR BID
- FOR CONSTRUCTION
- FOR RECORD
- "AS BUILT"
- REFERENCE



LEGEND

- ROAD
- RAILROAD
- EXISTING T-LINE
- PROPOSED T-LINE
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- PROPOSED POLE
- PROPOSED DOWNGWY
- EXISTING EASEMENT
- PROPOSED EASEMENT
- PROPERTY LINE
- 500' CENTERLINE OFFSET

REV	DATE	DRFT	ENGR	REVISION DESCRIPTION
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B	01/17/22	ABG		UPDATE PVA DATA

Big Rivers

SOUTH HENDERSON - HENDERSON PAPER MILL
 161KV TRANSMISSION LINE
 CENTERLINE & EASEMENT BOUNDARIES

W.O.		DATE	
SCALE:	1" = 200'	ENGINEER	ABG (P&D ENGINEERS)
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**South Henderson – Henderson Paper
Mill
161 kV Transmission Line
Siting Study**

Project Report

Prepared by: Jesse Glasgow and Nicholas Arjona, Team Spatial

Date: December 10, 2021



**Case No. 2022-00012
Application Exhibit D**



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Project Overview

Big Rivers Electric Corporation plans to construct a transmission line that connects the Proposed Henderson Paper Mill Substation on the west side of the project study area and the Proposed South Henderson Switching Station on the existing Reid – Henderson County 161 kV transmission line on the eastern side of the study area. The proposed 161 kV transmission line is being built to provide service for the new Henderson Paper Mill.

In support of this project, Team Spatial performed a siting study to help the Big Rivers team identify the preferred route to construct the new line. The siting study considered the natural environment and people, as well as cost and engineering concerns. The route selection process is described in this report.

Study Area Description

The project study area is south of the city of Henderson in Henderson County, Kentucky. Henderson County is home to about 46,000 residents and has a population density of about 106 people per square mile.

The study area is mainly agricultural with more development in the northern portion which is closer to Henderson. The terrain is relatively flat, with some areas prone to flooding, as the Ohio River serves as a northern border to the county. The primary north/south oriented transportation corridors include Interstate 69 and US Hwy 41 – both of which the new line must cross. Kentucky State Route 425 runs east/west through the study area.

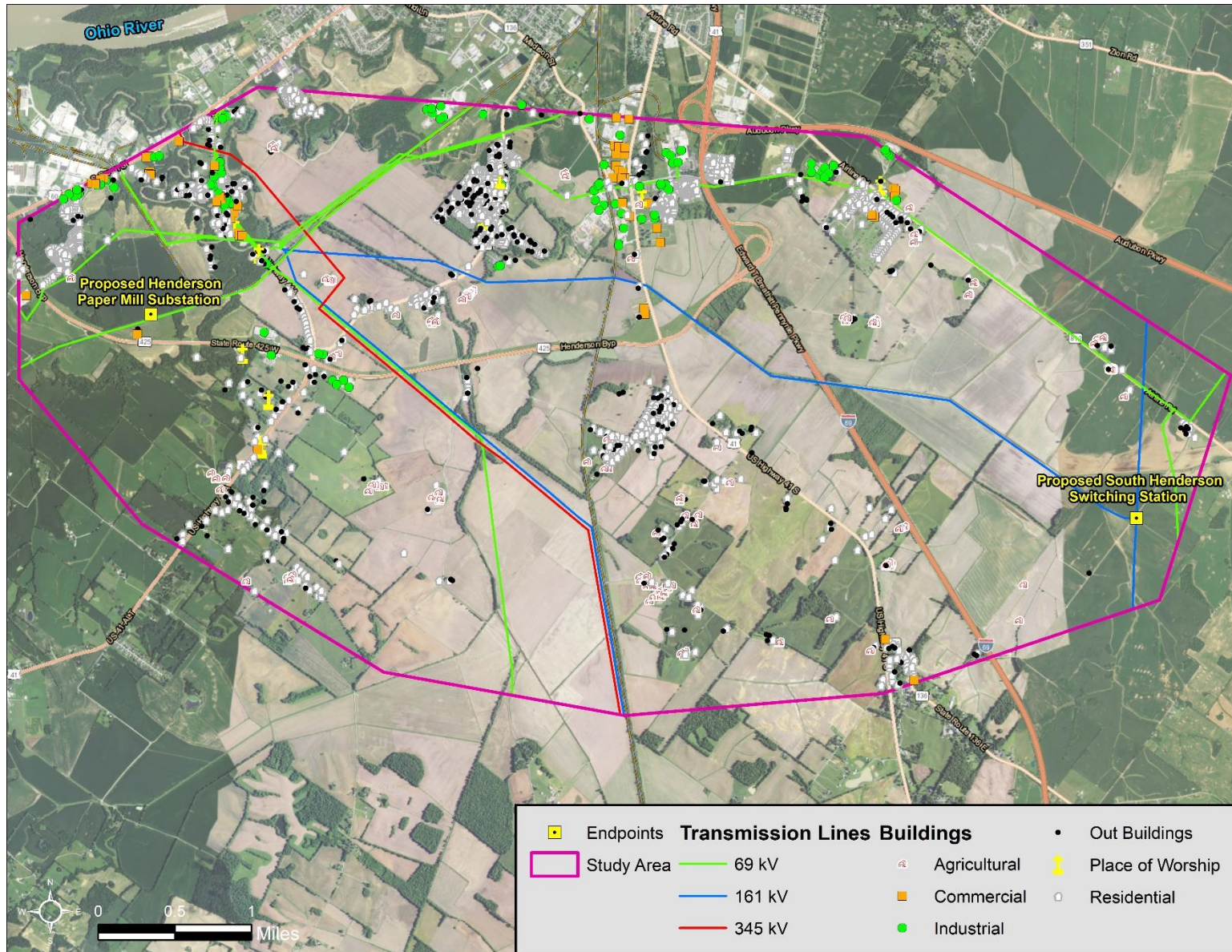


Figure 1 Study Area Map

Siting Methodology Overview

The EPRI (Electric Power Research Institute) - GTC (Georgia Transmission Corporation) Siting Methodology¹ and the Kentucky Siting Model² were used on this project. The methodology uses a data driven objective process that leverages external stakeholder input from representative organizations to help calibrate the Alternative Corridor model using the Analytical Hierarchy and the Modified Delphi processes. It relies on routing experts to identify alternate routes using the Alternative Corridors as a guide. The method leverages internal experts to calibrate the Alternative Route Evaluation Model and uses the Alternative Route Evaluation Model to help identify the top routes. Finally, the Expert Judgment Model is used to select the preferred route.

The Methodology is analogous to a funnel used to process information. Into the funnel goes geographic information which is calibrated with community concerns, natural concerns, and engineering considerations. Each phase of the process is like a filter in the funnel which is used to reduce the area of consideration. As the area of focus is reduced, users are able to invest more effort into studying the area at a greater level of detail. More detailed information is collected as one proceeds through the funnel. The bottom of the funnel results a preferred route for the transmission line.

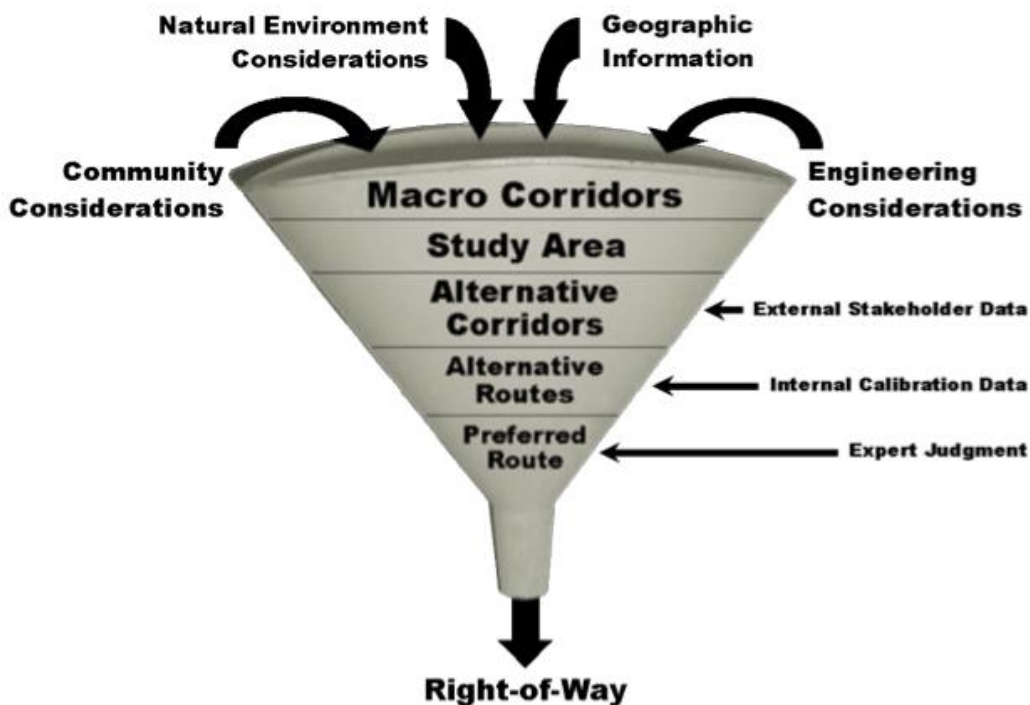


Figure 2 Funnel Analogy

¹ <https://www.epri.com/#/pages/product/1013080/?lang=en-US>

² <https://www.epri.com/#/pages/product/1016198/?lang=en-US>



Alternative Corridors

Engineering Environment	
Linear Infrastructure	86.2%
Parallel Existing Transmission Lines	1
Rebuild Existing Transmission Lines (good)	-
Background	5.4
Parallel Interstates ROW	5.8
Parallel Roads ROW	6.8
Parallel Pipelines	6.9
Future DOT Plans	-
Parallel Railway ROW	7.5
Road ROW	9
Rebuild Existing Transmission Lines (bad)	-
Scenic Highways ROW	-
Slope	13.8%
Slope 0-15%	1
Slope 15-30%	4
Slope 30-40%	6.7
Slope >40%	9
Areas of Least Preference	
Non-Spannable Waterbodies	
Mines and Quarries (Active)	
Buildings	
Airports	
Military Facilities	
Center Pivot Irrigation	

Natural Environment	
Floodplain	5.6%
Background	1
100 Year Floodplain	9
Streams/Wetlands	35.5%
Background	1
Streams < 5cf+Regulatory Buffer	6.4
Streams > 5cf+Regulatory Buffer	7.3
Wetlands + 30' Buffer	9
Outstanding State Resource Waters	-
Public Lands	-
Background	-
WMA + Not State Owned	-
USFS (proclamation area)	-
Other Conservation Land	-
USFS (actually owned)	-
State Owned Conservation Land	-
Land Cover	24.1%
Developed Land	1
Agriculture	4.6
Forests	9
Wildlife Habitat	34.9%
Background	1
Species of Concern Habitat	9
Areas of Least Preference	
EPA Superfund Sites	
State and National Parks	
USFS Wilderness Area	
Wild/Scenic Rivers	
Wildlife Refuge	
State Nature Preserves	
Designated Critical Habitat	

Built Environment	
Proximity to Buildings	16.8%
Background	1
900-1200	3.4
600-900	5.7
300-600	8
0-300	9
Building Density	8.4%
0 - 0.05 Buildings/Acre	1
0.05 - 0.2 Buildings/Acre	3
0.2 - 1 Buildings/Acre	5.9
1 - 4 Buildings/Acre	9
>4 Buildings/Acre	-
Proposed Development	3.9%
Background	1
Proposed Development	9
Spannable Lakes and Ponds	4.0%
Background	1
Spannable Lakes and Ponds	9
Land Use	35.9%
Commercial/Industrial	1
Agriculture (crops)	3.5
Agriculture (other livestock)	4.6
Silviculture	-
Other (forest)	6.7
Equine Agri-Tourism	-
Residential	9
Proximity to Eligible Historic and Archeological Sites	31.0%
Background	1
900-1200	4.6
600-900	7.9
0-300	8.6
300-600	9
Areas of Least Preference	
Listed Archaeology Sites and Districts	
Listed NRHP Districts and Buildings	
Day Care Parcels	
City and County Park Parcels	
Cemetery Parcels	
School Parcels (K-12)	
Church Parcels	

Figure 3 Alternate Corridor Model

The above model is the Kentucky Siting Model that was developed with input from subject-matter experts and stakeholders. Each perspective (Built, Engineering, and Natural) represent the three groupings of considerations in the model. Within the perspectives, there are layers like Linear Infrastructure that further specify the groups. Finally, there are features that lie in the layers that tie to specific features such as Road Right-of-Way (ROW).

Each feature is given a value 1-9 depending on the relative suitability for a potential transmission line to intersect with said feature. 1 being the most suitable and 9 being the least. At the layer level, all of the layers within a perspective are given a weight and all of the weights must equal 100%. The features and layers that are not present in this project are grayed out in the table above.

Areas of Least Preference

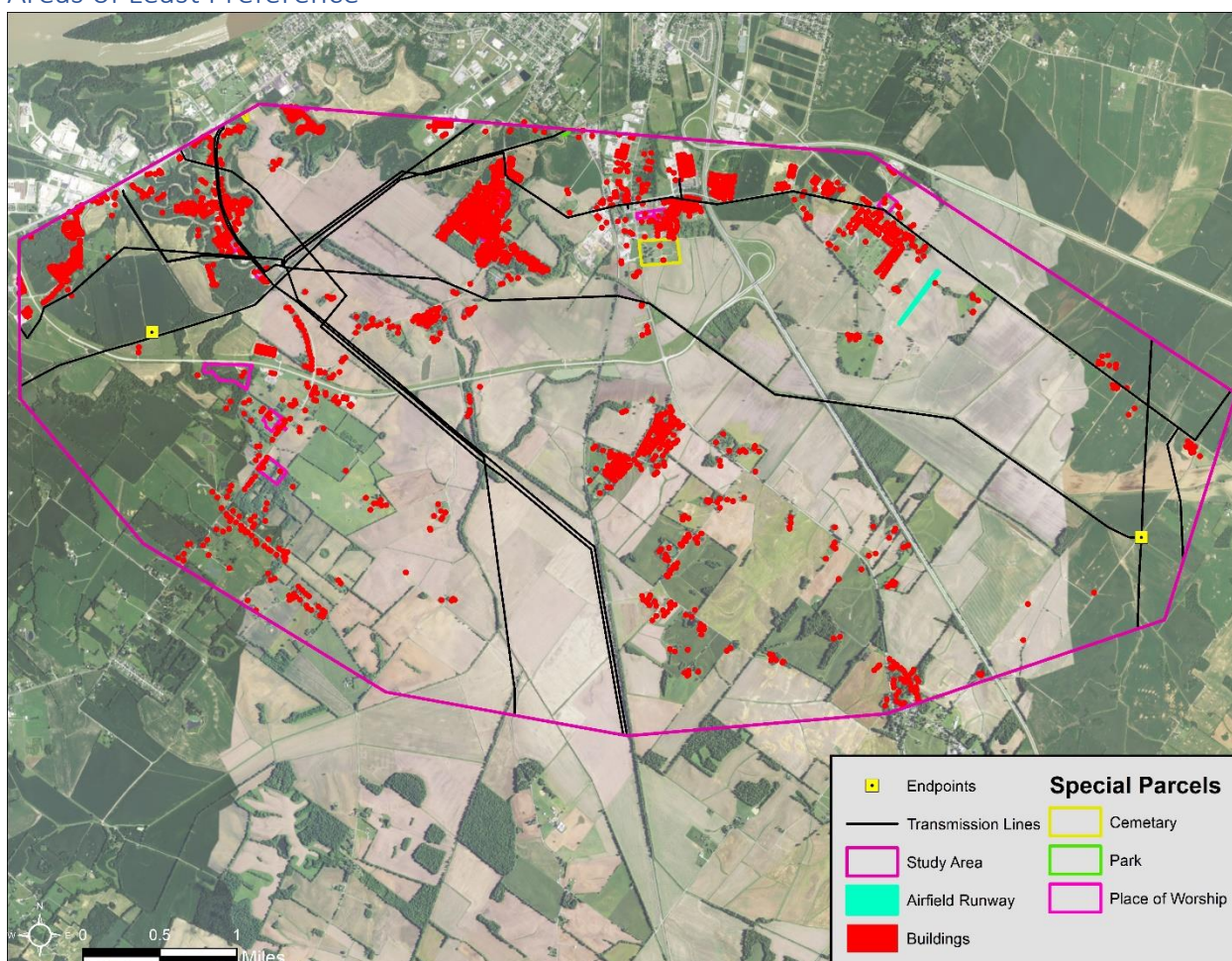


Figure 4 Areas of Least Preference

Built Criteria

The Built portion of the Alternate Corridor Model considers places where people live, work, and play. The Built Environment contains six layers: Building Density, Building Proximity, Proposed Development, Spannable Lakes and Ponds, Land Use, and Proximity to Eligible Historic and Archaeological Sites.

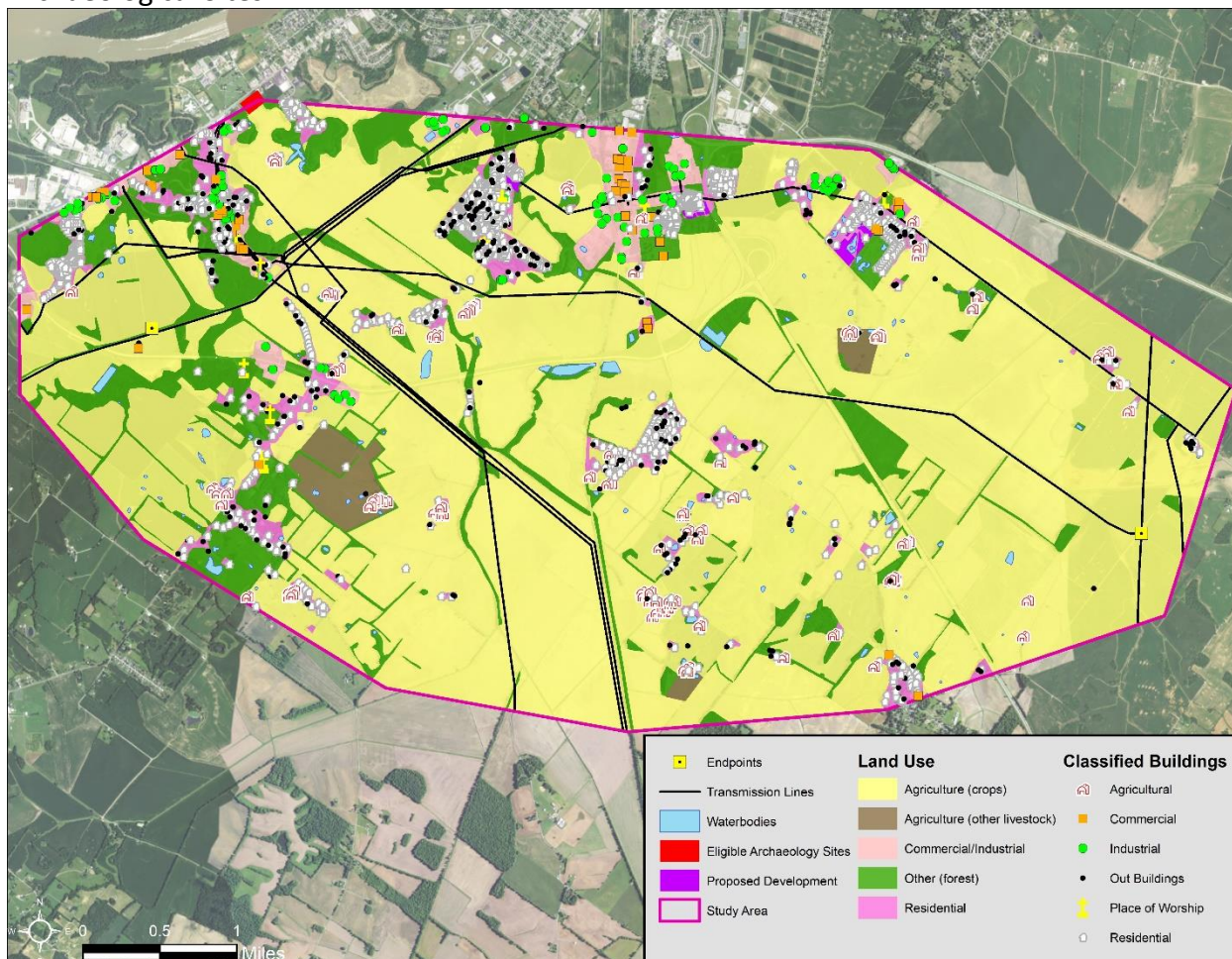


Figure 5 Built Source Data

The above map shows the source data in the Built Environment.

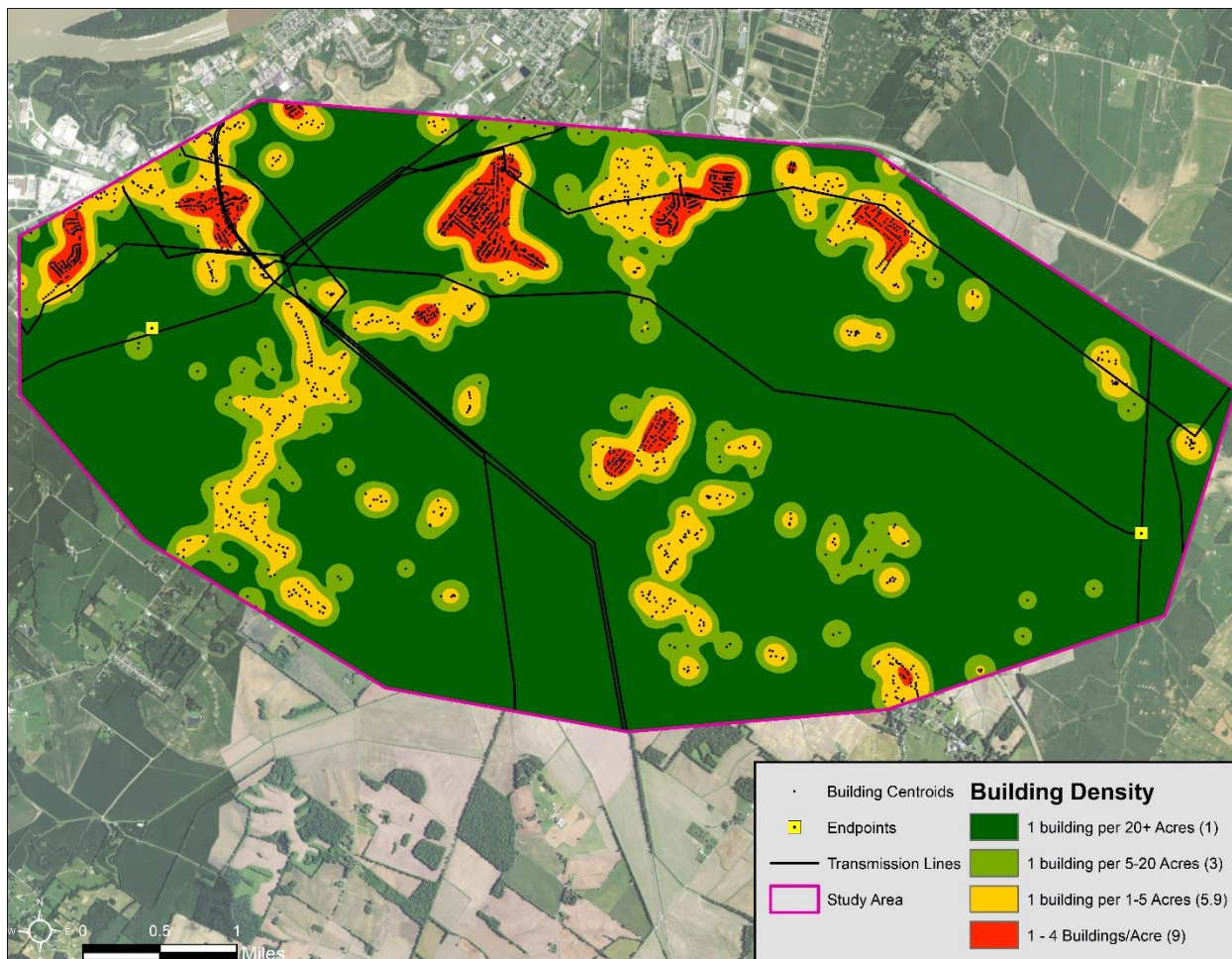


Figure 6 Building Density Suitability Grid

The Building Density layer is classified by the number of buildings per acre. The higher the density, the less suitable that location is for a potential transmission line. *Note: The legend of the following maps illustrates the categories from the Kentucky model, and the relative suitability values. Within each layer the number 1 represents the most suitable place for a transmission line (in that layer) and the number 9 represents the least suitable place.*

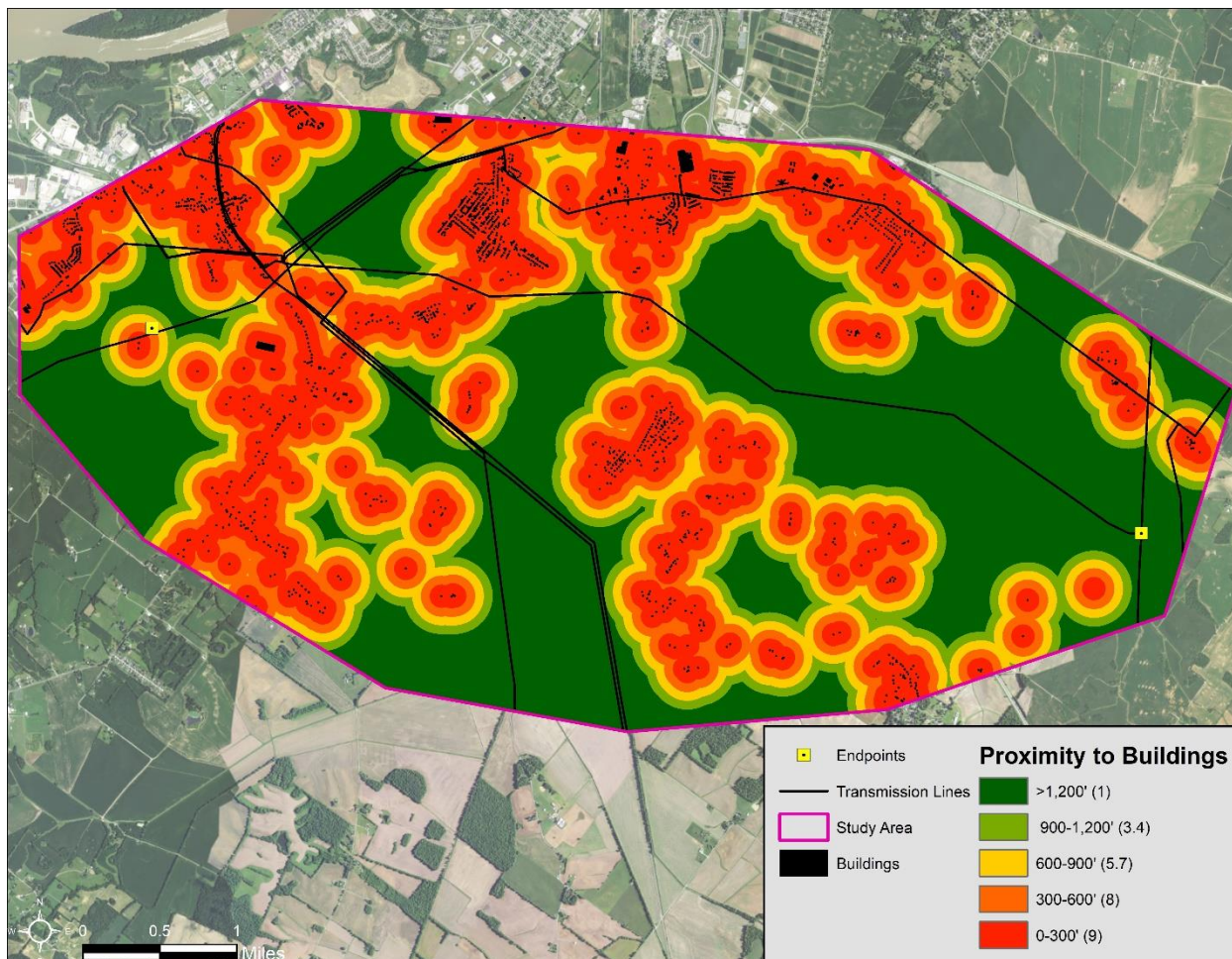


Figure 7 Building Proximity Suitability Grid

For the Building Proximity layer, the most suitable location for a potential transmission line is beyond 1,200 feet from a building. These areas are shown in dark green in the map above. The least suitable areas are within 300 feet of a building.

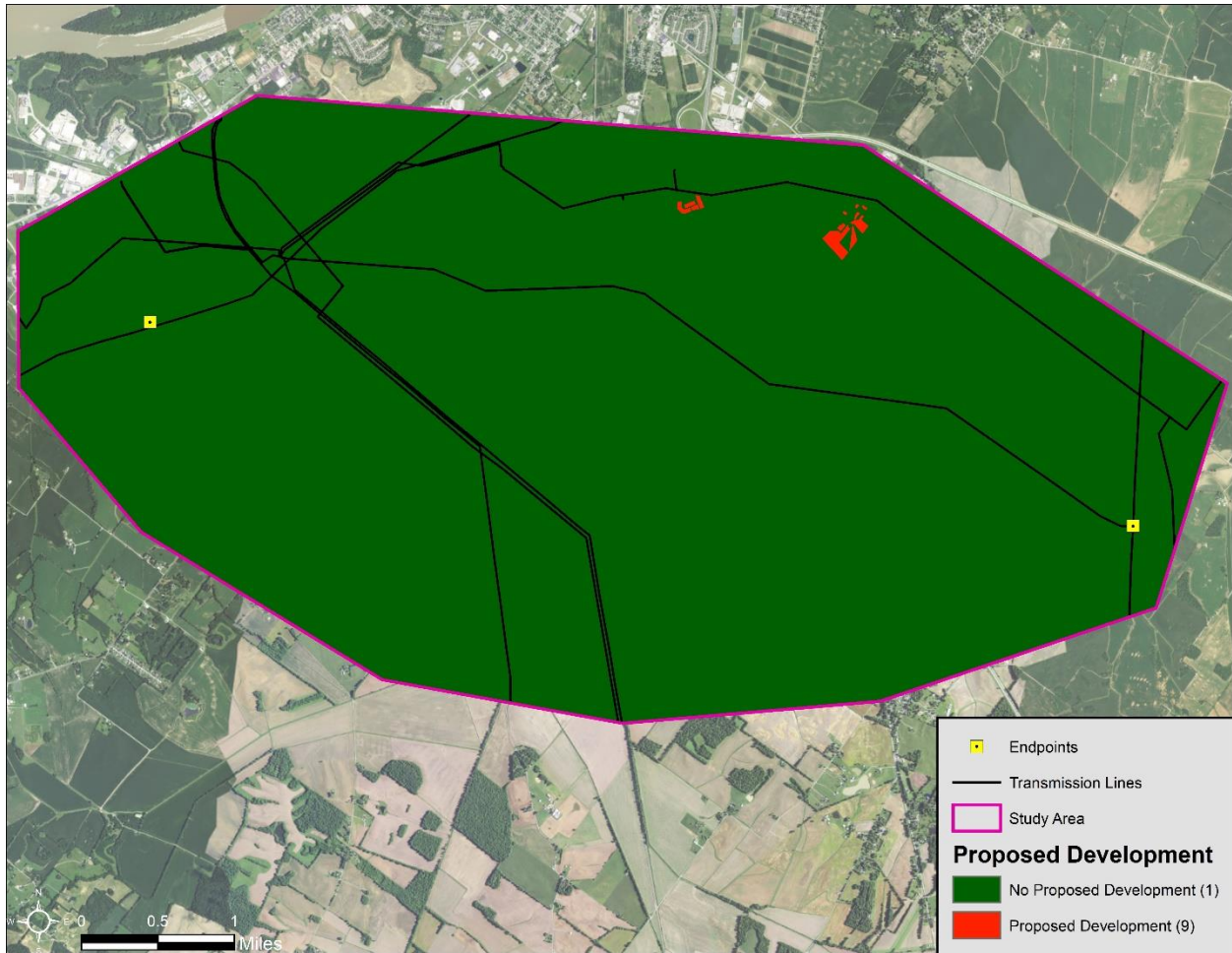


Figure 8 Proposed Development Suitability Grid

The Proposed Development suitability grid contains two options, either the location is a proposed development or not. The areas that are not a proposed development are more suitable for a new transmission line.

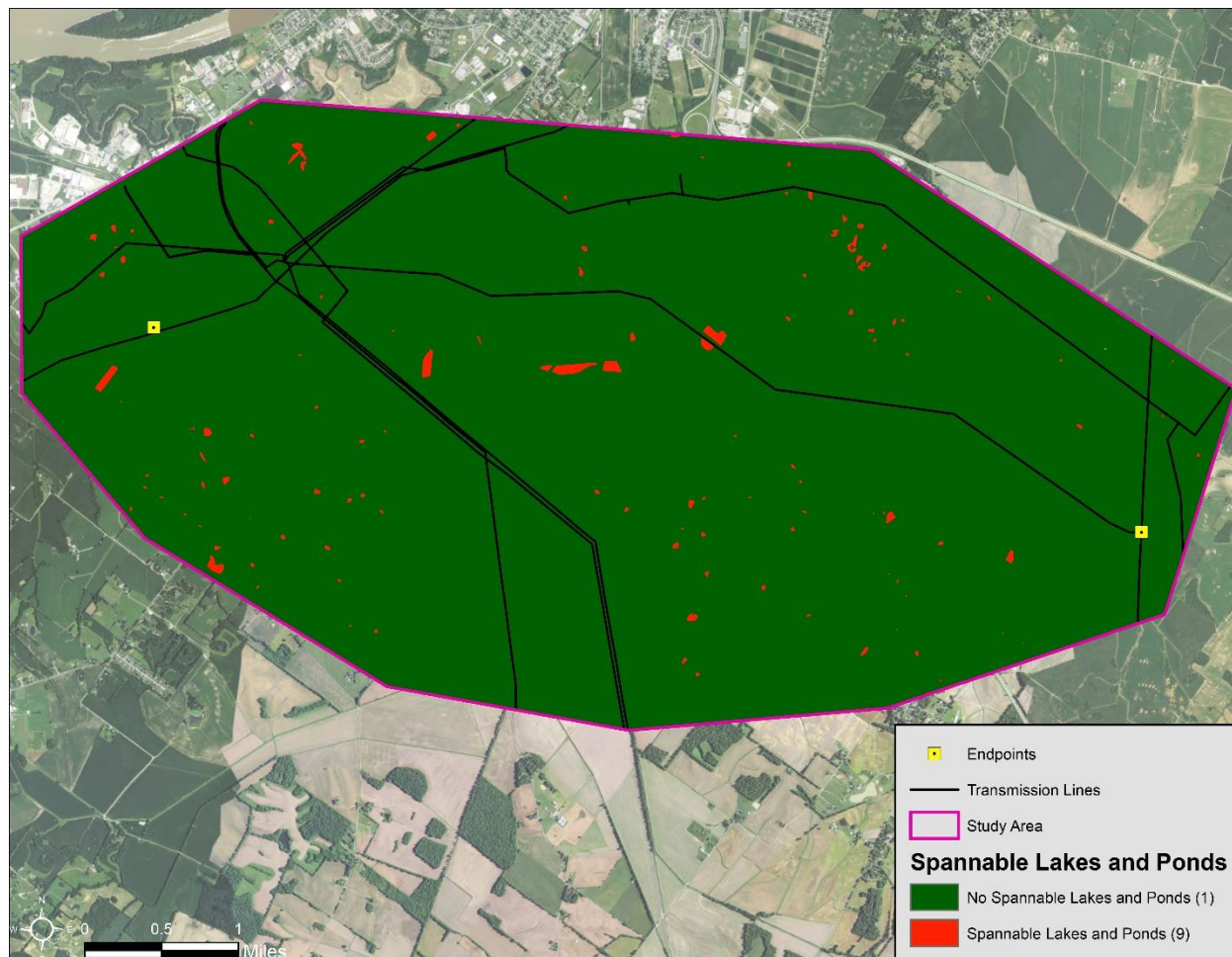


Figure 9 Spannable Lakes and Ponds Suitability Grid

The Spannable Lakes and Ponds suitability grid is characterized by two options, either the location is within a spannable lake and pond, or the location is not. The areas that are not in a spannable lake or pond are more suitable for a potential transmission line. A maximum span distance of 800' was used for this analysis.

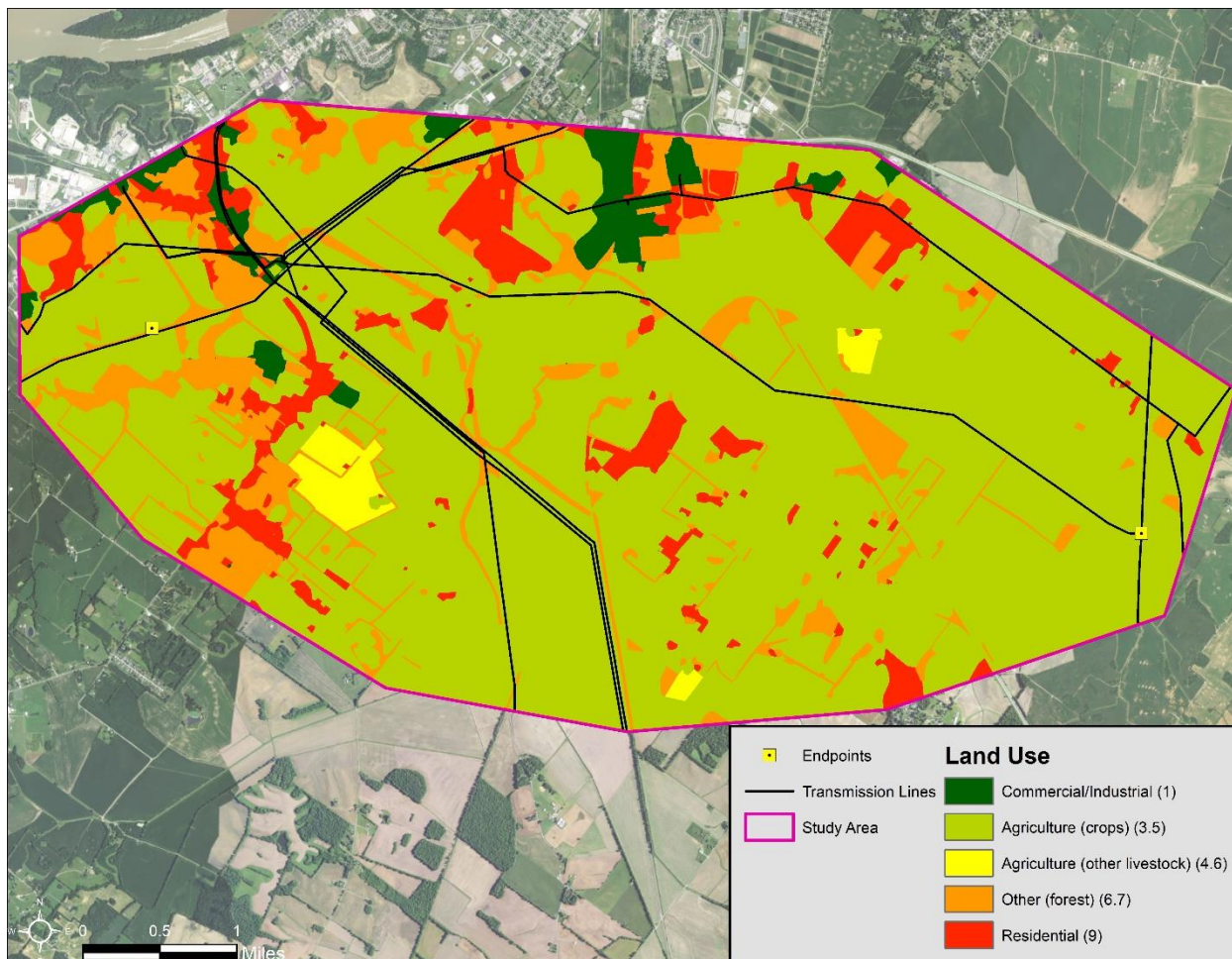


Figure 10 Land Use Suitability Grid

According to the Kentucky Model, from a Built Perspective the most suitable land use classification for a potential transmission line is an area with a commercial or industrial land use, while the least suitable classification is residential areas. An area with an agricultural land use classification is the second most suitable, while any other land use classification would be the third most suitable area. In this case the “other” classification consists of areas with trees.

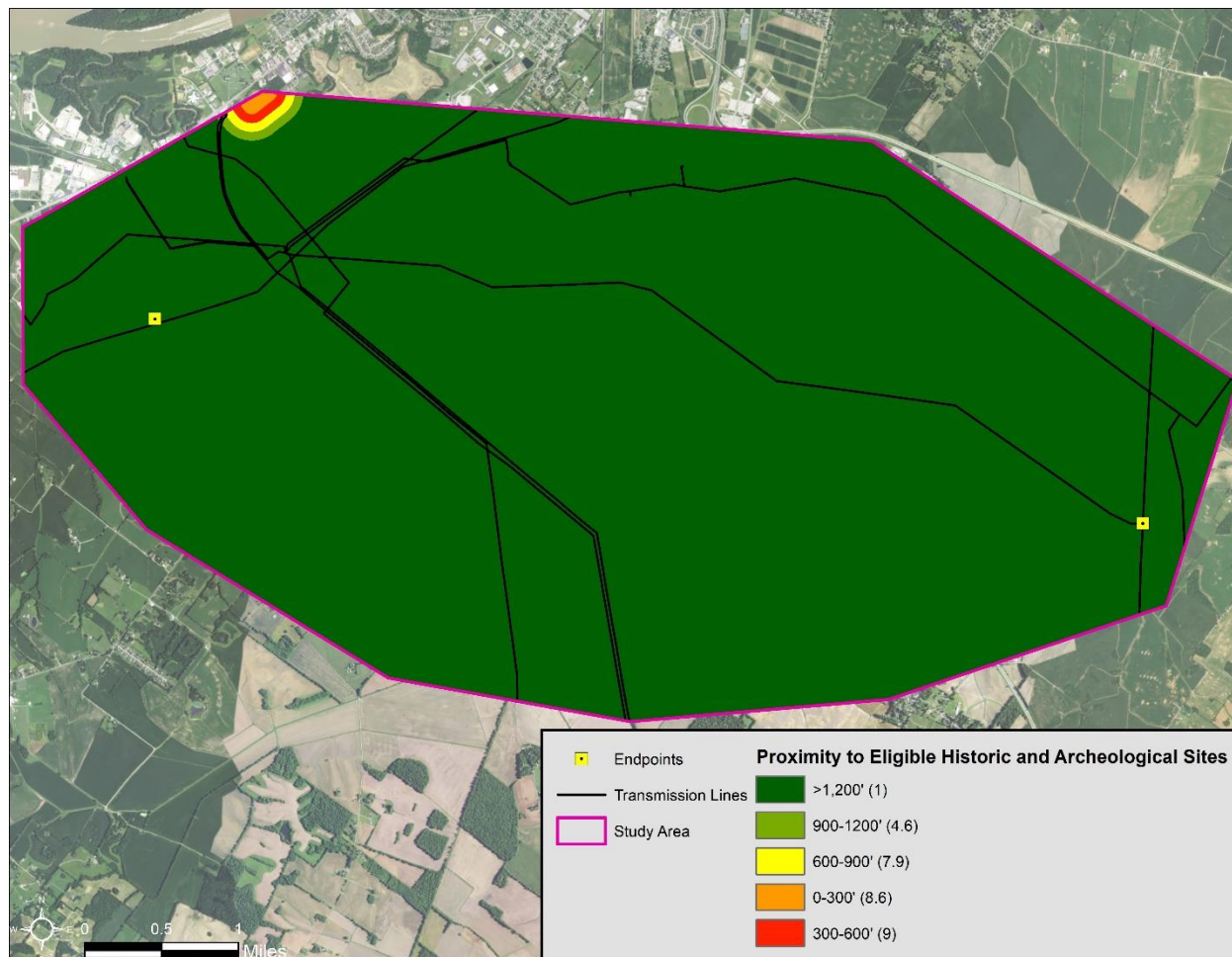


Figure 11 Proximity to Historic Sites Suitability Grid

The Proximity to Historic Sites and Archaeological layer is meant to protect the Historic and Archaeological sites in or near the study area. This is done by making the areas near the sites to be the least suitable, while the farthest away from the sites is the most suitable location for a potential transmission line. There was one Archaeological site within the study area that was classified as “eligible” for the National Register of Historic Places.

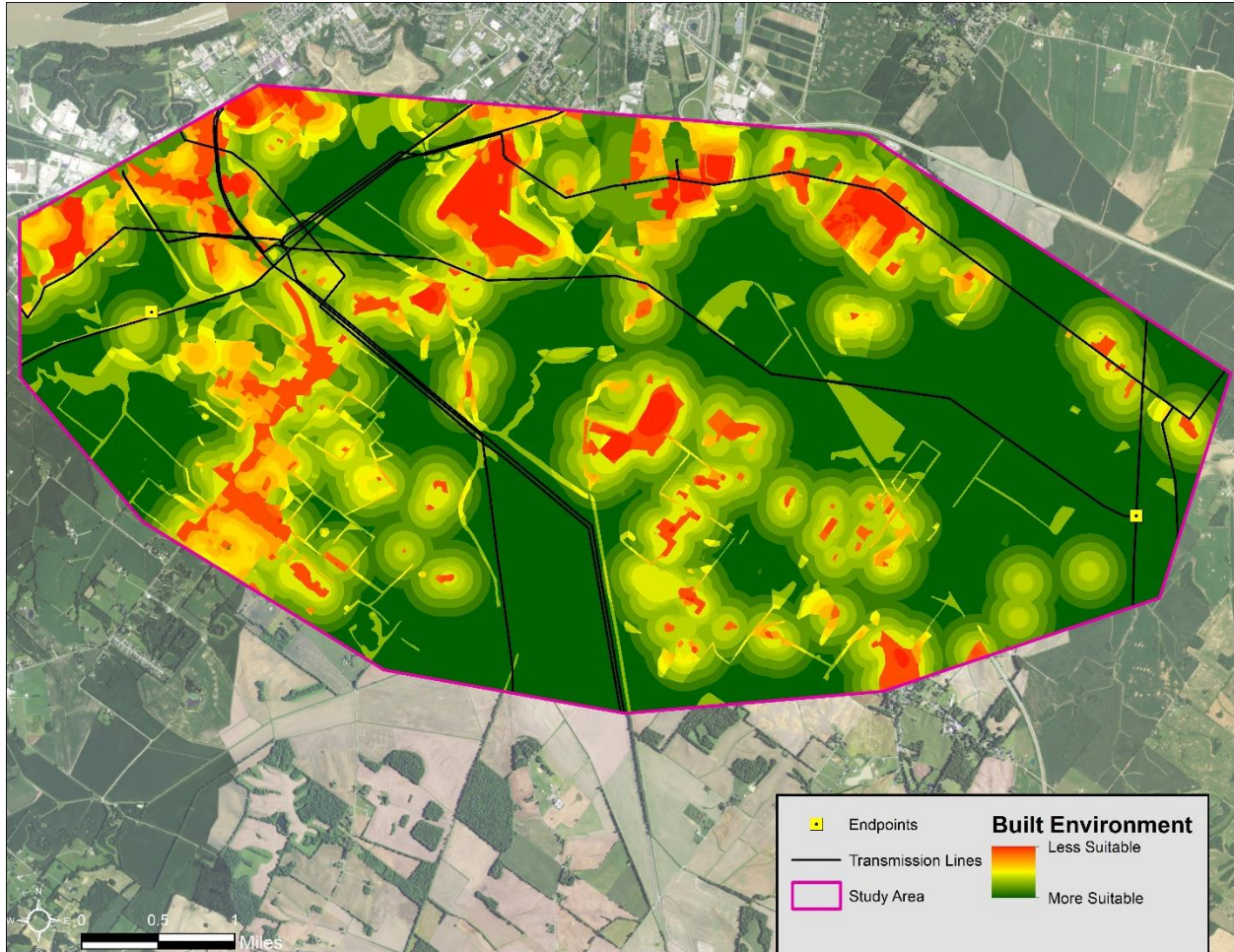


Figure 12 Built Suitability Grid

The suitability grids for each perspective are created by multiplying the values of the individual layer grids by the weights in the model and then combining them to create a weighted average suitability grid as shown above.

Natural Criteria

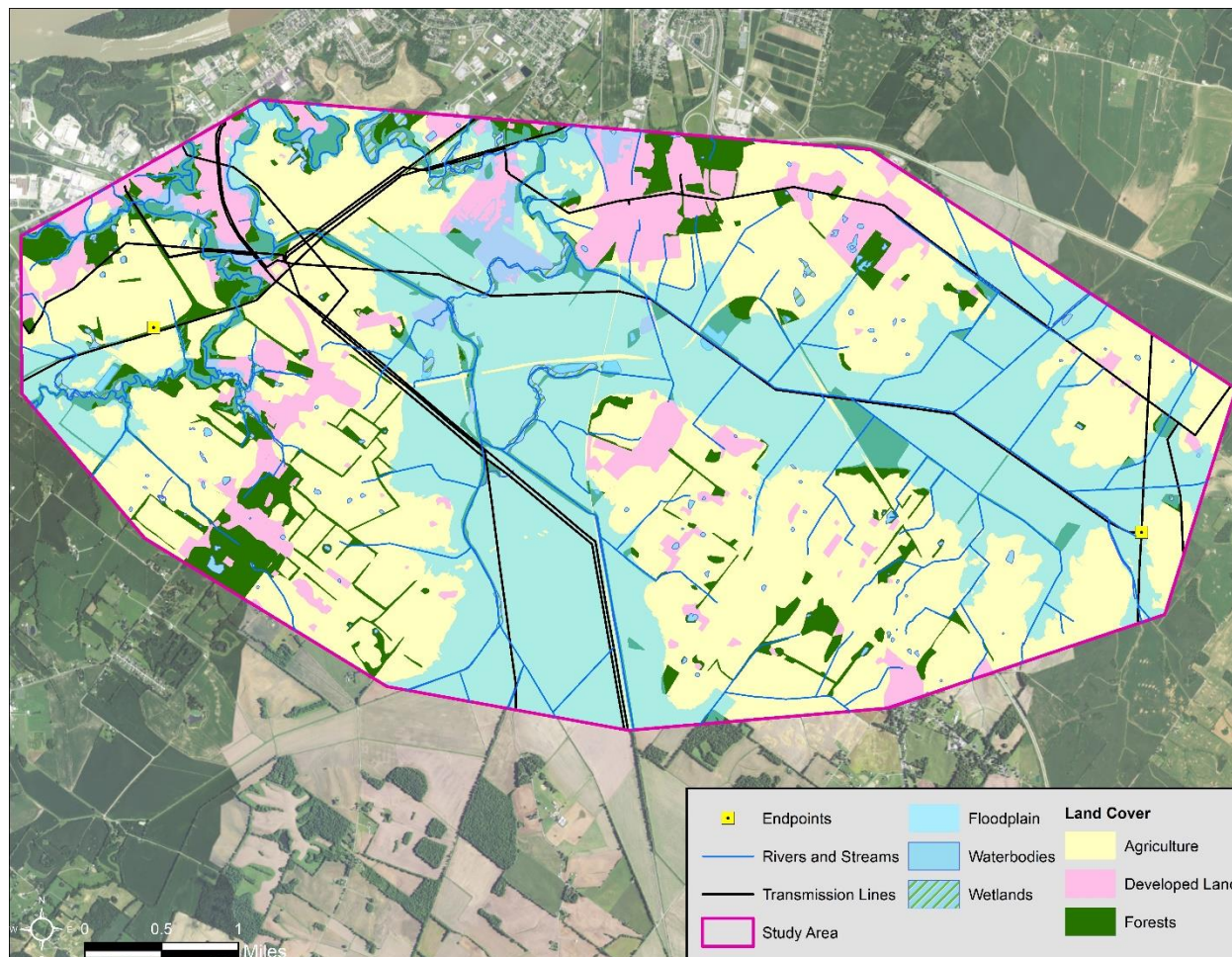


Figure 13 Source Data for the Natural Perspective

The Natural Perspective considers rivers, streams, and 100-year floodplain. The land cover is also considered when assessing the natural suitability of a potential transmission line in the area. The Wildlife Habitat was modeled utilizing a combination of forested lands and rivers. Public Lands were also considered with the Natural Perspective; however, none are present in the study area.

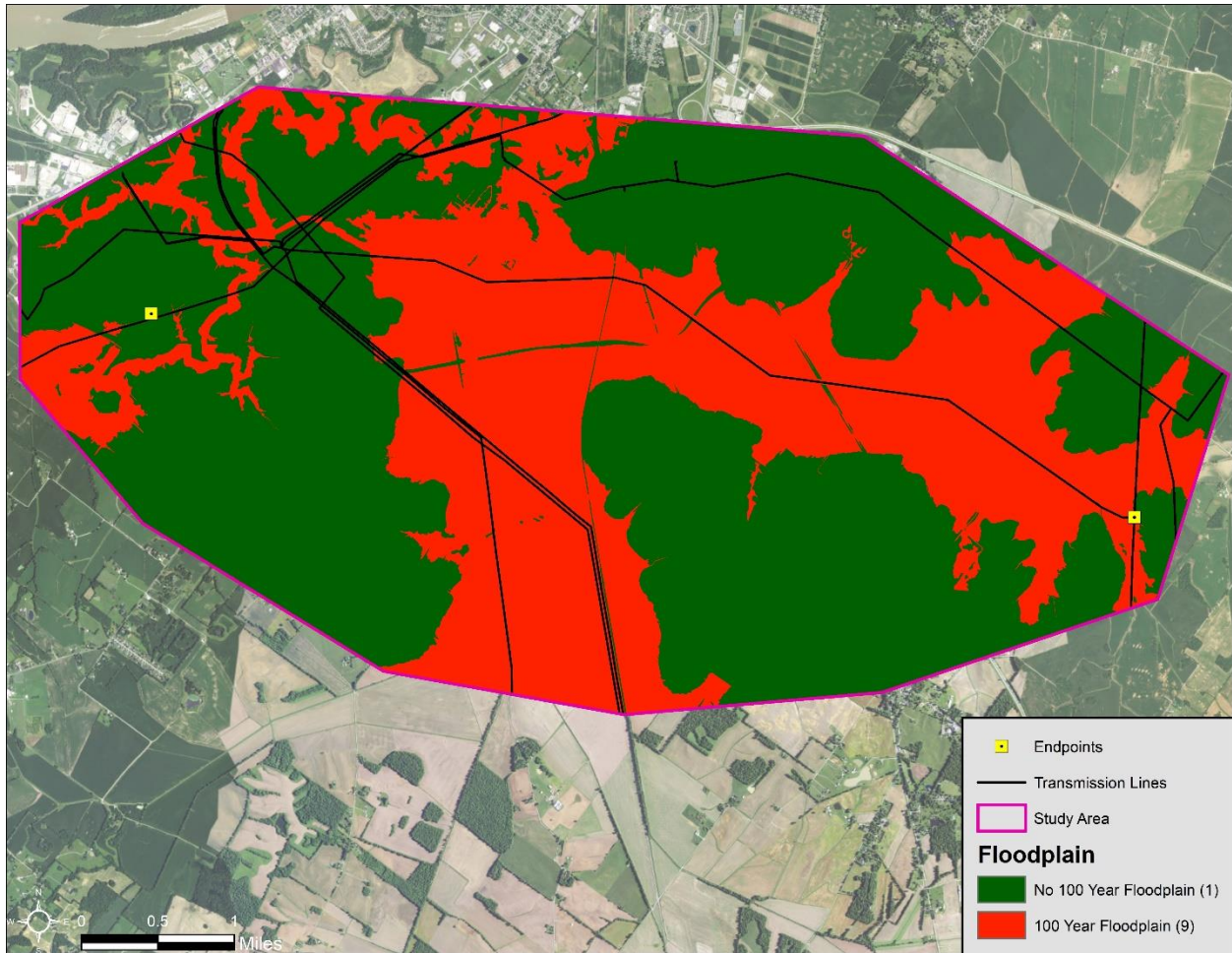


Figure 14 Floodplain Suitability Grid

The most suitable areas are not within a 100-year floodplain.

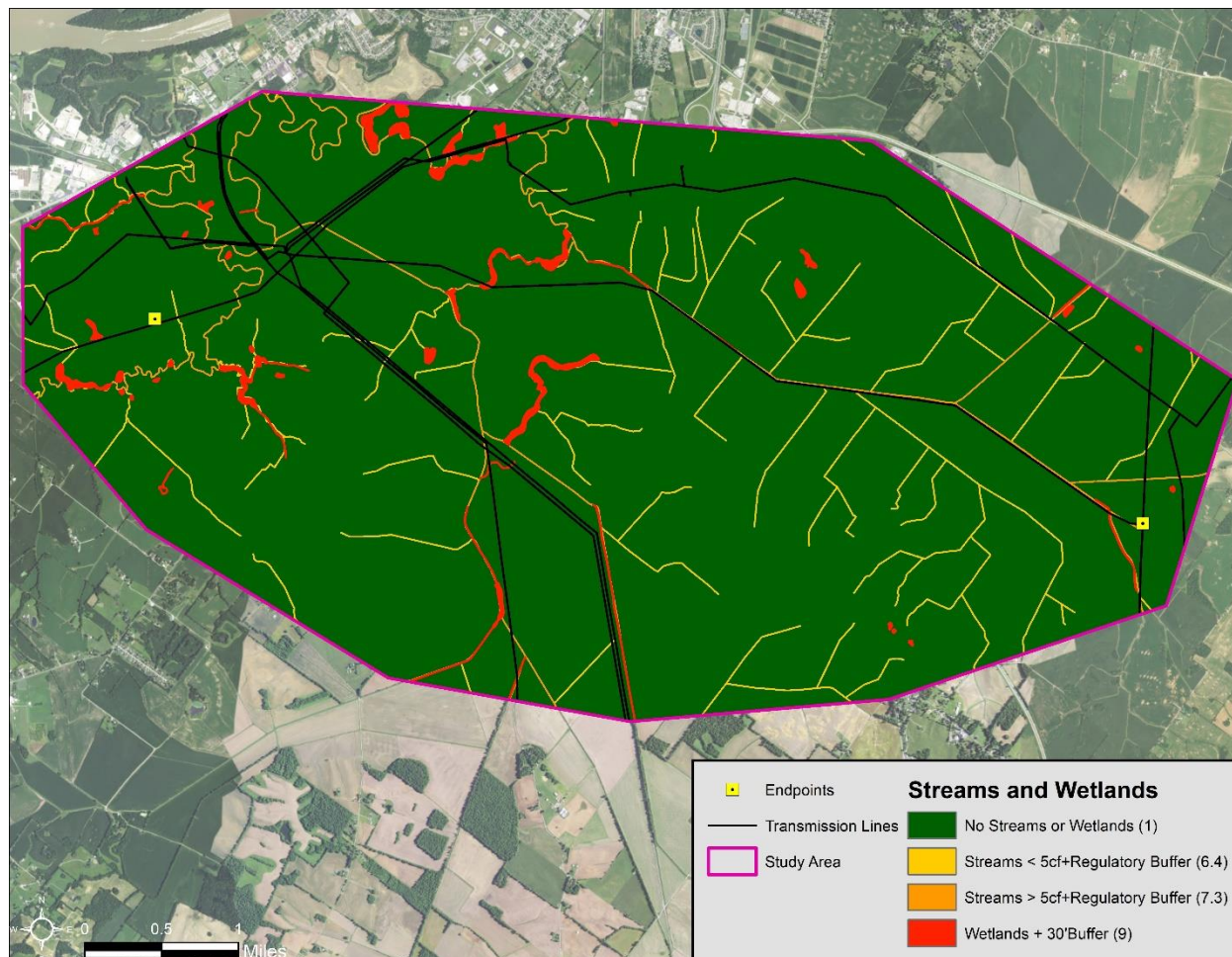


Figure 15 Streams and Wetlands Suitability Grid

Wetlands, plus a 30' buffer are the least suitable location for a potential transmission line. Any streams with a flow greater than 5 cubic feet per second are the second least suitable location for a new transmission line. The most suitable areas do not contain wetlands or streams/rivers. No Outstanding State Resource Waters were identified within the study area.

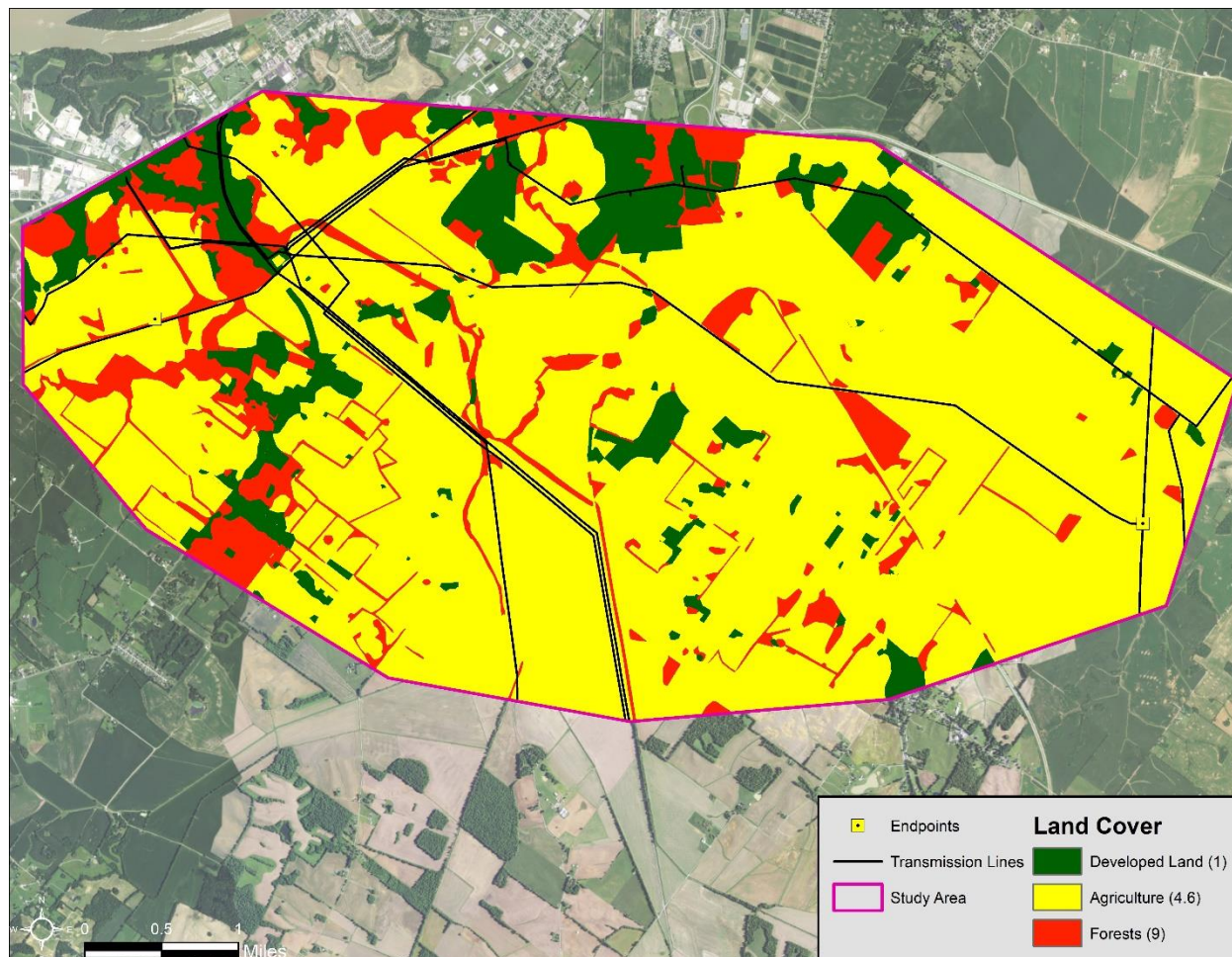


Figure 16 Land Cover Suitability Grid

The land cover is classified by developed land, agriculture, and forest. From a Natural Perspective, forested land is the least suitable area for a potential transmission line. Developed land is the most suitable area and agriculture land is rated near the middle.

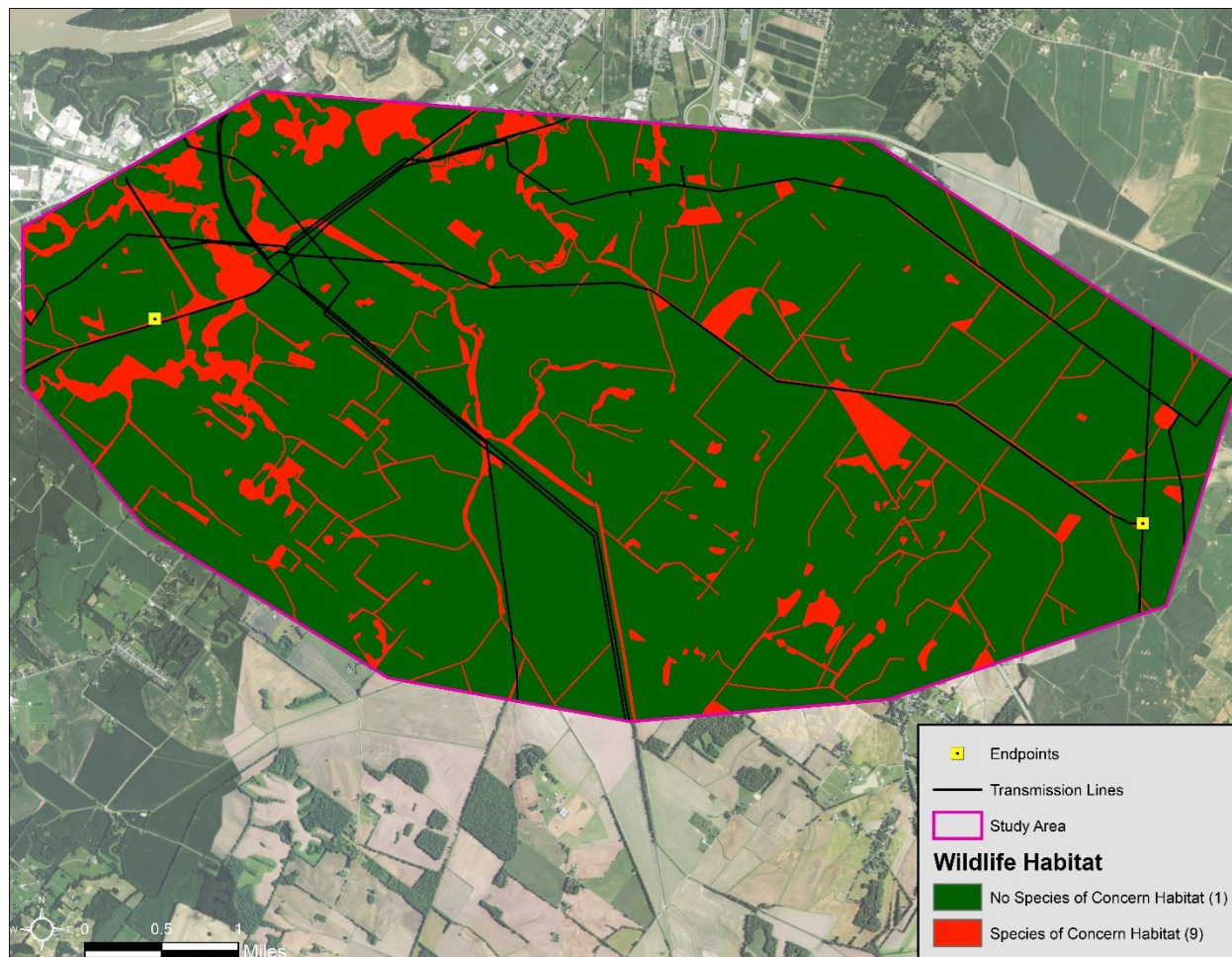


Figure 17 Wildlife Habitat Suitability Grid

The Species of Concern Wildlife Habitat within the study area considered the following species: Northern Long-Eared Bat, Clubshell, Gray Bat, Indiana Bat, Ring Pink, Rough Pigtoe, Purple Cat’s Paw, Orangefoot Pimpleback, Pink Mucket, Fat Pocketbook, Fanshell, and Rabbitsfoot. The habitats for these species are modeled based off the U.S Forest and Wildlife descriptions of their habitats. The Northern Long-Eared Bats and Indiana Bats are found in forested areas. The Clubshell, Rough Pigtoe, Purple Cat’s Paw, Orangefoot Pimpleback, Fat Pocketbook, Ring Pink, Pink Mucket, Fanshell, and Clubshell species are found in rivers and streams. The Gray Bat is found in caves along rivers, but no caves were identified within the study area as per the Kentucky Speleological Society map in Appendix B of the report. Forested land, open water, and surrounding areas were used to model potential wildlife habitat of the threatened and endangered species.

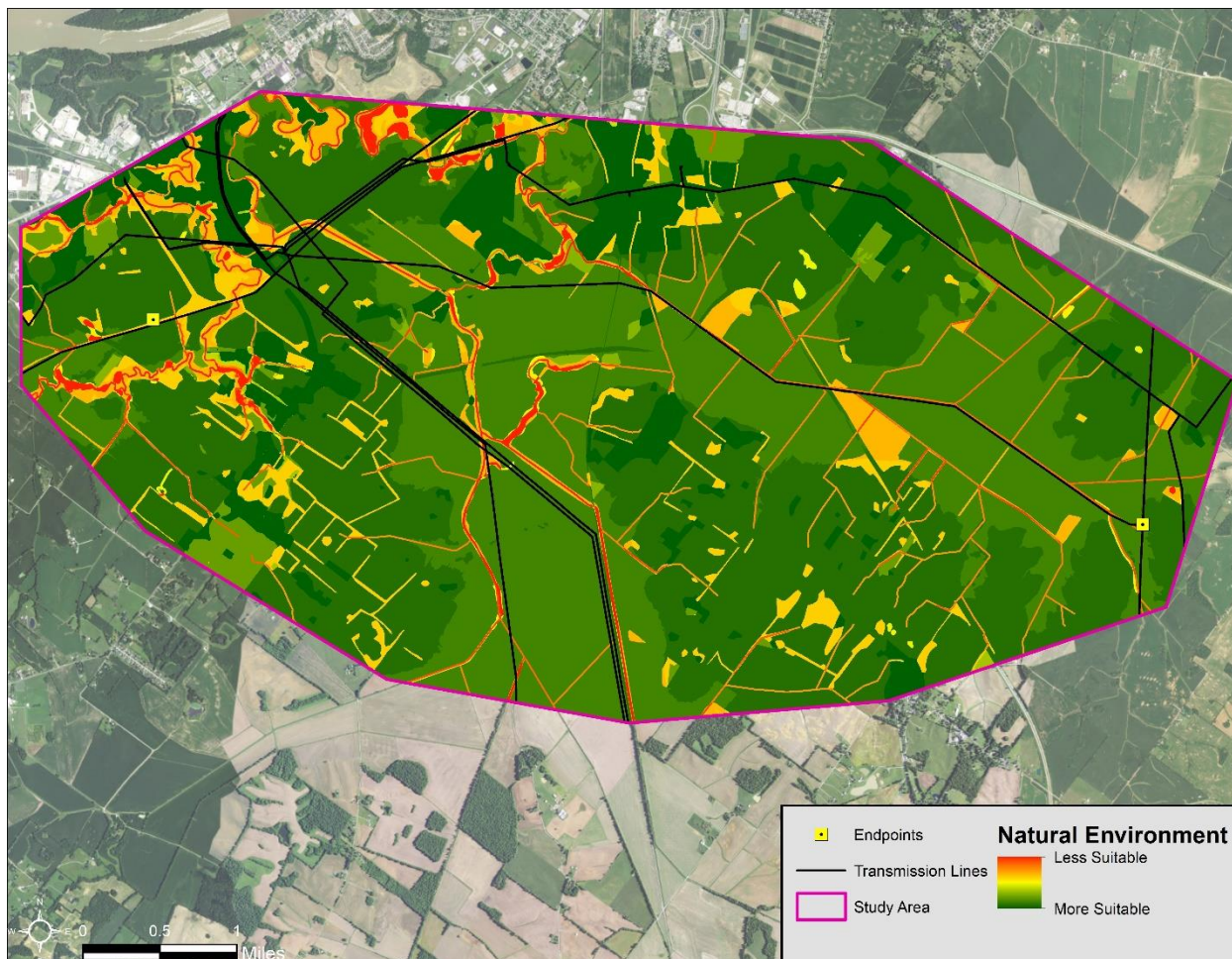


Figure 18 Overall Natural Suitability Grid

The suitability grids for each perspective are created by multiplying the values of the individual layer grids by the weights in the model and then combining them to create a weighted average suitability grid as shown above.

Engineering Criteria

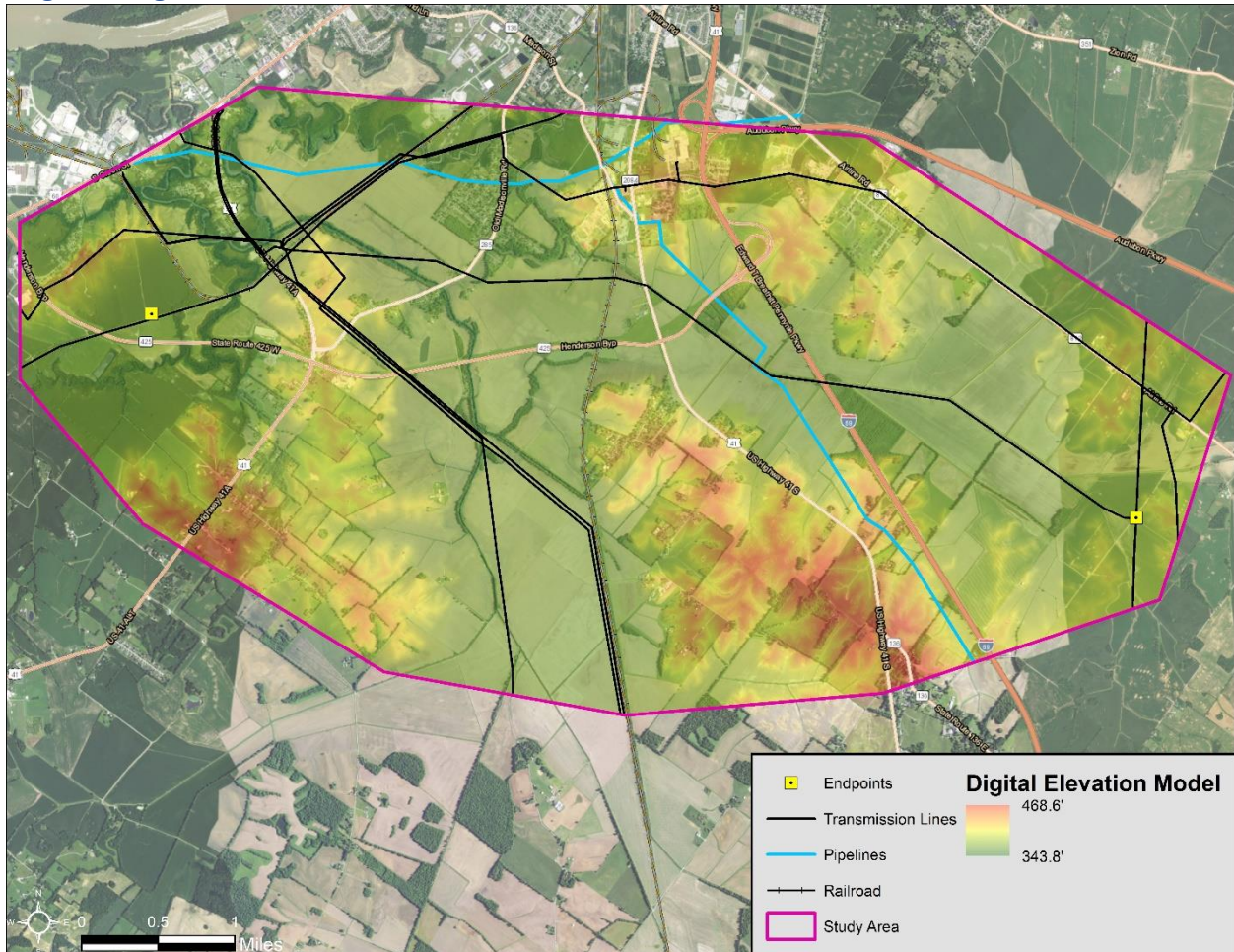


Figure 19 Engineering Perspective Source Data

The Engineering Perspective of the Alternate Corridor Model considers existing linear infrastructure and slope.

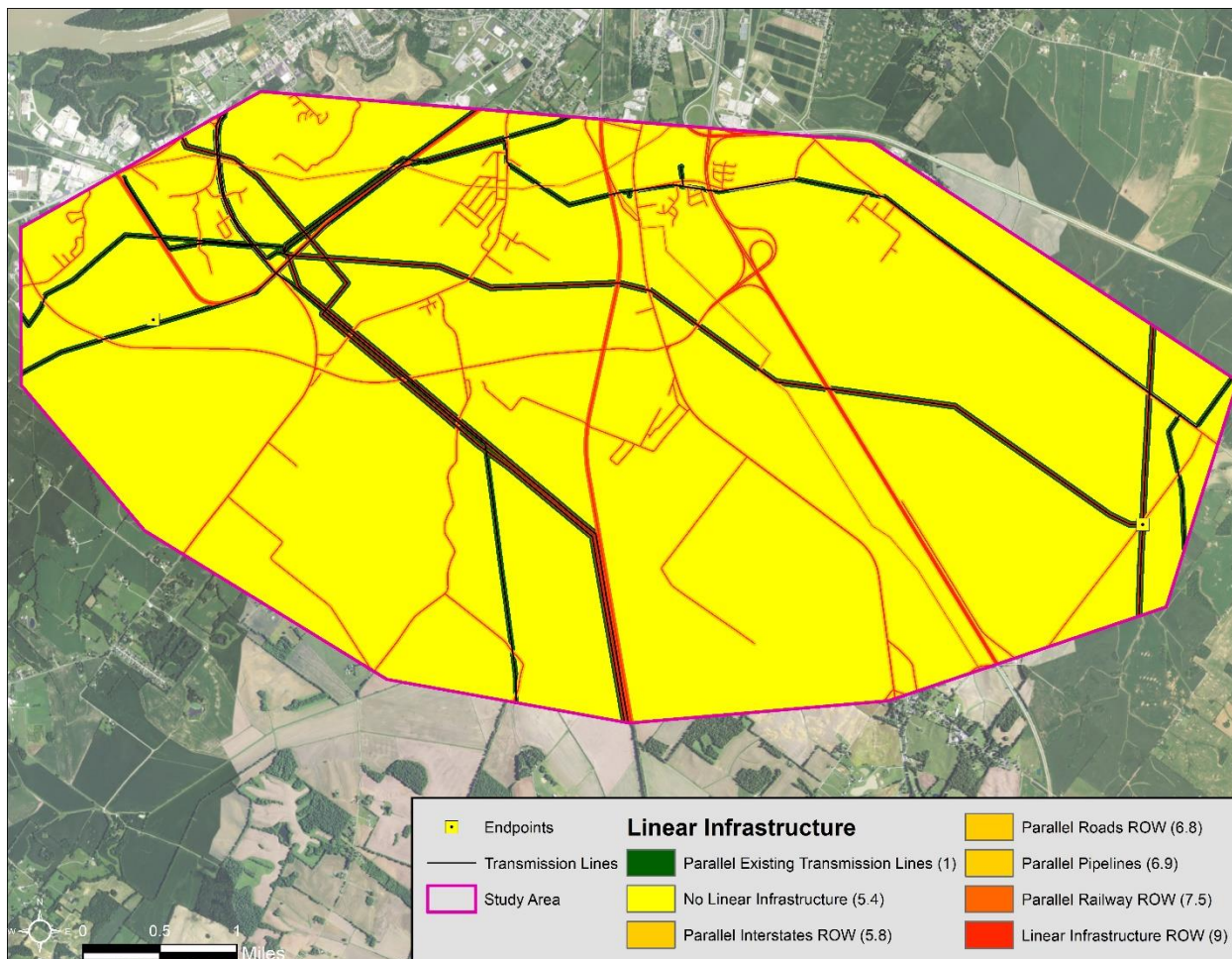


Figure 20 Linear Infrastructure Suitability Grid

The Linear Infrastructure layer considers co locating with roads, railroads, and existing transmission lines. The least suitable is an existing ROW for any linear infrastructure (road, railway, pipeline, or transmission line). Parallel transmission lines are considered the most suitable areas within this layer. There are no transmission line rebuild opportunities, scenic highways, or future Department of Transportation (DOT) plans identified within the study area.



Figure 21 Linear Infrastructure Suitability Grid

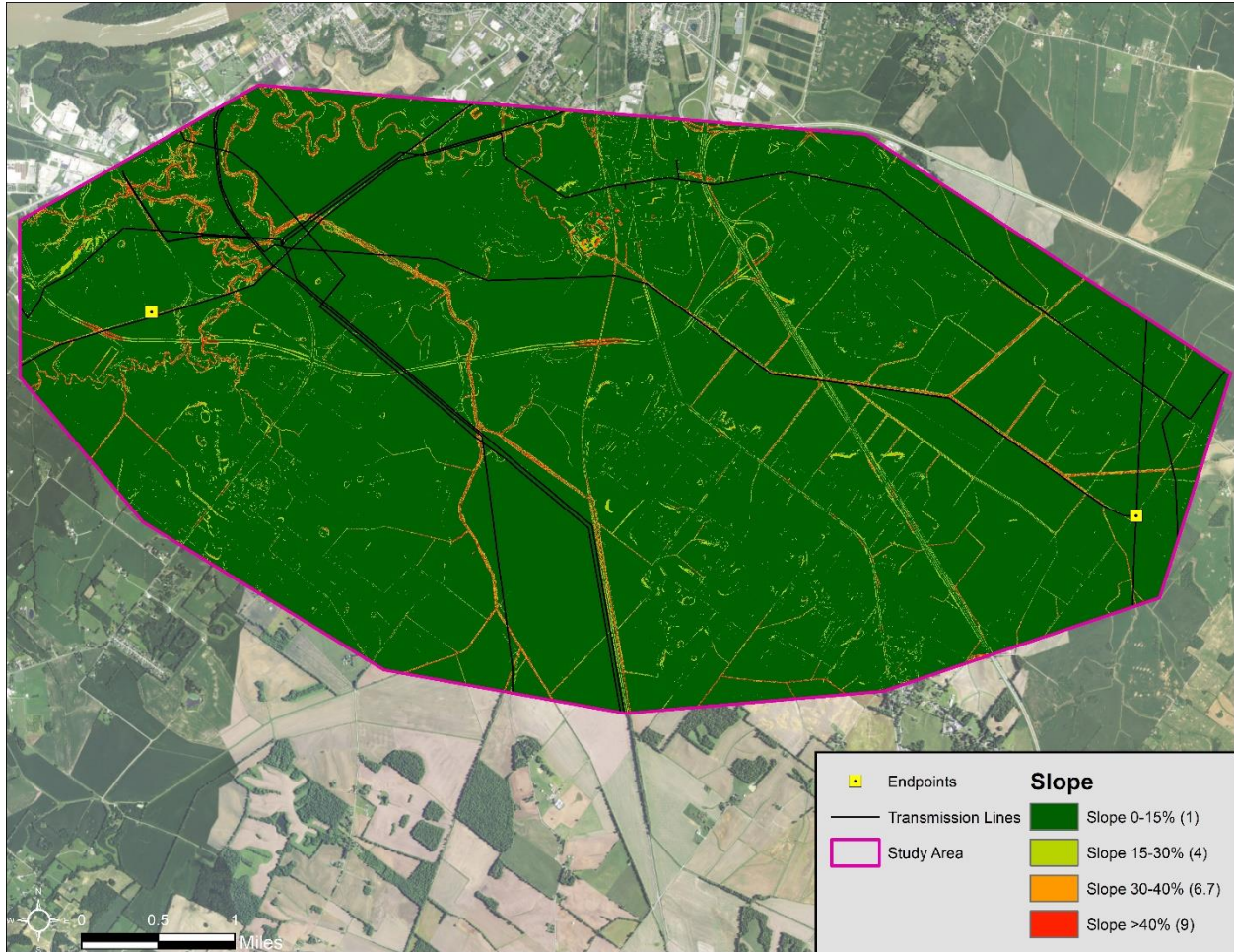


Figure 22 Slope Suitability Grid

The slope layer assesses the suitability in regard to the degree slope of the land. The higher the slope, the less suitable the location. Most of the study area has a slope less than 15%, which is the most suitable location for a transmission line.

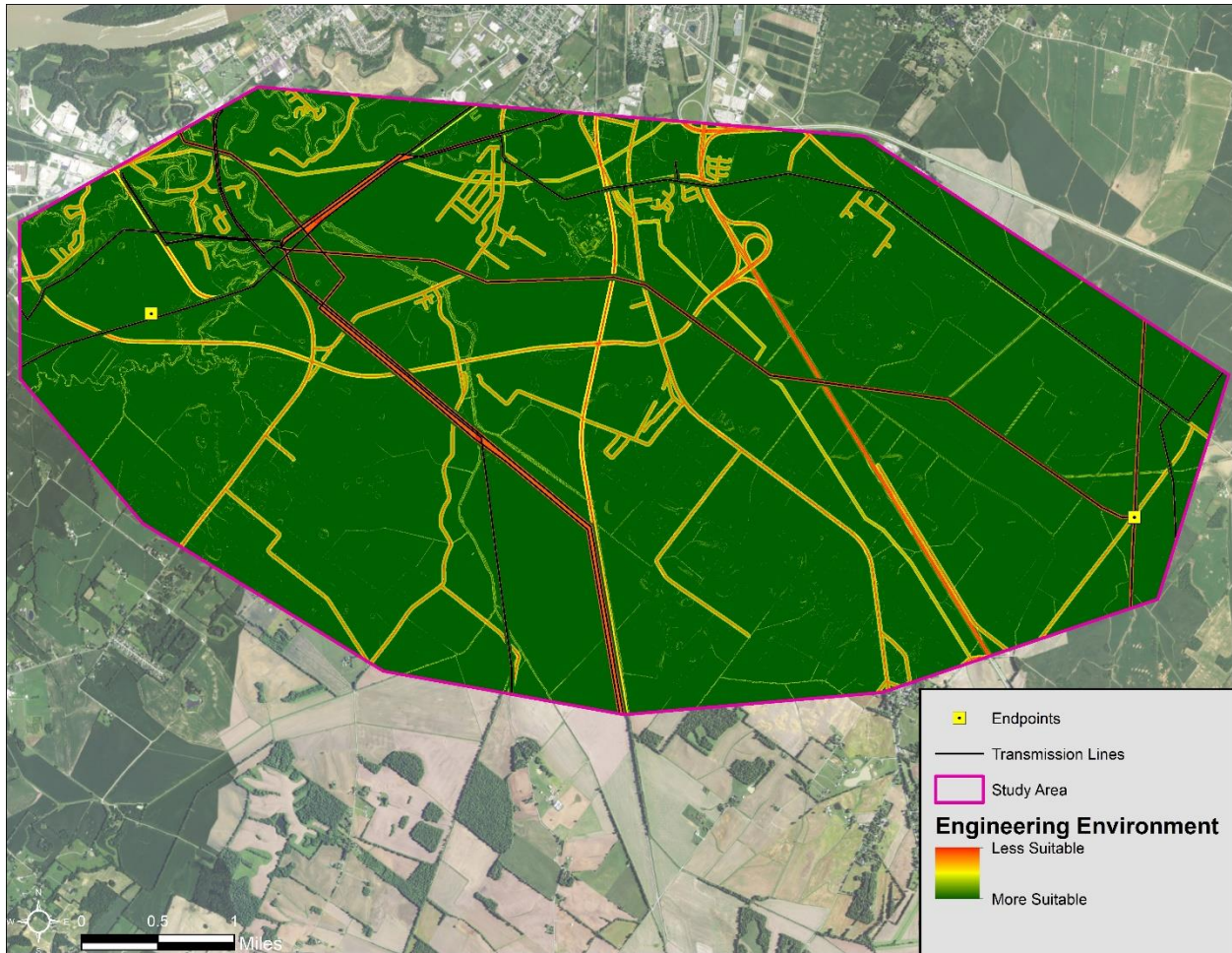


Figure 23 Engineering Suitability Grid

The suitability grids for each perspective are created by multiplying the values of the individual layer grids by the weights in the model and then combining them to create a weighted average suitability grid as shown above.

Built Emphasis Corridor

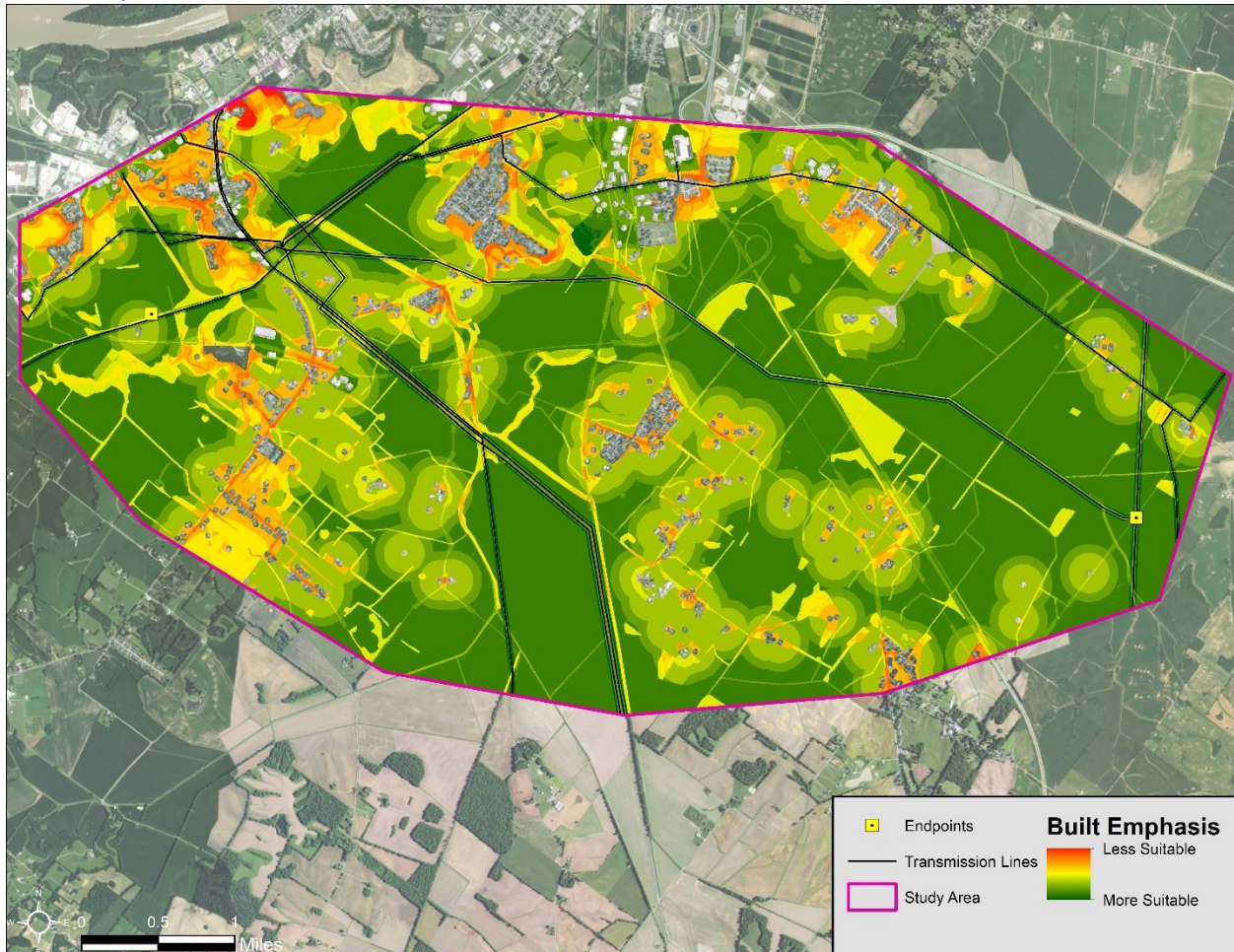


Figure 24 Built Suitability Grid

The Built suitability grid is created by putting emphasis (5x) on the built perspective while taking into consideration the Natural and Engineering perspectives (1x).

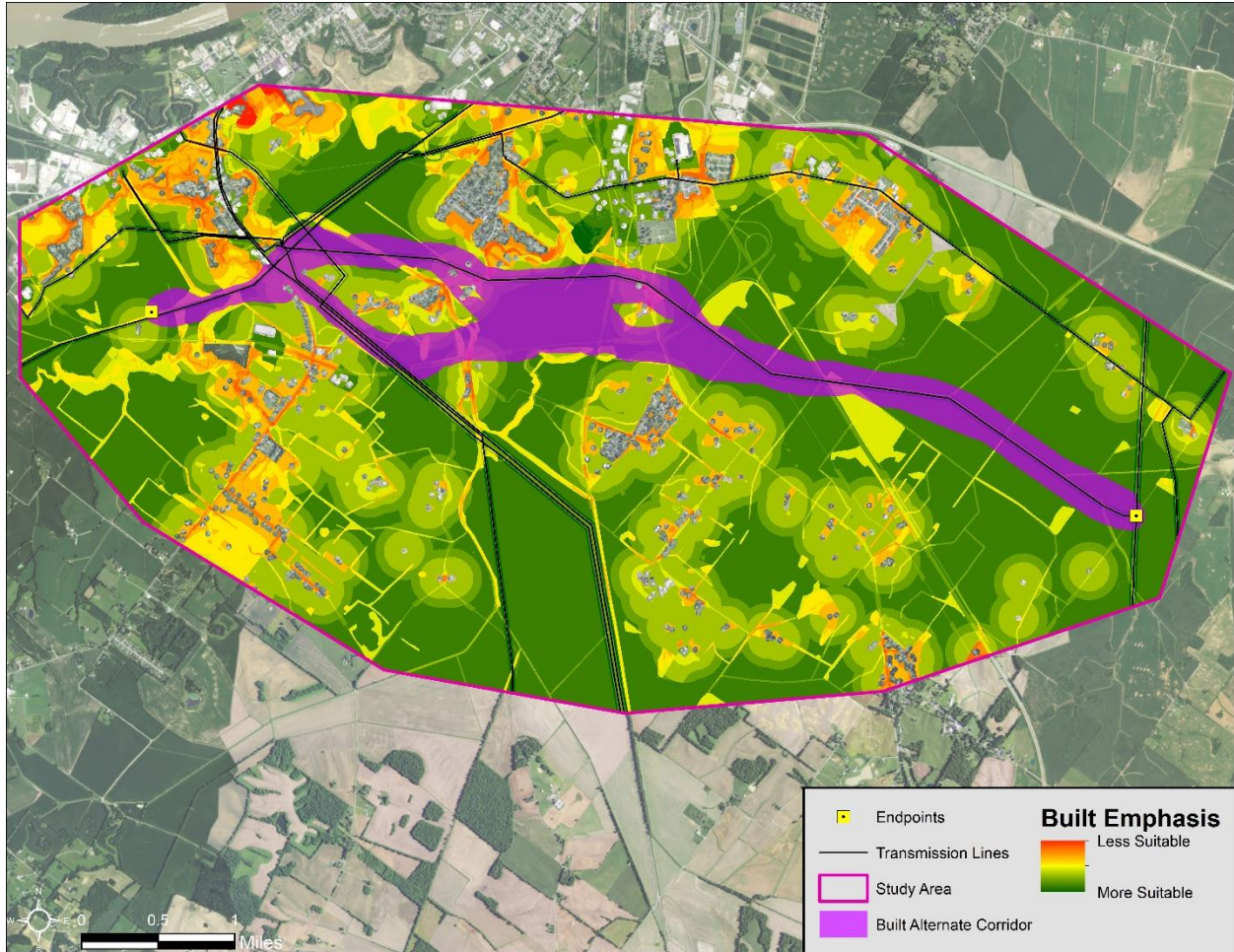


Figure 25 Built Suitability Grid with the Alternate Corridor

The Built Alternate Corridor was created by calculating the top 3% of routes between the Proposed Henderson Paper Mill Substation and the Proposed South Henderson Switching Station.

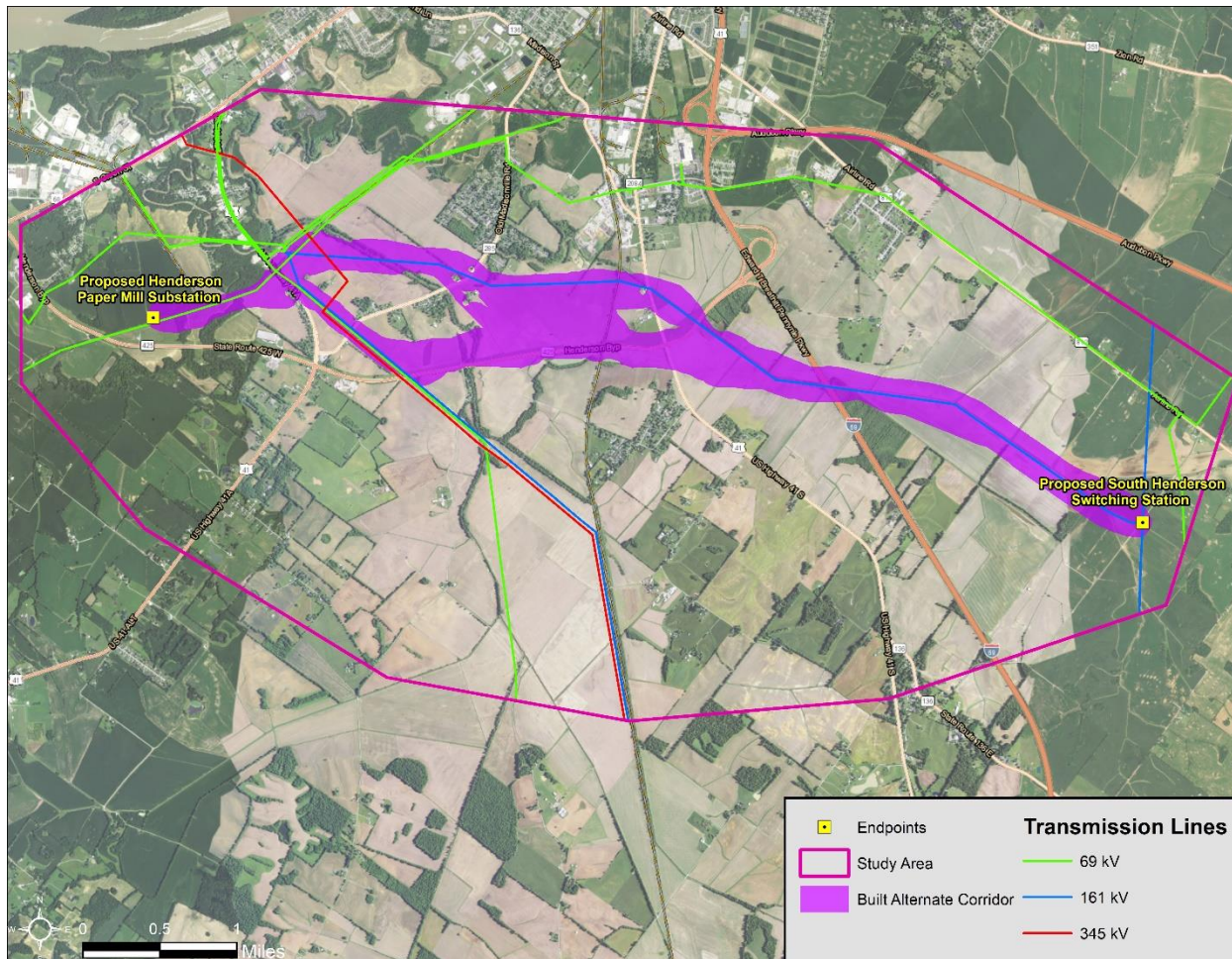


Figure 26 Built Alternate Corridor

Beginning in the east and heading west, the Built Corridor parallels the existing 161 kV transmission line then it follows the 69 kV transmission line southwest until it reaches the proposed Henderson Paper Mill Substation. In addition, an alternative corridor developed which splits from the existing 161 kV transmission line, about midway, and co-locates with State Route 425 until it reaches the existing transmission line corridor, where it parallels into the proposed Paper Mill Substation.

Natural Emphasis Corridor

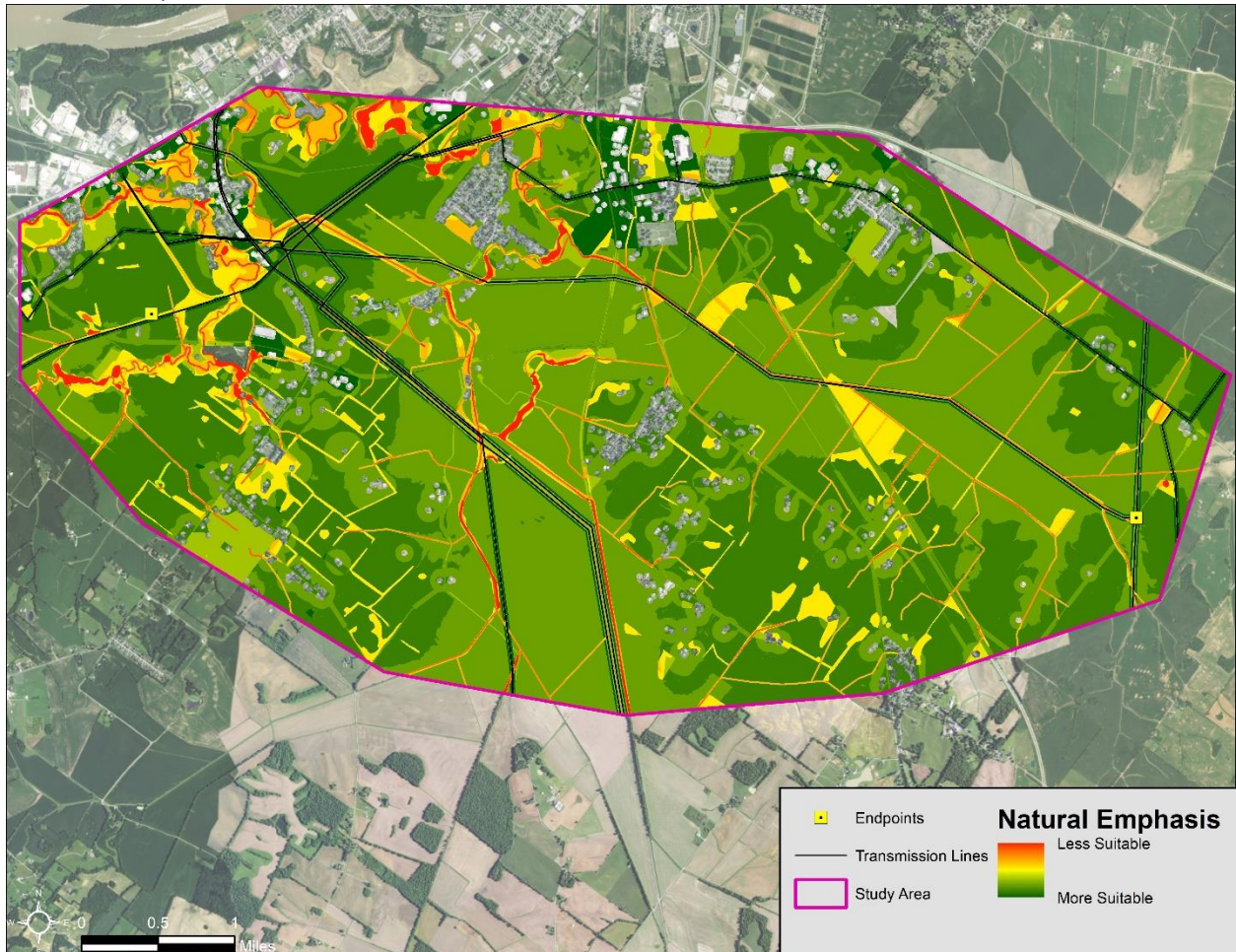


Figure 27 Natural Suitability Grid

The Natural suitability grid is created by putting emphasis (5x) on the natural perspective while taking into consideration the Built and Engineering perspectives (1x).

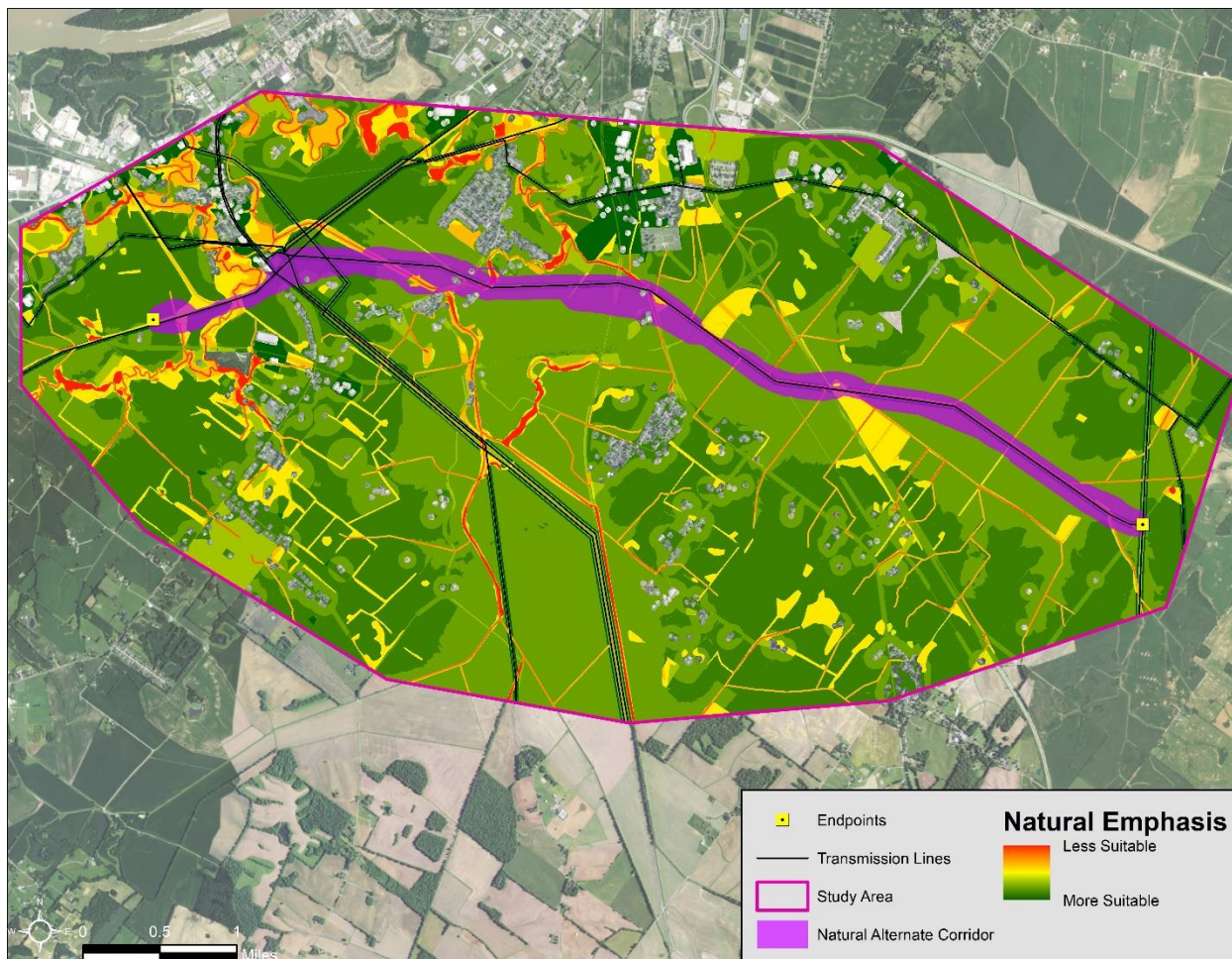


Figure 28 Natural Suitability Grid with the Alternate Corridor

The Natural Alternate Corridor was created by calculating the top 3% of routes between the Proposed Henderson Paper Mill Substation and the Proposed South Henderson Switching Station.

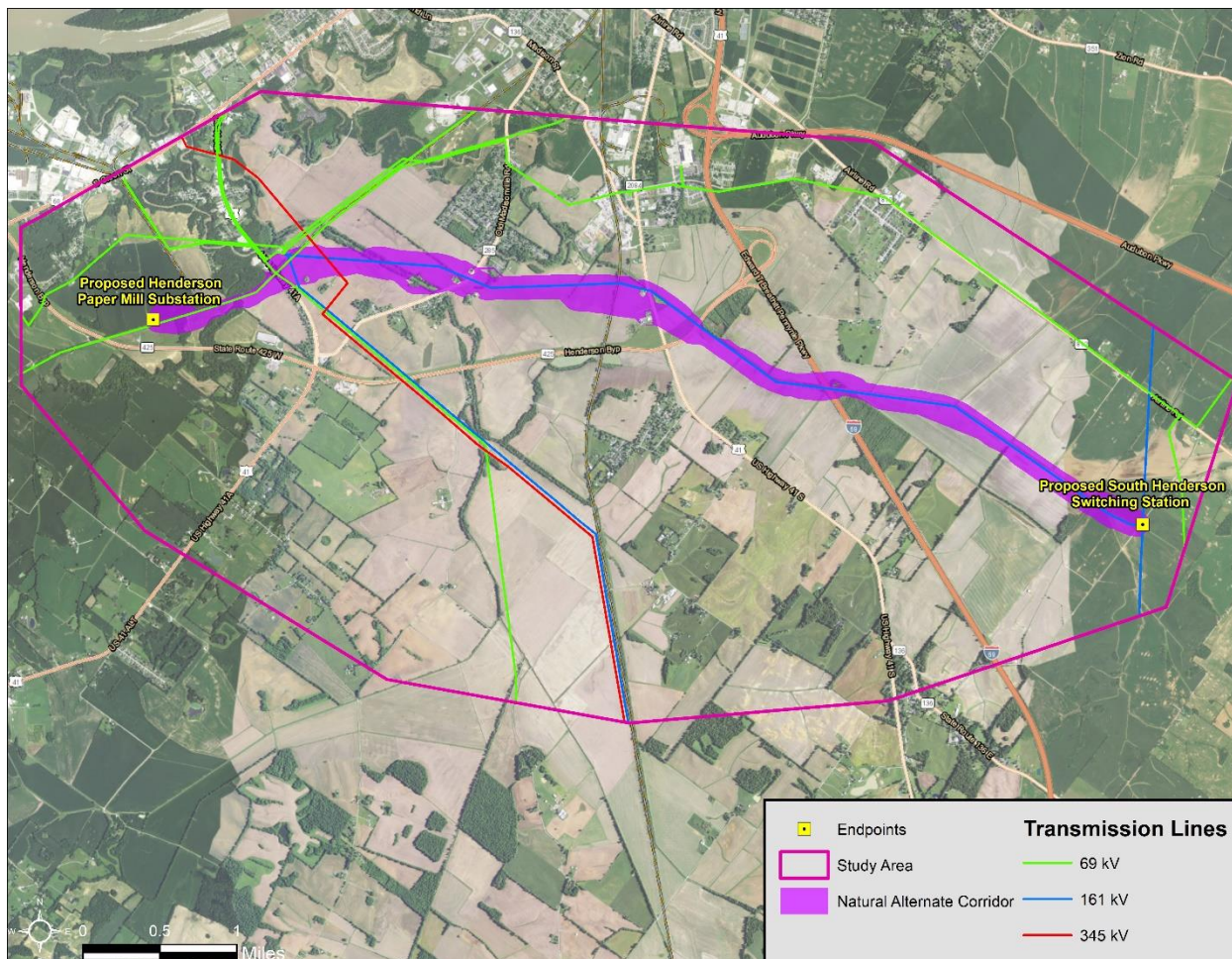


Figure 29 The Natural Alternate Corridor

Beginning in the east and heading west, the Natural Corridor parallels the existing 161 kV transmission line, then follows the 69 kV transmission line southwest until it reaches the proposed Henderson Paper Mill Substation.

Engineering Emphasis Corridor

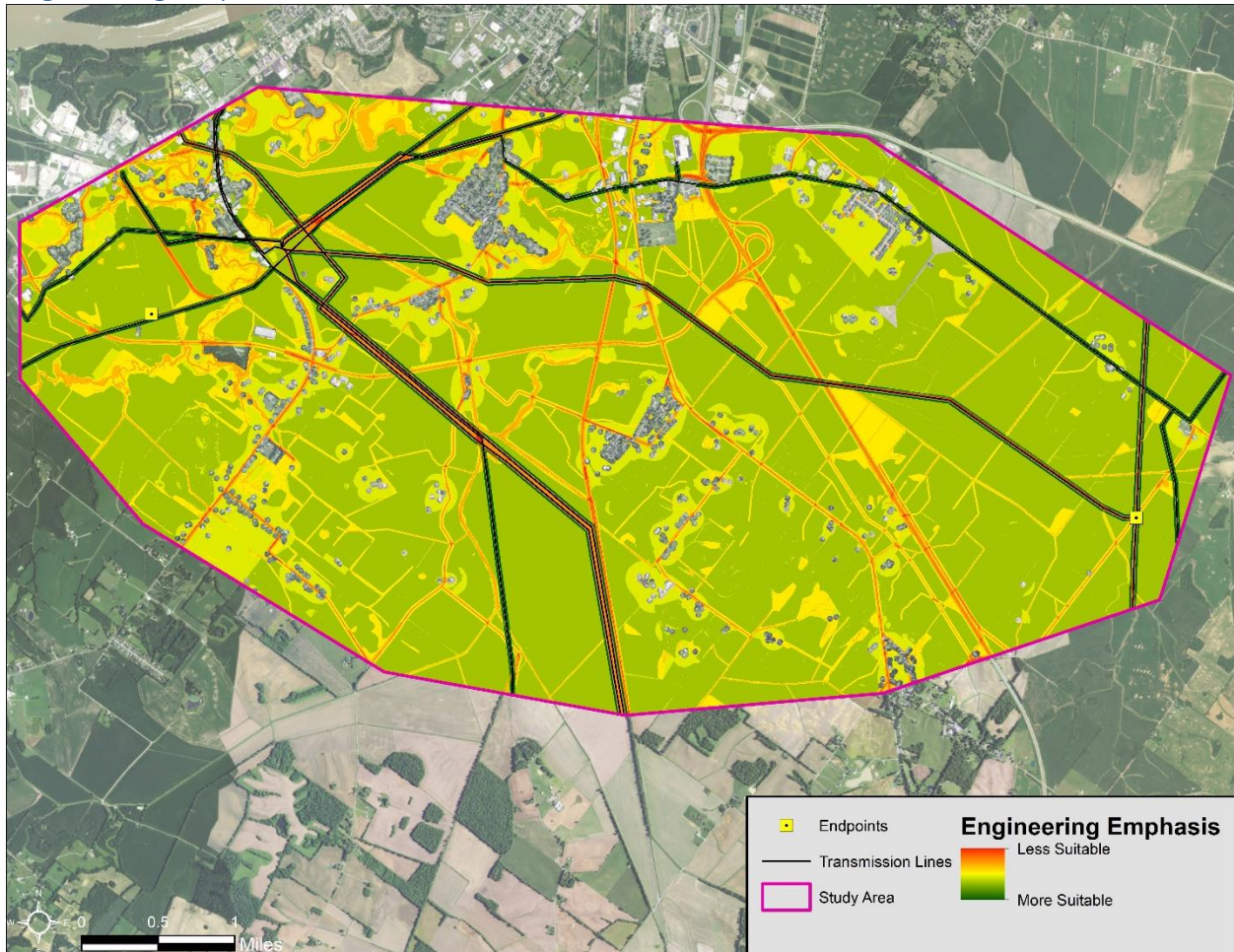


Figure 30 Engineering Suitability Grid

The Engineering suitability grid is created by putting emphasis (5x) on the engineering perspective while taking into consideration the Built and Natural perspectives (1x).

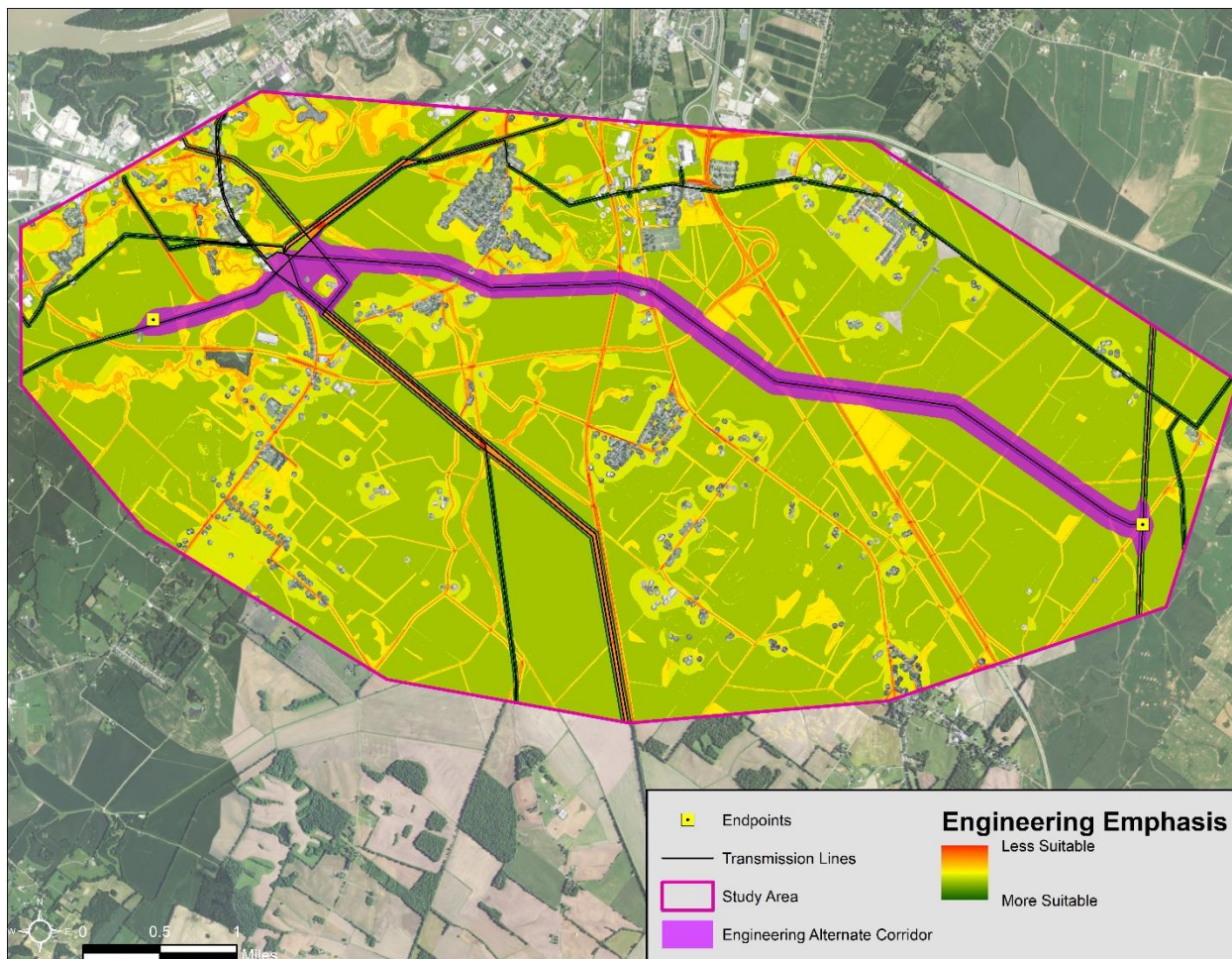


Figure 31 Engineering Suitability Grid with the Alternate Corridor

The Engineering Alternate Corridor was created by calculating the top 3% of routes between the Proposed Henderson Paper Mill Substation and the Proposed South Henderson Switching Station.

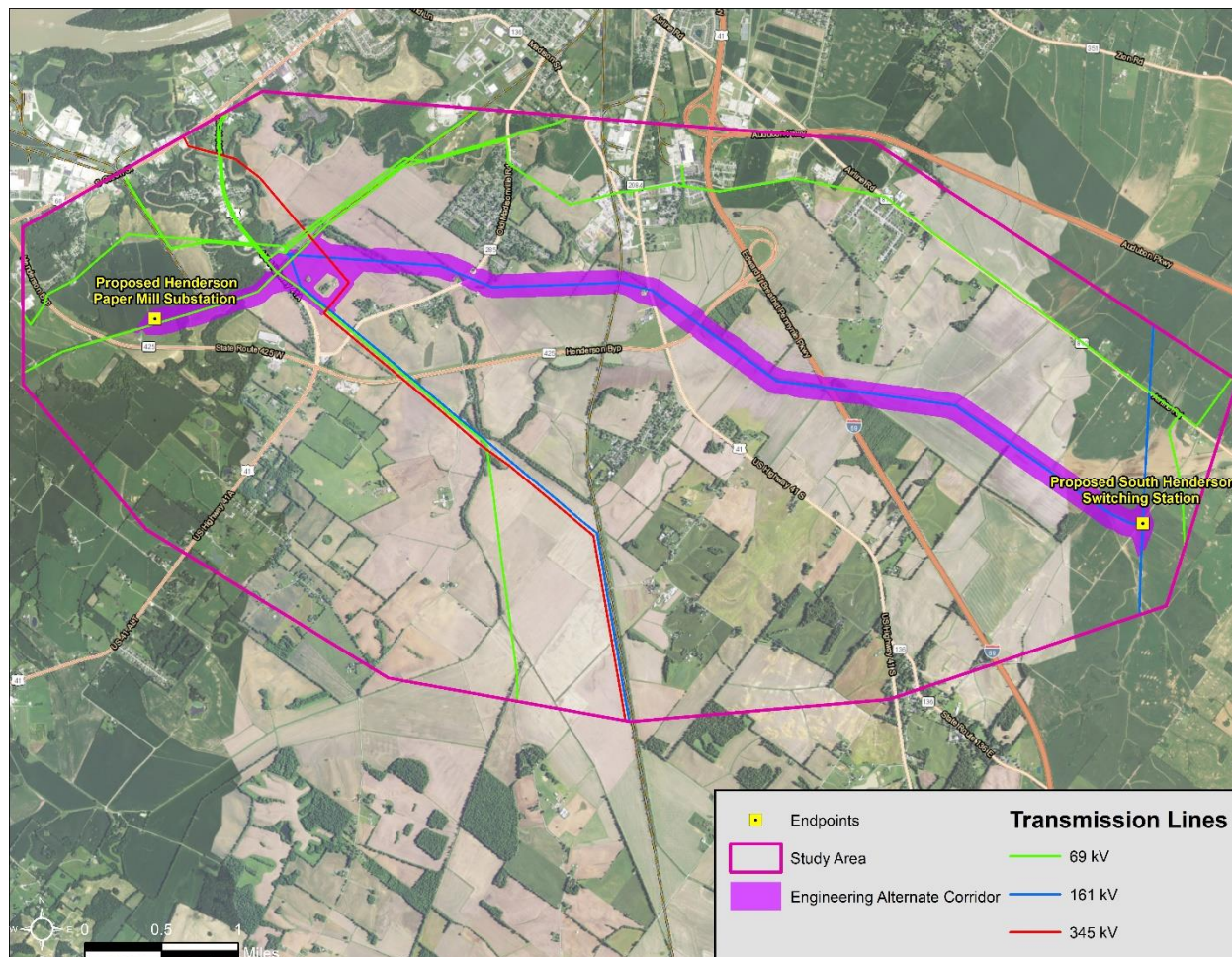


Figure 32 Engineering Alternate Corridor

Beginning in the east and heading west, the Engineering Corridor parallels the existing 161 kV transmission line, then follows the 69 kV transmission line southwest until it reaches the proposed Henderson Paper Mill Substation.

Simple Emphasis Corridor

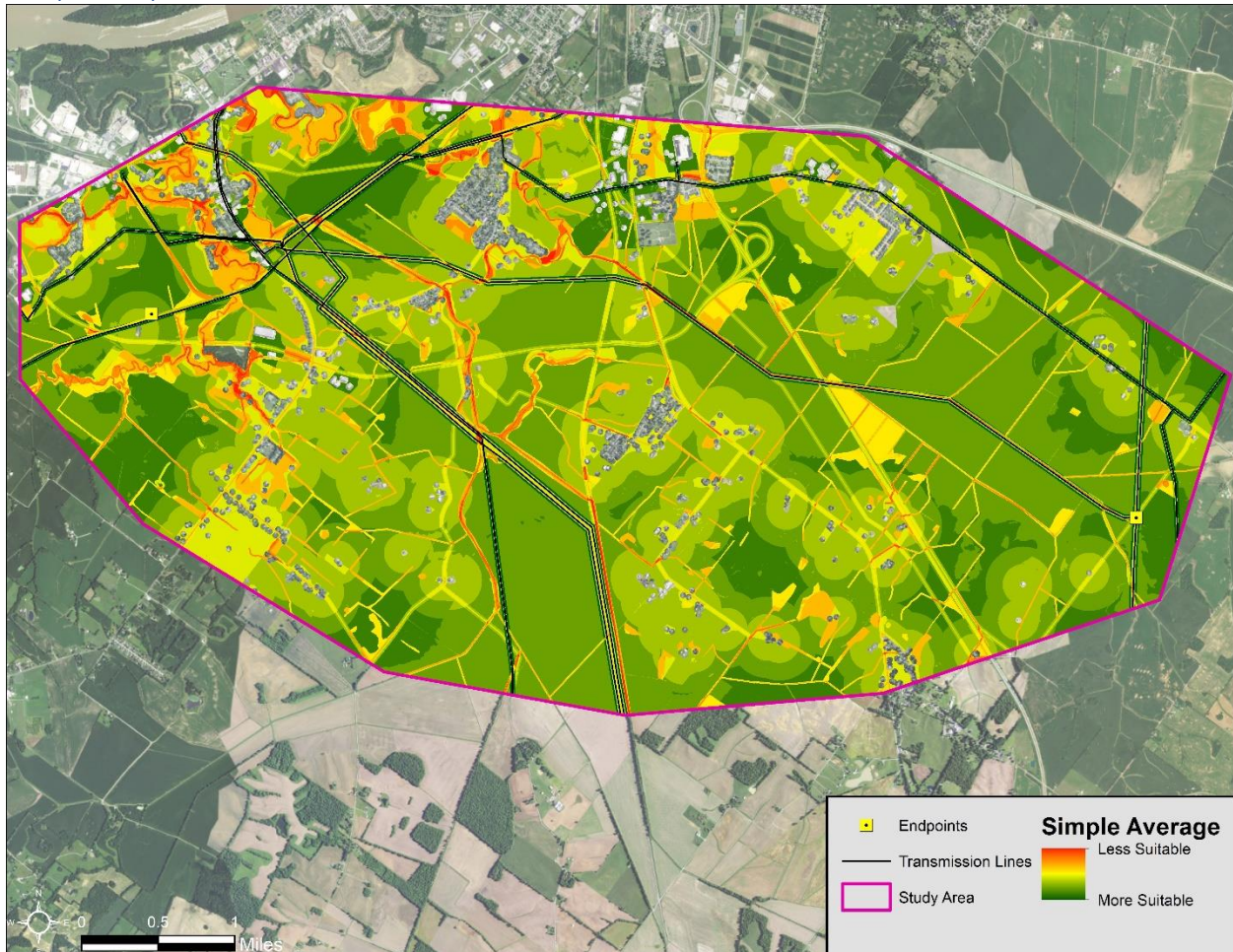


Figure 33 Simple Suitability Grid

The Simple suitability grid is created by putting equal emphasis on the Built, Natural, and Engineering perspectives.

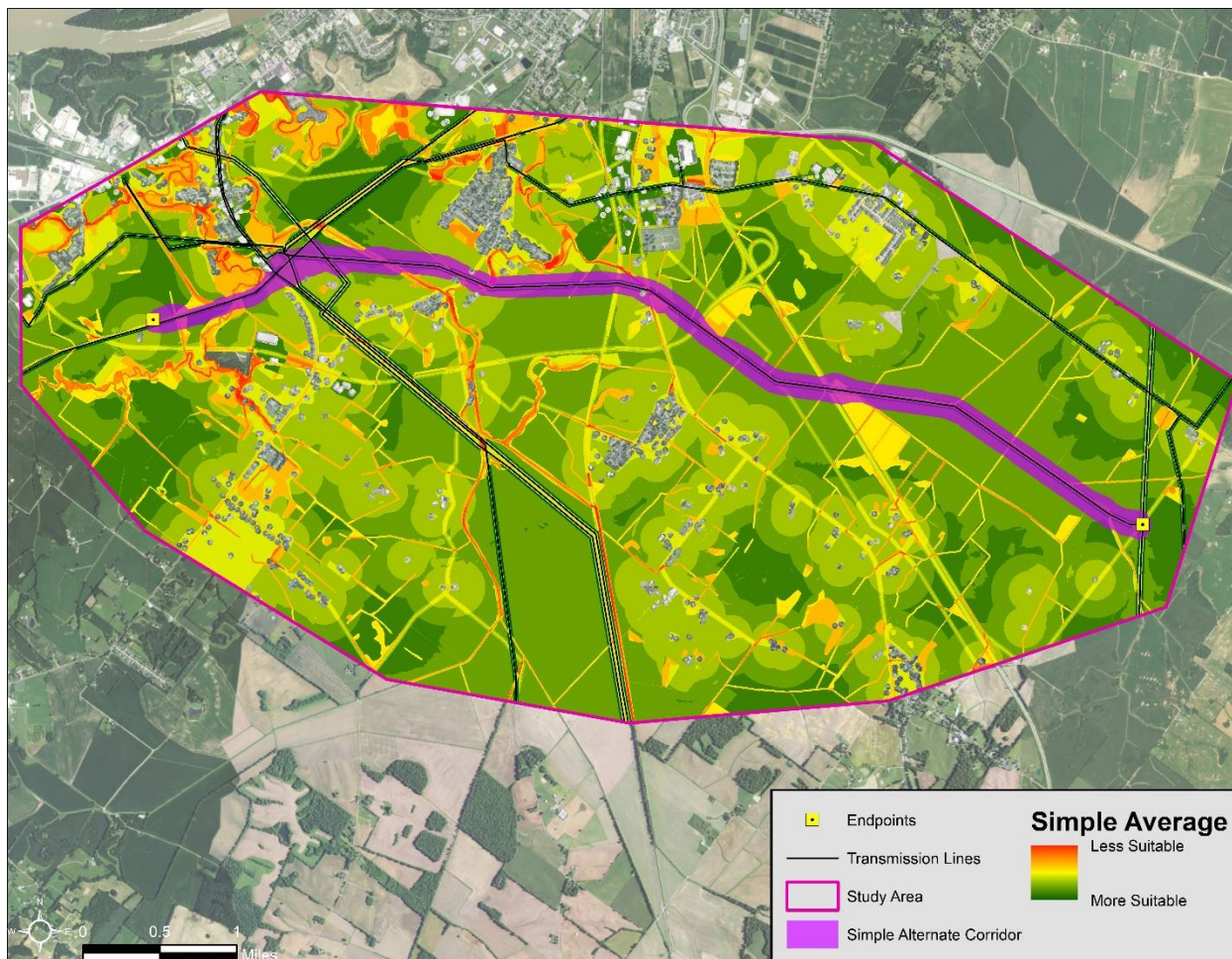


Figure 34 Simple Suitability Grid with the Alternate Corridor

The Simple Average Alternate Corridor was created by calculating the top 3% of routes between the Proposed Henderson Paper Mill Substation and the Proposed South Henderson Switching Station.

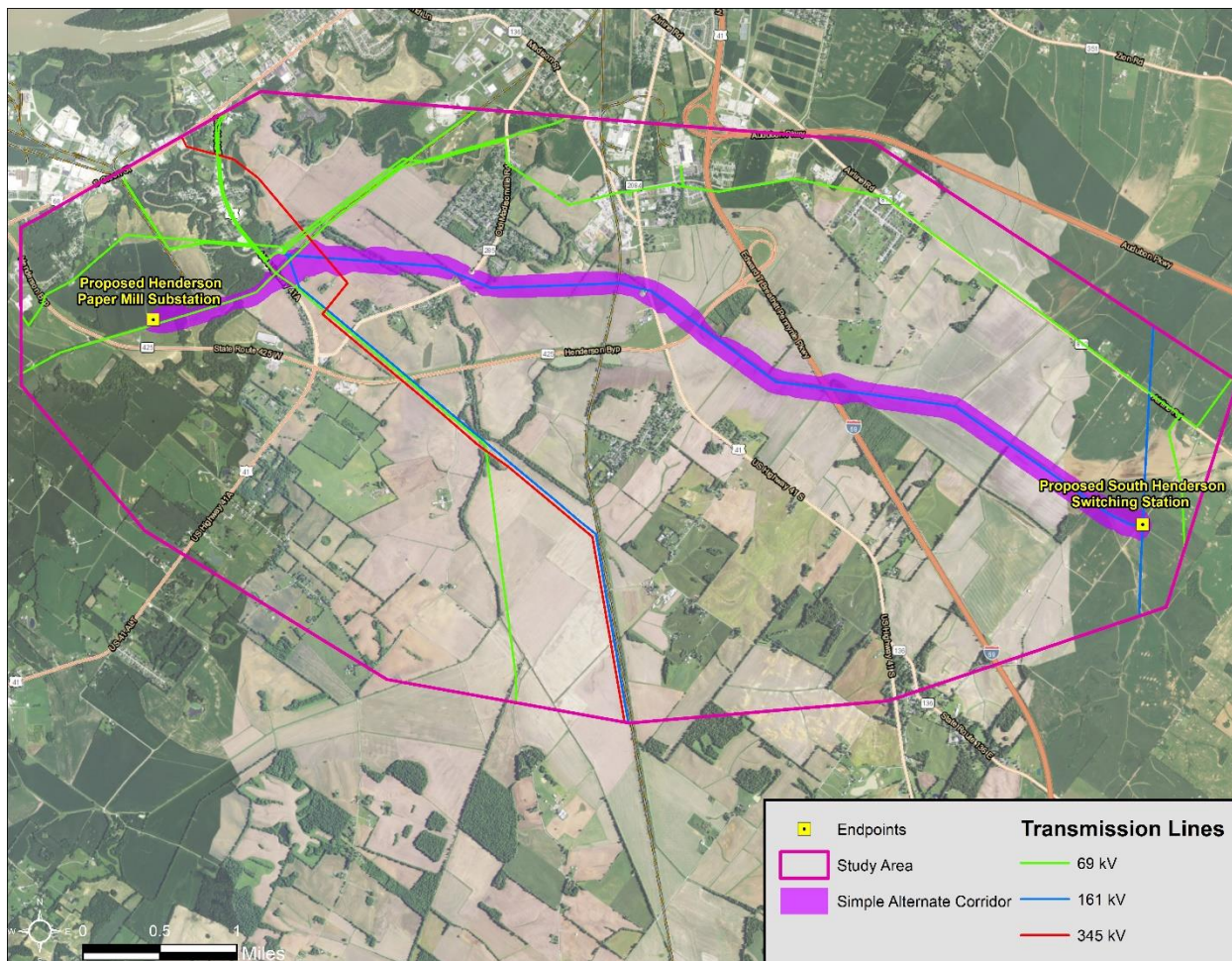


Figure 35 Simple Alternate Corridor

Beginning in the east and heading west, the Simple Corridor parallels the existing 161 kV transmission line, then follows the 69 kV transmission line southwest until it reaches the proposed Henderson Paper Mill Substation.

Composite Alternative Corridors

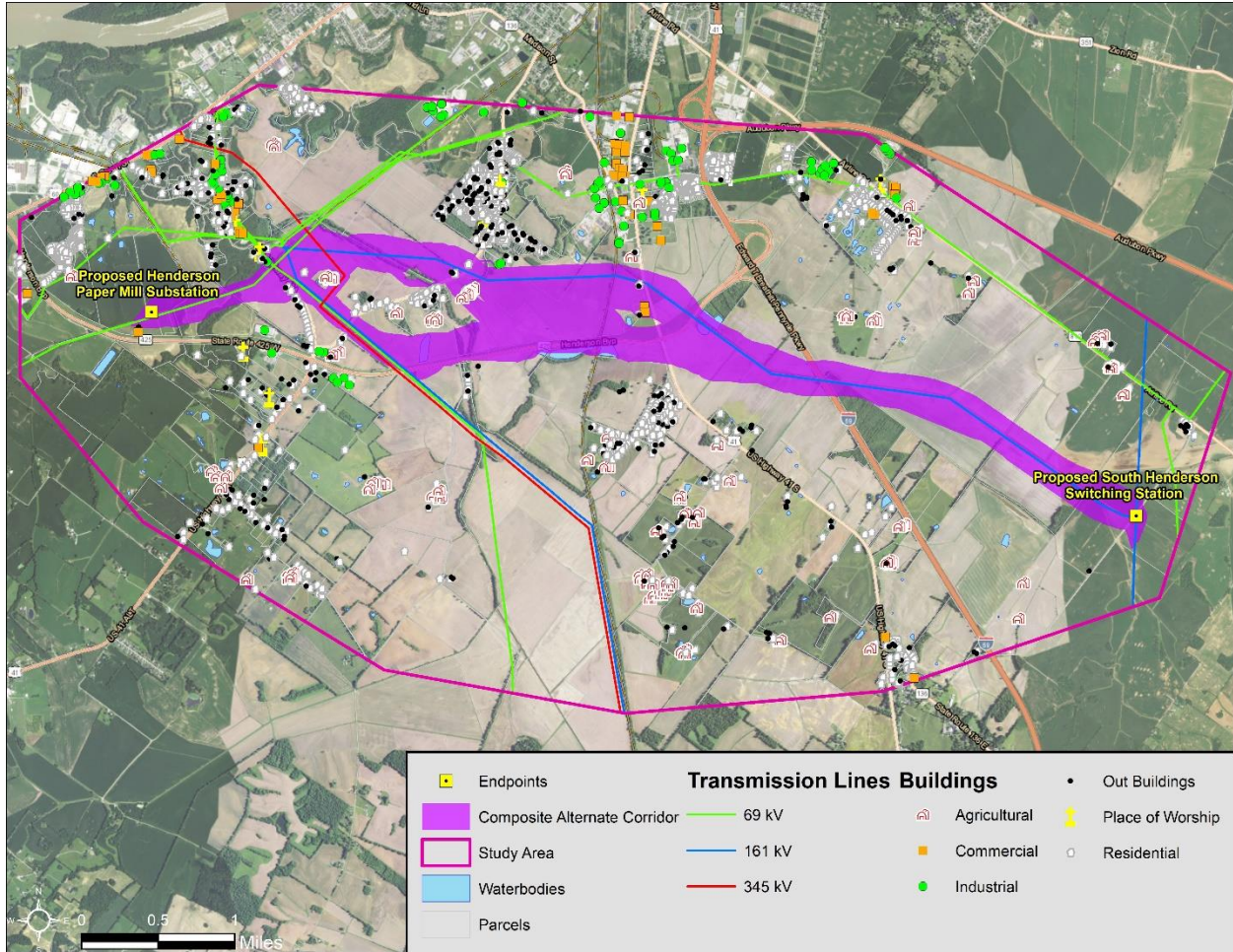


Figure 36 All Alternate Corridors

The above map shows all the alternate corridors combined as a single composite corridor.

Alternate Routes

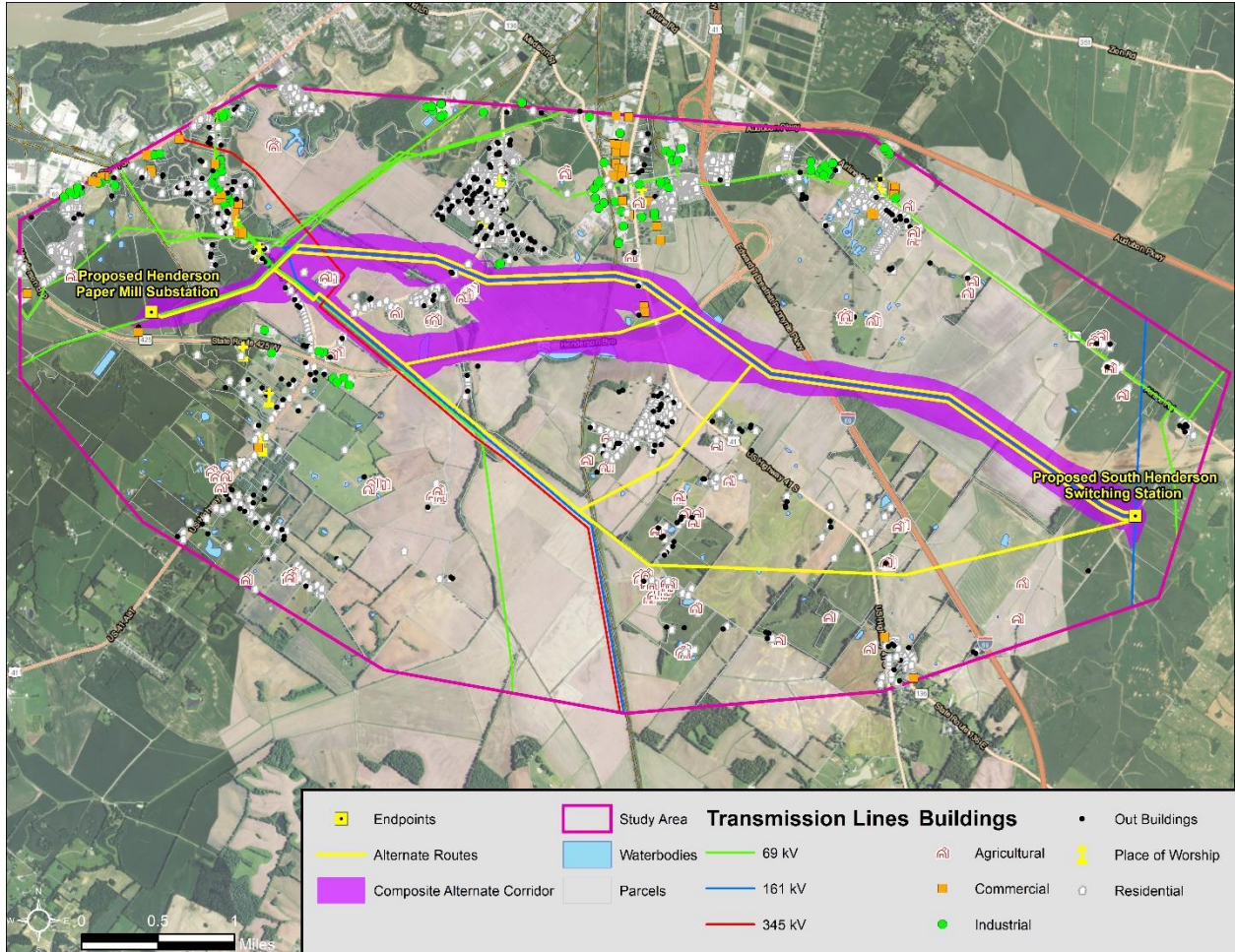


Figure 37 Alternate Routes with Composite Corridors

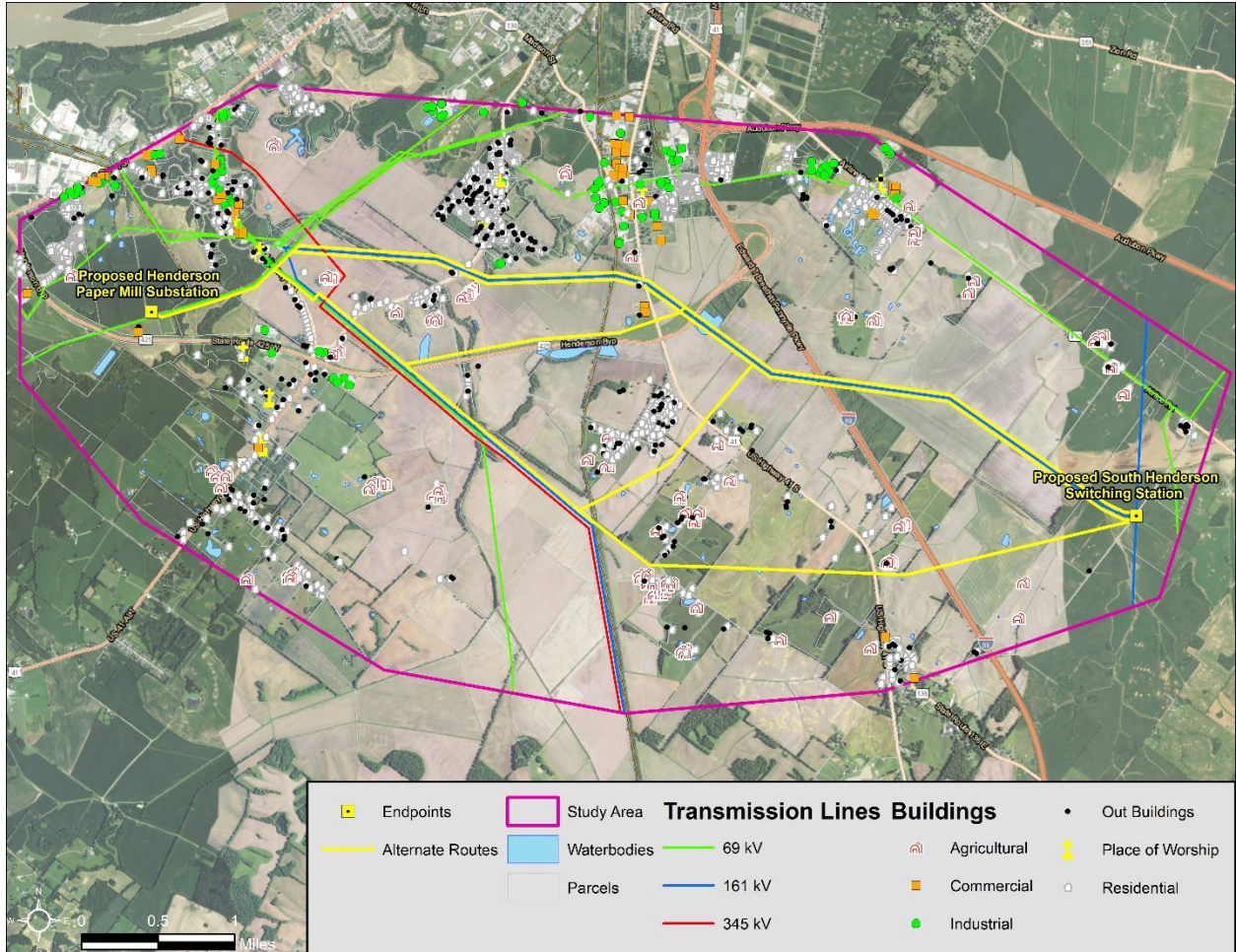


Figure 38 Alternate Routes

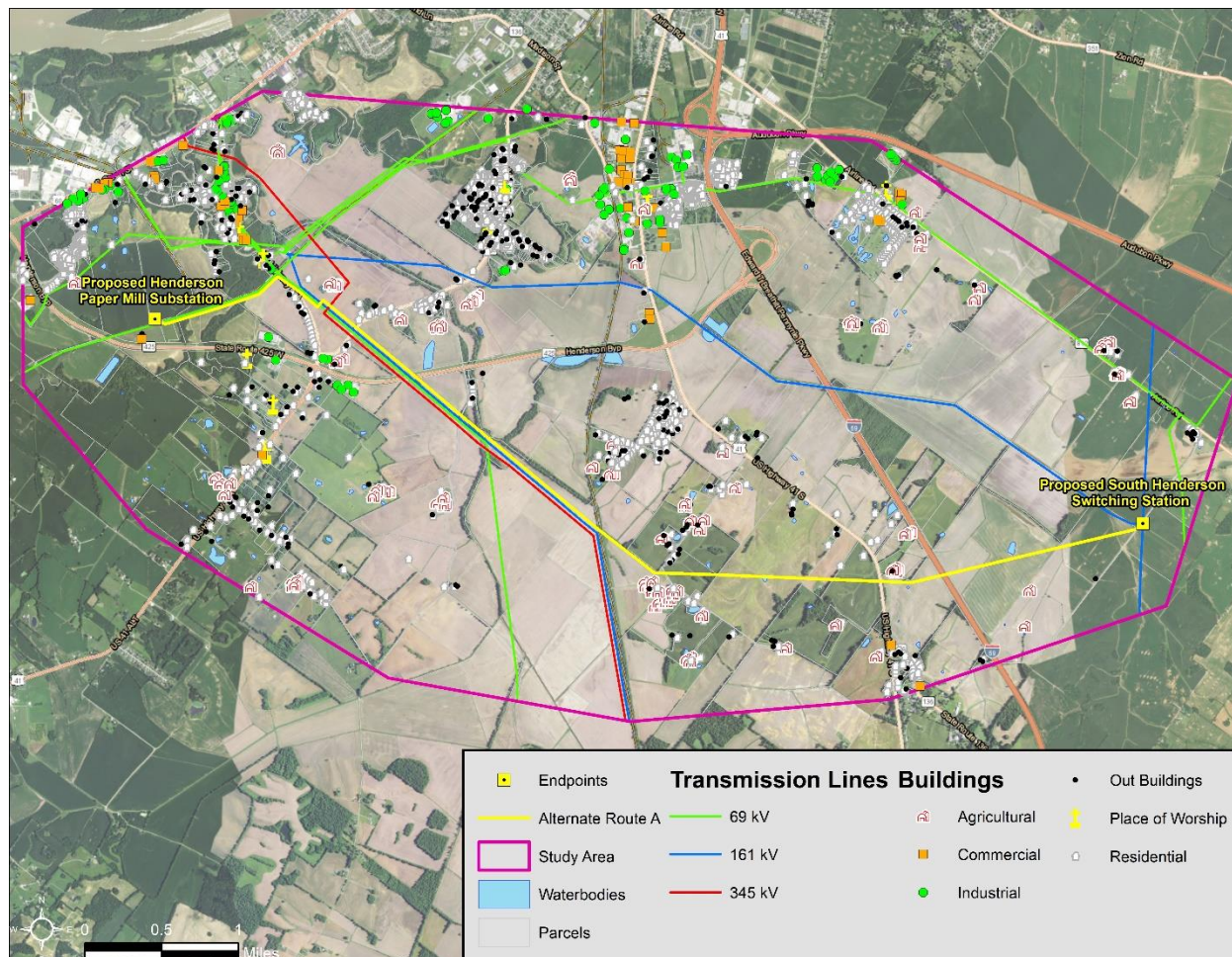


Figure 39 Alternate Route A

Alternate Route A comes out of the Proposed South Henderson Switching Station going across agriculture land southwest towards Interstate 69. After the route crosses over Interstate 69, the route turns due west until it encounters Smith Staples Road and then it goes northwest to parallel the existing 69, 161, and 345 kV transmission lines. Finally, the route parallels the existing 69 kV transmission line until it reaches the Proposed Henderson Paper Mill Substation on the right.

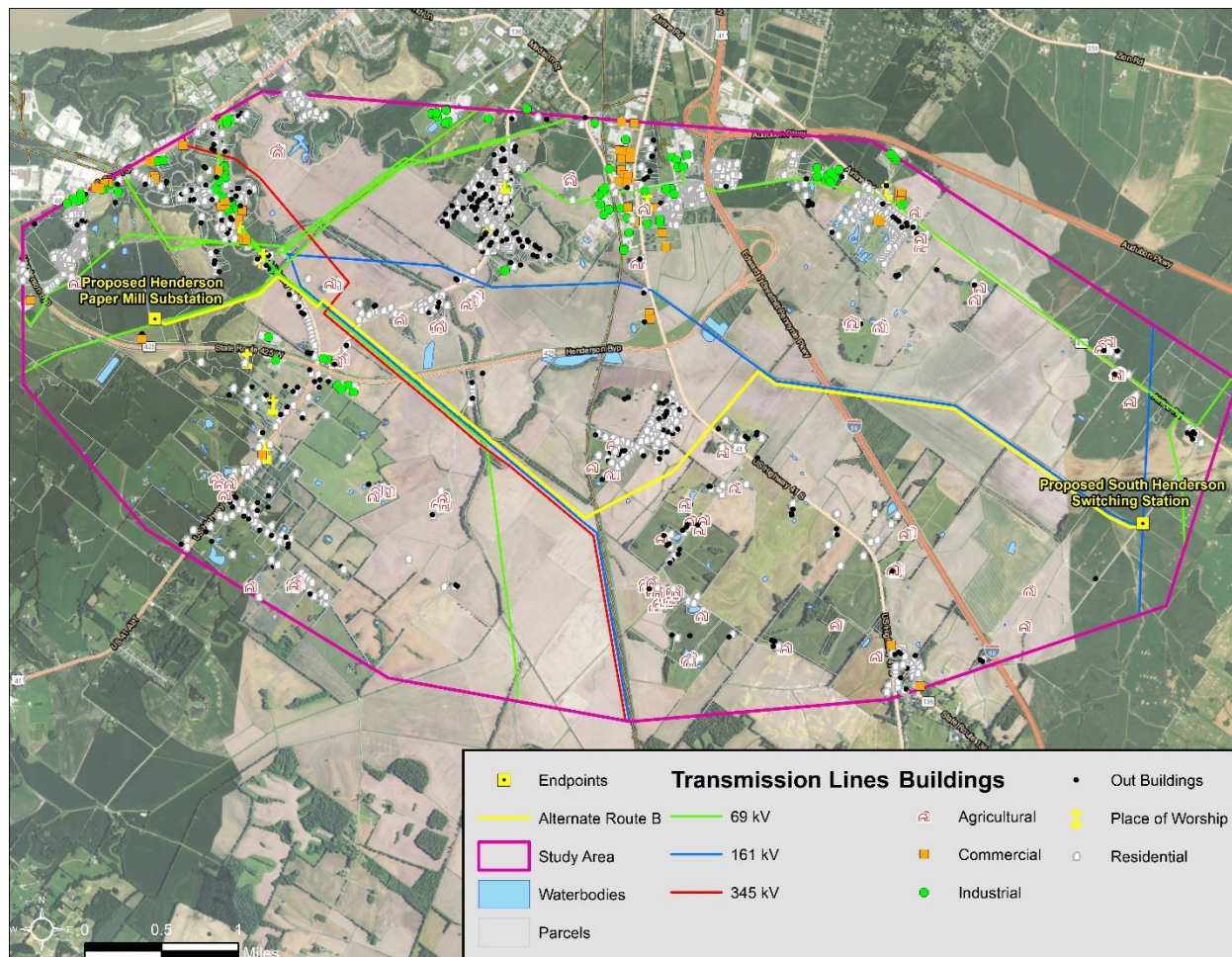


Figure 40 Alternate Route B

Alternate Route B begins by paralleling the existing 161 kV transmission line on the southern side. The route then takes a sharp left turn cross country until it encounters the existing 69, 161, and 345 kV transmission lines. From that point, the route follows the same path as Alternate Route A to the Proposed Henderson Paper Mill Substation.

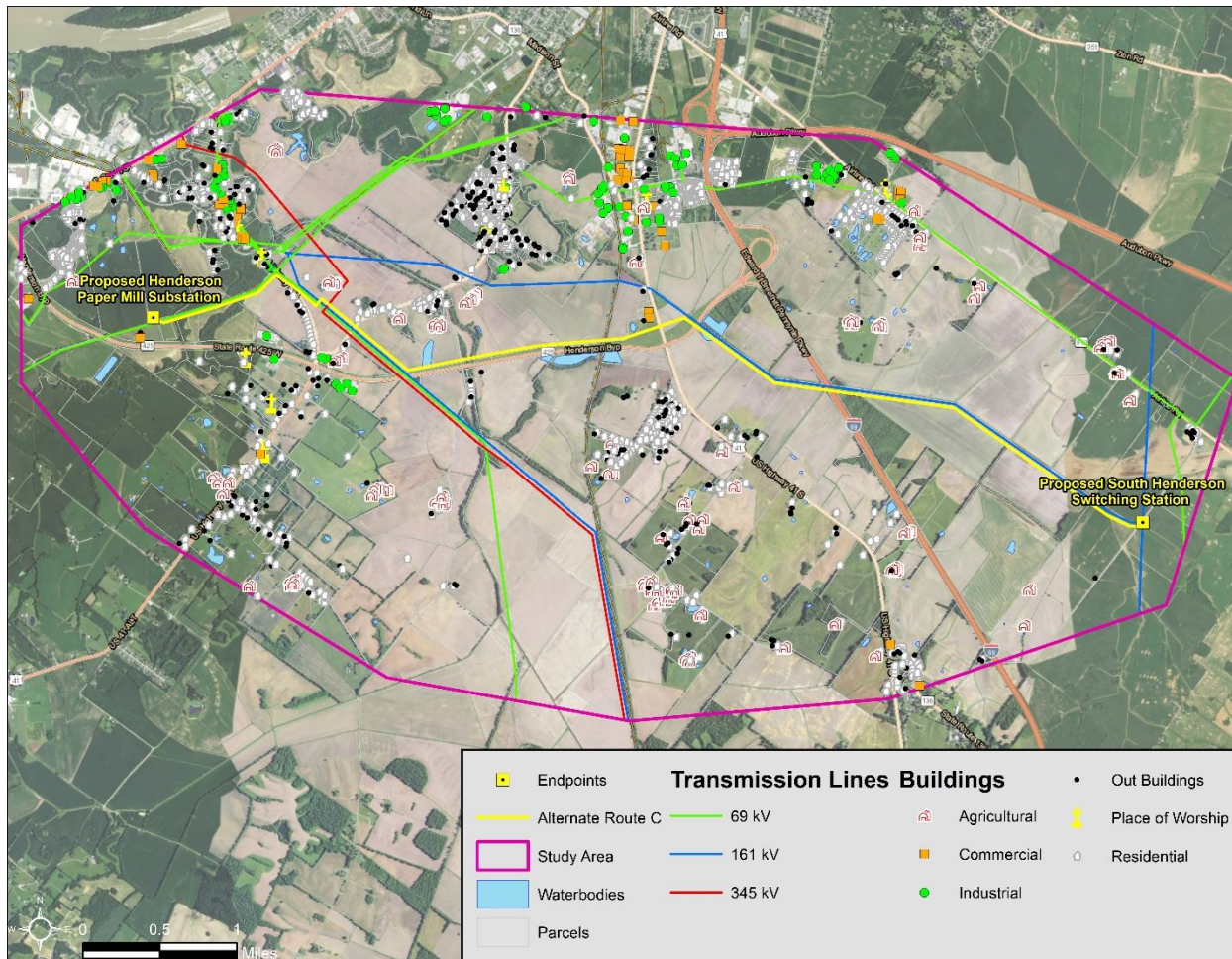


Figure 41 Alternate Route C

Alternate Route C comes out of the Proposed South Henderson Switching Station to the northwest paralleling the existing 161 kV transmission line (Figure 54) to the south. The route continues to parallel the existing 161 kV transmission line until the route crosses over the Henderson Bypass (SR 425) and turns to the left to parallel the Henderson Bypass on the northern side of the road. Once the route comes upon three other transmission lines (Figure 55) that are oriented northwest to southeast, the route takes a right turn to head northwest paralleling the existing transmission lines. Finally, the route parallels the existing 69 kV transmission line until it reaches the Proposed Henderson Paper Mill Substation on the right.

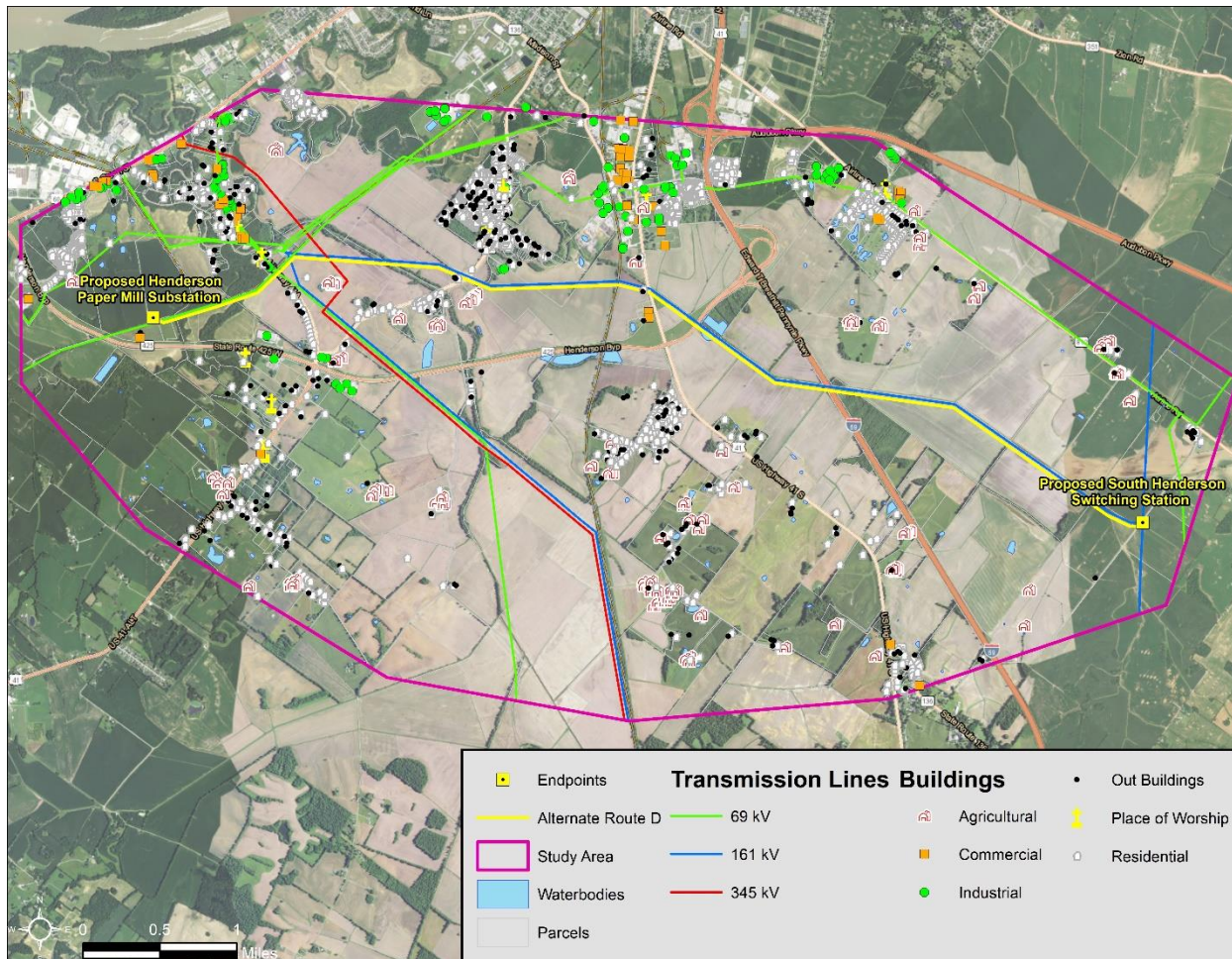


Figure 42 Alternate Route D

Alternate Route D parallels the existing Reid – Henderson County 161 kV transmission line on the southern side until the intersection with the existing 69 kV transmission line that goes northeast to southwest. The route then parallels the existing 69 kV transmission line until it reaches the Proposed Henderson Paper Mill Substation on the right.

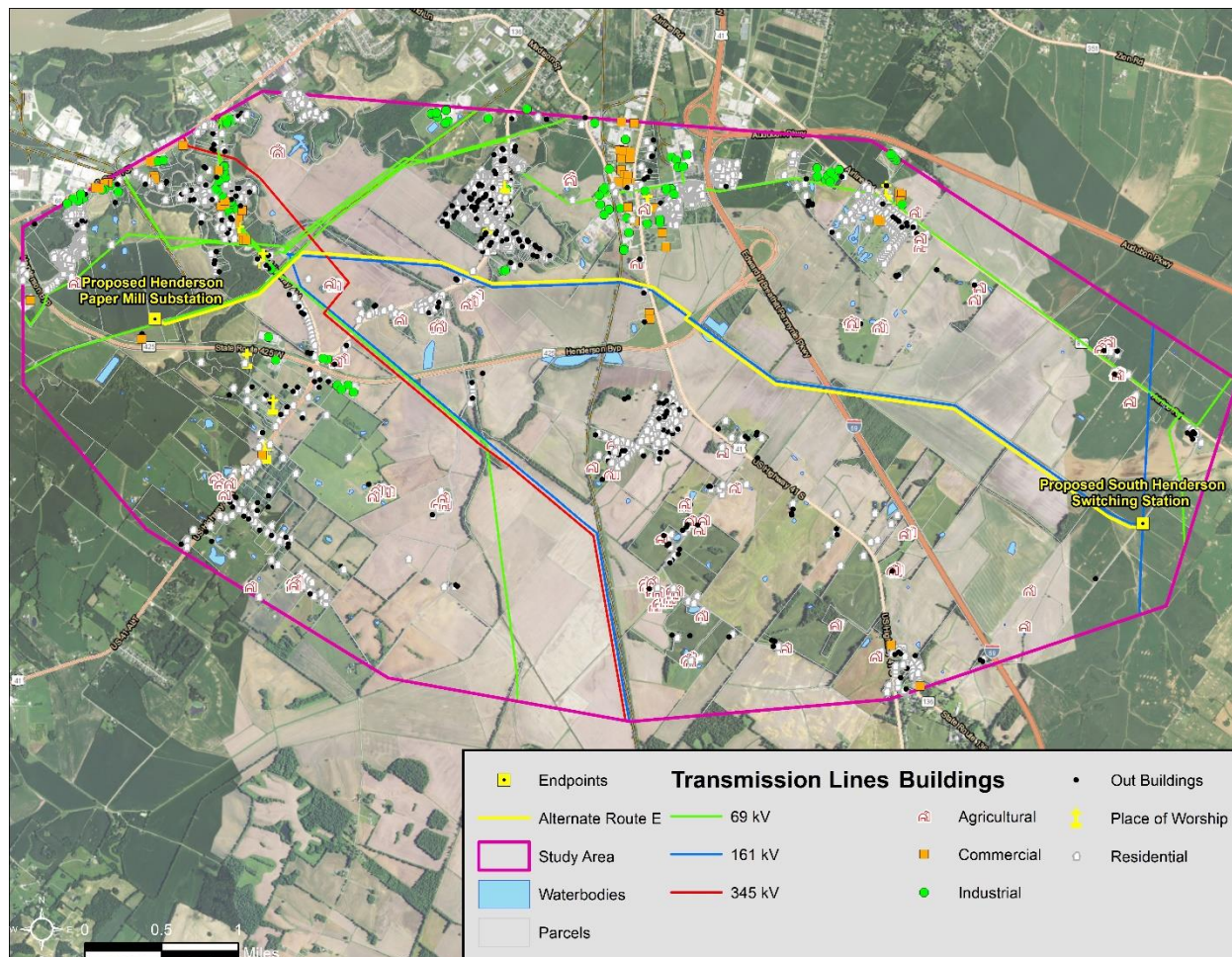


Figure 43 Alternate Route E

Alternate Route E parallels the existing Reid – Henderson County 161 kV transmission line on the southern side until after the transmission line crosses the Henderson Bypass. Then the route crosses over the Reid – Henderson County 161 kV transmission line and continues to parallel the line on the northern side until the intersection with the existing 69 kV transmission line that goes southwest. The route then parallels the existing 69 kV transmission line until it reaches the Proposed Henderson Paper Mill Substation on the right.

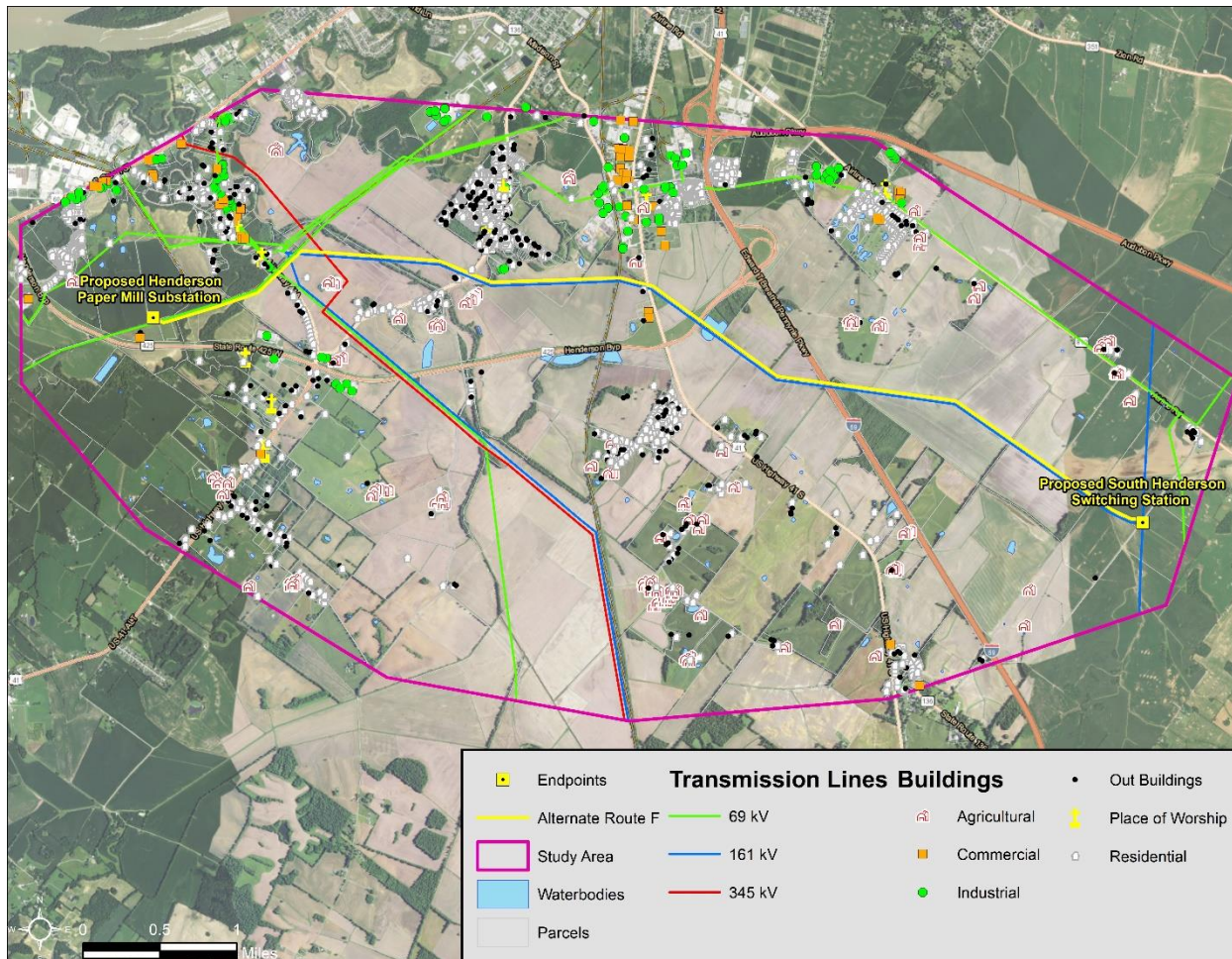


Figure 44 Alternate Route F

Alternate Route F parallels the existing Reid – Henderson County 161 kV transmission line on the northern side until the intersection with the existing 69 kV transmission line that goes southwest. The route then parallels the existing 69 kV transmission line until it reaches the Proposed Henderson Paper Mill Substation on the right.



The Alternate Route Evaluation Model leverages weighted metrics to compare the Alternate Routes. The first step of the process is to compile data for each route. The metrics are grouped into three categories: Built, Natural, and Engineering.

The route data (Figure 45) is normalized on a scale from 0 to 1 with 0 being the best and 1 being the worst in each category. This allows comparisons of metrics in different units such as counts, acreage, and dollars. The percent parallel with roads and parallel existing transmission lines are inverted since the higher the number, the better it is for an alternate route.

The criteria is assigned weights based on its relative importance to the siting process. The weight for each criterion is represented by percentages, such as 40% residences within ROW and 10% Potential Historic structures within 600 feet of the Centerline. The weights within a perspective (built, natural, engineering) must total 100%.

The Alternate Route Evaluation Model places five times emphasis on each perspective to produce Built, Natural, and Engineering Emphasis Models. In addition, a Simple Average Model is implemented, which places equal emphasis on the three perspectives.



	Route A	Route B	Route C	Route D	Route E	Route F
Built						
Residences Within the ROW	0	0	0	2	0	0
Out Buildings Within the ROW	0	0	0	2	0	0
Residences Within 300' of the Centerline	5	5	4	0	3	3
Commercial and Government Buildings within 300' of the Centerline	0	0	0	0	0	0
Industrial Buildings within 300' of the Centerline	1	1	1	1	1	1
Agricultural Buildings within 300' of the Centerline	1	0	0	1	0	0
School, Daycare, Church, Cemetery, & Park within 50' of the ROW	0	0	0	0	0	0
Potential Historic structures within 600' of the Centerline	0	0	0	2	1	1
Natural						
Tree Clearing (Acres)	9.63	10.76	7.96	10.98	9.81	10.01
Stream / River Crossings	13	12	11	10	12	12
Wetlands (Acres)	0.15	0.13	0.07	0.61	0.79	0.95
Engineering						
% Rebuild of Existing Transmission Lines	0%	0%	0%	0%	0%	0%
% Parallel with Existing Transmission Lines	48%	79%	64%	99%	98%	99%
% Parallel Roads	1%	1%	21%	0%	0%	0%
Total Project Costs	\$8,556,542	\$9,719,619	\$8,997,751	\$8,944,168	\$10,108,714	\$8,771,435
Construction Cost (\$820k/mile)	\$5,967,964	\$6,363,647	\$5,799,350	\$5,765,313	\$5,843,562	\$5,781,071
Land Acquisition Cost	\$145,235	\$157,537	\$162,580	\$189,453	\$200,990	\$205,319
Angles	\$1,200,000	\$1,950,000	\$1,800,000	\$1,140,000	\$1,620,000	\$1,140,000
0-45° Angle (\$90K)	\$360,000	\$630,000	\$720,000	\$900,000	\$900,000	\$900,000
45-90° Angle (\$240K)	\$240,000	\$720,000	\$480,000	\$240,000	\$720,000	\$240,000
>90° Angle (\$300K)	\$600,000	\$600,000	\$600,000	\$0	\$0	\$0
Clearing Cost (\$4.5K/Acre)	\$43,343	\$48,435	\$35,820	\$49,402	\$44,162	\$45,045
Transmission Line Crossing Cost (\$400K/Crossing)	\$1,200,000	\$1,200,000	\$1,200,000	\$1,600,000	\$2,400,000	\$1,600,000
Cost of Residence	\$ -	\$ -	\$ -	\$ 200,000	\$ -	\$ -
Length (Miles)	7.3	7.8	7.1	7.0	7.1	7.1

Figure 45 Route Data



Built	Route A	Route B	Route C	Route D	Route E	Route F
Residences Within the ROW	0.0	0.0	0.0	2.0	0.0	0.0
<i>Normalized</i>	0.0	0.0	0.0	1.0	0.0	0.0
Out Buildings Within the ROW	0.0	0.0	0.0	2.0	0.0	0.0
<i>Normalized</i>	0.0	0.0	0.0	1.0	0.0	0.0
Residences Within 300' of the Centerline	5.0	5.0	4.0	0.0	3.0	3.0
<i>Normalized</i>	1.0	1.0	0.8	0.0	0.6	0.6
Commercial and Government Buildings within 300' of the Centerline	0.0	0.0	0.0	0.0	0.0	0.0
<i>Normalized</i>	-	-	-	-	-	-
Industrial Buildings within 300' of the Centerline	1.0	1.0	1.0	1.0	1.0	1.0
<i>Normalized</i>	-	-	-	-	-	-
Agricultural Buildings within 300' of the Centerline	1.0	0.0	0.0	1.0	0.0	0.0
<i>Normalized</i>	1.0	0.0	0.0	1.0	0.0	0.0
School, Daycare, Church, Cemetery, & Park within 50' of the ROW	0.0	0.0	0.0	0.0	0.0	0.0
<i>Normalized</i>	-	-	-	-	-	-
Potential Historic structures within 600' of the Centerline	0.0	0.0	0.0	2.0	1.0	1.0
<i>Normalized</i>	0.0	0.0	0.0	1.0	0.5	0.5
Natural						
Tree Clearing (Acres)	9.6	10.8	8.0	11.0	9.8	10.0
<i>Normalized</i>	0.6	0.9	0.0	1.0	0.6	0.7
Stream / River Crossings	13.0	12.0	11.0	10.0	12.0	12.0
<i>Normalized</i>	1.0	0.7	0.3	0.0	0.7	0.7
Wetlands (Acres)	0.1	0.1	0.1	0.6	0.8	0.9
<i>Normalized</i>	0.1	0.1	0.0	0.6	0.8	1.0
Engineering						
% Rebuild of Existing Transmission Lines	0.00	0.00	0.00	0.00	0.00	0.00
<i>Normalized</i>	-	-	-	-	-	-
<i>Inverted</i>	-	-	-	-	-	-
% Parallel with Existing Transmission Lines	47.64%	78.93%	63.62%	98.95%	98.31%	98.95%
<i>Normalized</i>	0.0	0.6	0.3	1.0	1.0	1.0
<i>Inverted</i>	1.0	0.4	0.7	0.0	0.0	0.0
% Parallel Roads	1%	1%	21%	0%	0%	0%
<i>Normalized</i>	0.0	0.0	1.0	0.0	0.0	0.0
<i>Inverted</i>	1.0	1.0	0.0	1.0	1.0	1.0
Total Project Costs	\$ 8,556,542	\$ 9,719,619	\$ 8,997,751	\$ 8,944,168	\$ 10,108,714	\$ 8,771,435
<i>Normalized</i>	0.0	0.7	0.3	0.2	1.0	0.1

Figure 46 Normalized Data

Built	72%	Route A	Route B	Route C	Route D	Route E	Route F
Residences Within the ROW	40%	0.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.00	0.00	0.00	0.40	0.00	0.00
Out Buildings Within the ROW	0%	0.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.00	0.00	0.00	0.00	0.00	0.00
Residences Within 300' of the Centerline	35%	1.00	1.00	0.80	0.00	0.60	0.60
<i>Weighted</i>		0.35	0.35	0.28	0.00	0.21	0.21
Commercial and Government Buildings within 300' of the Centerline	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Industrial Buildings within 300' of the Centerline	10%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Agricultural Buildings within 300' of the Centerline	5%	1.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.05	0.00	0.00	0.05	0.00	0.00
School, Daycare, Church, Cemetery, & Park within 50' of the ROW	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Potential Historic structures within 600' of the Centerline	10%	0.00	0.00	0.00	1.00	0.50	0.50
<i>Weighted</i>		0.00	0.00	0.00	0.10	0.05	0.05
TOTAL	100%	0.40	0.35	0.28	0.55	0.26	0.26
WEIGHTED TOTAL		0.29	0.25	0.20	0.40	0.19	0.19
Natural	14%						
Tree Clearing (Acres)	40%	0.55	0.93	0.00	1.00	0.61	0.68
<i>Weighted</i>		0.22	0.37	0.00	0.40	0.25	0.27
Stream / River Crossings	20%	1.00	0.67	0.33	0.00	0.67	0.67
<i>Weighted</i>		0.20	0.13	0.07	0.00	0.13	0.13
Wetlands (Acres)	40%	0.09	0.08	0.00	0.61	0.82	1.00
<i>Weighted</i>		0.04	0.03	0.00	0.25	0.33	0.40
TOTAL	100%	0.46	0.54	0.07	0.65	0.71	0.81
WEIGHTED TOTAL		0.06	0.07	0.01	0.09	0.10	0.11
Engineering	14%						
% Rebuild of Existing Transmission Lines	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
% Parallel with Existing Transmission Lines	20%	1.00	0.39	0.51	0.00	0.01	0.00
<i>Weighted</i>		0.20	0.08	0.10	0.00	0.00	0.00
% Parallel Roads	20%	0.96	0.97	0.02	1.00	1.00	1.00
<i>Weighted</i>		0.19	0.19	0.00	0.20	0.20	0.20
Total Project Costs	60%	0.00	0.75	0.52	0.25	1.00	0.14
<i>Weighted</i>		0.00	0.45	0.31	0.15	0.60	0.08
TOTAL	100%	0.39	0.72	0.42	0.35	0.80	0.28
WEIGHTED TOTAL		0.05	0.10	0.06	0.05	0.11	0.04
SUM OF WEIGHTED TOTALS		0.41	0.43	0.27	0.54	0.40	0.34

Figure 47 Built Emphasis

Built	14%	Route A	Route B	Route C	Route D	Route E	Route F
Residences Within the ROW	40%	0.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.00	0.00	0.00	0.40	0.00	0.00
Out Buildings Within the ROW	0%	0.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.00	0.00	0.00	0.00	0.00	0.00
Residences Within 300' of the Centerline	35%	1.00	1.00	0.80	0.00	0.60	0.60
<i>Weighted</i>		0.35	0.35	0.28	0.00	0.21	0.21
Commercial and Government Buildings within 300' of the Centerline	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Industrial Buildings within 300' of the Centerline	10%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Agricultural Buildings within 300' of the Centerline	5%	1.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.05	0.00	0.00	0.05	0.00	0.00
School, Daycare, Church, Cemetery, & Park within 50' of the ROW	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Potential Historic structures within 600' of the Centerline	10%	0.00	0.00	0.00	1.00	0.50	0.50
<i>Weighted</i>		0.00	0.00	0.00	0.10	0.05	0.05
TOTAL	100%	0.40	0.35	0.28	0.55	0.26	0.26
WEIGHTED TOTAL		0.06	0.05	0.04	0.08	0.04	0.04
Natural	72%						
Tree Clearing (Acres)	40%	0.55	0.93	0.00	1.00	0.61	0.68
<i>Weighted</i>		0.22	0.37	0.00	0.40	0.25	0.27
Stream / River Crossings	20%	1.00	0.67	0.33	0.00	0.67	0.67
<i>Weighted</i>		0.20	0.13	0.07	0.00	0.13	0.13
Wetlands (Acres)	40%	0.09	0.08	0.00	0.61	0.82	1.00
<i>Weighted</i>		0.04	0.03	0.00	0.25	0.33	0.40
TOTAL	100%	0.46	0.54	0.07	0.65	0.71	0.81
WEIGHTED TOTAL		0.33	0.39	0.05	0.47	0.51	0.58
Engineering	14%						
% Rebuild of Existing Transmission Lines	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
% Parallel with Existing Transmission Lines	20%	1.00	0.39	0.51	0.00	0.01	0.00
<i>Weighted</i>		0.20	0.08	0.10	0.00	0.00	0.00
% Parallel Roads	20%	0.96	0.97	0.02	1.00	1.00	1.00
<i>Weighted</i>		0.19	0.19	0.00	0.20	0.20	0.20
Total Project Costs	60%	0.00	0.75	0.52	0.25	1.00	0.14
<i>Weighted</i>		0.00	0.45	0.31	0.15	0.60	0.08
TOTAL	100%	0.39	0.72	0.42	0.35	0.80	0.28
WEIGHTED TOTAL		0.05	0.10	0.06	0.05	0.11	0.04
SUM OF WEIGHTED TOTALS		0.44	0.54	0.15	0.59	0.66	0.66

Figure 48 Natural Emphasis

Built	14%	Route A	Route B	Route C	Route D	Route E	Route F
Residences Within the ROW	40%	0.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.00	0.00	0.00	0.40	0.00	0.00
Out Buildings Within the ROW	0%	0.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.00	0.00	0.00	0.00	0.00	0.00
Residences Within 300' of the Centerline	35%	1.00	1.00	0.80	0.00	0.60	0.60
<i>Weighted</i>		0.35	0.35	0.28	0.00	0.21	0.21
Commercial and Government Buildings within 300' of the Centerline	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Industrial Buildings within 300' of the Centerline	10%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Agricultural Buildings within 300' of the Centerline	5%	1.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.05	0.00	0.00	0.05	0.00	0.00
School, Daycare, Church, Cemetery, & Park within 50' of the ROW	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Potential Historic structures within 600' of the Centerline	10%	0.00	0.00	0.00	1.00	0.50	0.50
<i>Weighted</i>		0.00	0.00	0.00	0.10	0.05	0.05
TOTAL	100%	0.40	0.35	0.28	0.55	0.26	0.26
WEIGHTED TOTAL		0.06	0.05	0.04	0.08	0.04	0.04
Natural	14%						
Tree Clearing (Acres)	40%	0.55	0.93	0.00	1.00	0.61	0.68
<i>Weighted</i>		0.22	0.37	0.00	0.40	0.25	0.27
Stream / River Crossings	20%	1.00	0.67	0.33	0.00	0.67	0.67
<i>Weighted</i>		0.20	0.13	0.07	0.00	0.13	0.13
Wetlands (Acres)	40%	0.09	0.08	0.00	0.61	0.82	1.00
<i>Weighted</i>		0.04	0.03	0.00	0.25	0.33	0.40
TOTAL	100%	0.46	0.54	0.07	0.65	0.71	0.81
WEIGHTED TOTAL		0.06	0.07	0.01	0.09	0.10	0.11
Engineering	72%						
% Rebuild of Existing Transmission Lines	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
% Parallel with Existing Transmission Lines	20%	1.00	0.39	0.51	0.00	0.01	0.00
<i>Weighted</i>		0.20	0.08	0.10	0.00	0.00	0.00
% Parallel Roads	20%	0.96	0.97	0.02	1.00	1.00	1.00
<i>Weighted</i>		0.19	0.19	0.00	0.20	0.20	0.20
Total Project Costs	60%	0.00	0.75	0.52	0.25	1.00	0.14
<i>Weighted</i>		0.00	0.45	0.31	0.15	0.60	0.08
TOTAL	100%	0.39	0.72	0.42	0.35	0.80	0.28
WEIGHTED TOTAL		0.28	0.52	0.30	0.25	0.58	0.20
SUM OF WEIGHTED TOTALS		0.40	0.64	0.35	0.42	0.71	0.35

Figure 49 Engineering Emphasis

Built	33%	Route A	Route B	Route C	Route D	Route E	Route F
Residences Within the ROW	40%	0.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.00	0.00	0.00	0.40	0.00	0.00
Out Buildings Within the ROW	0%	0.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.00	0.00	0.00	0.00	0.00	0.00
Residences Within 300' of the Centerline	35%	1.00	1.00	0.80	0.00	0.60	0.60
<i>Weighted</i>		0.35	0.35	0.28	0.00	0.21	0.21
Commercial and Government Buildings within 300' of the Centerline	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Industrial Buildings within 300' of the Centerline	10%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Agricultural Buildings within 300' of the Centerline	5%	1.00	0.00	0.00	1.00	0.00	0.00
<i>Weighted</i>		0.05	0.00	0.00	0.05	0.00	0.00
School, Daycare, Church, Cemetery, & Park within 50' of the ROW	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
Potential Historic structures within 600' of the Centerline	10%	0.00	0.00	0.00	1.00	0.50	0.50
<i>Weighted</i>		0.00	0.00	0.00	0.10	0.05	0.05
TOTAL	100%	0.40	0.35	0.28	0.55	0.26	0.26
WEIGHTED TOTAL		0.13	0.12	0.09	0.18	0.09	0.09
Natural	33%						
Tree Clearing (Acres)	40%	0.55	0.93	0.00	1.00	0.61	0.68
<i>Weighted</i>		0.22	0.37	0.00	0.40	0.25	0.27
Stream / River Crossings	20%	1.00	0.67	0.33	0.00	0.67	0.67
<i>Weighted</i>		0.20	0.13	0.07	0.00	0.13	0.13
Wetlands (Acres)	40%	0.09	0.08	0.00	0.61	0.82	1.00
<i>Weighted</i>		0.04	0.03	0.00	0.25	0.33	0.40
TOTAL	100%	0.46	0.54	0.07	0.65	0.71	0.81
WEIGHTED TOTAL		0.15	0.18	0.02	0.21	0.23	0.27
Engineering	33%						
% Rebuild of Existing Transmission Lines	0%	-	-	-	-	-	-
<i>Weighted</i>		-	-	-	-	-	-
% Parallel with Existing Transmission Lines	20%	1.00	0.39	0.51	0.00	0.01	0.00
<i>Weighted</i>		0.20	0.08	0.10	0.00	0.00	0.00
% Parallel Roads	20%	0.96	0.97	0.02	1.00	1.00	1.00
<i>Weighted</i>		0.19	0.19	0.00	0.20	0.20	0.20
Total Project Costs	60%	0.00	0.75	0.52	0.25	1.00	0.14
<i>Weighted</i>		0.00	0.45	0.31	0.15	0.60	0.08
TOTAL	100%	0.39	0.72	0.42	0.35	0.80	0.28
WEIGHTED TOTAL		0.13	0.24	0.14	0.12	0.26	0.09
SUM OF WEIGHTED TOTALS		0.41	0.53	0.25	0.51	0.58	0.44

Figure 50 Simple Average

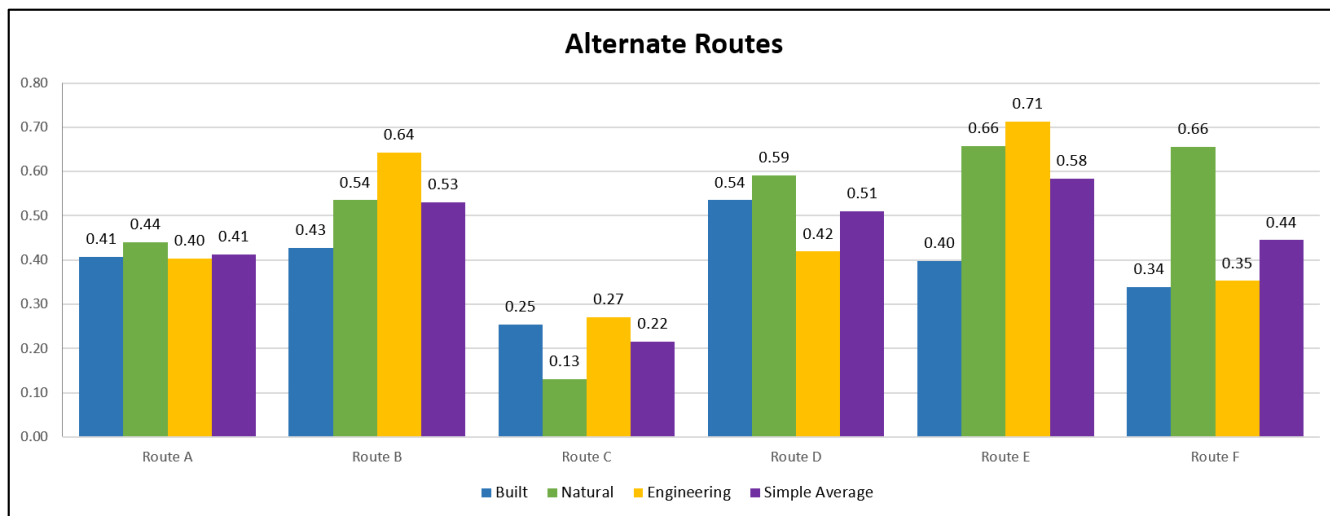


Figure 51 Alternate Route Graph

Route C scores the lowest (most suitable) from a Built perspective. This is partially because Route C does not have any residences within the ROW or any Potential Historic Structures within 600 feet. Route D scores the highest (least suitable) in the Built perspective since it has the most residences within the ROW and Potential Historic structures within 600’.

The Natural perspective contained the largest difference between the lowest scoring route and the second lowest scoring route. Route C was the lowest scoring route due to the fact that the route has the least amount of tree clearing and wetlands, while also having the second least amount of stream/river crossings. Route F scored highest for having the most wetlands and the second most tree clearing and stream/river crossings.

In the Engineering perspective, Route C has the lowest score with the most parallel roads percentage and second lowest cost being the main factors. The cost is kept lower since there is only one major angle in the route. Route E has the highest score with the highest Total Project Costs.

Route C has the lowest Simple Average score as it was the most suitable in all three categories. Routes B and E have the highest Simple Average score because both routes have the highest score from an Engineering Perspective and are among the least suitable half of the routes in the Natural Perspective.

Based on the Alternate Route Evaluation Model, Route E scored least suitable in the Natural, Engineering, and Simple Average Models. Therefore, it was eliminated from further consideration prior to the Expert Judgment phase. Route D also had the least suitable Simple Average score and was also eliminated from consideration. Finally, Route B was eliminated from consideration because the Engineering score was the second least suitable. Routes A, C, and F were the routes in consideration during the Expert Judgement process.



Preferred Route Selection

The Expert Judgment Model was used by the transmission line experts on the project team to select the preferred route. The team determined the high-level siting criteria and assigned weights to represent the relative importance. Cost was weighed the most at 30%, followed by Construction/Maintenance Accessibility at 20%, Schedule Delay Risk and Reliability at 15%, and Community Issues and Natural Environment Considerations at 10%.

Next, the experts ranked each route for each of the criteria. Finally, the weights were applied, and the preferred route has the lowest total score.

For the Community criteria, Route F was given the best score since it is within proximity of the least number of residences and stays on the edge of the fields that it crosses. Route F also parallels the existing transmission line more than the other two routes. Route A was ranked a point higher since it is within proximity to more residences and agriculture buildings than Route C.

Route C is scored better than route A and F in Schedule Delay Risk since there is more existing right-of-ways (road and transmission line) that can be used for access. Route A has the second highest score due to the new construction taking place through the middle of fields where access and disruptions are an issue. The worst score from a Schedule Delay standpoint is Route F because there are more transmission line crossings and the proximity to potential historic sites.

On this project the experts judged that routes that parallel another company's transmission lines are less reliable because of the potential for increased time to resolve issues and less control. Route A scores the best since it does not parallel other transmission lines as much as the other routes. Route C gets the second best score since it parallels less transmission lines than Route F, which parallels the most transmission lines.

From a Natural Environment Considerations perspective, Route C scores the best since it has the best weighted score in the Alternate Route Evaluation from a Natural Perspective (factors being tree clearing, stream, and wetland crossings). Route F scores the worst in the statistical evaluation and Route A is in between the other two routes in that evaluation.

Route C parallels the most roads for access and is tied for the least amount of transmission line crossings, so it has the best score from a Construction/Maintenance Accessibility criteria. Route F and A were tied due to the lower percentage of roads paralleled.

The relative cost estimates were relied on for the Cost category. Routes A and F score the best in the category since they are the least expensive when compared to Route C.

When all factors were considered in the Expert Judgement Model, Route C was selected as the preferred route with the lowest score of 1.28 compared with a score of 1.65 for Route A and 2.0 for Route F. Route C also scored the best in all four perspectives of the Alternative Route Evaluation Model (Figure 51).

Criteria	Weight	Route A	Route C	Route F
Community Issues	10%	3.0	2.0	1.0
<i>Weighted</i>		0.3	0.2	0.1
Schedule Delay Risk	15%	2.0	1.0	3.0
<i>Weighted</i>		0.3	0.2	0.5
Reliability	15%	1.0	2.0	3.0
<i>Weighted</i>		0.2	0.3	0.5
Natural Environment Considerations	10%	2.0	1.0	3.0
<i>Weighted</i>		0.2	0.1	0.3
Construction/Maintenance Accessibility	20%	2.0	1.0	2.0
<i>Weighted</i>		0.4	0.2	0.4
Cost	30%	1.0	1.1	1.0
<i>Weighted</i>		0.3	0.3	0.3
TOTAL	100%	1.65	1.28	2.00

Figure 52 Expert Judgement Model

Preferred Route Description

Route C comes out of the Proposed South Henderson Switching Station to the northwest paralleling the existing 161 kV transmission line (Figure 54) to the south. The route continues to parallel the existing 161 kV transmission line until the route crosses over the Henderson Bypass (Route 425) when it turns to the left to parallel the Henderson Bypass on the northern side of the road. Once the route comes upon three other transmission lines (Figure 55) that are traveling northwest to southeast, the route takes a right turn to head northwest paralleling the existing transmission lines on the northern side. Finally, the route parallels the existing 69 kV transmission line until it reaches the Proposed Henderson Paper Mill Substation on the right.

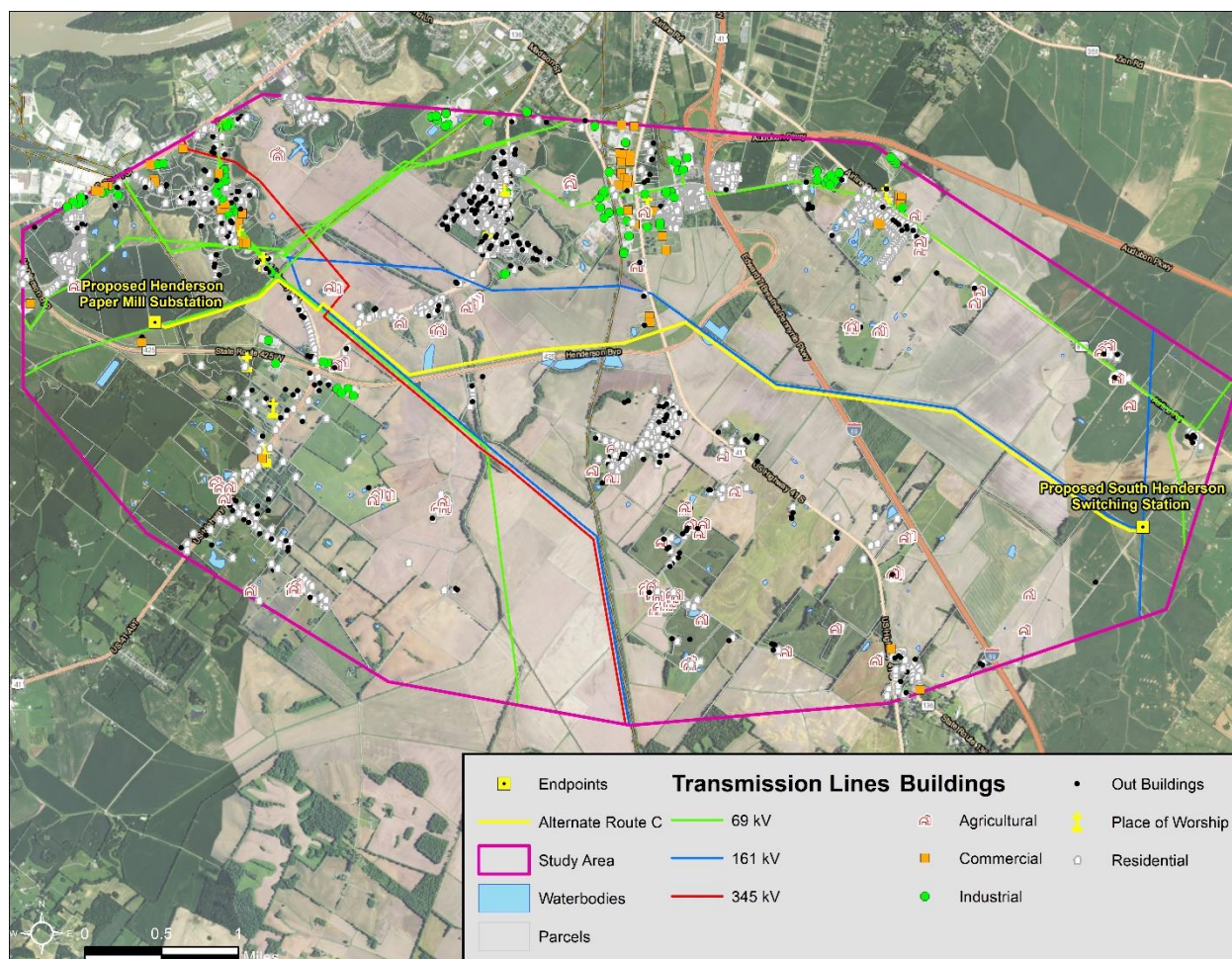


Figure 53 Preferred Route



Figure 54 161 kV Transmission Line near the Proposed South Henderson Switching Station



Figure 55 Existing 69 kV, 161 kV, and 345 kV Transmission Lines



Source Data Appendix A

Perspective / Layer	Source	
Engineering Environment	Source	Source Notes
Linear Infrastructure		
Parallel Existing Transmission Lines	Big Rivers Provided	
Rebuild Existing Transmission Lines (good)	Big Rivers Provided	None present in Study Area
Background		
Parallel Interstates ROW	Kentucky Transportation Cabinet	
Parallel Roads ROW	Kentucky Transportation Cabinet	
Parallel Pipelines	National Pipeline Mapping System (USDT) and US EIA	
Future DOT Plans	Kentucky Transportation Cabinet	-
Parallel Railway ROW	Kentucky Transportation Cabinet	-
Road ROW	Kentucky Transportation Cabinet	
Rebuild Existing Transmission Lines (bad)	Big Rivers Provided	None present in Study Area
Scenic Highways ROW	Kentucky Transportation Cabinet	None present in Study Area
Slope		
Slope 0-15%	DEM from KyFromAbove Initiative from the Commonwealth Office of Technology	
Slope 15-30%	DEM from KyFromAbove Initiative from the Commonwealth Office of Technology	
Slope 30-40%	DEM from KyFromAbove Initiative from the Commonwealth Office of Technology	
Slope >40%	DEM from KyFromAbove Initiative from the	

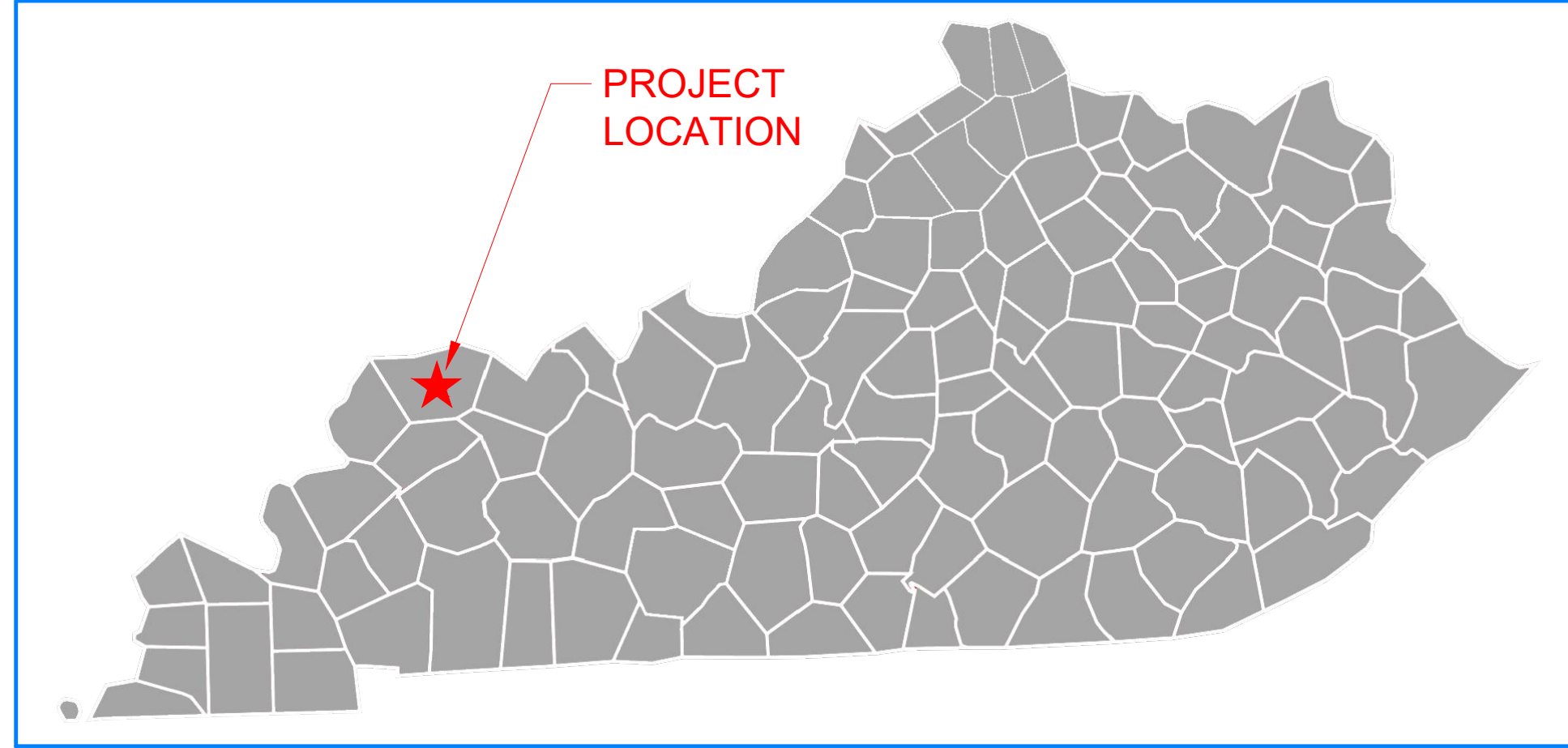
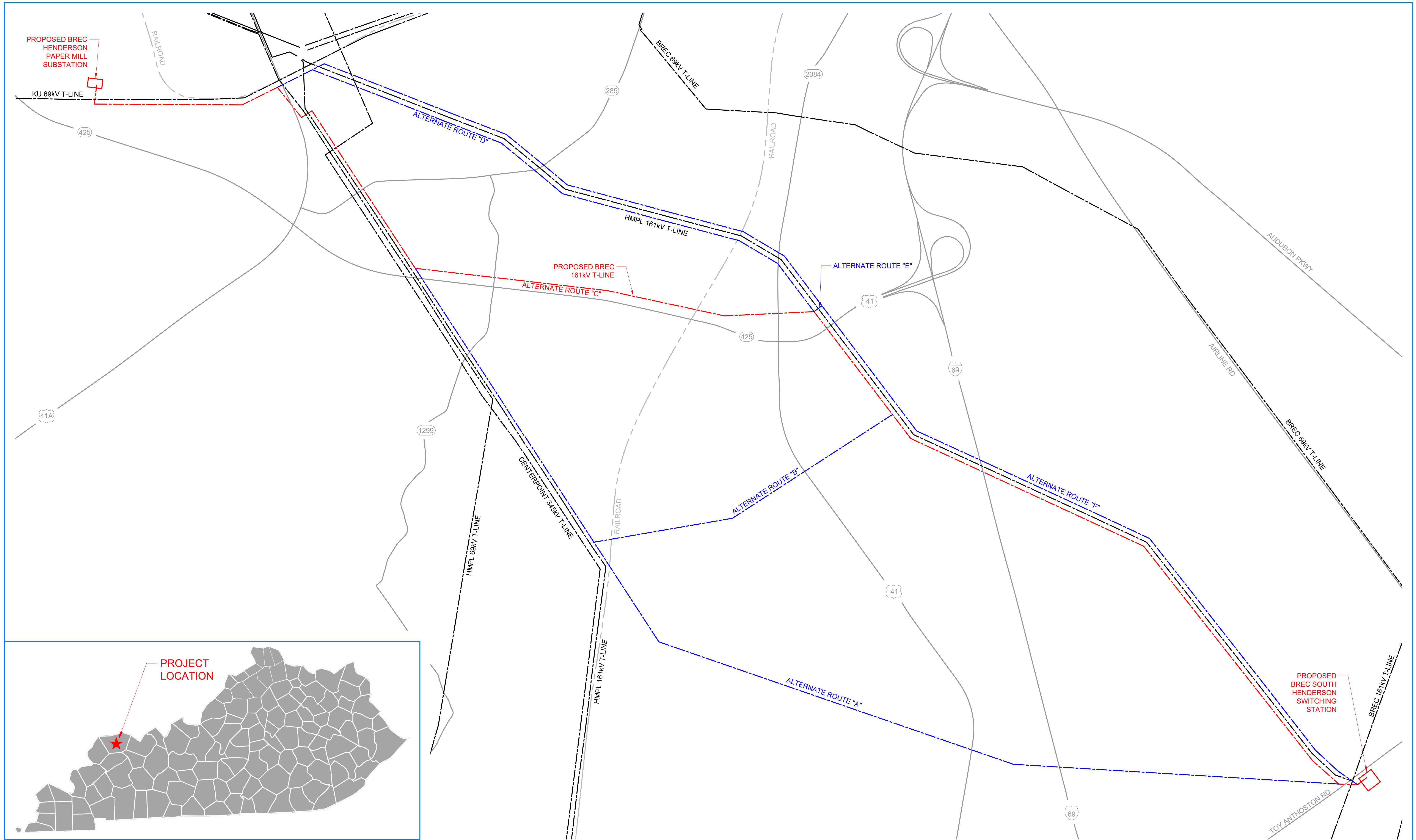
	Commonwealth Office of Technology	
Areas of Least Preference		
Non-Spannable Waterbodies	USGS NHD Hydrography Dataset	None present in Study Area
Mines and Quarries (Active)	Kentucky Mine Mapping Information System	None present in Study Area
Buildings	Digitized based on Aerial Photography	
Airports	Kentucky Transportation Cabinet	
Military Facilities	Kentucky Department of Military Affairs	None present in Study Area
Center Pivot Irrigation	Checked by Aerial Photography	None present in Study Area
Natural Environment		
	Source	Source Notes
Floodplain		
100 Year Floodplain	FEMA National Flood Zone Layer	
Streams/Wetlands		
Streams < 5cfs+Regulatory Buffer	USGS NHD Hydrography Dataset	Utilized USGS Streamstats to determine the size of the streams to use for this classification
Streams > 5cfs+Regulatory Buffer	USGS NHD Hydrography Dataset	Utilized USGS Streamstats to determine the size of the streams to use for this classification
Wetlands + 30'Buffer	USFWS National Wetlands Inventory	-
Outstanding State Resource Waters	Kentucky Waterways Alliance	None present in Study Area
Public Lands		
WMA + Not State Owned	USFWS	None present in Study Area
USFS (proclamation area)	USDA Forest Service	None present in Study Area
Other Conservation Land	Kentucky Department of Fish and Wildlife Resources, USPS, USFS, Nature Conservancy, US Army Corp of Engineers, among other datasets	None present in Study Area
USFS (actually owned)	USDA Forest Service	None present in Study Area

State Owned Conservation Land	Kentucky Department of Fish and Wildlife Resources	None present in Study Area
Land Cover		
Developed Land	Digitized based on aerial photography	
Agriculture	Digitized based on aerial photography	
Forests	Digitized based on aerial photography	
Wildlife Habitat		
Species of Concern Habitat	USFWS Threatened, endangered and at-risk species	Data was generated based on of the wildlife habitats described by the USFWS. The Wildlife Habitat data is modeled based on Appendix J of the Kentucky Transmission Line Siting Methodology Report
Areas of Least Preference		
EPA Superfund Sites	EPA	None present in Study Area
State and National Parks	NPS	None present in Study Area
USFS Wilderness Area	USDA Forest Service	None present in Study Area
Wild/Scenic Rivers	USDA Forest Service	None present in Study Area
Wildlife Refuge	USFWS	None present in Study Area
State Nature Preserves	Kentucky Energy and Environment Cabinet - Kentucky Nature Preserves Commission	None present in Study Area
Designated Critical Habitat	USFWS	None present in Study Area
Built Environment		
Built Environment	Source	Source Notes
Proximity to Buildings		
Background	Digitized based on aerial photography	
900-1200	Digitized based on aerial photography	
600-900	Digitized based on aerial photography	
300-600	Digitized based on aerial photography	
0-300	Digitized based on aerial photography	
Building Density		
0 - 0.05 Buildings/Acre	Digitized based on aerial photography	

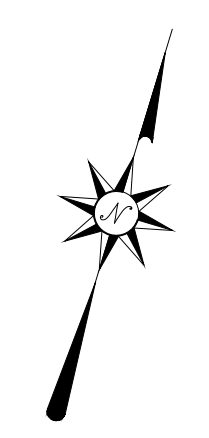
0.05 - 0.2 Buildings/Acre	Digitized based on aerial photography	
0.2 - 1 Buildings/Acre	Digitized based on aerial photography	
1 - 4 Buildings/Acre	Digitized based on aerial photography	
>4 Buildings/Acre	Digitized based on aerial photography	
Proposed Development		
Proposed Development	Based on field observations	
Spannable Lakes and Ponds		
Spannable Lakes and Ponds	NHD Hydrography Dataset	
Land Use		
Commercial/Industrial	Digitized based on aerial photography	
Agriculture (crops)	Digitized based on aerial photography	
Agriculture (other livestock)	Digitized based on aerial photography	
Silviculture	Digitized based on aerial photography	None present in Study Area
Other (forest)	Digitized based on aerial photography	
Equine Agri-Tourism	Kentucky Thoroughbred Farm Managers' Club	None present in Study Area
Residential	Digitized based on aerial photography	
Proximity to Eligible Historic and Archeological Sites		
900-100	Provided by Kentucky Office of Archaeology and Kentucky Heritage Council	
600-900	Provided by Kentucky Office of Archaeology and Kentucky Heritage Council	
0-300	Provided by Kentucky Office of Archaeology and Kentucky Heritage Council	
300-600	Provided by Kentucky Office of Archaeology	



	and Kentucky Heritage Council	
Areas of Least Preference		
Listed Archaeology Sites and Districts	Provided by Kentucky Office of Archaeology and Kentucky Heritage Council	
Listed NRHP Districts and Buildings	Provided by Kentucky Office of Archaeology and Kentucky Heritage Council	
Day Care Parcels	Internet research \ Henderson County PVA data	None present in Study Area
City and County Park Parcels	Internet research \ Henderson County PVA data	Confirmed based on aerial photography inspection
Cemetery Parcels	Internet research \ Henderson County PVA data	Confirmed based on aerial photography inspection
School Parcels (K-12)	Internet research \ Henderson County PVA data	None present in Study Area
Church Parcels	Internet research \ Henderson County PVA data	Confirmed based on aerial photography inspection




PRELIMINARY
 FOR BID
 FOR CONSTRUCTION
 FOR RECORD
 "AS BUILT"
 REFERENCE



LEGEND

- ROAD
- - - RAILROAD
- - - EXISTING T-LINE
- - - PROPOSED T-LINE
- - - ALTERNATE T-LINE ROUTE

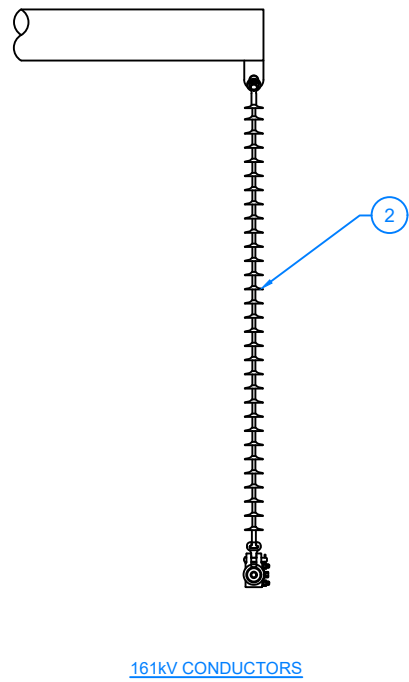
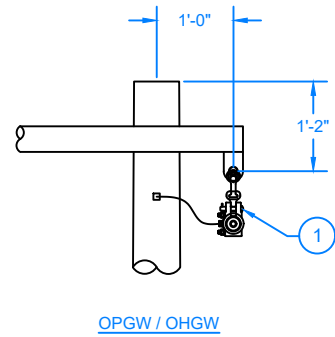
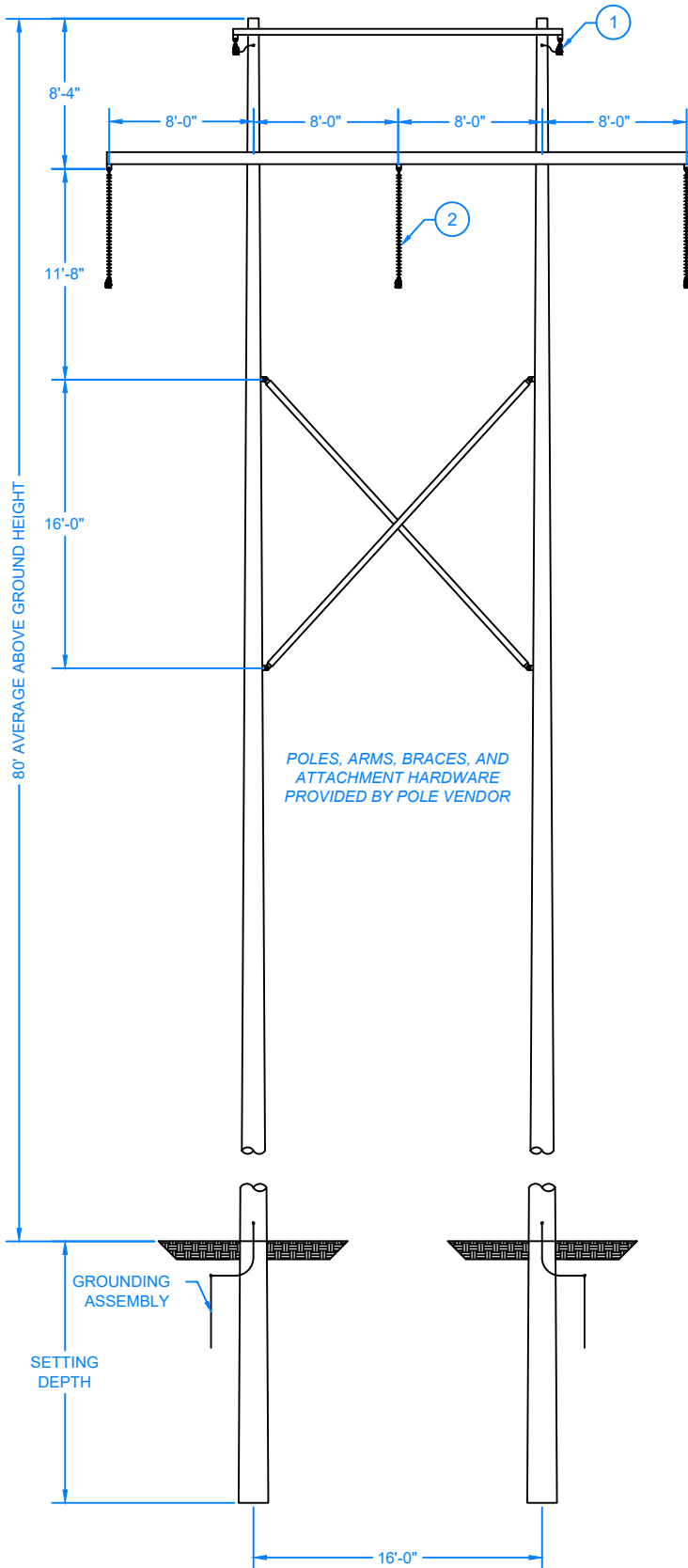
REV	DATE	DRFT	ENGR	REVISION DESCRIPTION
A	01/10/22		ABG	ISSUED FOR REFERENCE
B	01/17/22		ABG	ISSUED FOR REFERENCE
C	02/03/22		ABG	UPDATED WITH ALL ALTERNATE ROUTES



**SOUTH HENDERSON - HENDERSON PAPER MILL
161KV TRANSMISSION LINE
VICINITY MAP**

W.O.		DATE	
SCALE:	1" = 1000'	ENGINEER	ABG (P&D ENGINEERS)
		DRAWN	
		DATE	01-10-2022
			SHEET 1 of 6

ITEM	QTY	DESCRIPTION	UNIT / PART NUMBER
1	2	OPGW ASSEMBLY or OHGW ASSEMBLY TANGENT	TM-4(B1) or TM-4(A1)
2	3	161KV INSULATOR ASSEMBLY, SUSPENSION	TM-1(CP53)



161kV TRANSMISSION LINE
H-FRAME, X-BRACED

TH-10X-161

DATE: 01/17/2022
BY: ABG



201 Third Street
P.O. Box 24
Henderson, KY 42419-0024
270-827-2561
www.bigrivers.com

February _____, 2022

[Name]
[Address]

RE: Notice of Proposed Electric Transmission Line Construction Project in
Henderson County

Dear [Name]:

Big Rivers Electric Corporation (“Big Rivers”), a western Kentucky electric generation and transmission cooperative, proposes to construct a 7.1-mile 161 kilovolt transmission line in Henderson County, Kentucky. The purpose of the proposed transmission line is to serve load growth southwest of Henderson, KY, and to improve reliability in the area.

The proposed route for the transmission line is shown on the attached map. The line is proposed to extend from a switching station that will be constructed along or near Toy Anthoston Road in Henderson, Kentucky. It will run primarily northwest and will parallel existing transmission lines and KY-425 for the majority of the route to a substation to be located at 5908 KY-425, Henderson, Kentucky.

It is expected that this line will cross property you own in Henderson County. Big Rivers is sending a letter to each property owner whose property the proposed line is expected to cross according to Property Valuation Administrators records. Hunter Rickard, Easement Agent at Big Rivers, will be in contact with you to discuss necessary surveying and to discuss purchasing an easement from you for the proposed electric line. Enclosed is an “Agreement for Permission to Survey.” This is the first step in the surveying process. Please review the agreement, sign and print your name on the provided lines, and return it in the enclosed addressed, post-paid envelop. This will help expedite the process and will be greatly appreciated.

Big Rivers plans to file an application with the Kentucky Public Service Commission (“Commission”) in February 2022, seeking a certificate of public convenience and necessity authorizing this project. The purpose of the Commission’s review of Big Rivers’ application is to determine whether the proposed line is required for public convenience and necessity. Interested persons have the right to move to intervene and

participate in the proceeding. They also have the right to request the Commission to conduct a public hearing in Henderson County on the application.

To request to intervene in the Commission's proceeding on Big Rivers' application, or to request a public hearing in the case, persons can contact the Executive Director, Public Service Commission, 211 Sower Boulevard, P.O. Box 615, Frankfort, Kentucky 40602-0615, telephone number (502) 564-3940. The docket number under which this application will be processed is 2022-00012.

A motion to intervene shall include the movant's full name, mailing address, and electronic mail address and shall state his or her interest in the case and how intervention is likely to present issues or develop facts that will assist the Commission in fully considering the matter without unduly complicating or disrupting the proceedings. The motion may also include a request for delivery of Commission orders by United States mail and shall state how good cause exists for that means of delivery.

A request for a public hearing shall be requested no later than thirty (30) days after Big Rivers files its application, and shall contain the docket number of the case; the name, address, and telephone number of the person requesting the hearing; and a statement as to if the person requesting the hearing wishes to participate in an evidentiary hearing or to make unsworn public comments. If a person requesting a local public hearing wishes to participate in an evidentiary hearing as well, that person shall also apply to intervene in the Commission's case.

If you have any questions, you may contact me at (270) 827-2561 or via email at Jerrod.Thomas@BigRivers.com.

Sincerely yours,

BIG RIVERS ELECTRIC CORPORATION

Jerrod Thomas, P.E.
Director Engineering

Enclosures (Map and Survey Form)

Big Rivers Electric Corporation
Case No. 2022-00012
Property Owner Listing
Henderson 161 Kv Transmission Line

Property Owner	Address	Property Address
HARRISON ROBERT G & SHIRLEY A	9008 TILLMAN BETHEL RD, HENDERSON, KY 42420	HWY 425 (ADJ 2995 OLD MADISONVILLE)
RAY WILLIAM R JR LLC	12097 AIRLINE RD, HENDERSON, KY 42420	AIRLINE RD (ADJOINS 7352)
COMMONWEALTH OF KENTUCKY		KEACH DR 8298
KEACH A HOUSTON JR & R SCOTT	1586 HWY 136 W, HENDERSON, KY 42420	HWY 2084 S 8375 and HWY 41 S
CITY OF HENDERSON KY & HC ECON DEV C	207 N ELM ST, HENDERSON, KY 42420	HWY 425 6303 and OLD CORYDON RD 2290
FRUIT FARMS LC	2323 S GREEN ST, HENDERSON, KY 42420	HWY 425 BY PASS
MARTIN BASSIL ELLEN & PHILLIP	4100 HWY 41A, HENDERSON, KY 42420	HWY 41 A 4100
MATTINGLY LEO JR & CAROLE	4285 HWY 1299, HENDERSON, KY 42420	HWY 41 A 0
SELLARS COLLIN & CARRIE MCGILLIS	3896 OLD MADISONVILLE RD, HENDERSON, KY 42420	HWY 41 A 4195
MASON DARREL & DEBBIE	4105 HWY 41 A, HENDERSON, KY 42420	HWY 41 A 4105
NEAL GREENWELL FARMLAND LLC	925 ST RT 948, MORGANFIELD, KY 42437	HWY 425 5149
DOUTHITT MARY	210 LORRIE LYNN CT, EVANSVILLE, IN 47715	HWY 1299 0
CATES ROBERT A & AMY V	8132 PRUITT AGNEW RD, HENDERSON, KY 42420	OLD MADISONVILLE RD 2995

Big Rivers Electric Corporation
Case No. 2022-00012
Property Owner Listing
Henderson 161 Kv Transmission Line

Property Owner	Address	Property Address
HUTCHESON F MARION & DELORIS	210 S MAIN ST, HENDERSON, KY 42420	HWY 2084 S 8367
JOHNS PROPERTIES LLC	1331 CLAY ST, HENDERSON, KY 42420	HWY 41 S 9838
TOY BARRY JOSEPH	5505 KULA MAUU, KAPAA, HI 96746	HWY 41 S 9368
CYPRESS FLATS LAND CO LLC	4135 ST RT 141 NORTH, UNIONTOWN, KY 42461	OLD KNOBLICK RD (WATKINS FARM) and HWY 41 S (ADJOINS 8383- WILSON FARM)
M H O LLC	P O BOX 1754, OWENSBORO, KY 42302	(ADJOINS 8383- WILSON FARM)
MARSHALL TIMBER ENTERPRISE LLC	4965 US HWY 42 #10, LOUISVILLE, KY 40222	HWY 41 S 0
JUDY NELSON FARMS LLC	2340 SCHUETTE LN, HENDERSON, KY 42420	HWY 41 S 0 and HWY 41 S (ADJOINS 9288)
FRANCIS BETH ANN & JEFF	9592 CORYDON GENEVA RD, HENDERSON, KY 42420	HWY 425 (ADJ TO 6300)
HANCOCK WILLIAM & KRISTI	8906 AIRLINE RD, HENDERSON, KY 42420	AIRLINE RD (ADJ TO 8912)

Black History Month events in the Evansville area

Rayonna Burton-Jernigan
Evansville Courier & Press | USA TODAY NETWORK

Black History Month offers several local opportunities for anyone interested in learning more or just enjoying events that highlight the culture.

Ivy Tech Keynote Speaker

Feb. 15, Noon, Vectren Auditorium, 3501 N. First Ave. Free.

The Rev. J.C. Campbell, senior pastor at Greater Hope Christian Church, presents "Leading with Faith" Picking up the torch from Martin, Malcolm, John, and other Civil Rights Leaders" as a part of Ivy Tech's Black History Month observances.

USI Black History Month speaker

Feb. 15, 6 p.m., University Center West, Carter Hall D. Free.

The University of Southern Indiana is hosting Shirval Moore, an entrepreneur and motivational speaker, for its keynote speaker. This event is open to the public.

Lyles Station keynote speaker

Feb. 19, 1 to 4 p.m., Lyles Station Historic School & Museum, 953 N. County Road, Gibson County, Indiana. Free.

This program will feature Eunice Trotter, an author, reporter and expert on Southwestern Indiana history. She will be speaking about her new book "Black in Indiana," which details how slavery ended in the Hoosier State. Following her talk, there will be a showing of the documentary "An Eagle on His Button," which explores the story of a group of local African-American farm boys from Southern Illinois who fought in the Civil War.

Free tours of the museum will be available.

History in The Making: Adult talent show

Feb 26, 6 to 8 p.m., Old National Events Plaza; Tickets are \$20.

The local chapter of the NAACP is hosting its inaugural adult talent show for the public. This multicultural event highlights the history of Black entertainment and features local artists from across different genres.

Evansville-Vanderburgh Public Library events:

'Queen of Katwe' movie night

Feb. 18, 4 p.m. to 6 p.m., EVPL McCollough branch.

The movie follows a young Ugandan



Schoolchildren in grades 1-4 are shown standing outside a school in Lyles Station.
LYLES STATION CONSOLIDATION SCHOOL

girl whose life changes when she is introduced to the world of chess.

The Princess and the Frog

Feb. 21, noon to 2 p.m., EVPL McCollough branch.

This movie follows the story of Tiana, Disney's first African-American princess, as she works to get her restaurant that she's always wanted

Heart Black Art 2022

Feb. 12, Noon to 2 p.m., EVPL East. Free.

Celebrate Black History Month with a free family art class with Janice R. King.

Teen trivia

Feb. 21, 4 p.m. to 5 p.m., EVPL Central. Free.

Young adults are encouraged to come out and test their Black History knowledge.

African-American Read-In

Feb. 24, 3 to 5 p.m., EVPL Central, Free Families are encouraged to attend and enjoy African-American literature and storytime, songs, crafts, and more.

Rayonna Burton-Jernigan covers diversity and culture-related topics and can be contacted at rbj@courierpress.com or (812) 454-1765.

Ice

Continued from Page 1A

NWS stated.

The bulk of the storm is expected to unfold late Wednesday and throughout the day on Thursday.

"Travel could be nearly impossible and should be avoided unless absolutely necessary," one NWS bulletin read.

Still, this week's system doesn't appear to be on the same level as the late January 2009 storm. Here's how they compare.

Less snow and ice

The 2009 storm spewed 1.25 inches of freezing rain. It caused tree branches to buckle and spiral into ice-encased

power lines, knocking out power and leaving countless roads impassable. As if that wasn't enough, the storm also brought five inches of snow.

Vectren estimated it cost between \$15-20 million to restore power to the area in the aftermath, and the city paid more than \$250,000 for debris cleanup.

The forthcoming storm shouldn't be as bad. Snow totals are trending lower, and the difference between a quarter inch and 1.25 inches of ice is much bigger than the basic math.

Still, any significant amount of ice is troubling. As a tweet from the NWS' Weather Prediction Center said Monday morning, "freezing rain is the worst."

The same cold and wind

The system should be out of the area by Thursday night. But the mess it

leaves behind could stick around for a while.

Frigid temperatures are expected to follow, so melting will happen at a drip. Friday will be stabbingly cold, with a high of only 28 degrees. The NWS expects wind chills to be in the single digits, with gusts immediately after the storm reaching as high as 21 miles per hour.

Temperatures aren't expected to climb above freezing until Sunday, and even then the forecast high is only 37 degrees. The first solid chance for a thaw may not come until the middle of next week.

2009 followed a similar script.

The ice didn't start to melt until about a week after the storm rumbled through. But that didn't help the thousands of utility workers who scrambled to restore power for the tens of thousands of

residents who had either spent days in dark, frigid homes or fled to stay in shelters or with relatives.

"When the melting begins, tree limbs that are bent over but not broken will snap back or have a whipping effect," a Vectren spokesperson said. "Some are under power lines, and that could knock down more lines."

If you do lose power, it's important to have a plan.

The Weather Channel suggest stocking up on nonperishable food and bottled water. Charge your phones ahead of the storm, keep blankets and a battery-powered radio on hand, and know where you can go if your home gets too cold or dangerous.

Contact Jon Webb at jon.webb@courierpress.com

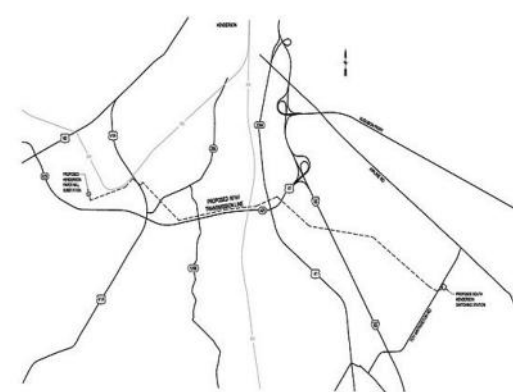
Notice of Proposed Electric Transmission Line Construction Project

Big Rivers Electric Corporation ("Big Rivers"), a western Kentucky electric generation and transmission cooperative, proposes to construct a 7.1-mile 161 kilovolt transmission line in Henderson County, Kentucky. The purpose of the proposed transmission line is to serve new load growth southwest of Henderson, KY, and to improve reliability in the area.

The route for the proposed line will parallel existing transmission lines and Kentucky Highway 425. The new line will begin at a proposed switching station to be located on Toy Anthoston Road, Henderson, Kentucky. It will run northwest to a substation to be located at 5908 KY-425, Henderson, Kentucky. The line will typically be constructed using H-frame structures and three-pole steel dead-end angle structures. Big Rivers is sending a letter to each property owner over whose property the proposed circuit is expected to cross according to Property Valuation Administrators records.

Big Rivers plans to file an application with the Kentucky Public Service Commission ("Commission") by April 8, 2022, seeking a certificate of public convenience and necessity authorizing this project. The purpose of the Commission's review of Big Rivers' application is to determine whether the proposed line is required for public convenience and necessity. Interested persons have the right to move to intervene and participate in the proceeding. They also have the right to request the Commission to conduct a public hearing in Henderson County on that application.

Interested parties may request to intervene in the Commission's proceeding on Big Rivers' application, or may request a public hearing in that case, by contacting the Executive Director, Public Service Commission, 211 Sower Boulevard, P.O. Box 615, Frankfort, Kentucky 40602-0615, telephone number (502) 564-3940. The docket number under which this application will be processed is 2022-00012. You may also direct questions to Big Rivers by contacting Jerrod Thomas, Big Rivers Director Engineering, at (270) 827-2561.



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