

# State Office of Administrative Hearings



Cathleen Parsley  
Chief Administrative Law Judge

December 16, 2010

**TO: Stephen Journeay, Director**  
**Commission Advising and Docket Management**  
**William B. Travis State Office Building**  
**1701 N. Congress, 7th Floor**  
**Austin, Texas 78701**

**Courier Pick-up**

**RE: SOAH Docket No. 473-10-5546**  
**PUC Docket No. 38354**

**Application of LCRA Transmission Services Corporation to Amend its Certificate of Convenience and Necessity for the Proposed Mccamey D to Kendall to Gillespie 345-kV CREZ Transmission Line in Schleicher, Sutton, Menard, Kimble, Mason, Gillespie, Kerr, and Kendall Counties**

Enclosed is a copy of the Proposal for Decision (PFD) in the above-referenced case. Please file-stamp and return a copy to the State Office of Administrative Hearings for our records.

Please place this case on an open meeting agenda for the Commissioners' consideration. The jurisdictional deadline in this case is January 24, 2011. It is my understanding that you will be notifying me and the parties of the open meeting date, as well as the deadlines for filing exceptions to the PFD, replies to the exceptions, and requests for oral argument.

Sincerely,

A handwritten signature in black ink, appearing to read "Wendy K. L. Harvel", with a stylized flourish at the end.

Wendy K. L. Harvel  
Administrative Law Judge

Enclosure

xc: All Parties of Record

**SOAH DOCKET NO. 473-10-5546**  
**PUC DOCKET NO. 38354**

APPLICATION OF LCRA	§	BEFORE THE STATE OFFICE
TRANSMISSION SERVICES	§	
CORPORATION TO AMEND ITS	§	
CERTIFICATE OF CONVENIENCE AND	§	
NECESSITY FOR THE PROPOSED	§	
MCCAMEY D TO KENDALL TO	§	OF
GILLESPIE 345-KV CREZ	§	
TRANSMISSION LINE IN	§	
SCHLEICHER, SUTTON, MENARD,	§	
KIMBLE, MASON, GILLESPIE, KERR,	§	
AND KENDALL COUNTIES	§	ADMINISTRATIVE HEARINGS

## PROPOSAL FOR DECISION

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**Attachment A**

**SOAH DOCKET NO. 473-10-5546  
PUC DOCKET NO. 38354**

<b>APPLICATION OF LCRA</b>	<b>§</b>	<b>BEFORE THE STATE OFFICE</b>
<b>TRANSMISSION SERVICES</b>	<b>§</b>	
<b>CORPORATION TO AMEND ITS</b>	<b>§</b>	
<b>CERTIFICATE OF CONVENIENCE AND</b>	<b>§</b>	
<b>NECESSITY FOR THE PROPOSED</b>	<b>§</b>	
<b>MCCAMEY D TO KENDALL TO</b>	<b>§</b>	<b>OF</b>
<b>GILLESPIE 345-KV CREZ</b>	<b>§</b>	
<b>TRANSMISSION LINE IN</b>	<b>§</b>	
<b>SCHLEICHER, SUTTON, MENARD,</b>	<b>§</b>	
<b>KIMBLE, MASON, GILLESPIE, KERR,</b>	<b>§</b>	
<b>AND KENDALL COUNTIES</b>	<b>§</b>	<b>ADMINISTRATIVE HEARINGS</b>

**PROPOSAL FOR DECISION**

**I. SUMMARY OF CASE AND RECOMMENDATIONS**

LCRA Transmission Services Corporation’s (LCRA TSC or Company) proposed routes for this Project can be divided into four groups: routes that parallel US Highway 277 and I-10 for all or a significant portion of their length (MK32, MK33); routes that parallel I-10 for a portion of their length but do not parallel Highway 277 (Staff’s MK15, MK15, MK61, MK62); routes that run more in the center of the study area (MK13 (LCRA TSC’s preferred route) and numerous others); and the northern routes, called “P-Lines” that parallel a portion of a 138-kV transmission line (MK22, MK23, MK24).

The routes that parallel Highway 277 and I-10 are superior environmentally but affect more habitable structures than the central routes. They are also more expensive. The central routes affect fewer habitable structures and are some of the least costly routes proposed, but they cut through undeveloped land in the Texas Hill Country, parallel little existing right-of-way (ROW), and are much poorer environmentally. The P-Line routes are disfavored by LCRA, Staff, and the Texas Parks and Wildlife Department (TPWD). They are longer than many of the routes, perform poor environmentally, and are expensive. Although they parallel an existing 138-kV transmission line, that line is on wooden pole, H frame structures. Much of the easement under that line has significant

shrubbery and growth, and is not a ROW that is as compatible with a 345-kV line as I-10. For those reasons, the P-Lines are not recommended.

The ALJs recommend the selection Staff's MK15. It parallels highways for much of its length, performs better environmentally than routes such as the preferred route MK13 that runs through the center of the study area, is more cost-effective than the routes that parallel Highway 277 before turning east at I-10, and affects fewer habitable structures than the I-10 routes that run through Kerrville. Staff's MK15 also runs north of the Kimble County Airport. Construction along I-10 to the south of the airport would require underground construction, costing \$54 million for a one-half mile portion of the line to be buried, which makes routes paralleling I-10 through the City of Junction cost-prohibitive.

Clear View Alliance's (CVA) proposed route, MK33, is the best route environmentally. It parallels existing highway ROW for almost its entire length. It is, however, the most expensive route at \$406.8 million because it is long, using Highway 277 to move south from the McCamey D substation all the way to I-10 before turning east. It also includes a \$54 million cost to bury the line south of the Kimble County Airport. Were the cost of MK33 not so great, it would be the best routing option proposed, and the ALJs would recommend it. MK32, which deviates from MK33 at Junction to run north of the airport, is more cost-effective at \$349.3 million, but it is still on the upper-end of all routes in terms of cost. MK32 is also an attractive option. With the understanding that cost is a significant factor in the Commission's route selection process, the ALJs recommend Staff's MK15, which parallels I-10 for much of its length but diverts around Junction, with an estimated cost of \$302.3 million. While Staff's route is still more expensive than the preferred route, which is estimated to cost \$266.4 million, it is well within the range of all filed routes. Staff's route parallels I-10 for much of its length, while avoiding the cities of Junction and Kerrville and avoids more habitable structures due to the deviation around Kerrville.

Staff's MK15 does, however, affect the Tierra Linda Ranch subdivision. Tierra Linda is a rural subdivision that has a pipeline easement running through it. Staff's MK15 parallels the pipeline easement roughly through the middle of the subdivision. The affected property owners in

the subdivision participated in the hearing, as did the homeowners' association and property owners who are not directly affected by the line but live in the subdivision. Tierra Linda is opposed to the line running through its subdivision. The alternative to running the line through Tierra Linda is to use either the preferred route, which is poor environmentally, and opposed by numerous intervenors, use a P-Line route, which is disfavored by Staff, LCRA TSC, and TPWD, or continue to parallel I-10 through Kerrville, affecting more habitable structures, including 17 that appear to be in the ROW. None of these choices near the termination point are good, and this Proposal for Decision (PFD) lays out the options to permit the Commission to decide. The ALJs recommend Staff's MK15 because it affects fewer habitable structures and does not have any habitable structures within the ROW. One promising alternative to Staff's MK15, however, is MK62. This route is the same as Staff's MK15 except that it continues along I-10 through Kerrville rather than turning north from I-10, through Tierra Linda. If the Commission determines MK62 to be the better option, it carries the environmental and aesthetic advantages of paralleling I-10 for a greater length.

## **II. PROCEDURAL HISTORY, NOTICE, AND JURISDICTION**

The Commission has jurisdiction to adjudicate this case pursuant to Public Utility Regulatory Act (PURA) §§ 14.001, 32.001, 37.001, 37.051, 37.053, 37.054, 37.056, 37.057, 39.203, 39.904, and P.U.C. SUBST. R. 25.101, 25.174, and 25.216. SOAH has jurisdiction to conduct a hearing on the merits and to prepare a proposal for decision pursuant to PURA § 14.053 and certain portions of the Administrative Procedure Act, TEX. GOV'T CODE ANN. §§ 2003.021(b)(2) and 2003.049. The Commission's jurisdiction over this docket and the issues raised and addressed herein were not challenged by any party. Jurisdiction is fully addressed in the Findings of Fact and Conclusions of Law.

### III. THE PARTICIPANTS

Over 1,100 persons and entities intervened in this proceeding. The intervenors included individuals, aligned groups, cities, counties, a public utility board, environmental groups, and state agencies. At the final prehearing conference, over 40 parties appeared and participated. At the hearing on the merits, over 30 parties actively participated by questioning witnesses, presenting evidence, and raising objections. The large groups of intervenors included CVA, Tierra Linda, and P-Line, although many of the individual intervenors from Tierra Linda are not considered to be directly affected landowners because their properties are more than 500 feet from the centerline, they intervened individually and as part of the homeowners' association. The two cities that participated most actively in the hearing were the City of Kerrville and the City of Fredericksburg, working with Kerr County, the Kerrville Public Utility Board (KPUB), and Gillespie County, respectively. State agency participation included TPWD, which intervened as well as providing a comment letter. The Texas Historical Commission (THC) also intervened and participated in the hearing. CVA was a group formed of hundreds of intervenors who all advocate for the line to be routed along Highway 277 and I-10, away from the central routes and parallel to existing paved highway. CVA included intervenors along almost every proposed link, and included individuals who live along I-10 who, as part of the group, advocate for the line to be built parallel to the highway, through or close to their properties, rather than through land in the central part of the study area.

Parties affected by the lines that would have run between Kendall and Gillespie and the P-Lines south of the Gillespie substation also participated. They included the Fredericksburg River Road intervenors, the Sharpes, the Fosters, and the A3O4 intervenors. Those intervenors advocated for a route other than the P-Lines.

Staff participated actively as well, supporting a modified MK15 (Staff MK15), which Staff asserts best balances the factors to be considered in routing a new transmission line. Staff opposed the use of the P-Lines and agreed that the line should be routed parallel to existing highway as much as possible while still considering cost and choosing a route that was more cost-effective than paralleling Highway 277 and I-10 for the maximum length at the maximum cost.



In addition to the groups listed above, numerous individuals participated in the hearing either *pro se* or through counsel. Some people had testimony admitted into the record but did not participate thereafter. Others filed statements of position and did not question witnesses but observed the entire hearing and filed briefing. The level of participation in the case and the professionalism of all involved enabled the hearing to proceed efficiently.

The chart below illustrates the routes opposed, supported, and any alternate preferences stated by the majority of the participating parties.<sup>1</sup>

Route Preferences by Party<sup>2</sup>

Party	MK 13 (LCRA Pref)	MK 15 (Wnzl Pref)	MK 15A (Wnzl 2)	Staff MK15	MK 22	MK 23	MK 24	MK 32	MK 33	MK 61 (MK 15 Mod. Wnzl Pref)	MK 62 (Mod MK 15 Modified PUC Staff)
A3/04											
AC RANCHES											
AHMAD FAKHR											
ALLIANCE FOR A3 <sup>3</sup>											
B-47 GROUP											
B21 GROUP AND HARVEY BOERNER											
BRZEZINSKI, ET. AL											
CEW VENTURES											
CHESTER & KATHERINE FOSTER											
CHIROSS											

<sup>1</sup> These tables are taken from the Alliance for A3 Updated Attachment 1. For convenience, LCRA TSC Ex. 26 is attached to the PFD as Attachment A.

<sup>2</sup> Routes are derived from LCRA TSC Ex. 26, which is attached to the PFD as Attachment A. This chart does not include the Segrest routes because the Segrest parties no longer support them. It also does not include Staff's alternate route that was proposed only if the Kendall to Gillespie project was built.

<sup>3</sup> The Alliance for A3 has changed "Staff MK15" from "Opposes" to "Alternate Preference" since the writing of their reply brief.

Route Preferences by Party<sup>2</sup>

Party	MK 13 (LCRA Pref)	MK 15 (Wnzl Pref)	MK 15A (Wnzl 2)	Staff MK15	MK 22	MK 23	MK 24	MK 32	MK 33	MK 61 (MK 15 Mod. Wnzl Pref)	MK 62 (Mod MK 15 Modified PUC Staff)
CLEAR VIEW ALLIANCE											
CYH RANCH											
DAVID SEGREST											
FREDERICKSBURG RIVER ROAD INTERVENORS											
GILLESPIE CO/CTY FREDERICKSBURG											
HARVEY M. BOERNER											
INTERVENOR AHMAD FAKHR											
JOHN KINNEY KANE AND TYRA COX KANE											
JUNCTION 1090											
KEITH SHARPE											
KERRVILLE PARTIES											
LCRA											
MCGINLEY L- RANCH & ARMSTRONG											
NANCY LIND											
P-LINE INTERVENTION ASSOCIATION											
PAUL MEEK											
RAFTER AKA SABA											
SCHAEFFER RANCH <sup>4</sup>											
SCYTHIAN											
SETTLER RIDGE GROUP											
SIX MILE RANCH											
STAFF											
STONEHENGE <sup>5</sup>											
TEXAS HISTORICAL COMMISSION											
TIERRA LINDA											

<sup>4</sup> Schaeffer Ranch supports “MK33 (the '277/I-10 Route') if it can be constructed without any underground portions in the vicinity of the Kimble County Airport.” Schaeffer Ranch supports Staff MK15 “in the event that the Commission determines that the 277/I-10 Route is too expensive to adopt.”

<sup>5</sup> Stonehenge “opposes any route which includes Link c13b and supports MK61 or MK62.” Initial Brief of Stonehenge Properties, LP, at 1.

Route Preferences by Party<sup>2</sup>

Party	MK 13 (LCRA Pref)	MK 15 (Wnzl Pref)	MK 15A (Wnzl 2)	Staff MK15	MK 22	MK 23	MK 24	MK 32	MK 33	MK 61 (MK 15 Mod. Wnzl Pref)	MK 62 (Mod MK 15 Modified PUC Staff)
TIMOTHY H. BANNWOLF, ET AL											
TRIPLE OAKS											
TPWD											
VICTORIA ANDERSON											
WALTER SCOTT MCGREGOR											
WEINZIERL											

Key	
OPPOSES	
SUPPORTS	
ALTERNATE PREFERENCE	
NEUTRAL/NOT MENTIONED	

#### IV. PROJECT BACKGROUND

The overall Commission Competitive Renewable Energy Zone (CREZ) process that led to the Proposed Project in the Application consisted of the (1) Commission's selection of the CREZ areas (PUC Docket No. 33672), (2) the selection of the transmission plan to support the movement of wind energy from those areas (PUC Docket No. 33672), and (3) the Commission's selection of

transmission service providers to implement the transmission plan (PUC Docket Nos. 36146, 35665, and 37928).<sup>6</sup>

The need for the CREZ Transmission Plan (CTP) projects, including the endpoints for the new transmission lines, was established in Docket No. 33672. In Docket No. 35665, Order on Rehearing (issued May 15, 2009, Conclusion of Law No. 10), the Commission found that the CREZ transmission projects are exempt from addressing the need criteria in PURA § 37.056(c)(1) and (2). More recently, in Docket No. 37928, Order on Rehearing (issued February 25, 2010, Conclusion of Law No. 12), the Commission re-stated that the CREZ transmission projects are exempt from addressing the need criteria in PURA § 37.056(c)(1) and (2).<sup>7</sup>

In Docket No. 33672, the Commission analyzed and considered three critical ERCOT studies of transmission plans for various wind generation levels and analyzed wind generation impact on ERCOT ancillary service requirements. As a result, the Commission identified five specific geographic areas as “Competitive Renewable Energy Zones.” The Commission also examined four scenarios of wind generation that could be installed in these CREZ areas and considered a set of transmission plans for each of the scenarios to be implemented. After the Commission selected the so-called “Scenario 2” and its associated transmission plan as the most appropriate level of wind generation and transmission capacity to implement the CREZ goals, this resulted in the identification of over 100 transmission projects to be constructed. Based on its CREZ Transmission Optimization (CTO) study results, ERCOT determined that this set of projects will maintain curtailment of wind generation below 2.3 percent.<sup>8</sup>

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<sup>6</sup> *Commission Staff’s Petition for Designation of Competitive Renewable Energy Zones*, Docket No. 33672, Order on Rehearing (October 7, 2008); *Issues Related to Default Projects Severed from No. 35665*, Docket No. 36146, Order (November 6, 2008); *Commission Staff’s Petition for the Selection of Entities Responsible for Transmission Improvements Necessary to Deliver Renewable Energy from Competitive Renewable Energy Zones*, Docket No. 35665, Order on Rehearing (May 15, 2009); *Priority Projects Severed from Docket No. 37902*, Docket No. 37928, Order on Remand (February 25, 2010); LCRA TSC Ex. 6, at 11.

<sup>7</sup> LCRA TSC Ex. 1 at 20; LCRA TSC Ex. 6 at 9.

<sup>8</sup> LCRA TSC Ex. 6 at 12-13.

Included in the Commission-approved transmission plan were 13 system improvements that the Commission determined to be of high priority (Priority Projects). These projects were designated as Priority Projects because, in addition to facilitating the CREZ goals, these projects are critical in relieving current congestion that is hampering the delivery of existing generation to the ERCOT grid. One of these Priority Projects, the McCamey D to Kendall 345-kV double-circuit transmission line, has been identified by ERCOT on several occasions (most recently on September 24, 2010) as a critical element to the performance of the overall CTP.<sup>9</sup>

The Commission's goal throughout the CREZ process was to ensure delivery to customers of the energy generated by renewable resources in the CREZ in a manner that is most beneficial and cost-effective to the customers.

The electric customers include all electric consumers within the ERCOT region including those located in the Hill Country as well as the broader Central Texas area.<sup>10</sup>

Staff initiated Docket No. 35665 to select the TSPs to construct the non-default CREZ projects. The Proposed Project includes two of the system improvements listed in the CTP selected in Docket No. 33672. LCRA TSC was ordered to build these two projects by the Commission in Docket No. 35665. Specifically, in the Order on Rehearing in Docket No. 35665 (May 15, 2009), the Commission lists the Proposed Project (composed of two CREZ Priority Projects) which is the subject of this CCN Application. The Commission later affirmed this assignment to LCRA TSC when it severed the 13 CREZ priority projects into Docket No. 37928, for the purpose of specifically assigning the 13 CREZ priority projects (February 25, 2010). In so doing, the Commission emphasized that the severance is "necessary to facilitate the processing of the [priority project CCN applications] most expeditiously." LCRA TSC's Proposed Project is included in Ordering Paragraph No. 1 and associated Attachment B of Docket No. 37928.<sup>11</sup>

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<sup>9</sup> LCRA TSC Ex. 6 at 13; LCRA TSC Ex. 13, Ex. SG-1R.

<sup>10</sup> LCRA TSC Ex. 6 at 14.

<sup>11</sup> LCRA TSC Ex. 6 at 14-15.

ERCOT's CTO Study assumed 137 miles of transmission line for the project. This is reasonably consistent with the range of overall route length indicated in LCRA TSC's proposed alternative routes. Due to the critical nature of the McCamey D to Kendall 345-kV double-circuit transmission line to the overall CTP performance, route length was an important factor affecting the routing options recommended by LCRA TSC in this CCN Application for the transmission line section connecting the McCamey D and Kendall endpoints. For this project, excessive length will detrimentally affect the ability of the transmission line to perform the function assigned it by ERCOT in its CTO Study.<sup>12</sup>

The endpoints for project were identified by ERCOT, specified in the CTO Study report as are required to meet the cost-effectiveness of the overall CTP, and approved by the Commission in its Final Order in Docket No. 33672.<sup>13</sup>

The McCamey D Station is an appropriate endpoint because it is a necessary switching station to connect transmission lines in the immediate area from and to other locations. Also, the McCamey D Station is located in an area near a CREZ and provides effective and efficient service as a CREZ hub to interconnect wind generation facilities. The McCamey D Station is also part of an approved Certificate of Convenience and Necessity (CCN) (*i.e.*, the Twin Buttes to McCamey D single-circuit double-circuit-capable 345-kV transmission line approved in Docket No. 37778).<sup>14</sup>

The existing Kendall station provides excellent CREZ transmission line endpoints for integrating the bulk power delivery transmission lines into the load-serving network. As ERCOT explained in the CTO Study, "each of the plans developed as part of this study has been evaluated on how cost-effectively it is able to collect wind from the five CREZ areas and move that generation to load centers." There are no other stations in the immediate area of each of these stations that provide this level of existing infrastructure.<sup>15</sup>

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<sup>12</sup> LCRA TSC Ex. 6 at 16.

<sup>13</sup> LCRA TSC Ex. 6 at 10.

<sup>14</sup> LCRA TSC Ex. 6 at 10-11.

<sup>15</sup> LCRA TSC Ex. 6 at 11.

LCRA TSC's Proposed Project does not include the 50 percent series compensation project identified in the CTP for the McCamey D to Kendall 345-kV transmission line. Per the Final Order in Docket No. 37928, that project will be constructed by Electric Transmission Texas (ETT). Because the length and location of the McCamey D to Kendall 345-kV transmission line is also an important factor related to the series compensation, LCRA TSC will timely communicate the routing results of the Proposed Project to both ERCOT and ETT.<sup>16</sup>

With the exception of certain combinations of transmission line routes addressed below, both portions of the Proposed Project in LCRA TSC's CCN Application (*i.e.*, McCamey D to Kendall, and Kendall to Gillespie) meet the requirements of the ERCOT CTO Study and comply with the Order on Rehearing in PUC Docket Nos. 35665 and 37928 for constructing CREZ-related facilities. Consistent with the Commission's goals for the CREZ program and P.U.C. SUBST. R. 25.174, LCRA TSC's Proposed Project provides: long-term, cost-effective solutions that are consistent with the Final Order in Docket No. 37928; transmission facilities that are consistent with specifically-associated ERCOT recommendations in the Commission-approved CTP; and transmission facilities that are constructed and placed in service as soon as possible to alleviate existing and growing constraints in delivering wind generation from West Texas to loads in ERCOT.<sup>17</sup>

LCRA TSC's proposed station designs at McCamey D and Kendall will be of the high reliability configurations required for terminations of CREZ transmission lines, such as a ring bus or breaker-and-a-half arrangement designated in the CTO Study.<sup>18</sup>

On December 1, 2010, the Commission determined that the Kendall to Gillespie portion of the transmission line would be replaced with a cost-effective alternative that does not require the construction of a transmission line between the Kendall and Gillespie substations at this time.<sup>19</sup>

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<sup>16</sup> LCRA TSC Ex. 6 at 16-17; *see also* LCRA TSC Ex. 5 at 6.

<sup>17</sup> LCRA TSC Ex. 6 at 17; *see also* LCRA TSC Ex. 1 at 7; LCRA TSC Ex. 2 at 10, 28-29, 31.

<sup>18</sup> LCRA TSC Ex. 5 at 14-15.

<sup>19</sup> *Proceeding to Determine Whether to Modify the CREZ Transmission Plan*, Docket No. 38577, Final Order

Therefore, this PFD does not address the routing issues between those substations. However, most of the links originally filed between those two substations could also be used if the Commission determined to route the transmission line along any of the P-Lines. Because the ALJs recommend against all the P-Lines, none of the links from Kendall to Gillespie are recommended.

## V. PRELIMINARY ORDER ISSUES

### A. Preliminary Order Issue No. 1

**Is LCRA TSC's Application to amend its CCN adequate? Does the Application contain an adequate number of reasonably differentiated alternative routes to conduct a proper evaluation?**

In Order No. 5, the ALJs concluded that the Application was materially sufficient. As part of the evidence concerning material sufficiency, Staff concurred that the Application contains an adequate number of reasonably differentiated routes for the Commission's evaluation.<sup>20</sup> LCRA TSC provided 60 primary alternative routes for the MK Project.<sup>21</sup>

LCRA TSC's Application provided an adequate number of routes and otherwise complies with all applicable statutory and regulatory requirements. Several parties (Settler's Ridge, Fredericksburg River Road Intervenors, and the Fosters) filed motions challenging the adequacy of the routes proposed in the Application.<sup>22</sup> These motions were denied by the ALJs in Order Nos. 5, 7, and 10, respectively.

### B. Preliminary Order Issue No. 2

**Did the notice provided by LCRA TSC comply with P.U.C. PROC. R. 22.52(a)?**

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(December 1, 2010).

<sup>20</sup> PUC Staff Ex. 2 at 19; PUC Staff Ex. 1 at 18-19. There are at least 100 possible routes (using noticed links) for the KG Project and at least 20,000 possible routes (using noticed links) for the MK Project. LCRA TSC Ex. 2 at 27.

<sup>21</sup> LCRA TSC Ex. 9 at 32. LCRA TSC designated the Kendall to Gillespie lines as the KG Project and the McCamey D to Kendall lines as the MK Project.

<sup>22</sup> See Docket No. 38354, Settler's Ridge Motion on Route Adequacy (Aug. 11, 2010), Interchange Item No. 684; Fredericksburg River Road Intervenors' Motion on Route Adequacy (Aug. 23, 2010), Interchange Item No. 880; Motion for Review of the Adequacy of Routes Proposed Herein (Sept 3, 2010), Interchange Item No. 1743.



In accordance with P.U.C. PROC. R. 22.52, LCRA TSC provided notice to directly affected landowners, utilities, city governments, and county governments on July 28, 2010;<sup>23</sup> re-mailed notice to certain landowners for whom the original notice was returned to LCRA TSC on or before August 17, 2010, or for whom LCRA TSC subsequently learned of different ownership of a directly affected property;<sup>24</sup> provided notice by publication in newspapers having general circulation in the counties where the CCN is being requested on August 5 and 13, 2010;<sup>25</sup> provided copies of the Application and the Environmental Assessment and Alternative Route Analysis (EA) compiled for this project to representatives of TPWD,<sup>26</sup> and held public open houses on May 4, 5, 7, 11, 12, and 14, 2009 and February 16, 17, 18, 22, 23, and 24, 2010.<sup>27</sup>

On August 20, 2010, Staff filed Comments in Response to Order No. 1. In the Comments, Staff reviewed LCRA TSC's Affidavit of Notice and Supplemental Affidavit of Notice as well as its Publishers Affidavits and found them sufficient and compliant with the notice provisions set out in P.U.C. PROC. R. 22.52(a) and Order No. 1.<sup>28</sup> On August 23, 2010, the ALJs issued Order No. 5, which found the Application sufficient and free of any material deficiencies. LCRA TSC has complied with the requirements of P.U.C. PROC. R. 22.52(a)(1)-(4).

ChiRoss Intervenors argued that notice was improperly served upon them because they are not traditional directly affected landowners under P.U.C. PROC. R. 22.52(a)(3). LCRA TSC argued, however, that the Commission's rules present the minimum notice required; nothing in the rules preclude the noticing of additional property owners in order to provide the Commission with flexibility in its selection of a final route.<sup>29</sup> Recognizing this fact, the ALJs issued Order No. 16 finding that either the ALJs or the Commission could approve a route on noticed property that is not

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<sup>23</sup> LCRA TSC Ex. 4

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> *Id.*

<sup>27</sup> LCRA TSC Ex. 2 at 13-14.

<sup>28</sup> Comments in Response to Order No. 1 On Compliance With Notice Requirements (Aug. 20, 2010), Interchange Item No. 822.

<sup>29</sup> LCRA TSC Ex. 12 at 7.

directly affected by a proposed route, and that absent a stipulation, the ALJs would not grant a motion to dismiss on grounds that the project would not directly affect an intervenor's property.

**C. Preliminary Order Issue No. 3**

**Does the Application meet the filing requirements set forth in P.U.C. SUBST. R. 25.216(g)(2) and (3)?**

In Order No. 5, the ALJs found that the Application is sufficient and contains no material deficiencies. No party has challenged the sufficiency of this ruling. LCRA TSC's Application has met the filing requirements set forth in P.U.C. SUBST. R. 25.216(g)(2) and (3).

**D. Preliminary Order Issue No. 4**

**Did LCRA TSC submit the CCN application in compliance with the Orders in Docket Nos. 37928 and 36802 designating it as a CREZ Priority Transmission Plan facility? If not, should the Commission revoke the designation awarded to LCRA TSC and select another entity for the CREZ Priority Transmission Plan facility at issue in this docket pursuant to P.U.C. SUBST. R. 25.216(f)(1)?**

The Application was submitted in compliance with Docket No. 35665 designating it as a CREZ Priority Transmission Line Project that was filed in accordance with the sequence of filing ordered in Docket Nos. 36801 and 36802.<sup>30</sup>

LCRA TSC's proposed double-circuit or double-circuit-capable 345-kV transmission lines between the McCamey D and Kendall stations are a part of the ERCOT CREZ Transmission Plan ordered by the PUC in Docket No. 33672.<sup>31</sup> The lines are "priority projects" designated as such by the PUC because they help to relieve congestion restricting existing wind generation in addition to

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<sup>30</sup> Staff Ex. 2 at 13.

<sup>31</sup> Docket No. 33672, Order on Rehearing (October 7, 2008) at 39-47 (FOF 117-178) 48 (COL 6-7), and 49 (Ordering Paragraph 2). Double-circuit-capable structures will be constructed for the McCamey D to Kendall and Kendall to Gillespie CREZ projects. As required by the CREZ Transmission Plan (CTP) the McCamey D to Kendall CREZ Project will be built as a double-circuit line while the CTP calls for the Kendall to Gillespie CREZ Project to be constructed initially as a single-circuit project with a second circuit to follow sometime in the future.

performing the CREZ function of supporting the development of new wind generation.<sup>32</sup> In Docket No. 35665, the PUC ordered LCRA TSC to build the McCamey D to Kendall and Kendall to Gillespie lines.<sup>33</sup> As stated by the PUC in its Order in Docket No. 35665<sup>34</sup> and its Order of Referral and Preliminary Order in this docket,<sup>35</sup> PURA Sections 39.203(e) and 39.904(h) exempt CREZ facilities from CCN requirements addressing need, adequacy of existing service, effects on the applicant or other utilities, and probable improvement of service or lowering of cost to customers.<sup>36</sup>

In addition to CREZ-related benefits, the line is intended to benefit the general area of their location by providing increased transmission support to meet growing needs in the Central Texas and Hill Country areas.<sup>37</sup> Meeting increasing transmission needs in the Hill Country region was a benefit cited by ERCOT in its CTO Study.<sup>38</sup>

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<sup>32</sup> *Id.* at 42 (FOF 136).

<sup>33</sup> Docket No. 35665, Order on Rehearing (May 15, 2009) at p. 50 (FOF 120).

<sup>34</sup> *Id.* at p. 60 (COL 10).

<sup>35</sup> Order of Referral and Preliminary Order at 7-9.

<sup>36</sup> TEX. UTILITIES CODE §§ 39.203(e) and 39.904(h).

<sup>37</sup> LCRA TSC Ex. 6 at 26.

<sup>38</sup> *Id.* at 29-30.

**E. Preliminary Order Issue No. 5**

**Will completion of the project proposed by LCRA TSC in this docket accomplish the intended result for the CREZ project designated as "McCamey D to Kendall to Gillespie 345-kV Transmission Line Project" in the CREZ Transmission Plan and ordered by the Commission in Docket Nos. 37928 and 36802?**

The Application will accomplish the intended results for the CREZ priority project designated in the CREZ CTO and ordered by the Commission in Docket Nos. 35665, 37928, and 36802.<sup>39</sup> In Docket No. 33672, the Commission found that certain lines are critical to relieve the congestion that is hampering the delivery of existing wind-powered energy to the grid and designated them as priority projects.<sup>40</sup> In an effort to relieve this congestion, the Commission specifically required LCRA TSC to build new, double-circuit 345-kV line running from the McCamey D Station to the Kendall Station and then a double-circuit-capable, single-circuit 345-kV line from the Kendall Station to the Gillespie Station.<sup>41</sup>

A number of intervenors asserted that the need for the project is not demonstrated and that a transmission line owned by NextEra, the Horse Hollow Generation Tie, LLC (HHGT) could provide a substitute for the Project. On September 24, 2010, ERCOT submitted a letter summarizing the study that it had conducted at request of the Commission regarding the need for the MK to KG lines.<sup>42</sup> ERCOT's study concluded that (a) the MK portion of the project has no viable alternative and must remain part of the CREZ transmission plan; (b) the HHGT is not a viable alternative to the MK CREZ priority transmission line, and (c) the KG project could potentially be avoided with a less expensive alternative of installing certain infrastructure improvements.<sup>43</sup> In Order No. 12, the ALJs held that, unless directed otherwise by the Commission, they would not consider the issue of whether the HHGT line could be used in the place of the MK Project because (1) that is an issue of

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<sup>39</sup> PUC Staff Ex. 2 at 13; Staff Ex. 1 at 11.

<sup>40</sup> Docket No. 33672, *Commission Staff's Petition for Designation of Competitive Renewable Energy Zones*, Order on Rehearing (Oct. 7, 2008) at 12.

<sup>41</sup> LCRA TSC Ex. 1, Attachment 1 (EA) at 1-5.

<sup>42</sup> LCRA TSC Ex. 13 (Ex. SG-1R).

<sup>43</sup> *Id.*

need, which is not to be considered in this proceeding, and (2) ERCOT's study found that there is no viable alternative to this line.<sup>44</sup> In Order No. 14, the ALJs ordered the direct testimony of HHGT witnesses to be struck in accordance with LCRA TSC's objections.<sup>45</sup>

**F. Preliminary Order Issue No. 6**

**Which proposed transmission line route is the best alternative, weighing the factors set forth in PURA § 37.056(c)(4), excluding (4)(E), and P.U.C. SUBST. R. 25.101(b)(3)(B)?**

After weighing the factors, Staff MK15 is the best alternative because it best balances all of the relevant criteria. While MK32 and 33 are better choices environmentally, they sacrifice cost and habitable structures to parallel existing highway.

**1. The Effect of Granting the Certificate on LCRA TSC and Any Electric Utility Serving the Proximate Area**

Although included in CCN proceedings, this issue is specifically excluded from CREZ CCN proceedings.<sup>46</sup>

**2. Community Values**

Although "community values" is not formally defined in Commission rules or in PURA, the term has been described as a "shared appreciation of an area or other natural or human resource by a national, regional, or local community."<sup>47</sup> The study area in this case and the length of the transmission line from McCamey D to Kendall are so large that there is no consensus on community values.

To address and consider community values, LCRA TSC conducted 20 public meetings on

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<sup>44</sup> Order No. 12 (Oct. 1, 2010), Interchange Item No. 2657, at 2-3.

<sup>45</sup> Order No. 14 (Oct. 12, 2010), Interchange Item No. 2772, at 4.

<sup>46</sup> PURA §§ 39.203(e) and 39.904(h) and P.U.C. SUBST. R. 25.174(d)(2).

<sup>47</sup> LCRA TSC Ex. 1, EA at 2-55.

May 4, 2009, May 5, 2009, May 7, 2009, May 11, 2009, May 12, 2009, and May 14, 2009. In addition, LCRA TSC conducted public meetings on February 15 and February 16, 17, 18, 22, 23, and 24, 2010.<sup>48</sup> These meetings provided information to LCRA TSC regarding community values by participants who provided a ranking of a series of routing criteria. LCRA TSC further took into account expressions of community values in a review of the questionnaires, letters, meetings, phone calls, and other public input it has received.<sup>49</sup> LCRA TSC received additional information about community values at the Technical Conference held on September 1, 2010, and at the Settlement Conferences it held on September 20, 21, and 22, 2010.

Four strong indications of community values arose during the pendency of this case: the effect of the line on the Texas Hill Country; the effect of the line on habitable structures, particularly in developed areas, such as cities; the effect on rural residential subdivisions; and the use of monopoles. Almost all intervenors testified that they did not want the line on their property and it was better to place the line on someone else's property (or in another county). The ALJs do not consider those arguments to be representative of community values. It is understood that most people would prefer not to have the line routed across their land or through their town, but that is not helpful for determining whether the community as a whole or larger portions of the community share certain values.

**a. Texas Hill Country**

Avoiding "central" routes that would cut through undisturbed areas of the Texas Hill Country is one shared community value relevant to this proceeding. It was one reason for the delay of this proceeding for several months so that the study area could be expanded to include the existing AEP 138-kV line to the north (now paralleled by the P-Lines) and the US 277/I-10 corridor to the south.<sup>50</sup> As Chairman Smitherman explained at the September 24, 2009 Open Meeting:

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<sup>48</sup> LCRA TSC Ex. 2 at 12-13.

<sup>49</sup> LCRA TSC Ex. 2 at 11.

<sup>50</sup> WR Ex. 8 at 4; LCRA TSC Ex. 2 at 21.

I do think that some of the letters raised some legitimate concerns about making sure that we follow the statute and follow our rules which say, hey, take a look at existing corridors, take a look at existing rights-of-way, **take a look at existing infrastructure. Can you run along these rather than going straight across virgin ranch territory. . . .**<sup>51</sup>

Thus, the Commission has already acknowledged public support in favor of using existing compatible corridors, rather than impacting areas of the Hill County, as MK13 does.

The questionnaires received by LCRA from the members of the community in the McCamey D to Kendall study area consistently ranked paralleling existing compatible ROW among the highest factors in importance, if not *the* highest factor.<sup>52</sup> LCRA witness Sarah Morgenroth, who was responsible for overseeing the public involvement program for this project, including coordinating open houses and meetings with governmental officials, confirmed that there has been a great deal of public interest in developing a route along the I-10 corridor.<sup>53</sup> As Ms. Morgenroth testified, “[t]here was a lot of comment about preserving the Hill Country.”<sup>54</sup>

Further, one of the parties in this case, CVA, which represents approximately 240 landowners in this proceeding, has promoted a route that avoids traversing the “heart of the Hill Country” in favor of a path that follows existing compatible corridors, such as the US 277/I-10 corridor.<sup>55</sup> CVA’s lead landowner witness, Bill Neiman, testified that one goal in forming CVA was to form a large group of concerned landowners to speak with a common voice.<sup>56</sup> He also testified that he realized the line may cross or come close to his land, but decided he would have to be “at peace” with that possibility because his goal was to do his best to keep the line from running through the Hill Country.<sup>57</sup> There is much evidence in this proceeding that many parties hold

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<sup>51</sup> WR Ex. 8 at 4 (emphasis added).

<sup>52</sup> See generally LCRA TSC Ex. 1, Attachment 1 at Section 6.

<sup>53</sup> Tr. at 346; LCRA TSC Ex. 2 at 4, 20-21.

<sup>54</sup> Tr. at 164.

<sup>55</sup> CVA Ex. 9 at 2-3.

<sup>56</sup> Tr. at 629-630; CVA Ex. 9 at 5.

<sup>57</sup> Tr. at 679; see also CVA Ex. 9.

community values that support using existing compatible corridors such as I-10, and minimizing the impact to the Texas Hill Country.

Yet MK13, the preferred route, would cut a new ROW through the Hill Country and would parallel few property lines. A large number of intervenors who want to preserve the nature of the Hill Country vehemently oppose the preferred route and all other central routes. Because it is a central community value, the ALJs recommend against the preferred route and against the other central routes. Routing the line parallel to existing highways that have already scarred the landscape and are not natural or scenic is a better choice to address the values expressed by many, if not most of the intervenors. Staff MK15 parallels I-10 for much of its length, coming off of the central routes at Ranch Road 1674, travelling south to hit I-10 west of Junction before moving east. The ALJs recommend the Commission approve Staff MK15.

**b. Habitable structures**

In contrast to the community values held by those intervenors advocating routes that do not run through the Hill Country, many intervenors expressed concern about the line running in close proximity to a large number of habitable structures and also running through Kerrville and other cities, and running close to Fredericksburg.

The parties concerned with habitable structures and city development oppose all routes that travel through Kerrville, citing limiting impacts to residences as a strongly held community value. Maximizing the distance of the proposed line from residences/habitable structures was also one of the most highly ranked values in the questionnaires received by LCRA.<sup>58</sup> While routes MK32 and 33 best satisfy the community value of paralleling existing compatible corridors, they also have some of the highest numbers of habitable structures within 500 feet of the centerline. Routes MK32 and 33, with 151 and 153 impacted habitable structures respectively, would each affect more than

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<sup>58</sup> See LCRA TSC Ex. 1, EA at 6-5 to 6-58.



eight times as many habitable structures as Route MK13.<sup>59</sup>

The ALJs conclude that, neither Route MK13 nor routes MK32 or 33 are the best overall routes in terms of community values. Rather, the evidence shows that Staff MK15 best satisfies the expressed community values because it parallels a substantial length of existing compatible corridors, while impacting relatively few habitable structures.<sup>60</sup> Although the various MK15 route options do not parallel as great a length of existing corridors as routes MK32 and 33, they impact vastly fewer habitable structures and cost significantly less.<sup>61</sup> Likewise, while Staff MK15 impacts more habitable structures (55) than Route MK13 (18), it parallels significantly more existing compatible ROW and is only 10 miles longer.<sup>62</sup> If Staff's route is used with a variation that continues the line along I-10 through Kerrville, it would impact 128 habitable structures. This variation is MK62.

The communities of Mason, Fredericksburg, and Kerrville provided testimony that their communities did not want the transmission line through their towns.<sup>63</sup> Staff MK15 avoids the communities of Eldorado, Sonora, Mason, Menard, and Fredericksburg.<sup>64</sup> Staff MK15 also circumvents the community of Kerrville and avoids 99 habitable structures (including 17 within the ROW).<sup>65</sup> Although avoiding Kerrville, Staff MK15 parallels a gas pipeline through Tierra Linda and affects 12-14 habitable structures as opposed to the 99 in that subdivision, which would not be affected by MK32 or 33.<sup>66</sup>

### **c. Cities**

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<sup>59</sup> LCRA TSC Ex. 26.

<sup>60</sup> *See id.*; LCRA TSC Ex. 1, EA at 6-85 to 6-92.

<sup>61</sup> *Id.*

<sup>62</sup> *Id.*; LCRA TSC Ex. 1, EA at 6-85 to 6-92.

<sup>63</sup> Kerrville Ex. 1 at 4; P-Line Ex. 1 at 2; P-Line Ex. 12 at 2; Tr. at 715; 718-719.

<sup>64</sup> Tr. at 719.

<sup>65</sup> LCRA TSC Ex. 20 at 6-85 to 6-93.

<sup>66</sup> Staff Ex. 1 at 25; Tr. at 563-564, 1059, 1167.

Kerrville, Kerr County, and Gillespie County intervened in this proceeding on behalf of their citizens. The elected officials of Kerrville and Kerr County appeared for cross-examination at the hearing presented testimony on behalf of their citizens and expressed the community values of their constituents.<sup>67</sup> Kerrville Mayor Wampler and Kerr County Judge Tinley expressed the will of their constituencies in Kerrville and Kerr County for the proposed transmission line to avoid the growing population centers of Kerrville and northern Kerr County.<sup>68</sup>

The Kerrville community is currently expanding along I-10.<sup>69</sup> The City has made significant expenditures in order to ready the I-10 corridor for further development.<sup>70</sup> The Kerrville Public Utility Board (KPUB) also has spent over \$1 million to extend utility infrastructure to the areas along I-10, in the vicinity of Links Y16, Y17b, Y18, Y19b and Y20, which are links in routes MK32, 33, 61, and 62.<sup>71</sup>

Kerr County is also experiencing growth just north of I-10.<sup>72</sup> Kerr County Judge Tinley identified the Whiskey Canyon subdivision and other communities that would be affected by Links c1a, b57a, c3, c9, c6, and c8, some of which are in routes MK15 and Staff MK15.<sup>73</sup> Property owners from the Whiskey Ridge subdivision also intervened individually to express their concerns. Jerry Ahrens, Kenneth and Carol Swanson, and Michael and Margie Schwartz all testified that construction of the proposed transmission line along Link c1a would negatively impact their properties, would not comport with the community values of Whiskey Ridge, and would negatively

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<sup>67</sup> Tr. at 241, 718. The parties were able to waive cross-examination on many witnesses who pre-filed testimony. Therefore, many witnesses whose testimony is part of the record of this proceeding did not testify live at the hearing.

<sup>68</sup> Kerrville Ex. 1 at 4; Kerr County Ex. 1 at 5-8.

<sup>69</sup> Atkisson Ex. 1 at 7; Kerrville Ex. 1 at 5.

<sup>70</sup> Kerrville Ex. 1 at 5-10, Attachments A-F.

<sup>71</sup> KPUB Ex. 1 at 6.

<sup>72</sup> Kerr County Ex. 1 at 5-9, Attachments A-H.

<sup>73</sup> Kerr County Ex. 1 at 6-7.

impact property values.<sup>74</sup> Thus, it is apparent that the existing communities in Kerr County value the placement of the proposed transmission line away from the ongoing development in Kerrville and northern Kerr County.

Kerrville and Kerr County also intervened to present the special concerns they share as local governments. Specifically, the placement of the proposed transmission line in the areas of proposed major developments will impair their abilities to raise much-needed funds through property taxes. Mayor Wampler testified that:

[C]onservatively, that the impact -- the economic impact by the line going along I-10 as proposed would have an effect of over half a million dollars in taxable -- future taxable dollars. That equates to 32 percent of our current taxable ad valorem value. I think that once that impact is felt, it's perpetual and would be extremely negative and damaging to our future as a city.<sup>75</sup>

Kerr County Judge Pat Tinley described similar negative potential impacts on Kerr County. He demonstrated that the land values of the developed parcels along I-10 are valued substantially higher than the parcels that have not yet been developed.<sup>76</sup> City and county governments raise funds for civil services through property taxes; reducing the property values along I-10 and northern Kerr County will lower the funds available for law enforcement, road maintenance, emergency services and other civic services provided to residents of the County.<sup>77</sup> The communities of Kerrville and Kerr County, through their elected officials, have expressed their desire for selection of a route that avoids the use of Links Y16, Y17b, Y18, Y19b, Y20, c1a, b57a, c3, c9, c6 and c8. Staff MK15 uses only one of those links, c6.

Given the competing community concerns of avoiding the Hill Country versus avoiding habitable structures and cities, Staff MK15 strikes a good balance between those interests. However, following I-10 through Kerrville permits the line to continue along a compatible corridor.

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<sup>74</sup> Ahrens Ex. 1 at 1-2; Swanson Ex. 1 at 1-2; Schwartz Ex. 1 at 2-3.

<sup>75</sup> Tr. at 718-719.

<sup>76</sup> Kerr County Ex. 2 at 4-5, Attachments A and B.

<sup>77</sup> Kerr County Ex. 1 at 5-6.

Those routes would affect more habitable structures and may require moving structures that are in the ROW, but they would avoid the rural residential subdivision of Tierra Linda.

**d. Other Community Values**

*Tierra Linda Ranch*

Routing along I-10 but avoiding Kerrville would route the line through Tierra Linda. The subdivision currently has a pipeline easement through it, and LCRA TSC proposes to route the line parallel to that existing easement. The owners of the 15 directly-affected habitable structures intervened as did the Homeowners' Association and other residents and property owners in the subdivision even if they were not considered to be directly affected.<sup>78</sup> They all oppose the line running through their subdivision and note that a pipeline ROW may not be compatible with a transmission line because the impact of the pipeline easement is minimal in comparison.

*P-Line Intervenors*

The P-Line intervenors also express concern for the resources of the Hill Country. They argue that the existing 138-kV line is old and small. The proposed line would be much larger and more intrusive. The line would cross ranch land that has been held in the same family for generations. P-Line Intervenors note that the communities along the P-Lines are rural with shared values for preserving cultural resources and history.<sup>79</sup> Because the P-Line routes perform poorly on so many of the routing criteria, they are not recommended as discussed throughout this PFD.

*Fort McKavett*

Several intervenors note the community values concern about Fort McKavett.<sup>80</sup> The issues

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<sup>78</sup> Unlike in other CCN cases, LCRA TSC chose not to object to requests to intervene from individuals who would not be considered directly affected landowners under the Commission's rules.

<sup>79</sup> P-Line Initial Brief at 5.

<sup>80</sup> Six Mile Initial Brief at 11-12; THC Initial Brief at 3; Saba Initial Brief at 12-13.

relating to the routes close to and visible from Fort McKavett are addressed in the sections related to historical resources. The recommended route does not affect Fort McKavett.

**e. Monopoles**

A number of intervenors have requested the use of steel and spun concrete poles, commonly called “monopoles,” for the proposed project. LCRA TSC filed its application proposing lattice structures to be consistent with its proposal in Docket No. 35665 and because lattice is the most cost-effective structure type.<sup>81</sup> As a result, its base cost estimates for routes and segments assume lattice structures.<sup>82</sup>

Regardless of the type of structures used, the double-circuit-capable 345-kV structures required for the project will be visible to landowners and the public. Because LCRA TSC recognizes the support expressed for monopole structures, it also included detailed cost information for a variety of structure types, including mixtures using both steel poles and spun concrete poles.<sup>83</sup> LCRA TSC has repeatedly stated its position that any of its proposed structures are acceptable and will be used if the PUC determines such structures are preferred. The ultimate decision as to structure type necessarily rests with the PUC and its balancing of costs and benefits.<sup>84</sup>

The ALJs support the use of monopoles to the extent it is cost-effective and particularly in any areas with denser population, such as along I-10 though population centers such as Sonora, Junction, and Kerrville if the line is ultimately routed through those communities. There was strong support from almost all intervenors for the use of monopoles, which tends to show that the use of monopoles is a shared community value.

Along Staff MK15, the ALJs support and recommend monopoles through Tierra Linda.

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<sup>81</sup> LCRA TSC Ex. 7 at 12-17.

<sup>82</sup> *Id.* at 19 and CDS-3; LCRA TSC Ex. 14 at 5.

<sup>83</sup> LCRA TSC Ex. 7 at 13, 18-19; LCRA TSC Ex. 14 at 5-12, CDS-2REB, and CDS-3REB.

<sup>84</sup> LCRA TSC Ex. 14 at 12.

### **3. Recreation and Park Areas**

LCRA TSC notes that avoiding parks and recreational areas was a consideration in designing the routes proposed in the Application. PBS&J reviewed U.S. Geological Survey topographic maps, Texas Department of Transportation (TxDOT) county highway maps and federal, state, and local maps, the TPWD “Texas Outdoor Recreation Inventory,” the Texas Outdoor Recreation Plan, recent aerial photography, and conducted a limited field reconnaissance. As a result of that review, PBS&J identified two parks or recreation areas located within 1,000 feet of the preferred route MK13 centerline, Flat Rock Ranch, and a TxDOT roadside park. Other notable recreation areas within the study area are the Old Tunnel Wildlife Management Area (Old Tunnel WMA) and Fort McKavett State Historical Site, one of the best preserved and most intact examples of a Texas Indian Wars military post, both addressed below. Of the other 59 primary alternative routes, 53 are located within 1,000 feet of additional parks or recreation areas (with a few routes within this range of as many as seven such areas).<sup>85</sup>

Staff notes that one park/recreation area is crossed by 27 of the proposed routes, including MK13 and Staff MK15. The lines pass within 1,000 feet of the Flat Rock Ranch, which features mountain biking and camping areas, paralleling the eastern side of the Horse Hollow generation tie 345-kV transmission line. Only one park/recreation area is within 1,000 feet of the centerline of MK13 and Staff MK15. MK32 and MK33 run within 1,000 feet of six and seven parks/recreation areas, respectively.<sup>86</sup>

#### **a. Old Tunnel Wildlife Management Area**

TPWD is the owner and operator of the 16.1 acre Old Tunnel WMA, located in Kendall County. TPWD opposes all routes that use Links A3 or O4, which run within 500 feet of the Old Tunnel area’s western boundary. The only route in contention that uses either Link A3 or O4 is

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<sup>85</sup> LCRA TSC Ex. 1, Application at 40, and EA at 2-64, 2-68, 5-24; LCRA TSC Ex. 9 at 26; LCRA TSC Ex. 20, Ex. RRR-3R (rev. Table 6-1).

<sup>86</sup> Staff Ex. 1 at 33; LCRA TSC Ex. 23 at 1; LCRA TSC Ex. 1 at 5-23; LCRA TSC Ex. 26.

MK22, which is a P-Line route. Most of the original filed routes that used those links were part of the KG project. Although the KG line is not a part of this proceeding and the ALJs recommend against the P-Line routes, they address TPWD's arguments in the event the Commission considers a route that would impact the Old Tunnel. The Old Tunnel area is comprised of an abandoned railroad tunnel and includes a bat colony of up to three million Brazilian free-tailed bats and three thousand cave myotis -- more mammals than any other Wildlife Management Area in Texas. The Old Tunnel includes nature trails for hiking and bird watching, educational programs, bat watching, and guided nature tours. TPWD estimates that 21,324 visitors visited the Old Tunnel just to watch bats emerge from the tunnel. TPWD estimates the annual economic benefit to the region of at least \$748,000.<sup>87</sup>

TPWD is concerned that the line, if placed on Links A3 or O4, would result in bat mortality and possible abandonment of the colony. As a result of potential harm to the Old Tunnel as an environmental and recreational resource, TPWD opposes any route that uses these links. As discussed in the environmental section below, the ALJs find that TPWD has raised genuine questions about the potential impact of transmission lines on the bat colonies at the Old Tunnel. The ALJs do not recommend a route using any of the links opposed by TPWD regarding the Old Tunnel.

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<sup>87</sup> LCRA TSC Ex. 1, EA at 2-65, Table 4-1; TPWD Ex. 1 at 3, 6, 10, 12; TPWD Ex. 3 at 4; TPWD Ex. 2 at 10.

**b. Fort McKavett**

A number of intervenors, including the THC and TPWD oppose links that would impact the view shed and historic and aesthetic value of Fort McKavett.<sup>88</sup> The THC owns and operates the Fort McKavett State Historic Site in Menard County, Texas (Fort). The THC is an agency of the State of Texas, charged with providing leadership and coordination in the field of historic preservation, using its facilities to stimulate the protection of historic resources, and conducting related educational programs. These duties are in furtherance of the THC's mission to protect and preserve the state's historic and prehistoric resources for the use, enjoyment, and economic benefit of present and future generations.<sup>89</sup>

The Fort was designated as a state historic site on May 17, 1968, in order to help preserve its role in history as a federal fort protecting settlers on the mid-19th-century Texas frontier. Fort McKavett is among the most intact, surviving 19th-century frontier military installations in Texas. The Fort is a State Historic Site, as well as a National Historic District listed on the National Register of Historic Places. Fort McKavett is part of TPWD's Great Texas Wildlife Trails, as well as the THC's Texas Forts Trail. The Fort McKavett State Historical Site is also designated a riparian conservation area.<sup>90</sup>

The Fort is located in the vicinity of a number of the north-central routes and segments proposed by LCRA TSC. They are: b16b, b17b, the Z1 and Z2 lines connecting those routes, and the Powell Ranch proposed modification to route/segment b16b, Option 2 (THC Opposed Routes). Although the ALJs recommend against a northern-central route that would impact the Fort, they nevertheless address the THC's arguments in the event the Commission considers these segments.

Thomas Alexander, a THC commissioner and historian explained that for defensive reasons, the Fort was built between 75 and 100 feet above the surrounding terrain. The THC is concerned

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<sup>88</sup> TPWD Ex. 4 at 25; THC Ex. 4 at 5, 8-9; THC Ex. 18; Tr. at 554-555, 584, 645-647, 760-761, 969-970, 972.

<sup>89</sup> TEX. GOV'T CODE §§ 442.002(a), 442.003, 442.005(j), (l).

<sup>90</sup> Six Mile Ex. 1 at 7; LCRA TSC Ex. 1, EA at 2-66, 2-67, 2-72; TPWD Ex. 4 at 32.



that transmission towers of up to 180 feet in height would be easily visible from the grounds of the Fort. The towers would range from 1.18 miles (b16b), 1.26 miles (Z1 and Z2), and 1.55 miles (b17b) from the Fort. Mr. Alexander and THC witness Michael Garza, the Fort's site manager, explained that the Fort remains isolated from modern development, with pristine views in all directions; they note that the view from the Fort is much as it was in the mid-nineteenth century. Mr. Alexander testified that it is this ambiance, virtually unchanged for nearly 160 years, that makes the Fort unique and valuable. The Fort hosts living history events, star parties, Boy Scout functions, and visitor tours throughout the year. The THC notes that the isolation and historical character of the Fort contributes greatly to the efficacy of these events. As a result, the THC argues that transmission towers of up to 180 feet in height would directly and negatively impact those view sheds from the Fort, and would likewise negatively impact the Fort's historic character, its isolation, and the overall appeal of the Site.<sup>91</sup>

LCRA TSC disagrees, noting that there is no evidence that the proximity and visibility of the line will repel tourists interested in visiting the Fort.<sup>92</sup> Furthermore, LCRA TSC argues that the THC lacks evidentiary support for its arguments regarding the view shed and impact on the appeal of the Fort. As discussed above, however, THC submitted expert testimony to support its arguments regarding the view shed and historic and aesthetic value of the fort. Also, LCRA TSC acknowledged that the comparative view shed impact of existing cell towers in the vicinity of the Fort would be substantially less than a transmission line of 120 to 180 feet.<sup>93</sup> Although the THC did not establish that tourists would avoid the Fort due to the proximity of a large transmission line, LCRA TSC did not conduct a causation analysis either.<sup>94</sup> While it is unclear what impact, if any, the lines would have on tourism at the Fort, the ALJs agree with the THC that the line would have a negative impact on Fort McKavett's historic character, the Fort's view shed, and the aesthetic values associated with its preservation and isolation.

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<sup>91</sup> THC Ex. 18 at 4, 7-8, 12-13 and Ex. 1-17; THC Ex. 4 at 7-9, THC Ex. 1 at RFI Response No. 1-4.

<sup>92</sup> LCRA TSC Ex. 11 at 11.

<sup>93</sup> THC Ex. 18 at 4.

<sup>94</sup> Tr. at 1358-1359.

**c. Camp Sol Mayer**

Camp Sol Mayer is a 300-acre Boy Scout camp with 18 permanent buildings. The Boy Scout troops that use Camp Sol Mayer participate in a wide variety of activities, including horsemanship, shooting sports, swimming, canoeing, row boating, climbing/repelling, fishing, soil and water conservation, handicrafts, ecology/nature, camping, first aid, fire safety, mammal study, lifesaving, pioneering and wilderness survival. Additionally, camp sites may be reserved by the public on a space-available basis.<sup>95</sup>

Opponents of segment b17b argue that it would cross the southwest corner of the camp, passing near several camping areas and near where the camp's horses are maintained. ROW clearing for the transmission line on the southwest portion of the camp would eliminate many trees that are along the western boundary line and the San Saba River. The camp would also be impacted by Links Z1 and Z2, which are both in close proximity to the camp.<sup>96</sup> The ALJs do not recommend any routes that use these links.

**d. Tierra Linda Ranch**

Tierra Linda Ranch has questioned whether LCRA TSC evaluated a private park that it claims is potentially affected by a proposed link. LCRA TSC argues, however, that private recreation areas such as Tierra Linda's are not included in the PUC's CREZ CCN Application definition of "parks and recreation areas."<sup>97</sup> LCRA TSC explains that the PUC's consideration of "parks and recreation areas owned by a governmental body or an organized group, club or church" is an objective means to identify park and recreation areas. Without this objective standard, many landowners who use their private property for a variety of private recreational uses could raise this issue and introduce inappropriate subjectivity into the evaluation process.<sup>98</sup> The ALJs find that

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<sup>95</sup> Saba Group Ex. 3 at 4-5.

<sup>96</sup> Saba Group Ex. 3 at 4-6.

<sup>97</sup> Tr. at 1265-1268.

<sup>98</sup> LCRA TSC Ex. 9 at 27.

LCRA TSC and PBS&J properly identified parks and recreation areas consistent with the Commission's definition. Nevertheless, the ALJs recommend that the Commission consider the line's potential negative impact on the residents' recreational use of their property.

**e. Flat Rock Ranch**

Flat Rock Ranch is a privately owned mountain biking and camping facility open to the public. The ranch is crossed (for 1.68 miles) by 27 of the alternative routes. The routes parallel the eastern side of an existing NextEra transmission line, which also crosses through the property along its western boundary. LCRA TSC contends that potential interference with recreational activities and impacts to these facilities would be indirect because the mountain bike trails could be spanned by LCRA TSC's transmission line structures. LCRA TSC also argues that visual impacts would be minimal because these routes parallel an existing transmission line.<sup>99</sup> Staff concluded that the line could be constructed in a way that would not unduly disturb the recreational activities at the property.<sup>100</sup> Considering the existence of the NextEra line, the ALJs agree with LCRA TSC and Staff on this matter.

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<sup>99</sup> LCRA TSC Ex. 1, EA at 5-23 to 5-24.

<sup>100</sup> Staff Ex. 2 at 27.

#### **4. Cultural, Aesthetic, and Historical Values**

##### **a. Aesthetic Values**

###### *Background*

“Aesthetics” refers to the subjective perception of natural beauty in the landscape and attempts to define and measure an area’s scenic qualities. Aesthetic values considered from a public standpoint in the EA, include topographical variation (hills, valleys, etc.), prominence of water in the landscape, vegetation variety (forests, pasture, etc.), diversity of scenic elements, degree of human development or alteration, and overall uniqueness of the scenic environment compared to the larger region.<sup>101</sup>

Based upon the consideration of these aesthetic values, PBS&J found that the study area reflects overall a medium to high level of aesthetic value for the region. Particularly the eastern portion of the study area, located in the Hill Country, is within an area of the state noted for its scenic beauty and characterized by impressive topographical relief, vegetation and wildflowers, abundant wildlife, and plateaus. LCRA TSC asserts that the level of human impact to the study area is relatively high, mainly due to the extensive agricultural and oil and gas operations, the development of numerous cities, and the development of rural subdivisions. The presence of various large creeks and rivers present some viewsapes of high aesthetic value. There are also a number of designated routes or trails, scenic overlooks, and rest areas, within the study area that emphasize the Hill Country’s natural beauty and other unique attractions.<sup>102</sup>

In order to evaluate aesthetic impacts from LCRA TSC’s various alternative routes for the Project, PBS&J conducted field investigations to determine the estimated length of the line that would be visible from selected publicly accessible areas. These areas included those of potential

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<sup>101</sup> LCRA TSC Ex. 1, EA at 2-71; LCRA TSC Ex. 20 at 10.

<sup>102</sup> LCRA TSC Ex. 1, EA at 2-71 to 2-3; LCRA TSC Ex. 9 at 27.

community value, recreational areas, particular scenic vistas that were encountered during the field surveys, and U.S. and state highways within the study area. Measurements were made to estimate the length of each of the primary alternative routes that would fall within the foreground visual zone (0.50 mile, unobstructed by vegetation or topography) of recreational areas or major highways. The determination of visibility of the transmission line from various points was calculated from USGS maps and aerial photography.<sup>103</sup>

All of LCRA TSC's 60 primary alternative routes for the MK Project have some amount of ROW within the foreground visual zone of U.S. and state highways, in part a direct result of the deliberate inclusion of alternative routes paralleling U.S. and state highways. The length of route ROW within the foreground visual zone ranges from 7.80 (Routes MK3 and MK5) to 157.87 miles (Route MK33). Although a rather large number of parks and recreation areas are located within the study area, small portions of the routes' ROW would be located within the foreground visual zone of parks and recreation areas, ranging from 0.47 mile (Route MK23) to 10.00 miles (Route MK33). LCRA TSC's preferred route MK13 has 8.46 miles of ROW within the foreground visual zone of U.S. and state highways, and 4.24 miles of ROW within the foreground visual zone of parks or recreational areas.<sup>104</sup>

LCRA TSC notes that with regard to visibility by the public, the alternative routes that follow all or portions of I-10 will be much more visible to more people than any of the alternative routes away from I-10.<sup>105</sup>

Staff noted that construction of the Project will likely have both temporary and permanent negative aesthetic impacts, including views of ongoing construction, the cleared ROW, and the transmission facilities.<sup>106</sup> LCRA TSC also stated that construction of the line could have both temporary and permanent aesthetic effects, and therefore identified various mitigation measures

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<sup>103</sup> LCRA TSC Ex. 1, EA at 5-26.

<sup>104</sup> LCRA TSC Ex. 1, EA at 26 to 5-27; LCRA TSC Ex. 20, Ex. RRR-3R (Rev. EA Table 6-1).

<sup>105</sup> LCRA TSC Ex. 20 at 10.

<sup>106</sup> Staff Ex. 1 at 36; Staff Ex. 2 at 28.

available to assist in reducing those impacts, including the manner in which ROW would be cleared and maintained.<sup>107</sup>

A number of intervenors requested the use of steel and spun concrete poles, commonly called “monopoles,” for the proposed project. LCRA TSC explains that the Application proposes lattice structures to be consistent with its proposal in Docket No. 35665 and because lattice is the most cost-effective structure type. The Company’s base cost estimates for routes and segments assume lattice structures.<sup>108</sup>

Regardless of the type of structures used, the double-circuit-capable 345-kV structures required for the project will be visible to landowners and the public. A number of intervenors have stated a preference for monopoles based on aesthetic interests. LCRA TSC notes that because lattice towers are not solid, they may blend into background views, while monopoles, which are large in diameter, can appear prominent in both background and close foreground views.<sup>109</sup>

Because LCRA TSC recognizes the support expressed for monopole structures, it also included detailed cost information for a variety of structure types, including mixtures using both steel poles and spun concrete poles.<sup>110</sup> The ALJs note that LCRA TSC has repeatedly represented that any of the proposed structures are acceptable and will be used if the PUC determines such structures are preferred. Because this is a matter of cost and landowner or community-specific, the ALJs agree with the Company that the ultimate decision as to structure type necessarily rests with the PUC and its balancing of costs and benefits.<sup>111</sup>

If monopole structures are approved for at least certain locations, LCRA TSC requests that the Commission permit the Company to have the flexibility in design to deploy both steel and spun

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<sup>107</sup> LCRA TSC Ex. 1, EA at 1-8 to 1-28, 2-71 to 2-73, 5-26.

<sup>108</sup> LCRA TSC Ex. 7 at 12-19 and CDS-3; LCRA TSC Ex. 14 at 5.

<sup>109</sup> LCRA TSC Ex. 7 at 16-17.

<sup>110</sup> LCRA TSC Ex. 7 at 13, 18-19; LCRA TSC Ex. 14 at 5-12, CDS-2REB, and CDS-3REB.

<sup>111</sup> LCRA TSC Ex. 14 at 12.

concrete poles where appropriate for each to produce a cost-effective result. LCRA TSC also notes that, unlike other TSPs whose ROWs can change depending on which structure type is used, this is not the case with LCRA TSC. In LCRA TSC's case both lattice towers and monopoles will fit within a 100-foot ROW, which is as narrow, generally speaking, as the ROW for a double-circuit 345-kV transmission line can be made.

### *Discussion*

In this docket, the Commission is faced with a choice regarding aesthetic values between placing the line along a northern or central route where it will be viewed by far fewer people, or placing it along I-10 (and possibly other highways) where it will be viewed by far more people. As explained below, the ALJs recommend that placing the line along a highway is a far better choice from an aesthetic values perspective.

First, however, in terms of numbers of habitable structures affected, Staff points out that it considered the aesthetic impact caused by the visibility of the line from habitable structures within 500 feet of the centerline of the ROW. Viewing aesthetics strictly from this perspective, MK13 impacts the fewest number of habitable structures. A review of LCRA TSC Exhibit 26 reveals that MK13 impacts only 18 habitable structures; Staff MK15 impacts 55; the Weinzierl proposed MK15 routes impact 45 each; if those three routes are altered to remain along I-10 past Kerrville, MK 61 (Weinzierl) and 62 (Staff) impact an additional 73 habitable structures, while MK 63 (Segrest) impacts 77 more. Finally, Routes MK32 and 33 impact 151 and 153 habitable structures respectively, the most significant impact on the aesthetic values in terms of structures.<sup>112</sup>

Staff also notes that MK13 has a length of 8.46 miles visible from US and State highways, whereas Staff MK15 has a visibility for a length of 49.11 miles.<sup>113</sup> MK33 has the highest impact, with a length of 157.87 miles along US and State highways. With regard to visibility from

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<sup>112</sup> LCRA TSC Ex. 20 at 6-85 to 6-93; LCRA TSC Ex. 26.

<sup>113</sup> Staff Ex. 1 at 37.

parks/recreation areas, MK33 has the highest visibility of LCRA TSC's alternate routes with a length of 10 miles visible from state parks and recreational areas. MK13 is visible for a length of 4.24 miles from state parks and recreation areas. Staff MK15 has 4.43 miles of ROW within the foreground visual zone of parks/recreation area.<sup>114</sup>

As with community values, the aesthetic impact of the line is largely a function of who is viewing it from where. Kerrville argues that Route MK13 is preferable in terms of aesthetic values, because Route MK13 travels along the fifth least amount of right-of-way in the foreground visual zone of highways.<sup>115</sup> Kerrville notes that one way to measure aesthetic disturbance is to calculate how many people would be affected by the disturbance. LCRA TSC witness Rob Reid testified that alternative routes following all or any portion of I-10 will have maximum visibility by people. The most recent TxDOT traffic counts indicated 18,800 vehicle trips per day on I-10 within Kerrville on an annual average basis. As a result, Mr. Reid concluded that "the routes along I-10 will be much more visible to more people than any of the alternative routes away from I-10."<sup>116</sup> Routes MK33, MK32, MK61, MK62, and MK63 have between 64.22 and 157.87 miles within the foreground visual zone of U.S. and State Highways.<sup>117</sup> Route MK 13 only has 8.46 miles of the route within the foreground visual zone of U.S. and State Highways.<sup>118</sup> And in response to certain intervenors who state that I-10 "is not driven by citizens for its scenic views,"<sup>119</sup> Kerrville points out that Route MK13 also avoids aesthetic disturbance to two of the best Scenic Overlooks and Rest Areas in Texas that are located along I-10 in the vicinity of Links Y16 and Y20 and/or c1b.<sup>120</sup> As a result, Kerrville argues that, by avoiding I-10 and these scenic rest stops, Route MK13 presents minimal aesthetic disturbance to the study area.

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<sup>114</sup> LCRA TSC Ex. 1, EA at Table 6-1.

<sup>115</sup> LCRA TSC Ex. 1, EA at 6.1.3.1 at 6-96.

<sup>116</sup> LCRA TSC Ex. 20 at 10.

<sup>117</sup> LCRA TSC Ex. 26.

<sup>118</sup> LCRA TSC Ex. 26.

<sup>119</sup> Nancy Lind Initial Brief at 5.

<sup>120</sup> LCRA TSC Ex. 1, EA at 2.11 at 2-73; Tr. at 246-247.



Parties opposed to central routes first argue that focusing solely on visibility from highways does not address the full range of aesthetic impacts. The ALJs agree. Aesthetic impacts to the Hill Country were expressed as a concern throughout the process including the Open Houses. And although LCRA TSC Exhibit 26 reflects numeric measures of aesthetics, full consideration of the line's aesthetic impact requires consideration of factors that are not included in the chart. These intervenors generally opine that routing the line across ranches in the heart of the Hill Country, will ruin the visual appearance of the landscape.<sup>121</sup> CVA witness Mr. Jonathan Ogren testified, "[t]he transmission lines through the interior components of the study area would have a detrimental effect on the vast viewsheds that are a characteristic of the Hill Country and they would negatively impact the economic and natural capacity of the land through visual degradation."<sup>122</sup>

Opponents of the central and northern routes also note that the central study area contains large tracts of relatively unfragmented and undeveloped land.<sup>123</sup> The natural beauty of this largely unspoiled region, includes scenic vistas, meadows, and oak-lined creeks and rivers, and is cherished by residents and visitors alike.<sup>124</sup> In contrast, the I-10 corridor is more densely developed than the surrounding Hill Country area.<sup>125</sup>

And although the southeastern portion of the study area is recognized and valued for its scenic vistas, segments that follow I-10 transect an area that is largely commercial in nature.<sup>126</sup> They point out that the area already has elevated signage, such as billboards, and commercial development such as gas stations, and restaurants that do not evoke the same type of aesthetic sensitivity as the other areas of the Hill Country where undeveloped natural beauty is preserved.<sup>127</sup> The ALJs agree.

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<sup>121</sup> Tr. at 1331; WR Ex. 1 at 6.

<sup>122</sup> CVA Ex. 4 at 8.

<sup>123</sup> CVA Ex. 9 at 9-10; TPWD Ex. 4 at 14; Tr. at 827-828.

<sup>124</sup> CVA Ex. 3 at 14-15.

<sup>125</sup> CVA Ex. 9 at 10.

<sup>126</sup> Gillespie Ex. 1 at Att. 3; LCRA TSC Ex. 1 at 2-71.

<sup>127</sup> Kerrville Ex. 1 at 5; Kerr County Ex. 3; Tr. at 708.

In reaching the recommendation that the line will have less aesthetic impact along a highway, the ALJs have made rational inferences, based on the evidence, that it would be far more jarring to see a 345-kV transmission line in a relatively remote and undeveloped area than to see it along I-10. The obvious downside to a route along I-10 is the sheer number of people who will see the line. However, as with most interstate highways, I-10 is by and large, a means of transportation across the state, where aesthetically pleasing views are incidental. Travelers and anyone in the proximity of I-10 in this part of Texas will see a myriad of commercial development including gas stations, convenience stores, chain and fast-food restaurants, strip malls, traffic – including heavy tractor-trailers, car lots, power lines, roadways – including feeder roads, and all of the development associated with small towns, larger municipalities, and cities like San Antonio. To be clear, the drive along I-10 west of San Antonio can be very aesthetically pleasing, but considering the existing development along this highway, it is far more likely that a 345-kV line will be lost in the visual foreground than if it were run along a central route through what is undoubtedly the aesthetically pleasing and relatively undeveloped Texas Hill Country.

**b. Cultural, Historic, and Archeological Sites**

*Background*

LCRA TSC explains that much of the study area has a high probability of containing previously unrecorded cultural resource sites. Therefore, PBS&J's analysis of these environmental criteria for the cultural resources evaluation was based on known data regarding sites in the area, the density of the sites, and the National Register of Historic Places (NRHP) and State Archaeological Landmark (SAL) potential for the sites. LCRA TSC notes that mitigation and construction practices are available to reduce or eliminate impacts to cultural resources sites.<sup>128</sup>

One method used by archeologists to assess an area for potential cultural resources is to

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<sup>128</sup> LCRA TSC Ex. 1, EA at 5-29 to 5-30, 5-32.

identify “high probability areas” (HPAs) where cultural resource sites might occur. Locations that are usually identified as HPAs for the occurrence of pre-historic sites include water crossings, stream confluences, drainages, alluvial terraces, wide floodplains, upland knolls and areas where lithic resources may be found.<sup>129</sup>

PBS&J’s literature and records review indicate that in the portions of the study area where archeological investigations have been conducted, 174 recorded prehistoric or historic archeological sites are either crossed by one of LCRA TSC’s primary alternative routes or are within 1,000 feet of the centerline of such a route. Of these, 147 are associated with the MK proposed routes, nine are associated with the KG proposed routes, and 18 sites are shared by both.<sup>130</sup>

Of the 60 primary alternative routes evaluated for the MK Project, 54 cross one or more recorded historic or prehistoric sites, with four routes crossing at least 15 or more sites. All 60 routes have additional recorded historic or prehistoric sites within 1,000 feet of the ROW centerline, with numbers ranging between 6 and 46 sites. Of the primary alternative routes, 22 cross one NRHP-listed or determined eligible site, and the other 38 cross no such sites. Exactly half (30) of the primary alternative routes have ROW centerline within 1,000 feet of one or more additional NRHP-listed or determined eligible sites, ranging from one to six sites, and the other 30 have none.<sup>131</sup> Staff notes that the number of recorded historical/archaeological sites<sup>132</sup> within 1,000 feet of the centerline of the routes varies from 8 to 70 sites.<sup>133</sup>

There are 23 known or recorded historical or archeological sites either crossed (two sites) or located within 1,000 feet of the preferred route MK13 ROW centerline (21 sites). For Staff MK15 there are 47 sites.<sup>134</sup>

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<sup>129</sup> LCRA TSC Ex. 1, EA at 5-30.

<sup>130</sup> LCRA TSC Ex. 1, EA at 5-30.

<sup>131</sup> LCRA TSC Ex. 20, Ex. RRR-3R (Rev. EA Table 6-1); LCRA TSC Ex. 1, EA at 5-31 to 5-32.

<sup>132</sup> These sites include recorded historic and prehistoric sites and National Register-listed or determined eligible sites.

<sup>133</sup> Staff calculation using data at Table 6-1, Items 37-40.

<sup>134</sup> LCRA TSC Ex. 1 at 41; LCRA TSC Ex. 9 at 27; LCRA TSC Ex. 20, Ex. RRR-3R (Rev. EA Table 6-1).

Length of HPAs for ROW of LCRA TSC's 60 primary alternative MK routes ranged from a low of approximately 77.43 miles (Route MK20) to a high of approximately 126.95 miles (Route MK51), for routes of varying lengths.<sup>135</sup> Route MK13 (the MK preferred route) has a moderate HPA number, 103.53 miles.<sup>136</sup>

LCRA TSC did not consider Fort McKavett to be a directly-affected landowner and none of the route segments proposed in this docket cross the Fort. The distances between the segments that pass by the Fort are from approximately 1.18 miles to over 7 miles from the Fort site. The Fort has been more fully discussed in the Parks and Recreation section of this PFD.

Finally, LCRA TSC notes that in the process of evaluating the primary alternative routes in recommending the preferred route, potential for impact on cultural resources did not present a primary evaluation criterion for comparison between LCRA TSC's routes.<sup>137</sup>

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<sup>135</sup>LCRA TSC Ex. 20, Ex. RRR-3R (Rev. EA Table 6-1) and Ex. RRR-4R (Rev. EA Table 6-2); LCRA TSC Ex. 1, EA at 6-30.

<sup>136</sup> LCRA TSC Ex. 20, Ex. RRR-3R (Rev. EA Table 6-1) and Ex. RRR-4R (Rev. EA Table 6-2).

<sup>137</sup> LCRA TSC Ex. 1, EA at 6-96, 6-98.

*Discussion*

A number of intervenors offered expert archaeological testimony regarding the potential for the existence of historic sites on their properties. LCRA TSC, however, has specifically acknowledged that many areas of the Hill Country have high potential for the occurrence of archeological sites. The Company outlined a plan for addressing any sites encountered during construction in Section 5.3 of the EA. LCRA TSC argues, however, that no evidence was offered regarding specific impacts on cultural resources that would warrant consideration for purposes of routing the proposed transmission line. Nor is there evidence that LCRA TSC's method for addressing archeological sites during construction is inappropriate.<sup>138</sup> Staff proposes that specific language be included in the order requiring LCRA TSC, if it finds any archeological or cultural resources during construction, to cease work immediately in the vicinity of the resources and notify the THC to determine what appropriate actions should be taken.<sup>139</sup> Although LCRA TSC obviously possesses expertise in dealing with archeological sites, the ALJs support Staff's recommendation in addition to those measures proposed by the Company.

Kerrville argues that Route MK13 respects historical values by avoiding known historical landmarks in the study area.<sup>140</sup> The group notes that MK13 avoids Fort McKavett<sup>141</sup> and also avoids historic sites in Mason County, such as the Pinta Trail<sup>142</sup> and Fort Mason.<sup>143</sup> In response, a number of intervenors who oppose a central route note that Route MK13 does not avoid historical areas in the southeastern portion of the study area.<sup>144</sup> These intervenors also argue that a central route would have a negative impact on historical values. They point out that many ranches in the interior of the

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<sup>138</sup> LCRA TSC Ex. 9 at 27-28; LCRA TSC Ex. 20 at 8-9.

<sup>139</sup> Staff Ex. 1 at 14; Staff Ex. 2 at 16.

<sup>140</sup> Kerrville refers to the Kerrville group of parties, including the City of Kerrville, Kerr County, KPUB, and Cecil Atkisson.

<sup>141</sup> Garza Ex. 18 at 4-7; Alexander Ex. 4 at 4-7; Tr. at 1469.

<sup>142</sup> P-Line Ex. 9 at 2-3.

<sup>143</sup> P-Line Ex. 7 at 3-7.

<sup>144</sup> Gillespie Initial Brief at 8.

study area contain historical artifacts.<sup>145</sup> These parties generally argue that the selection of Route MK15 alternatives will have a lesser impact on historical values than would the selection of a central route. Route MK15, for example, crosses 7.5 fewer miles of ROW across areas of high archeological/historical site potential than MK13. MK15 also has three fewer National Register-listed or determined-eligible sites within 1,000 ft of the centerline of the ROW than MK13.<sup>146</sup> Finally, while the City of Kerrville argues that Route MK13 avoids historic landmarks such as Fort McKavett and Fort Mason, Gillespie County notes that the same is equally true for Route MK62 Modified.<sup>147</sup>

The ALJs first note that the majority of the routes in contention avoid Fort McKavett. From a historical and archeological perspective, the ALJs prefer routes parallel to I-10 as opposed to the central routes. The existence of the highway, in addition to commercial and residential development normally associated with proximity to an interstate highway system means that historical sites in the area are more likely to have been disturbed. In contrast, the central routes are more likely to impact previously undisturbed sites of historical value. Taking everything into consideration, the ALJs recommend that, from a historical and archeological perspective, the routes along I-10 are better suited for placement of the line than central routes such as MK13.

## **5. Environmental Integrity**

### **a. Background**

LCRA TSC's consultant PBS&J, examined a wide range of environmental information in its EA, which was researched and analyzed through a variety of methods and by representatives of various environmental disciplines. In developing the EA, the geographic locations of environmentally sensitive and other restrictive areas within the study area were located and considered during the route delineation process. Each alternative route was evaluated, considering a

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<sup>145</sup> WR Ex. 1 at 5; McGinley L-Ranch Ex. 1 at 11.

<sup>146</sup> LCRA TSC Ex. 26.

<sup>147</sup> Kerrville Initial Brief at 7.

variety of criteria and environmental conditions present. As a result of this process, LCRA TSC represents that all routes presented in the Application (and all segments that form those routes) provide environmentally acceptable alternatives and the overall impact of the routes was greatly reduced.<sup>148</sup>

Factors considered particularly important in the ecological evaluation of potential impacts from the line includes the length across potential Golden Cheeked Warbler (Warbler) habitat, the length across upland and riparian woodland, the length paralleling/utilizing existing ROW, and the length parallel to and within 100 feet of streams. Based on the relationship, sensitivity, and relative importance of the major environmental criteria, LCRA TSC focused on paralleling existing ROW, potential impacts to threatened/endangered species, and woodlands as among the primary evaluation criteria used to recommend a preferred route. Based on these criteria, LCRA TSC's preferred route (MK13) was ranked first from an ecological standpoint in the EA.<sup>149</sup>

The Company acknowledges that, as with all transmission lines, some impacts are inevitable. However, based upon an assessment of environmental conditions and in consideration of construction techniques and mitigation measures, LCRA TSC asserts that the Project will cause only short-term impacts to soil, water, and ecological resources.<sup>150</sup> The Company has undertaken a permitting process under Section 10 of the Endangered Species Act with the U.S. Fish and Wildlife Service (USFWS) to appropriately consider impacts to federally listed species and their habitat, regardless of the route ultimately approved by the Commission.<sup>151</sup>

Animal species potentially occurring along the proposed transmission routes include the federally listed (endangered) Black-Capped Vireo (Vireo) and Warbler, and the state-listed (threatened) Zone-Tailed Hawk, Bald Eagle, Texas Tortoise, and Texas Horned Lizard. Table 2.5 of the EA lists all threatened or endangered species of potential occurrence in the study area based on

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<sup>148</sup> LCRA TSC Ex. 9 at 9, 34.

<sup>149</sup> LCRA TSC Ex. 1, EA at 5-16, 6-84, 6-96, 6-98.

<sup>150</sup> LCRA TSC Ex. 9 at 28; LCRA TSC Ex. 1, EA at 5-1 to 5-16.

<sup>151</sup> LCRA TSC Ex. 9 at 28.

information from USFWS, TPWD, and TPWD's Natural Diversity Database (TXNDD). The project is not expected to adversely impact populations of any federally listed endangered wildlife species, and it is unlikely that it will result in adverse impacts to federal and state listed threatened species. Nevertheless, LCRA TSC is aware of and has prepared for the need to obtain a permit from USFWS to take endangered species habitat. Before construction, an assessment will be made to verify whether any habitat for endangered or threatened species is present along the route that is approved. Finally, LCRA TSC plans to undertake mitigation projects in conjunction with this project in order to protect Warbler and Vireo habitats, among other species.<sup>152</sup>

Based on the EA, LCRA TSC considers wildlife habitat throughout the study area to be fragmented by land use impacts such as roads, brush clearing associated with ranching and agricultural activities, pipelines, electric distribution lines, and a host of other activities. According to the Company, whether fragmentation of habitat is of actual consequence to individual wildlife species depends on additional considerations, including the particular species.<sup>153</sup>

Once a route is selected, LCRA TSC proposes to account for the location of endangered/threatened species on individual landowners' property or additional known occupied habitat by routing adjustments, construction procedures and techniques, and mitigation. The Company points out that various transmission service providers have faced these conditions in certification proceedings and there exists an established set of Commission-accepted adjustments, procedures, techniques and mitigation to allow the successful completion of the Project for any route

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<sup>152</sup> LCRA TSC Ex. 1, EA at 1-25, 5-13 to 5-15; Table 2-5; LCRA TSC Ex. 9 at 28-29, 33.

<sup>153</sup> LCRA TSC Ex. 20, at 44.



the Commission selects.<sup>154</sup> In the past, both formal and informal post-order consultation with other agencies has allowed transmission service providers the ability to accommodate these concerns.<sup>155</sup>

After the route is selected by the Commission, the Company proposes to consult with the USFWS for known occupied or potential habitat for endangered species. As part of those efforts, LCRA TSC will use a Habitat Conservation Plan (HCP) development and Endangered Species Act Section 10(a) permitting process that is ongoing with the USFWS. As a result of these measures, even if Warbler and Vireo are present along the Commission selected route, the Company represents that the Project will neither jeopardize their continued existence, nor have a significant adverse impact to those populations.<sup>156</sup>

Finally, the Company notes that different techniques are available to accommodate all federally-listed endangered species identified in the study area. The Commission may select a route that passes through an area containing plant species composition and configuration favorable to a protected species, or there may even be known individuals of the species scattered throughout the area. In that case: the route could be adjusted in minor ways to avoid higher quality “blocks” of habitat; transmission towers could be placed in existing “openings” with limited further clearing for ROW access; and/or permits could be granted for appropriate clearing permissions along with possible mitigation, depending on a number of considerations.<sup>157</sup>

*Staff*

Staff’s witnesses reviewed and considered the EA, responses to requests for information, and

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<sup>154</sup> The Company noted the following LCRA TSC projects that properly dealt with the presence of endangered species and/or potential habitat after the Commission selected a route: Kendall-CPS Tie (Kendall County) Docket No. 29065; Andice-Glasscock (Williamson County) Docket No. 28450; Hill Country (Kendall & Bexar County) Docket No. 29684; Sandy Creek (Llano County) Docket No. 29833; Medina Lake-CPS Tie (Bandera & Medina Counties) Docket No. 32934; Rim Rock-Goat Creek (Kerr County) Docket No. 33844. All of these projects have been successfully constructed and where appropriate, in consultation with the USFWS. For some of these projects, no consultation was required. LCRA TSC Ex. 20 at 14-15.

<sup>155</sup> LCRA TSC Ex. 9 at 28-30.

<sup>156</sup> LCRA TSC Ex. 20 at 15-16.

<sup>157</sup> LCRA TSC Ex. 9 at 30.

testimony and statements of position.<sup>158</sup> Staff concluded that any route selected in this case will affect the environmental integrity of the study area.<sup>159</sup> Staff notes that items 13 and 27-36 of the 41 criteria evaluated by LCRA TSC reflect the environmental impact of the proposed routes.<sup>160</sup> Those factors measure the miles of ROW that will be in rangeland/pastureland, in upland woodland, or bottomland/riparian woodland habitat, in potential wetlands, in known federally endangered/threatened species habitat, in potential Warbler habitat, across open water or 100-year flood plains, paralleling streams or rivers and the number of streams or river crossings that will be made by the transmission line.<sup>161</sup>

Staff also notes that the construction of a line in rangeland/pastureland would be less detrimental than it would be in a woodland habitat. Mr. Reid testified that construction in rangeland/pastureland will recover from the effects of construction because the habitat will regrow within the ROW. Woodland habitat, however, requires a greater regenerative time compared to pastureland.<sup>162</sup>

To illustrate general difference among the primary routes in contention, Staff outlined the environmental criteria on three routes, Staff MK15, MK13 and MK33 (a complete list of the routes in contention and relative criteria is found in LCRA TSC Ex. 26). The environmental statistics for those three routes are:<sup>163</sup>

Criteria	Staff MK15	MK13	MK33
Miles of Rangeland/pastureland	140.98	129.72	150.54
Miles of upland woodland habitat	31.88	29.20	36.80
Miles of bottomland/riparian	.75	1.37	1.24

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<sup>158</sup> Staff Ex. 1 at 9

<sup>159</sup> TPWD Ex. 5.

<sup>160</sup> LCRA TSC Ex. 1 at Table 6.

<sup>161</sup> LCRA TSC Ex. 1 at Table 6.

<sup>162</sup> LCRA TSC Ex. 1 at 5-11; LCRA TSC Ex. 23 at 1; Tr. at 396 -397.

<sup>163</sup> LCRA TSC Ex. 23 at 1.

Criteria	Staff MK15	MK13	MK33
woodland			
Miles of potential wetlands	.21	.27	.40
Miles of known/occupied federally endangered or threatened species habitat	.88	.55	0
Cross miles of open water	.11	.08	.08
Miles of 100-year flood plains	7.58	5.13	14.67
Miles of streams and rivers paralleled	2.46	1.34	1.82
Streams crossed	160	144	143
Rivers crossed	2	4	4

Staff found that all three routes rank well in terms of the miles of known/occupied federally endangered or threatened species habitat. On its face, MK13 ranks very well in limiting the miles through potential Warbler habitat, although the limits of TXNDD records are discussed below. Upland woodland is the primary habitat for the Warbler though that species is also found in bottomland/riparian habitat. Of the three primary routes, MK13 impacts the least upland woodland habitat. Staff MK15 impacts 2.68 miles more upland woodland than MK13 and MK33 impacts 7.6 miles more. The statistics for the impacts on bottomland/riparian woodland range from 3 miles more than MK13 to a little under one tenth of a mile less than MK13. MK33 and similarly situated routes traverse 36 miles of upland woodland habitat, almost 7 more miles of upland woodland habitat than MK13 and 5 miles more than Staff MK15. MK33 and MK13 impact more bottomland/riparian woodland habitat than Staff MK15.<sup>164</sup>

Specific arguments raised by Staff are addressed below.

#### *TPWD*

TPWD's participation in this docket is also discussed below. TPWD provided comments and recommendations regarding the Project in a letter dated September 24, 2010 (TPWD Letter) and through the testimony of four TPWD witnesses. TPWD asserts that construction of any of the

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<sup>164</sup> LCRA TSC Ex. 23 at 1.

proposed routes would require almost entirely new ROW and take significant amounts of existing wildlife habitat. Although the TPWD Letter states its opposition to all routes in the Application, to the extent the Commission approves a transmission line in this docket, TPWD supports routes MK32 and MK33 because they would have the least adverse impact on fish and wildlife resources. The specifics of TPWD's recommendations are discussed below.<sup>165</sup>

TPWD owns and operates the 16.1 acre Old Tunnel WMA in Kendall County, Texas, located within 500 feet of Links A3 and O4, the latter of which is part of proposed route MK 22.<sup>166</sup> TPWD opposes all routes that use Links A3 or O4 because of the expected negative impact to the public benefits of Old Tunnel WMA, and the Old Tunnel bat colony. Impacts on the bat colony are discussed separately below.

There is one major concern raised by TPWD regarding data collection for the TXNDD records that many parties, including LCRA TSC, specifically rely on. Due to lack of access to private property, the absence of TXNDD records at a specific site does not mean that the species does not occur there. Most TXNDD records are gathered from publicly accessible lands (parks and wildlife management areas) and highway ROW. Most of the impacted Project area, however, consists of privately owned ranch land. Endangered species and their habitat on private lands are little known due to this lack of access and state laws governing the collection and dissemination of biological information from private lands. As a result, much of the empty space on the map represents record gaps for which no information was available because they have not been surveyed. However, known TXNDD records for most species follow highway ROW, are located in state, county or city parks and preserves, or are found close to university campuses such as the one at Junction, where biologists or scientists are more likely to recognize an endangered species. TPWD argues the only way to determine if a species is present on a project is to conduct on-the-ground surveys in potential habitat at the time of year when the species is most likely to be present, and only with repeated visits.<sup>167</sup>

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<sup>165</sup> Staff Ex. 7 at 78; TPWD Ex. 5.

<sup>166</sup> TPWD Ex. 1 at 3, 12; TPWD Ex. 3 at 4; LCRA TSC Ex. 1 at Table 4-1.

<sup>167</sup> Staff Ex. 1, Appendix C at bates 55-56; TPWD Ex. 4 at 10-11.

The issue of insufficient information on endangered species and habitat raises a major concern for the ALJs over the use of TXNDD records to demonstrate potential impact of the routes. There are two primary problems that flow from this. First, surveys cannot be conducted as requested by TPWD. Second, the conclusion that the I-10 routes will take more habitat than central and northern routes is thrown into serious doubt, because the TXNDD records are an incomplete sample and the matter is more nuanced than counting the sheer amount of property taken.

As discussed below, there appears to be no reasonable remedy for the lack of species and habitat information in the study area. Limited access to private property rules out a series of Project area-wide surveys. And even if limited to a Commission-selected route, TPWD's proposal of multiple on-the-ground surveys in potential habitat at specific times of the year is simply unworkable for a project of this scope and within the CREZ timeframe. TPWD may be correct that the only way to establish species occurrence at a specific site is through such surveys. Nevertheless, the ALJs consider them too cumbersome, potentially costly, and time-consuming for implementation. Furthermore, without access to private property before the CCN is approved, there is no means for LCRA TSC to conduct the surveys.

As for selecting a route based on environmental factors, parties opposed to the I-10 routes reference their sheer length and TXNDD records to argue that these routes involve more habitat loss. While this may facially accurate, based on TPWD's clarification, the ALJs do not consider the absence of TXNDD records to establish the absence of species or habitat. Furthermore, as argued by TPWD, CVA, and other supporters of MK32 and MK33, the I-10 corridor is obviously fragmented to a much greater extent than the central routes, although those routes involve fragmentation as well. Fragmentation is discussed below.

To be clear, the ALJs do not discount the value of TXNDD records in this proceeding for certain purposes. TXNDD records, however, appear to have limited value in establishing the absence of a particular species or habitat in certain areas. As noted by Staff, a thorough analysis of

the impacts of a route on environmental integrity must also evaluate the type of habitat in which the endangered species is likely to be located.

Kerrville argues that TPWD's testimony and recommendations should be given little to no weight, because TPWD provided conflicting recommendations in this proceeding. As addressed above, the TPWD Letter appears to recommend rejection of all routes on environmental grounds, while TPWD witnesses and TPWD's Initial Brief recommend MK32 or MK33. Kerrville explains this change in position by noting that TPWD witness Dr. Karen Clary only reviewed the testimony of LCRA TSC, Staff, and CVA. Dr. Clary also admitted that she met with members of CVA.<sup>168</sup>

Kerrville raises a valid point. The ALJs would have preferred that Dr. Clary had reviewed more evidence in reaching her conclusions. However, she still possesses the qualifications to support her opinions and she did review evidence in this proceeding. As for TPWD's change in positions, the ALJs do not consider such a change to render TPWD's recommendations useless. To the contrary, TPWD's position is consistent in that it opposes the Project on environmental grounds, but that if a route must be selected, it prefers MK32 or MK33.

Kerrville also complains that TPWD focused only on wildlife habitat fragmentation to the exclusion of all other factors, such as impacts to upland woodlands or impacts to wetlands.<sup>169</sup> Again, while the ALJs prefer that a party's position be as developed as possible, TPWD addressed wetlands, creeks, and streams as specifically discussed below. Regardless, TPWD provided evidence in this case that the ALJs found valuable.

Kerrville criticizes TPWD's preference for MK32 or MK33 arguing that it is contrary to PBS&J's findings on ecological factors, which ranked Route MK13 first ecologically.<sup>170</sup> Kerrville argues that TPWD's preferred routes cross more Warbler habitat than others, in order to minimize

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<sup>168</sup> Staff Ex. 1, Appendix C at bates 52; Staff Ex. 7 at 59, 62, 75-77; PUC Staff Ex. 8.

<sup>169</sup> TPWD Ex. 4 at 13.

<sup>170</sup> Tr. at 1469-1470.

total habitat fragmentation.<sup>171</sup> PBS&J found that Route MK 13 crosses the least amount of potential Warbler habitat and the thirteenth least amount of upland woodland.<sup>172</sup> However, this again raises the issue of the limited utility of TXNDD records in comparative analysis, due to the lack of access to private lands. MK32 and MK33 parallel I-10, providing access for survey of habitat, while MK13 crosses a great deal of private land. As a result, the ALJs are not persuaded by this criticism of TPWD's route preference.

Finally, Staff, LCRA TSC, and a number of intervenors note that TPWD's recommendation is based solely upon environmental impacts and does not account for other factors the Commission must evaluate when approving a route, such as cost, constraints, prudent avoidance, or impacts on aviation.<sup>173</sup> The ALJs expressly acknowledge the limits of TPWD's recommendation. However, solely from an environmental standpoint the ALJs agree with TPWD's preference for MK 32 or MK33.

**b. Discussion**

*Land Fragmentation*

Although many intervenors expressed concern over land fragmentation, it is one of the greatest concerns of those parties opposed to the central routes. From a fragmentation perspective, the ALJs conclude that the absence of a major highway or transmission line for much of the central study area argues against placing the line there and favors paralleling the I-10 corridor.

Parties opposed to the central routes generally argue that MK32 and MK33 are most preferable in terms of minimizing habitat fragmentation.<sup>174</sup> TPWD's Dr. Clary and CVA's expert

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<sup>171</sup> Tr. at 830-833.

<sup>172</sup> LCRA TSC Ex. 1, EA at 6.1.3.1 at 6-96 and Table 6-1; LCRA TSC Ex. 26.

<sup>173</sup> Tr. at 839.

<sup>174</sup> *For parties other than TPWD and CVA who generally support these routes, see, Weinzierl Initial Brief at 8-9; Gillespie County and City of Fredericksburg Initial Brief at 9; Six Mile Ranch Initial Brief at 13. In the alternative,*

Dr. Neal Wilkins testified that avoiding additional fragmentation of wildlife habitat is one of the most important environmental considerations in this proceeding – for TPWD it is the single greatest concern regarding the environmental impact of the line. Although there is relatively little existing habitat fragmentation within the MK study area, Dr. Clary testified, “this project has the potential to fragment wildlife habitat on a scale not seen since the construction of I-10.”<sup>175</sup> In fact, major highway ROW comprises the largest corridors of habitat fragmentation in the area, particularly the I-10 corridor. In contrast, the portion of the study area north of I-10 contains some of the “largest blocks of unfragmented wildlife habitat on the Edwards Plateau.”<sup>176</sup>

Dr. Wilkins testified that land fragmentation, and its consequence, is one of the greatest statewide challenges to wildlife management and conservation in Texas. In 2000, a report from the Governor’s Task Force on Conservation concluded that “The fragmentation of . . . family owned farms and ranches poses perhaps the greatest single threat to our wildlife habitat and to the long-term viability of agriculture in Texas.”<sup>177</sup>

Dr. Wilkins explained that development of a new corridor, which is in contrast with the surrounding landscape, is likely to stimulate current landowners to sell their property. Landowners are aware that the construction of ROW creates an opportunity for that area to be considered a compatible corridor, opening the door for the cumulative effects of widened ROW and additional construction for future pipelines and/or transmission lines. Dividing a large tract into smaller parcels causes a series of changes that often negatively impact wildlife management, natural resource conservation, and agricultural production. For instance, smaller operations impact economies-of-scale for wildlife management and animal agriculture.<sup>178</sup>

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some of these parties argue that if other factors make these routes unacceptable, MK15 is the next best option.

<sup>175</sup> TPWD Ex. 4 at 14, 20.

<sup>176</sup> TPWD Ex. 5 at 6; TPWD Ex. 4 at 4, 13-14; CVA Ex. 1 at 17, 25.

<sup>177</sup> CVA Ex. 1 at 10.

<sup>178</sup> CVA Ex. 1 at 10-11.



Dr. Wilkins also testified that MK13 and all of the links contributing to the central routes cut through the middle section of lands managed by the Doss-Harper Wildlife Management Association (WMA). These landowners manage their wildlife resources in a cooperative that helps them overcome some of the inefficiencies common to land fragmentation. Some of these privately-managed lands have been managed for generations under the same ownership. Along Links b36, b50, b51, and b42-47, Route MK13 would run through the center of the Doss-Harper WMA for approximately 12 miles.<sup>179</sup>

CVA, TPWD, Weinzierl, and other opponents of a central route recommend a route that parallels the greatest extent of existing disturbed corridor, like the I-10 corridor, because habitat along highways is already fragmented. Dr. Wilkins explained that:

When a right-of-way is placed along a wide corridor such as I-10, the effects to the species are lessened due to the fact that the potential habitat removed . . . does not further fragment larger patches into numerous smaller patches.<sup>180</sup>

As a result, these parties recommend MK32 and MK33 because they follow US 277 and I-10. As TPWD's witness, Dr. Clary concluded, "[s]uch a route would have the least adverse impact on wildlife and habitat in this part of the Edwards Plateau."<sup>181</sup>

In response, Staff and a number of other intervenors argue that the longer the transmission line traverses any habitat, the more damage it inflicts. These parties oppose MK33 and MK32, asserting that they cause more damage to habitat because they are longer – MK33 is the longest proposed route at 161.09 miles. From that perspective, MK13 is the most favorable route as it is shortest at 134.99 miles. Staff proposes that Staff MK15 is a fair compromise, because it falls between these two routes at 144.13 miles.<sup>182</sup>

Although the ALJs ultimately recommend Staff MK15, in terms of fragmentation, they are

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<sup>179</sup> CVA Ex. 1 at 12-14.

<sup>180</sup> CVA Ex. 1 at 17.

<sup>181</sup> TPWD Ex. 5 at 6; CVA Ex. 1 at 17, 25.

<sup>182</sup> LCRA TSC Ex. 23

not persuaded that it is superior to MK32 or MK33. The ALJs find the sheer counting of miles overly simplistic. The ALJs agree with TPWD, CVA, Weinzierl, and others that the I-10 corridor is already heavily fragmented, whereas the central and northern routes (to a somewhat lesser extent) are not. And to the extent that Staff and opponents of MK32 and MK33 rely on the TXNDD, TPWD has made clear that there is less information about the northern and central routes than the I-10 corridor due to limited access for sampling.

The ALJs do, however, agree with Staff's environmental evaluation of the P-Line routes. In particular, although those routes parallel a 138-kV transmission line for a considerable distance, Staff determined they were not preferable to other routing alternatives, in part, because of the environmental impacts of such routing. The benefits expected from routing parallel to an existing transmission line are not experienced in this situation because the existing footprint of the 138-kV transmission line is small and substantially re-grown such that it doesn't have a deleterious effect on the habitat.<sup>183</sup> P-Line Intervenors provided considerable evidence that the existing line is in various stages of re-growth with prevalent groundcover and a moderate amount of woody vegetation.<sup>184</sup> As a result, adding another much taller line with sizably larger structures and a wider ROW will have a more significant impact on the wildlife habitat, including endangered species habitat, than construction along more compatible ROWs such as roads or highways.

In response to concerns over fragmentation, the Company notes that the voluntary activities of many current landowners result in, or will result in, fragmentation including fencing and roads, clearing of cedar or brush, re-seeding with native grasses, improving structures, enhancing property for recreation, business, or family interests, and future development, all of which alter land's pristine

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<sup>183</sup> Tr. at 829.

<sup>184</sup> P-Line Ex. 16 at 3.

condition.<sup>185</sup> In addition, LCRA TSC argues that land fragmentation also results from the decisions of individual landowners to subdivide and/or sell their property.<sup>186</sup>

While LCRA TSC is correct that landowner activities throughout the Project area results in fragmentation, the ALJs find that fragmentation associated with a project of this size and scope is qualitatively and quantitatively different from those activities. As argued by TPWD and CVA, the scale of the Project and its potential for land fragmentation rivals that of the creation of the I-10 corridor through the Hill Country. From a fragmentation perspective, the ALJs conclude that MK32 and MK33 are superior to other routes.

### *Oak Wilt*

Intervenors opposed to a central route are also concerned that fragmentation could lead to the spread of Oak Wilt disease. Oak Wilt is caused by a fungus that clogs water-conducting vessels in infected oak trees, causing them to wilt and ultimately die. While Oak Wilt can be spread through the roots of oak trees, it can also be spread much longer distances by sap-feeding beetles that carry spores from infected trees and deposit them on “wounds” in uninfected trees. Once a new tree is infected, the disease will spread through root contact to other nearby trees at a rate of approximately 75 feet per year.<sup>187</sup>

Parties concerned about Oak Wilt argue that the central portion of the Hill Country, which is currently impacted by very little Oak Wilt, could become susceptible to the disease as a result of the cutting and pruning necessary to clear and maintain the ROW for the proposed line. Parties opposed to a central route argue that the impact will be greatest in the central portion of the study area. They note that approximately 700 to 1,600 live oaks per mile will be removed and another 200-500 live oaks per mile will need to be pruned. These parties argue that routes that follow existing disturbed corridors, where the trees are more likely to have been cleared or previously exposed to Oak Wilt,

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<sup>185</sup> LCRA TSC Ex. 11 at 9-10; LCRA Ex. 20 at 16. LCRA TSC points out that two intervenors – Triple Oaks Partners, Ltd and CEW Ventures have subdivided their land and are building roads and utilities for a residential community, and yet claim that their land is “untouched by man-made infrastructure” and offers “scenic views.” Initial Brief of Triple Oaks Partners at 8, Initial Brief of CEW at 5; Tr. at 843-850.

<sup>186</sup> LCRA TSC Ex. 20 at 16.

<sup>187</sup> CVA Ex. 2 at 5-6.

will pose less risk of increasing the spread of the disease.<sup>188</sup> As a result, they argue that routes along the I-10 corridor, such as MK32, MK33, and variants of MK15, and other previously disturbed areas should be used to the greatest extent practicable to minimize the impact and spread of Oak Wilt. The ALJs agree and note that it reflects another reason the I-10 corridor is superior from an ecological perspective.

*Warbler and Vireo*

Potential habitat for both the federally and state-endangered Vireo and Warbler is likely to be encountered along most of the routes. There are known occurrences of the Vireo and Warbler along or near segments proposed as part of route alternatives for the Project.<sup>189</sup> Data provided by Loomis Partners, Inc. documents that all of the routes cross potential Warbler habitat. Among the routes, MK13 crosses the least amount of known potential Warbler habitat (approximately 3.34 miles). But the ALJs again caution against giving too much weight to the absence of TXNDD records in areas on private land.

LCRA TSC argues that the presence of, or claimed potential habitat for Vireo should not be considered a conclusive factor or even a deciding factor in the choice between routes for several reasons. First, echoing TPWD's concerns, the Company explains that without ground inspection of particular ecological areas, it is difficult to impossible to determine the presence of suitable habitat for Vireo, due to particular species composition and configuration needed. Vireo habitat consists of patchy shrubs interspersed with open areas and cannot be identified by aerial photography. For that reason, USFWS does not accept aerial imagery interpretation as confirmation of the presence or absence of Vireo habitat.<sup>190</sup> Thus, all routes cannot be equally evaluated for Vireo habitat.

Second, given the nature of the study area, the Company deems it likely that areas of actual inhabited Vireo habitat occur throughout the area and along most, if not all, routes. Consistent with

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<sup>188</sup> CVA Ex. 2 at 9-13.

<sup>189</sup> LCRA TSC Ex. 20 at 13; LCRA TSC Ex. 1, EA 5-13 and 5-14.

<sup>190</sup> LCRA TSC Ex. 20 at 27.

TPWD's concerns over use of TXNDD records, LCRA TSC notes that while reported occurrences may be identified in TXNDD and brought forth by landowners, Vireo will likely occur on other routes and at other locations not documented presently. Additional locations of Vireo will likely be discovered post-certification and pre-construction on any route chosen. Thus, it is unlikely that potential habitat and actual Vireo can be avoided as part of the certification process.

Third, based on the Commission's past practices and the work of utilities with USFWS, accommodations for the species can be made through structure placement, ROW clearance and other forms of mitigation. Specifically, Mr. Reid stated that LCRA TSC could place structures in open areas or route around habitat that is identified in the field thereby minimizing the impact on Vireo. LCRA TSC asserts that this allows the Commission to accommodate a host of competing concerns in comparing potential routes.<sup>191</sup>

As for the Warbler, its occurrence and potential habitat is different from the Vireo. Due to species composition and configuration, it is possible to identify and map potential habitat with some accuracy through certain types of aerial photography. Attempts can then be made to minimize/avoid potential habitat, in addition to reviewing TXNDD data in making comparisons.

CVA, however, takes issue with LCRA TSC's quantification of the impact to Warblers and Vireos. CVA argues that the Company simply quantified the total length of each proposed route that would cross potential habitat, rather than examining which routes would result in the greatest additional habitat fragmentation. According to Dr. Wilkins, "it is not necessarily the length of potential habitat cleared that is relevant, but it is the ultimate habitat fragmentation created that is the most relevant metric" in evaluating impacts to Warblers.<sup>192</sup>

Nevertheless, as with the Vireo, the Company argues the presence of potential habitat or even the occurrence of Warbler along a route is not a fatal flaw, but rather one of many issues to be

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<sup>191</sup> LCRA TSC Ex. 9 at 29; Tr. at 1200.

<sup>192</sup> CVA Ex. 1 at 14-15, 17, 25.

evaluated by the Commission. LCRA TSC argues that Warbler populations are not inconsistent with either existing or newly-constructed transmission line ROW.<sup>193</sup>

Finally, the Company notes that transmission line projects in Texas have been successfully constructed through known occupied habitat for Warbler and Vireo. The Commission-selected route for the LCRA TSC Segovia transmission line in Kimble County (Docket No. 20313), which parallels Link b23a in this docket, was routed through known occupied habitat of the Warbler.<sup>194</sup> Through informal consultation with the USFWS, the line was successfully placed and constructed. CPS Energy's portion of the Cagnon-Kendall transmission line passed through known occupied habitat of the Warbler in Bexar County. Through formal consultation with USFWS, the line was constructed and CPS Energy voluntarily conducted three years of monitoring surveys for Warblers. The number of Warblers and Warbler territories in proximity to the line has increased since the line was constructed. Finally, the Morgan Creek-Twin Buttes-Red Creek-Comanche transmission line (Docket No. 22798) was routed by PBS&J, certificated by LCRA TSC, and constructed by American Electric Power Co. on behalf of LCRA TSC through known occupied habitat and high quality potential habitat of the Vireo in an area north of San Angelo with informal consultation with USFWS.<sup>195</sup>

The ALJs conclude that Vireo and Warbler habitat are likely to be present throughout the Project area, regardless of the route chosen. As discussed above, the TXNDD records may not reflect the actual presence of habitat or species. Based on the evidence, the ALJs conclude that some impact on the Vireo or Warbler should be assumed. Nevertheless, LCRA TSC has a demonstrated capacity in dealing with endangered species and implementing mitigation efforts.

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<sup>193</sup> LCRA TSC Ex. 9 at 29-30.

<sup>194</sup> *Application of Lower Colorado River Authority to Amend Certificate of Convenience and Necessity for a Proposed 138 kV Transmission Line in Kimble County*, Docket No. 20313 (May 21, 1999).

<sup>195</sup> LCRA TSC Ex. 20 at 15; *Application of West Texas Utilities Company to Amend Certificate of Convenience and Necessity for Proposed Transmission Line in Sterling, Coke, Tom Green, Concho, Coleman, and McCullough Counties*, Docket No. 22798 (Aug. 10, 2001).

*Creeks, Streams, and Rivers*

Several intervenors raised concerns regarding environmental impacts on creek and river crossings. As set out below, each alternative route involves several such crossings. Construction in a flood plain is also a concern because it may impede the flow of water or result in erosion and sedimentation impacts.<sup>196</sup> Returning to Staff's three representative routes, Staff notes that MK33 impacts three times more miles of 100-year flood plain than MK13 and twice as many miles as Staff MK15.<sup>197</sup>

The EA notes that length parallel to streams and rivers is a highly significant environmental factor. MK13 has 1.34 miles parallel to rivers and streams, the lowest length of the routes listed in LCRA TSC Ex. 26. MK32 and MK33 parallel 1.93 and 1.82 miles, respectively. Staff MK15 has 2.46 miles. The P-Line routes range between 3.49 and 3.73 miles, the highest among those routes. Stated another way, Staff's route parallels 0.64 miles more than MK33 and 1.12 more miles than MK13, though it crosses fewer rivers than either.<sup>198</sup>

Staff MK15 and MK32 have only two river crossings, while MK13 and MK33 have four river crossings each. The P-Line routes are the highest with five river crossings each. MK13 and MK33 have among the lowest number of stream crossings, at 144 and 143, respectively. MK32 has 154 crossings, while Staff MK15 has 160. The P-Line routes cross between 186 and 190 streams, the highest among the routes listed in LCRA TSC Ex. 26.<sup>199</sup>

LCRA TSC has established that creek and river crossings can be spanned by the line in a manner that is technically feasible and also minimally disruptive of natural resources in the surrounding area. In order to address construction effects near rivers and creeks, LCRA TSC intends to implement appropriate erosion control measures as described in sections 1.5, 5.1.2, 5.1.3, and

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<sup>196</sup> LCRA TSC Ex. 1, EA at 5-4.

<sup>197</sup> LCRA TSC Ex. 26.

<sup>198</sup> LCRA TSC Ex. 1, EA at 6-84; LCRA TSC Ex. 26.

<sup>199</sup> LCRA TSC Ex. 26.

5.1.4 of the EA. LCRA TSC will also develop and implement a Storm Water Pollution Prevention Plan (SWPPP) to prevent silting of bodies of water, including creeks, rivers, and springs. The SWPPP will be in effect during all phases of construction and until re-growth is achieved.<sup>200</sup>

LCRA TSC expects that the Project will not adversely impact water resources and streams, including Ecologically Significant Stream Segments (ESSS). TPWD has designated ESSS throughout the state based on criteria related to “biological function, hydrological function, riparian conservation areas, water quality, aquatic life, aesthetic value, and the presence of threatened or endangered species or unique communities.”<sup>201</sup> In its April 1, 2010 letter to LCRA TSC, TPWD stated that it “strongly recommends that the proposed project avoid any adverse impacts to . . . ESSSs.”<sup>202</sup> Due to the nature of the study area, all of the route options would cross at least one ESSS and many of the routes will cross more than one ESSS, some at more harmful locations than others. Nevertheless, LCRA TSC maintains that there will be no adverse impact in light of the Company’s proposals for spanning creeks and other measures that are intended to be minimally disruptive of natural resources in the surrounding area.<sup>203</sup>

Weinzierl Ranch notes that all routes using Links b21c or z4, b33 or z5, b34, or b35a, will cross the James River ESSS, and the majority of central routes use one of these links.<sup>204</sup> In addition, all routes that use Links b44, b50b, b52, or O3 would cross the Pedernales River ESSS (most of the MK routes use one of these links). For example, Route MK13 crosses both the James River on Link b33, as well as the Pedernales River on Link b50b.<sup>205</sup> Weinzierl points out that Staff MK15, MK32, and MK33 cross neither. Because these routes travel south to parallel the I-10 corridor, they contain a single ESSS crossing—the Fessenden Branch.<sup>206</sup> Further, the Fessenden Branch crossing

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<sup>200</sup> LCRA TSC Ex. 7 at 28-29.

<sup>201</sup> LCRA Ex. 1, EA at 2-15 to 2-16; *see also* 31 TAC § 357.8.

<sup>202</sup> LCRA Ex. 1, EA at Appendix F.

<sup>203</sup> LCRA TSC Ex. 14 at 18; LCRA TSC Ex. 20 at 45-46; LCRA TSC Ex. 1, EA at 2-15 to 2-16, 5-2 to 5-8, and Fig. 3.

<sup>204</sup> LCRA TSC Ex. 1, EA at Fig. 3-1c, g; LCRA Ex. 2 at Exhibit SM-2.

<sup>205</sup> LCRA TSC Ex. 1, EA at Fig. 3-1d, g; LCRA Ex. 2 at Exhibit SM-2.

<sup>206</sup> LCRA TSC Ex. 1, EA at Fig. 3-1g.



on Link b29d is at a previously disturbed location, where the stream is already crossed by I-10.<sup>207</sup> As a result, Weinzierl argues that this crossing poses a much lower impact than the James River and Pedernales River crossings on the central routes.

The Company anticipates potential impacts to mussel species to be minimal. The Commission has found that the appropriate way to address potential mussel impacts is to examine carefully the factual assertions concerning the impacts and consider whether standard construction techniques would alleviate any potential impacts. In this case, the Company argues that no impact has been demonstrated and construction techniques are adequate to deal with potential impacts. Although certain links among the KG routes cross the Live Oak Creek mussel sanctuary, LCRA TSC will span the creek upstream of the lower dam at Lady Bird Johnson Park. As a result LCRA TSC argues that impacts to this particular mussel sanctuary will be minimal.<sup>208</sup>

Six Mile Ranch notes that the headwaters of the San Saba River located between FM 864 in Menard County upstream and Fort McKavett in Menard County is an ESSS. This segment contains one of only four known remaining populations of the state-listed Texas Fatmucket freshwater mussel and one of only four known remaining populations of the state-listed Texas Pimpleback freshwater mussel. TPWD recommends that the proposed project avoid any adverse impacts to this ESSS.<sup>209</sup> While the ALJs are confident that LCRA TSC can minimize any impact to this ESSS, the ALJs nevertheless consider this another reason to avoid routes that impact Fort McKavett.

Although the ALJs recommend against the P-Lines, the P-Line Intervenors note that TPWD's comments and P-Line Intervenors' witness Kevin Ramberg's testimony reference the presence of two mussel sanctuaries along MK-22, MK-23 and MK-24, including the San Saba River Mussel sanctuary and the Live Oak Creek TPWD Mussel Sanctuary (crossed by KG routing links, as well). Mr. Ramberg also testified that Segment P1 crosses limestone considered the likely recharge zone of the Clear Creek Gambusia karstic spring cave complexes, which are the habitat for a

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<sup>207</sup> LCRA TSC Ex. 1, EA at Fig. 3-1g.

<sup>208</sup> LCRA TSC Ex. 1, EA at 5-15; LCRA TSC Ex. 20 at 47.

<sup>209</sup> TPWD Ex. 4 at 32-34; LCRA TSC Ex. 1, EA at 2-15.

federally-listed endangered fish, the Clear Creek Gambusia. The Clear Creek Gambusia exists only in the Clear Creek stream complex.<sup>210</sup>

McGinley L-Ranch and Armstrong Exempt Trust argue that along MK13, the land in the area of segments b36, b50a, and b51 is sensitive in many ways. These links (among others throughout the study area, including the P-Lines) cross karstic terrain formed by the dissolution of limestone. The terrain is generally characterized by sinkholes, caves, cavities, and depressions that channel water underground. “Karstic formations are web-like and interconnected to the degree that a perturbation in a formation may have a result in another formation long distances away.”<sup>211</sup> Heavy equipment for construction of the line as well as the installation of the poles themselves can disturb the surface and subsurface water systems and their flow back into an aquifer. LCRA TSC acknowledged that with caves near the surface “you can impact it [the cave] and have issues . . . [with] installing foundations. [LCRA] prefer[s] to find out about them in advance, relocate structures, do things not to encounter them when you drill a hole to install a foundation.”<sup>212</sup> The McGinley L-Ranch’s hydrology system plays a part in actively recharging the Edwards aquifer. The McGinley L-Ranch’s springs also serve as the headwaters for Threadgill Creek, a tributary to the Llano River, in turn a tributary to the Colorado River. If the line were built on these links, some springs on the McGinley L-Ranch would be within 200 and 400 yards of the line.<sup>213</sup>

Although LCRA TSC has established that it can safely span creeks and streams, the ALJs find that issues associated with potential risks to mussel sanctuaries, karstic formations, and ESSS as factors that reinforce the unattractiveness of the P-Lines, MK13, and other central routes from an environmental perspective. To the extent that the I-10 links may implicate floodplain issues, LCRA TSC SWPPP may be able to prevent or mitigate silting of bodies of water, including creeks, rivers, and springs until re-growth is achieved. In particular, streams, rivers and floodplains along I-10 have already been impacted, unlike much of the central and northern Project areas.

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<sup>210</sup> Staff Ex. 1 at 67; P-Line Ex. 6 at 3-4.

<sup>211</sup> P-Line Ex. 3 at 6.

<sup>212</sup> Tr. at 236.

<sup>213</sup> McGinley Ranch L- Ex. 1 at 16; McGinley L Ranch Ex. 2 at 5-10; McGinley L- Ranch Ex. 3 at 10.

*Old Tunnel WMA and Bat Issues*

Old Tunnel WMA issues are also generally discussed under Recreation and Park Areas. However, certain issues specific to environmental concerns warrant further discussion here. TPWD is concerned that the line, if placed on Links A3 or O4, would result in bat mortality and possible abandonment of the colony. As a result of potential harm to the Old Tunnel as an environmental and recreational resource, TPWD opposes any route that uses these links.

Professor John Baccus, who testified on behalf of TPWD, is an expert on human impacts on birds and mammals through land disturbance or habitat modification. In particular, he has spent a great deal of time researching and publishing articles on bat populations in Texas, New Mexico, Mexico, and Asia. Professor Baccus testified that biologists have recently become alarmed at the risk posed to birds and bats by power lines. In particular, he articulated concerns raised by the proximity of a transmission line to the Old Tunnel, in that: based on observed flight patterns, the bats will fly into the area of the line; subsonic, ultrasonic and ambient noise may place the colonies at risk and in fact, may attract bats to the line; and electromagnetic radiation may affect the bats' navigation capacities.<sup>214</sup>

LCRA TSC argues that for segments A3 and O4 structure designs, all conductor-to-conductor and conductor-to-tower clearances are well above the recommended clearance of 60 inches, therefore electrocution of bats should not be an issue with this transmission line. The Company also argues that a lack of bat collisions with respect to existing transmission lines demonstrates there is no serious risk of collisions for bat populations from the line. LCRA TSC notes that no evidence exists of any collisions with the existing 138-kV line near Old Tunnel WMA despite reported observations of bat emergences on over 2500 occasions. Further, LCRA TSC argues there is no evidence of bat collisions in similar situations, such as with the Austin Energy

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<sup>214</sup> TPWD Ex. 3 at 6-8.

double-circuit 138-kV transmission line near the Congress Avenue Bridge bat colony.<sup>215</sup>

LCRA TSC also argues that TPWD's concerns are speculative and lack evidentiary foundation, because some of the studies cited by Dr. Baccus are speculative, contradictory, or do not focus sufficiently on bats, as opposed to birds.<sup>216</sup> While these are valid criticisms, they do not completely undermine the evidentiary basis for TPWD's concerns. Dr. Baccus' testimony was supported by literature and symposiums, with which he was familiar. Most importantly, these studies and Mr. Baccus' testimony are sufficient evidentiary support for TPWD's concern that the line may have some impact on bat populations, even if the scientific research is conflicting as to the nature of that impact. The ALJs find that TPWD has raised genuine questions about the potential impact of transmission lines on the bat colonies at the Old Tunnel. The ALJs do not recommend a route using any of the links opposed by TPWD regarding the Old Tunnel.

Finally, Links b34 and b36 of MK13 cross the headwaters of the James River basin and approach the Little Devil's River. As the route crosses the Little Devil's and James Rivers, it comes in close proximity to the Eckert James River Bat Cave Preserve, with one of the largest known concentrations of breeding Mexican free-tailed bats anywhere. The ALJs' conclusion that TPWD raised valid concerns over the line's impact on bat colonies applies equally to this bat cave preserve.<sup>217</sup>

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<sup>215</sup> LCRA TSC Ex. 14 at 33; LCRA TSC Ex. 20 at 50.

<sup>216</sup> LCRA TSC Ex. 16 at 12-14; LCRA TSC Ex. 20 at 48-52.

<sup>217</sup> CVA Ex. 1 at 12-14.

**c. Conclusion**

The central study area, and to a somewhat lesser extent the P-Lines, are relatively unfragmented compared to the I-10 corridor. Land fragmentation and Oak Wilt are major environmental concerns for the ALJs -- the impact of the line is expected to be greatest in the central study area, where there may be relatively fewer TXNDD records. Although there are also concerns over flood-plains, and paralleling and crossing rivers, creeks, and streams, LCRA TSC has a demonstrated ability to span these areas and use SWPPP. From an environmental perspective, the ALJs agree with TPWD, Weinzierl, and CVA that paralleling US 277 and the I-10 corridor is the best way to avoid major fragmentation associated with the line's new ROW. As a result, the ALJs recommend MK32 or MK33 as the routes, best designed to avoid all of the negative consequences of habitat fragmentation.

However, the ALJs are aware that other factors weigh against selecting routes MK32 or MK33. In recognition of these factors, certain parties opposed to a central route request that the Commission use the highest length of compatible corridors possible. Although Staff MK15 is the ultimate recommendation of the ALJs, MK62 maximizes the length of Staff MK15 parallel to I-10. As a result, the ALJs rank MK62 second from an environmental standpoint (along with MK61). Of the remaining routes, Staff's is best. Nearly 60 miles of MK15, or 44% of its total length, would parallel existing ROW, including a substantial distance along I-10.<sup>218</sup> MK15 would parallel a much greater length of existing ROW than Route MK13 or other central routes.<sup>219</sup> As a result, the ALJs recommend Staff MK15 as clearly preferable to any of the central routes in terms of minimizing habitat fragmentation.

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<sup>218</sup> LCRA TSC Ex. 26.

<sup>219</sup> LCRA TSC Ex. 1, EA at 6-85 to 6-92.

**6. The Effect of Granting the Certificate on the Ability of this State to Meet the Goal Established by Section 39.904(a)**

In order to fulfill the renewable energy goals established by the Legislature in PURA § 39.904(a), the Commission adopted, in Docket No. 33672, a transmission plan to deliver renewable energy to the market. In Docket No. 35665, the Commission designated certain transmission service providers to build the required transmission facilities. In Docket No. 33672, the Commission determined that the transmission facilities identified in its final order, including the Project, were necessary to deliver to customers the renewable energy generated in the CREZ. As a designated CREZ project that will provide transmission capacity for the delivery of renewable energy, the ALJs find that the Project plays a key role in helping this State to meet the goal established by PURA § 39.904(a).

**7. Engineering Constraints**

**a. Kimble County Airport and Llano River Floodplain**

The Kimble County Airport, located just north of I-10 in Junction presents one of the more significant engineering constraints. The runway is oriented north-south, and the transmission line if it is approved along either the MK 15 routes using Links b19b and b19c or the MK 32 or 33 routes using Link Y11 will pass perpendicular to the runway either to the north or the south of the airport. Construction of the line along any of the links will require Federal Aviation Administration (FAA) notification.<sup>220</sup> Link Y11 also runs through the Llano River floodplain, further complicating construction of the line.

**i. Links b19b and b19c, North of the Airport**

LCRA TSC has proposed routing options that it asserts will maintain reliability of the line, are feasible to construct, and which LCRA TSC believes are likely to be accepted by the FAA.

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<sup>220</sup> CVA Ex. 7 at 3.

Links b19b and b19c to the north of the airport are segments proposed to bypass the airport restrictions but still permit routes that generally follow the I-10 corridor.

While the routes north of the airport using Links b19b and b19c would technically violate the FAA Part 77 imaginary surface and would require FAA notification, LCRA TSC believes that the segment could be built without FAA objection. The proposed links are located behind and below the crest of a hill that lies in the northern approach to the airport.<sup>221</sup> The hill itself violates the Part 77 imaginary surface rules because the imaginary surface runs through the hill.<sup>222</sup> Construction along segments b19b and b19c would be below the existing obstacle clearance slope and well below the instrument approach slope.<sup>223</sup> As a result, it is LCRA TSC's belief, based upon its experience with the FAA and upon the opinion of its airport consultant, that the FAA would not object to the construction.<sup>224</sup> In addition, there are adjustments that LCRA TSC could make to work out a solution with the FAA, if necessary. Lower structures could be used, minor route deviations could move the structures to locations slightly more downhill from the airport, or warning lights could be added.<sup>225</sup>

While construction along these links would require FAA notification, construction is feasible because the proposed line would not violate the published obstacle clearance slope or instrument approach slopes and room exists for minor route adjustments, reduced height structures or warning lights should such adjustments be required by the FAA.

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<sup>221</sup> LCRA TSC Ex. 14 at 35-36 and CDS-5REB and CDS-6REB.

<sup>222</sup> *Id.*; LCRA TSC Ex. 15 at 9.

<sup>223</sup> LCRA TSC Ex. 15 at 9-11; LCRA TSC Ex. 14 at 35-36.

<sup>224</sup> LCRA TSC Ex. 15 at 11.

<sup>225</sup> LCRA TSC Ex. 15 at 9-11; LCRA TSC Ex. 14 at 35-36.

**ii. Link Y11, South of the Airport**

Link Y11 is proposed as a part of the routes that follow I-10 through the Junction area, including Route MK 33.<sup>226</sup> Construction along Y11 would locate the line approximately 1,200 to 1,800 feet from the south end of the airport's primary runway. In addition to the constraint presented by the airport, this area presents unique engineering challenges as it is in a flood plain and is on a narrow strip of land between I-10 and the northern bank of the Llano River north of Junction. As a result, there is limited room for route adjustments to avoid the airport because the main flood channel of the river lies to the south and the location of the city itself precludes a move farther south to avoid the flood channel.<sup>227</sup>

Considering these conditions, LCRA TSC tried to design an overhead solution that would avoid the high cost of underground construction. Such an overhead solution had to stay beneath the published obstacle clearance slope but permit sufficient surface clearance over flood levels so that line clearances could be maintained and the line could remain in service during flood events. An overhead solution is not available in the professional engineering opinion of LCRA TSC's transmission design staff because it would not meet industry standards.<sup>228</sup> The only solution that will permit a safe, reliable transmission line along this segment that will achieve the purpose for which the PUC has ordered LCRA TSC to construct the line is an underground transmission line for approximately one-half mile to get past the airport restrictions. Given the high cost of this solution (approximately \$54 million for that one-half mile), the links bypassing the airport to the north are preferable.<sup>229</sup>

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<sup>226</sup> LCRA TSC Ex. 7 at 35-36; LCRA TSC Ex. 14 at 35-38.

<sup>227</sup> LCRA TSC Ex. 7 at 35; LCRA TSC Ex. 14 at 36-38; Tr. at 1463-64.

<sup>228</sup> LCRA TSC Ex. 7 at 35; Tr. at 1216.

<sup>229</sup> LCRA TSC Ex. 7 at 35; LCRA TSC Ex. 14 at 36-38; Tr. at 1188-1191, 1462-1466.



### iii. Intervenor's and Staff's Arguments

The Segrest parties and CVA addressed the concerns of routing around the Kimble County Airport. The Segrest parties support the preferred route and the P-Line routes. They own property along Links b19b and b19c and do not want the transmission line routed through their property. They argue that because there may be difficulties in constructing the line either north or south of the airport, the line should be placed much farther to the north along the preferred route or the P-Line.<sup>230</sup>

Although CVA advocates for a route that parallels I-10 for its entire length, CVA recognizes that the additional cost of \$54 million to bury the transmission line south of Kimble County Airport along Link Y11 is prohibitive.<sup>231</sup> CVA argues, however, that the line does not have to be buried along Link Y11. CVA's expert, Frank McIlwain, is a pilot and an engineer with airport design experience. Mr. McIlwain testified that he believes the FAA would not object to construction of the transmission line on Link Y11 if the heights of the structures do not exceed 61 feet.<sup>232</sup> LCRA TSC's expert witness, William Griffin, P.E., acknowledged on cross examination that a structure 60 feet tall would not be determined by the FAA to be an obstruction to air navigation.<sup>233</sup> A structure of that height would, however, have reliability issues in the event of a flood because the wires would be close to the rising water level, which would require taking the line out of service in the event of a flood.<sup>234</sup> For that reason, LCRA TSC cannot build a safe and reliable above-ground transmission line south of the Kimble County airport.

LCRA TSC, the entity that will be responsible for the safe construction, operation and maintenance of the D to K line, testified that an above-ground line along I-10 near the Kimble

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<sup>230</sup> At the hearing, the Segrest parties proposed a route identified as Segrest MK15, which was routed south of the airport and included the underground construction on Link Y11. In briefing, Segrest no longer advocated for its route because of the cost of underground construction and advocated instead for MK13 or one of the P-Lines. The routes that are north of the Kimble County airport cross the Segrest parties' properties.

<sup>231</sup> CVA Initial Brief at 9.

<sup>232</sup> CVA Ex. 7 at 6.

<sup>233</sup> Tr. at 1303, 1462.

<sup>234</sup> LCRA TSC Ex. 7 at 35.

County airport is not a safe, reliable, and viable option.<sup>235</sup> For these reasons Staff does not believe it would be prudent to recommend construction of the line on Y11 except as an underground facility. Staff also agrees with CVA that the cost of underground construction is prohibitive.

#### **iv. Analysis**

Although the ALJs agree with CVA and TPWD that environmentally, the best choice for the line would be to parallel I-10 as much as possible, underground construction along Link Y11 is too expensive to recommend. The weight of the evidence does not support CVA's contention that Link Y11 can be built above ground. Although Links b19b and b19c may require some modification if the FAA expresses concern about the construction, those modifications would be considerably cheaper than building the line underground at Link Y11. Given that LCRA TSC is responsible for ensuring that the line is safe and reliable, the better option is to route the line north of the Kimble County Airport. Staff, Weinzierl, and CVA alternate proposal MK32 all route around the airport along Links b19b and b19c. Staff MK15 best balances the factors of cost, paralleling ROW, prudent avoidance, and environment. MK32 and 33 are better in terms of the environmental factors but are poor on cost and prudent avoidance. Therefore, the ALJs recommend Staff MK15.

#### **b. P-Line Concerns**

The P-Line Intervenors raise concerns about the difficulty of constructing transmission lines along the P-Lines due to the geology of caves and granite.

Mason County is geologically "karstic," which means the terrain is formed by the dissolution of bedrock, and is generally characterized by sinkholes, caves, cavities and depressions that channel water underground.<sup>236</sup> These formations are interconnected in such a way that disturbances in the formation may impact another formation some distance away.<sup>237</sup> LCRA would prefer to avoid caves when constructing transmission lines/structures, because encountering them when drilling for

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<sup>235</sup> Tr. at 1404-1406.

<sup>236</sup> P-Line Ex. 24 at 15 (picture by Mr. Meinzer from his book Texas Hill Country, showing caves).

<sup>237</sup> P-Line Ex. 3 at 6.

foundations is problematic. P-Line Intervenor asserts that because the karstic features are not necessarily visible from the surface, construction of the project through Mason County would be complicated by the delays that would occur as caves are encountered, which would require LCRA to find another area to which it could re-locate the transmission structures.<sup>238</sup>

The Llano, or Central Texas, Uplift is a central basin having a rolling floor studded with rounded granite hills 400 to 600 feet high.<sup>239</sup> The foundation requirements for transmission structures vary depending on soil types. Because granite is the dominant soil type in the Llano Uplift, in Mason County the cost for construction of any of the P-Lines would be higher regardless of the type of structures used.<sup>240</sup>

LCRA TSC has indicated, and it is undisputed, that it can construct the transmission line along any route. There is no evidence that it cannot construct the line along the P-Line routes. However, as discussed in other sections, the P-Line routes are among the least desirable in terms of reliability issues, cost, and environmental effects.

## **8. Costs, Using Existing Compatible ROW, and Prudent Avoidance**

### **a. Tension Between Cost, Paralleling ROW and Prudent Avoidance**

No party disputed LCRA TSC's cost estimates. The 60 filed routes for the McCamey D to Kendall transmission line range in cost from \$251.8 million to \$406.8 million.<sup>241</sup> Of the routes in discussed in depth at the hearing, the cost estimates range from \$266.4 million (MK13) to \$406.8 million (MK33). Staff MK15 is estimated to cost \$302.3 million. The P-Line routes all cost over \$315 million.<sup>242</sup>

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<sup>238</sup> Tr. at 236.

<sup>239</sup> P-Line Ex. 10 at Ex. BG-2 and BG-3 (photos); P-Line Ex. 24 at 12 - 13.

<sup>240</sup> LCRA TSC Ex. 7 at 14 and CDS-2.

<sup>241</sup> LCRA TSC Ex. 14, Ex. CDS-2REB at 4.

<sup>242</sup> LCRA TSC Ex. 26.

Although MK13 is the least expensive route in contention at the hearing, the difference in the cost estimates associated with using MK13 does not outweigh the benefits associated with paralleling as much existing cleared ROW as is feasible. Although Staff MK15, MK61, 62, and 63, and CVA's MK32 are more expensive than LCRA TSC's preferred route, they parallel I-10 for a much greater distance than the preferred route, thereby avoiding ranch land located in the central part of the study area. These areas north of I-10 in the study area are remote, largely unfragmented, and sparsely populated.<sup>243</sup> This region includes the "virgin ranch" lands to which Commissioner Smitherman referred when the Commission delayed this project and ordered the study of addition routes, including the I-10 corridor. The preferred route also parallels parcel lines for the least distance of any of the routes in contention. Staff's route parallels Ranch Road 1624 to merge with I-10, making it the most western route that does not follow Highway 277. None of the filed routes use existing ROW.

The table below illustrates the tension in this case between the high environmental and aesthetic impact of not following existing ROW compared to the expected lower cost of a shorter, straighter route.<sup>244</sup> It also shows how many habitable structures would be affected by the route.

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<sup>243</sup> See, e.g. TPWD Ex. 4 at 14; Tr. at 827-828; CVA Ex. 9 at 9-10.

<sup>244</sup> This table is derived from LCRA TSC Ex. 26.

Route	Overall length	Length paralleling existing ROW <sup>245</sup>	Cost in millions	Number of habitable structures
MK13 (preferred)	134.99	39.34	\$266.4	18
MK15	135.63	59.76	\$286.8	45
Staff MK15	144.13	79	\$302.3	55
MK22	155.29	94.17	\$326.4	44
MK23	151.84	80.75	\$315.6	43
MK24	151.5	87.53	\$315.9	37
MK32	164.42	130.25	\$349.3	151
MK33	161.09	132.96	\$406.8	153
MK61	133.31	60.86	\$287.3	118
MK62	141.81	80.09	\$302.9	128

The higher habitable structure counts along MK32, 33, 61, and 62, are primarily a result of the line running parallel to I-10 through Kerrville.

P.U.C. SUBST. R. 25.101(a)(4) defines the term “prudent avoidance” as “the limiting of exposures to electric and magnetic fields that can be avoided with reasonable investments of money and effort.” Essentially, prudent avoidance includes the consideration of reasonable and cost-effective routing adjustments to limit EMF exposure by minimizing the number of habitable structures in close proximity.

It is undisputed that all of LCRA TSC’s filed routes are consistent with the Commission’s prudent avoidance policy.

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<sup>245</sup> This section includes any ROW paralleled, whether highway, transmission line, pipeline, or road. For the P-Line routes (MK22, MK23, and Mk24), it includes the existing 138-kV line that may not be compatible ROW with a 345-kV CREZ line.

**b. Best Balance of Cost, Paralleling, and Prudent Avoidance**

Because all filed routes comply with the Commission's policy on prudent avoidance, no route can be completely excluded on the basis of prudent avoidance alone. While the preferred route has the fewest habitable structures, it is weak environmentally and parallels significantly less existing ROW than other routes. As discussed throughout this PFD, given the length of this line, the characteristics of the Hill Country, and the tremendous opposition to routing the line through the Hill Country, a better solution is to parallel more existing cleared ROW, such as I-10.

CVA's two preferred routes parallel as much existing highway ROW as possible. Staff MK15 parallels I-10 but not Highway 277, thereby reducing the cost. Staff's preferred route also uses Links b84 and b86, which bisect AC Ranches. AC Ranches has agreed to have the transmission line routed through its property. Because a landowner along those links has agreed to take the line, Staff recognized that agreement as an indication of community values and recommended routing the line along those links.<sup>246</sup> However, other landowners along b84 and b86 are members of CVA and oppose the line on those links and others not paralleling the highway.

The parties agree that running the transmission line along I-10 south of the Kimble County Airport underground is prohibitively expensive. Therefore, a better recommendation is to follow I-10 as much as possible, as Staff MK15 does, deviating north of the Kimble County Airport, and deviating north of Kerrville. Going through Kerrville along MK33, 61, or 62, adds several habitable structures but it avoids cutting through the Tierra Linda Ranch subdivision. The habitable structures along the links that run through Kerrville include 59 habitable structures along Links Y18 and Y19b. Of these 59 habitable structures, 17 would need to be relocated.<sup>247</sup> Of the 17 habitable structures identified as being located within the right-of-way near Interstate 10 in the vicinity of Kerrville, only six would be within the ROW if LCRA TSC constructed the line using a 100' instead of a 140' ROW for this portion of the line.<sup>248</sup> Additionally, the City of Kerrville is concerned with the

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<sup>246</sup> Staff Ex. 1 at 25.

<sup>247</sup> Tr. at 706.

<sup>248</sup> Tr. at 1317-1324.

line running close to the city and its growing population.<sup>249</sup> Both Kerrville and Kerr County are concerned that running the transmission line either parallel to I-10 or deviating just to the north of I-10 will impact existing and future development.<sup>250</sup>

If the line deviates round Kerrville using Link b56, which must be used if the line deviates around Kerrville from the west along I-10, it will affect the Tierra Linda Ranch subdivision.<sup>251</sup> The line would parallel an existing pipeline easement through the subdivision. Landowners in Tierra Linda, both those directly affected by the proposed line, and those who are not directly affected by the proposed line intervened to argue that the line should not go through their subdivision.

LCRA TSC identified 15 habitable structures within 500' of the ROW centerline along Link b56 within Tierra Linda Ranch. One structure lies within 69 feet of the proposed centerline.<sup>252</sup> These habitable structures lie along a linear distance of approximately  $\frac{3}{4}$  mile, or 4,000 feet.<sup>253</sup> Thus, Tierra Linda argues that the density of the housing development along with the vocal opposition of its homeowners' association should weigh strongly against routing the transmission line through the subdivision.

Whether a route is chosen that runs along I-10 through the northern portions of Kerrville or deviates around Kerrville through the Tierra Linda Ranch subdivision, landowners will be affected. Some structures along I-10 will have to be moved if the line goes through Kerrville. But the northern portions of Kerrville are already affected and bisected by I-10. I-10 is an exiting disturbance in the landscape that is not natural or scenic. Moving the line into an area that does not have a large scar across the landscape already is more damaging than placing it along an already-disturbed area. Not only is it better environmentally, as TPWD and CVA argue, but it helps to

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<sup>249</sup> Kerrville Ex. 1 at 4; Kerr County Ex. 1 at 5-8.

<sup>250</sup> Kerrville Ex. 1 at 5-10, Attachments A-F; KPUB Ex. 1 at 6. These issues are also discussed in the community values section of the PFD.

<sup>251</sup> Tierra Linda is not affected by LCRA TSC's preferred route, the P-Line routes or any of the routes that follow I-10 through Kerrville.

<sup>252</sup> Tr. at 1264.

<sup>253</sup> Tr. at 279 – 280.

preserve the scenic nature of the Hill Country, which position CVA has held throughout the proceeding. Therefore, although they affect more habitable structures than MK13 and are more expensive, Staff MK15, CVA's second choice of MK32, and MK62 provide a better balance of the factors of cost, paralleling existing ROW, and prudent avoidance.

**c. EMF**

Several individual intervenors expressed concerns about possible adverse effects from electric-magnetic fields (EMF), including health effects and impacts to electrical and mechanical devices.<sup>254</sup> LCRA TSC's proposed alternative routes reflect reasonable investments of money and effort in order to limit exposure to electric and magnetic fields. The project design incorporates, where technically feasible, optimal phasing arrangements and ground clearance heights that result in lower EMF levels, which is consistent with prudent avoidance from an engineering perspective.<sup>255</sup>

A series of EMF measurements at various locations along the proposed routes (in Fredericksburg, Kerrville, Junction, and Menard) demonstrates, in relation to the calculated EMF levels modeled for the proposed project, that EMF from this project are within the range of the fields that people can experience every day in their normal living and working environments, and are substantially below the EMF exposure limits adopted by recognized international organizations.<sup>256</sup>

Extensive scientific research has been conducted on EMF and health over the past several decades. Based on the large body of scientific research on EMF and human health, there is no reliable scientific basis to conclude that exposure to power frequency EMF from these 345-kV transmission lines will cause or contribute to adverse health effects, including the development of childhood leukemia or other childhood and adult cancers, or other health problems such as neurological disorders or adverse reproductive outcomes, in persons along the proposed line route.<sup>257</sup>

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<sup>254</sup> See e.g. Foster Ex. 2 at 8; TPWD Ex. 1 at 13; TPWD Ex. 3 at 7-8.

<sup>255</sup> LCRA TSC Ex. 9 at 33; LCRA TSC Ex. 2 at 30; LCRA TSC Ex. 8 at 15; LCRA TSC Ex. 7 at 11-12.

<sup>256</sup> LCRA TSC Ex. 8 at 15; LCRA TSC Ex. 7 at 11-12; LCRA TSC Ex. 19 at 6; LCRA TSC Ex. 14 at CDS-1R.

<sup>257</sup> LCRA TSC Ex. 17 at 16-17; LCRA TSC Ex. 18 at 14-15; Tr. 1430-1431.



Based on the large body of scientific research on EMF and animals, there is no reliable scientific basis to conclude that power frequency EMF from these 345-kV transmission lines will cause or contribute to adverse effects on the well-being of animals living along the route of the transmission line. Given that scientific research on EMF has shown no reproducible effects on genetic changes related to the development or progression of cancer, there is no reliable scientific basis to conclude that exposure to power frequency EMF would make an existing cancer worse.<sup>258</sup>

There is nothing unusual about the EMF levels from the proposed project. They are within the range of EMF exposures that can be experienced in daily home and work environments and are substantially below the public EMF exposure limits adopted by international organizations.<sup>259</sup>

The EMF concerns raised by the intervenors are not a basis for choosing between any particular route or altering any particular route for the proposed transmission line.

**G. Preliminary Order Issue Nos. 7 and 8**

**Are there alternative routes or facilities configurations that would have a less negative impact on landowners? What would be the incremental cost of those routes? If alternative routes or facility configurations are considered due to individual landowner preference: (a) have the affected landowners made adequate contributions to offset any additional costs associated with the accommodations; and (b) have the accommodations to landowners diminished the electric efficiency of the line or reliability?**

Several alternatives to LCRA TSC's preferred route were proposed by intervenors. LCRA TSC represents that none of the proposed alternatives, each made up of segments that were part of the Application, would diminish the efficiency of the line or its reliability. Staff concluded that no alternative routes or facilities that would have a less negative impact on landowners than those proposed by LCRA TSC were proposed by any party or were apparent from Staff's review of the

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<sup>258</sup> LCRA TSC Ex. 16 at 15.

<sup>259</sup> LCRA TSC Ex. 8 at 15.

application.<sup>260</sup> However, Staff has identified a number of minor route adjustments that can be made at reasonable cost and included these adjustments in its recommendation.

A brief description of the modifications to the preferred route, alternatives, and associated cost issues are addressed below. No intervenor testified regarding an offer to offset additional costs associated with a requested accommodation due to landowner preferences.<sup>261</sup>

### **1. Alternative Routes Evaluated by LCRA TSC**

LCRA TSC Ex. 26 (Attachment A to the PFD) is a comparison of suggested alternative routes in addition to LCRA TSC's preferred route. The alternatives described below are formulated from segments contained in the EA. The following is a descriptive comparison of the routes represented in LCRA TSC Ex. 26. The descriptions begin with LCRA TSC's environmental and routing consultant witness's summary of key points of the preferred route,<sup>262</sup> and continue with comparable points in routes either suggested by Staff and intervenors as having less negative impact on landowners, or suggested by the ALJs for comparative purposes.

- a. MK 13 (LCRA TSC preferred route)
  - base cost \$266.4 million;
  - 134.99 mile length;
  - 18 habitable structures within 500 feet;
  - 29% paralleling existing ROW;
  - avoids towns and cities (such as Eldorado, Sonora, Junction, Menard, Mason, Kerrville, and Fredericksburg), and Fort McKavett;
  - crosses least amount of potential Warbler habitat (3.34 miles);
  - avoids Tierra Linda;
  - avoids visibility of major roadways.<sup>263</sup>
- b. MK 15 (Weinzierl preferred route)
  - base cost \$286.8 million;
  - 135.63 mile length;

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<sup>260</sup> Staff Ex. 1 at 11-12, 19.

<sup>261</sup> Staff Ex. 1 at 12; Staff Ex. 2 at 14.

<sup>262</sup> Tr. at 1469-1470.

<sup>263</sup> Tr. at 1469-1470.

- 45 habitable structures within 500 feet;
  - 44% paralleling existing ROW;
  - avoids towns and cities, and Fort McKavett;
  - routes around Kimble County Airport using segments to north of airport;
  - crosses high amount of potential Warbler habitat (15.35 miles);
  - parallels existing ROW through Tierra Linda;
  - parallels I-10 between Junction and Kerrville.<sup>264</sup>
- c. MK 15A (Weinzierl Alternate)
- base cost \$286.6 million;
  - 137.02 mile length;
  - 45 habitable structures within 500 feet;
  - 44% paralleling existing ROW;
  - avoids towns and cities, and Fort McKavett;
  - routes around Kimble County Airport using segments to north of airport;
  - crosses high amount of potential Warbler habitat (15.35 miles);
  - crosses one willing landowner;
  - parallels existing ROW through Tierra Linda;
  - parallels I-10 between Junction and Kerrville.<sup>265</sup>
- d. MK 15 Modified (PUC Staff Recomm.)
- base cost \$302.3 million;
  - 144.13 mile length;
  - 55 habitable structures within 500 feet;
  - 55% paralleling existing ROW;
  - avoids Fort McKavett;
  - routes around Kimble County Airport using segments to north of airport;
  - crosses high amount of potential Warbler habitat (15.9 miles);
  - crosses one willing landowner;
  - parallels existing ROW through Tierra Linda;
  - parallels I-10 both north of Junction and between Junction and Kerrville.<sup>266</sup>

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<sup>264</sup> Weinzierl Ex. 3; *See* LCRA TSC Ex. 20 (Ex. RRR-3R); LCRA TSC Ex. 26 and observations based on LCRA TSC testimony, intervenor and Staff testimony, and Hearing on the Merits discussions.

<sup>265</sup> *Id.*

<sup>266</sup> PUC Staff Ex. 1 at 21-25; *See* LCRA TSC Ex. 20 (Ex. RRR-3R); LCRA TSC Ex. 26 and observations based on LCRA TSC testimony, intervenor and staff testimony, and Hearing on the Merits discussions.

- e. MK 22 (“P-line route”; Opposed by P-line intervenors)
- base cost \$326.4 million;
  - 155.29 mile length;
  - 44 habitable structures within 500 feet;
  - 61% paralleling existing ROW;
  - avoids towns and cities but approaches NW portion of Fredericksburg, and avoids Fort McKavett and Kimble County Airport;
  - crosses less potential Warbler habitat than MK 15 routes but more than LCRA TSC preferred route;
  - avoids Tierra Linda;
  - lower lengths paralleling state, U.S. and interstate highways than MK15 routes.<sup>267</sup>
- f. MK 23 (P-line route variant)
- base cost \$315.6 million;
  - 151.84 mile length;
  - 43 habitable structures within 500 feet;
  - 53% paralleling existing ROW;
  - other factors similar to MK 22.<sup>268</sup>
- g. MK 24 (P-line route variant)
- base cost \$315.9 million;
  - 151.5 mile length;
  - 37 habitable structures within 500 feet;
  - 58% paralleling existing ROW;
  - other factors similar to MK 22.<sup>269</sup>
- h. MK 32 (U.S. Hwy. 277 and I-10 route variant)
- base cost \$349.3 million;
  - 164.42 mile length;
  - 151 habitable structures within 500 feet;
  - 79% paralleling existing ROW;
  - avoids Eldorado, Sonora and Junction but not Kerrville, and avoids Fort McKavett;
  - routes around Kimble County Airport using segments to north of airport;
  - crosses relatively high amount of potential Warbler habitat (17.36 miles);
  - avoids Tierra Linda;
  - very high length paralleling state, U.S. and interstate highways.<sup>270</sup>

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<sup>267</sup> LCRA TSC Ex. 26 and observations based on LCRA TSC testimony, intervenor and staff testimony, and Hearing on the Merits discussions; LCRA TSC Ex. 20 (Ex. RRR-3R).

<sup>268</sup> LCRA TSC Ex. 26.

<sup>269</sup> LCRA TSC Ex. 26.

<sup>270</sup> LCRA TSC Ex. 26.

- i. MK 33 (U.S. Hwy 277 and I-10 route variant)
  - base cost \$406.8 million;
  - 161.09 mile length;
  - 153 habitable structures within 500 feet;
  - 83% paralleling existing ROW;
  - avoids Eldorado and Sonora, passes through Junction and Kerrville, and avoids Fort McKavett;
  - routes underground along I-10 near Kimble County Airport;
  - crosses between high and low amount of potential Warbler habitat comparable to MK 15 routes (13.23 miles);
  - avoids Tierra Linda;
  - very high length of proposed ROW parallel to state, U.S. and interstate highways.<sup>271</sup>
- j. MK 61 (modified MK15 with I-10 segments used beginning in SW Gillespie County)
  - base cost \$287.3 million;
  - 133.31 mile length;
  - 118 habitable structures within 500 feet;
  - 46% paralleling existing ROW;
  - avoids towns and cities except Kerrville, and Fort McKavett;
  - routes around Kimble County Airport using segments north of airport;
  - crosses relatively high amount of potential Warbler habitat (17.08 miles);
  - avoids Tierra Linda; about half of length parallel to state, U.S. and interstate highways.<sup>272</sup>
- k. MK 62 (modified MK15 PUC Staff Recommended with I-10 segments beginning in SW Gillespie County)
  - base cost \$302.9 million;
  - 141.81 mile length;
  - 128 habitable structures within 500 feet;
  - 56% paralleling existing ROW;
  - avoids towns and cities except Kerrville, and Fort McKavett;
  - routes around Kimble County Airport using segments north of airport;
  - crosses relatively high amount of potential Warbler habitat (17.63 miles);
  - crosses one willing landowner;
  - avoids Tierra Linda; about half of length parallel to state, U.S. and interstate highways.<sup>273</sup>

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<sup>271</sup> LCRA TSC Ex. 26.

<sup>272</sup> LCRA TSC Ex. 26.

<sup>273</sup> LCRA TSC Ex. 26.

## 2. Routing Adjustments Evaluated by LCRA TSC

During and after the public involvement phase of the project, numerous parties contacted LCRA TSC with requests to modify particular route segments to moderate the impact of a proposed transmission line route on their property. LCRA TSC prepared Attachment 13 to the Application<sup>274</sup> and Corrected Supplemental Attachment 13.<sup>275</sup> Both documents evaluate the proposed modifications that *were not made* part of the routes contained within the Application.<sup>276</sup>

The route modifications found in Attachment 13 are all technically feasible from an engineering and environmental perspective and each affect noticed landowners only. However, LCRA TSC did not adopt these modifications due to issues including additional cost, the use of larger angle structures, and an increase in overall length.<sup>277</sup>

After the filing of the Application, LCRA TSC continued to work with potentially affected landowners. Corrected Supplemental Attachment 13 discusses numerous route modifications that landowners have proposed to mitigate or reduce the impact of the proposed transmission line on their property. Many of these modifications were either proposed in discovery responses or discussed at the Technical Conference held by LCRA TSC on September 1, 2010, or at the Settlement Conferences held by LCRA TSC on September 20, 21, and 22 in Eldorado, Junction, and Fredericksburg, respectively. Each of the proposed modifications, found in Corrected Supplemental Attachment 13, is technically feasible from an engineering and environmental perspective and affects only noticed property owners, but potentially in a different manner, and may add costs and length to the project.

One proposed modification requires separate attention. In the event the Commission

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<sup>274</sup> LCRA TSC Ex. 1, Attachment 13.

<sup>275</sup> LCRA TSC Ex. 1.C. *Corrected Supplemental Information for Attachment 13 to the CREZ CCN Application* (Oct. 25, 2010), Interchange Item No. 3007. See Appendix A and B to LCRA TSC's Initial Brief, summary tables of route modifications from Attachment 13 and Corrected Supplemental Attachment 13.

<sup>276</sup> Section 4 of the EA includes the route modifications that have been incorporated into the routes found in the Application.

<sup>277</sup> While most of these modifications added cost, a few would decrease the cost of the Project.

considers MK 22, 27, or 46, the Nances, who participated as members of the A3/O4 group, request that the Commission reject the proposed Bannwolf Modification, because it would substantially increase the impact of Link O4 on their property. The Nances argue that the Bannwolf Modification would reroute the line from their northern property boundary through the middle of their 65 acre tract. Mr. Bannwolf does not own property or a habitable structure within 500 feet of the centerline. Nevertheless, Mr. Bannwolf met with LCRA TSC on September 21, 2010, to develop this modification. The Nances were not invited to, nor did they attend this meeting.<sup>278</sup> The manner in which the Bannwolf Modification was created was not in keeping with LCRA TSC's typical efforts to develop landowner modifications. Had LCRA TSC been aware of the Nances' objection to the Bannwolf Modification, they would probably not have included it as a possibility for consideration in this docket.<sup>279</sup> For these reasons, the ALJs find that the Bannwolf Modification should be rejected.

#### **H. Preliminary Order Issue No. 9**

**Has LCRA TSC proposed modifications to the transmission improvements described in the CREZ Order? If so: (a) would such improvements reduce the cost of transmission or increase the amount of generating capacity that transmission improvements for the CREZ can accommodate; (b) would such modifications speed up the project's implementation timeline, achieve other technical efficiencies, or otherwise be cost-effective and consistent with the CREZ Transmission Plan; and (c) have all such modifications been submitted to the Electric Reliability Council of Texas (ERCOT), and has ERCOT made a recommendation to LCRA TSC to be filed in this proceeding?**

LCRA TSC has proposed one modification to the project as it is contained in the CREZ Order in Docket No. 37928. In the Application, LCRA TSC proposed using a different conductor than the one ERCOT assumed in the CTO Study. Based on LCRA TSC's transmission line rating methodology, a transmission line using bundled Merrimack conductor in the location of the Project does not result in the 5000 Amps capacity assumed by ERCOT in its CTO Study. Therefore, LCRA TSC proposes that the 345-kV double-circuit transmission line between the McCamey D and Kendall Stations will be constructed using bundled Cumberland conductor (2x1926.9 Aluminum

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<sup>278</sup> Tr. at 472-474.

<sup>279</sup> Tr. at 478-481.

Conductor Steel Supported/trapezoidal wire (ACSS/TW)) instead of the bundled Merrimack conductor (2x1433 ACSS/TW) that ERCOT assumed in its CTO Study.<sup>280</sup> Staff also concluded this modification was cost-effective and consistent with the CTO Study.<sup>281</sup> ERCOT reviewed the LCRA TSC conductor modification and recommended the use of the bundled Cumberland conductor that LCRA TSC proposes in the Application.<sup>282</sup>

## **I. Preliminary Order Issue No. 10**

**Are there discrepancies between the estimated total cost included in the Application in this docket and the cost identified for the proposed project in the CREZ Transmission Plan? If so, what are the reasons for the discrepancies?**

ERCOT estimated the “overnight” cost for the MK Project at \$257.56 million and 137 miles in length. LCRA TSC’s estimated cost for LCRA TSC’s preferred route MK13 is \$219.5 million, with estimated costs for all 60 evaluated routes ranging from \$199.9 million to \$328.8 million.<sup>283</sup> LCRA TSC’s estimates range, respectively, both below and above ERCOT’s CTO costs for the transmission lines included in this project.<sup>284</sup> ERCOT estimated the “overnight” costs for CREZ projects based on unit costs included in the CTO Study. The reasonable variation between LCRA TSC’s projected costs and the ERCOT “overnight” estimates is due to several factors. First, LCRA TSC’s estimates include costs not contemplated by ERCOT, such as costs for potential endangered species habitat mitigation, longer routes, complex terrain, constrained paths, and capitalized interest. Second, LCRA TSC’s estimated construction costs are higher due to project-specific considerations, such as difficulties associated with maneuvering equipment in rugged terrain and drilling foundations in harder geologic substrates typical in the Hill Country area, substantial length changes within the evaluated routes, and endangered species issues.<sup>285</sup>

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<sup>280</sup> LCRA TSC Ex. 6 at 17.

<sup>281</sup> Staff Ex. 1 at 12, 14, 20-21.

<sup>282</sup> LCRA TSC Ex. 6 at 19.

<sup>283</sup> LCRA TSC Ex. 7 at 22.

<sup>284</sup> LCRA TSC Ex. 14 (Ex. CDS-2REB, table of length and costs by proposed route, at 3).

<sup>285</sup> LCRA TSC Ex. 7 at 21, 22. LCRA TSC Exhibits CDS-3 and CDS-4 compare estimated CTO and LCRA TSC route cost and length comparisons for the Project.



Staff concluded that the estimated costs for LCRA TSC's MK routes range from \$251.8 million to \$406.18 million, while the CTO estimate is \$257.56 million.<sup>286</sup> Staff explained that the CTO Study assumed straight line lengths for the project which does not account for topography or related constraints in estimating the size and cost of various routes. The CTO estimated a cost of \$1.88 million per mile.<sup>287</sup> Staff also notes that on an "apples to apples" basis, the cost of Staff MK15 is \$31.32 million more than the CTO estimate.

**J. Supplemental Preliminary Order Issue No. 1**

**On or after September 1, 2009, did the Texas Parks and Wildlife Department provide any recommendations or informational comments regarding the Application pursuant to Section 12.0011(b) of the Texas Parks and Wildlife Code?**

**1. TPWD Participation**

TPWD provided recommendations or informational comments regarding the Application pursuant to Section 12.0011(b) of the Texas Parks and Wildlife Code. In particular, TPWD provided the following comments:

On January 21, 2009, TPWD provided preliminary information and recommendations regarding the entire CREZ Scenario 2 Project to the PUC.

On May 12, 2009, TPWD provided comments to PBS&J on the general study area for the proposed CREZ LCRA TSC Westwind/Kendall-Gillespie-Newton 345 kV transmission line project, which included portions of this Project (Docket No. 38354, Item 173, CCN Application, Attachment I, EA, vol. 111).

On June 2, 2009, TPWD provided comments to PBS&J on the general study area for the proposed CREZ LCRA TSC Twin Buttes-Kendall 345 kV transmission line project, which also included portions of this Project (Docket No. 38354, Item 173, CCN Application, Attachment I, EA, Vol. II1).

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<sup>286</sup> Staff Ex. 1 at 13; LCRA TSC Ex. 7 at 22 ; LCRA TSC Ex. 1 at Attachment 2.

<sup>287</sup> Staff Ex. 1 at 13, 20.

On January 27, 2010, the TPWD provided PBS&J with project-specific Geographic Information System (GIS)-based maps (shape files) of recorded occurrence locations of rare and protected species and other rare resources in the Project Area specific to the development of the EA.

On April 1, 2010, TPWD provided comments to PBS&J on the general study area for the Project (Docket No. 38354, Item 173, CCN Application, Attachment 1, EA, vol. 111).

After receiving the July 28, 2010 notice letter from LCRA TSC as a directly affected landowner of Old Tunnel WMA, TPWD intervened. On September 24, 2010, TPWD sent Staff a letter that included its comments and recommendations concerning the Project.<sup>288</sup> TPWD also filed testimony in this docket, was deposed by Staff regarding its specific routing proposals, responded to written discovery from Staff, participated at the hearing on the merits, and filed post-hearing briefing.<sup>289</sup>

## **2. TPWD's Recommendations on Routing**

The TPWD Letter recommended that the Commission reject all of LCRA TSC's proposed routes, "because insufficient information is available to clearly understand the potential impacts to wildlife, state managed areas and water resources stemming from construction of the proposed alternatives."<sup>290</sup> As discussed above in the environmental discussion, TPWD pointed out that due to the lack of access to private property, the lack of TXNDD records at a specific site on an alignment does not mean that the species does not occur there.<sup>291</sup>

Furthermore, TPWD asserts that construction of any of the proposed MK alternatives would require almost entirely new ROW and take significant amounts of existing wildlife habitat. Although the TPWD Letter states its opposition to all routes in the Application, to the extent the

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<sup>288</sup> Staff Ex. 1 at 13; Staff Ex. 2 at 15.

<sup>289</sup> Staff Ex. 1 at 13.

<sup>290</sup> Staff Ex. 1, Appendix C at bates 52.

<sup>291</sup> Staff Ex. 1, Appendix C at bates 55-56.

Commission approves a transmission line in this docket, TPWD supports routes MK32 and MK33 because they would have the least adverse impact on fish and wildlife resources.<sup>292</sup>

TPWD's routing arguments have been more thoroughly discussed above in sections regarding environmental issues. Neither Staff nor LCRA TSC agrees with TPWD's recommendations because, when the routes are analyzed using the entirety of the factors in PURA and the Commission's Rules and not focusing solely on the issue of the new fragmentation of wildlife habitat, their preferred routes are superior. Staff also notes that a number of engineering constraints on MK33 near Junction impose additional costs and may result in the delay of the Project's completion.

### **3. TPWD's Recommendations for Surveying the Project Area and Mitigation of Environmental Impact**

Through the communications described above, TPWD also provided comments and recommendations to LCRA TSC and Staff to avoid adverse impacts to migratory birds, rare and protected species, existing wildlife and habitat, unique native plant and animal communities, watercourses, wetlands, ecologically significant stream segments, mussel sanctuaries, and parks and recreation areas.<sup>293</sup> TPWD stated that a significant potential threat to wildlife habitat is the spread of invasive species along the transmission line corridor.<sup>294</sup> As a result, TPWD made recommendations to prevent the establishment and spread of invasive species during transmission line construction and revegetation.<sup>295</sup> In addition to TPWD's recommendations regarding route selection set out above, TPWD also recommends that a comprehensive mitigation plan be imposed for the life of the project to address impacts to natural resources.<sup>296</sup>

In response, LCRA TSC and Staff note that some of TPWD's recommendations can be

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<sup>292</sup> Staff Ex. 7 at 78; TPWD Ex. 5; TPWD Initial Brief.

<sup>293</sup> TPWD Ex. 4 at 9-10; Staff Ex. 1 at 54-55.

<sup>294</sup> TPWD Ex. 4 at 18.

<sup>295</sup> Staff Ex. 1 at 54-55.

<sup>296</sup> TPWD Ex. 4 at 41-42.

implemented, some are already followed by the Company, some should not be implemented, and some are inapplicable to this project.<sup>297</sup> Additionally, Staff and LCRA TSC argue that TPWD fails to consider in its analysis other factors that the Commission and the Company must consider and balance in considering the application, including the numerous routing criteria that involve direct impacts on people.<sup>298</sup>

Nevertheless, the Company specifically represents that it complies with all applicable laws and regulations, including the Migratory Bird Treaty Act and those related to the applicable regulations of the North American Electric Reliability Corporation (NERC), the USFWS, TCEQ, and the United States Army Corps of Engineers (USACE). LCRA TSC also stated that will follow the procedures described in the latest publications for protecting raptors from Avian Power Line Interaction Committee (APLIC).<sup>299</sup>

LCRA TSC and Staff argue that Staff's recommended Ordering Paragraphs are sufficient to address TPWD recommendations or requests.<sup>300</sup> LCRA TSC also argues that TPWD's recommendations or requests should not be implemented in this docket for the reasons discussed below.

LCRA TSC represents that the Company and PBS&J's development of preliminary segments and routes sought to avoid known occupied habitat locations of federally listed endangered or threatened species, based on the TXNDD records and Loomis Partners (Loomis) data for identifying potential Warbler habitat. As a result, the Company notes that the concept of "avoidance first" was used in the routing.<sup>301</sup>

LCRA TSC also argues that TPWD "polygon" information (based on TXNDD) alone does

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<sup>297</sup> LCRA TSC Ex. 14 at 39.

<sup>298</sup> Staff Ex. 7 at 26-27.

<sup>299</sup> LCRA TSC Ex. 14 at 39.

<sup>300</sup> LCRA TSC Ex. 14 at 41.

<sup>301</sup> LCRA TSC Ex. 7 at 14; LCRA TSC Ex. 14 at 39-41; LCRA TSC Ex. 20 at 45-48.

not appropriately indicate “avoidance areas” because it establishes very little until considered along with existing land uses, the specific TXNDD element of occurrence data, the requirements of the species and the nature of transmission line impacts (including mitigation). TPWD’s polygon data is useful only as an initial reference point and should not be relied upon for definitive choices between routes.<sup>302</sup>

Regarding on-ground surveys, LCRA TSC argues that they cannot be conducted throughout the Project areas, due to the lack of access to private property and the tremendous amount of time and resources required to review the study area. The Company argues that it is more appropriate to conduct a detailed assessment of potential habitat of threatened and endangered species after the Commission has selected a route, to continue consulting with the USFWS, and implement measures to comply with the Endangered Species Act as necessary.<sup>303</sup>

The ALJs agree that it would be very inefficient, time-consuming, and costly to conduct such surveys for Project-wide action areas, before the Commission’s approval of a route. As for TPWD’s suggestion that if endangered species habitat is present, “a survey for the presence of the species should be conducted . . .” LCRA TSC has committed to identify potential endangered species habitat along the route approved by the Commission in its dealings with USFWS and does not intend to conduct presence/absence surveys, which could delay the project. The ALJs agree with this approach.<sup>304</sup>

Because the Project is subject to NERC reliability requirements, including vegetation management, LCRA TSC is required to remove trees, brush, and undergrowth from the ROW that could potentially interfere with the safe and reliable operation of the line. Furthermore, although LCRA TSC typically does not remove low growing ground cover, it must trim trees that overhang the ROW, and it needs to remove vegetation that could potentially interfere with access to the lines. The Company points out that utilities that violate NERC requirements, fail to remove vegetation,

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<sup>302</sup> *Id.*

<sup>303</sup> *Id.*

<sup>304</sup> *Id.*

and consequently experience outages can be subject to substantial fines. The ALJs agree that LCRA TSC must comply with NERC requirements and reasonably maintain access to the line. Any TPWD recommendation to the contrary must be disregarded.<sup>305</sup>

Nevertheless, LCRA TSC commits to minimize the amount of flora and fauna disturbed during construction of the line, except to the extent necessary to establish appropriate ROW clearance. After construction of the line, LCRA TSC will determine if any reseedling of the ROW in herbaceous species or a cover of forage crop would be useful and practical to facilitate erosion control. LCRA TSC commits to consider landowner preferences in doing so.<sup>306</sup>

To the extent practical, LCRA TSC will also avoid or mitigate adverse environmental impacts to sensitive plant and animal species and their habitats as identified by TPWD and USFWS. LCRA TSC intends to address re-vegetation in its TCEQ-required SWPPP and re-vegetation will be performed to the extent reasonable, feasible, and practical, except where permanent structures (*e.g.*, berms, gabions, retaining structures, etc.) installed by the Company would be used to control erosion and sedimentation. As for wetland disturbance, LCRA TSC intends to coordinate with the USACE concerning any methods or measures to be employed. As a result, LCRA TSC argues that TPWD's, *Guidelines for Construction and Clearing Within Riparian Areas* recommending certain methods be employed in "General Mitigation Measures" and "General Stream Conservation Criteria" are unnecessary. While some of TPWD's recommended methods may already be instituted as acknowledged by the Company, the ALJs find that LCRA TSC's measures are adequate to avoid adverse environmental impacts beyond those necessitated by the installation of the line itself.<sup>307</sup>

Regarding risks to birds from construction harassment, habitat loss/fragmentation, and collisions/electrocutions, the Company will work with USFWS concerning these issues. LCRA TSC intends to place avian markers for flyways at river crossings, and LCRA TSC's phase spacing for this transmission line far exceeds the minimums in the guides recommended by TPWD (*e.g.*,

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<sup>305</sup> *Id.*

<sup>306</sup> *Id.*

<sup>307</sup> *Id.*

*Suggested Practices for Raptor Protection on Power Lines and Mitigating Bird Collisions with Power Lines*”).<sup>308</sup>

LCRA TSC states that it does not expect to employ significant channel modification, construct significant stream crossing structures, or conduct significant stream maintenance once an appropriate ROW for the line is established. The Company intends to avoid clearing trees and other vegetation along stream banks, except as necessary to establish an appropriate ROW for the line. LCRA TSC will re-vegetate where reasonable, feasible, and practical. As a result, the Company argues that TPWD’s *Guidelines for Construction and Clearing Within Riparian Areas* recommending certain methods be employed in “Channel Modification,” “Stream Crossing Structures,” and “Stream Maintenance” are unnecessary.<sup>309</sup>

LCRA TSC argues that it should not be required to develop and implement a compensatory mitigation plan for the life of the project in cooperation with TPWD. The Company notes that it is already working with the jurisdictional authority (USFWS) to determine a permitting mechanism for endangered species in this and other projects. TPWD’s jurisdictional authority does not extend to this project and no state law or regulation requires electric utilities to comply with TPWD’s request or recommendation. The Company argues that the strategies presented in the Application adequately avoid or minimize the impacts on regulated and unregulated native wildlife resources. The ALJs agree with Staff and LCRA TSC on these matters and recommend that their proposals be put in place rather than TPWD’s.<sup>310</sup>

Finally, in the Conclusion and Recommendation sections of their testimony, Mohammed Ally and Brian Almon recommended that the Commission include in its final order paragraphs to mitigate the impact of the Project, including mitigation procedures addressing the discovery of archeological artifacts, raptor protection, herbicide use, flora and fauna disturbance, erosion control, landowner impact, and bird diverters on river crossings. Mr. Ally and Mr. Almon testified that their

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<sup>308</sup> *Id.*

<sup>309</sup> *Id.*

<sup>310</sup> *Id.*

recommended mitigation paragraphs would address a number of TPWD's concern and other issues are addressed in Staff's routing recommendation.<sup>311</sup> The ALJs agree.

## VI. CONCLUSION

While the ALJs would prefer that Routes MK32 or 33 be approved by the Commission for the same reasons TPWD, Weinzierl, and CVA present, the ALJs acknowledge that Staff MK15 represents a more balanced weighing of the Commission's routing criteria and recommend it for Commission approval. As for TPWD's survey and mitigation recommendations, while TPWD raises valid concerns and recommends solutions to those concerns, due to limited resources, time-constraints, practicality, and past practice in other CREZ cases, the ALJ recommend that Staff and LCRA TSC's approaches to these issues be adopted, instead of those proposed by TPWD.

## VII. FINDINGS OF FACT

### *Procedural History, Notice, Jurisdiction, and Project Background*

1. LCRA Transmission Services Corporation (LCRA TSC) is a non-profit corporation providing service under Certificate of Convenience and Necessity (CCN) No. 30110.
2. On July 28, 2010, LCRA TSC filed an application with the Public Utility Commission of Texas (Commission) to amend its CCN to include the McCamey D to Kendall to Gillespie Competitive Renewable Energy Zone (CREZ) 345-kV transmission line project (Application). The two lines that comprised this project, McCamey D to Kendall, and Kendall to Gillespie, were identified by ERCOT in its CREZ Transmission Optimization Study (CTO Study), and originally assigned to LCRA TSC to construct as a "Priority Project" in *Commission Staff's Petition for the Selection of Entities Responsible for Transmission Improvements Necessary to Deliver Renewable Energy from Competitive Renewable Energy Zones*, Docket No. 35665, Order on Rehearing (May 15, 2009).
3. On December 1, 2010, the Commission determined that the Kendall to Gillespie portion of the transmission line would be replaced with a cost-effective alternative that does not require the construction of a transmission line between the Kendall and Gillespie substations at this time.

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<sup>311</sup> Staff Ex. 1 at 13-16; Staff Ex. 2 at 15-17.



4. LCRA TSC's double-circuit McCamey D to Kendall preferred route and each of the other 59 proposed alternative McCamey D to Kendall routes extend from LCRA TSC's approved McCamey D Station (to be renamed Big Hill Station), located in northern Schleicher County, to the existing Kendall Station in western Kendall County. The alternative McCamey D to Kendall routes proceed generally in a northwesterly to southeasterly direction, in multiple varied corridors. This line may be located in portions of Schleicher, Menard, Mason, Sutton, Kimble, Kerr, Gillespie, and Kendall counties, depending on the route selected.
5. LCRA TSC filed 60 alternate routes. The links in the Application can be combined to form over 20,000 different forward progressing routes.
6. Typical structure heights are expected to be approximately 105-185 feet above the ground surface, depending on the type of structures used.
7. LCRA TSC will install two 345-kV circuits on the transmission line.
8. LCRA TSC will build and own the new McCamey D (Big Hill) Station for the project, which Station will accommodate both the project proposed in this docket and another of its CREZ priority projects (Twin Buttes to McCamey D 345-kV line), as well as another CREZ project of South Texas Electric Cooperative, Inc. (McCamey C to McCamey D 345-kV line) and future wind generation interconnect facilities to be constructed and owned by Electric Transmission Texas at the collection stations associated with the McCamey D Station.
9. LCRA TSC owns the existing Kendall Station, at which additional equipment will be installed to accommodate the termination of the new 345-kV transmission lines for this project.
10. Written direct notice of the Application was mailed on July 28, 2010, to each owner of land whose property would be directly affected by the proposed transmission line.
11. Written direct notice was mailed to several directly-affected landowners whose names had not appeared on LCRA TSC's original list.
12. On July 28, 2010, LCRA TSC also mailed written direct notice of the Application to additional area landowners who might be affected by various potential routing configurations described in the Application and LCRA TSC's direct testimony.
13. Written notice was mailed on July 28, 2010 to the municipalities of Boerne, Comfort, Eldorado, Sonora, Menard, Junction, Mason, Harper, Fredericksburg, Ingram, and Kerrville, and to county officials of Schleicher, Sutton, Menard, Kimble, Mason, Gillespie, Kerr, and Kendall counties.
14. Written notice was mailed on July 28, 2010, to nine neighboring utilities providing electric utility service, specifically Bandera Electric Cooperative (BEC), Central Texas Electric Cooperative (CTEC), Pedernales Electric Cooperative (PEC), Southwest Texas Electric Cooperative, Inc. (SwTEC), American Electric Power (AEP) Texas North Company, Cap

Rock Energy Corporation, City of Fredericksburg, Kerrville Public Utility Board (KPUB), and City of Mason.

15. Notice of the Application was published in the following newspapers: *San Angelo Standard Times, Eldorado Success, Junction Eagle, Mason County News, Boerne Star and Record, Fredericksburg Standard, Comfort News, San Antonio Express-News, Austin American-Statesman, Devil's River News, Kerrville Daily Times, Menard News & Messenger, West Kerr Current and Harper News.*

***Material Deficiencies***

16. No material deficiencies exist in the Application.

***CREZ Priority Transmission Plan***

17. The Application is for a CREZ priority project.
18. The project will accomplish the intended results for the CREZ priority project between the McCamey D and Kendall stations.
19. In addition, the project will also provide increased transmission support to meet growing needs in Central Texas and the Hill Country.

*Route*

*Community Values*

20. To address and consider community values, LCRA TSC conducted 20 public meetings on May 4, 2009, May 5, 2009, May 7, 2009, May 11, 2009, May 12, 2009, and May 14, 2009. In addition, LCRA TSC conducted public meetings on February 15 and February 16, 17, 18, 22, 23, and 24, 2010.
21. LCRA TSC considered expressions of community values in a review of the questionnaires, letters, meetings, phone calls, and other public input it has received. LCRA TSC received additional information about community values at the Technical Conference held on September 1, 2010, and at the Settlement Conferences it held on September 20, 21, and 22, 2010.
22. Based on input from the open houses and throughout the proceeding, strong community values included: avoiding the Texas Hill Country; reducing the effect of the line on habitable structures, particularly in developed areas; reducing the effect on rural residential subdivisions, and building the line with monopoles.
23. The community values of avoiding habitable structures in developed areas and avoiding the Hill Country are competing values.
24. Staff MK15 parallels roadways for much of its distance, thereby avoiding much of the Hill Country.
25. Where Staff MK15 parallels I-10, it does not cut a new path through the heart of the Hill Country. I-10 has already cut through the area and Staff MK15 will not cut an entirely new corridor through the area.
26. Staff MK15 parallels other right-of-way (ROW) for over 54% of its length.
27. Staff MK15 deviates around the cities of Junction and Kerrville.
28. Kerrville and the Kerrville Public Utility Board have spend over \$1 million in infrastructure for development along I-10 in the vicinity of Links Y16, Y17b, Y18, Y19b, and Y20, which are included in Routes MK32, 33, 61, and 62.
29. Tierra Linda Ranch, a rural subdivision crossed by Staff MK15 has an existing pipeline easement, which Staff MK15 will parallel.
30. Staff MK15 provides the best balance between the community values of avoiding the Hill Country, and avoiding habitable structures and cities.
31. Monopoles should be used through Tierra Linda Ranch.

***Recreational and Park Areas***

32. Avoiding parks and recreational areas was a consideration in designing the routes proposed in the Application. PBS&J reviewed U.S. Geological Survey topographic maps, Texas Department of Transportation (TxDOT) county highway maps and federal, state, and local maps, the Texas Parks and Wildlife Department's (TPWD) "Texas Outdoor Recreation Inventory," the Texas Outdoor Recreation Plan, recent aerial photography, and conducted a limited field reconnaissance.
33. MK13 and Staff MK15 each have one park or recreation areas located within 1,000 feet of the centerline. MK32 and MK33 run within 1,000 feet of six and seven parks/recreation areas, respectively.
34. TPWD is the owner and operator of the 16.1 acre Old Tunnel Wildlife Management Area (Old Tunnel WMA), located in Kendall County. The Old Tunnel WMA is comprised of an abandoned railroad tunnel and includes a bat colony of up to three million Brazilian free-tailed bats, three thousand cave myotis. The Old Tunnel WMA includes nature trails for hiking and bird watching, educational programs, bat watching, and guided nature tours. TPWD estimates that 21,324 visitors visited the Old Tunnel to watch bats emerge from the tunnel. TPWD estimates the annual economic benefit to the region of at least \$748,000.
35. The line should avoid the Old Tunnel bat colony.
36. The Texas Historical Commission (THC) owns and operates the Fort McKavett State Historic Site in Menard County, Texas (Fort McKavett), one of the best preserved and most intact examples of a fort from the Texas Indian Wars. The Fort is a State Historic Site, as well as a National Historic District listed on the National Register of Historic Places. Fort McKavett is part of TPWD's Great Texas Wildlife Trails, as well as the THC's Texas Forts Trail. The Fort McKavett State Historical Site is also designated a riparian conservation area.
37. For defensive reasons, the Fort was built between 75 and 100 feet above the surrounding terrain. Transmission towers of up to 180 feet in height may be easily visible from the grounds of the Fort. The towers would range from 1.18 miles (Link b16b), 1.26 miles (Links Z1 and Z2), and 1.55 miles (Link b17b) from the Fort. The Fort remains isolated from modern development, with pristine views in all directions; the view from the Fort is much as it was in the mid-nineteenth century. The Fort hosts living history events, star parties, Boy Scout functions, and visitor tours throughout the year. Transmission towers of up to 180 feet in height would directly and negatively impact those view sheds from the Fort, and would likewise negatively impact the Fort's historic character, its isolation, and the overall appeal of the Site.
38. Camp Sol Mayer is a 300-acre Boy Scout camp with 18 permanent buildings. Link b17b would cross the southwest corner of the camp, passing near several camping areas and near

where the camp's horses are maintained. ROW clearing for the transmission line on the southwest portion of the camp would eliminate many trees that are along the western boundary line and the San Saba River. The camp would also be impacted by Links Z1 and Z2, which are both in close proximity to the camp.

### *Aesthetic and Historical Values*

#### **Aesthetics**

39. "Aesthetics" refers to the subjective perception of natural beauty in the landscape and attempts to define and measure an area's scenic qualities. Aesthetic values considered from a public standpoint in the Environmental Assessment and Alternative Route Analysis (EA), include topographical variation, prominence of water in the landscape, vegetation variety, diversity of scenic elements, degree of human development or alteration, and overall uniqueness of the scenic environment compared to the larger region.
40. The Project area reflects overall a medium to high level of aesthetic value for the region. The eastern portion of the study area, located in the Hill Country, is within an area of the state noted for its scenic beauty and characterized by impressive topographical relief, vegetation and wildflowers, abundant wildlife, and plateaus. The presence of various large creeks and rivers present some views of high aesthetic value. There are also a number of designated routes or trails, and scenic overlooks and rest areas, within the study area that emphasize the Hill Country's natural beauty and other unique attractions.
41. The level of human impact to the study area is relatively high, due to the extensive agricultural and oil and gas operations, the development of numerous cities, and the development of rural subdivisions.
42. All of the 60 primary alternative routes for the MK Project have some amount of ROW within the foreground visual zone of U.S. and state highways, in part a direct result of the deliberate inclusion of alternative routes paralleling U.S. and state highways.
43. A large number of parks and recreation areas are located within the study area. Only a small portion of the routes' ROW would be located within the foreground visual zone of parks and recreation areas.
44. The alternative routes that follow all or portions of I-10 will be much more visible to more people than any of the alternative routes away from I-10.
45. Construction of the Project will likely have both temporary and permanent negative aesthetic impacts, including views of ongoing construction, the cleared ROW, and the transmission facilities.
46. Wherever monopole structures are approved, LCRA TSC will have the flexibility in design to deploy both steel and spun concrete poles where appropriate for each to produce a cost-effective result.

47. Both lattice towers and monopoles will fit within a 100-foot ROW, which is as narrow as the ROW for a double-circuit 345-kV transmission line can be made.
48. MK13 has a length of 8.46 miles visible from US and State highways. Staff MK15 has a visibility for a length of 49.11 miles from US and State highways. MK33 has a length of 157.87 miles along US and State highways.
49. MK33 has the highest visibility from parks/recreation areas with a length of 10 miles visible from state parks and recreational areas. MK13 is visible for a length of 4.24 miles from state parks and recreation areas. Staff MK15 is visible for a length of 4.43 miles from parks/recreation areas.
50. The aesthetic impact of the line is largely a function of who is viewing it from where.
51. The central Project area contains large tracts of relatively unfragmented and undeveloped land. The natural beauty of this part of the Project area includes scenic vistas, meadows, and oak-lined creeks and rivers.
52. I-10 is a means of transportation across the state, where aesthetically pleasing views are incidental. Travelers and anyone in the proximity of I-10 in the Project area will see commercial development including gas stations, convenience stores, chain and fast-food restaurants, strip malls, traffic – including heavy tractor-trailers, car lots, power lines, roadways – including feeder roads, and all of the development associated with small towns, larger municipalities, and cities like San Antonio. It is far more likely that a 345-kV line will be lost in the visual foreground along I-10 than if it were run along a central or northern route through what is undoubtedly the aesthetically pleasing and relatively undeveloped Texas Hill Country.

### **Archeological and Cultural Resources**

53. Much of the study area has a high probability of containing previously unrecorded cultural resource sites. PBS&J's cultural resources evaluation was based on known data regarding sites in the area, the density of the sites, and the National Register of Historic Places (NRHP) and State Archaeological Landmark (SAL) potential for the sites.
54. Of the 60 primary alternative routes evaluated for the Project, 54 cross one or more recorded historic or prehistoric sites, with four routes crossing at least 15 or more sites. All 60 routes have additional recorded historic or prehistoric sites within 1,000 feet of the ROW centerline, with numbers ranging between 6 and 46 sites. Of the primary alternative routes, 22 cross one NRHP-listed or determined eligible site, and the other 38 cross no such sites. Exactly half of the primary alternative routes have ROW centerline within 1,000 feet of one or more additional NRHP-listed or determined eligible sites, ranging from one to six sites, and the other 30 have none. The number of recorded historical/archaeological sites within 1,000 feet of the centerline of the routes varies from 8 to 70 sites.

55. There are 23 known or recorded historical or archeological sites either crossed (two sites) or located within 1,000 feet of the MK13 ROW centerline (21 sites). On Staff MK15, there are 47 sites.
56. Mitigation and construction practices are available to reduce or eliminate impacts to cultural resources sites. LCRA TSC planned appropriately for addressing any sites encountered during construction.
57. None of the route segments proposed in this case cross Fort McKavett.
58. MK13 does not avoid historical areas in the southeastern portion of the study area.
59. MK15 crosses 7.5 fewer miles of ROW across areas of high archeological/historical site potential than MK13. MK15 also has three fewer National Register-listed or determined-eligible sites within 1,000 ft of the centerline of the ROW than MK13.
60. Routes parallel to I-10 include commercial and residential development normally associated with proximity to an interstate highway system. Historical and cultural sites in these areas are more likely to have been disturbed than those in the central and northern Project areas.

### ***Environmental Integrity***

#### **General, Surveys, and Mitigation**

61. LCRA TSC's consultant PBS&J, examined a wide range of environmental information in its EA, which was researched and analyzed through a variety of methods and by representatives of various environmental disciplines.
62. LCRA TSC represents that all routes presented in the Application (and all segments that form those routes) provide environmentally acceptable alternatives.
63. LCRA TSC's preferred route (MK13) was ranked first from an ecological standpoint in the EA.
64. LCRA TSC avoided specific known occupied habitat locations in the process of delineating preliminary route links and alternative routes.
65. The Company has undertaken a permitting process under Section 10 of the Endangered Species Act with the U.S. Fish and Wildlife Service (USFWS) to consider impacts to federally listed species and their habitat.
66. Animal species potentially occurring along the proposed transmission routes include, but are not limited to, the federally listed (endangered) Black-Capped Vireo (Vireo) and Golden-

Cheeked Warbler (Warbler), and the state-listed (threatened) Zone-Tailed Hawk, Bald Eagle, Texas Tortoise, and Texas Horned Lizard.

67. The EA lists all threatened or endangered species of potential occurrence in the study area based on information from USFWS, TPWD, and TPWD's Natural Diversity Database (TXNDD).
68. Once a route is selected, LCRA TSC will account for the location of endangered/threatened species on individual landowners' property or additional known occupied habitat by routing adjustments, construction procedures and techniques, and mitigation. The Company shall consult with the USFWS for known occupied or potential habitat for endangered species.
69. LCRA TSC will use a Habitat Conservation Plan (HCP) development and Endangered Species Act Section 10(a) permitting process that is ongoing with the USFWS.
70. Prior to construction, an assessment will be made to verify whether any habitat for endangered or threatened species is present along the route that is approved. LCRA TSC will seek a permit from USFWS to take endangered species habitat.
71. Different techniques are available to accommodate all federally-listed endangered species identified in the study area. If a route passes through an area containing plant species composition and configuration favorable to a protected species, or if known individuals of the species are in the area, LCRA TSC will adjust the route in minor ways to avoid higher quality "blocks" of habitat; transmission towers will be placed in existing "openings" to limit further clearing for ROW access; and/or permits will be sought for appropriate clearing permissions along with possible mitigation.
72. LCRA TSC will undertake mitigation projects to protect the habitats of Warbler, Vireo and other species.

### **Fragmentation and Oak Wilt**

73. Wildlife habitat throughout the study area is fragmented by land use impacts such as roads, brush clearing associated with ranching and agricultural activities, pipelines, electric distribution lines, and other activities normally engaged in by landowners in the Study Area.
74. The Project will not jeopardize the continued existence of Warbler or Vireo.
75. Staff concluded that any route selected in this case will affect the environmental integrity of the study area.
76. Due to lack of access to private property, the absence of TXNDD records at a specific site within the Project area does not mean that the species does not occur there. Most TXNDD records are gathered from publicly accessible lands, such as parks and wildlife management areas and highway ROW. Most of the impacted Project area consists of privately owned



ranch land. Endangered species and their habitat on private lands may not be reflected in TXNDD records due to the lack of access and state laws governing the collection and dissemination of biological information from private lands.

77. Major highway ROW comprises the largest corridors of habitat fragmentation in the Project area, particularly the I-10 corridor. Avoiding additional fragmentation of wildlife habitat is one of the most important environmental considerations for the Project. Land fragmentation, and its consequence, is one of the greatest statewide challenges to wildlife management and conservation in Texas.
78. The portion of the Project area north of I-10 contains some of the largest blocks of unfragmented wildlife habitat on the Edwards Plateau.
79. The I-10 corridor is fragmented to a much greater extent than the central routes or northern routes.
80. MK13 and all of the links contributing to the central routes cut through the middle section of lands managed by the Doss-Harper Wildlife Management Association. Landowners who are members of the Doss-Harper Wildlife Management Association manage their wildlife resources in a cooperative that helps them overcome some of the inefficiencies common to land fragmentation. MK13 would run through the center of the Doss-Harper WMA for approximately 12 miles.
81. Additional fragmentation of wildlife habitat is expected to spread Oak Wilt disease. Oak Wilt is caused by a fungus that clogs water-conducting vessels in infected oak trees, causing them to wilt and die. Oak Wilt can be spread through the roots of oak trees. Oak Wilt can also be spread much greater distances by sap-feeding beetles that carry spores from infected trees and deposit them on “wounds” in uninfected trees. Once a new tree is infected, the disease will spread through root contact to other nearby trees at a rate of approximately 75 feet per year.
82. The central portion of the Hill Country is currently impacted by very little Oak Wilt. Oak trees in the Project are susceptible to Oak Wilt as a result of cutting and pruning necessary to clear and maintain the ROW. It is estimated that approximately 700 to 1,600 live oaks per mile will be removed and another 200-500 live oaks per mile will need to be pruned.
83. The selection of MK13 or a central or northern route is expected to spread Oak Wilt more than a route that uses the I-10 corridor such as MK32, MK33, or Staff MK15.

#### **Warbler and Vireo**

84. Potential habitat for Vireo and Warbler is likely to be encountered along most of the routes. Data provided by Loomis Partners, Inc. documents that all of the routes cross potential Warbler habitat. There are known occurrences of the Vireo and Warbler along or near segments proposed as part of route alternatives for the Project.

85. Without ground inspection of particular ecological areas, it is difficult to impossible to determine the presence of suitable habitat for Vireo. Vireo habitat consists of patchy shrubs interspersed with open areas and cannot be identified by aerial photography.
86. Inhabited Vireo habitat occurs throughout the area and along most, if not all, routes. It is unlikely that potential habitat and actual Vireo can be avoided as part of the certification process.
87. Based on the Commission's past practices and the work of utilities with USFWS, accommodations for Vireo can be made through structure placement, ROW clearance and other forms of mitigation.
88. Due to species composition and configuration, it is possible to identify and map potential Warbler habitat with some accuracy through certain types of aerial photography. Attempts can then be made to minimize/avoid potential habitat.
89. Warbler populations are not inconsistent with either existing or newly-constructed transmission line ROW.
90. Transmission line projects in Texas have been successfully constructed through known occupied habitat for Warbler and Vireo.
91. The Project will have some acceptable impact on the Vireo and Warbler. LCRA TSC can institute avoidance and mitigation efforts to minimize any impact on these species.

### **Creeks, Streams and Rivers**

92. Length parallel to streams and rivers is a highly significant environmental factor. MK13 has 1.34 miles parallel to rivers and streams. MK32 and MK33 parallel 1.93 and 1.82 miles, respectively. Staff MK15 parallels to streams and rivers for 2.46 miles. The P-Line routes range between 3.49 and 3.73 miles.
93. Staff MK15 and MK32 have two river crossings. MK13 and MK33 have four river crossings. MK22, MK23, and MK24 have five river crossings each.
94. MK13 and MK33 have 144 and 143 stream crossings, respectively. MK32 has 154 stream crossings. Staff MK15 has 160 stream crossings. MK22, MK23, and MK24 cross between 186 and 190 streams each.
95. Creek and river crossings can be spanned by the line in a manner that is technically feasible and minimally disruptive of natural resources in the surrounding area. For construction near rivers and creeks, LCRA TSC will implement appropriate erosion control measures as described in sections 1.5, 5.1.2, 5.1.3, and 5.1.4 of the EA. LCRA TSC will also develop and implement a Storm Water Pollution Prevention Plan (SWPPP) to prevent silting of

bodies of water, including creeks, rivers, and springs. The SWPPP will be in effect during all phases of construction and until re-growth is achieved.

96. TPWD strongly recommends that the Project avoid any adverse impacts to Ecologically Significant Stream Segments (ESSS).
97. All of the route options would cross at least one ESSS and many of the routes will cross more than one ESSS, some at more sensitive locations than others.
98. LCRA TSC expects no adverse impact to ESSSs in light of the Company's proposals for spanning creeks and other measures that are intended to be minimally disruptive of natural resources in the surrounding area.
99. All routes using Links b21c or z4, b33 or z5, b34, or b35a, will cross the James River ESSS, and the majority of central routes use one of these links. All routes that use Links b44, b50b, b52, or O3 would cross the Pedernales River ESSS (most of the routes use one of these links). MK13 crosses both the James River on Link b33 and the Pedernales River on Link b50b.
100. Staff MK15, MK32, and MK33 do not cross the James or Pedernales Rivers. These routes travel contain a single ESSS crossing—the Fessenden Branch crossing on Link b29d, which is at a previously disturbed location, because the stream is already crossed by I-10.
101. Potential impacts to mussel species are expected to be minimal. LCRA TSC's construction techniques are adequate to deal with potential impacts to mussel species.
102. Although LCRA TSC can safely span creeks and streams, due to potential risks to mussel sanctuaries, karstic formations, and ESSS, the P-Lines, MK13, and central routes are less attractive from an environmental perspective than routes that parallel I-10.

### **Old Tunnel WMA and Bat Issues**

103. The Eckert James River Bat Cave Preserve is located on MK13, with one of the largest known concentrations of breeding Mexican free-tailed bats located near Links b34 and b36.
104. The Old Tunnel WMA also has a bat colony located near Links A3 and O4. Based on observed flight patterns, the bats at Old Tunnel WMA are expected to fly into the area of the line.
105. For Link A3 and O4 structure designs, all conductor-to-conductor and conductor-to-tower clearances are well above the recommended clearance of 60 inches, minimizing the risk of electrocution to bats.
106. Although there is no evidence regarding bat collisions with the existing 138-kV line near Old Tunnel WMA, there is some scientific evidence that suggests that power lines pose some risk

to birds and bats due to subsonic, ultrasonic and ambient noise, and electromagnetic radiation.

***Goal for Renewable Energy***

107. The Project is necessary to deliver renewable energy generated in the CREZ.

***Engineering Constraints***

108. Staff MK15 will be constructed in new areas and parallel to existing ROW. New easements will vary from an estimated minimum easement width of 100 feet to an estimated maximum easement width of 160 feet, and these widths are sufficient for all LCRA TSC structure types.
109. LCRA TSC will design and construct the proposed transmission line to meet nationally recognized guidelines and specifications, including the applicable version of the National Electrical Safety Code (NESC), as well as established regional electric system planning criteria to address various categories of contingency conditions and applicable PUC rules, in order to operate the proposed transmission line in a safe and reliable manner.
110. The Kimble County Airport presents a significant engineering constraint when routing to the south.
111. Links b19b and b19c, north of the airport will be built below the crest of an existing hill and will not create a new aerial obstruction.
112. LCRA TSC can modify the design of Links b19b and b19c if the Federal Aviation Administration requires modifications.
113. Link Y11, south of the airport is part of MK33. It would be located approximately 1,200 to 1,800 feet from the south end of the airport's runway.
114. Link Y11 would run through a flood plain north of the Llano River.
115. Link Y11 cannot be moved further south because it would encroach on the City of Junction.
116. LCRA TSC cannot build a safe and reliable transmission line along Link Y11 using above-ground construction.
117. Because of the engineering constraints, Link Y11 would have to be built underground at the cost of \$54 million for one-half mile, and is prohibitively expensive.
118. Staff MK15 deviates to the north of the Kimble County Airport using Links b19b and b19c and does not require underground construction.

***Costs, Compatible ROW, and Prudent Avoidance***

119. LCRA TSC's estimated transmission line costs for all routes range from \$251.8 million to \$406.8 million.
120. LCRA TSC's preferred route would cost approximately \$266.4 million. MK33 would cost approximately \$406.8 million. Staff MK15 is estimated to cost \$302.3 million.
121. The lower cost of MK13 does not outweigh the benefits associated with paralleling more ROW.
122. Staff MK15 parallels compatible ROW for more than 54% of its length and avoids much ranch land located in the central part of the study area.
123. Staff MK15 uses Links b84 and b86 along which one landowner has consented to the line.
124. Staff MK15 affects 55 habitable structures.
125. Staff MK15 complies with the Commission's policy on prudent avoidance.
126. LCRA TSC's proposed alternative routes reflect reasonable investments of money and effort in order to limit exposure to electric and magnetic fields (EMF).
127. The project design incorporates, where technically feasible, optimal phasing arrangements and ground clearance heights that result in lower EMF levels, which is consistent with prudent avoidance from an engineering perspective.
128. The EMF levels from this project are within the range of the fields that people can experience every day in normal living and working environments and are substantially below the EMF exposure limits adopted by recognized international organizations.
129. Based on the current scientific research, there is no reliable scientific basis to conclude that exposure to power frequency EMF from the line will cause or contribute to adverse health effects in people or animals.

***Alternative Routes with Less Impact***

130. Staff identified a number of minor route adjustments that can be made at a reasonable cost and those adjustments are adopted along Staff MK15.
131. LCRA TSC identified landowner-proposed route modifications.
132. LCRA TSC made some modifications before filing the Application.
133. As part of LCRA TSC's analysis of landowner-proposed segment modifications not incorporated into LCRA TSC's proposed routes, whether proposed by the landowner before or after the CCN Application filing, LCRA TSC has provided estimates of the modified

route length and cost associated with each of these modifications. This information facilitates the Commission's consideration of these landowner proposals.

134. These landowner-requested routing adjustments mapped and reviewed in LCRA TSC's Attachment 13 (as supplemented) are generally longer and generally require more angle structures than LCRA TSC's filed routes in those respective locations. These requested adjustments are generally in the same land use/habitat types as the filed routes in those locations and they are feasible adjustments from an environmental standpoint if the Commission chooses to approve any or all of them.
135. These routing adjustments affect only noticed landowners in a potentially different manner than shown in LCRA TSC's proposed routes and may add length and cost.
136. No landowner has offered financial contribution relating to alternative routes or route modifications.
137. The Bannwolf Modification would reroute Link O4 from a northern property boundary through the middle of the property belong to Mr. and Mrs. Nance.
138. The Bannwolf Modification is not adopted.
139. It is reasonable for LCRA TSC to use monopoles through the Tierra Linda Ranch subdivision along Link b56.

***Proposed Modifications to CREZ Order***

140. LCRA TSC proposes to use bundled Cumberland conductor (2x1926.9 Aluminum Conductor Steel Supported/trapezoidal wire (ACSS/TW)) instead of the bundled Merrimack conductor (2x1433 ACSS/TW) that ERCOT assumed in its CTO Study.
141. Staff and ERCOT recommend the use of the bundled Cumberland conductor.
142. LCRA TSC's proposed modification to use the bundled Cumberland conductor is approved.

***Cost Discrepancies***

143. ERCOT estimated the overnight cost for the Project at \$257.56 million and 137 miles in length.
144. LCRA TSC's estimated cost for Staff MK15 is \$302.3 million.
145. LCRA TSC's estimates include costs not contemplated by ERCOT, including endangered species habitat mitigation, longer routes, complex terrain, constrained paths, and capitalized interest.

- 146. LCRA TSC's estimated construction costs are higher due to maneuvering equipment in rugged terrain and drilling foundations in harder geologic substrates typical in the Hill Country area.
- 147. LCRA TSC's estimated costs are reasonable even though they vary from ERCOT's estimate.

***TPWD Comments and Recommendations***

- 148. TPWD provided comments and recommendations regarding the Project in a letter dated September 24, 2010 (TPWD Letter) and through the testimony of four TPWD witnesses.
- 149. The TPWD letter and evidence addressed issues related to ecology and the environment. TPWD did not consider other factors that the Commission and utilities must consider and balance in CCN applications, including the numerous routing criteria that involve direct effects on people.
- 150. TPWD concluded that construction of any of the proposed routes would require almost entirely new ROW and take significant amounts of existing wildlife habitat.
- 151. TPWD concluded that routes MK32 and MK33 would have the least adverse impact on fish and wildlife resources.
- 152. TPWD owns and operates the 16.1 acre Old Tunnel WMA in Kendall County, Texas, located within 500 feet of Links A3 and O4, the latter of which is part of proposed route MK 22. TPWD opposes all routes that use Links A3 or O4 because of the expected negative impact to the public benefits of Old Tunnel WMA, and the Old Tunnel bat colony.
- 153. Once the Commission approves a route, LCRA TSC can access private property and perform a survey of the area, and if permits are necessary, apply for and comply with all permit conditions.
- 154. LCRA TSC does not have access to private property prior to the selection of a route.
- 155. No requirement exists for a particular methodology for assessment of endangered species for the examination by the Commission of the "environmental integrity" factor. The Commission's acceptance of the "known habitat" analysis is not prohibited by any regulatory requirements.
- 156. LCRA TSC must comply with all applicable environmental laws and regulations governing erosion control, endangered species, storm water prevention, and all other environmental concerns.
- 157. The recommended Ordering Paragraphs are sufficient to address TPWD's recommendations or requests.

## VIII. CONCLUSIONS OF LAW

1. LCRA TSC is an electric utility as defined in Public Utility Regulatory Act (PURA) §§11.004 and 31.002(6).
2. The Commission has jurisdiction over this matter pursuant to PURA §§14.001, 32.001, 37.051, 37.053, 37.054, 37.056, and 39.203(e).
3. LCRA TSC filed its CREZ CCN Application in this docket on July 28, 2010, in conformance with the Commission's standard CREZ CCN Application form and the Commission's Orders in P.U.C. Docket Nos. 33672 and 35665. LCRA TSC's Application has met the filing requirements set forth in P.U.C. SUBST. R. § 25.216(g)(2) and (3).
4. LCRA TSC provided proper notice of the Application in compliance with PURA §37.054 and P.U.C. PROC. R. 22.52(a).
5. LCRA TSC's Application is sufficient under P.U.C. SUBST. R. 25.216(g)(2) and (3).
6. LCRA TSC's notice of its Application was adequate.
7. SOAH exercised jurisdiction over this docket pursuant to PURA §14.053 and TEX. GOV'T CODE ANN. §2003.049.
8. This docket was processed in accordance with the requirements of PURA and the Administrative Procedure Act, TEX. GOV'T CODE ANN. Chapter 2001.
9. LCRA TSC is entitled to approval of the Application, as described in the findings of fact, using Staff's MK15, taking into consideration the factors set out in PURA §37.056 and P.U.C. SUBST. R. 25.101.
10. Staff MK15 complies with all aspects of PURA §37.056 and P.U.C. SUBST. R. 25.101, including the Commission's policy of prudent avoidance.
11. The Project, as a CREZ transmission project identified in Docket No. 35665, is exempt under PURA §§39.203(e) and 39.904(h) and P.U.C. SUBST. R. 25.174(d)(2) from the requirement of proving that the construction ordered is necessary for the service, accommodation, convenience, or safety of the public and need not address the adequacy of existing service, the need for additional service, the effect of granting the certificate on the recipient of the certificate and any electric utility serving the proximate area, and the probable improvement of service or lowering of cost to consumers in the area if the certificate is granted.
12. The Proposed Project is consistent with the Commission's goals for the CREZ program and P.U.C. SUBST. R. 25.174 in that it provides (1) long-term cost effective solutions consistent



with the Final Order in Docket No. 35665, and (2) transmission facilities consistent with ERCOT's recommendations to be constructed as soon as possible to relieve existing and growing constraints in delivering wind generation and placed in service.

13. The Project is consistent with and in furtherance of the goals and mandates of PURA § 39.904.
14. Pursuant to P.U.C. SUBST. R. 25.174(d)(10), the level of financial commitment by generators is sufficient under PURA §39.904(g)(3) to grant LCRA TSC's Application for a CCN in this docket.

### IX. ORDERING PARAGRAPHS

In accordance with these findings of fact and conclusions of law, the Commission issues the following orders:

1. LCRA TSC's CCN is amended and LCRA TSC's Application to build a new 345-kV double-circuit transmission lines that extend from the McCamey D Switching Station to the Kendall Switching Station is approved. The Project will follow the route described as Staff Route MK15.
2. LCRA TSC shall implement erosion control measures as appropriate. LCRA TSC shall return each affected landowner's property to its original contours and grades except to the extent necessary to establish appropriate right-of-way, structure sites, setup sites, and access for the transmission line or unless otherwise agreed to by the landowner.
3. In the event LCRA TSC or its contractors encounter any archaeological artifacts or other cultural resources during construction of the Project, LCRA TSC shall cease work immediately in the vicinity of the resource and report the discovery to the Texas Historical Commission (THC) and take action as directed by the THC.
4. LCRA TSC shall follow the procedures outlined in the following publications for protecting raptors: *Suggested Practices for Avian Protection on Power Lines, The State of the Art in 2006*, Avian Power Line Interaction Committee (APLIC), 2006 and the *Avian Protection Plan Guidelines* published by APLIC in April 2005.
5. LCRA TSC shall install bird diverters at all river crossings.
6. LCRA TSC shall minimize the amount of flora and fauna disturbed during construction of the Project, except to the extent necessary to establish appropriate right-of-way clearance for the transmission line. LCRA TSC shall re-vegetate using native species considering

landowner preferences and avoid adverse environmental impacts to sensitive plant and animal species and their habitats as identified by TPWD and USFWS.

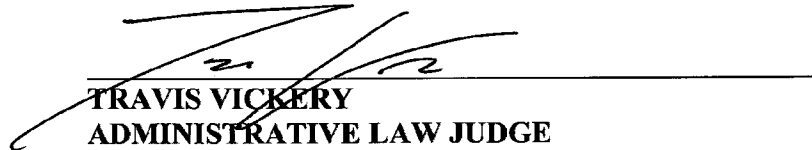
7. LCRA TSC shall exercise extreme care to avoid affecting non-targeted vegetation or animal life when using chemical herbicides for controlling vegetation within the right-of-way and that such herbicide use comply with rules and guidelines established in the *Federal Insecticide, Fungicide and Rodenticide Act* and with the Texas Department of Agriculture regulations.
8. LCRA TSC shall cooperate with directly affected landowners to implement minor deviations in the approved route to minimize the impact of the Project. Any minor deviations in the approved route shall only directly affect landowners who received notice of the transmission line in accordance with P.U.C. PROC. R. 22.52(a)(3) and shall directly affect only those landowners that have agreed to the minor deviation.
9. LCRA TSC shall update the reporting of this project on their monthly construction progress report prior to the start of construction to reflect final estimated cost and schedule in accordance with P.U.C. SUBST. R. 25.83(b). In addition, LCRA TSC shall provide final construction costs, with any necessary explanation for cost variance, after completion of construction and when all charges have been identified.

10. All other motions, requests for entry of specific findings of fact and conclusions of law, and any other requests for general or specific relief, if not expressly granted, are denied.

**SIGNED December 16, 2010.**



**WENDY K.L. HARVEL**  
**ADMINISTRATIVE LAW JUDGE**  
**STATE OFFICE OF ADMINISTRATIVE HEARINGS**



**TRAVIS VICKERY**  
**ADMINISTRATIVE LAW JUDGE**  
**STATE OFFICE OF ADMINISTRATIVE HEARINGS**

ATTACHMENT A

CRITERIA FOR SELECTED ROUTES (EXCLUDING MODIFICATIONS)  
MCCAMEY D-KENDALL-GILLESPIE 345-KV PROJECT  
MCCAMEY D-KENDALL

	MK15	MK15	MK15A	MK15 Modified	MK15 Alternate	MK15 Segrest	MK22	MK23	MK24	MK32	MK33	MK 61	MK62	MK63
	(\$266.4	(Wnrl Pref) \$286.8	(Wnrl 2) \$286.6	PUC Staff <sup>4</sup> \$302.3	PUC Staff <sup>5</sup> \$285.6	\$359.9	\$326.4	\$315.6	\$315.9	\$349.3	\$406.8	(MK15 Mod, Wnrl Pref) \$267.3	(Mod, MK15 Modified PUC Staff) \$302.9	(Mod, MK15 Segrest) \$360.5
Base Cost (in millions of dollars)														
LAND USE														
1 Length of alternative route	134.99	135.63	137.02	144.13	143.31	140.80	155.29	151.84	151.50	164.42	161.09	133.31	141.81	138.48
2 Number of habitable structures <sup>1</sup> within 500 ft of ROW centerline	18	45	45	55	84	57	44	43	37	151	153	118	128	134
3 Number of newly affected habitable structures <sup>1</sup> within 500 ft of ROW centerline (not within 500 ft of an existing transmission line)	18	40	40	51	80	54	23	30	24	146	150	113	123	131
4 Number of habitable structures <sup>2</sup> within the ROW	0	0	0	0	0	0	0	0	0	17	17	17	17	17
5 Length of ROW parallel to existing transmission line ROW	9.14	24.42	24.42	24.42	13.67	16.26	30.56	77.14	83.92	8.82	0.67	8.58	8.58	0.43
6 Length of ROW parallel to other existing compatible ROW (highways, roads, pipelines, etc.)	30.20	35.34	35.34	54.58	57.83	65.44	3.61	3.61	3.61	121.43	132.29	52.25	71.51	82.38
7 Length of ROW utilizing existing transmission line ROW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8 Length of ROW parallel to parcel lines (not following existing ROW) <sup>3</sup>	1.80	5.55	7.63	7.63	9.43	7.63	10.43	9.56	9.56	8.34	8.34	6.48	8.46	8.46
9 Number of parks/recreational areas crossed by ROW	1	1	1	1	0	1	0	0	1	0	0	0	0	0
10 Length of ROW across parks/recreational areas	1.68	1.68	1.68	1.68	0.00	1.68	0.00	0.00	1.68	0.00	0.00	0.00	0.00	0.00
11 Number of additional parks/recreational areas within 1,000 ft of ROW centerline	1	1	1	1	2	2	2	1	1	6	7	6	6	7
12 Length of ROW across cropland	3.69	0.16	0.24	0.62	0.62	1.36	3.04	2.70	2.54	3.96	4.70	1.14	1.60	2.34
13 Length of ROW across rangeland/pastureland	129.72	133.41	134.69	140.88	140.23	136.26	150.33	147.40	147.14	155.26	150.54	128.34	135.91	131.19
14 Length of ROW across land irrigated by traveling systems (rolling or pivot type)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15 Number of pipeline crossings	9	8	8	8	6	8	8	8	8	12	12	5	5	5
16 Number of transmission line crossings	8	7	7	7	8	8	7	9	7	4	5	6	6	7
17 Number of U.S. and State highway crossings	6	9	9	9	10	12	10	10	9	12	15	10	10	13
18 Number of Farm-to-Market and Ranch-to-Market road crossings	12	9	9	11	11	12	9	9	9	15	16	12	14	15
19 Number of FAA-registered airports within 10,000 ft of ROW centerline	0	1	1	1	1	1	2	2	2	3	2	1	1	1
20 Number of FAA-registered airports within 20,000 ft of ROW centerline	0	0	0	0	0	0	0	1	1	0	0	0	0	0
21 Number of private airstrips within 10,000 ft of ROW centerline	6	12	11	11	11	11	8	7	7	11	11	12	11	11
22 Number of heliports within 5,000 ft of ROW centerline	0	0	0	0	0	2	0	0	0	1	2	1	2	1
23 Number of commercial AM radio transmitters within 10,000 ft of ROW centerline	0	0	0	0	0	1	0	0	0	0	1	0	0	1
24 Number of FM radio transmitters, microwave relay stations, or other electronic installations within 2,000 ft of ROW centerline	2	11	12	13	14	15	4	6	6	32	35	23	25	27
AESTHETICS														
25 Estimated length of ROW within foreground visual zone <sup>3</sup> of U.S. and State highways	8.46	38.32	38.27	49.11	49.25	60.34	19.83	20.16	20.16	146.63	157.87	64.22	75.01	86.24
26 Estimated length of ROW within foreground visual zone <sup>3</sup> of parks/recreational areas	4.24	4.43	4.43	4.43	3.13	6.73	1.58	0.47	3.18	7.69	10.00	5.82	5.82	8.12
ECOLOGY														
27 Length of ROW across upland woodland	29.20	32.35	31.92	31.88	31.91	32.51	19.34	19.80	20.41	36.16	36.80	33.97	33.49	34.13
28 Length of ROW across bottomland/riparian woodland	1.37	0.63	0.63	0.75	0.75	0.75	1.34	1.40	1.34	1.24	1.24	0.66	0.80	0.80
29 Length of ROW across potential wetlands (including forested wetlands)	0.27	0.13	0.15	0.21	0.23	0.23	0.32	0.32	0.32	0.38	0.40	0.19	0.27	0.28
30 Length of ROW across known/occupied federally endangered/threatened species habitat	0.55	0.88	0.88	0.88	0.88	0.00	0.00	0.00	0.00	0.88	0.00	0.88	0.88	0.00
31 Length of ROW across potential golden-cheeked warbler habitat (as mapped by Loomis Partners, Inc.)	3.34	15.35	15.35	15.90	16.05	11.77	8.10	7.46	7.44	17.36	13.23	17.08	17.63	13.50
32 Length of ROW across open water (lakes, ponds)	0.08	0.05	0.05	0.11	0.11	0.11	0.11	0.11	0.11	0.08	0.08	0.02	0.08	0.08
33 Number of stream crossings	144	144	151	160	152	149	190	186	190	154	143	137	153	142
34 Number of river crossings	4	2	2	2	2	4	5	5	5	2	4	2	2	4
35 Length of ROW parallel (within 100 ft) to streams or rivers	1.34	1.73	2.20	2.46	3.35	2.34	3.50	3.73	3.49	1.93	1.82	2.28	2.95	2.84
36 Length of ROW across 100-year floodplains	5.13	3.43	3.33	7.58	7.73	12.07	4.38	3.88	3.60	10.17	14.67	5.08	9.22	13.72
CULTURAL RESOURCES														
37 Number of recorded historic and prehistoric sites crossed	1	11	11	12	12	2	6	6	6	17	7	12	13	3
38 Number of additional recorded historic and prehistoric sites within 1,000 ft of ROW centerline	15	24	24	27	27	14	22	16	16	46	33	29	32	19
39 Number of National Register-listed or determined-eligible sites crossed	1	0	0	0	0	0	1	1	1	1	1	0	0	0
40 Number of additional National Register-listed or determined-eligible sites within 1,000 ft of ROW centerline	6	3	3	5	5	5	0	0	0	6	6	3	5	5
41 Length of ROW across areas of high archeological/historical site potential	103.53	95.97	97.56	105.77	101.35	106.97	104.90	101.76	102.96	97.59	98.79	93.56	103.36	104.56

Note: All length measurements in miles.

<sup>1</sup> Single-family and multifamily dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, schools, or other structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis.

<sup>2</sup> Property lines created by existing road, highway, or railroad ROW are not "double-counted" in the length of ROW parallel to parcel lines criterion.

<sup>3</sup> One-half mile, unobstructed.

<sup>4</sup> Route "MK15 Modified PUC Staff" does not include PUC Staff witness Mohammed Ally's recommendation for monopole construction on tract c6-001 (See Attachment 13, Supplement 1, page 5, adding \$0.6M), and PUC Staff witness Mohammed Ally's recommendation for a modification to Segment c6 (See Attachment 13, Supplement 1, page 43, adding 0.49 miles and \$1.3M).

<sup>5</sup> Route "MK15 Alternate PUC Staff" does not include PUC Staff witness Mohammed Ally's recommendation for monopole construction on tract c6-001 (See Attachment 13, Supplement 1, page 5, adding \$0.6M), and PUC Staff witness Mohammed Ally's recommendation for a modification to Segment c6 (See Attachment 13, Supplement 1, page 43, adding 0.49 miles and \$1.3M).

Selected Route Composition

McCamey-D-Kendall-Gillespie Project

Route	Segments
MK13	b3a-b5a-b5b-b14a-b14ba-b14bb-b14c-b18-b20-b22a-b22b-b22c-b34-b36-b50a-b50b-c7a-c7-c13a-c13e-c13b-c13c-c13d-c19-c20-c21
MK15 / Weinzierl Preferred	b3a-b5a-b5b-b14a-b14ba-b14bb-b14c-b19aa-b19ab-b19b-b19c-b23a-b23b-b29a-Y14-b29c-b29d-b48-b53-b56-b56a-b58b-c6-c10-c11-c13a-c13e-c13b-c13c-c13d-c19-c20-c21
MK15A Weinzierl Alternate	b3a-b5a-b5b-b14a-b14ba-b84-b86-b86a-b19ab-b19b-b19c-b23a-b23b-b29a-Y14-b29c-b29d-b48-b53-b56-b56a-b58b-c6-c10-c11-c13a-c13e-c13b-c13c-c13d-c19-c20-c21
MK15 Modified PUC Staff	b3a-b5a-b5b-b14a-b14ba-b84-b86-b90-y5cc-y7b-y8-b19b-b19c-b23a-b23b-b29a-y14-b29c-b29d-b48-b53-b56-b56a-b58b-c6-c10-c11-c13a-c13e-c13b-c13c-c13d-c19-c20-c21
MK15 Alternate PUC Staff	b3a-b5a-b5b-b14a-b14ba-b84-b86-b90-y5cc-y7b-y8-b19b-b19c-b23a-b23b-b29a-y14-b29c-b29d-b48-b53-b56-b56a-b58b-c6-c10-c12a-c12b-c12c-c19-c20-c21
MK15 Segrest	b3a-b5a-b5b-b14a-b14ba-b84-b86-b90-Y5cc-Y7b-Y9-Y10b-Y11-Y12a-Y13-b23b-b29a-Y14-b29c-b29d-b48-b53-b56-b56a-b58b-c6-c10-c11-c13a-c13e-c13b-c13c-c13d-c19-c20-c21
MK22	b3a-b3b-b10-b13aa-b83-P1-P2b-P3-P4b-P5-P6a-P7-P8b-P9-O1-O2-O4-c13c-c13d-c19-c20-c21
MK23	b3a-b3b-b10-b13aa-b83-P1-P2b-P3-P4b-P5-P6a-P7-P8b-P9-O1-O3-O6-O7-c12b-O8-c13d-c19-c20-c21
MK24	b3a-b3b-b10-b13aa-b83-P1-P2b-P3-P4b-P5-P6a-P7-P8b-P9-O1-O3-O6-c13e-c13b-c13c-c13d-c19-c20-c21
MK32	b3a-b5a-Y1-Y2b-Y2c-Y3a-Y4-Y5c-Y5cc-Y7b-Y8-b19b-b19c-b23a-b23b-b29a-Y14-b29c-b29d-Y16-Y17b-Y18-Y19b-Y20-c1b-c1c-c14a-c14b-Y22-Y22a-c18ab-c18b-c21
MK33	b3a-b5a-Y1-Y2b-Y2c-Y3a-Y4-Y5c-Y5cc-Y7b-Y9-Y10b-Y11-Y12a-Y13-b23b-b29a-Y14-b29c-b29d-Y16-Y17b-Y18-Y19b-Y20-c1b-c1c-c14a-c14b-Y22-Y22a-c18ab-c18b-c21
<b>Additional Routes along IH-10 past Segment b29d</b>	
MK61 (modified MK15 / Weinzierl Pref.)	b3a-b5a-b5b-b14a-b14ba-b14bb-b14c-b19aa-b19ab-b19b-b19c-b23a-b23b-b29a-Y14-b29c-b29d-Y16-Y17b-Y18-Y19b-Y20-c1b-c1c-c14a-c14b-Y22-Y22a-c18ab-c18b-c21
MK62 (modified MK15 Modified PUC Staff)	b3a-b5a-b5b-b14a-b14ba-b84-b86-b90-y5cc-y7b-y8-b19b-b19c-b23a-b23b-b29a-y14-b29c-b29d-Y16-Y17b-Y18-Y19b-Y20-c1b-c1c-c14a-c14b-Y22-Y22a-c18ab-c18b-c21
MK63 (modified MK15 Segrest)	b3a-b5a-b5b-b14a-b14ba-b84-b86-b90-Y5cc-Y7b-Y9-Y10b-Y11-Y12a-Y13-b23b-b29a-Y14-b29c-b29d-Y16-Y17b-Y18-Y19b-Y20-c1b-c1c-c14a-c14b-Y22-Y22a-c18ab-c18b-c21