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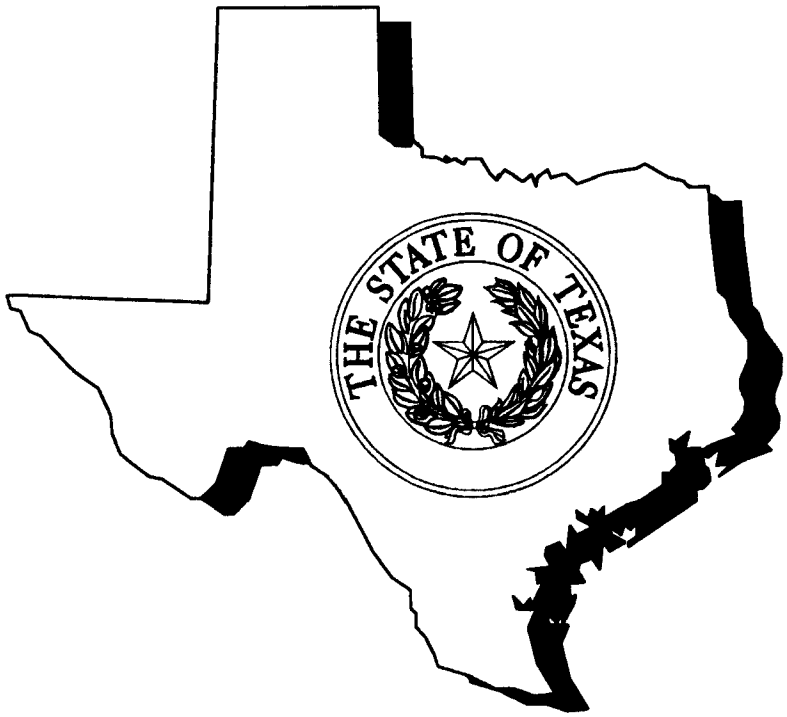
SOAH DOCKET NO. 473-10-4398
DOCKET NO. 38230

APPLICATION OF LONE STAR TRANSMISSION, LLC FOR A CERTIFICATE OF CONVENIENCE AND NECESSITY FOR THE CENTRAL A TO CENTRAL C TO SAM SWITCH/NAVARRO PROPOSED CREZ TRANSMISSION LINE	§	**BEFORE THE STATE OFFICE**
	§	**OF**
	§	**ADMINISTRATIVE HEARINGS**



DIRECT TESTIMONY OF

CHRIS ROELSE

INFRASTRUCTURE & RELIABILITY DIVISION

PUBLIC UTILITY COMMISSION OF TEXAS

August 26, 2010

1265

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APPENDICES

I. STATEMENT OF QUALIFICATIONS

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

A. My name is Chris Roelse. I am employed by the Public Utility Commission of Texas (PUC or the Commission) as an Engineering Specialist V in the Infrastructure and Reliability Division. My business address is 1701 North Congress Avenue, Austin, Texas 78711-3326.

Q. Please briefly outline your educational and professional background.

A. I have a Bachelor of Science in Mechanical Engineering. My professional experience includes manufacturing of semiconductor capital equipment, design, troubleshooting, documentation, process, and product improvements. A more detailed resume is provided in Appendix CR-1.

Q. Are you a registered professional engineer?

A. No. I have an Engineer-In-Training certificate (#35534) in the State of Texas.

Q. Have you filed testimony at the Commission?

A. Yes. A list of the dockets in which I have testified is provided as Appendix CR-2.

II. SCOPE OF TESTIMONY

Q. What is the purpose of this testimony?

A. The purpose of my testimony is to present Staff's recommendations concerning the Application of Lone Star Transmission Company, LLC (Lone Star) for a new certificate of convenience and necessity (CCN) to construct new double-circuit (single-circuit from Sam Switch to Navarro) 345-kV transmission lines from the new Central A Substation

(constructed by Oncor Electric Delivery) to the new Central C Substation located in Shackelford county, from the Central C Substation to the new Sam Switch Substation located in Hill county, and from Sam Switch to the new Navarro Substation located in Navarro County.

I will present Staff's recommendation for the Sam Switch to Navarro project. This project will be referred to as the "Sam Switch-Navarro project" or the "proposed project" in my testimony. Lone Star was ordered to construct this proposed project in Docket Nos. 37902 and 36802 as part of the Competitive Renewable Energy Zone (CREZ) plan designated by the Commission in Docket No. 33672.[1]

Q. Who are the Commission Staff members that will review the Application?

A. The Commission Staff members that will review this Application are Mohammed Ally, Brian Almon, and myself. Mohammed Ally will review and provide a recommendation for the Central A to Central C project and Brian Almon will file a recommendation for the Central C to Sam Switch project.

Q. What requirements must be met before the Commission can grant a CCN for a transmission line?

[1] See Commission Staff's Petition for Selection of Entities Responsible for Transmission Improvements Necessary to Deliver Renewable Energy from Competitive Renewable Energy Zones, Docket No. 35665, Order on Rehearing at Ordering Paragraph 1, referencing Attachment B (May 15, 2009); Issues Related to Default Projects Severed from Docket No. 35665 (Commission Staff's Petition for Selection of Entities Responsible for Transmission Improvements Necessary to Deliver Renewable Energy from Competitive Renewable Energy Zones), Docket No. 36416; Commission Staff's Petition for Designation of Competitive Renewable-Energy Zones, Docket No. 33672, Order on Rehearing (Oct. 6, 2008).

A. Section 37.056(a) of the Public Utility Regulatory Act[2] (PURA) states that the Commission may approve such an Application only if the Commission finds that the new transmission line is necessary for the service, accommodation, convenience, or safety of the public. Further, the Commission shall approve, deny, or modify a request for a transmission line after considering the factors specified in PURA § 37.056(c) which are as follows:

(1) the adequacy of existing service;

(2) the need for additional service;

(3) the effect of granting the certificate on the recipient of the certificate and any electric utility serving the proximate area; and

(4) other factors, such as:

(a) community values;

(b) recreational and park values;

(c) historical and aesthetic values;

(d) environmental integrity;

(e) the probable improvement of service or lowering of cost to consumers in the area if the certificate is granted; and

(f) to the extent applicable, the effect of granting the certificate on the ability of this state to meet the goal established by Section 39.904(a) of this title.

PURA § 39.904(h) provides that the factors enumerated in § 37.056(c)(1) and (2) relating to the adequacy of existing service and the need for additional service do not have to be

[2] Public Utility Regulatory Act ("PURA"), Tex. UTIL. Code §§ 11-001-64.158 (Vernon 1998 & Supp. 2005) (PURA).

considered for CREZ projects. Consequently, these factors need not be considered in this docket and are not addressed in this testimony.

Q. Do the Commission's rules provide any instruction regarding routing criteria?

A. Yes. P.U.C. SUBST. R. 25.101(b)(3)(B) requires that an Application for a new line address the criteria in PURA § 37.056(c) and that considering those criteria, engineering constraints, and costs, the line shall be routed to the extent reasonable to moderate the impact on the affected community and landowners unless grid reliability and security dictate otherwise. P.U.C. SUBST. R. 25.174(c)(5) removes consideration of the adequacy of existing service and the need for additional service from consideration in CCNs for CREZ transmission projects. Unless a route is agreed to by (1) the utility, (2) the landowners whose property is crossed by the proposed line, and (3) the owners of land that contains a habitable structure within 300 feet of the centerline of a transmission project of 230 kV or less, or within 500 feet of the centerline of a transmission project greater than 230 kV, and otherwise conforms to the criteria in PURA § 37.056(c), the following factors shall be considered in the selection of the utility's preferred and alternate routes:

(i) whether the routes utilize existing compatible rights-of-way, including the use of vacant positions on existing multiple-circuit lines;

(ii) whether the routes parallel existing compatible rights-of-way;

(iii) whether the routes parallel property lines or other natural or cultural features; and

(iv) whether the routes conform with the policy of prudent avoidance.

Q. What issues identified by the Commission must be addressed in this docket?

A. In this docket's Order of Referral and Preliminary Order filed on May 26, 2010, the Commission identified the following issues that must be addressed in this docket:

Application

1. Is Lone Star'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 answering this question, consideration must be given to the number of proposed alternatives, the locations of the proposed transmission line, and any associated proposed facilities that influence the location of the line. Consideration may also be given to the facts and circumstances specific to the geographic area under consideration, and to any analysis and reasoned justification presented for a limited number of alternative routes.[3] A limited number of alternative routes is not in itself a sufficient basis for finding an Application inadequate when the facts and circumstances or a reasoned justification demonstrates a reasonable basis for presenting a limited number of alternatives. If an adequate number of routes in not presented in the Application, the ALJ shall allow Lone Star to amend the Application and to provide proper notice to affected landowners; if Lone Star chooses not to amend the Application, the ALJ may dismiss the case without prejudice.

2. Did the notice provided by Lone Star comply with P.U.C. PROC. R. §22.52(a)?

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

[3] *See Application of Wood County Electric Cooperative, Inc. for a Certificate of Convenience and Necessity for a Proposed Transmission Line in Wood County, Texas*, Docket No. 32070, Order on Appeal of Order No. 8 at 6 (Nov. 1, 2006).

4. Did Lone Star submit the CCN Application in compliance with the Orders in Docket Nos. 37902 and 36802 assigning it responsibility as a CREZ Transmission Plan facility? If not, should the Commission revoke the designation awarded to Lone Star and select another entity for the CREZ Transmission Plan facility at issue in this docket pursuant to P.U.C. SUBST. R. 25.216(f)(1)?

5. Will completion of the project proposed by Lone Star in this docket accomplish the intended result for the CREZ priority project designated as "Central A to Sam Switch (Combined Application)" in the CREZ Transmission Plan and ordered by the Commission in Docket Nos. 37902 and 36802?

Route

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)?

7. 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?

8. 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?

   b. Have the accommodations to landowners diminished the electric efficiency of the line or reliability?

Proposed Modifications

9. Has Lone Star 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?[4]

   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?[5]

   c. Have all such modifications been submitted to the Electric Reliability Council of Texas (ERCOT), and has ERCOT made a recommendation to Lone Star to be filed in this proceeding?[6]

Estimated Cost

10. Are there discrepancies between the estimated total cost included in the CCN Application in this docket and the cost identified for the proposed project in the CREZ Transmission Plan?[7] If so, what are the reasons for the discrepancies?

11. On or after September 1, 2009, did the Texas Parks and Wildlife Department (TPWD) provide any recommendations or informational comments regarding this Application pursuant to Section 12.0011(b) of the Texas Parks and Wildlife Code? If so, please address the following issues:

[4] P.U.C. SUBST. R. 25.174(d)(9).
[5] Docket No. 37902 at 52, Finding of Fact No. 166
[6] *Id.* at 52, Findings of Fact Nos. 67-70.
[7] The CREZ Transmission Plan, developed by the Commission in Docket No. 33672 (*Commission Staff's Petition for Designation of Competitive Renewable-Energy Zones*, Docket No. 33672 (Oct. 7, 2008)), is based on the ERCOT CREZ Transmission Optimization Study, Scenario 2.

a) What modifications, if any, should be made to the proposed project as a result of any recommendations or comments?

b) What conditions or limitations, if any, should be included in the final order in this docket as a result of any recommendations or comments?

c) What other disposition, if any, should be made of any recommendations or comments?

d) If any recommendation or comment should not be incorporated in this project or the final order, or should not be acted upon, or is otherwise inappropriate or incorrect in light of the specific facts and circumstances presented by this Application or the law applicable to contested cases, please explain why that is the case.

Q. Which issues in this proceeding have you addressed in your testimony?

A. I have addressed all of the above eleven issues and the requirements of PURA § 37.056(c)(3) and (c)(4), and P.U.C. SUBST. R. 25.101.

Q. What have you relied upon in your analysis and evaluation of the Application and your recommendations?

A. I have relied upon my review and analysis of the Application and its attachments, including the Environmental Assessment and Alternative Route Analysis (EA) prepared for Lone Star by Burns & McDonnell (Attachment 1). I relied upon the Direct Testimonies and/or Statements of Position filed in this proceeding by or on behalf of Lone Star and the intervenors, as well as responses to Requests for Information (RFIs)

provided by them. I have also relied upon the recommendation letter filed by TPWD to Mr. Brian Almon dated July 19, 2010.

III. CONCLUSIONS AND RECOMMENDATIONS

Q. Based on your evaluation of Lone Star's Application and other relevant material, what conclusions have you made about Lone Star's proposed transmission line?

A. In addressing the eleven issues, I have reached the following conclusions:

1. I conclude that the Application adequately addresses the questions stated in the CREZ CCN Application form and the factors identified in PURA and the Commission's rules. Sufficient responsive information has been provided in the Application and the Environmental Assessment (EA) to propose a CCN recommendation. Furthermore, Lone Star has proposed seven different alternative routes that traverse the northern, central, and southern areas of the Sam Switch to Navarro study area. Therefore, I conclude that Lone Star has provided a reasonably differentiated number of alternative routes and all of these routes are viable.

2. I conclude the Application complies with P.U.C PROC. R. 22.52(a).

3. I conclude that Lone Star met the filing requirements set forth in P.U.C. SUBST. R. 25.216(g)(2) and (3) by filing a completed CREZ Application form and by providing direct testimony with the Application.

4. I conclude that this Application was submitted in compliance with Docket Nos. 37902 and 36802 designating it as a CREZ Transmission Plan Facility. No party has asserted the position that the Commission should revoke the CREZ Facility designation.

5. I conclude that the completion of the project proposed by Lone Star in this docket will accomplish the intended result for the CREZ project designated as "Central A to Sam Switch (Combined Application)" in the CREZ Transmission Plan and ordered by the Commission in Docket Nos. 37902 and 36802.

6. I conclude that Alternate Route SSN7 (Links DDD-FFF) is the best alternative when considering the factors set forth in PURA § 37.056(c)(4), excluding (4)(E), and as set forth in P.U.C. SUBST. R. 25.101(b)(3)(B).

7. I conclude that Alternate Route SSN5 (Links DDD, EEE, GGG, III) would be an acceptable alternative route if agreed upon by all parties affected by the selection of that route. There are no other alternative routes or facilities' configurations that would have a less negative impact on landowners and still allow for the secure and reliable operation of the transmission line which is subject of the Application have been proposed by any party or are evident from a review of the Application and EA.

8. No alternative routes or facility configurations were considered due to individual landowner preference.

9. I conclude that Lone Star proposed three significant modifications to the transmission improvements described in the CREZ order for the proposed project routing from Sam Switch to Navarro Substations. One of these proposed modifications is the location of the Sam Switch and Navarro Substations. The CTO Study did not identify precise locations for the substations, but Lone Star has identified locations for these substations and has acquired purchase options for their locations.[8] A second proposed modification is to use 2-1590 ACSS/TW conductor rather than 2-1433 ACSS/TW conductor.[9] The third

[8] Dan Mayer's testimony at 6.
[9] *Id.*

proposed modification was to construct the project from the Sam Switch to Navarro Substation as a single-circuit with double-circuit capability.[10] The proposed changes were reviewed by ERCOT which deemed it to be cost-effective and consistent with the intent of the CTO Study and recommended that it be implemented.[11]

10. I conclude that there are differences between the estimated total cost identified in the CCN Application in this docket and the cost estimated by the ERCOT CTO Study for the project. The estimated transmission line cost identified in the ERCOT CTO Study for the Sam Switch to Navarro project, based on a straight-line distance of 20 miles and a cost per mile basis of $1.5 million using 2-1433 kcmil ACSS/TW conductor was $30 million.[12] Lone Star's estimated cost for a single-circuit/double-circuit capable 345-kV transmission line using 2-1590 ACSS/TW conductor along their Preferred Route (33.3 miles) between the Sam Switch and Navarro Substations is $56 million.[13] Lone Star's estimated cost of the alternative routes for the Sam Switch-Navarro project ranges from $50.4 million to $56.0 million.[14] Also, the ERCOT CTO Study estimates the Sam Switch Substation to cost $20 million and the Navarro Substation to cost $30 million.[15] Lone Star estimated the Sam Switch and Navarro Substations total project costs, including land acquisition costs, to be $26.1 and $40.8 million, respectively.[16]

11. I conclude that TPWD provided recommendations and informational comments regarding this Application and that the mitigation measures provided in Items 2, 3, and 4 on Pages 14 and 15 of this testimony shall address most of TPWD's concerns. I also

[10] *Id.*
[11] *Id.* at Exhibit DM-3.
[12] *Id.* at 24.
[13] *Id.* at 15.
[14] *Id.*
[15] *Id.* at 24.
[16] *Id.* at 21.

conclude that Lone Star has the resources and the procedures in place for accommodating the recommendations and comments by TPWD.

Q. What recommendations do you have regarding this Application?

A. I recommend that the Commission approve Lone Star's Application for a CCN to construct a new single-circuit/double-circuit capable 345-kV transmission line from Lone Star's new Sam Switch Substation in Hill County to Lone Star's new Navarro Substation in Navarro County. I also recommend that the Commission order Lone Star to construct the proposed project on Route SSN7 (Links DDD-FFF) as described in the Application.

Q. What other recommendations do you have if the Commission approves one of the routes proposed by Lone Star?

A. I recommend that the Commission should include in its Order the following paragraphs to mitigate the impact of the proposed project:

1. In the event Lone Star or its contractors encounter any artifacts or other cultural resources during project construction, work shall cease immediately in the vicinity of the resource and the discovery shall be reported to the Texas Historical Commission (THC). The utility will take action as directed by the THC.
2. Lone Star shall follow the procedures outlined in the following publication for protecting raptors: *Suggested Practices for Raptor 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 the APLIC in April, 2005.
3. Lone Star shall exercise extreme care to avoid affecting non-targeted vegetation or animal life when using chemical herbicides to control vegetation within the

right-of-way, *and shall ensure that such herbicide use complies with rules and guidelines established in the Federal Insecticide, Fungicide and Rodentiacide Act and with the Texas Department of Agriculture regulations.*

4. Lone Star shall minimize the amount of flora and fauna disturbed during construction of the transmission line, except to the extent necessary to establish appropriate right-of-way clearance for the transmission line. In addition, the utility shall revegetate using native species and shall consider landowner preferences in doing so. Furthermore, to the maximum extent practicable, the utility shall avoid adverse environmental impacts to sensitive plant and animal species and their habitats as identified by Texas Parks and Wildlife (TPWD) and the United States Fish and Wildlife Service (USFWS).

5. Lone Star shall implement erosion control measures as appropriate. Also, the utility 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, including access roads for the transmission line.*

6. Lone Star shall cooperate with the directly affected landowners to implement minor deviations in the approved route to minimize the impact of the transmission line. Any minor deviation to 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. *Any agreed minor deviations shall not delay*

the Project beyond its Commission-required completion date nor shall any minor deviation add any significant cost to the Project.

7. Lone Star shall install bird diverters on any river crossings along the Commission-approved route.

Q. Has Lone Star suggested additions to the Ordering Paragraphs that you have recommended?

A. Yes. Lone Star witness David Turner has suggested changes to Paragraphs 3, 5, and 6 as identified above by italics in the previous response.[17]

Q. Do you have an opinion about the suggested changes?

A. I conclude that his suggestions are reasonable and should be adopted by the Commission.

Q. Did Mr. Turner also make statements about mitigation of unidentified oil and gas wells and the potential impacts to the whooping crane?

A. Yes. Mr. Turner defined how Lone Star will work with the Railroad Commission of Texas (RRC) so that the RRC can inspect any wells identified by Lone Star in the right of way of the transmission project and to allow the RRC to take appropriate action. Also, Mr. Turner stated that Lone Star will mark the small diameter overhead ground wires in certain locations with bird diverter devices to reduce the risk of a collision by the whooping crane.

Q. Do you agree with these mitigation measures?

A. Yes.

Q. Do you have further recommendations?

[17] Lone Star Direct Testimony of David Turner at DT 14-15.

A. Yes. I also recommend that the Commission include in its Order the following paragraphs concerning reporting of information after the approval of the Application.

1. Lone Star shall file in Project No. 37858 information pursuant to P.U.C. SUBST. R. 25.216(f) and the Order on Rehearing in Docket No. 35665.

2. Lone Star shall comply with the reporting requirements of P.U.C. SUBST. R. 25.83.

Q. Does your recommended route differ from the one preferred by Lone Star?

A. Yes, Lone Star's preferred route is Route SSN4 (Links AAA-CCC-FFF). I will discuss the reasons for my recommendation of Route SSN7 later in my testimony.

IV. PROJECT JUSTIFICATION

A. DESCRIPTION OF THE PROJECT

Q. Is the Application for this project adequate?

A. Yes. On June 3, 2010, Staff filed comments in response to Order No. 1 stating that no material deficiencies were found in the Application and therefore it should be deemed sufficient. A couple of parties filed comments concerning deficiencies in Lone Star's Application requesting that the Application be found materially deficient for failing to include routing maps that cross-reference each habitable structure and directly affected property with a list of corresponding landowner names and addresses, and that Lone Star has not filed with the Commission or provided intervenors copies of maps identifying directly-affected tracts of properties and habitable structures for cross-referencing those tracts and structures with names and addresses provided in the Application. Instead, Lone Star has simply provided landowner maps on its company website. Parties

conclude that this failure constitutes a material deficiency in the Application because the correlation between the proposed routes, property boundaries, and directly-affected landowners goes to the merits of whether Lone Star's proposed routes adequately comply with the Commission's routing requirements. After considering the arguments presented, on June 14, 2010 in Order No. 2, the Administrative Law Judge (ALJ) denied the motion to find the Application deficient, and stated that Lone Star's routing maps meet the minimum requirements of the rules and through their supplemental filing and other commitments, Lone Star is adequately providing the routing maps and other information in a timely and sufficient manner.

Q. Does the Application contain an adequate number of alternative routes for the Sam Switch-Navarro project to conduct a proper evaluation?

A. Yes. Burns & McDonnell provided information for seven alternative routes for the Sam Switch-Navarro project and Lone Star selected all seven of them as alternative routes to be considered by the Commission. The data presented in the EA provides information necessary to provide an evaluation of these routes. Staff concludes that the seven routes are an adequate number of alternative routes to conduct proper evaluation for the Sam Switch-Navarro project.

Q. Please describe the Sam Switch-Navarro project as you understand it based on the information provided by Lone Star.

A. For the Sam Switch-Navarro project, Lone Star is proposing to build a single 345-kV circuit using bundled 1590 kcmil ACSS/TW conductor with double-circuit capable structures. The proposed line begins at the new Sam Switch Substation located southeast

of Hillsboro in Hill County and extends between 33 and 38 miles in length, depending on the route selected, to the new Navarro Substation located southwest of Corsicana in Navarro County. The proposed new Sam Switch and Navarro Substations are associated with the proposed new transmission line and will be built by Lone Star.[18] The proposed right-of-way (ROW) width for this project is approximately 100 feet but could be wider in some places as required.[19] The estimated date to energize facilities for this transmission line is March 2013.[20]

Q. Is the Sam Switch-Navarro project located within the incorporated boundaries of any municipality?

A. None of the proposed routes for Lone Star's Sam Switch-Navarro project cross a municipality.[21]

Q. Does any part of the Sam Switch-Navarro project lie within the Texas Coastal Management Program (TCMP) boundary?

A. No, the proposed transmission line project is not located, either whole or in part, within the coastal management program boundary as defined in 31 T.A.C. § 503.1.[22]

B. NEED FOR THE PROJECT

Q. Are the proposed facilities for the Sam Switch-Navarro project necessary for the service, accommodation, convenience, or safety of the public within the meaning of PURA § 37.056(a) taking into account the factors set out in PURA § 37.056(c)?

[18] Application at Questions 4, 7, and 13.
[19] *Id.* at Question 6.
[20] *Id.* at 9.
[21] *Id.* at 11.
[22] *Id.* at 43.

A. P.U.C. SUBST. R. 25.174(d)(2) removes consideration of the need for additional service from consideration in CCNs for CREZ transmission projects, so I am not addressing those issues here.

V. ROUTING

A. STAFF RECOMMENDATIONS

Q. Please describe the process you used in your route recommendation.

A. I initially considered all seven of the proposed routes filed by Lone Star for the Sam Switch-Navarro project and made an objective comparison of the relative advantages of the routes and their accordance with PURA and the Commission's Substantive Rules. My review began with an evaluation of the data in Burns & McDonnell's Environmental Assessment and Routing Study. Table C-3 (Appendix C of the EA) was the primary resource used for comparing routes. In addition, I reviewed and considered the estimated project costs provided in Attachment 5 of the Application.

Q. What is your final route recommendation considering all factors, including the factors set forth in PURA § 37.056(c)(4)(A)-(D) and Substantive Rule 25.101(b)(3)(B)?

A. After analyzing all the factors that the Commission must consider, I recommend that Route SSN7 be approved for the Sam Switch-Navarro project. The basis for my recommendation is discussed in more detail in the remainder of my testimony.

Q. How did Lone Star arrive at Route SSN4 as its preferred route for the Sam Switch-Navarro project?

A. The direct testimony of Mr. Dan Mayers offered the following:

> Burns & McDonnell and ECI provided information on seven alternative routes. Lone Star has submitted its Preferred Route and six alternate routes for consideration. Though Lone Star considered all statutory and regulatory factors, those considered most important in the analysis, based on Commission precedent and specific features of this area, were: overall cost, the amount parallel to existing transmission line and oil/gas pipeline corridors and apparent property boundaries, overall length, environmental concerns, and the number of habitable structures within 500 feet of the transmission line centerline areas. Given a balance of the listed factors, Route SSN4 was selected as the Preferred Route for the Sam Switch to Navarro segment. Relative to the other alternative routes, SSN4 has the second fewest habitable structures within 500 feet of the transmission line centerline and had the highest percentage of the route parallel to existing transmission line ROW.

Q. How did you arrive at your selection of Alternative Route SSN7 as your recommended route?

A. I compared the various factors for the seven routes submitted in the Application. I conclude that Route SSN7 provides the best balance of the various factors. After reviewing and comparing the information provided in Table C-3 of the EA for the seven proposed alternative routes, alternative route SSN7 has the following characteristics that differentiate it from the other proposed routes:[23]

- Route SSN7 is the third shortest route (34.1 miles),
- Route SSN7 has the second highest percentage (approximately 75%) of its route parallel to existing corridors, including apparent property boundaries,
- Route SSN7 has the lowest number of habitable structures (8) within close proximity,
- Route SSN7 does not cross any parks/recreation areas and has no known parks/recreation areas within 1,000 feet of its centerline,
- Route SSN7 traverses the most amount of agricultural pastureland (17.7 miles), and the second least amount of agricultural cropland (10.5 miles),

[23] Gathered and/or calculated from data in Table C-3 of the EA.

- Route SSN7 crosses the least amount of upland woodlands (3.8 miles), and is tied for crossing the least amount of bottomland forest including forested wetlands (0.8 miles),
- Route SSN7 crosses approximately 0.94 miles of emergent wetland,
- Route SSN7 crosses the fourth least number of streams (59) and is parallel and within 100 feet to the fourth least amount of streams (1.6 miles),
- Route SSN7 crosses no recorded cultural resource sites and only 2 recorded cultural resource sites are reported to be within 1,000 feet of its centerline,
- Route SSN7 crosses the fourth least amount of length (4 miles) through areas having high historic or prehistoric archaeological site potential,
- Route SSN7 has 2 FAA-registered airstrips less than 3,200 feet long within 10,000 feet of the route centerline,
- Route SSN7 has one private airstrip within 10,000 feet of the route centerline,
- Route SSN7 crosses approximately 0.32 miles of open water,
- Route SSN7 crosses the second least number of farm-to-market, county roads, or other streets (19),
- Route SSN7 is not in the foreground visual zone of any parks/recreation areas,
- Route SSN7 has approximately 3.6 miles within the foreground visual zone of any State or U.S. Highways, and
- Route SSN7 costs approximately $55.7 million.

Q. How does the route you have recommended for the Sam Switch-Navarro project compare to the one recommended by Lone Star?

A. Both routes utilize link FFF, which accounts for approximately 27.5 miles of both routes lengths. The route I have recommended, Route SSN7, compares similarly to Lone Star's preferred Route SSN4; however, the following conclusions can be made:[24]

- Route SSN7 has approximately 0.8 miles (4,200 feet) more length parallel to existing public roads and highways, compared to Route SSN4,
- Route SSN7 has approximately 0.4 miles (2,300 feet) more length parallel to apparent property boundaries, compared to Route SSN4,
- Route SSN7 has 3 less habitable structures within close proximity than Route SSN4,
- Route SSN7 has approximately 0.7 miles (3,516 feet) less length through upland woodland, and approximately 0.02 miles (81 feet) less length through bottomland forest, including forested wetlands, compared to SSN4,

[24] *Id.*

- Route SSN7 crosses no recorded cultural resource sites, whereas Route SSN4 crosses 1,
- Route SSN7 has 2 recorded cultural resource sites within 1,000 feet of the centerline, compared to 3 for Route SSN4, and
- Route SSN7 costs an estimated $300,000 less than Route SSN4.

Q. What are the recommendations of the intervenors regarding Lone Star's preferred route?

A. There are approximately ten parties that have been granted intervenor status in this case for the Sam Switch-Navarro project. There were two direct written testimonies and two statements of position filed on behalf of the intervening parties for the Sam Switch-Navarro project. In general, the intervenors' primary concerns are the impact of the proposed project on aesthetic values, cattle production operations, exposure to electric and magnetic fields (EMF), and the impact to wooded areas and riparian habitat. Intervenors opposed to Lone Star's preferred route SSN4, generally, have the same concerns.

Q. What is Staff's opinion regarding the intervenor recommendation and concerns?

A. In general, most of the concerns expressed by intervenors are representative of the factors to be considered by the Commision set forth in PURA § 37.056(c)(4), excluding (4)(E). When considering these factors and the factors set forth in P.U.C. SUBST. R. 25.101(b)(3)(B), I conclude that alternate route SSN7 is the best route. In the case where the transmission line is not following property boundaries or paralleling existing, compatible ROW or features, Staff would support any reasonable and viable minor route deviations proposed by intervenors in order to minimize impacts to their properties.

B. COMMUNITY VALUES

Q. Has Lone Star sought input from the local community regarding community values?

A. Yes. Lone Star published notice of the proposed project in local newspapers as required by P.U.C. PROC. R. § 22.52(A)(1).[25] Lone Star provided written notice of the proposed project to county and municipal officials and neighboring utilities as required by P.U.C. PROC. R. § 22.52(A)(2)[26] and to affected landowners as required by P.U.C. PROC. R. § 22.52(A)(3).[27] For all three projects, Lone Star held eight public open house meetings pursuant to P.U.C. PROC. R. § 22.52(A)(4).[28] At the open house meetings questionnaires were provided for each attendee to return. A total of 1,116 people signed in as attending the public open-house meetings. Of these, 153 individuals submitted questionnaires. In addition, 232 questionnaire responses were mailed in following the open-house meetings.[29] I conclude that Lone Star provided adequate notice and adequate means by which members of the community could express their concerns.

Q. Are there any airstrips within 10,000 feet of the centerline of the preferred route and alternative routes for the Sam Switch-Navarro project?

[25] Application at 38-39.
[26] *Id.* at 37-38.
[27] *Id.* at 37.
[28] *Id.* at 20-27.
[29] *Id.* at 22.

A. Burns & McDonnell's identified airports and heliports along the alternative routes from field reconnaissance surveys, aerial interpretation, aeronautical charts, and GIS data obtained from the Bureau of Transportation Statistics (BTS, 2008).[30]

Lone Star's response to Question 21 of the Application as well as Table 7-2 of the EA discusses these airports and airstrips and provides approximate distances from each of the identified airfields to the links. I conclude the following:

None of the alternative routes for the Sam Switch to Navarro project have any FAA-registered airports having a runway greater than 3,200 feet in length within 20,000 feet or any heliports within 5,000 feet.[31]

The number of FAA-registered airstrips having runways equal to or less than 3,200 feet within 10,000 feet of the route centerline: [32]

- Route SSN7 has two; and
- Route SSN4 has two

The number of private airstrips (non-FAA registered) within 10,000 feet of the route centerline:[33]

- Route SSN7 has one; and
- Route SSN4 has one

No significant impact to the operations of the area airports is anticipated from the construction of the proposed project along any of the alternative routes.[34] These constraints will be further reviewed during the engineering phase of the project on the Commission approved route, and notification of the FAA will be completed, if required.

[30] EA at 7-21
[31] *Id.* at 7-24.
[32] *Id.*
[33] *Id.*
[34] *Id.*

Q. Are there any AM radio transmitters within 10,000 feet of the centerline and other types of electronic installations within 2,000 feet of the preferred and alternative route for the Sam Switch-Navarro project?

A. There are no commercial AM communication towers within 10,000 feet of any of the alternative routes for the Sam Switch-Navarro project. Also, there are no FM radio transmitters, microwave relay stations, or other electronic installations identified within 2,000 feet of any of the alternative routes for the Sam Switch-Navarro project.[35]

C. RECREATIONAL AND PARK AREAS

Q. Do any of the routes pass through any parks or recreational areas?

A. None of the alternative routes for the Sam Switch-Navarro project cross any parks or recreational areas.[36]

Q. Are any additional recreational and park areas located within 1,000 feet of the centerline of the preferred route or alternate routes for the Sam Switch-Navarro project?

A. Alternative routes SSN7 and SSN4 do not have any parks or recreational areas within 1,000 feet of the route centerline. All other proposed alternative routes have one park or recreational area within 1,000 feet of the route centerline.[37]

[35] Application at 32.
[36] EA at 7-20.
[37] EA at 7-20, 7-21.

D. HISTORICAL VALUES

Q. Are there possible impacts from the proposed project on archaeological and historical values, including known cultural resources crossed by any of the alternative routes or that are located within 1,000 feet of the centerline of any of the alternative routes?

A. The number of known cultural resource sites crossed by the alternative routes ranges from zero to two. Route SSN7 crosses none and Route SSN4 crosses one.[38] The number of additional recorded cultural resource sites within 1,000 feet of the route centerline ranges from two to five. Route SSN7 has two and Lone Star's preferred route SSN4 has three additional sites within 1,000 feet.[39]

All of the proposed routes cross areas of high prehistoric and historic archaeological site potential for distances ranging from 2.7 miles to 5.5 miles. Route SSN7 crosses 4 miles, while Route SSN4 crosses 3.5 miles.[40] If any archeological or cultural resources are found during construction, Lone Star should immediately cease work in the vicinity of the resources and notify the THC immediately to determine what appropriate actions should be taken.

E. AESTHETIC VALUES

Q. What are the potential impacts on aesthetic values from the proposed project?

[38] EA at Table C-3, line criteria no.22.
[39] *Id.* at line criteria no.23.
[40] *Id.* at line criteria no.24.

A. The construction of the proposed line will have both temporary and permanent aesthetic impacts. Temporary effects would include views of the actual construction (assembly and erection of the structures) and any clearing of the ROW. Permanent aesthetic impacts from the project exist when the structures and lines are visible from homes, businesses, property, US and state highways, FM roads, county roads, streets, and recreation and park areas after construction is completed.

Q. In your opinion, which of the proposed alternative routes for the Sam Switch-Navarro project will have a negative impact on aesthetic values and which portions of the study area will be affected?

A. In my opinion, all of the proposed alternative routes would have a negative impact, some more than others depending on the visibility from homes, businesses, property, public roadways, and recreational areas, and I therefore conclude that aesthetic values would be impacted throughout the study area near the Sam Switch-Navarro project.

Q. In your opinion, how will the negative impact on aesthetic values of Route SSN7 compare to the negative impact of the other proposed alternative routes?

A. The number of habitable structures in close proximity to Route SSN7 is 8, which is the fewest of all proposed routes for the Sam Switch-Navarro project. The Lone Star preferred route, SSN4, has 11 habitable structures in close proximity.[41] Route SSN7 does not have any length within the foreground visual zone of park and recreational areas.[42] Route SSN7 is tied for having the most length (3.6 miles) within the foreground visual

[41] *Id.* at line criteria no. 8.
[42] *Id.* at line criteria no. 34.

zone of State and U.S. highways.[43] Link FFF of Route SSN7 includes all 3.6 miles of length within the foreground visual zone of State and U.S. highways.[44] Link FFF parallels an existing 138-kV transmission line for approximately 72% of its length.[45] In my opinion, Route SSN7 has a less negative impact on aesthetic values in some of these areas since it parallels an existing transmission line for segments visible from SH 171 and SH 31. It is, therefore, my opinion that Route SSN7 will have a less negative impact on aesthetic values when compared to the other alternative routes.

F. ENVIRONMENTAL INTEGRITY

Q. Please provide a general description of the area traversed by the Sam Switch-Navarro project.

A. The Sam Switch-Navarro project is just south of the Dallas-Ft.Worth Metroplex. Livestock sales account for a majority of the agriculture revenue in the area. The area is mostly a nearly level to gently rolling dissected plain. Nearly level to gently sloping uplands merge into narrow valleys that have more sloping valley walls. Prairies dominate the landscape in the area between Sam Switch-Navarro project. In general, the majority of residential areas are located within the city limits of municipalities. There are also occasional rural residences throughout the area along county and FM roads.

Q. What was involved in your analysis of the environmental impact of the proposed project?

[43] *Id.*at line criteria no. 35.
[44] Acquired using EA, Table C-3, line criteria no. 35 and Environmental Data Table by Link for Sam Switch-Navarro Project, line criteria no. 35.
[45] Calculated by Staff using Environmental Data Table by Link for Sam Switch-Navarro Project, line criteria nos.1 and 2.

A. I reviewed the information provided in the EA and the direct testimonies and/or statements of position of the intervenors. I also reviewed a letter containing recommendations and informational comments from TPWD after their evaluation of the Environmental Assessment (EA). The letter was dated July 19, 2010 to Mr. Brian Almon, P.E. and was filed in this docket on July 21, 2010.

Q. Has TPWD presented information concerning the potential negative impacts of the proposed project and/or made any recommendations in order to minimize those impacts?

A. Yes. TPWD discusses various environmental considerations and recommends a route be selected that minimizes impacts to natural resources.[46] TPWD provides recommendations to minimize impacts to various state and federally-listed animal species. TPWD states that they cannot support a preferred alternative route since information based on on-the-ground surveys has not been provided but do state that Route SSN4 appears to best minimize potential impacts to natural resources.[47]

Q. What do you conclude regarding whether construction of the proposed project on any or all of Lone Star's Sam Switch-Navarro identified alternative routes could present a potential negative impact to the local environment and/or wildlife?

A. Construction on each of the alternative routes could present a potential negative impact to the local environment and/or wildlife. However, in my opinion, such potential negative impacts of construction on each of the alternative routes could be mitigated if, during

[46]Page 8 of TPWD letter to Brian Almon, P.E. dated July 19, 2010.
[47] *Id.* at 9.

construction of the proposed project, Lone Star employs design and construction practices and techniques that are usual and customary in the electric utility industry.

Q. In your opinion how would construction of the Sam Switch-Navarro project on Route SSN7 compare from an environmental perspective to construction on the other alternative routes?

A. In my opinion, construction of the proposed project on Route SSN7 compares favorably from an overall environmental perspective to construction on Route SSN4 and the other alternative routes. Route SSN7 crosses the least amount of upland woodlands and is tied for crossing the least amount of bottomland forest, including forested wetlands, when compared against all the other proposed routes.[48] Route SSN7 is tied with Route SSN4 for having the most length across emergent wetland area (0.9 miles) and next to most length across open waters (0.3 miles).[49] However, both Routes SSN7 and SSN4 utilize Link FFF which traverses 0.87 miles of emergent wetland and 0.3 miles across open waters.[50] In my opinion, impacts to these areas will be minimized since Link FFF parallels an existing transmission line for approximately 72% of its length.[51]

Q. Do you conclude that Route SSN7 is acceptable from an environmental and land use perspective?

A. Yes.

[48] Acquired from comparing data in EA, Table C-3, line criteria nos. 15 and 16.
[49] *Id.* at line criteria nos. 17 and 29.
[50] Acquired from Environmental Data Table by Link for Sam Switch-Navarro Project, line criteria nos. 17 and 29.
[51] Calculated by Staff using Environmental Data Table by Link for Sam Switch-Navarro Project, line criteria nos. 1 and 2.

G. ENGINEERING CONSTRAINTS

Q. Are there any possible engineering constraints associated with this project?

A. In the direct written testimony of Mr. Dan Mayers on page 37, it states, "Examples of engineering constraints include difficult topography, water crossings, crossing transmission or distribution lines, and other infrastructure facilities." Further explained by Mr. Mayers on the same page, it states "However, based on my review of the EA and utilizing my engineering background, I have reviewed the preferred route and alternative routes and identified no engineering constraints that cannot be overcome to construct and reliably operate Lone Star's lines along any of the preferred or alternative route segments. As is common practice in the industry, Lone Star will coordinate with the owners of transmission and distribution circuits and other infrastructure facilities."

H. COSTS

Q. What is Lone Star's estimated cost of constructing the proposed project on each of the proposed alternative routes?

A. The response to Question 13 of the Application provided the cost breakdown for the total estimated transmission facilities cost for each of the three projects along the preferred route. Also provided was a cost breakdown for the substation facilities for the projects. Attachment 5 of the Application shows the estimated total project cost for the Sam Switch Substation to be $26,100,000 and the Navarro substation to be $40,800,000. Attachment 5 of the Application also shows the total estimated project cost for the

transmission facilities along each of the proposed alternative routes for the Sam Switch-Navarro project and are shown below from least expensive to most expensive:[52]

Sam Switch-Navarro Project	
Route	Estimated Total Transmission Facilities Cost
SSN6	$50,400,000
SSN3	$50,700,000
SSN1	$53,200,000
SSN5	$54,300,000
SSN2	$54,700,000
SSN7	$55,700,000
SSN4	$56,000,000

The estimated total transmission facilities cost of Route SSN7 is approximately $5,300,000 more than the least expensive route (SSN6). The estimated cost of Route SSN7 is $300,000 less than Lone Star's preferred route SSN4.

Q. Do Lone Star's estimated costs for constructing the proposed transmission line from Sam Switch-Navarro appear to be reasonable?

A. The reasonableness of the final installed costs incurred to complete the project will be determined at a future date as part of a Lone Star Transmission Cost of Service (TCOS) proceeding.

[52] Acquired from Application at Attachment 5.

I. MODERATION OF IMPACT ON THE AFFECTED COMMUNITY AND LANDOWNERS

Q. Do the Commission's rules address routing alternatives intended to moderate the impact on landowners?

A. Yes. P.U.C. SUBST. R. 25.101(b)(3)(B) provides that "the line shall be routed to the extent reasonable to moderate the impact on the affected community and landowners unless grid reliability and security dictate otherwise."

Q. Subsequent to filing its Application, has Lone Star made or proposed any routing adjustments to accommodate landowners?

A. Not to my knowledge.

Q. Has Lone Star proposed any means to reduce the impact on landowners of acquiring new ROW for the proposed project?

A. Not to my knowledge.

Q. Has Lone Star proposed any means to reduce the impact of the Sam Switch-Navarro project on the landowners or the affected community other than addressing the requirements of P.U.C. SUBST. R. § 25.101(b)(3)(B)?

A. Not to my knowledge.

Q. Has Lone Star proposed any specific means by which it will moderate the impact of the proposed Sam Switch-Navarro project on landowners or the affected community, other than the use of good utility practices, acquisition of and adherence to the terms of all required permits, and what you have discussed above?

A. Not to my knowledge.

J. RIGHT-OF-WAY

Q. Do the Commission's rules address routing along existing corridors?

A. Yes, P.U.C. SUBST. R. 25.101(b)(3)(B) provides that the following factors are to be considered:

(i) whether the routes utilize existing compatible rights-of-way, including the use of vacant positions on existing multiple-circuit transmission lines;

(ii) whether the routes parallel existing compatible rights-of-way;

(iii) whether the routes parallel property lines or other natural or cultural features; and

(iv) whether the routes conform with the policy of prudent avoidance.

1. USE AND PARALLELING OF EXISTING, COMPATIBLE RIGHT-OF-WAY

Q. How will the Sam Switch-Navarro project use existing compatible ROW?

A. I conclude that this project uses no existing right-of-way.

Q. Please describe how Lone Star proposes to parallel existing compatible ROW for Sam Switch-Navarro project.

A. All of the routes parallel existing compatible ROW. The amount of existing, compatible ROW (transmission lines and public roads/highways) paralleled ranges from 30% to 70%

of a routes estimated total length.[53] Route SSN7 parallels the second most at 65%. Route SSN4 parallels 70%.[54] None of the routes parallel existing pipelines or railroads.

Q. Do any of the proposed routes for the Sam Switch-Navarro project parallel existing transmission lines?

A. All seven of the proposed routes parallel some existing transmission lines. The amount paralleled ranges from about 11% to 67% of a routes overall length.[55] Route SSN7 is parallel to transmission lines for approximately 60% of its length, the second highest percentage when compared to the other proposed routes. Route SSN4 is parallel to transmission lines for approximately 67% of its length.[56]

2. PARALLELING OF PROPERTY LINES OR OTHER NATURAL OR CULTURAL FEATURES

Q. Please describe how Lone Star proposes to parallel property line or other natural features for the Sam Switch-Navarro project.

A. All of the routes parallel a significant amount of streams. The amount of property lines and streams paralleled ranges from approximately 19% to 51% of a routes estimated overall length.[57] Route SSN7 parallels about 20% (6.9 miles) and Route SSN4 parallels about 19% (6.2 miles).[58]

[53] Staff calculation using data in EA, Table C-3, line criteria nos. 1-5.
[54] *Id.*
[55] *Id.* at line criteria nos. 1 and 2.
[56] *Id.*
[57] Staff calculation using data in EA, Table C-3, line criteria nos. 1, 6, and 19.
[58] *Id.*

K. PRUDENT AVOIDANCE

Q. Please define "prudent avoidance."

A. Prudent avoidance is defined by P.U.C. SUBST. R. 25.101(a)(4) as follows: "The limiting of exposures to electric and magnetic fields that can be avoided with reasonable investments of money and effort."

Q. How can exposure to electric and magnetic fields (EMF) be limited when routing transmission lines?

A. Primarily by proposing alternative routes that would minimize, to the extent reasonable, the number of habitable structures located in close proximity to the routes.

Q. How many habitable structures are located in close proximity to each of the proposed alternative routes?

A. The following summarizes the number of habitable structures located in close proximity to each of the proposed alternative routes, from least to most.[59]

Route	Number of habitable structures
SSN7	8
SSN4	11
SSN5	17
SSN1	17
SSN6	20
SSN2	20
SSN3	23

[59] Data acquired from EA, Table C-3, line criteria no. 8.

As can be seen from the above tabulation, Route SSN7 has the least amount of habitable structures (Qty 8) in close proximity to the center line. Lone Star preferred Route SSN4 has 11.

Q. Do you conclude that Lone Star proposed alternative routes that minimized, to the extent reasonable, the number of habitable structures located in close proximity to the routes?

A. Yes.

Q. Does this conclude your testimony?

A. Yes.

APPENDIX CR-1

Statement of Qualifications
Chris Roelse

I received a Bachelor of Science in Mechanical Engineering from the University of Texas (UT) at Austin.

In 1995, I joined Applied Materials (Austin, Texas) as a Manufacturing Technologist. I was production team leader for the manufacturing of semiconductor capital equipment. I was responsible for meeting production schedules, manufacturing new products, implementing process improvements, and training new employees. In 1997, I took a Mechanical Engineering position where I was responsible for quoting, designing, testing, and documenting customer requested non-standard designs into the product. In 1999, I took a position as Final Test Engineering Technician where I was responsible for testing and troubleshooting multi-million dollar equipment prior to being shipped to the customer. In 2001, I transferred into a Manufacturing Engineering position where I was responsible for transitioning new products from pilot manufacturing to volume production. Responsibilities included troubleshooting, engineering changes, product and process documentation, and cost reduction projects.

In 2005, I joined Accretech, USA (Austin, Texas) as a Manufacturing Engineer where I was responsible for the manufacturing of a new product in the semiconductor capital equipment industry. My responsibilities included manufacturing processes, material acquisition, outsourcing, product/process documentation, troubleshooting, engineering projects, and compliance with safety and industry standards. I was promoted to Manufacturing Engineering Manager becoming responsible for engineers on multiple product lines.

In January 2009, I started my employment with the Commission as an Engineering Specialist.

I have an Engineer-in-Training (EIT) certificate (#35534) in the State of Texas.

APPENDIX CR-2

List of Dockets Containing Testimony by Chris Roelse

PUC Docket Number	Description
37464	Application of Oncor Electric Delivery Company, LLC to Amend its Certificate of Convenience and Necessity for a Proposed CREZ 345 kV Transmission Line in Brown, Mills, Lampasas, McCulloch and San Saba Counties.
36995	Application of Oncor Electric Delivery Company, LLC to Amend a Certificate of Convenience and Necessity for a Proposed Transmission Line within Bell, Falls, Milam, and Robertson Counties.

TABLE C-3
Environmental Data For Alternative Route Evaluation
Sam Switch - Navarro Segment of the Transmission Line Project

Route	SSN1	SSN2	SSN3	SSN4	SSN5	SSN6	SSN7
1. Length of alternative route	38.0	35.4	34.1	33.3	36.2	34.8	34.1
2. Length of route parallel and adjacent to existing transmission lines	9.2	3.9	5.9	22.4	6.9	3.9	20.4
3. Length of route parallel and adjacent to existing public roads/highways	3.1	5.3	3.8	1.1	7.1	6.6	1.9
4. Length of route parallel and adjacent to existing pipelines	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. Length of route parallel and adjacent to railroads	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. Length of route parallel to apparent property boundaries	10.8	15.2	0.5	4.9	15.6	13.0	5.0
7. Total length of route parallel to existing corridors (including apparent property boundaries)	10.0	21.0	0.2	27.2	22.7	17.6	26.6
8. Number of habitable structures[1] within 500 ft of the route centerline	17	20	23	11	17	20	9
9. Length of route across parks/recreational areas[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10. Number of additional parks or recreational areas within 1,000 ft of the route centerline	1	1	1	1	1	1	0
11. Length of route through commercial/industrial areas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12. Length of route across agricultural pastureland	14.7	14.3	12.6	16.6	15.4	13.7	17.7
13. Length of route across agricultural cropland	15.7	14.4	14.2	10.2	14.7	14.8	10.5
14. Length of route across agricultural land with mobile irrigation systems	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15. Length of route across upland woodland	5.3	4.8	5.4	4.5	4.1	4.7	3.8
16. Length of route across bottomland forest, including forested wetlands	1.3	1.3	1.1	0.8	1.3	1.1	0.8
17. Length of route across emergent wetlands	0.5	0.6	0.3	0.9	0.6	0.4	0.9
18. Number of streams crossed by the route	02	05	00	03	03	04	03
19. Length of the streams parallel to routes (within 100 ft)	2.6	2.5	0.8	1.0	2.0	1.2	1.8
20. Number of known rare/unique plant locations within the ROW	0	0	0	0	0	0	0
21. Length of route through known habitat of endangered or threatened species	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22. Number of recorded cultural resource sites crossed by the route	1	2	1	1	-	0	0
23. Number of additional recorded cultural resource sites within 1,000 ft of the route centerline	-	5	4	-	4	3	2
24. Length of route across areas of high prehistoric and historic archaeological site potential	5.5	4.1	2.7	3.5	4.6	3.2	4.0
25. Number of FAA-registered airstrips > 3,200 ft long within 20,000 ft of the route centerline	0	0	0	0	0	0	0
26. Number of FAA-registered airstrips < 3,200 ft long within 10,000 ft of the route centerline	1	1	2	2		2	2
27. Number of private airstrips (non-FAA registered) within 10,000 ft of the route centerline	0	0	0	1	0	0	1
28. Number of heliports within 5,000 ft of the route centerline	0	0	0	0	0	0	0
29. Length of route across open water (lakes, ponds)	0.4	0.1	0.2	0.3	0.1	0.2	0.3
30. Number of commercial AM radio transmitters within 10,000 ft of route centerline	0	0	0	0	0	0	0
31. Number of FM radio transmitters, microwave relay stations, and other electronic installations within 2,000 ft	0	0	0	0	0	0	0
32. Number of U.S. or State Highways crossed by the route	2	2	2	2	2	2	2
33. Number of farm-to-market (FM), county roads, or other streets crossed by the route	33	25	20	18	23	27	19
34. Length of route within foreground visual zone of park/recreational areas (1/2 mile)	1.5	0.9	0.9	0.0	0.9	0.9	0.0
35. Length of route within foreground visual zone of State or U.S. Highways (1/2 mile)	2.3	2.2	2.2	3.8	2.2	2.2	3.8
Links	AAA,EBE,III	AAA,CCC,EEE,GGG,III	AAA,CCC,EEE,HHH	AAA,CCC,FFF	DDD,EEE,GGG,III	DDD,EEE,HHH	DDD,FFF

Note: All length measurements are in feet. All linear measurements were obtained from aerial photographs flown on May 19, 2000 and orthorectified to National Map Accuracy Standards of +/- 25 feet.

[1] Structures normally inhabited by humans or intended to be inhabited by or daily or regular basis. Habitable structures include but are not limited to single-family and multi-family dwellings and related structures, mobile homes, agricultural buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, and schools.

[2] Park or recreational area owned by a governmental body or an organized group, club, or church.

APPENDIX CR-3

IN MILES

Environmental Data For Alternative Route Evaluation
Sam Switch - Navarro Segment of the Transmission Line Project

	AAA	BBB	CCC	DDD	EEE	FFF	GGG	HHH	III
1 Length of alternative route	0.3	30.3	5.5	6.5	15.2	27.6	7.0	13.1	7.5
2 Length of route parallel and adjacent to existing transmission lines	0.2	2.6	2.3	0.5	0.0	19.9	0.0	3.4	6.4
3 Length of route parallel and adjacent to existing public roads/highways	0.0	2.4	1.1	1.9	4.0	0.0	0.5	0.7	0.7
4 Length of route parallel and adjacent to existing pipelines	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 Length of route parallel and adjacent to railroads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 Length of route parallel to apparent property boundaries	0.0	10.0	2.6	3.0	7.9	2.3	4.1	2.8	0.6
7 Total length of route parallel to existing corridors (including apparent property boundaries)	0.2	12.6	4.9	3.5	8.0	22.1	4.1	6.1	7.1
8 Number of habitable structures[1] within 500 ft of the route centerline	0	15	3	0	9	8	6	11	2
9 Length of route across parks/recreational areas[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 Number of additional parks or recreational areas within 1,000 ft of the route centerline	0	1	0	0	1	0	0	0	0
11 Length of route through commercial/industrial areas	0	0	0	0	0	0	0	0	0
12 Length of route across agricultural pastureland	0.0	9.9	0.6	1.7	5.4	16.0	3.5	6.6	4.8
13 Length of route across agricultural cropland	0.3	14.3	3.9	4.5	7.3	6.0	1.9	3.0	1.1
14 Length of route across agricultural land with mobile irrigation systems	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15 Length of route across upland woodland	0.0	4.3	0.8	0.1	1.8	3.7	1.2	2.8	1.0
16 Length of route across bottomland forest, including forested wetlands	0.00	1.05	0.25	0.23	0.44	0.53	0.34	0.39	0.28
17 Length of route across emergent wetlands	0.00	0.31	0.00	0.07	0.18	0.87	0.18	0.14	0.22
18 Number of streams crossed by the route	0	44	10	14	20	45	17	20	18
19 Length of the streams parallel to routes (within 100 ft)	0	0.98	0.32	0.60	0.36	0.98	0.23	0.25	1.58
20 Number of known rare/unique plant locations within the ROW	0	0	0	0	0	0	0	0	0
21 Length of route through known habitat of endangered or threatened species	0	0	0	0	0	0	0	0	0
22 Number of recorded cultural resource sites crossed by the route	0	1	1	0	0	0	1	0	0
23 Number of additional recorded cultural resource sites within 1,000 ft of the route centerline	0	1	1	0	2	2	0	1	2
24 Length of route across areas of high prehistoric and historic archaeological site potential	0.0	3.7	0.5	1.0	1.1	3.0	0.7	1.1	1.9
25 Number of FAA-registered airstrips > 3,200 ft long within 20,000 ft of the route centerline	0	0	0	0	0	0	0	0	0
26 Number of FAA-registered airstrips < 3,200 ft long within 10,000 ft of the route centerline	0	1	1	1	0	1	0	1	0
27 Number of private airstrips (non-FAA registered) within 10,000 ft of the route centerline	0	0	0	0	0	1	0	0	0
28 Number of heliports within 5,000 ft of the route centerline	0	0	0	0	0	0	0	0	0
29 Length of route across open water (lakes, ponds)	0.00	0.36	0.00	0.02	0.00	0.30	0.02	0.16	0.07
30 Number of commercial AM radio transmitters within 10,000 ft of route centerline	0	0	0	0	0	0	0	0	0
31 Number of FM radio transmitters, microwave relay stations, and other electronic installations within 2,000 ft	0	0	0	0	0	0	0	0	0
32 Number of U.S. or State Highways crossed by the route	0	1	0	0	1	2	0	1	1
33 Number of farm-to-market (F M), county roads, or other streets crossed by the route	0	30	4	5	14	14	4	8	3
34 Length of route within foreground visual zone of park/recreational areas (1/2 mile)	0.0	1.5	0.0	0.0	3.9	0.0	0.0	0.0	0.0
35 Length of route within foreground visual zone of State or U S Highways (1/2 mile)	0.0	1.2	0.0	0.0	1.1	3.6	0.0	1.1	1.1

Note: All length measurements are in feet. All line and area features were obtained from aerial photography flown on May 19, 2009 and ortho-rectified to National Map Accuracy Standards of +/- 30 feet.

[1] Structures normally inhabited by humans or intended to be inhabited by on a daily or regular basis. Habitable structures include but are not limited to single-family and multi-family dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, and schools.

[2] Defined as park or recreational area owned by a governmental body or an organized group, club, or church.

APPENDIX CR-4

APPENDIX CR-5

TEXAS PARKS & WILDLIFE

Life's better outside.

July 19, 2010

Mr. Brian Almon, P.E.
Public Utilities Commission
P.O. Box 13326
Austin, TX 78711-3326

RE: Lone Star Transmission's Central A to Central C to Sam Switch to Navarro 345-kilovolt (kV) Transmission Line Project, (PUC Docket No. 38230) Scurry, Mitchell, Fisher, Jones, Shackelford, Stephens, Palo Pinto, Callahan, Eastland, Comanche, Erath, Somervell, Bosque, Johnson, Hill, and Navarro Counties

Dear Mr. Almon:

Texas Parks and Wildlife Department (TPWD) received the Environmental Assessment (EA) and Alternative Route Analysis regarding the above-referenced proposed transmission line, which is part of the Competitive Renewable Energy Zones (CREZ) Scenario 2 Transmission Plan. TPWD staff has reviewed the EA and offers the following comments concerning this project.

Please be aware that a written response to a TPWD recommendation or informational comment received by a state governmental agency on or after September 1, 2009 may be required by state law. For further guidance, see the Texas Parks and Wildlife Code, Section 12.0011 which can be found online at http://www.statutes.legis.state.tx.us/Docs/PW/htm/PW.12.htm#12.0011. For tracking purposes, please refer to TPWD project number 15145 in any return correspondence regarding this project.

Project Description

The proposed project entails the construction of a new double-circuit 345-kV transmission line connecting the Central A Substation in Scurry County to the Central C Substation in Shackelford County, continuing to the proposed Sam Switch Substation in Hill County, and finally to the Navarro Substation in Navarro County. The proposed transmission line would be approximately 300 to 341 miles long depending on the route chosen and would be built as a single-circuit (double-circuit capable) line. Lone Star Transmission, LLC

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(Lone Star) retained Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) to prepare an EA and Alternative Route Analysis to support their application for a Certificate of Convenience and Necessity (CCN). Lone Star has proposed to use concrete pole structures in most areas. Most of the proposed line angle structures will utilize guy wires and anchors. In some cases, self supporting steel poles on concrete foundations would be utilized where guying is not possible. The proposed transmission line was evaluated in three segments: Central A to Central C (87 to 104 miles), Central C to Sam Switch (180 to 199 miles), and Sam Switch to Navarro (33 to 38 miles). Typical structure height would be approximately 110 feet. The proposed right-of-way (ROW) width for this project would be approximately 100 feet but would be wider in some places as required.

As included in Appendix A of the EA, TPWD provided preliminary information and recommendations regarding the entire CREZ Scenario 2 project to the PUC on January 21, 2009, and regarding the general study area for this specific project on August 3, 2009.

> **Recommendation:** Please review the above-referenced TPWD correspondence and consider the recommendations provided, as they remain applicable to the project as proposed.

Preferred Routes of Lone Star

As stated above, the proposed project was evaluated in three segments. The number of links used to create the alternative routes, the number of alternative routes evaluated in the EA, and the preferred route of Lone Star for each of the project segments is shown in the following table.

Route Segment	Number of Links	Number of Alternatives	Preferred Alternative of Lone Star
Central A to Central C	12	9	Route 6
Central C to Sam Switch	60	255	Route 14
Sam Switch to Navarro	9	7	Route 4

All 9 of the preliminary alternative routes developed for the Central A to Central C segment and all 7 of the preliminary alternative routes developed for the Sam Switch to Navarro segment were carried forward as alternatives

considered viable by Lone Star. Of the 265 preliminary alternative routes developed for the Central C to Sam Switch segment, 14 were carried forward as viable.

Route Selection

Threatened and Endangered Species Information

In direct testimony on behalf of Lone Star, Mark Van Dyne of Burns & McDonnell stated that according to TPWD personnel, the occurrences of rare, threatened, and endangered species documented in the Texas Natural Diversity Database (TXNDD) have been mapped by TPWD based on historic records, oral descriptions, and various other means; therefore these areas are not exact boundaries and are not considered to be completely accurate. Burns & McDonnell utilized this data for informational purposes and to supplement the more detailed helicopter surveys that were conducted to identify potential environmentally sensitive areas along the alternative routes.

TPWD supports the use of TXNDD data as a resource to supplement or inform more detailed surveys. TXNDD records are mapped using polygons that incorporate provided location information as well as the locational uncertainty inherent in the information. TXNDD records depict locations of occupied or previously occupied habitat for rare, threatened, and endangered species and other significant ecological features. All areas within a geographic boundary used to represent a species occurrence in the TXNDD are not known to be occupied or previously occupied habitat; however TXNDD mapping methodology is designed to provide reasonable certainty that the occupied habitat was located somewhere within that boundary at the time the occurrence was recorded.

> **Recommendation:** In general TPWD recommends the PUC consider the presence of TXNDD records on or near an alternative route as an indication that the represented rare or protected species may be present on that route if suitable habitat exists. TXNDD records do not delineate the extent of occupied habitat. Although some, but not all, TXNDD records do contain a large amount of locational uncertainty, the presence of a TXNDD record in an area indicates that some portion of the habitat in that area was or is occupied by that rare or protected species. Nearby suitable habitat may be occupied by that species even if no occurrence of the species has been documented in that exact

location or if the TXNDD record is not accurate enough to determine exactly where within the polygon the species was seen.

Federal Law

Endangered Species Act (ESA)

Federally-listed animal species and their habitat are protected from "take" on any property by the ESA. Take of a federally-listed species can be allowed if it is "incidental" to an otherwise lawful activity and must be permitted in accordance with Section 7 or 10 of the ESA. Federally-listed plants are not protected from take except on lands under federal/state jurisdiction or for which a federal/state nexus (i.e., permits or funding) exists. Any take of a federally-listed species or its habitat without the required take permit (or allowance) from U.S. Fish and Wildlife Service (USFWS) is a violation of the ESA.

Whooping Crane

When combined, the Central C to Sam Switch segment and Sam Switch to Navarro segment cross the majority of the 200-mile-wide corridor in which 95 percent of sightings of the federal- and state-listed endangered Whooping Crane (*Grus americana*) have been documented during migration. As stated in Section 7.1.6.1 of the EA, the proposed project has the potential to adversely affect this species by means of inadvertent collisions and possible human disturbance during construction and maintenance activities.

Recommendation: In the absence of surveys for suitable stopover habitat prior to route selection, TPWD recommends that during route selection the PUC assume all route segments that come near or cross shallow wetland habitats such as marshes, small ponds, lake edges, and some river habitat contain potential stopover habitat for the Whooping Crane.

Preferred Routes of Lone Star

The basis for recommendation of preferred routes for each of the three project segments was provided in the direct testimony of Dan Mayers on behalf of Lone Star, obtained by TPWD from the PUC interchange Web site.

Central A to Central C Segment

According to the testimony of Dan Mayers, Route 6 was selected by Lone Star as the preferred route for the Central A to Central C segment because this route has the highest percent of the proposed route parallel to existing transmission lines and is competitive with other routes both in terms of its cost estimate and the number of habitable structures within 500 feet.

Other CREZ Lines

Link C within Route 6 of the Central A to Central C segment is located approximately 500 feet from the existing Tonkawa Substation. According to SOAH Docket # 473-10-0400, the approved route for the Oncor Electric Delivery Company (Oncor) Central A to Tonkawa CREZ transmission line is Route 28, as evaluated in PUC Docket Number 37409. Only a very small portion of Lone Star's Route 6 parallels the approved route for Oncor's Central A to Tonkawa line, and Oncor's approved route was not evaluated as an alternative for this portion of Lone Star's Central A to Central C line. According to testimony by Dan Mayers, there are no reliability concerns associated with constructing or operating some portions of this project parallel to existing 345-kV transmission lines.

If there are no reliability concerns, it is unclear to TPWD why there would be two separate, distinct lines between the same two substations.

Water Resources

Route 6 of Lone Star's Central A to Central C segment crosses the Clear Fork of the Brazos River twice and is located less than one mile north of Lake Fort Phantom Hill along apparent property boundaries. In direct testimony, Dan Mayers states that Lone Star would prefer to avoid Link L, located south of Lake Fort Phantom Hill, because this route would result in multiple crossings of an existing Oncor 345-kV transmission line and would result in scheduled outages and coordination issues. However, routes that contain Link L are still viable and constructible.

Central C to Sam Switch Segment

According to the testimony of Dan Mayers, Route 14 was selected as the preferred route of Lone Star for the Central C to Sam Switch segment because

it is among the routes with the fewest habitable structures within 500 feet of the transmission centerline, parallels existing transmission lines for a significant portion of the route, and is competitive with all others in terms of cost estimates.

Federal Law

Endangered Species Act

Section 7.1 6.1 of the EA states that suitable habitat for the federal- and state-listed endangered Golden-cheeked Warbler (*Dendroica chrysoparia*) was found along links EF, WW, RR, II, and KK1 during helicopter surveys. Link KK1 is included in Lone Star's preferred Route 14.

In direct testimony, Dan Mayers states that if a route including one of these links is approved by the PUC, Lone Star will conduct a survey of the identified area to determine if it contains actual habitat and avoid or mitigate as appropriate. The EA states that, upon approval of a final route, a detailed survey will be conducted along the proposed transmission line to determine if the project crosses habitat that is occupied by Golden-cheeked Warblers and, if necessary, Lone Star will coordinate with the USFWS.

The EA states that no suitable habitat for the federal- and state-listed endangered Black-capped Vireo (*Vireo atricapilla*) was determined to be present along any of the alternative routes. The EA also states that marginally suitable habitat for this species was observed on some of the immediately adjacent properties, and portions of some of the alternative routes do provide potential habitat for transient or migrating Black-capped Vireo.

The EA did not discuss whether the presence or absence of suitable habitat for other federally-listed species, such as the Whooping Crane, or state-listed species was detected during helicopter surveys.

Managed Areas

Dan Mayers states that crossings of property owned by the U.S. Army Corps of Engineers (USACE) were considered very important in the analysis for this segment, and routes that crossed the Brazos River south of Lake Whitney were deemed less desirable because, according to the testimony, they would require a Section 10 permit from the USACE. Links that crossed USACE fee-owned

property were eliminated due to potential project delays associated with the preparation of the required Environmental Impact Statement (EIS). However, the testimony states that the USACE indicated that links crossing short lengths of USACE fee-owned property along existing easements would only require the preparation of an EA rather than a lengthier EIS, and those routes were therefore not eliminated. Route 14 crosses 0.8 mile of a flowage easement managed by the USACE located north of Lake Whitney

Sam Switch to Navarro Segment

Route 4 was selected as the preferred alternative for the Sam Switch to Navarro Segment because, relative to the other alternative routes, Route 4 has the second fewest habitable structures within 500 feet of the transmission centerline and the highest percentage of the route parallel to existing transmission line ROW.

Overall Route Impacts

According to the information provided in Table 7-1 of the EA, of the seven alternative routes evaluated for the Sam Switch to Navarro segment, Route 4 is the shortest route, parallels the most transmission lines, and would result in the shortest distance across bottomland forest, including forested wetlands, and the third shortest distance across upland woodland. Route 4 would also have the shortest distance along new ROW (calculated by subtracting line 7 from line 1). Of the seven alternatives considered, Route 4 would result in the third shortest length across upland woodlands and parallel to streams within 100 feet and would cross the third lowest number of streams.

Alternative Routes

The evaluation below is based solely on the natural resource information provided in the CCN application and the EA, as well as publicly available information examined in a Geographic Information System. TPWD does not have sufficient information to support a preferred alternative route because the EA did not provide necessary information regarding potential impacts to all rare and protected species based on surveys (aerial or on-the-ground), remote sensing, modeling, or other available analysis techniques.