Valueª	Question	
1	Maximize distance from residences	
2	Minimize loss of trees	
3	Maximize length along existing transmission facilities	
4	Minimize visibility of the line	
5	Minimize length across cropland	
6	Maximize distance from public facilities	
7	Maximize length along property boundaries	
8	Minimize length through wetlands and number of stream/river crossing	
9	Maximize length along highways or other roads	
10	Minimize impacts to archaeological/historical/Native American lands	
11	Maximize distance from businesses	
12	Minimize total length of line	

Table 8-2: Public Open House Question Rankings

(a) In this table, a value of 1 is the highest ranking, and a value of 12 is the lowest ranking.

The range of weights (1-12) was determined by the number of factors, the relative importance of each factor in relation to the others (based primarily on the public responses), and the need to differentiate among the 96 primary routes. The weights are reversed from the public ranks in Table 8-2 because a higher weight places more significance on factors considered most important to the public. Thus, the primary routes with the highest scores are those with the greatest impact.

Following calculation of the weighted z-scores, which have now transformed the data into comparable units, Burns & McDonnell developed a total route z-score by adding together all of the z-scores for the 21 weighted criteria. Both positive and negative z-scores were included in the total z-score. In the resulting route z-scores, positive total z-scores indicate that the overall route would have a greater environmental and social impact than the average for all routes, while negative total z-scores indicate that the route would have a smaller than average overall impact. The resulting total weighted z-scores for the 96 primary routes ranged from a low of -108.8 to a high of 137.0, and are included in Appendix D.

Route Factor ^a	Weight
Habitable structure score (score)	12
Length parallel to pipelines (ft.)	11
Forested/scrub-shrub wetlands within ROW (acres)	11
Length not along transmission lines (ft.)	10
Length parallel to streams (within 100 ft.) (ft.)	9
Wooded areas within ROW (acres)	9
Unique landowners crossed by ROW (count)	8
Length not parallel to apparent property lines (ft.)	7
Stream crossing score (score)	7
Cultural score (score)	7
Emergent and riverine wetlands within ROW (acres)	6
Oil/gas wells within 500 ft. (count)	6
Angle score (score)	5
Visual score (score)	5
Length not along roads (ft.)	5
Length through High Probability Areas (ft.)	4
Length through potential threatened and endangered species habitat (ft.)	3
Total length (ft.)	2
Length across parks and recreation areas ^b (ft.)	2
Public road crossings (count)	2
Number of FM towers within 2,000 ft. (count)	1

Table 8-3: Weights Applied to Routing Factors

(a) In this table, a weight of 12 is the highest ranking, and a weight of 1 is the lowest ranking.

(b) Parks and recreation areas are defined as park or recreational areas owned by a government body or an organized group, club, or religious organization.

Using the total route z-scores, Burns & McDonnell ranked all 96 primary routes and then selected the topranking Northern, Central, and Southern routes. This resulted in a total of 3 routes comprised of only 24 segments (out of 51 total segments). Burns & McDonnell noted that primary routes containing Segments 20, 22, and 25 were consistently ranked as the most impacting routes and, as a result, these segments were not carried forward for further consideration or for submittal to the PUCT for approval. In addition to the top ranked Northern, Central, and Southern routes, Burns & McDonnell selected another 9 routes, generally those that ranked highest and included the remaining 24 segments, to carry forward for additional analysis. These 12 routes are referred to as the proposed routes (Table 8-4 and Figure 8-1).

These proposed routes, which are a selected subset of the primary routes, will be filed with the PUCT. The proposed routes are: RP4, RP5, RP8, RP10, RP16, RP28, RP41, RP46, RP50, RP53, RP82, and

RP93. Table 8-4 lists the segments comprising these 12 proposed routes. The proposed routes are listed in Table 8-5 with their corresponding route data for all 39 analyzed criteria (data tables for all of the primary routes are included in Appendix D). Table 8-5 also lists the z-scores for these 12 proposed routes. Figure 8-1 (located in a map pocket at the end of Chapter 8.0) shows these proposed routes overlaid on the constraint map and includes parcels either crossed by the proposed routes or with habitable structures within 500 ft. of the routes, which are indexed to a list of affected landowners who will receive mailed notice of the CCN application (Appendix E). Throughout the remainder of Chapter 8.0, the proposed routes are further analyzed qualitatively based on their impacts to natural, social, and cultural resources. Detailed descriptions of each of the segments that are used in the proposed routes are included in Appendix C.

Proposed Route		
Designation	Segments	Corridor
RP4	1,7,8,15,26,28,31,34,41,43	North
RP5	1,7,8,15,26,28,31,34,42,48	North
RP8	1,7,8,15,26,28,31,35,45,49,51	North
RP10	1,7,9,13,23,24,28,31,34,42,48	Central
RP16	2,3,5,7,8,14,27A,27B,38,42,48	North
RP28	2,3,6,10,13,23,24,28,31,34,42.48	Central
RP41	2,3,6,11,12,16,18,21,24,28,31,34,42,48	Central
RP46	2,3,6,11,12,16,19,29,31,34,42,48	Central
RP50	2,3,6,11,12,16,19,30,36,44,46,48	South
RP53	2,3,6,11,12,17,32,36,44,46,48	South
RP82	2,4,12,17,33,39,50,51	South
RP93	1,7,8,14,27A,52,37,43	North

Table 8-4:	Proposed	Routes	with	Corridor	Designation	ns
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The following sections describe the relative differences and the potential environmental impacts that could arise from the construction of any of the 12 proposed routes.

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8.2 Impacts on Natural Resources

This section contains a discussion of the potential impacts of the project on the natural resources found along the 12 proposed routes, including physiography and land cover, soils, hydrology, vegetation, wetlands, wildlife, and threatened and endangered species.

8.2.1 Physiography and Land Cover

Upland land cover impacts along the proposed routes have been broken down into three categories: rangeland, cultivated land, and wooded areas. Wetlands and open water were taken into consideration as well, but are discussed in Subsection 8.2.6. Cultivated land is also discussed in Subsection 8.3.1.2. Land cover impacts were determined based primarily on a review of aerial photography and field reconnaissance.

Rangeland is the most desirable land cover for transmission line routing based on the low potential for impacts. Cultivated lands are the next most desirable land cover. Wooded areas are the least desirable, as transmission ROWs require a low clearance, and these areas would have to be cleared within the ROW.

Construction and operation of the transmission line would not result in any significant impacts to the existing physiography. Land clearing would consist only of tree and shrub removal. Any potential impact to topography would be minimal and temporary in nature and would be from the use of heavy construction equipment and excavation required for the construction of new foundations and support structures. All routes were designed to parallel existing ROW and disturbed areas (where possible) to limit potential impacts to land cover.

Due to the nature of this study area, none of the proposed routes cross any land designated by TPWD as rangeland. Likewise, only two of the proposed routes cross land classified by TPWD as cultivated, and these routes (RP50 and RP53) cross very little (0.3 acres). All of the proposed routes cross land identified as prime farmland by the USDA, as described in Section 3.2.2 which can include land used for cropland, pastureland, rangeland, or forestland.

Because the majority of the study area is wooded, the majority of the proposed routes have a significant amount of woodland within the ROW. The proposed routes cross from 712.9 to 768.8 acres of woodland within the proposed ROWs. The Northern Routes (RP4, RP5, RP8, RP16, and RP93) generally have the least amount of woodland within the ROW with a range of 712.9-732.6 acres. The Southern Routes (RP50, RP53, and RP82) have a generally higher amount of woodland within the ROW with a range of 731.6-759.4 acres. The Central Routes (RP10, RP28, RP41, and RP46) generally have the largest amount of woodland within the ROW with a range of 726.6-768.8 acres. Route RP93 (Northern route) would

have the least amount of woodland within the ROW, and Route RP41 (Central route) would have the greatest amount of woodland within the ROW.

Based on the amount of woodland (land cover) crossed, Route RP93 would be preferred due to the least amount of woodland crossed.

8.2.2 Soils

The project would result in temporary, minor impacts to the soils within the ROW during construction activities; no significant impacts to soils are anticipated along any of the proposed routes. The primary impacts to soils would result from the use of heavy construction equipment and excavation required for construction of new foundations and support structures. These activities would be temporary in nature but could cause soil compaction, ruts, or tracks from vehicle movement, and mixing of the soil profile.

During construction of the proposed transmission line, some erosion could occur within the cleared ROW, resulting in localized increases in soil loss and perhaps sedimentation of area streams. To limit erosion and sedimentation, a Storm Water Pollution Prevention Plan (SWPPP) and applicable permits will be prepared and obtained prior to any soil disturbance.

Erosion control measures employed during construction would include seeding, placement of staked straw bales or silt fences on sloped areas, and other appropriate Best Management Practices to control erosion and runoff. To the extent possible, construction crews would avoid soil-disturbing activities during excessively wet weather.

Although the TPWD data indicated the presence of very little cultivated land crossed by the proposed routes, all of the proposed routes traverse soils that are considered by the USDA as prime farmland. Prime farmland is well suited for cropland, pastureland, rangeland, or forestland. Aside from potential construction-related erosion, impacts to prime farmland soils are anticipated to be minor and occur only at the base of transmission line structures. Transmission lines are typically not considered to cause a conversion of farmland because the land can still be used after construction.

8.2.3 Hydrology

Potential hydrology impacts along the proposed routes were considered and evaluated by the number of streams and rivers crossed by each route, the number of ESSS crossed, and the length of streams and rivers parallel to the routes (within 100 ft.). These potential impacts were determined using digital hydrology data from the USGS National Hydrology Dataset (NHD, 2015).

The Sabine River has been designated as an ESSS between the Toledo Bend Reservoir and the Rusk/Panola County line. The only proposed route that does not cross an ESSS is Route RP82, as this route crosses the Toledo Bend Reservoir. Both the Sabine River and the Toledo Bend Reservoir are narrow enough that the transmission line would be able to span these water features. Garland and Rusk will also implement a SWPPP and obtain associated permits prior to any soil disturbance to reduce the potential for impacting the water quality of streams and rivers during construction.

In general, the Northern Routes RP4, RP5, and RP8 cross the fewest streams and rivers, from 83 (Route RP5) to 86 (Routes RP4). The other Northern routes, Routes RP16 and RP93, cross more streams with 100 and 93 streams crossed, respectively. The Southern Routes (RP50, RP53, and RP82) cross between 94 and 100 streams. The Central Routes (RP10, RP28, RP41, and RP46) cross the most streams with between 98 and 107 streams crossed.

In general, the Northern routes (RP4, RP5, RP8, RP16, and RP93) have the shortest length parallel to streams and rivers, ranging from 7,910-10,300 ft. The Central routes (RP10, RP28, RP41, and RP46) are parallel to streams and rivers the most with a length between 13,590 and 17,260 ft. The Southern routes (RP50, RP53, and RP82) have a length parallel to streams and rivers that is slightly shorter than the Central routes, with a length parallel between 11,740 and 14,810 ft.

Based on this information, Route RP5 (a Northern route) is preferred from a hydrology perspective given the number of streams and rivers crossed (83), as well as a relatively short length of streams and rivers parallel to the route centerline (9,010 ft.). Three Northern routes (RP4, RP8, and RP93) are very close, with similar stream and river crossing counts and lengths parallel to streams and rivers as RP5.

Construction and operation of the project would not significantly impact surface water features along the proposed transmission line. Short-term, minor water quality impacts may occur during the construction of the proposed project. Such impacts would be associated with soils from disturbed areas being transported into adjacent surface waters during storm events. Appropriate measures will be taken to reduce these impacts. To the extent required, Garland and Rusk would obtain the appropriate permits from the USACE for any work that crosses streams and rivers.

Impacts to groundwater and aquifers are not expected to occur from construction of the proposed project. Precautions will be taken during construction for the proper control and handling of any petroleum products or other chemicals that may be needed during construction. Additionally, no mobile irrigation systems were identified which would be impacted by any of the proposed routes. If structures of the approved route were to be located in a FEMA-designated 100-year floodplain, then planning, structure siting, engineering design, and any necessary permitting would help mitigate construction activities impacting flood channels, and, therefore, the project should not significantly affect flooding.

TPWD indicated in its November 24, 2015, letter (Appendix A, page A-5) that routes should avoid crossing riparian areas, wetland, and open water habitat where feasible. It also recommended crossing streams and rivers in a perpendicular manner and avoiding routing the line parallel to streams and rivers. In addition, TPWD requested that crossings of streams, wetlands, and lakes be marked at the crossings or closest point with marker balls to avoid potential bird strikes. Garland and Rusk will work with TPWD during the design and permitting phase of the project so the approved route limits impacts to hydrological resources.

8.2.4 Vegetation

Construction and operation of the project would result in the loss of some vegetation within the transmission line ROW due to clearing. The majority of the vegetation that would be impacted by the proposed project consists of pine hardwood forests and young forests/grassland. Additionally, the vegetation cover along the Sabine River is classified as willow oak-water oak-blackgum forests, and all of the proposed routes would cross and require some clearing of vegetation within this cover type. Generally, clearing in these areas would be to provide access for construction and maintenance equipment, unless the vegetation could grow tall enough to interfere with the lines. Where possible, proposed routes were designed to parallel existing ROW and extend through disturbed areas to minimize potential impacts to vegetation.

TPWD indicated in its November 24, 2015, letter (Appendix A, page A-5) that impacts to native vegetation should be minimized to the extent feasible during construction. If native vegetation must be impacted, TPWD recommended mitigating for the loss by re-vegetating areas disturbed by project activities with site-specific native species. Additionally, TWPD strongly recommended that areas of existing native grasses and forbs should be preserved to the extent feasible.

8.2.5 Threatened and Endangered Plant Species

Potential impacts to threatened and endangered plant species were determined by reviewing data from the TXNDD, maintained by the TPWD, written correspondence with the USFWS and TPWD personnel, and potential habitat within the study area. No impacts to threatened or endangered plant species are expected. The USFWS database does list the potential for one threatened plant species to occur within Rusk

County; however, as described in Subsection 4.4.5, it is unlikely to occur within the study area. In Table 8-5, the known rare plant species shown crossed by all the proposed routes is the willow oak-water oakblackgum forests community described in Section 7.2.4 above. Upon approval of a route by the PUCT, detailed environmental surveys will be conducted along the proposed transmission line to identify potential habitat and/or endangered plant species. If encountered, Garland and Rusk will coordinate with both the USFWS and TPWD, as needed.

8.2.6 Wetlands

Potential wetland impacts along the proposed routes have been broken down into three categories: forested/scrub-shrub, emergent, and open water (lakes and ponds). For this analysis, both riverine and emergent wetlands were counted in the emergent category due to the similarity of these two types of wetlands in this area and the limited amount of riverine wetlands. These potential impacts were determined based on a review of aerial photography, USFWS maps, USDA NAIP infrared imagery, and topographic maps.

The amount of forested/scrub-shrub wetlands within the ROW of the proposed routes ranges from 22.8 acres (Route RP5, North) to 123.7 acres (Route RP28, Central). In general, the Northern routes are split between a low (RP4, RP5, and RP8) and moderate (RP16 and RP93) amount of forested/scrub-shrub wetlands within the ROW. The three Northern routes (RP4, RP5, and RP8) have the least amount of forested /scrub-shrub wetlands impacts compared with all the other proposed routes. The Central routes are split between a moderate (RP41 and RP46) and high (RP10 and RP28) amount of forested/scrub-shrub wetlands within the ROW. The Southern routes are split between a low (RP82) and a moderate (RP50 and RP53) amount of forested/scrub-shrub wetlands within the ROW. The Southern routes ranges from 0.6 acre (Route RP82, South) to 5.1 acres (Routes RP10 and RP28, Central). In general, the Southern routes (Routes RP50, RP53, and RP82) cross the least amounts of riverine and emergent wetlands of riverine and emergent wetlands (less than 1 acre). The Northern routes (RP4, RP5, RP8, RP16, and RP93) cross a moderate amount of riverine and emergent wetlands, while the remaining two Central routes (RP10 and RP28) cross the most (approximately 5.1 acres).

The amount of open water crossed by the proposed routes ranges from 270 ft. (Route RP28, Central) to 1,090 ft. (Route RP8, North). The Central routes (RP10, RP28, RP41, and RP46) generally have the least length across open water, with a range of 270 to 630 ft. of open water crossed. The Northern routes (RP4, RP5, RP8, RP16, and RP93) in general have the highest amount of open water crossed, ranging from 730-

1,090 ft. of open water crossed. The Southern routes (RP50, RP53, and RP82) have a comparatively moderate impact, ranging from 330-710 ft. of open water crossed.

Route RP5 is preferred from a wetlands perspective since it crosses the least forested/scrub-shrub wetlands, the least total wetlands, and only a moderate length of open water.

To limit impacts to wetland areas, efforts were first made to identify routes that crossed as few wetlands as feasible, and the approved route will be designed to avoid or span wetland areas to the extent possible. Additionally, the proposed routes were aligned parallel to existing ROW and through disturbed areas (where possible) to limit potential impacts to wetlands. Upon approval of a route by the PUCT, detailed environmental surveys will be conducted along the proposed transmission line to identify jurisdictional waters of the U.S. Garland and Rusk would obtain the appropriate permits from the USACE for work within wetlands.

TPWD indicated in its November 24, 2015, letter (Appendix A, page A-5) that transmission lines should be located as far from wetlands and open water as possible to avoid potential collisions by waterfowl and other bird species. Transmission lines adjacent to these areas should have bird flight diverter markings installed. Garland will follow APLIC suggested practices for reducing avian electrocutions and collisions with the proposed project.

8.2.7 Wildlife

Construction and operation of the transmission line could result in some temporary adverse impacts to wildlife, primarily from the removal of large trees within or near the proposed project that could provide feeding, shelter, or nesting habitat for some species. Impacts to most species would be temporary and short-term during construction and would consist primarily of displacement and disturbance. Some less-mobile species occurring along the transmission line could be directly impacted, and movements between segmented habitats could be temporarily impeded due to noise and human presence. Additional temporary disturbance could occur during future maintenance of the transmission line. To the extent possible, waterways will be spanned or avoided to limit impacts to aquatic species. Proposed routes were designed to parallel existing ROWs to the extent possible to limit potential impacts to wildlife.

8.2.8 Threatened and Endangered Animal Species

Potential impacts to threatened and endangered animal species were determined by reviewing data from the TXNDD, maintained by TPWD; correspondence with both USFWS and TPWD personnel; and reviewing aerial photography to determine potential habitat for threatened and endangered species likely to occur within the study area. Correspondence letters from USFWS and TPWD can be found in

Appendix A of this document. Once a route is approved by the PUCT, Garland and Rusk will coordinate with USFWS and TPWD to avoid impacts to threatened and endangered animal species along the approved route. Detailed surveys will also be completed, if required, and any identified habitat will be reported to both USFWS and TPWD.

TPWD made several recommendations in its November 24, 2015, letter (Appendix A, page A-5) pertaining to threatened and endangered animal species. TPWD recommended the avoidance of impacts to all threatened and endangered wildlife, habitat, and their food supplies. Following is a discussion of potential impacts to each of the protected species listed by the USFWS and TPWD.

Because the proposed transmission line project is not likely to be built directly along high cliffs or adjacent to bluffs known to provide roosting, nesting, or foraging habitat for the peregrine falcon, no impacts are expected. The proposed project is not likely to lead to a loss of viability or federal listing of this species.

Bachman's sparrows could be present along any proposed route, and all proposed routes would result in a decrease in pine forests within the study area; however, this decrease is not likely to lead to a loss of viability or federal listing of this species.

Bald eagles, which are not federally listed but are still protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, may forage in the study area; however, direct impacts would be limited to accidental collisions with the transmission lines. Nesting habitat is not expected to be impacted by any of the proposed routes, although a survey for bald eagle nests will likely be required to verify the absence of any nests along the approved route. Should any bald eagle nests be discovered near the approved route, Garland will coordinate any mitigation requirements with the USFWS and TPWD. The proposed project is not expected to lead to a loss of viability or federal protection of the species.

Piping plovers are listed by TPWD as potentially occurring within both Rusk and Panola Counties. Piping plovers require similar habitat to the interior least tern, and these species are often found breeding in close proximity to each other. TPWD does list the interior least tern as potentially occurring within both Rusk and Panola Counties. A review of the habitat requirements of both of these species indicates that suitable habitat may be found within both Rusk and Panola Counties within the study area. If areas are found to contain this species during field surveys along the approved route, precautions would be taken to avoid potential impacts, including limiting activities within the inhabited area to outside of the nesting period, which is typically May to August.

Wood storks are listed by TPWD as potentially occurring within both Rusk and Panola Counties. Impacts to this species are not anticipated due to the limited amount of the line that crosses over open water that may contain trees suitable for nesting.

Red-cockaded woodpeckers are listed by TPWD as potentially occurring within Panola County. Impacts to this species are possible due to the large amount of clearing of pine plantations that would occur from the construction of any of the proposed routes. Precautions should be taken to limit impacts to potential cavity trees, and field surveys may be required to determine the presence of habitat along the approved route.

The red knot is not listed by TPWD as occurring within either Rusk or Panola Counties; however, the USFWS does list it as potentially occurring within the study area. If this species does occur in the study area, it is likely to stop-over during the annual migration to feed and rest. As a result of the limited time the species is present within the study area, impacts to this species are not likely to occur from this project.

Ravinesque's big-eared bat is listed by TPWD as likely to occur within Rusk and Panola Counties. Impacts to this species are possible due to the amount of clearing required by this project. Precautions should be taken to identify roost trees and avoid clearing while bats are present.

Both the Louisiana black bear and the red wolf are extirpated from the region; thus, no impact to these two endangered species is expected. The black bear is listed due to similarity of appearance to the Louisiana black bear, and habitat is present for this species. Impacts to this species are not likely to occur due to the abundance of habitat within the area and the relatively large range and easy mobility of this species.

Northern scarlet snake and the timber rattlesnake are both listed by TPWD as likely to occur within both Rusk and Panola Counties. TPWD recommended that Garland and Rusk train construction and clearing crews of the potential to encounter these snakes, to avoid contact, and to allow the snakes to leave the premise before commencing work. Impacts to these species are not anticipated.

For the Texas horned lizard, TPWD recommended that potential impacts to this species should be avoided during construction. TPWD recommended the use of a biological monitor to help identify this species and avoid impacts. If areas are found to contain this species, precautions would be taken to avoid potential impacts.

There are several aquatic species known or likely to occur within either Rusk or Panola Counties: alligator snapping turtle, Louisiana pigtoe, sandbank pocketbook, southern hickorynut, Texas heelsplitter, Texas pigtoe, creek chubsucker, paddlefish, and the blackside darter. Impacts to these species are not anticipated because the project will span rivers, creeks, and open bodies of water. Additionally Best Management Practices will be included in the SWPPP to further protect water quality and aquatic species.

For routes within or near colonial waterbird rookeries and when impacts are unavoidable, TPWD recommended construction activities be scheduled when the birds are not present, such as after nesting activities have ceased. TPWD recommended that surveys be conducted prior to construction to determine if any colonial waterbird rookeries exist within or near the approved route ROW. TPWD also stated that with proper construction timing, construction impacts to colonial waterbirds are expected to be limited, and the use of bird flight diverters would reduce the chance of bird strikes on the line following construction. Garland will also follow the APLIC suggested practices for reducing avian electrocution and collisions with the proposed project. TPWD further recommended avoiding any vegetation clearing within 300 meters of a heronry.

The amount of threatened and endangered species habitat crossed by the proposed routes (determined by the length through TXNDD elemental occurrences GIS data) ranges from 0 ft. to 22,910 ft. The Northern routes (RP4, RP5, RP8, RP16, and RP93) and one Central Route (RP10) do not cross any threatened and endangered species habitat. The remaining Central routes (RP28, RP41, and RP46) and two Southern routes (RP50 and RP53) each cross approximately 13,330 ft. of threatened and endangered species habitat. The remaining Southern route (RP82) crosses significantly more threatened and endangered species habitat than any other proposed route, with 22,910 ft. Additionally, route RP82 crosses an area identified by TPWD as containing a previously identified rookery. It is possible this route would not be able to meet the recommendation of TPWD to avoid clearing within 300 meters of a heronry.

From a threatened and endangered species perspective, the Northern routes (RP4, RP5, RP8, RP16, or RP93) and one Central route (RP10) are preferred as they avoid all known occurrences of threatened and endangered animal species.

8.2.9 Summary of Natural Resource Impacts

Several natural resources have been evaluated to determine the possibility of both ecological and natural resource impacts from the proposed transmission line project. Considering natural resources as a whole, the Northern routes (Routes RP4, RP5, RP8, RP16, and RP93) are preferred, as they cross significantly less forested wetlands, cross fewer streams and rivers, have the least amount of route parallel to streams

and rivers, and generally require the least amount of forest clearing. Of these proposed routes, Route RP5 is anticipated to have the least impact to natural resources because it involves the least amount of forested wetlands with similar impacts on the remaining natural resource factors as described in the previous sections. Although Route RP5 has the least potential to impact natural resources, it is not anticipated that any of the proposed routes would significantly impact or alter the natural resources within the study area.

8.3 Impacts on Social Resources

This section contains a discussion of the potential impacts of the project on the social resources found along the proposed routes, including land use, infrastructure, and socioeconomics. The primary criteria considered to measure potential land use impacts from this project included overall route length, proximity to habitable structures, length parallel to existing corridors (including apparent property boundaries), number of airstrips and airports, communication facilities near the proposed routes, potential impacts to park/recreational areas, road crossings, and visibility.

8.3.1 Community Values and Community Resources

Community resources can be impacted directly where construction of a transmission line, support structures, or ROW would result in restricted access to or removal of a resource. Community resources also can be impacted indirectly when the intrinsic value of the resource, usually aesthetic, would be diminished. Impacts to community values and community resources are discussed in detail in the subsections below.

8.3.1.1 Land Use and Development Patterns

Land use impacts from transmission line construction are determined by the amount of land (of whatever use) displaced by the actual ROW and by the compatibility of electric transmission line ROW with adjacent land uses. During construction, temporary impacts to land uses within the ROW could occur due to the movement of workers and materials through the area. Construction noise and dust, as well as temporary disruption of traffic flow, may also temporarily affect the area immediately adjacent to the ROW. Coordination among Garland and Rusk, their contractors, and landowners regarding access to the ROW and construction scheduling should minimize these disruptions. Most existing land uses may continue during construction.

16 Tex. Admin. Code § 25.101 requires that the PUCT consider whether new transmission line routes parallel existing compatible ROWs, property lines, or other natural or cultural features. In general, all of the proposed routes parallel existing corridors (including apparent property boundaries) for a portion of their length. Due to Garland, Rusk, and the PUCT's preference not to parallel pipeline corridors and the

limited amount of other suitable utility corridors between the two proposed switching stations, identifying potential alternatives that parallel existing corridors for a substantial length (more than 50% of their length) was not possible for this project.

The 12 proposed routes range from 36.9 to 39.8 miles in total length, with a range of approximately 16.0 to 38.5 percent of their total length parallel to existing corridors (i.e., existing transmission lines, roads, and apparent property boundaries). The Northern routes (RP4, RP5, RP8, RP16 and RP93) are generally the shortest routes (36.9-38.0 miles), and they parallel existing transmission lines (9.8-25.7 percent) for a greater percentage of their length, compared to the other proposed routes. RP10 is the only other proposed route that parallels existing transmission lines (11.1 percent parallel). Additionally, the Northern routes parallel all corridors, including roads and apparent property lines) more (23.4-38.5 percent) than most of the other Central and Southern proposed routes (16.0-24.4 percent). For the Central and Southern routes, the majority of existing corridor paralleled is apparent property lines, rather than an existing utility or road.

By paralleling existing corridors, potential impacts to property, community values and community resources, and viewsheds are typically limited due to the already disturbed nature of the area crossed by the existing facility/corridor. Paralleling existing corridors is therefore normally considered preferable to creating a completely new corridor. Route RP93 (Northern) is the shortest proposed route, has the highest percentage of its total length parallel to existing corridors, and is preferred in this respect.

8.3.1.2 Agriculture

Impacts to agriculture would be minor due to the limited amount of agricultural land that occurs within the study area. Only two of the proposed routes (RP50 and RP53, both Southern) would cross land identified as cultivated by TPWD (0.3 acre each), and none of the proposed routes would cross land identified as rangeland by TPWD. During the open houses, some land owners identified land that is either currently used or planned to be used as rangeland. Impacts to pasture land would be minimal as the land encumbered by the ROW would continue to be used as rangeland.

8.3.1.3 Urban and Residential Areas

Generally, when developing routes for a new transmission line, cities and towns are avoided when possible due to the concentration of development located within their boundaries. There are two municipal areas located within the study area. Though the most densely populated portions of these cities were avoided, some proposed routes were closer to municipal boundaries than others, but none of the proposed routes crossed the city limits of either of the municipalities within the study area.

One of the more important measures of potential land use impacts is the number of habitable structures located in the vicinity of each proposed route. Burns & McDonnell determined the number, distance, and direction of habitable structures located within 500 ft. of the centerline of each route through interpretation of aerial photography and verification during the reconnaissance survey along public roads, where possible. Burns & McDonnell, to the extent reasonable and in accordance with the policy of prudent avoidance, attempted to avoid habitable structures in the routing of the proposed routes.

The number of habitable structures located within 500 ft. of the proposed routes' centerlines ranges between 13 and 27. Route RP53 (Southern) has the fewest habitable structures within 500 ft. of the centerline (13 structures). The other two Southern routes (RP50 and RP82) have between 21 and 24 structures within 500 ft. The Central routes (RP10, RP28, RP41, and RP46) followed Route RP53 with 15 to 20 structures within 500 ft., while the Northern routes (RP4, RP5, RP8, RP16, and RP93) had the most structures within 500 ft. (between 21 and 27). While the Northern routes have the greatest number of habitable structures within 500 ft., because they parallel existing transmission lines for more of their length than the other proposed routes, some of these structures are already located close to an existing line, thereby limiting the overall impact of these proposed routes on the habitable structures. Table 8-6 lists the types of habitable structure, the direction and distance from the closest segment component of each proposed route, and the unique identification number assigned to each habitable structure depicted in Figure 8-1. Because Route RP53 (Southern) has the fewest habitable structures within 500 ft., it is preferred from an urban/residential perspective.

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8.3.1.4 Park and Recreational Areas

The evaluation of potential impacts to park and recreational areas considered the disruption or preemption of recreational activities. Based on field reconnaissance and a review of the TPWD, Texas Natural Resource Information System (TNRIS), and Environmental Systems Research Institute, Inc. (ESRI) digital data, only two of the proposed routes cross any park and recreational areas (RP28 and RP82). Route RP28 (Central) crosses the George W. Pirtle Scout Reservation and Route RP82 (Southern) crosses land managed by the Sabine River Authority and identified by TPWD as Unit #630 hunting area (Table 8-7). Both proposed routes appear to cross in areas of the properties that are not developed and are heavily wooded. Route RP16 (Northern) is the only proposed route that does not cross any parks and has no identified park and recreation area within 1,000 ft. Route RP82 also does not have any park and recreation areas within 1,000 ft. (excluding the Unit #630 hunting area that is crossed). All of the remaining proposed routes each have one park and recreation area located within 1,000 ft. of the route. Most of the identified parks and recreation areas that are not crossed but within 1,000 ft. are boat launches located along the Sabine River or on Lake Murvaul. Route RP16 (Northern) is preferred from a park and recreation perspective because it is the only proposed route that does not cross a park or recreational area and does not have any park and recreation areas within 1,000 ft.

Proposed Route	Park & Recreation Area	Distance	Direction	Segment
RP4	Boat Ramp	270	S	31
RP5	Boat Ramp	270	S	31
RP8	Boat Ramp	270	S	31
<u>RP10</u>	Boat Ramp	270	S	31
RP28	Boat Ramp	270	S	31
	George W. Pirtle Scout Reservation	Crossed	N/A	10
RP41	Boat Ramp	270	S	31
RP46	Boat Ramp	270	S	31
RP50	Boat Ramp	840	SE	36
RP53	Boat Ramp	840	SE	36
RP82	Sabine River Authority (Unit #630)	Crossed	N/A	39
RP93	Boat Ramp	410	N	52

Table 8-7 Park & Recreation Areas within 1,000 ft. of the Proposed Routes

8.3.1.5 Transportation and Aviation

No long-term impacts are anticipated to the transportation system of the study area due to the construction of the proposed project. Short-term impacts may occur during construction which would result in a temporary disruption of traffic service.

The proposed routes all cross 2 state or federal highways and between 24 and 30 other public roads. Routes RP28 (Central) and RP82 (Southern) cross the fewest other public roads (24 apiece) and, as a result, these proposed routes are preferred from this perspective.

Average structure heights for the transmission line will be between 135 and 145 ft. The PUCT requires identification of all known private airstrips and all airports registered with the FAA that have no runway more than 3,200 ft. in length within 10,000 ft. of the route centerline. For private airstrips, no FAA notification is required. For all public-use airports registered with the FAA having no runway more than 3,200 ft. in length, the FAA would be notified if the proposed transmission line structures exceed a 50:1 horizontal slope from the closest point of the closest runway. The PUCT also requires identification of all public-use airports registered with the FAA having at least one runway more than 3,200 ft. in length within 20,000 ft. of the route centerline. For all public-use airports registered with the FAA would be notified if the proposed transmission line structures exceed a 50:1 horizontal slope from the closest point of the closest runway. The PUCT also requires identification of all public-use airports registered with the FAA having at least one runway more than 3,200 ft. in length within 20,000 ft. of the route centerline. For all public-use airports registered with the FAA would be notified if the proposed transmission line structures exceed a 100:1 horizontal slope from the closest point of the closest point of the closest runway. The PUCT also requires that all heliports within 5,000 ft. of the route centerline be identified. For all public-use heliports, the PUCT requests the utility identify whether or not any transmission line structures will exceed a 25:1 horizontal slope from the closest point of the closest landing and takeoff area of the heliport.

Burns & McDonnell identified airports along the proposed routes from the field reconnaissance survey, aerial interpretation, public comments from the open houses, aeronautical charts, and GIS data obtained from the FAA NFDC (NFDC, 2015). Two of the Northern routes (RP16 and RP93) are within 20,000 ft. of the Panola County-Sharpe Field (shown on Figure 3-2), which is a FAA-registered airport with a runway greater than 3,200 ft. in length. No proposed routes were within 10,000 ft. of any FAA-registered airstrips or airports with runways less than 3,200 ft. in length. One new private airstrip (Hilltop Springs Airport as shown on Figure 8-1) was identified within 10,000 ft. of the centerline of Routes RP5, RP8, and RP16 (Northern); RP10, RP28, RP41, and RP46 (Central); and RP50, RP53, and RP82 (Southern). No heliports were identified within 5,000 ft. of any proposed route. Table 8-8 shows the FAA registration status of the airstrips, the name of the airstrip (if known), and the direction and distance of the airstrip from the closest segment.

Based on Burns & McDonnell's preliminary calculations, FAA notification will not be required for any airstrips as a result of this project. Due to the fact that the proposed routes in the proximity of the private airstrip are approximately 4,400 ft. away (and lower in elevation), the proposed routes are not anticipated to impact the airstrip, using a 20:1 approach slope. Route RP4 (Northern) is the only proposed route that

does not have any airport within the specific distance; however, since no impacts are anticipated to any airport, no proposed route is preferred from this perspective.

1			1			
Proposed Route	Airport	Туре	Distance	Direction	FAA Notification	Segment
RP5	Hilltop Springs Airport	Private	6,440	N	No	48
RP8	Hilltop Springs Airport	Private	2,680	S	No	45
RP10	Hilltop Springs Airport	Private	6,440	N	No	48
RP16	Panola County-Sharpe Field	Public	17,330	N	No	27A
	Hilltop Springs Airport	Private	6,440	N	No	48
RP28	Hilltop Springs Airport	Private	6,440	N	No	48
RP41	Hilltop Springs Airport	Private	6,440	N	No	48
RP46	Hilltop Springs Airport	Private	6.440	N	No	48
RP50	Hilltop Springs Airport	Private	6.440	N	No	
RP53	Hilltop Springs Airport	Private	6,440	N	No	40
RP82	Hilltop Springs Airport	Private	8.100	E	No	
RP93	Panola County-Sharpe Field	Public	17.330		No	27 A
Source: EAAD		t			110	2/A

Table 8-8:	Airports	Along	the	Proposed	Routes
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Source: FAA NFDC 2015 and public comments

8.3.1.6 Visual Character

Aesthetic impacts, or impacts on visual resources, exist when the ROW, transmission lines, and/or structures of a transmission line create an intrusion into, or substantially alter the character of, the existing view. The significance of the impact is directly related to the quality of the view, in the case of natural scenic areas, or the importance of the existing setting in the use and/or enjoyment of an area, in the case of valued community resources and recreational areas.

The assessment of aesthetic impacts to the visual character along the proposed routes was determined through field the reconnaissance survey and review of GIS mapping data. The evaluation focused on the potential view of the proposed project from park and recreational areas and from state and U.S. highways. The viewshed for both parks and roads were defined as a one-half-mile buffer around parks and recreation areas or highways.

The length of the proposed routes within the viewshed of state or U.S. highways ranges from approximately 2.4 to 6.7 miles. The proposed routes with the shortest length of line within in a state or U.S. highway viewshed are RP50, RP53, and RP82 (Southern); RP28, RP41, and RP46 (Central); and RP16 (Northern). The Northern routes (RP4, RP5, RP8, and RP93) and the more northern Central route

(RP10) all have significantly higher lengths within the state/U.S. highway viewshed (6.3-6.7 miles). In contrast, the Northern routes (RP4, RP5, RP8, RP16, and RP93) along with RP10, RP41, and RP46 (Central) have the least length within the park and recreation viewshed (0 to 1 mile). Two of the Southern routes (RP50 and 53) have a moderate length within the park and recreation viewshed (2.2 miles). The more southerly Central route (RP28) and the southernmost Southern route (RP82) have significantly higher lengths within the park and recreation viewsheds (4.5 miles). Overall, Route RP16 (Northern) is preferred from a visual character perspective as it has no length within the viewshed of park and recreation areas and nearly the least amount of length within the viewshed of state/U.S. highways.

8.3.1.7 Utility Facilities

A comparatively high amount of the Northern routes (16-25.7 percent) and a moderate amount of the Central route RP10 (11.1 percent) will parallel existing transmission lines. The remaining Central routes and all of the Southern routes would not parallel any existing transmission line. All of the proposed routes would parallel property lines, and most of the proposed routes would also parallel roads (except Route RP82). To the extent feasible, the proposed routes would avoid being parallel and adjacent (within 500 ft.) to existing oil/gas pipelines in an effort to avoid induction and to meet the requirement for cathodic protection on the pipelines, although the density of oil/gas pipelines in the study area made it nearly impossible to not parallel them for at least some length.

The proposed transmission line, when paralleling existing utility corridors, will not share any ROW with the existing utilities but instead will be located immediately adjacent to the existing ROWs. This separation will minimize potential impacts to existing utilities in the area. In addition, the proposed project will cross numerous existing utilities. In both cases, where the proposed project either crosses or parallels an existing utility, some mitigation measures may be required to protect the existing utilities. Once a route is approved, detailed studies regarding the potential impact of the proposed project on existing utilities will be conducted, and appropriate mitigation measures will be taken where necessary.

In general, the Southern (RP50, RP53, and RP83) and Central (RP28, RP41, and RP46 – all but RP10) routes would have the least impact on oil and gas wells, with between 9 and 30 wells located within 500 ft. of these proposed routes. The Northern routes (RP4, RP5, RP8, RP16, and RP93) along with route RP10 (Central) would have significantly more oil and gas wells located within 500 ft. (48 to 59 wells). No wells were identified within the ROW of any proposed route.

From a utility and existing corridors perspective, Route RP93 (Northern) is preferred as it has the greatest length parallel to existing corridors of the proposed routes, with approximately one-third of the total length parallel to transmission lines, roads, or apparent property lines.

8.3.1.8 Communication Towers

Communication towers were identified using GIS data obtained from the FCC, aerial interpretation, and the field reconnaissance survey. The PUCT requires the identification of the following communication towers:

- Commercial AM radio transmitters within 10,000 ft. of the route centerline; and
- All FM radio transmitters, microwave relay stations, or other similar electronic installations within 2,000 ft. of the centerline. (For this report, those towers fitting this second definition will be referred to collectively as "communication" towers because most of them appear to be cellular towers based on field reconnaissance).

There are no commercial AM communication towers within 10,000 ft. of any of the proposed routes. The Southern routes (RP50, RP53, and RP82) have the fewest other communication towers within 2,000 ft. (0 to 2 towers). The Central routes (RP10, RP28, RP41, and RP46) have the next fewest, with between 2 and 6 towers within 2,000 ft. The Northern routes (RP4, RP5, RP8, RP16, and RP93) have the greatest amount of towers, between 6 and 11 towers within 2,000 ft. Table 8-9 lists the towers within 2,000 ft. of each proposed route, with the type, direction, and distance to the closest segment.

No significant impacts to the operation of communication installations are anticipated from any of the proposed routes.

8.3.2 Socioeconomic Patterns

This section addresses the potential impacts (both positive and negative) of the proposed project on the socioeconomic patterns along the proposed routes, including population, employment, and income.

8.3.2.1 Population

Construction and operation of the proposed transmission line along any of the proposed routes would not directly result in a change to the population in the study area. The project would, however, help to provide the electrical needs for a growing population in Texas. Reliable electric service is important to residents and a significant factor in the location of many industries.

Proposed Route	Operator	Туре	Distance from Centerline (ft.)	Direction	Segment
RP4	Unknown	Unknown	470	N	1
	Rusk County Electric Cooperative, Inc.	Industrial/Business Pool, Conventional	390	N	7
	Unknown	Unknown	360	N	8
	Unknown	Unknown	2,000	SW	43
RP5	Unknown	Unknown	470	N	1
	Rusk County Electric Cooperative, Inc.	Industrial/Business Pool, Conventional	390	N	7
	Unknown	Unknown	360	N	8
	Unknown	Unknown	1,240	N	42
RP8	Unknown	Unknown	470	N	1
	Rusk County Electric Cooperative, Inc.	Industrial/Business Pool, Conventional	390	N	7
	Unknown	Unknown	360	N	8
	Chevron USA Inc.	Microwave Industrial/Business Pool	1,360	N	45
	Texas RSA #11B Limited Partnership	Common Carrier Fixed Point To Point Microwave	1,360	N	45
	Unknown	Unknown	1,360	N	45
RP10	Unknown	Unknown	470	N	1
-	Rusk County Electric Cooperative, Inc.	Industrial/Business Pool, Conventional	390	N	7
	BNSF Railway Co.	Industrial/Business Pool, Conventional	1,810	SW	9
	Unknown	Unknown	1,240	N	42
RP16	Rusk County Electric Cooperative, Inc.	Industrial/Business Pool, Conventional	390	N	7
	Unknown	Unknown	360	N	8
L	Unknown	Unknown	940	S	14
	Tx-10 Licensee Co., Llc	Common Carrier Fixed Point To Point Microwave	970	S	14

Table 8-9: Communication Towers within 2,000 ft. of the Proposed Routes

Proposed Route	Operator	Туре	Distance from Centerline (ft.)	Direction	Segment
	Unknown	Unknown	490	S	27A
	Unknown	Unknown	1,240	N	42
RP28	Unknown	Unknown	1,240	N	42
RP 41	Conoco Phillips Communications Inc.	Microwave Industrial/Business Pool	1,760	SE	18
	Phillips 66 Communications Inc.	Other Indust/Land Transp	1,770	SE	18
	Unknown	Unknown	1,240	N	42
RP46	Unknown	Unknown	1,240	N	42
RP82	Unknown	Unknown	340	NW	39
RP93	Unknown	Unknown	470	N	1
	Rusk County Electric Cooperative, Inc.	Industrial/Business Pool, Conventional	390	N	7
	Unknown	Unknown	360	N	8
	Unknown	Unknown	940	S	14
	Tx-10 Licensee Co., LLC	Common Carrier Fixed Point To Point Microwave	970	S	14
ļ	Unknown	Unknown	490	s	27A
	Unknown	Unknown	2,000	SW	43

8.3.2.2 Employment and Income

Construction and operation of the proposed transmission line along any of the proposed routes would not significantly affect long-term employment in the study area. Transmission construction activities will occur over a 1- to 2-year timeframe, and maintenance requirements are low. The construction force needed to construct the proposed project would be small and temporary. The presence of additional workers and increased employment would potentially increase retail sales in the study area due to the purchases of food, fuel, and other merchandise. The project would increase the tax base in counties crossed by the proposed project, regardless of which route is selected due to the payment in lieu of taxes by Garland.

8.3.3 Summary of Social Resources

Route RP53 is the recommended route from a land use and social resource perspective. Route RP53 has the fewest habitable structures, lower visibility from highways, fewer road crossings, the fewest public

airports in its vicinity, and nearly the fewest oil and gas wells located within 500 ft. than most of the other proposed routes.

8.4 Impacts on Cultural Resources

Construction activities associated with any proposed project have the potential to adversely impact cultural resources. The effects that could adversely affect a cultural resource eligible for the NRHP are discussed in the Code of Federal Regulations (36 CFR 800) and include:

- Destruction or alteration of all or part of a property (NRHP Eligible Property);
- Isolation from or alteration of the property's surrounding environment (setting); or
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting.

Impacts may be direct or indirect. Direct impacts typically occur during construction. Indirect impacts include those that occur later in time or are further removed, but are foreseeable; examples include alterations in land use patterns, changes in population density, or accelerated growth rates, all of which can impact properties with historical, architectural, archaeological, or other cultural significance.

Although an on-the-ground cultural resources survey has not been conducted, High Probability Areas (HPAs) have been identified by cultural specialists along the proposed routes using USGS topographic maps. HPAs are locations that are usually identified as having a high probability for the occurrence of prehistoric sites and include areas where the proposed project crosses water, stream confluences, drainages, alluvial terraces, wide floodplains, upland knolls, and areas where lithics (workable stone) could be found. The proposed routes cross between 57,740 and 102,100 ft. of HPAs. The Northern routes are split between crossing a relatively small length of HPAs (RP4 and RP5 – 11.7-12.2 miles) and a relatively high length across HPAs (RP8, RP16, and RP93 – 14.1-19.3 miles). The Central routes are similarly split with RP28, RP41, and RP46 generally crossing a relatively long length of HPAs (16.0-18.2 miles) and RP10 crossing significantly shorter amounts of HPAs (12.9 miles). Likewise, the Southern routes are also split with both RP50 and RP53 crossing a relatively long amount of HPAs (13.6-15.1 miles) and RP82 crossing the least amount of HPAs of all proposed routes (10.9 miles).

Maps on file with the Texas Archaeological Laboratory and the THC Archeological Sites Atlas were reviewed in an effort to identify known and recorded archaeological sites and historic resources within 1,000 ft. of the centerline of the proposed routes. Two Northern routes (RP16 and RP93) and one Central route (RP46) each cross one known recorded cultural resource site. Strategic pole placement and access road development could potentially avoid impacts to these sites. The proposed routes would be located within 1,000 ft. of between one and five recorded cultural sites. The Northern routes (RP4, RP5, RP8, RP16, and RP93) would have between two and five recorded cultural sites located within 1,000 ft. The Central routes (RP10, RP28, RP41, and RP46) would have fewer than the Northern routes overall, with between one and two recorded cultural sites located within 1,000 ft. The Southern routes (RP50, RP53, and RP82) would have between one and four recorded cultural sites located within 1,000 ft. Table 8-10 lists these sites as well as the direction and distance to these resources. Once a route is approved by the PUCT, Garland will work with the THC to determine what, if any, sites will be affected and what mitigation efforts could be required to limit impacts.

8.5 Cultural Resources Impact Summary

In general, the study area is rural and has not been the subject of many professional cultural resources surveys. Since much of the environment is suitable for past human occupation, the record of known cultural resources may be sparser than is actually the case. The Northern routes are generally preferred from a cultural resource perspective as proposed routes RP4, RP5, and RP8 each do not cross any known cultural sites, have relatively few (two) known cultural sites within 1,000 ft., and cross limited amounts of HPAs. Following PUCT approval for the proposed transmission line, a cultural resources survey along the approved route may be required by the PUCT and/or the THC or USACE.

8.6 Recommended Route

Figure 8-1 shows the proposed routes overlaid on the constraints map. Based on the previously described impacts of the proposed routes to natural, social, and cultural resources, Burns & McDonnell recommends that Route RP5 (Northern) be selected as the proposed route for the Rusk to Panola 345-kV Transmission Line Project that best meets the requirements of PURA and the Commission's Substantive Rules. Route RP5 is the second shortest proposed route and would be constructed largely along existing corridors, the majority of which are existing transmission lines. Route RP5 does have a higher habitable structure count, but most of these structures are already located near an existing transmission line, and, thus, the overall impact of Route RP5 would be relatively less for these residents compared to residents that would be affected by an entirely new ROW. Route RP5 has the least amount of forested wetlands and the least amount of total wetlands within the proposed ROW of the proposed routes. Additionally, Route RP5 has the second fewest number of recorded cultural sites within 1,000 ft. and the second shortest length through HPAs.

Proposed Route	Trinomial ^a	Distance (ft.)	Direction	Segment
RP4	41PN224	980	N	8
Ni 4	41PN181	750	N 31	
RP5	41PN224	980	N	8
M J	41PN181	750	N	31
RDS	41PN224	980	N	8
	41PN181	750	N	31
RP10	41PN181	750	N	31
	41PN224	980	N	8
	41PN240	40	S	27A
RP16	41PN223	160	N	27A
	41PN277	480	S	27B
	41PN278	490	S	27B
	41PN215	630	S	27A
RP28	41PN181	750	N	31
RP41	41PN165	970	SE	18
	41PN181	750	N	31
RP46	41PN225	90	Е	29
	41PN181	750	N	31
RP50	41PN3	680	SE	46
RP53	41PN258	660	SE	32
	41PN3	680	SE	46
	41PN161	420	N	4
RP82	41PN160	420	SW	4
	41PN168	440	S	4
	41PN159	450	S	4
	41PN224	980	N	8
RP93	41PN240	40	S	27A
	41PN223	160	N	27A
	41PN215	630	S	27A

Table 8-10: Cultural Sites Located within 1,000 ft. of the Proposed Routes

(a) No name of site or other information available, a trinomial is a designation given by the SHPO to identify a site

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APPENDIX A - AGENCY CORRESPONDENCE

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BURNS MEDONNELL

October 27, 2015

Ms. Karen Hardin Habitat Assessment Biologist Texas Parks and Wildlife Department 4200 Smith School Rd Austin, TX 78744

Re: Rusk - Panola Transmission Project

Dear Ms. Hardin:

Garland Power and Light and Rusk Interconnection LLC (Rusk) are developing the Rusk to Panola Transmission Project (Project) in order to interconnect the Electric Reliability Council of Texas (ERCOT) transmission grid to the Southern Cross electric transmission line that is planned to connect ERCOT and the southeastern United States. We are requesting your input on the Project, which will be submitted to the Public Utility Commission of Texas for approval of a Certificate of Convenience and Necessity (CCN). The Project will begin at a new switching station in Rusk County and extend eastward for approximately 40 miles to a new switchyard adjacent to a new converter station, both to be located at the border of Texas and Louisiana (see enclosed map of the Project study area). Rusk and Garland have retained Burns & McDonnell to assist in the alternative route development and route selection for the Project.

Enclosed with this letter is a map depicting the study area for the Project. Burns & McDonnell is requesting your assistance inventorying the human and natural resources in the Project area to identify any routing constraints or opportunities within the area that should be considered as part of the Project. The new transmission line in the Project, and the subject of the CCN application, will be double circuit, 345-kV AC. Routing constraints include those areas or resources which may not be compatible with transmission line construction, such as airports, protected species habitat, or dense residential areas. Route opportunities include such things as previously disturbed areas, industrial corridors, and existing utility rights-of-way. Your input will assist the project team in developing preliminary alternative routes that take advantage of opportunities while minimizing potential environmental and land use impacts, including the following:

- Land use (current or proposed land development projects, park/recreation areas, etc.)
- Aesthetics
- Water quality and wetlands
- Soils and geology
- Wildlife, vegetation, and fisheries (including threatened and endangered species)
- Socioeconomics (population, employment, growth, current/future development)
- Cultural resources (historic and archaeological)
- Transportation and roads (airport and roadway expansions, construction, operations, and maintenance)

9400 Ward Parkway \ Kansas City, MO 64114 • 816-333-9400 \ F 816-333-3690 \ burnsmcd com

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BURNS MEDONNELL

Ms. Karen Hardin Texas Parks and Wildlife Department October 27, 2015 Page 2

In addition to the above requested items, we are also requesting information regarding any permits or any type of approval for construction of the Project within your jurisdiction.

Your input is important. The information we collect will be used to help Burns & McDonnell develop alternative routes that are compatible with existing and planned land uses as well environmentally compatible. We request that responses be submitted by Monday, November 30th to allow us time to incorporate the information into the study and CCN application. Additional Project information can be found at the following website: <u>http://www.ruskpanolatransmissionproject.com/</u>

We appreciate your assistance. If you have any questions or require additional information please contact me at (816) 822-3446 or dwerth@burnsmcd.com.

Sincerely,

DustEmit

Dusty Werth Senior Environmental Scientist

DEW

Enclosure: Study Area Map

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November 24, 2015

Mr. Dusty Werth Burns & McDonnell

9400 Ward Parkway Kansas City, MO 64114

Life's better outside."

Commissioners

Dan Allen Hughes, Jr. Chairman Beeville

Ralph H. Duggins Vice-Chairman Fort Worth T. Dan Friedkin Chairman-Emeritus Houston

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> Bill Jones Austin

James H. Lee Houston

Margaret Martin Boerne

S. Reed Morian Houston

> Dick Scott Wimberley

Lee M. Bass Chairman-Emeritus Fort Worth

Carter P. Smith Executive Director RE: Garland Power and Light and Rusk Interconnection LLC Proposed Rusk to Panola 345-kilovolt (kV) Transmission Project Rusk and Panola County TPWD Project 35694

Dear Mr. Dusty Werth:

The Texas Parks and Wildlife Department (TPWD) received the request for comments and environmental resource information to aid in routing for the proposed transmission line and substation project referenced above.

TPWD, as the state agency with primary responsibility for protecting the state's fish and wildlife resources and in accordance with the authority granted by Parks and Wildlife Code §12.0011, hereby provides the following recommendations and informational comments to minimize the adverse impacts to the state's fish and wildlife resources in the routing, construction and operation of the proposed transmission project.

A written response to a TPWD recommendation or informational comment received by a state governmental agency may be required by state law. For guidance, see the Texas Parks and Wildlife Code, Section 12.0011 at http://www.statutes.legis.state.tx.us/Docs/PW/htm/PW.12.htm#12.0011. Please refer to TPWD project number 35694 in return correspondence for this project.

TPWD Wildlife Habitat Assessment Program is now accepting projects through electronic submittal. Future project review requests can be submitted to WHAB@tpwd.texas.gov. If submitting requests electronically, please include **unzipped** geographic location files when available (GIS shape file, .kmz, etc.).

Project Description

Garland Power and Light and Rusk Interconnection LLC (GPL-Rusk) propose to construct a new double-circuit 345-kV transmission line from a new switching station in Rusk County to a new switchyard adjacent to a new converter station in Panola County. The proposed line would be developed to interconnect the Electric Reliability Council of Texas (ERCOT) transmission grid to the southeastern United States. The line would be approximately 40 miles in length and would connect to the Southern Cross electric transmission line at the Texas and Louisiana border.

4200 SMITH SCHOOL ROAD AUSTIN, TEXAS 78744-3291 512,389,4800 www.tpwd.texas.gov

To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations.

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Mr. Dusty Werth Page 2 November 24, 2015

In preparation of the alternative route development and route selection, on behalf of GPL-Rusk, Burns & McDonnell has provided a map of the approximately 600-square mile study area.

Recommendation: TPWD recommends using existing transmission facilities whenever possible. Where new construction is the only feasible option, TPWD recommends routing new transmission lines along existing roads, pipelines, transmission lines, or other utility rights of way (ROW) to reduce habitat fragmentation. By utilizing existing utility corridors and road ROWs, adverse impacts to fish and wildlife resources would be reduced by avoiding and/or minimizing the impacts to undisturbed habitats. Please review the TPWD Recommendations for Electrical Transmission/Distribution Line Design and Construction. which can be found at http://www.tpwd.texas.gov/huntwild/wild/wildlife_diversity/habitat_assessment/m edia/tpwd_electrical_transmission.pdf, and incorporate the measures into design and construction plans, where feasible.

Federal Regulations

Migratory Bird Treaty Act (MBTA)

The MBTA prohibits taking, attempting to take, capturing, killing, selling/purchasing, possessing, transporting, and importing of migratory birds, their eggs, parts and nests, except when specifically authorized by the Department of the Interior. The U.S. Fish and Wildlife Service (USFWS) Migratory Bird Office can be contacted at (505) 248-7882 for more information on potential impacts to migratory birds.

The study area includes a portion of Toledo Bend Reservoir, Lake Murvaul, the Sabine River, numerous creeks, small lakes, stock ponds and wetland areas.

Birds typically establish flight corridors along and within river and creek drainages. Riparian corridors, creeks, wetlands, and lakes provide habitat for a host of wildlife species including wading birds, waterfowl and predator species. There is potential for collision of large-bodied wading birds, waterfowl and avian predators with electrical wires near water features. Measures should be taken to ensure that migratory bird species within and near the project area are not adversely impacted by construction, maintenance, and operation activities. If migratory bird species are found nesting in or adjacent to the project area, they must be dealt with in a manner consistent with the MBTA.

Recommendation: TPWD recommends GPL-Rusk route transmission lines to avoid crossing riparian areas, wetlands, and open water habitat, to the extent feasible. TPWD recommends crossing streams in a perpendicular manner and avoiding placement of lines parallel to streams. Where lines cross or are located near creeks, drainages, wetlands, and lakes, TPWD recommends line markers be installed at the crossings or closest points to the drainages to reduce potential collisions by birds flying along or near the drainages. To prevent electrocution of perching raptors, raptor protection measures such as adequate conductor spacing, perch guards, and insulated jumper wires should also be used.

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For additional information, please see the guidelines published by USFWS and the Avian Power Lines Interaction Committee (APLIC) in the updated state-of-the-art guidance document *Reducing Avian Collisions with Power Lines: State of the Art in 2012.* This manual identifies best practices and provides specific guidance to help electric utilities and cooperatives reduce bird collisions with power lines. A companion document, *Suggested Practices for Avian Protection on Power Lines*, was published by APLIC and the USFWS in 2006. For more information on both documents, please visit www.aplic.org.

The Texas Natural Diversity Database (TXNDD) is intended to assist users in avoiding harm to rare species or significant ecological features. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Please note that absence of information in the database does not imply that a species is absent from that area. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and **cannot be used as presence/absence data**. This information cannot be substituted for on-the-ground surveys. The TXNDD is updated continuously based on new, updated and undigitized records. For questions regarding a record or to obtain digital data, please contact TexasNatural.DiversityDatabase@tpwd.texas.gov.

The TXNDD identified two known occurrences of colonial waterbird rookeries, Element Occurrences (EOID) 1436 and 4635, within the study area and five additional occurrences (EOIDs 1032, 4952, 5091, 7713 and 7938) within ten miles of the study area; see enclosed Figure 1 map and EOID tables.

Nesting dates for herons and egrets generally range from early February to late August in Texas, depending on the species. Great blue herons (GBH) are usually the first to nest. When GBH get disrupted from the nest and abandon nesting, other species of herons and egrets may not attempt to nest at the colony that year.

Recommendation: If rookeries or heronries are found within the vicinity of a route, TPWD recommends a primary buffer area of 300 meters (984 feet) from the heronry periphery to avoid any vegetation clearing as a protection measure to protect the heronry and its habitat. TPWD recommends re-routing, adjusting, or narrowing transmission line ROW to avoid clearing within this buffer area. Utilizing areas that have already been cleared within this buffer area may be acceptable depending on site-specific characteristics. Additionally, TPWD recommends that human foot traffic or machinery use not occur within this buffer area during the nesting season.

Recommendation: TPWD recommends a secondary buffer area of 1000 meters (3281 feet) from the heronry periphery to avoid clearing activities or construction using heavy machinery during the breeding season (courting and nesting).