Northern Missouri Transmission Line Phase 2

November 2024

Prepared for:

Ameren Transmission Company of Illinois

By

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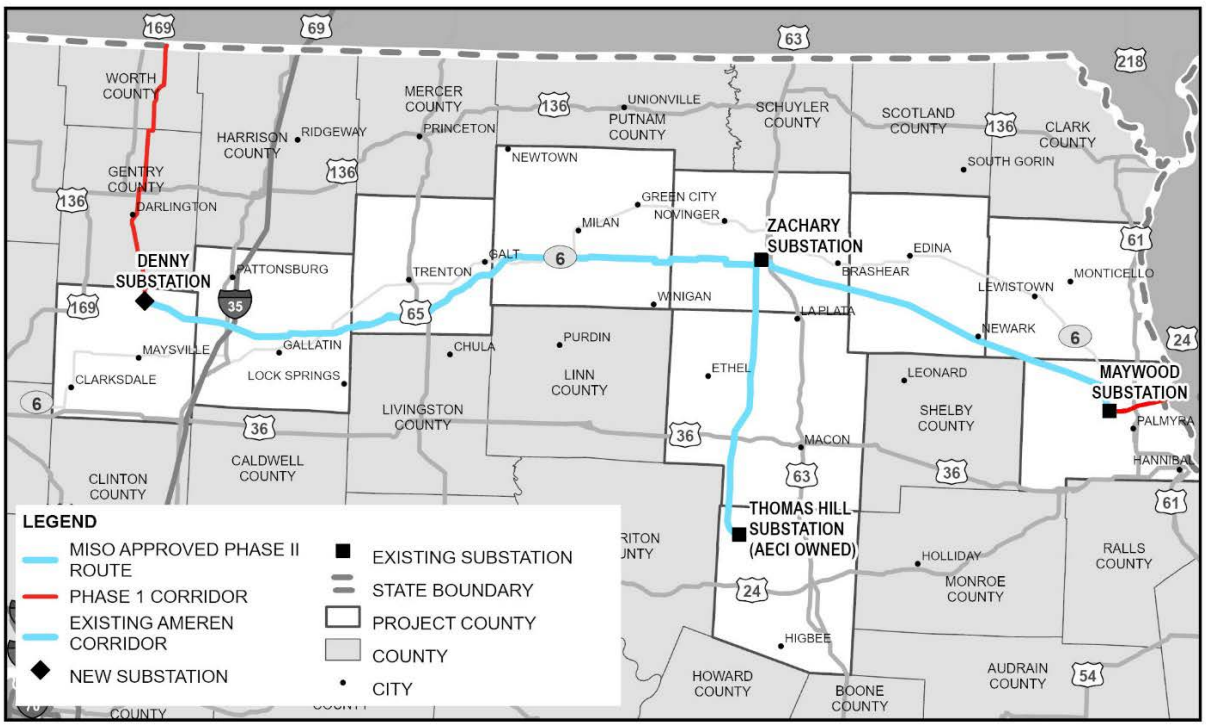
1. Introduction and Project Description

On July 25, 2022, MISO's Board of Directors approved the Long-Range Transmission Planning Tranche 1 portfolio for inclusion in the 2021 MISO Transmission Expansion Plan (MTEP21). Tranche 1 included Project 10, which consists of two new single-circuit 345 kV transmission lines, a replaced 161 kV transmission line, a new 345 kV conductor-only circuit that will share structures with the replaced 161 kV line, and several new 345 kV line positions at related substations. All Project 10 facilities will be in Missouri.

The two new 345 kV transmission lines and the new conductor-only 345 kV circuit were eligible for MISO's Competitive Developer Selection Process. These facilities consist of (1) a new single-circuit 345 kV transmission line that will run from ATXI's Denny substation to Ameren's Zachary substation, (2) a new single-circuit 345 kV transmission line that will run from Zachary to Ameren's Maywood substation, and (3) new 345 kV conductor, insulators, and hardware on replaced transmission line structures that will run from Zachary to AECI's Thomas Hill substation and share 161/345 kV structures replaced by Ameren.

Ameren and its initial routing team developed route proposals for each part of the MISO project. These routes were submitted to MISO for consideration. MISO responded and selected Ameren's proposal for all three segments in April 2024.

Figure 1-1 MISO Approved Routes



2. Final Route Development

HDR Engineering, Inc. (HDR), on behalf of Ameren Transmission Company of Illinois (ATXI), prepared this routing study to document the process used review and finalize the Proposed Routes for each of the MISO designated Segments. The process was undertaken by the "Routing Team," which comprised staff from both HDR and ATXI. The routing review process is similar to the initial routing process done to develop the MISO bid route. The final route review continued to review sensitivities and opportunities and included information and data collected from agency and local stakeholder coordination and public landowner open houses. The Routing Team was composed of a diverse group of professionals from the following technical disciplines: environmental, stakeholder outreach, engineering, system planning, real estate, and construction.

2.1 Overview of Route Selection Process

The phases of the route selection process detailed in this study are as follows:

1. Route Review - The Routing Team collected new data and reviewed the MISO designated route and identified areas where "pinch points or new data may preclude the placement of a new transmission line.
2. Stakeholder and Public Meetings - ATXI held 5 community Resource Forums across the Project Area in June 2024 and one round of public landowner meetings in each count in August 2024 to provide information about the project and solicit information about the proposed routes.
3. Final Route Development - A final route was developed based on feedback from stakeholders and members of the public. An attempt was made to minimize impacts to sensitivities while adhering the MISO bid award.

2.2 Route Review Process

2.2.1 Denny to Zachary Segment

The Denny to Zachary Segment largely follows an existing 161 kV line from Fairport Substation in DeKalb County to Locust Creek Substation in Sullivan County, then continues east to Zachary Substation in Adair County. For purposes of explaining the Denny to Zachary Segment, it was divided into six geographic sections which in some cases have both overall options (Figure 2-1). Table 2-1 describes the routes in general.

Figure 2-1 Denny to Zachary Segment by Section

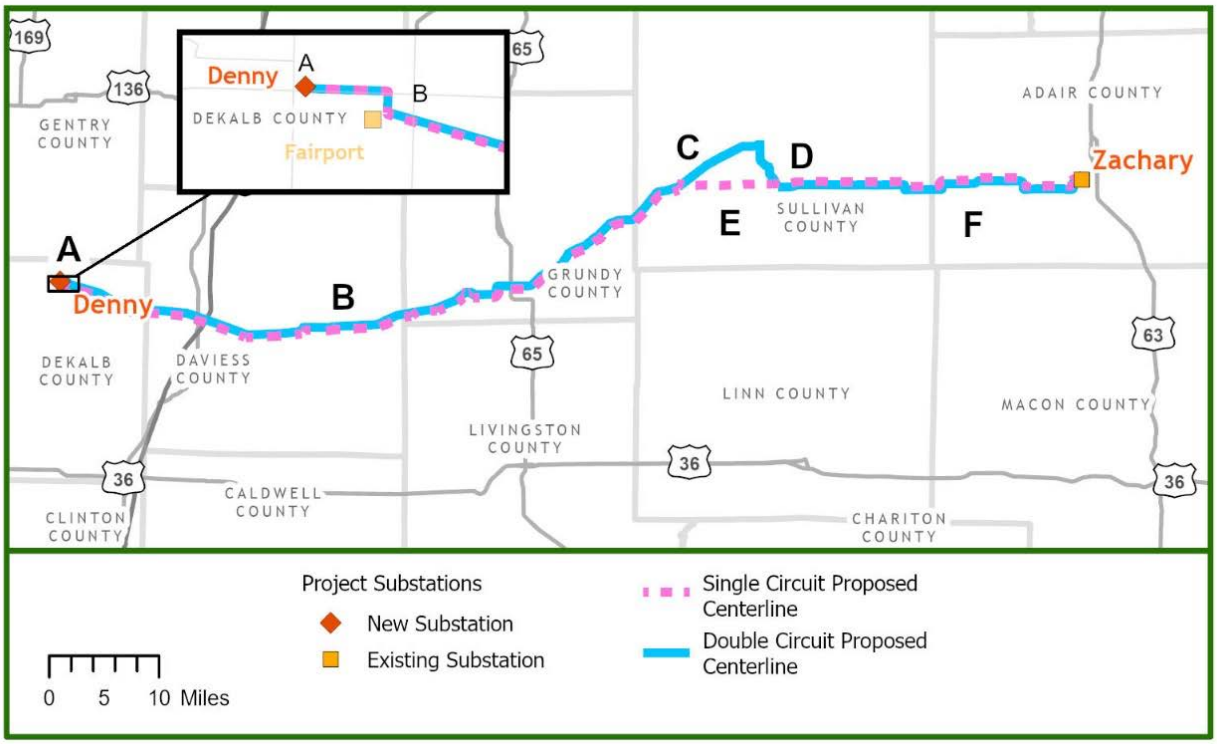


Table 2-1 Denny to Zachary Segment Description by Section

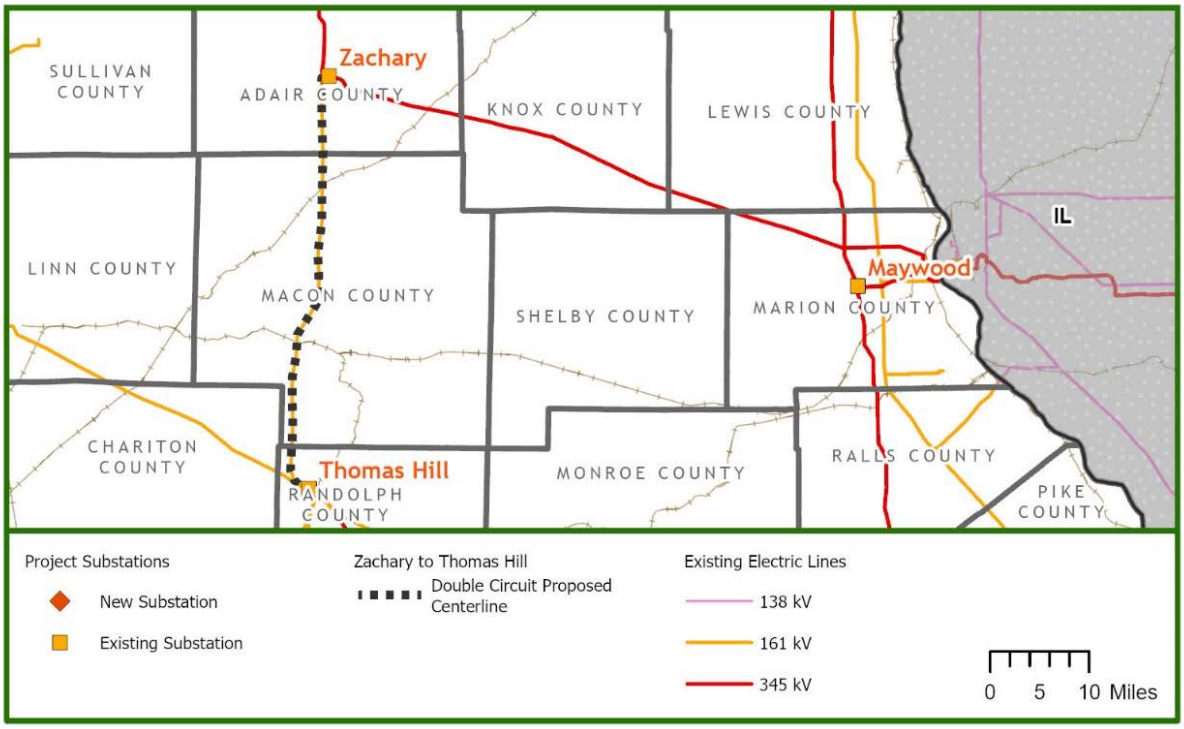
Section	Length (miles)	Description
A	0.90	Double circuit from new Denny Substation to a point east of Fairport where it meets the existing AECI 161 kV line
B-SC	61.36	Single circuit proposed route would follow the existing AECI 161 kV line from just east of Fairport Substation to a point where the proposed route crosses State Highway W northeast of Humphreys, Missouri in Sullivan County.
B-DC	61.24	The proposed route would double circuit with the existing AECI 161 kV line from just east of Fairport Substation to a point where the proposed route crosses State Highway W northeast of Humphreys, Missouri in Sullivan County.
C	8.55	Double circuit proposed route that continues to rebuild the existing AECI 161 kV line northeast up to just south of AECI's Locust Creek Substation.
D	4.02	The proposed route would double circuit with AECI's proposed 161 kV line from just south of Locust Creek Substation to a point 1.30 miles east-northeast of the intersection by state highway 5 and 6 in in Township in Sullivan County
E	8.68	Single circuit greenfield proposed route that runs to the east and eliminates going up to Locust Creek Substation. Would replace Section C and D.
F-SC	24.81	Single circuit proposed route would follow the north side of AECI's proposed 161 kV line east to Zachary Substation.
F-DC	24.71	The proposed route would double circuit with AECI's proposed 161 kV line east to Zachary Substation.

The initial routing found several areas where a deviation from the existing 161 kV line may be needed to minimize potential impacts to sensitivities. These areas were reviewed in more detail with updated sensitivities and opportunities as available. A larger study area was developed in the theses areas to encompass possible route options.

2.2.2 Zachary to Thomas Hill Segment

The Zachary to Thomas Hill Segment will add a 345 kV circuit on replaced 161 kV structures line from Zachary to Thomas Hill (Figure 2-2). No route deviations were identified in the initial route review

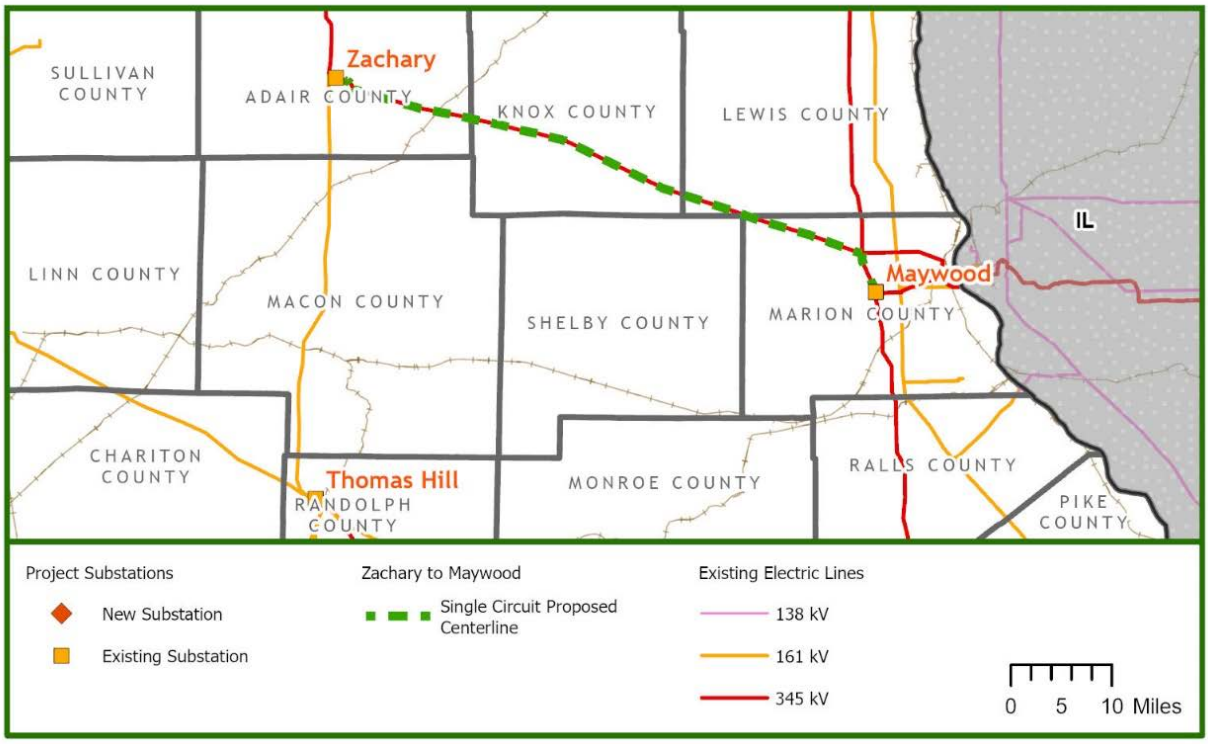
Figure 2-2 Zachary to Thomas Hill Segment



2.2.3 Zachary to Maywood Segment

The Zachary to Maywood Segment will largely follow an existing 345/161 kV line southeast from Zachary on the south side then an existing 345 kV line south into Maywood Substation (Figure 2-3). No route deviations were identified in the initial route review.

Figure 2-3 Zachary to Maywood Segment

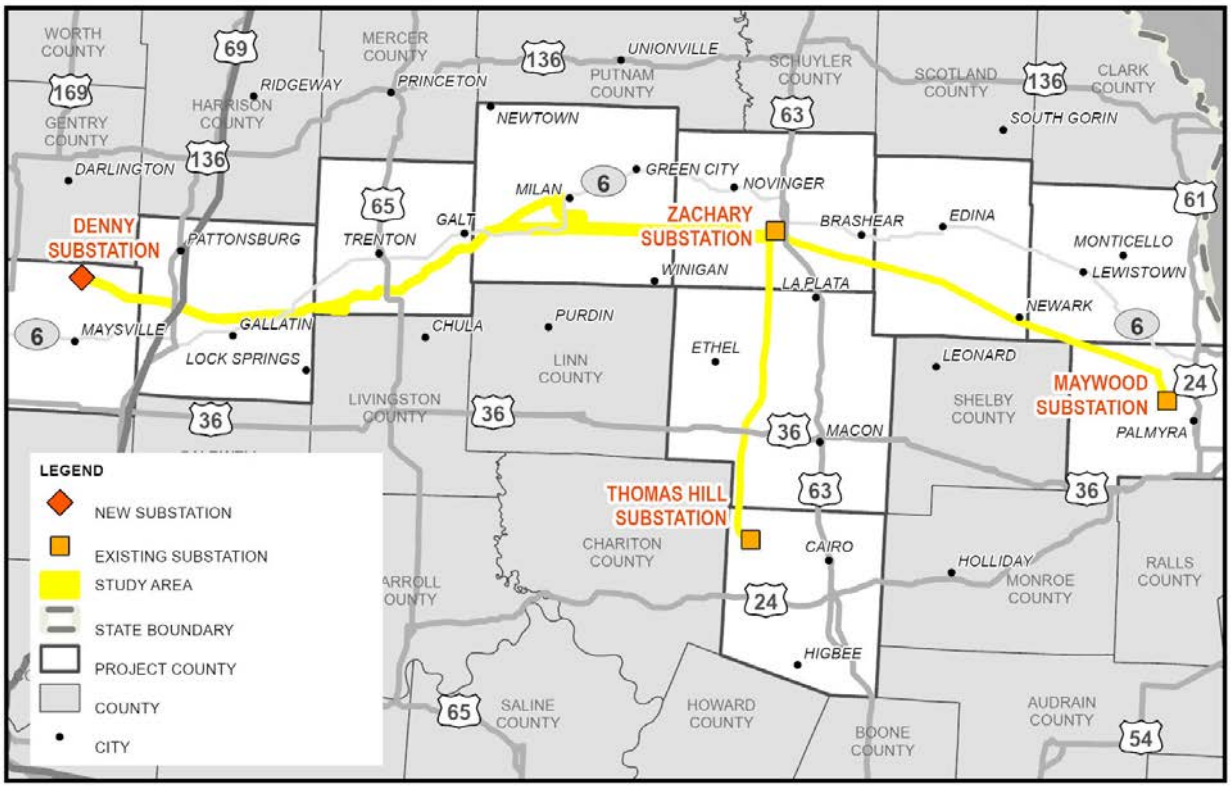


2.3 Stakeholder and Public Landowner Meetings

After MISO selected Ameren to build the Project 10 facilities, Ameren implemented a stakeholder and landowner engagement plan that included stakeholder meetings and public landowner meetings. Community Resource Forums were held in June 2024 in five locations across the Project area. These meetings involved local governmental and agency representatives. An overall study area was displayed (Figure 2-4), and attendees were asked to provide information that could help ATXI refine the route.

In August 2024, landowners in the Study Area were invited to a series of meetings (one day, two meetings in each county) to learn more about the project and provide feedback on the general study area and potential routes. Information provided at these meetings were used to refine the routes and develop a final route as described in this routing study. The engagement summary attached to Leah Dettmer's testimony describes the meeting in further detail.

Figure 2-4 Northern Missouri Phase 2 Study Area

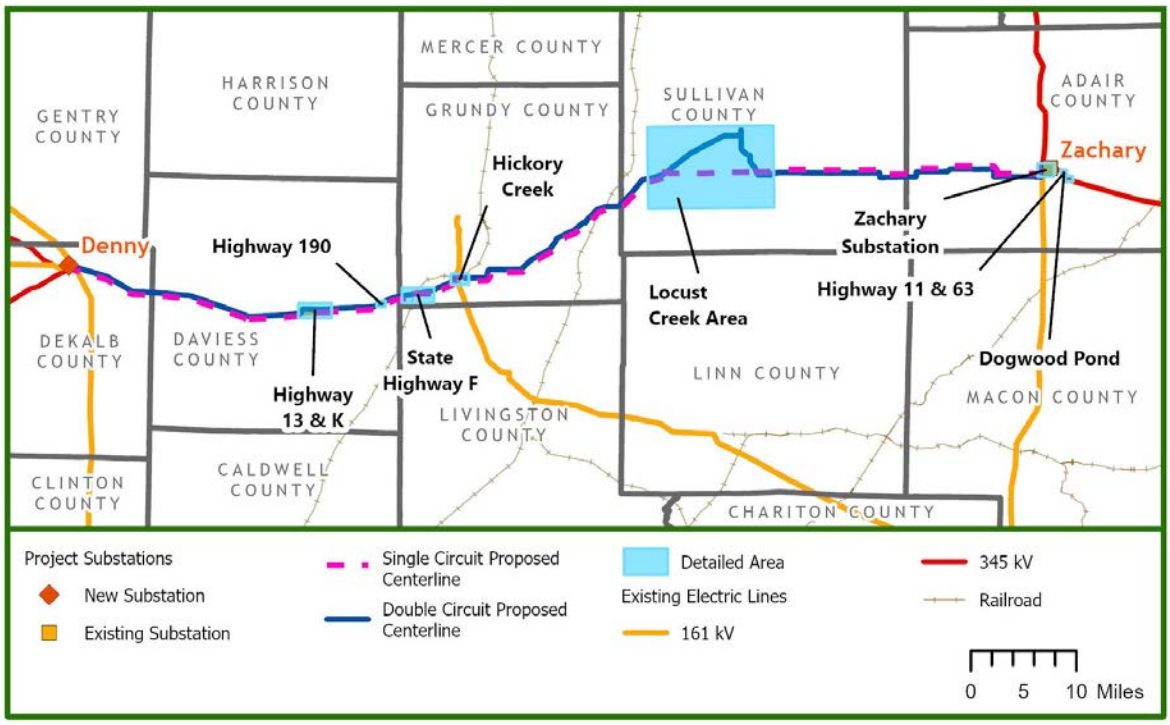


2.4 Final Route Development

2.4.1 Denny to Zachary Segment

The next step in the routing process is to identify final route options. New data and comments from the CRFs and open house meetings were considered, and final route options were developed that minimized impacts to sensitivities. The common theme from the public landowner open house was the desire to minimize additional right-of-way and co-locate or double circuit with the existing 161 kV line from Denny to Locust Creek and work with AECI to share right-of-way with their new 161 kV line from Locust Creek to Zachary. Developing the Segment as a double circuit line versus an adjacent single circuit (per the MISO order) would result in a reduction of new right-of way acres by 66%. Based on this feedback a single circuit and double circuit options were developed - a single circuit option that would follow the existing 161 kV line as much as feasible and a double circuit option that would combine the existing 161 kV line with the new 345 kV line on new structures as much as feasible. Generally, the south side of the existing line was identified as the least impactful and most feasible side to build both the single (offset by 125 feet) and double circuit options (offset by 25 feet). Within Section B, there are six areas where potential impacts to sensitivities or infrastructure placement required additional review and possible deviation from MISO defined route (Figure 2-5).

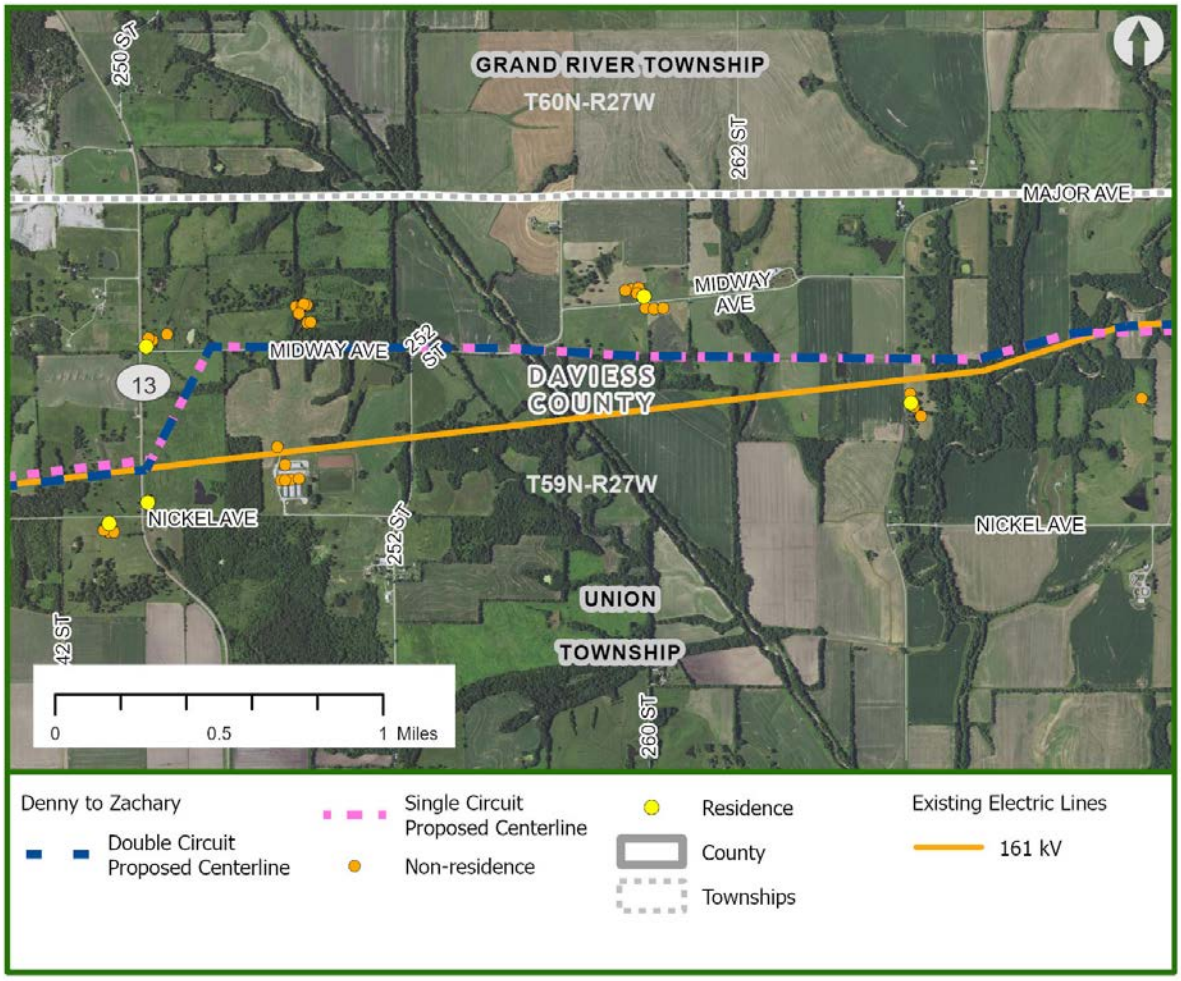
Figure 2-5 Denny to Zachary Segment Detailed Areas



STATE HWY 13 RE-ROUTE

About 0.5 miles east of State Hwy 13 and about 2 miles northeast of Gallatin, the existing line crosses through a hog operation with a small barn 65 feet to the north and a larger barn 180 feet to the south (Figure 2-6). Adding a new line would result in at least one structure in the new ROW. The hog operation also has more stringent access requirements which may make maintenance through this area more difficult. The Routing team identified a route alternative which would avoid the hog operation property. Just east of State Hwy 13, the proposed Route would turn northeast for 0.4 miles to the north side of Midway Ave, then turn east following Midway Ave on the north side for about 1 mile crossing over Muddy Creek. At this point the Hwy 13 Proposed Route would continue generally east for 1.7 miles before rejoining the existing 161 kV line just east of Brushy Creek. The Hwy 13 Proposed Route would increase the length by 0.2 miles and three homes are within 1,000 (1 at 700 ft and 2 at 1,000 ft.) The existing line has one home about 375 feet and would require a structure to be move or demolished. Because this route alternative is to the north, the Proposed Route would transition to the north side of the existing line 5 miles to the west. This would also minimize impacts to farmstead near State Highway MM and 223rd St.

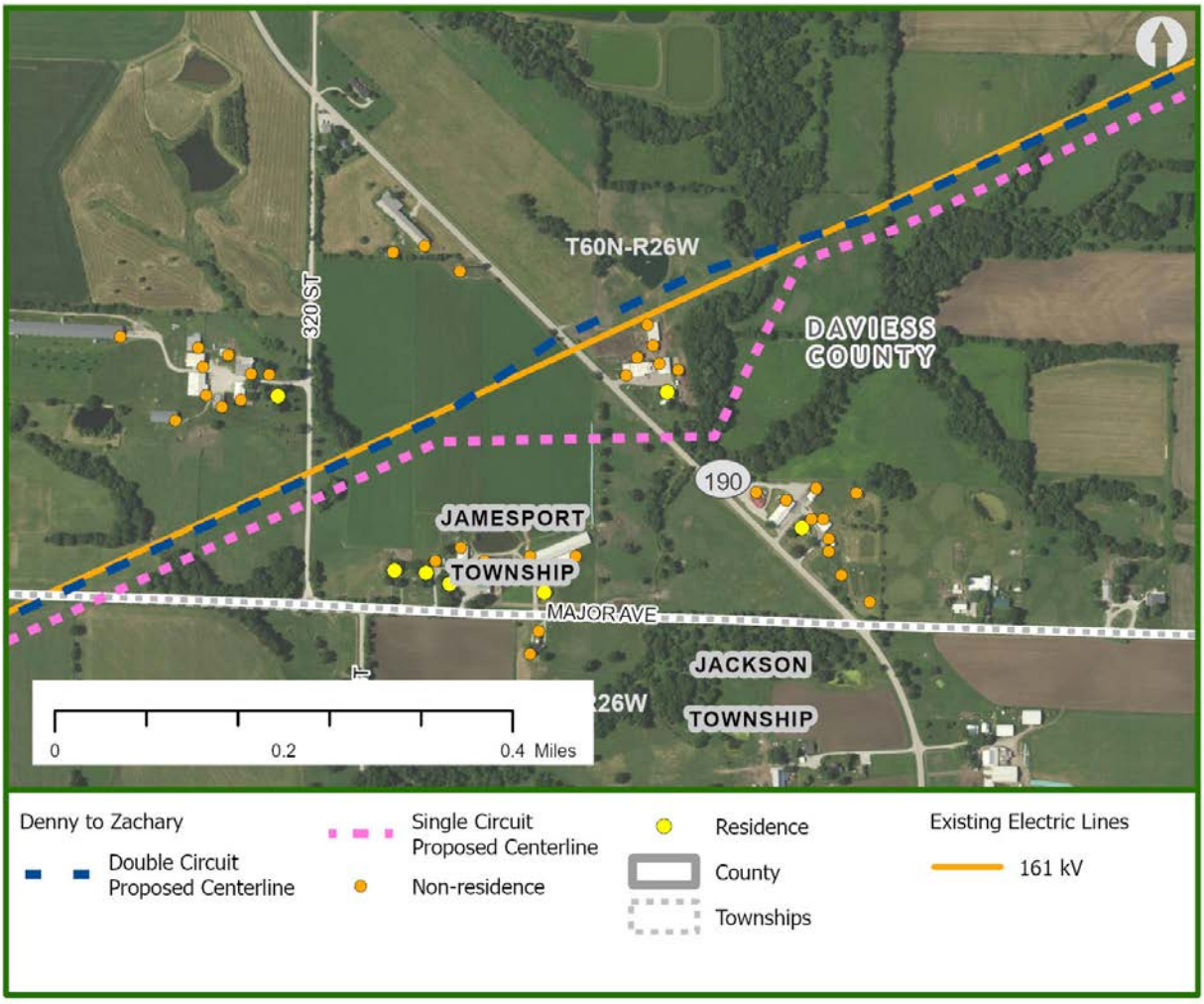
Figure 2-6 State Highway 13 Re-route Detailed Area



STATE HWY 190 RE-ROUTE

Just after crossing State Hwy 190, south of Jamesport, MO in the existing line runs through a livestock operation and is approximately 35 feet north of barn (Figure 2-7). The DZ SC Option would force the removal of at least two or more buildings, therefore, the single circuit option would be routed around the livestock operation to the south, crossing Hwy 190 about 600 feet south of the existing 161 kV line, then routed back north to meet back with the existing line about 1,000 feet east of Hwy 190. The DZ DC Option would shift the lines to the north about 75 feet to provide more clearance from the existing buildings.

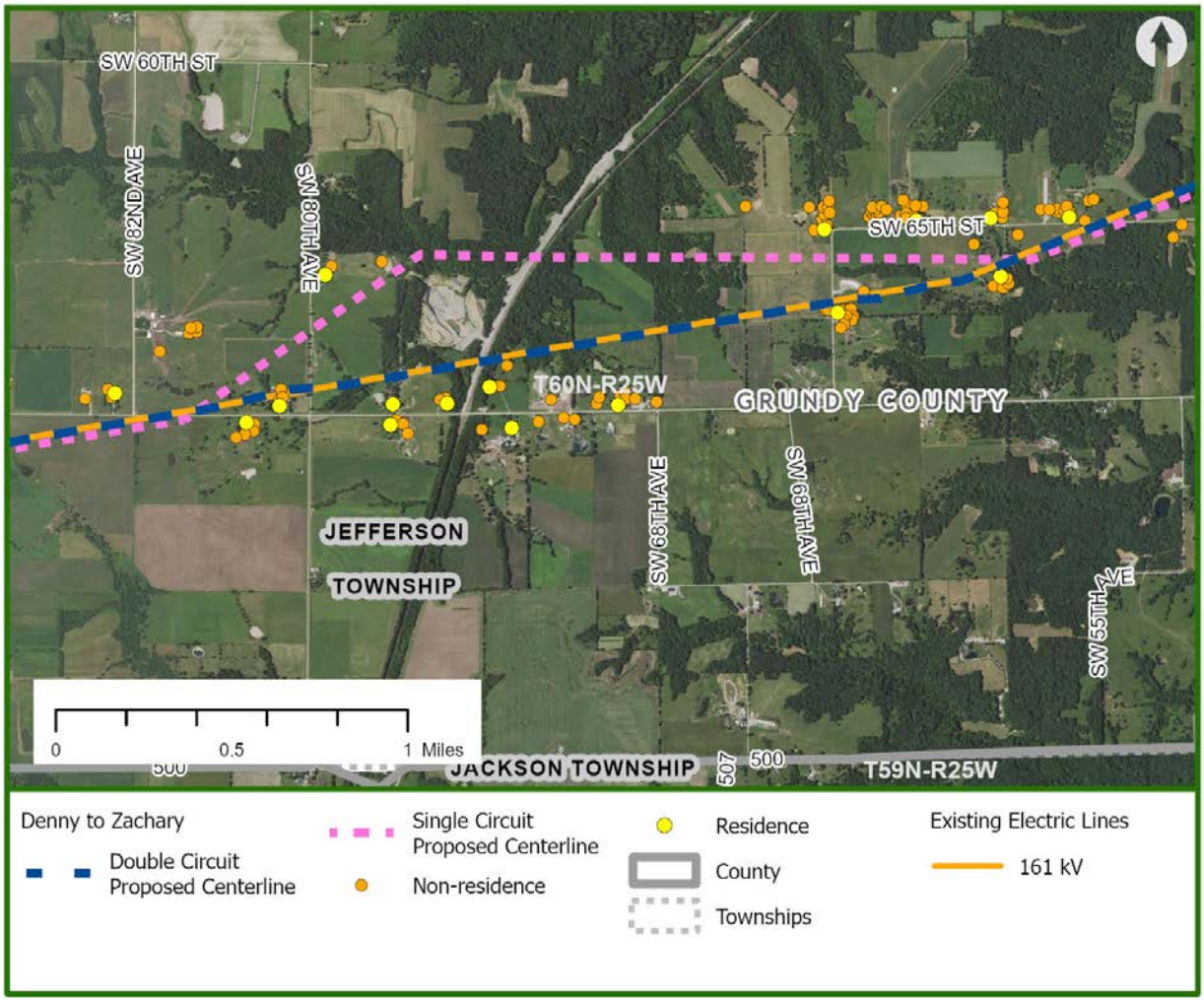
Figure 2-7 State Highway 190 Re-route Detailed Area



STATE HIGHWAY F RE-ROUTE

Just after the Proposed Route crosses State Hwy F in Jefferson Township, the existing line crosses a farmstead where a farm building is located 80 feet to the north and a residence is located 45 feet to the south (Figure 2-8). Adding a new line would result in at least one structure or residence in the new ROW. The Routing team identified a route alternative which would avoid impacting this property and would minimize impacts to several properties to the east. At the crossing of Hwy F, the DZ SC Option would turn south northeast across 2 properties for about 0.8 miles before turning east on the north side of a gravel quarry. The route would continue east cross-country for 1.7 miles before rejoining the existing line. The DZ DC Option would continue to follow the existing line but would shift to the north about 50 feet to avoid impacts on the residence. Farther to the east, just east of 65th St SW, the double circuit option would shift to the south up to 90 feet to avoid an existing livestock building.

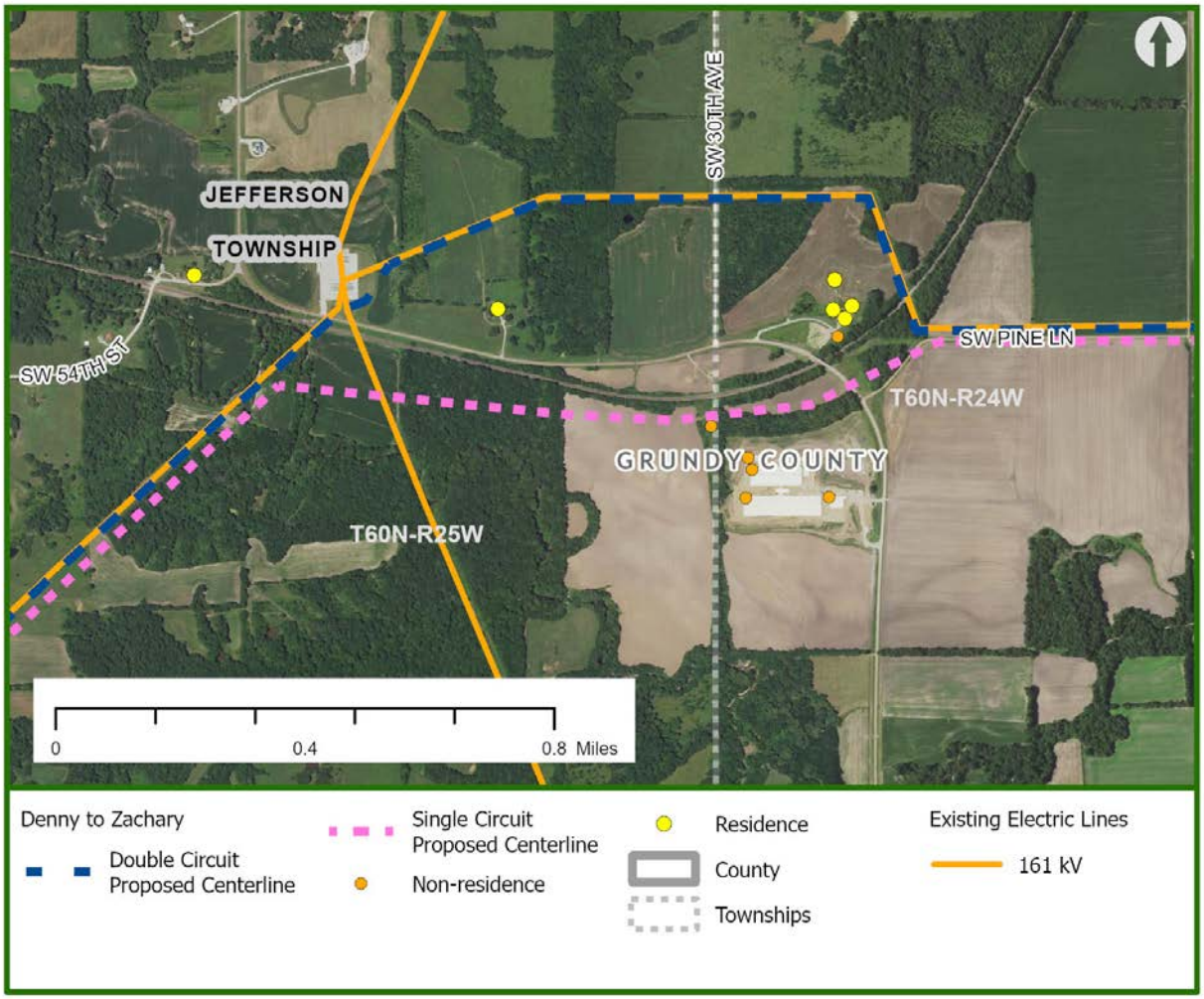
Figure 2-8 State Highway F Re-route Detailed Area



HICKORY CREEK SUBSTATION RE-ROUTE

After connecting to the Hickory Creek Substation just north of State Hwy W and Union Pacific Railroad in Jefferson Township, Grundy County, the existing 161 kV line continues north then east then back south across the Union Pacific Railroad before turning east (Figure 2-9). The Proposed 345 kV line does not connect with the Hickory Creek Substation, so to avoid multiple crossings on the railroad, an alternative was developed that turns east before crossing the railroad and follows the railroad east then northeast for 1.1 miles before rejoining the existing 161 kV line. The alternative would eliminate two railroad crossings, be 0.25 miles shorter, but may also impact more wetlands. The Proposed Double Circuit Route would continue to double circuit with the existing line.

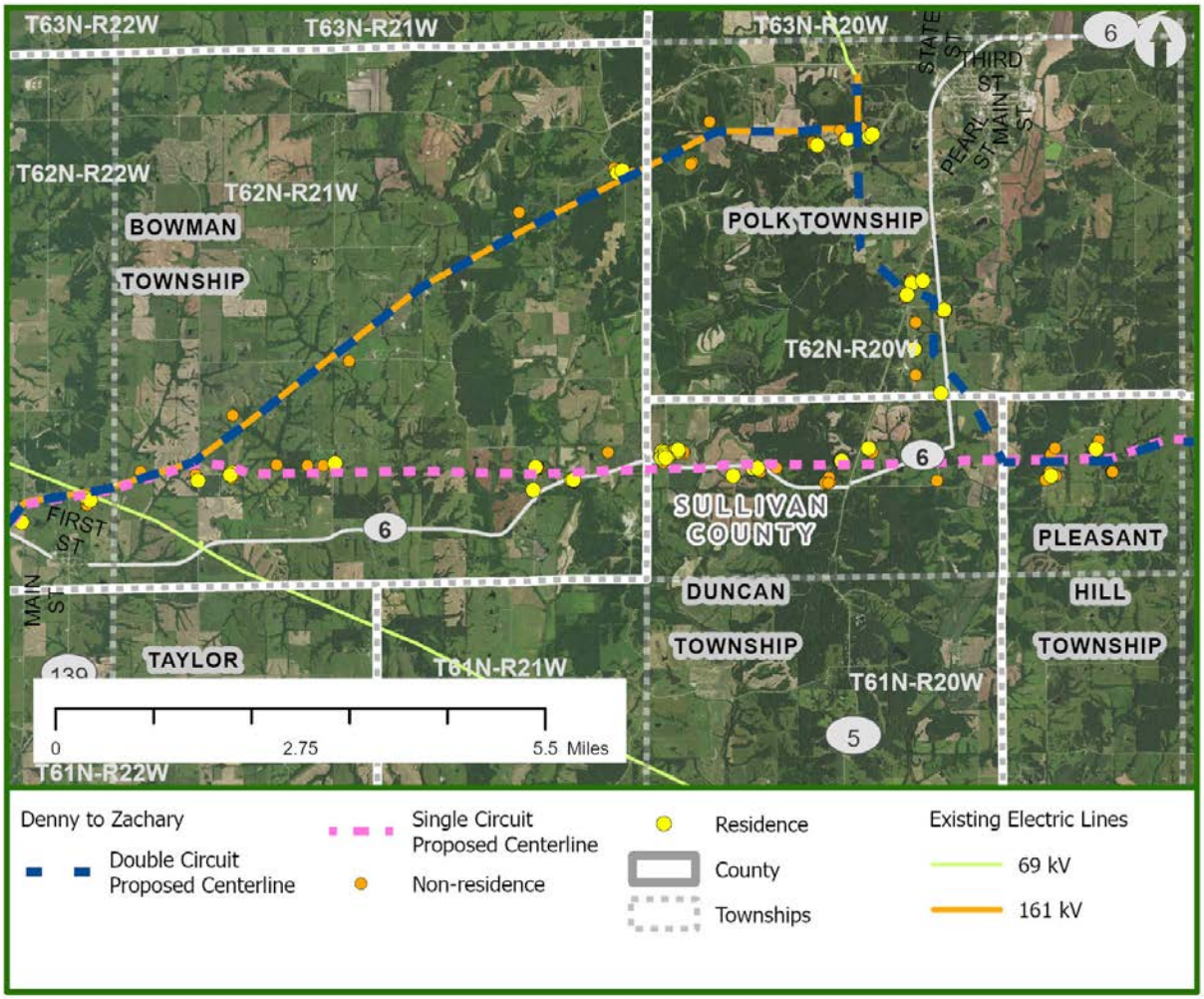
Figure 2-9 Hickory Creek Re-route Detailed Area



LOCUST CREEK AREA

For the vast majority of the DZ Project, the Single Circuit and Double Circuit options are adjacent to each other. The largest areas where they are not adjacent is in Sullivan County southeast of Milan, MO (Figure 2-10). Just east of Highway W in Section XX of Bowman Township, 1.7 miles NE of Galt, MO, existing 161 kV line continues northeast up to Locust Creek Substation near Milan, MO. The Proposed Double Circuit Route option continues to double circuit with the existing 161 kV line to just south of Locust Creek Substation where it will then double circuit with a planned AECI lines that will runs from Locust Creek to Zachary. Because the Proposed Project does not need to connect to the Locust Creek Substation, the Proposed Single Circuit Route turns east in Bowman Township on a greenfield alignment for about 8.6 miles before rejoining with the Proposed Double Circuit Route and continuing east to Zachary Substation.

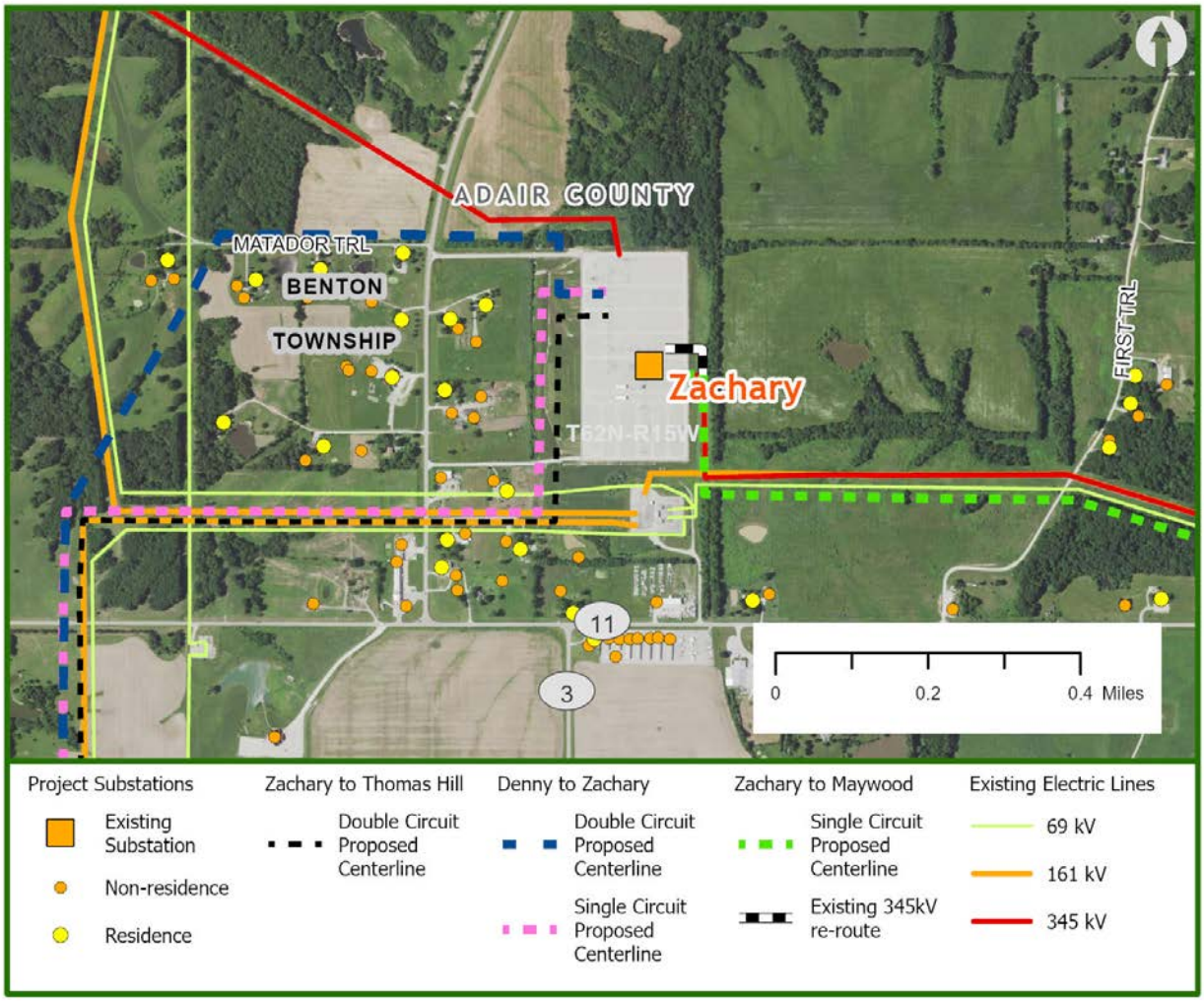
Figure 2-10 Locust Creek Area Detailed Area



ZACHARY SUBSTATION

East of Zachary Substation are a number of residences, building and existing transmission and distribution lines. The Proposed Single Circuit line would continue to follow the planned AECI line until just north of State Highway 11 where it would turn east in a double circuit configuration with an existing Ameren Missouri 161 kV line before turning north then into the Zachary Substation (Figure 2-11). The Proposed Double Circuit Route would continue to double circuit to the planned AECI line up and around to the north side of the Zachary Substation before turning south then into the substation.

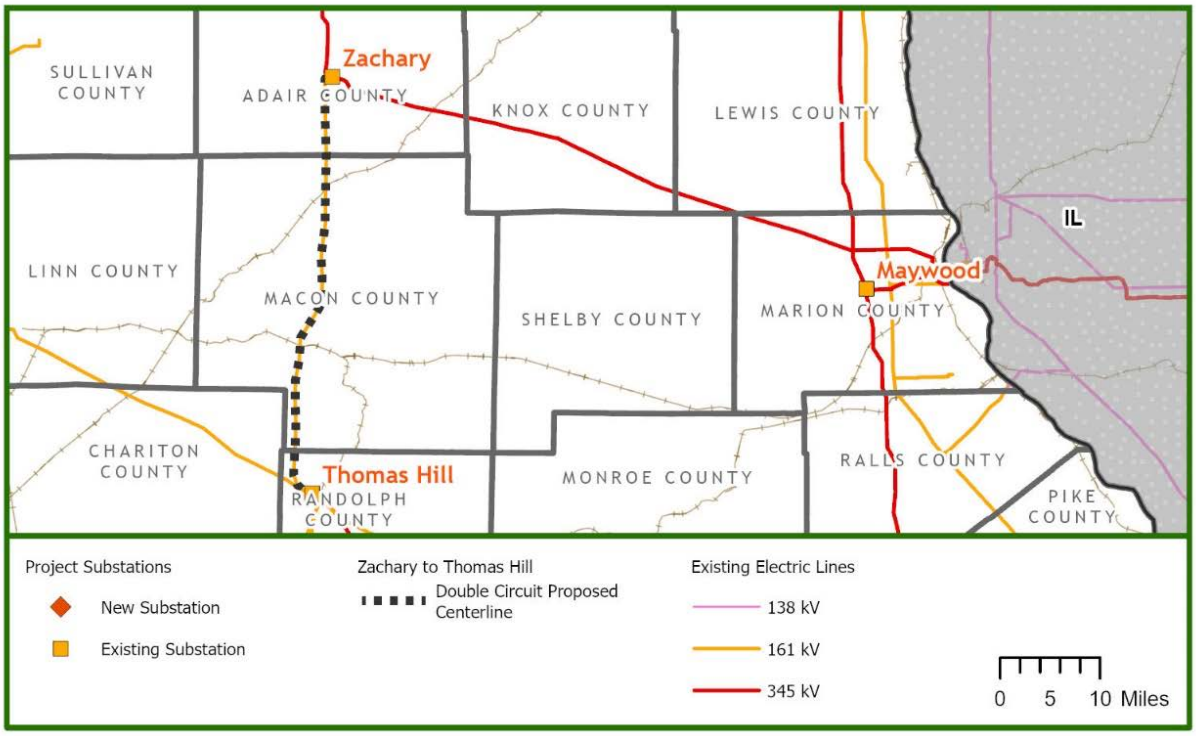
Figure 2-11 Zachary Substation Detailed Area



2.4.2 Zachary to Thomas Hill Segment

The Zachary to Thomas Hill Segment will double circuit and existing 161 kV line from Zachary to Thomas Hill. No route changes were identified in the final route review.

Figure 2-12 Zachary to Thomas Hill Segment Proposed Route



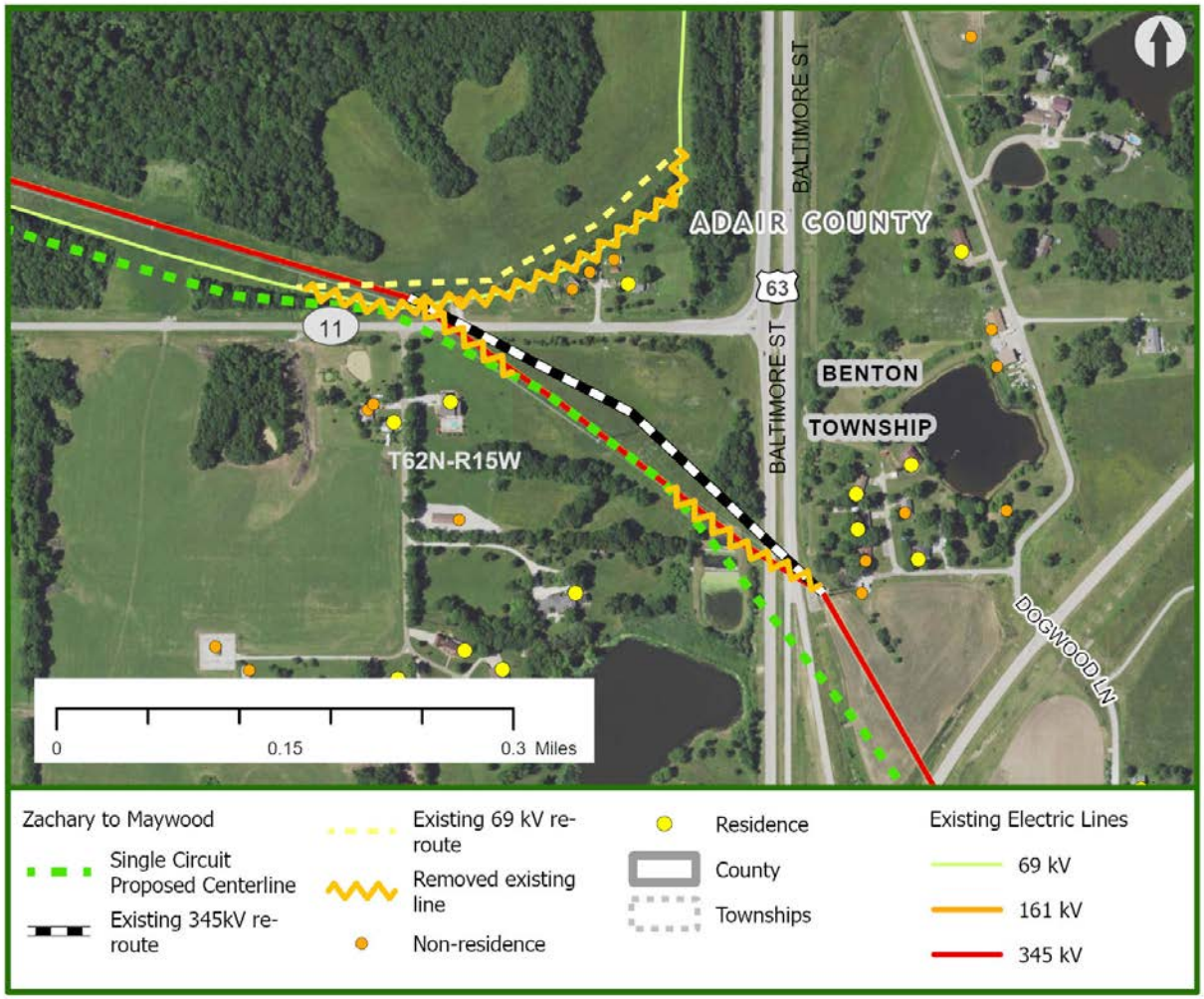
2.4.3 Zachary to Maywood Segment

The Zachary to Maywood Segment will largely follow an existing 345/161 kV line southeast from Zachary on the south side then an existing 345 kV line south into Maywood Substation. Landowner concerns expressed at the open houses in August prompted the Routing Team to review two areas around State Hwy 11 and US Hwy 63, south of Kirksville and east of Zachary Substation.

HWY 11/63 AREA

The existing 345/161 kV line runs diagonally through a parcel on the southeast corner of Hwy 1 and Hwy 63, north of a small subdivision. It crosses Hwy 63 and continues southeast. The initial route alignment on the south side of the existing line would place the new line within 80 feet of an existing home and it would cross 2 ponds. To minimize impacts to homes and provide a reasonable crossing of Hwy 63, the existing 345/161 kV line would be moved to the northeast 75-125 feet to allow for the new line to take over the alignment of the existing line in the parcel to the SW of the Hwy 11/63 intersection (Figure 2-13). This would result in a closest home being over 180 ft to the southeast and would eliminate crossing a pond west of Hwy 63.

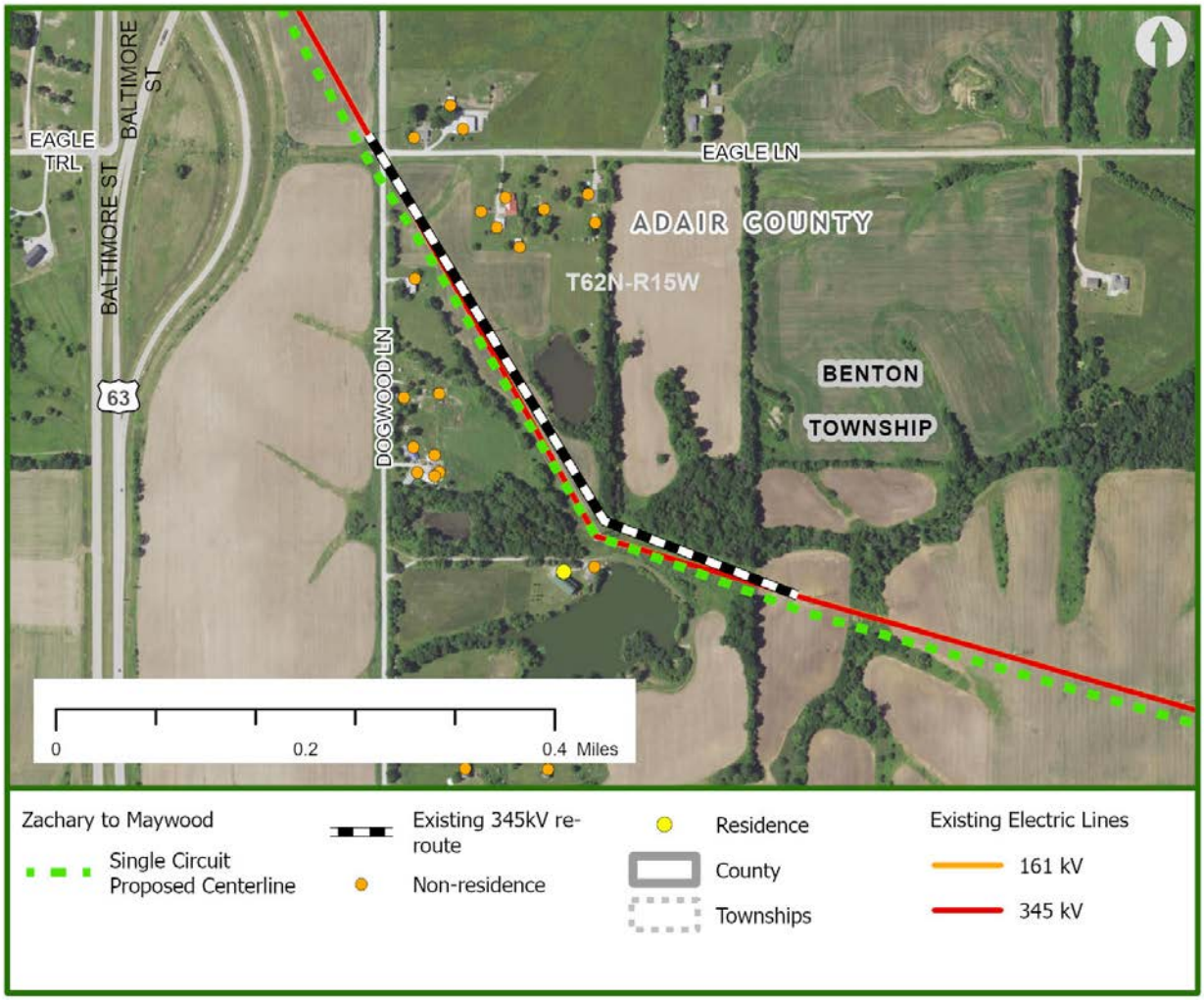
Figure 2-13 US Highway 63 Re-route Detailed Area



DOGWOOD LANE POND

The existing 345/161 kV line runs diagonally southeast through a parcel east of Dogwood Land then tuns east southeast. The initial route alignment on the south side of the existing line would place the new line within 65 feet of an existing house and over a pond east of Dogwood Lane. To minimize impacts to homes and the pond, the existing 345/161 kV line would be moved to the northeast 25-70 feet to allow for the new line to be placed southeast of it (Figure 2-14). This would result in the proposed route being about 110 feet northeast of the existing house and not crossing the pond.

Figure 2-14 Dogwood Lane Pond Re-route Detailed Area



3. Final Proposed Routes

3.1 Denny to Zachary Segment

Table 3-1 below describes the final proposed route options by section. The Proposed Single Circuit Route option (DZ-SC or Pink Option) includes sections A, B-SC, E-SC and F-SC. The Proposed Double Circuit Route option (DZ-DC or Blue Option) includes sections A, B-DC, C-DC, D-DC, and F-DC.

Table 3-1 Denny to Zachary Proposed Route by Section

Section	Length (miles)	Description
Denny to Zachary Segment		
A	0.90	The DZ-SC option would exit the new Denny Substation and travel east for approx. 0.7 miles in a double circuit configuration with an existing 69 kV line. Just east of the Fairport substation the proposed route would turn south for approx. 0.18-0.20 miles where it would intersect the existing AECI 161 kV line.
B-SC	61.36	The DZ-SC proposed route would then turn east following the existing AECI 161 kV line as single circuit line. The centerline would be 125 feet south of the existing lines and would continue for 17.1 miles before switching to the north side for 5 .1 miles. At State Highway 13, the DZ-SC route turns northeast for 0.4 miles, then turns east along Midway Ave for 1 mile. The route continues east cross-country for 1.8 miles before transitioning to the south side of the existing 161 kV line. From this point the proposed route follows the south side of the existing 161 kV line for 7.3 miles to State Highway F in Jefferson Township. The route then deviates from the existing line and turns northeast for 0.8 miles, then turns east for 1.75 miles back to the south side of the existing 161 kV line. The route continues along the south side of the existing 161 kV line for 2.5 miles before turning east just before the Hickory Creek substation and follows the south side of an existing railroad for about 1 mile where the route rejoins the existing 161 kV line. The route follows the 161 kV line on the south side for 22.7 miles to a point where the proposed route crosses State Highway W northeast of Humphreys, Missouri in Bowman Township, Sullivan County.
B-DC	62.42	The DZ-DC proposed route would then turn east double circuiting with the existing AECI 161 kV line. The centerline would be 25 feet south of the existing lines and would continue for 22.2 miles. At State Highway 13 the DZ-DC route deviates from the existing line and turns northeast for 0.4 miles, then turns east along Midway Ave for 1 mile. The route continues east cross-country for 1.8 miles before joining back with existing 161 kV line. From this point the proposed route continues as a double circuit for 26.1 miles to a point where the proposed route crosses State Highway W northeast of Humphreys, Missouri in Bowman Township, Sullivan County.
C-DC	8.55	The DZ-DC proposed route continues as a double circuit with the existing 161 kV line for 8.55 miles to just south of AECI's Locust Creek Substation in Polk Township in Sullivan County.
D-DC	4.26	The DZ-DC proposed route continues as a double circuit with AECI's proposed 161 kV line from just south of Locust Creek Substation to a point 1.30 miles

		east-northeast of the intersection of State Highway 5 and 6 in Duncan Township in Sullivan County
E-SC	8.68	The DZ-SC proposed route continues east from Section B as a greenfield, mainly cross-country route for 8.7 miles to a point 1.30 miles east-northeast of the intersection of State Highway 5 and 6 in Duncan Township in Sullivan County. This Section eliminates going up to Locust Creek Substation and would replace Section C and D.
F-SC	30.8	The DZ-SC proposed route continues east following the north side of AECI's planned 161 kV line east to a point 1.2 miles southeast of Zachary Substation. The route then turns north along the west side of an existing 161 kV line for 0.65 miles before turning east and double circuiting and existing 161 kV line for 0.6 miles, then turning north for 0.25 miles to the Zachary Substation.
F-DC	30.7	The DZ-DC proposed route continues east as a double circuit with AECI's planned 161 kV line for 29.9 miles to a point 0.5 miles to the east of the Zachary substation where the route intersects and existing 161 kV line. At this point the route will turn east and continue to double circuit the existing line for 0.5 miles before turning north for 0.25 miles to the Zachary substation.

3.1.1 Comparison of Options

ENGINEERING, AND CONSTRUCTION SUMMARY

Length

The length for the Proposed Routes ranges from 102 miles for the DZ-SC Single Circuit Route to 107 miles for the DZ-DC Route.

Right-of-Way Required

The new line will require a right-of-way of 150 feet. The DZ-SC option will be placed outside of existing transmission line rights-of-way, so a new 150 feet of right-of way will be needed. The DZ-DC option will overlap with existing AECI right-of-way so that an additional 50 feet of right-of-way will be needed. The DZ-DC option would encumber 33% less new right-of-way that the DZ-SC option.

Angle Structures

Angle structures were split into four categories: light angles (1–15 degrees), medium angles (15–35 degrees), medium angles (35–60 degrees), and heavy angles (>60 degrees). Typically, as the angle of the turn at a structure increases, a larger structure and foundation diameter will be required. Because the options both generally follow the existing 161 kV line, the number of angle structures is similar.

Infrastructure Crossings

Existing infrastructure crossings (e.g., pipelines, railroads, roads, and transmission lines) will require permits or agreements with the owners and may require additional engineering and construction requirements at each crossing. Because the options both generally follow the existing 161 kV line, the number of angle structures is similar.

EXISTING OPPORTUNITY USE

Existing Linear Infrastructure and Right-of-Way

Paralleling existing linear infrastructure typically provides an opportunity to minimize potential impacts to Sensitivities near the feature, as well as potentially minimize the amount of new ROW required. Both Proposed Routes follow existing transmission line infrastructure for most of the project length. Roads and railroads are also followed for short distances. The DZ-SC Single Circuit Route option follows existing or planned transmission lines for 93% of the length while the DZ-DC Option follows existing or planned transmission lines for 96% of the length. The DZ-DC Option would encumber 66% less new right-of-way.

Existing Divisions of Land

While paralleling other divisions of land, such as property lines and field lines, does not provide an opportunity to minimize the amount of new ROW required, it may still provide an opportunity to minimize potential impacts to Sensitivities. For example, placement of transmission structures along a field line may minimize impact to farming operations. When not following existing transmission lines the DZ-SC Route option follows existing divisions of land for 5.6 miles (80% of non-transmission sharing) while the DZ-DC Route Option follows for 2.39 miles (60% of non-transmission sharing).

RESIDENCES, NON-RESIDENTIAL STRUCTURES, AND LANDOWNERS

Residences

Residences were identified through aerial imagery interpretation, field review from public roads and from comments from stakeholders. No residences are located within the proposed right-of-way. There is one residence within 75-150 feet and nine within 150-300 feet for the DZ-DC Option, while the DZ-SC option has three residences within 75-150 and 15 within 150-300 feet. The DZ-SC option has more residences within 1,000 feet (102 vs 88) than the DZ-DC Option.

Non-Residential Structures

Residences were identified through aerial imagery interpretation, field review from public roads and from comments from stakeholders. Six non-residential structures are located within 75 feet of the DZ-DC Route Option, while the DZ-SC Route option has two structures within 75 feet. There are 16 structures on the DZ-DC Route and eight structures on the DZ-SC Route within 75-150 feet. Overall, both routes have over 300 non-residential structures within 1,000 feet. Non-residential structures are not typically allowed to remain within the ROW of a transmission line. Non-residential structures include farm buildings, small sheds, and barns.

Landowners and Parcels

The ROW for the DZ-SC Single Circuit Route covers 329 parcels with 258 unique landowners. The DZ-DC Route covers 386 parcels with 289 unique landowners.

MISCELLANEOUS LAND USE FEATURES

Airports and Navigational Aids

Airport and navigational aids facility initial information was obtained from the Federal Aviation Administration (FAA), AirNav, and Our Airports. The data from the FAA included public and FAA registered private airports, as well as the location of navigational aids. One private airport (Bogard-Cowgill Airport) is located within one mile of Section D of the DZ-DC Route near Milan, MO. A

VORTAC navigational air is located just over one mile to the southeast of the Proposed Routes, near the Zachary Substation.

Scenic Byways

The Proposed Routes do not cross any designated national or state scenic byways.

Cemeteries

Several cemeteries were identified with through parcel ownership, landmark databases and public comments. Three cemeteries are located within 1000 feet of both Proposed Routes.

Religious Facilities

There are no religious facilities within 1000 feet of the Proposed Routes.

Daycares

No licensed daycares are within1000 feet of the Proposed Routes. Information was reviewed from Missouri Department of Health and Senior Services and Homeland Information Foundation Level Data (HIFLD) data based were reviewed.

Golf Courses

No golf courses are within 1000 feet of the Proposed Routes.

Hospital / Medical Care Facility

No hospitals or medical care facilities are located within 1000 feet of the Proposed Routes.

Local Park or Recreation Land

No local parks or recreation land are within 1000 feet of the Proposed Routes

Schools

There are no schools located within 1000 feet of the Proposed Route.

Communication Towers

No communication towers are within 1000 ft of the Proposed Routes.

Mines and Quarries

There one active gravel mine or quarry adjacent to the Proposed Routes located three miles east of Jamesport in Jefferson Township, Grundy County.

Contaminated Sites

There are no known contaminated sites within 1000 feet of the Proposed Routes.

LAND COVER, LAND USE, AND PLANNED DEVELOPMENT

Land Cover

Land cover data from the USGS National Land Cover Dataset (NLCD) was used to assess the land cover types crossed by the Proposed Route. NLCD land cover classes were combined to form six general land cover classes, including aquatic environment, barren, cropland, developed, forested, and grassland. These classes also typically indicate the land uses crossed.

Forested land will require all trees will be cleared from the ROW. Permanent direct impacts to cropland will be limited to the foundation of the transmission line structures; however, indirect impacts such as restricting aerial application of pesticides or herbicides may also occur. Direct impacts to irrigation systems from the Project are discussed later. Permanent direct impacts to

grassland will be limited to the foundations of the transmission structures. An indirect impact would include potential burning restrictions that could inhibit grassland management practices. No impact to aquatic resources is expected since it is anticipated that no structures will be placed or work conducted within streams or waterbodies. Impacts to developed land cover would include the requirement for the removal of any existing structures and prohibition of the placement of any new structures within the ROW.

AGRICULTURE

U.S. Department of Agriculture Classified Farmland

Prime farmland is a designation by the U.S. Department of Agriculture (USDA) used to define land (soil) that has the best physical and chemical characteristics for producing food, feed, forage, fiber, and oil seed crops. “Prime farmland if drained” is soil that has the same characteristics as prime farmland if it has been drained, which is typically done through tile drainage systems. “Farmland of statewide importance” is farmland or unique farmland that is also highly productive but with physical and chemical characteristics that are not as good as prime farmland. “Unique farmland” is soil that 1) is used for a specific high-value food or fiber crop; 2) has a moisture supply that is adequate for the specific crop (the supply is from stored moisture, precipitation, or a developed-irrigation system); and 3) combines favorable factors of soil quality, growing season, temperature, humidity, air drainage, elevation, aspect, or other conditions, such as nearness to market, that favor the growth of a specific food or fiber crop.

The DZ-SC Route option has slightly more prime farmland and farmland of state importance but has less prime farmland if drained. Overall, the DZ-SC Route option has 20 less aces of designated farmland (less than 2% difference).

RESOURCE LANDS

Federal Lands

There are no federal resource lands within the vicinity of the Project.

Federal Easements

There are no known federal easements (e.g., United States Fish and Wildlife Service [USFWS] or USDA Wetland Reserve Program) crossed by or within ¼ mile of the Proposed Routes. The Proposed Routes may cross USDA Conservation Reserve Program (CRP) easements or Healthy Forests Reserve Program (HFRP); however, the location of those easements is unknown as the information is confidential without landowners providing their consent to the USDA to have the information released. ATXI real estate agents will coordinate with landowners along the route approved by the PSC to determine whether the route crosses any CRP or HFRP easements. ATXI will also coordinate with landowners and the USDA Farm Service Agency and USDA Natural Resource Conservation Service so that the construction of the transmission line will comply with easement requirements.

Missouri Department of Conservation Lands

The Proposed Routes do not cross any Missouri Department of Conservation Lands. Locust Creek Conservation Area, near Milan and Big Creek Conservation Area near Kirksville are within 0.25 mile of the Proposed Routes.

Missouri State Park land

There are no state park lands within 0.25 mile of the Proposed Routes. The closest state park is Thousand Hills State Park – 0.75 miles to the north of the Proposed Routes near Kirksville.

Local Conservation Land or Easements

There are no known local conservation lands or easements within 0.5 mile of the Proposed Routes.

Private Conservation or Recreation Lands

There is one private recreation land within 0.5 mile of the Proposed Routes. The Samual Ziegler Prairie Trust property is a Missouri Outdoor Recreational Access Program (MRAP) property and is 0.25 miles north of the Proposed Routes near Sticklerville in Sullivan County.

SENSITIVE HABITAT, CRITICAL HABITAT, AND PROTECTED SPECIES

Designated Critical Habitat

There is no designated critical habitat within 0.5 mile of the Proposed Routes.

Federal Threatened and Endangered Species

A review of the United States Fish and Wildlife (USFWS) Information for Planning and Consultation (IPaC) identified the following listed species as potentially affected by the Proposed Route: Gray bat, Indiana Bat, Northern long-eared bat, Tricolored bat, Monarch butterfly, Western regal fritillary, Eastern Prairie Fringed Orchid, and Mead's Milkweed. No critical habitat for these species has been identified near the Proposed Route. Once a route is approved by the Missouri Public Service Commission (PSC), ATXI will coordinate with USFWS regarding species or habitat surveys that may be required.

State Threatened and Endangered Species

Once the Route is approved by the PSC, ATXI will coordinate with MDC regarding necessary habitat surveys or best management practices that may be necessary to protect species and habitat.

HYDROLOGY

Wetlands

National Wetland Inventory mapped wetlands are located along creeks and streams that will be crossed by the Proposed Routes and in isolated basins. Based on an assumption of a maximum structure span of 1,000 feet, there may be several structures that may need to be placed in a wetland. ATXI will continue to coordinate with the U.S. Army Corps of Engineers (USACE) and will acquire any necessary permits for impacts to wetlands should they occur along the route approved by the PSC.

Streams and Waterbodies

Based on the National Hydrology Database, the DZ-DC Proposed Route crosses 197 named and unnamed streams while the DZ-SC Proposed Route crosses 189. Larger streams crossed include (from west to east) the Grand River, Thompson River Locust Creek and Chariton River and several unnamed tributaries. None of these streams are considered Outstanding State Resource Waters (rivers, lakes, watersheds) or Outstanding National Resource Watersheds, or Cold Water Fisheries.

Impaired Waters

Impaired waters are waters that have been determined to be too degraded or polluted to meet water quality standards. Both Proposed Routes cross five rivers (Thompson River, No Creek, Locust Creek, North Fork Locust Creek and Mussel Fork) that are considered an impaired water for E. Coli.

Crossing of impaired waters may require additional storm water management practices during construction.

Floodplain

Floodplain area are largely associated with the larger streams that cross the Proposed Routes from north to south. Several of the stream crossings may require structures be placed within defined floodplains. ATXI will coordinate with Missouri Emergency Management Agency (SEMA) and county floodplain administrators to determine whether floodplain permits will be required for the route approved by the PSC.

Sink Holes

According to Missouri Department of Geology no mapped sinkholes are within 1 mile of the Proposed Routes. Additional investigations will be completed prior to construction.

CULTURAL RESOURCES

National Register of Historic Properties

No National Register of Historic Places (NRHP) sites are within the ROW of the Proposed Routes. One site, Henry Cemetery is within 1 mile of Preferred Route – south of Reger in Sullivan County. ATXI will continue to consult with the Missouri SHPO to determine if additional surveys are required after the Proposed Route is approved by ATXI.

3.1.2 Selection of the Preferred Route

Table 3-2 provides a summary of the characteristics of the Proposed Route Options.

Table 3-2 Denny to Zachary Proposed Route Summary

Criteria Type	Routing Criterion	Measure (unit)		DZ-SC Single Circuit Route	DZ-DC Double Circuit Route
	Length	Miles		102	107
	Angle Structures	Light (1-15 deg.)	(count)	56	64
		Medium (15-30 deg.)		25	23
		Light Heavy (30-60 deg.)		15	14
		Heavy (>60 deg.)		15	19
Right-of-way	Total ROW needed	Area	(acreage)	1851	1928
	ROW Overlap with existing Transmission Lines			12	1309
	New ROW Encumbered			1839	619
Residence and Non-Residential Structures	Residences (distance interval from route centerline)	0-75’	(count)	0	0
		75-150’		3	1
		150-300’		15	9
		300-500’		24	26
		500-1,000’		102	88
	Non-Residential Structures	0-75’		2	6
	Landowners	Crossed by ROW		258	289
	Parcels			329	386
Miscellaneous Land Use Features	Religious Facilities and Cemeteries	Within 1000 feet	(count)	3	3
	Local Parks or Recreation Lands			3	3
	Mines & Quarries	Within 1000 feet		3	6
Land Cover	Aquatic Environment	Area within ROW	(acreage)	40	31
	Cropland			1266	1396

Criteria Type	Routing Criterion	Measure (unit)		DZ-SC Single Circuit Route	DZ-DC Double Circuit Route
	Developed			33	27
	Forested			431	376
	Grassland			7.6	12
Agriculture	USDA Classified Farmland	Prime Farmland	Area within ROW[1] (acreage)	185	168
		Prime Farmland if Drained		580	591
		Farmland of State Importance		559	573
		Total of all Farmland Classes		1324	1333
Resource Lands	MDC or DNR Lands	Crossed by ROW[1]	(count)	0	0
		Area Crossed by ROW	(acreage)	0	0
		Within 1 Mile of Route	(count)	3	3
Hydrology	Non-Forested Wetlands	Within ROW	(acreage)	41	40
	Forested Wetlands	Within ROW	(acreage)	29	20
	Streams	Crossed	(count)	186	194
	Floodplain (Special Flood Hazard Areas)	Acres by ROW	Area	171	176

The DZ-SC Single Circuit Option is the MISO approved option. The DZ-DC Option was added to minimize additional right-of-way requirements which was a major concern of public meeting attendees. The two route options are very similar. Major differences listed below are relatively minor:

- DZ-SC Route option is 4 miles shorter.
- DZ-DC Route Option needs 67% less new right-of-way (1839 vs 619 acres)
- DZ-SC Route Option crosses 15% less parcels
- DZ-SC Route Option has 16% more residences within 1000 feet.

3.2 Zachary to Thomas Hill Segment

The MISO approved segment is a rebuild and double circuit of an existing 161 kV line. No significant deviations or options were identified for this segment. The new facility will be built 25 feet to the west of the current line so existing right-of-way will be shared and new right-of-way will be limited.

ENGINEERING, AND CONSTRUCTION SUMMARY

Length

The length of the Proposed Route is 44 miles.

Right-of-Way Required

The new line will require a right-of-way of 150 feet. However, it will overlap with a portion of the existing 100 foot right-of-way so that an additional 50 feet of new easement will be required on the west side of the existing line

Angle Structures

Angle structures were split into four categories: light angles (1–15 degrees), medium angles (15–35 degrees), medium angles (35–60 degrees), and heavy angles (>60 degrees). Typically, as the angle of the turn at a structure increases, a larger structure and foundation diameter will be required. Because the options both generally follow the existing 161 kV line, the number of angle structures is similar.

Infrastructure Crossings

Existing infrastructure crossings (e.g., pipelines, railroads, roads, and transmission lines) will require permits or agreements with the owners and may require additional engineering and construction requirements at each crossing. Because segment will rebuild an existing line, no new crossings will be required.

EXISTING OPPORTUNITY USE

Existing Linear Infrastructure and Right-of-Way

Paralleling existing linear infrastructure typically provides an opportunity to minimize potential impacts to Sensitivities near the feature, as well as potentially minimize the amount of new ROW required. The Proposed Route will double circuit an existing line and use a portion of the existing ROW.

Existing Divisions of Land

While paralleling other divisions of land, such as property lines and field lines, does not provide an opportunity to minimize the amount of new ROW required, it may still provide an opportunity to minimize potential impacts to Sensitivities. The Proposed Route will double circuit an existing line and share ROW with that line.

RESIDENCES, NON-RESIDENTIAL STRUCTURES, AND LANDOWNERS

Residences

Residences were identified through aerial imagery interpretation, field review from public roads and from comments from stakeholders. No residences are located within the proposed right-of-way. There is one residence within 75-150 feet, five within 150-300 feet, seven within 300-500 feet and 24 within 500-1000 feet.

Non-Residential Structures

Residences were identified through aerial imagery interpretation, field review from public roads and from comments from stakeholders. One non-residential structure is located within 75 feet of the Proposed Route and 10 additional structures are located within 300 feet, while the DZ-SC Route option has two structures within 75 feet. Non-residential structures are not typically allowed to remain within the ROW of a transmission line. Non-residential structures include farm buildings, small sheds, and barns.

Landowners and Parcels

The Proposed Route will cross 156 parcels with 109 unique landowners.

MISCELLANEOUS LAND USE FEATURES

Airports and Navigational Aids

Airport and navigational aids facility initial information was obtained from the Federal Aviation Administration (FAA), AirNav, and Our Airports. The data from the FAA included public and FAA

registered private airports, as well as the location of navigational aids. No airports are within one mile of the Proposed Route, however, there is a VORTAC navigational aid for the Kirksville Airport one mile to the east of the Proposed Route, south of the Zachary Substation.

Scenic Byways

The Proposed Route do not cross any designated national or state scenic byways.

Cemeteries

Two known cemeteries are within 1000 feet of the Proposed Route but not within the ROW.

Religious Facilities

There are no religious facilities within 0.5 miles of the Proposed Routes.

Daycares

No licensed daycares are within 1000 feet of the Proposed Routes. Information was reviewed from Missouri Department of Health and Senior Services and Homeland Information Foundation Level Data (HIFLD) data based were reviewed.

Golf Courses

No golf courses are within 1000 feet of the Proposed Routes.

Hospital / Medical Care Facility

No hospitals or medical care facilities are located within 1000 feet of the Proposed Routes.

No local parks or recreation land are within 1000 feet of the Proposed Route

Schools

There are no schools located within 1000 feet of the Proposed Route.

Communication Towers

No communication towers are within 1000 ft of the Proposed Route.

Mines and Quarries

No active gravel mines or quarries are within 1000 feet of the Proposed Route.

Contaminated Sites

There are no known contaminated sites within 1000 feet of the Proposed Route.

LAND COVER, LAND USE, AND PLANNED DEVELOPMENT

Land Cover

Land cover data from the USGS National Land Cover Dataset (NLCD) was used to assess the land cover types crossed by the Proposed Route. NLCD land cover classes were combined to form six general land cover classes, including aquatic environment, barren, cropland, developed, forested, and grassland. These classes also typically indicate the land uses crossed.

Forested land will require all trees will be cleared from the ROW. Permanent direct impacts to cropland will be limited to the foundation of the transmission line structures; however, indirect impacts such as restricting aerial application of pesticides or herbicides may also occur. Direct impacts to irrigation systems from the Project are discussed later. Permanent direct impacts to grassland will be limited to the foundations of the transmission structures. An indirect impact would include potential burning restrictions that could inhibit grassland management practices. No impact

to aquatic resources is expected since it is anticipated that no structures will be placed or work conducted within streams or waterbodies. Impacts to developed land cover would include the requirement for the removal of any existing structures and prohibition of the placement of any new structures within the ROW.

AGRICULTURE

U.S. Department of Agriculture Classified Farmland

Prime farmland is a designation by the U.S. Department of Agriculture (USDA) used to define land (soil) that has the best physical and chemical characteristics for producing food, feed, forage, fiber, and oil seed crops. “Prime farmland if drained” is soil that has the same characteristics as prime farmland if it has been drained, which is typically done through tile drainage systems. “Farmland of statewide importance” is farmland or unique farmland that is also highly productive but with physical and chemical characteristics that are not as good as prime farmland. “Unique farmland” is soil that 1) is used for a specific high-value food or fiber crop; 2) has a moisture supply that is adequate for the specific crop (the supply is from stored moisture, precipitation, or a developed-irrigation system); and 3) combines favorable factors of soil quality, growing season, temperature, humidity, air drainage, elevation, aspect, or other conditions, such as nearness to market, that favor the growth of a specific food or fiber crop.

RESOURCE LANDS

Federal Lands

There are no federal resource lands within the vicinity of the Project.

Federal Easements

There are no known federal easements (e.g., United States Fish and Wildlife Service [USFWS] or USDA Wetland Reserve Program) crossed by or within 0.25 mile of the Proposed Routes. The Proposed Routes may cross USDA Conservation Reserve Program (CRP) easements or Healthy Forests Reserve Program (HFRP); however, the location of those easements is unknown as the information is confidential without landowners providing their consent to the USDA to have the information released. ATXI real estate agents will coordinate with landowners along the route approved by the PSC to determine whether the route crosses any CRP or HFRP easements. ATXI will also coordinate with landowners and the USDA Farm Service Agency and USDA Natural Resource Conservation Service so that the construction of the transmission line will comply with easement requirements.

Missouri Department of Conservation Lands

The Proposed Route crosses 1.25 miles of the Sugar Creek Conservation Area. An existing Ameren Missouri 161 kV line current crosses the conservation area and the Proposed Route will use the current easement. Big Creek CA is located 0.4 mile north of the Proposed Route as it turns south from Zachary Substation. Hidden Hollow CA is located less than 1 mile west of the Proposed Route near Elmer City. Thomas Hill CA is located 0.75 mile east of the Proposed Route near the south endpoint of the route at Thomas Hill Substation.

Missouri State Park land

There are no state park lands within 0.25 mile of the Proposed Route. The closest state park is Thousand Hills State Park – 0.75 miles to the north of the Proposed Route near Kirksville.

Local Conservation Land or Easements

There are no known local conservation lands or easements within 0.5 mile of the Proposed Routes.

Private Conservation or Recreation Lands

There are no private recreation lands within 0.5 mile of the Proposed Routes.

SENSITIVE HABITAT, CRITICAL HABITAT, AND PROTECTED SPECIES

Designated Critical Habitat

There is no designated critical habitat within 0.5 mile of the Proposed Routes.

Federal Threatened and Endangered Species

A review of the United States Fish and Wildlife (USFWS) Information for Planning and Consultation (IPaC) identified the following listed species as potentially affected by the Proposed Route: Gray bat, Indiana Bat, Northern long-eared bat, Tricolored bat, Monarch butterfly, Western regal fritillary and Mead's Milkweed. No critical habitat for these species has been identified near the Proposed Route. Once a route is approved by the Missouri Public Service Commission (PSC), ATXI will coordinate with USFWS regarding species or habitat surveys that may be required.

State Threatened and Endangered Species

Once the Route is approved by the PSC, ATXI will coordinate with MDC regarding necessary habitat surveys or best management practices that may be necessary to protect species and habitat.

HYDROLOGY

Wetlands

National Wetland Inventory mapped wetlands are located along creeks and streams that will be crossed by the Proposed Routes and in isolated basins. Based on an assumption of a maximum structure span of 1,000 feet, it is not expected that any structures will need to be placed in a wetland. ATXI will continue to coordinate with the U.S. Army Corps of Engineers (USACE) and will acquire any necessary permits for impacts to wetlands should they occur along the route approved by the PSC.

Streams and Waterbodies

Based on the National Hydrology Database, the Proposed Route crosses 79 named and unnamed streams. None of these streams are considered Outstanding State Resource Waters (rivers, lakes, watersheds) or Outstanding National Resource Watersheds, or Cold Water Fisheries. No transmission structures are anticipated to be placed in these waterbodies based on a maximum structure span of 1,000 feet.

Impaired Waters

Impaired waters are waters that have been determined to be too degraded or polluted to meet water quality standards. No streams crossed by the Proposed Route that are considered an impaired water for E. Coli. Crossing of impaired waters may require additional storm water management practices during construction.

Floodplain

Floodplain areas are largely associated with the larger streams that run parallel with the proposed Route. Only 35 acres of floodplain are located within the Proposed Route ROW. ATXI will coordinate with Missouri Emergency Management Agency (SEMA) and county floodplain administrators to determine whether floodplain permits will be required for the route approved by the PSC.

Sink Holes

Karst areas may be present in the Project Area and mapped sinkholes from 2018 Missouri Department of Geology identified one potential location within 1000 feet of the Proposed Route. Additional investigations will be completed prior to construction.

CULTURAL RESOURCES

National Register of Historic Properties

No National Register of Historic Places (NRHP) sites are within the ROW of the Proposed Routes. The closest site is a building in the city of Callao – over 1.8 miles to the east of the Proposed Route. ATXI will continue to consult with the Missouri SHPO to determine if additional surveys are required after the Proposed Route is approved by ATXI.

Table 3-3 provides a summary of the characteristics of the Proposed Route.

Table 3-3 Zachary to Thomas Hill Proposed Route Summary

Criteria Type	Routing Criterion	Measure (unit)		Proposed Route
	Length	Miles		44
	Angle Structures	Light (1-15 deg.)	(count)	42
		Medium (15-30 deg.)		4
		Light Heavy (30-60 deg.)		1
		Heavy (>60 deg.)		3
Right-of-way	Total ROW needed	Area	(acreage)	800
	ROW Overlap with existing Transmission Lines			533
	New ROW Encumbered			267
Residence and Non-Residential Structures	Residences (distance interval from route centerline)	0-75’	(count)	1
		75-150’		1
		150-300’		7
		300-500’		7
		500-1,000’		35
	Non-Residential Structures	0-75’		1
	Landowners	Crossed by ROW		152
	Parcels			222
Miscellaneous Land Use Features	Religious Facilities and Cemeteries	Within 1000 feet	(count)	2
	Local Parks or Recreation Lands			0
	Mines & Quarries	Within 1000 feet		0
Land Cover[1]	Aquatic Environment	Area within ROW	(acreage)	2.7
	Cropland			539
	Developed			9.4
	Forested			213
	Grassland			17
Agriculture	USDA Classified Farmland	Prime Farmland	Area within ROW[1] (acreage)	8.7
		Prime Farmland if Drained		131
		Farmland of State Importance		158
		Total of all Farmland Classes		297
Resource Lands	MDC or DNR Lands	Crossed by ROW	(count)	1
		Area Crossed by ROW	(acreage)	22.7
		Within 1 Mile of Route	(count)	5
Hydrology	Non-Forested Wetlands	Within ROW	(acreage)	18
	Forested Wetlands	Within ROW	(acreage)	0.5
	Streams	Crossed	(count)	77
	Floodplain (Special Flood Hazard Areas)	Acres by ROW	Area	35

[1] – Land cover data was obtained from the National Use Land Cover (NLCD). Aquatic environment classes include Emergent Herbaceuous Wetlands, woody wetlands and surface water classes. Cropland classes include cultivated crops and hay field or other agricultural classes. Grassland classes include herbaceous lands. Forested classes include deciduous, coniferous, upland and partial canopy, and floodplain forest. Developed classes include high density, low / medium density, and urban open space. Barren class represents barren lands.

3.3 Zachary to Maywood Segment

The MISO approved segment follows an existing ATXI/AECI 345/161 kV line or an existing Ameren Missouri 345 kV line. No significant deviations or options were identified for this segment. The new facility will be built 60 to 75 feet to the west of the current line so existing right-of-way will be shared and new right-of-way will be limited.

ENGINEERING, AND CONSTRUCTION SUMMARY

Length

The length of the Proposed Route is 60 miles.

Right-of-Way Required

The new line will require a right-of-way of 150 feet. However, it will overlap with a portion of the existing 150 foot right-of-way so that an additional 35 feet of new easement will be required on the south/west side of the existing line

Angle Structures

Angle structures were split into four categories: light angles (1–15 degrees), medium angles (15–35 degrees), medium angles (35–60 degrees), and heavy angles (>60 degrees). Typically, as the angle of the turn at a structure increases, a larger structure and foundation diameter will be required.

Infrastructure Crossings

Existing infrastructure crossings (e.g., pipelines, railroads, roads, and transmission lines) will require permits or agreements with the owners and may require additional engineering and construction requirements at each crossing.

EXISTING OPPORTUNITY USE

Existing Linear Infrastructure and Right-of-Way

Paralleling existing linear infrastructure typically provides an opportunity to minimize potential impacts to Sensitivities near the feature, as well as potentially minimize the amount of new ROW required. The Proposed Route will follow and share ROW with an existing transmission line.

Existing Divisions of Land

While paralleling other divisions of land, such as property lines and field lines, does not provide an opportunity to minimize the amount of new ROW required, it may still provide an opportunity to minimize potential impacts to Sensitivities. The Proposed Route will follow and share ROW with an existing transmission line.

RESIDENCES, NON-RESIDENTIAL STRUCTURES, AND LANDOWNERS

Residences

Residences were identified through aerial imagery interpretation, field review from public roads and from comments from stakeholders. No residences are located within the proposed right-of-way. There is one residence within 75-150 feet, five within 150-300 feet, seven within 300-500 feet and 24 within 500-1000 feet.

Non-Residential Structures

Residences were identified through aerial imagery interpretation, field review from public roads and from comments from stakeholders. One non-residential structure is located within 75 feet of the Proposed Route and 10 additional structures are located within 300 feet. , while the DZ-SC Route

option has two structures within 75 feet. Non-residential structures are not typically allowed to remain within the ROW of a transmission line. Non-residential structures include farm buildings, small sheds, and barns.

Landowners and Parcels

The Proposed Route will cross 264 parcels with 171 unique landowners.

MISCELLANEOUS LAND USE FEATURES

Airports and Navigational Aids

Airport and navigational aids facility initial information was obtained from the Federal Aviation Administration (FAA), AirNav, and Our Airports. The data from the FAA included public and FAA registered private airports, as well as the location of navigational aids. One airport – Harrison Airport near Shelton, MO is within one mile of the Proposed Route, In addition, , there is a VORTAC navigational aid for the Kirksville Airport one mile to the south of the Proposed Route, south of the Zachary Substation.

Scenic Byways

The Proposed Route do not cross any designated national or state scenic byways.

Cemeteries

Two known cemeteries are within 1000 feet of the Proposed Route but not within the ROW.

Religious Facilities

There are no religious facilities within 0.5 miles of the Proposed Routes.

Daycares

No licensed daycares are within 1000 feet of the Proposed Routes. Information was reviewed from Missouri Department of Health and Senior Services and Homeland Information Foundation Level Data (HIFLD) data based were reviewed.

Golf Courses

No golf courses are within 1000 feet of the Proposed Routes.

Hospital / Medical Care Facility

No hospitals or medical care facilities are located within 1000 feet of the Proposed Routes.

No local parks or recreation land are within 1000 feet of the Proposed Route

Schools

There are no schools located within 1000 feet of the Proposed Route.

Communication Towers

No communication towers are within 1000 feet of the Proposed Route.

Mines and Quarries

No active gravel mines or quarries are within 1000 feet of the Proposed Route.

Contaminated Sites

There are no known contaminated sites within 1000 feet of the Proposed Route.

LAND COVER, LAND USE, AND PLANNED DEVELOPMENT

Land Cover

Land cover data from the USGS National Land Cover Dataset (NLCD) was used to assess the land cover types crossed by the Proposed Route. NLCD land cover classes were combined to form six general land cover classes, including aquatic environment, barren, cropland, developed, forested, and grassland. These classes also typically indicate the land uses crossed.

Forested land will require all trees will be cleared from the ROW. Permanent direct impacts to cropland will be limited to the foundation of the transmission line structures; however, indirect impacts such as restricting aerial application of pesticides or herbicides may also occur. Direct impacts to irrigation systems from the Project are discussed later. Permanent direct impacts to grassland will be limited to the foundations of the transmission structures. An indirect impact would include potential burning restrictions that could inhibit grassland management practices. No impact to aquatic resources is expected since it is anticipated that no structures will be placed or work conducted within streams or waterbodies. Impacts to developed land cover would include the requirement for the removal of any existing structures and prohibition of the placement of any new structures within the ROW.

AGRICULTURE

U.S. Department of Agriculture Classified Farmland

Prime farmland is a designation by the U.S. Department of Agriculture (USDA) used to define land (soil) that has the best physical and chemical characteristics for producing food, feed, forage, fiber, and oil seed crops. “Prime farmland if drained” is soil that has the same characteristics as prime farmland if it has been drained, which is typically done through tile drainage systems. “Farmland of statewide importance” is farmland or unique farmland that is also highly productive but with physical and chemical characteristics that are not as good as prime farmland. “Unique farmland” is soil that 1) is used for a specific high-value food or fiber crop; 2) has a moisture supply that is adequate for the specific crop (the supply is from stored moisture, precipitation, or a developed-irrigation system); and 3) combines favorable factors of soil quality, growing season, temperature, humidity, air drainage, elevation, aspect, or other conditions, such as nearness to market, that favor the growth of a specific food or fiber crop.

RESOURCE LANDS

Federal Lands

There are no federal resource lands within the vicinity of the Project.

Federal Easements

There are no known federal easements (e.g., United States Fish and Wildlife Service [USFWS] or USDA Wetland Reserve Program) crossed by or within 0.25 mile of the Proposed Routes. The Proposed Routes may cross USDA Conservation Reserve Program (CRP) easements or Healthy Forests Reserve Program (HFRP); however, the location of those easements is unknown as the information is confidential without landowners providing their consent to the USDA to have the information released. ATXI real estate agents will coordinate with landowners along the route approved by the PSC to determine whether the route crosses any CRP or HFRP easements. ATXI will also coordinate with landowners and the USDA Farm Service Agency and USDA Natural

Resource Conservation Service so that the construction of the transmission line will comply with easement requirements.

Missouri Department of Conservation Lands

The Proposed Route crosses 225 feet of White Oak Bend Access near Newark, MO and 2025 feet of McPike Access near Naomi, MO. In both instances the new ROW will be an expansion of an existing ROW crossing. Henry Sever Lake Conservation Area is about 1 mile to the north near Newark, MO.

Missouri State Park land

There are no state park lands within 0.25 mile of the Proposed Route.

Local Conservation Land or Easements

There are no known local conservation lands or easements within 0.5 mile of the Proposed Routes.

Private Conservation or Recreation Lands

There are no private recreation lands within 0.5 mile of the Proposed Routes.

SENSITIVE HABITAT, CRITICAL HABITAT, AND PROTECTED SPECIES

Designated Critical Habitat

There is no designated critical habitat within 0.5 mile of the Proposed Routes.

Federal Threatened and Endangered Species

A review of the United States Fish and Wildlife (USFWS) Information for Planning and Consultation (IPaC) identified the following listed species as potentially affected by the Proposed Route: Gray bat, Indiana Bat, Northern long-eared bat, Tricolored bat, Monarch butterfly, Western regal fritillary and Mead's Milkweed. No critical habitat for these species have been identified near the Proposed Route. Once a route is approved by the Missouri Public Service Commission (PSC), ATXI will coordinate with USFWS regarding species or habitat surveys that may be required.

State Threatened and Endangered Species

Once the Route is approved by the PSC, ATXI will coordinate with MDC regarding necessary habitat surveys or best management practices that may be necessary to protect species and habitat.

HYDROLOGY

Wetlands

National Wetland Inventory mapped wetlands are located along creeks and streams that will be crossed by the Proposed Routes and in isolated basins. Based on an assumption of a maximum structure span of 1,000 feet, there are several areas along South Fabius Creek where structures may need to be placed in a wetland. ATXI will continue to coordinate with the U.S. Army Corps of Engineers (USACE) and will acquire any necessary permits for impacts to wetlands should they occur along the route approved by the PSC.

Streams and Waterbodies

Based on the National Hydrology Database, the Proposed Route crosses 143 named and unnamed streams. Larger streams crossed include (from west to east) Bear Creek, North Fork Salt River, Little Fabius River (several crossings), South Fabius River (several crossings), and Troublesome Creek, . None of these streams are considered Outstanding State Resource Waters (rivers, lakes, watersheds) or Outstanding National Resource Watersheds, or Cold Water Fisheries. No

transmission structures are anticipated to be placed in these waterbodies based on a maximum structure span of 1,000 feet.

Impaired Waters

Impaired waters are waters that have been determined to be too degraded or polluted to meet water quality standards. The Proposed Route Crosses one stream – Troublesome Creek that is considered an impaired water for E. Coli. Crossing of impaired waters may require additional storm water management practices during construction.

Floodplain

Floodplain areas are largely associated with the larger streams that cross the Proposed Routes. The Proposed Route crosses several stream numerous times increasing the prevalence of floodplain areas. About 235 acres of floodplain are present within the proposed Route right-of-way. Several of the stream crossings, most notably the South Fabius River, may require structures be placed within defined floodplains. ATXI will coordinate with Missouri Emergency Management Agency (SEMA) and county floodplain administrators to determine whether floodplain permits will be required for the route approved by the PSC.

Sink Holes

According to Missouri Department of Geology no mapped sinkholes are within 1 mile of the Proposed Routes. Additional investigations will be completed prior to construction.

CULTURAL RESOURCES

National Register of Historic Properties

No National Register of Historic Places (NRHP) sites are within the ROW of the Proposed Routes. The closest site is a building in the city of Callao – over 1.8 miles to the east of the Proposed Route. ATXI will continue to consult with the Missouri SHPO to determine if additional surveys are required after the Proposed Route is approved by ATXI.

3.3.1 Selection of the Preferred Route

Based on the detailed comparative analysis of the Preferred Routes as described in Section 3.6.2, and further review of the route options, the Routing Team selected the Green Route as the Preferred Route. See Appendix A for detailed route maps.

The Green Route is the shortest and least cost route. It requires the least right-of-way and the fewest crossings of existing infrastructure; parallels the greatest length of existing right-of-way and Opportunities; impacts the fewest landowners, parcels, floodplains, and agricultural land, including designated prime farmland; is not within 0.5 miles of a known occurrence of any listed species; has the least impact to wetlands, including forested wetlands; crosses the fewest streams; and has no National Register of Historic Places (NRHP) sites within 1.5 miles.

Table 3-4 provides a summary of the characteristics of the Proposed Route.

Table 3-4 Zachary to Maywood Proposed Route Summary

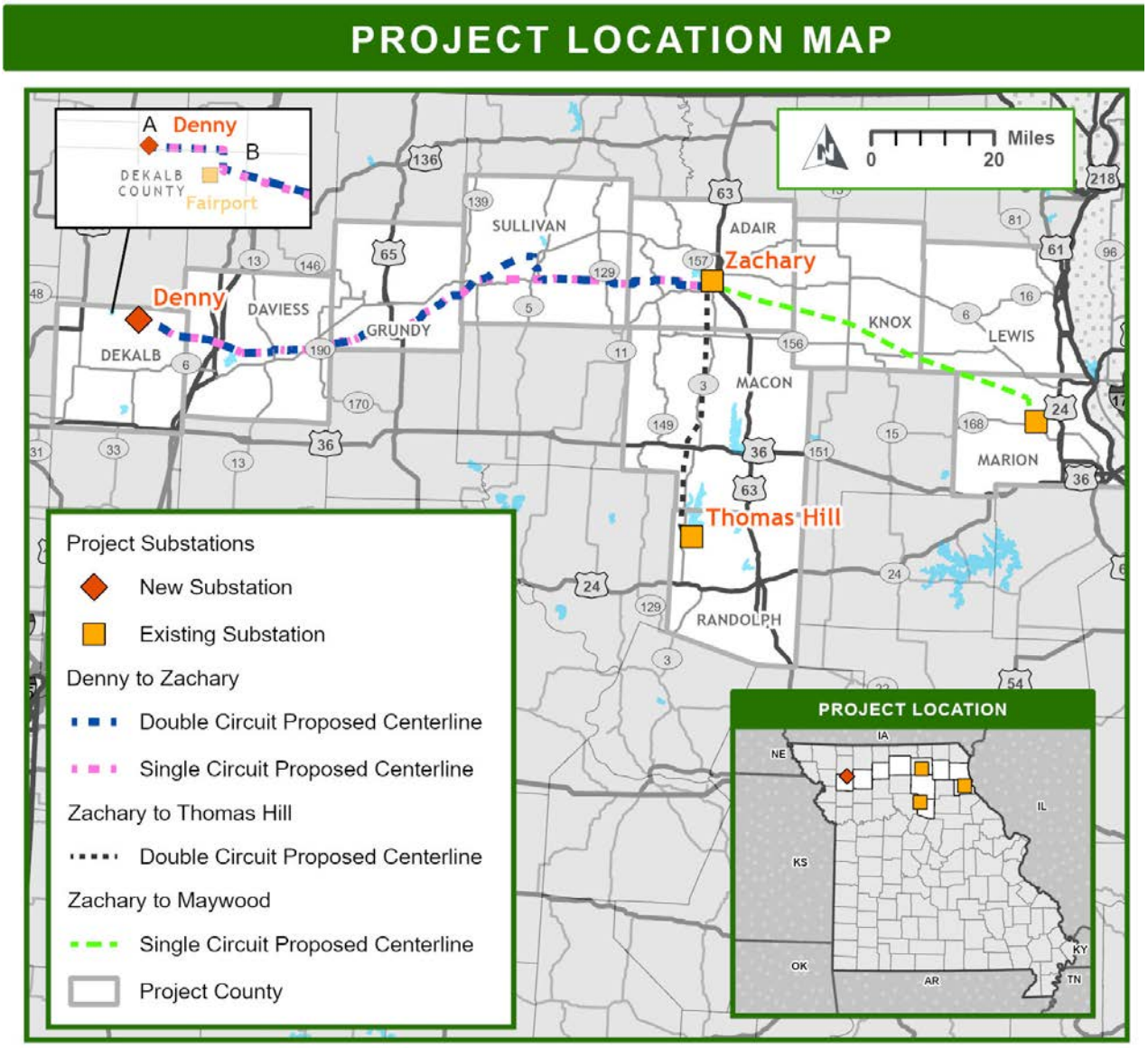
Criteria Type	Routing Criterion	Measure (unit)		Proposed Route
	Length	Miles		60
	Angle Structures	Light (1-15 deg.)	(count)	28
		Medium (15-30 deg.)		8
		Light Heavy (30-60 deg.)		1
		Heavy (>60 deg.)		5
Right-of-way	Total ROW needed	Area	(acreage)	1090
	ROW Overlap with existing Transmission Lines			704
	New ROW Encumbered			386
Residence and Non-Residential Structures	Residences (distance interval from route centerline)	0-75’	(count)	0
		75-150’		0
		150-300’		7
		300-500’		27
		500-1,000’		41
	Non-Residential Structures	0-75’		3
	Landowners	Crossed by ROW		169
	Parcels			266
Miscellaneous Land Use Features	Religious Facilities and Cemeteries	Within 1000 feet	(count)	4
	Local Parks or Recreation Lands			0
	Mines & Quarries	Within 1000 feet		0
Land Cover	Aquatic Environment	Area within ROW	(acreage)	58
	Cropland			798
	Developed			14
	Forested			184
	Grassland			9
Agriculture	USDA Classified Farmland	Prime Farmland	Area within ROW[1] (acreage)	139.3
		Prime Farmland if Drained		249.1
		Farmland of State Importance		232.9
		Total of all Farmland Classes		621.3
Resource Lands	MDC or DNR Lands	Crossed by ROW[1]	(count)	2
		Area Crossed by ROW[1]	(acreage)	7.9
		Within 1 Mile of Route	(count)	3
Hydrology	Non-Forested Wetlands	Within ROW[1]	(acreage)	32.3
	Forested Wetlands	Within ROW[1]	(acreage)	25.3
	Streams	Crossed	(count)	143
	Floodplain (Special Flood Hazard Areas)	Acres by ROW	Area	235.4

[1] – Land cover data was obtained from the National Use Land Cover (NLCD). Aquatic environment classes include Emergent Herbaceuous Wetlands, woody wetlands and surface water classes. Cropland classes include cultivated crops and hay field or other agricultural classes. Grassland classes include herbaceous lands. Forested classes include deciduous, coniferous, upland and partial canopy, and floodplain forest. Developed classes include high density, low / medium density, and urban open space. Barren class represents barren lands.

4. Conclusion

The final Proposed Route are shown in Figure 4-1.

Figure 4-1 Northern Missouri Proposed Routes



4.1 Denny to Zachary Segment

The Denny to Zachary Segment has two route options that run from Denny Substation to Zachary Substation. The DZ-SC Route is a single circuit option that generally follows an existing 161 kV line or will follow a planned 161 kV line, while the DZ-DC Route is a double circuit option that would rebuild an existing 161 kV line as 161/345 kV or build a planned 161 kV line to 161/345 kV. The DZ-SC Route is MISO's approved route with several short sections where it deviates because of impacts to sensitivities. The DZ-DC Route was developed in response to agency, stakeholders and landowners request to minimize additional right-of-way and impacts by utilizing the existing right-of-

way as much as possible. Both routes are feasible to build, and both minimize impacts as much as possible by sharing or following existing transmission line corridors.

4.2 Zachary to Thomas Hill Segment

The Zachary to Thomas Hill Segment will rebuild an existing Ameren Missouri 161 kV line to a 161/345 kV line using the same alignment. No alternatives were identified.

4.3 Zachary to Maywood Segment

The Zachary to Maywood Segment will build a new 345 kV line adjacent to an existing 161/345 kV line or an existing 345 kV line. The Proposed Route will share significant right-of-way with existing lines. In two small areas near Hwy 63, the existing lines will be moved to the east to accommodate the new line to minimize impacts to existing homes and ponds.

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Appendix A

Project Maps