Routing Study and Environmental Assessment for Southwestern Public Service Company Proposed TUCO to Texas/Oklahoma Interconnect 345 kV Transmission Line Project

Prepared for:

Southwestern Public Service Company

600 South Tyler Amarillo, Texas 79101

Prepared by:

TRC Environmental Corporation 505 East Huntland Drive, Suite 250 Austin, Texas 78752



Docket No. 38877

March 2011

CONTENTS

1.0	INTRODUCTION AND PROJECT DESCRIPTION	1-1
1.1	Project Scope	1-1
1.2	Project Purpose and Need	1-5
1.	.2.1 Right-of-Way Requirements	
1.3	PERMITS AND APPROVALS	1-5
2.0	ROUTING STUDY	2-1
2.1	Study Area Delineation and Data Collection	2-1
2.2	Identification of Potential Route Segments	2-2
2.3	Field Reconnaissance	2-2
2.4	Identification of Preliminary Alternative Route Segments	2-3
2.5	Public Involvement Program	2-3
2.	.5.1 Agency Correspondence and Meetings	2-3
2.	.5.2 Public Open House Meetings	2-7
2.	.5.3 Landowner Consultation	2-9
2.	.5.4 Other Public Involvement Process Tools	2-9
2.6	Adjustments to Preliminary Alternative Route Segments	2-10
3.0	IDENTIFICATION OF ALTERNATIVE ROUTES	3-1
4.0	ENVIRONMENTAL SETTING	4-1
4.1	Physiography and Geology	4-1
4.	.1.1 High Plains	4-1
4.	.1.2 North-Central Plains	4-2
4.2	Soils	4-3
4.	.2.1 Prime Farmland Soils	4-3
4.3	Water Resources	4-3
4.	.3.1 Surface Water/Floodplains	4-3
4.	.3.2 Groundwater/Aquifers	4-14
	4.3.2.1 Major Aquifers	4-14
	4.3.2.2 Minor aquifers	4-14
4.	.3.3 Wetlands	4-19
4.4	Vegetation, Fisheries, and Wildlife	4-20
4.	.4.1 Vegetation	4-20
	4.4.1.1 Community Types	
	4.4.1.2 Unique, Sensitive, or Protected Vegetation Communities	
Л	4.4.1.5 State and/or rederany protected vegetative species	4-50 1_20
4. 1	12 Wildlife	
4.	AA31 Unique Sensitive or Protected Wildlife Habitats	
	4.4.3.2 State and/or Federally Protected Wildlife Species	
4.5	Community Values and Resources	
4.6	Land Use	4-50
4.	.6.1 Urban/Residential Areas and Habitable Structures (Section 20 of the PUC CCN Application	Form) 4-51
4.	.6.2 Parks and Recreation Areas (Section 25 of the PUC CCN Application Form)	4-52
4.	.6.3 Irrigation Systems (Section 23 of the PUC CCN Application Form)	4-52

4.6.4 Aesthetics	
4.6.5 Transportation/Aviation	
4.6.5.1 Roadways	
4.6.5.2 Aviation Facilities (Section 22 of the PUC CCN Application Form	າ)
4.6.5.3 Electronic Installations (Section 21 of the PUC CCN Application	Form) 4-54
4.6.6 Coastal Management Program (Section 27 of the PUC CCN /	Application Form) 4-54
4.7 HISTORICAL AND ARCHAEOLOGICAL SITES (SECTION 26 OF THE PUC CCN AF	PLICATION FORM) 4-54
4.7.1 Cultural Background	
4.7.1.1 Paleoindian Period (ca. 9500–5500 B.C.)	
4.7.2.2 Archaic Period (ca. 5500 B.C.–A.D. 250)	
4.7.2.3 Late Prehistoric and Protohistoric Periods (A.D. 250–1450)	
4.7.2.4 Protohistoric Periods (A.D. 1450–1800)	
4.7.3 Previous Investigations	
4.7.4 Archaeological Assessment	
4.8 MINERAL AND ENERGY RESOURCES	
4.8.1 Non-Fuel Minerals	
4.8.2 Organic Fuel Minerals	
SELECTION	ES FOR FREFERRED ROUTE
5.1 Physiography and Geology	
5.2 Soils	
5.3 WATER RESOURCES	
5.3.1 Surface Waters	
5.3.2 Floodplains	
5.3.3 Groundwater	
5.3.4 Wetlands	
5.4 VEGETATION, FISHERIES, AND WILDLIFE	
5.4.1 Vegetation	
5.4.1.1 Unique, Sensitive, or Protected Vegetation Communities	
5.4.2 FISHERIES	
5.4.3 Wildlife	
5.4.3.1 Unique, Sensitive, or Protected Wildlife Habitats	
5.4.3.2 Migratory Birds	
5.4.3.3. Threatened and Endangered Species	
5.5 Community Values and Resources	
5.5.1 Community Values	
5.5.2 Community Resources	
5.6 Land Use	
5.6.1 Urban and Residential Areas and Habitable Structures (Sect	ion 20 of the PUC CCN Application Form) 5-
14	
5.6.2 Parks and Recreation Areas (Section 25 of the PUC CCN Ann	lication Form)
5.6.3 Irrigation Systems (Section 23 of the PUC CCN Application Fi	orm)
5.6.4 Aesthetics	5-16
5.6.5 Transportation and Aviation	5-16 5-16
5.6.5.1 Roadways	J-10 5_16
5.6.5.2 Aviation Facilities (Section 22 of the PLIC CCN Application Form	5-16 م
	.,

5.0	6.6 Electronic Installations (Section 21 of the PUC CCN Application Form)	. 5-17
5.7	HISTORICAL AND ARCHAEOLOGICAL SITES (SECTION 26 OF THE PUC CCN APPLICATION FORM)	. 5-18
5.	7.1 Archaeological and Historical Resources	. 5-18
5.	7.3 Native American Tribal Consultation	. 5-19
5.8	MINERAL AND ENERGY RESOURCES	. 5-20
6.0	SELECTION OF THE PREFERRED ROUTE	6-1
7.0	LIST OF PREPARERS	7-1
8.0	REFERENCES	8-1

LIST OF FIGURES

FIGURE 1-1	Project Study Area	1-3
FIGURE 2-1	(SHEETS 1-7) ALTERNATIVE ROUTE SEGMENTS AND OPPORTUNITIES AND CONSTRAINTS IN THE STUDY A	REA (OVERSIZED
	MAPS)	APPENDIX B
FIGURE 2-2	(Sheets 1-7) Preliminary Alternative Route Segments	APPENDIX C
FIGURE 2-3	Alternative Route Segment X Map	2-15
FIGURE 2-4	Alternative Route Segment BB Map	2-17
FIGURE 2-5	Alternative Route Segment AI Map	2-19
FIGURE 2-6	Alternative Route Segment UU Map	2-21
FIGURE 2-7	Alternative Route Segment AR Map	2-23
FIGURE 2-8	Alternative Route Segment AU Map	2-25
FIGURE 2-9	Alternative Route Segment BF Map	2-27
FIGURE 2-10	ALTERNATIVE ROUTE SEGMENT CP, EP, CM MAP	2-29
FIGURE 2-11	Alternative Route Segment EA Map	2-31
FIGURE 2-12	PRELIMINARY ALTERNATIVE ROUTE SEGMENT REMOVED FROM CONSIDERATION CK MAP	2-33
FIGURE 2-13	PRELIMINARY ALTERNATIVE ROUTE SEGMENT REMOVED FROM CONSIDERATION DN MAP	2-35
FIGURE 2-14	PRELIMINARY ALTERNATIVE ROUTE SEGMENT REMOVED FROM CONSIDERATION EX MAP	2-37
FIGURE 2-15	PRELIMINARY ALTERNATIVE ROUTE SEGMENT REMOVED FROM CONSIDERATION AV MAP	2-39
FIGURE 2-16	PRELIMINARY ALTERNATIVE ROUTE SEGMENT REMOVED FROM CONSIDERATION RR MAP	2-41
FIGURE 2-17	PRELIMINARY ALTERNATIVE ROUTE SEGMENT REMOVED FROM CONSIDERATION FF MAP	2-43
FIGURE 2-18	PRELIMINARY ALTERNATIVE ROUTE SEGMENT REMOVED FROM CONSIDERATION FF MAP	2-45
FIGURE 2-19	PRELIMINARY ALTERNATIVE ROUTE SEGMENT REMOVED FROM CONSIDERATION EA MAP	2-47
FIGURE 2-20	PRELIMINARY ALTERNATIVE ROUTE SEGMENT REMOVED FROM CONSIDERATION EN MAP	2-49
FIGURE 3-1	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA	3-3
FIGURE 3-2	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 1	3-5
FIGURE 3-3	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 2	3-7
FIGURE 3-4	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 3	3-9
FIGURE 3-5	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 4	3-11
FIGURE 3-6	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 5	3-13
FIGURE 3-7	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 6	3-15
FIGURE 3-8	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 7	3-17
FIGURE 3-9	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 8	3-19
FIGURE 3-10	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 9	3-21
FIGURE 3-11	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 10	3-23

GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 11	3-25
GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 12	3-27
GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 13	3-29
GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 14	3-31
GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 15	3-33
GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 15	3-35
GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 17	3-37
GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 18	3-39
GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 19	3-41
GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 20	3-43
PRIME FARMLAND SOILS IN THE STUDY AREA	4-5
WATERSHEDS IN THE STUDY AREA	4-9
SURFACE WATERS IN THE STUDY AREA	4-11
FEMA 100-year Floodplains in the Study Area	4-15
MAJOR AND MINOR AQUIFERS IN THE STUDY AREA	4-17
Kansan Biotic Province	4-21
VEGETATIONAL AREAS OF TEXAS	4-23
VEGETATION TYPES IN THE STUDY AREA	4-25
KNOWN OCCURRENCES OF THREATENED, ENDANGERED, OR SENSITIVE SPECIES IN THE STUDY AREA	4-37
Lesser Prairie Chicken Estimated Range and Habitat	4-43
ARCHAEOLOGICAL PLANNING REGIONS OF TEXAS	4-57
	GENERAL LOCATION OF ALTERNATIVE ROUTES IN THE STUDY AREA ALTERNATIVE ROUTE 11

LIST OF TABLES

TABLE 1-1 MAJOR PERMITS, APPROVALS, AND CONSULTATIONS FOR THE PROJECT	1-6
TABLE 2-1 SUMMARY OF MEETINGS AND COMMUNICATIONS WITH ELECTED OFFICIALS	2-7
TABLE 2-2 OPEN HOUSE LOCATIONS	2-7
TABLE 2-3 Public Library Locations	2-10
TABLE 3-1 Alternative Route and Route Segments	3-1
TABLE 4-1 WATERWAYS IN THE STUDY AREA RECOMMENDED FOR ECOLOGICALLY SIGNIFICANT STREAM SEGMENTS DES	IGNATION . 4-13
TABLE 4-2 COMMON WILDLIFE SPECIES OF THE KANSAN BIOTIC PROVINCE	4-31
TABLE 4-3 FEDERAL AND STATE PROTECTED SPECIES THAT MAY OCCUR IN THE STUDY AREA COUNTIES	4-34
TABLE 4-4 1990 AND 2000 CENSUS DATA FOR STUDY AREA	4-50
TABLE 4-5 COMMUNITY DATA FOR TOWNS/CITIES WITHIN THE STUDY AREA	4-51
TABLE 4-6 ROUTE SEGMENTS CROSSING THE TEXAS PLAINS TRAIL	4-53
TABLE 4-7 DESCRIPTION OF HIGHWAYS IN THE STUDY AREA	4-53
TABLE 4-8 PREVIOUSLY RECORDED ARCHAEOLOGICAL LOCATIONS WITHIN 1,000 FEET OF PROPOSED CENTER LINES	4-59
TABLE 5-1 QUANTITATIVE DATA FOR ALTERNATIVE ROUTES	5-3
TABLE 5-2 AVIATION FACILITIES	5-17
TABLE 5-3 Electronic Installations Relative to Transmission Line Segments	5-18

LIST OF APPENDICES

- APPENDIX A Agency Correspondence
- APPENDIX B Figure 2-1 (Sheets 1-7): Alternative Route Segments and Opportunities and Constraints in the Study Area (oversized maps)
- APPENDIX C Figure 2-2 (Sheets 1-7): Preliminary Alternative Route Segments (oversized maps)
- APPENDIX D Public Involvement
- APPENDIX E Alternative Route Segment Descriptions
- APPENDIX F Soil Types in the Study Area
- APPENDIX G Habitable Structures within 500 Feet of the Alternative Route Segments

AM	Amplitude Modulation
APLIC	Avian Power Line Interaction Committee
BEG	Bureau of Economic Geology
CCN	Certificate of Convenience and Necessity
CFR	Code of Federal Regulations
CRP	Conservation Reserve Program
ESA	Endangered species Act
ESSS	Ecologically Significant Stream Segment
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FEMA	Federal Emergency Management Agency
FM	Frequency Modulation
FSA	Farm Service Agency
GIS	Geographic Information System
HPAs	High probability areas
kV	Kilovolt
MBTA	Migratory Bird Treaty Act
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
ODWC	Oklahoma Department of Wildlife Conservation
OG&E	Oklahoma Gas and Electric Company
OK	Oklahoma
OWRB	Oklahoma Water Resources Board
PLJV	Playa Lakes Joint Venture
Project	TUCO Substation to Texas/Oklahoma Interconnect
PUC	Public Utility Commission
PURA	Public Utility Regulatory Act
RRC	Railroad Commission of Texas
ROW	Right-of-way
SPP	Southwest Power Pool, Inc.
SPS	Southwestern Public Service Company
SWPPP	Storm Water Pollution Prevention Plan
TAC	Texas Administrative Code
TARL	Texas Archeological Research Laboratory
THC	Texas Historical Commission
TPWD	Texas Parks and Wildlife Department
TRC	TRC Environmental Corporation
TWDB	Texas Water Development Board
ТХ	Texas
TXNDD	Texas Natural Diversity Database

United States
United States Army Corps of Engineers
United States Department of Agriculture
United States Fish and Wildlife Service
United States Geological Survey
Wetlands Reserve Program

1.0 INTRODUCTION AND PROJECT DESCRIPTION

TRC Environmental Corporation (TRC), with input from Southwestern Public Service Company (SPS), a subsidiary of Xcel Energy Inc., developed the Environmental Assessment and Routing Study for the TUCO to Texas/Oklahoma Interconnect 345 kilovolt (kV) Project. The Environmental Assessment and Routing Study were conducted by the Project Team in support of SPS's application for a Certificate of Convenience and Necessity (CCN) to the Public Utility Commission of Texas (PUC). The Project Team included project management, engineering, environmental, and land/real estate representatives from SPS and TRC. The analysis process began by delineating a Study Area for the proposed 345 kV Project. The boundaries of the Study Area were influenced by the location of the existing facility (TUCO Substation), other existing rights-of-way (ROW) (roads, highways, pipelines, canals, etc.), and existing biological and land use features. Study Area delineation required the identification of constraints in the area encompassing the project termination point (Texas/Oklahoma Interconnect), and inclusion of a large enough area within which alternative routes could be delineated to provide a geographic diversity for the analysis.

1.1 Project Scope

As part of the Southwest Power Pool, Inc. (SPP) Balanced Portfolio Report, SPP directed SPS and Oklahoma Gas & Electric (OG&E) to construct approximately 250 miles of new 345 kV transmission circuit from the existing SPS TUCO Substation in Hale County, Texas, to the proposed OG&E Woodward Substation in Woodward County, Oklahoma. Of the proposed 250 miles, SPS proposes to construct, own, operate, and maintain an approximately 187-mile portion of the circuit and an interconnect point, starting from the existing TUCO Substation and ending at a location approximately 3 miles east of the Texas/Oklahoma state line and approximately 600 feet west of the eastern intersection of E1250 Road and N1700 Road in Beckham County, Oklahoma (35° 12' 15.202" N, -99° 56' 36.075" W). (TUCO to Texas/Oklahoma Interconnect 345 kV Transmission Line Project, or Project). The Study Area of the Project includes portions of Lubbock, Hale, Floyd, Motley, Cottle, Swisher, Briscoe, Hall, Childress, Donley, Collingsworth, and Wheeler counties, Texas, as well as Beckham County, Oklahoma. Figure 1-1 depicts the Project Study Area.

The scope of the Project included delineating a Study Area, collecting data (i.e., aerial photography, geographic information system (GIS) data), conducting literature reviews and records searches, identifying and mapping opportunities and constraints in the Study Area, and examining the environmental setting of the Study Area in relation to potential Project impacts. The Routing Study included development of Preliminary Alternative Route Segments, desktop review of the Study Area's environmental settings, solicitation of and response to public input, conducting field reconnaissance, and arriving at the Preferred and Alternative Routes.



1.2 **Project Purpose and Need**

In June of 2009, SPP created a Balanced Portfolio Report as a strategic initiative to develop a cohesive grouping of economic upgrades that benefit the SPP region and allocates the cost of those upgrades regionally. Projects in the Balanced Portfolio include transmission upgrades of 345 kV projects that will provide customers with potential savings that exceed project costs. These economic upgrades are intended to reduce congestion on the SPP transmission system, resulting in savings in generation production costs. Economic upgrades may provide other benefits to the power grid (i.e., increasing reliability and lowering required reserve margins, deferring reliability upgrades, and providing environmental benefits) due to more efficient operation of assets and greater utilization of renewable resources.

As a result of the planning in the Balanced Portfolio Report, on June 19, 2009, SPP sent SPS a Notification to Construct "178 miles of 345 kV, 3,000 amp or greater capacity transmission line from SPS TUCO Substation to OG&E interception around the Texas/Oklahoma state line and acquire ROW able to accommodate the 345 kV line." Therefore, the purpose of the Project is to reduce congestion on the SPP transmission system, resulting in economic upgrade and improvement of electric reliability in the Panhandle area.

1.2.1 Right-of-Way Requirements

The proposed ROW width for this Project will typically be 150 feet. Additional ROW may be required to accommodate line angle and dead-end structures. ROW width may vary to accommodate topographic conditions or other construction issues. Access easements may be required during construction and for ongoing operation and maintenance of the facilities. The ROW will be maintained to allow for the safe operation and maintenance of the transmission line. SPS will work to minimize the adverse effects of electric transmission line construction on the natural environment.

1.3 Permits and Approvals

The construction, operation, and maintenance of the Project will require permits and regulatory approvals from various federal, state, and local agencies. The Project Team has initiated consultation with various agencies including the United States (U.S.) Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), Texas Parks and Wildlife Department (TPWD), and other federal and/or state wildlife management and environmental agencies. The applicable federal, state, and local permits and approvals that could be required for this Project and the corresponding responsible agencies are summarized in Table 1-1. Appendix A contains a summary of agency consultation and copies of pertinent agency correspondence regarding the Project.

TABLE 1-1			
Major Permits, Approvals, and Consultations for the Project			
Agency Permit/Approval/Consultation			
FEDERAL			
Advisory Council on Historic Preservation	Comment on the project and its effect on historic properties under Section 106 of the National Historic Preservation Act		
U.S. Army Corps of Engineers, Fort Worth District and Tulsa District	Authorization to discharge dredged or fill material into waters of the U.S. under Section 404, Clean Water Act		
U.S. Department of the Interior, U.S. Fish and Wildlife Service	Consultation regarding compliance with Sections 7 or 10 of the Endangered Species Act, the Migratory Bird Treaty Act, and the Fish and Wildlife Coordination Act		
U.S. Environmental Protection	Comment on the project and its effect on Section 402, Clean Water Act, National Pollutant Discharge Elimination System (permitting authority delegated to the Texas Commission for Environmental Quality)		
Agency	Section 404, Clean Water Act (veto power for wetland permits issued by the U.S. Army Corps of Engineers)		
STATE			
Public Utility Commission of Texas	Certificate of Convenience and Necessity under the Texas Public Utility Regulatory Act		
	Section 401, Clean Water Act, Water Quality Certification		
Texas Commission for Environmental Quality	Section 402, Clean Water Act, Texas Pollutant Discharge Elimination System Construction Storm Water Discharge Permit (General Construction Permit No. TXR150000)		
Texas General Land Office	Miscellaneous Easement for ROW crossing of state-owned riverbed or navigable stream		
Texas Historical Commission, State Historic Preservation Office	Review and comment on undertakings potentially affecting cultural resources (Section 106, National Historic Preservation Act)		
Texas Parks and Wildlife Department	State-listed threatened and endangered species consultations, Caprock Canyons State Park and Trailway consultation		
Texas Department of Transportation	Road crossing permits for state-maintained roads and highways		
COUNTIES			
County Public Works Department	Road crossing permits for county-maintained roads		

2.0 ROUTING STUDY

Route selection was conducted in accordance with Public Utility Regulatory Act (PURA) § 37.056(c)(4)(A)-(D), and considers various aspects of the natural and human environment including community values, recreational and park areas, historical and aesthetic values, and environmental integrity. The team involved in the Routing Study included experts in the following disciplines and areas of expertise:

- SPS project management, environmental permitting, engineering/design, system planning, construction, operations and maintenance
- TRC routing, ecology, land use, cultural resources, biological resources, GIS, database development, and information technology

The process used to evaluate and select the alternative routes included the following steps:

- Study Area Delineation and Data Collection
- Identification of Potential Route Segments
- Field Reconnaissance
- Identification of Preliminary Alternative Route Segments
- Public Involvement
- Adjustments to Preliminary Alternative Route Segments
- Identification of Preliminary Alternative Routes
- Evaluation and Selection of the Preferred and Alternative Routes

2.1 Study Area Delineation and Data Collection

The Project Team identified a Study Area encompassing the defined endpoints of the TUCO Substation and the point of interconnection, approximately 3 miles east of the Texas/Oklahoma state line and approximately 3 miles southeast of Texola, Oklahoma. Specifically, this site is located approximately 600 feet west of the eastern intersection of E1250 Road and N1700 Road in Beckham County, Oklahoma (35° 12' 15.202" N, -99° 56' 36.075" W). During initial planning stages the Study Area was to be defined as a 20-mile-wide area centered between the TUCO Substation and the defined point of interconnection. The purpose of identifying and defining the Study Area was to allow the team to focus efforts to identify and obtain information within the Study Area that could influence the route selection, including both routing opportunities and routing constraints.

The Project Team gathered data from various federal, state, and local officials and agencies; conducted literature, file, and record reviews; reviewed a variety of maps; and collected GIS data. Publicly available data sources were utilized to the extent feasible. Based on an initial review of this data, a major routing constraint, the Caprock Canyons State Park and Trailway, was identified. This is a 15,000-acre multi-use state park operated by TPWD near the center of the Study Area that includes a 64-mile-long trailway that traverses the Study Area east to west. Additional information on this park and recreation area is provided in Sections 4.6.2 and 5.6.2.

The Study Area was expanded to allow for additional potential routes that would minimize and/or avoid potentially impacting the Caprock Canyons State Park and Trailway as well as provide additional opportunities to cross the numerous creeks and rivers in the area.

As part of the data collection effort, SPS captured new high resolution aerial photography of the Study Area in May 2010. This photography was used to verify and supplement the available satellite imagery and information contained in the publicly available databases. The Project Team also used the photography to identify existing land uses, identify potential habitable structures, and locate existing electric transmission lines and other natural or human environmental features considered during the analysis and mapping of opportunities and constraints. This information was verified during later field reconnaissance (see Section 2.3).

Routing opportunities considered during the Routing Study include:

- Existing infrastructure
- Property/Tract lines

Routing constraints considered during the Routing Study include:

- Habitable structures
- Electronic installations
- Aviation facilities
- Agricultural land
- Parks and recreations areas
- Special land uses
- Recorded historic and archaeological sites
- Environmentally sensitive areas

Opportunities and constraints in the Study Area are mapped and included as Figure 2-1 (Sheets 1-7), which are provided as oversized maps in Appendix B.

2.2 Identification of Potential Route Segments

The next step in the routing process was to identify potential route segments that would allow the Project Team to assemble several viable and complete transmission line route alternatives to connect the TUCO Substation to the interception point in Oklahoma. To help analyze opportunities and constraints for siting the Project, the Project Team incorporated the aerial photography and other data collected into GIS data layers which enabled the Project Team to create "overlays" of information that enhanced alternative route comparison. The GIS data layers were used to evaluate numerous combinations of opportunities and constraints. The primary objective of this effort was to maximize use of opportunities and to avoid and/or minimize impacts to constraints.

2.3 Field Reconnaissance

On July 16 - 24, 2010, the Project Team conducted a helicopter reconnaissance augmented by

on-the-ground field reconnaissance of the potential route segments, with the following objectives:

- Confirm the location of opportunities and constraints initially identified in the GIS database and on the aerial photography
- Confirm that the locations of the potential route segments were accurate to on-theground features and maximized use of unobstructed paths while avoiding or minimizing constraints
- Confirm the constructability of the potential route segments
- If required, modify the location of any potential route segments to meet the objective of avoiding or minimizing impacts to constraints
- Confirm type and location of habitable structures within 600 feet of the potential route segments to ensure robust data collection and analysis
- Where paralleling an existing linear feature, confirm that the location (side) of the potential route segment relative to the feature is appropriate and accurate
- Confirm the location of airports or airfields and electronic installations

2.4 Identification of Preliminary Alternative Route Segments

As a result of the field reconnaissance, the Project Team incorporated appropriate modifications to the potential route segments and added additional segments. These new and modified route segments became the Preliminary Alternative Route Segments that would go forward and be presented to the public at the open house meetings held September 13 - 16, 2010 as part of the Public Involvement Program. The Preliminary Alternative Route Segments (Figure 2-2 (Sheets 1-7)) presented at the open house meetings are provided as oversized maps in Appendix C.

2.5 Public Involvement Program

The Project Team designed and executed a proactive Public Involvement Program. The purpose of this program was to provide information about SPS, present the Preliminary Alternative Route Segments to the public, and to solicit comments and input from residents, landowners, public officials, elected officials, resource agencies, special interest groups, and other non-governmental organizations affected by or interested in the Project. The Public Involvement Program focused on compliance with the regulatory requirement for SPS's CCN Application, and was executed to inform the public about the Project, obtain feedback on routing alternatives, and discuss opportunities and constraints in the Study Area and along the potential routes.

2.5.1 Agency Correspondence and Meetings

Representatives of federal, state, and local agencies and non-governmental organizations were consulted with the purpose of gathering data, obtaining permitting requirements, disseminating information, and understanding and incorporating stakeholder issues in the routing process. Initial consultation letters were sent to agencies during June and July, 2010. Appendix A includes a table of contents listing agencies contacted, a table summarizing agency consultation, and copies of both outgoing and incoming correspondences, communications, and meeting minutes.

In addition, Project Team members met with TPWD staff to inform them of the proposed transmission line and the potential need to cross the Caprcock Canyons Trailway, which is operated by TPWD.

Solicitation of Information

The Project Team contacted and/or conducted meetings with various public officials and agencies at the local, county, state, and federal levels to solicit information regarding the permitting, construction, and operation of a new electric transmission line in the Study Area. A summary of these consultations and copies of correspondence with the following entities is included in Appendix A.

- Abernathy Chamber of Commerce
- Abernathy Independent School District
- Abernathy Municipal Office
- Apache Tribe of Oklahoma
- Audubon Texas
- Brazos River Authority
- Canadian River Municipal Water Authority
- Cap Rock Soil and Water Conservation District #126
- Childress Economic Development Corporation
- Childress Independent School District
- Childress Municipal Office
- City of Childress Chamber of Commerce
- Clarendon Economic Development Corporation
- Clarendon Independent School District
- Collingsworth County (and City of Wellington) Chamber of Commerce
- Colton Center Independent School District
- Comanche Nation, Oklahoma
- Cottle Soil and Water Conservation District #163
- Donley County (and City of Clarendon) Chamber of Commerce
- Donley County Soil and Water Conservation District #127
- Federal Aviation Administration
- Floyd County (and City of Floydada) Chamber of Commerce
- Floyd County Soil and Water Conservation District #104
- Floydada Economic Development Corporation
- Floydada Independent School District
- Floydada Municipal Office
- Fort Elliot Independent School District
- Four Winds Resource Conservation and Development Area
- Gateway Groundwater Conservation District
- Greenbelt Municipal and Industrial Water Authority
- Groundwater Management Area #1
- Groundwater Management Area #2
- Groundwater Management Area #6
- Hale Center Chamber of Commerce
- Hale Center Independent School District
- Hale County Chamber of Commerce

- Hale County Soil and Water Conservation District #132
- Hall County Chamber of Commerce
- Hall-Childress Soil and Water Conservation District #109
- Happy Independent School District
- Hedley Independent School District
- Hedley Municipal Office
- High Ground of Texas
- High Plains Resource Conservation and Development Area
- High Plains Underground Water Conservation District #1
- Kelton Independent School District
- Kiowa Indian Tribe of Oklahoma
- Kress Independent School District
- Llano Estacado Regional Water Planning Group
- Lockney Area Chamber of Commerce
- Lockney Independent School District
- Lockney Municipal Office
- Lubbock County (and City of Lubbock) Chamber of Commerce
- Lubbock County Soil and Water Conservation District #108
- Lubbock Economic Development Alliance
- Mackenzie Municipal Water Authority
- Memphis Independent School District
- Memphis Municipal Office
- Mesquite Groundwater Conservation District
- Motley County Chamber of Commerce
- Motley County Independent School District
- National Park Service
- Native Prairies Association of Texas
- Nortex Regional Planning Commission
- North Rolling Plains Resource Conservation and Development Area
- Oklahoma Archeological Survey
- Oklahoma Corporation Commission
- Oklahoma Department of Wildlife Conservation
- Oklahoma Historical Society
- Oklahoma Natural Heritage Inventory
- Paducah County Chamber of Commerce
- Paducah Independent School District
- Panhandle Groundwater Conservation District #3
- Panhandle Regional Planning Commission
- Panhandle Water Planning Group
- Petersburg Independent School District
- Petersburg Municipal Office
- Plainview Chamber of Commerce
- Plainview/Hale County Industrial Foundation
- Plainview Independent School District
- Public Utility Commission of Texas
- Quail Tech Alliance
- Quitaque Chamber of Commerce
- Quitaque Economic Development Corporation

- Quitaque Municipal Office
- Red River Authority
- Region B Regional Water Planning Group
- Salt Fork Soil and Water Conservation District #133
- Samnorwood Independent School District
- Silverton Economic Development Corporation
- Silverton Municipal Office
- Shamrock Chamber of Commerce
- Shamrock Economic Development Corporation
- Shamrock Independent School District
- Shamrock Municipal Office
- Silverton Chamber of Commerce
- Silverton Independent School District
- South Plains Association of Governments
- Texas Alliance of Groundwater Districts
- Texas Department of Agriculture
- Texas Historical Commission
- Texas Land Trust Council
- Texas State Soil and Water Conservation Board
- Texas Water Conservation Association
- Texas Water Development Board
- The Archaeological Conservancy
- The Nature Conservancy Texas Chapter
- The Railroad Commission of Texas
- The Texas Land Conservancy
- TPWD
- Tule Creek Soil and Water Conservation District #110
- Tulia Chamber of Commerce
- Tulia Economic Development Corporation
- Tulia Independent School District
- Tulia Municipal Office
- Turkey-Quitaque Independent School District
- Turkey Municipal Office
- U.S. Department of Agriculture (USDA) Farm Service Agency (FSA) Texas and Oklahoma
- U.S. Environmental Protection Agency
- USACE Fort Worth and Tulsa Districts
- USDA Natural Resource Conservation Service (NRCS) Texas and Oklahoma
- USFWS Texas and Oklahoma
- Upper Pease Soil and Water Conservation District #164
- Wellington Independent School District
- Wellington Municipal Office
- Wes-Tex Resource Conservation and Development Area
- Wheeler County Chamber of Commerce
- Wheeler County Soil and Water Conservation District #141
- Wheeler Independent School District

Elected Officials

The Project Team met with elected county officials and leaders representing each of the counties in the Study Area. The Project Team informed officials of the open house meeting dates, locations and the general purpose of the meetings. Officials were invited and encouraged to attend or to send a representative. Each county official was provided with materials similar to those mailed out to affected landowners so that they could answer any preliminary questions from individuals in their counties. A summary of communication with elected officials is provided in Table 2-1.

TABLE 2-1			
Summary of Meetings and Communications with Elected Officials			
County	Elected Official	Meeting Date	
Briscoe County	Judge Wayne Nance	9/7/2010	
Childress County	Judge Jay Mayden	9/9/2010	
Collingsworth County	Judge John James	9/9/2010	
Cottle County	Judge D. N. Gregory, Jr.	9/7/2010	
Donley County	Judge Jack Hall	9/9/2010	
Floyd County	Judge Penny Golightly	9/7/2010	
Hale County	Judge Dwain Dodson	9/8/2010	
Hall County	Judge Buddy Logsdon	9/7/2010	
Lubbock County	Judge Tom Head	9/6/2010	
Motley County	Judge Ed Smith	9/7/2010	
Swisher County	Judge Harold Keeter	9/8/2010	
Wheeler County	Judge Jerry Hefley	9/8/2010	
Beckham County	Judge Floyd Douglas Haught	9/8/2010	

2.5.2 Public Open House Meetings

The open houses included four meetings in Floydada, Memphis, Quitaque, and Shamrock. These locations were chosen so that all areas within the Study Area were generally within an approximately 50-mile radius of a meeting location. Table 2-2 includes dates and locations of each open house meeting.

TABLE 2-2			
Open House Locations			
City	Location	Date	Time
Floydada, TX	Massie Activity Center	Monday, September 13, 2010	5:30 – 7:30 PM
Memphis, TX	Memphis Convention Center	Tuesday, September 14, 2010	5:30 – 7:30 PM
Quitaque, TX	The Hope Center	Wednesday, September 15, 2010	5:30 – 7:30 PM
Shamrock, TX	Shamrock Community Center	Thursday, September 16, 2010	5:30 – 7:30 PM

The open house meetings were announced through the SPS website, newspaper notices, a direct mail-out to all potentially affected landowners within 600 feet of the Preliminary Alternative Route Segments, and local newspaper announcements to ensure relevant public participation. SPS elected to exceed PUC requirements by noticing landowners within 600 feet of the centerline of all relevant route segments to ensure robust public participation, data collection, and analysis. However, for final routing and purposes of SPS's CCN Application, only data complying with P.U.C. PROC. R. 22.52(a)(3) (directly affected landowners) is provided. Copies of the newspaper notices and the landowner mail-out packets, regarding the open house meetings, are located in Appendix D. A copy of the survey provided to open house attendees also is provided in Appendix D. Discussions with various stakeholders continued throughout the development of alternative routes and will continue through the post-CCN permitting process.

A total of 347 people signed in at the open house meetings (157 attended in Floydada, 58 attended in Memphis, 55 in Quitaque and 77 attended in Shamrock). All participants were encouraged to fill out a questionnaire and return it at the meeting or by mail at a later date. A total of 69 questionnaires were returned: 39 were submitted at the meetings, two were submitted by fax, three were submitted both by email and mail, and 25 were returned by mail. Of those questionnaires returned, 34 indicated attendance at the Floydada meeting, nine indicated attendance at the Memphis meeting, eight indicated attendance at the Quitaque meeting, 11 indicated attendance at a Shamrock meeting, and seven indicated they had not attended any of the open house meetings.

The questionnaire was designed to elicit background information on those who attended the open house meetings, including their reasons for attending the open house, and to ensure that the information presented adequately explained the purpose and need for the Project. Of the respondents, 83 percent indicated that Preliminary Alternative Route Segments were on or near their land, 1 percent indicated that segments were near their business, 6 percent indicated that segments were near their business, 6 percent indicated that segments were near their business, 6 percent indicated that segments were near their business, 6 percent indicated that segments were near their business, 6 percent indicated that segments were near their business, 77 percent indicated "Other," and 1 percent indicated more than 21 years. Of the respondents, 77 percent felt that the information provided at the open house meeting adequately explained the need for the SPS transmission lines proposed in their area.

Attendees were directed to review the aerial photograph-based maps of the Preliminary Alternative Route Segments provided at the Project Description and the Landowner/ROW information stations at the open house meetings. A total of 78 percent of the respondents indicated that they thought the features on the maps were accurately located. Many individual attendees worked with SPS representatives at the Project Description and the Landowner/ROW information stations and provided specific comments about the features presented on the maps. The Project Team incorporated the comments into its GIS database to further assist in this Environmental Assessment.

In addition, attendees were asked if they had specific comments about the Preliminary Alternative Route Segments. Typical responses included:

• I prefer a specific segment over another.

- I prefer segments that follow property lines.
- I prefer the lines not on my property.
- I prefer the lines on my property.

2.5.3 Landowner Consultation

As part of its overall Public Involvement Program, SPS solicited landowner input via open house meetings, and invited input via multi-media venues (e.g., open house questionnaires, internet website, email, and toll-free phone number). The Project Team consulted with landowners who contacted SPS via multi-media venues requesting Project information or expressing interest or concern regarding potential Project impacts on landowners and/or their property and facilities. Furthermore, the Project Team initiated contacts with landowners where necessary to address potential Project impacts to landowners and/or their property and facilities. The Project Team also consulted with landowners directly affected by Preliminary Alternative Route Segments regarding alternatives or preferences for location of routes on a given property where prudent.

2.5.4 Other Public Involvement Process Tools

Internet Website

SPS maintains a company website (http://www.powerfortheplains.com) with up-to-date information about all of its projects in Texas, Oklahoma, and New Mexico, including the TUCO to Texas/Oklahoma Interconnect 345 kV Transmission Line Project. Posters, handouts, and aerial photograph-based maps displayed at the public open houses are available for viewing and downloading under the Projects link. The website also provides general information about SPS, the SPP, and frequently asked questions concerning transmission lines. SPS also will post a copy of its CCN application to the website.

Project Email

The Project website also includes a direct email link (<u>tuco@trcsolutions.com</u>) to Project representatives. Individuals are able to send questions and comments via email to the Project Team. Efforts are made by members of the SPS Project Team to respond to each request in a timely manner.

Toll-free Phone Number

SPS introduced and published a toll-free phone number (1-800-505-3230) on its website and all of its public handouts to facilitate and encourage ongoing public comment. Efforts are made by members of the Project Team to respond to each call in a timely manner.

Public Libraries

Table 2-3 includes the libraries that have copies of the Project information. SPS will provide these libraries with copies of the Application.

TABLE 2-3		
Public Library Locations		
Library	Address and County	
Sayre Public Library	113 East Poplar Avenue Sayre, Oklahoma 73662 Beckham County	
Caprock Public Library	104 North 1 st Street Quitaque, Texas 79255 Briscoe County	
Childress Public Library	117 Avenue B NE Childress, Texas 79201 Childress County	
Collingsworth Public Library	711 15 th Street Wellington, Texas 79095 Collingsworth County	
Burton Memorial Library	217 South Kearney Clarendon, Texas 79226 Donley County	
Floyd County Library	111 South Wall Street Floydada, Texas 79235 Floyd County	
Petersburg Public Library	1614 Main Street Petersburg, Texas 79250 Hale County	
Memphis Public Library	303 South 8 th Street Memphis, Texas 79245 Hall County	
Turkey Public Library	Lyles Avenue Turkey, Texas 79261 Hall County	
Motley County Library	1105 Main Street Matador, Texas 79244 Motley County	
Shamrock Public Library	712 North Main Street Shamrock, Texas 79079 Wheeler County	

2.6 Adjustments to Preliminary Alternative Route Segments

The Public Involvement Program to review the Preliminary Alternative Route Segments resulted in many verbal and written comments. All comments received at the public open houses and subsequently through emails, letters, questionnaires, and phone calls were collected and reviewed with information received from federal, state, and local agencies and other nongovernmental organizations. Nine Preliminary Alternative Route Segments were adjusted in an effort to address comments received (see Figures 2-3 through 2-11). All comments received regarding individual route segments were considered. In addition to the adjustments made to the Preliminary Alternative Route Segments after reviewing the comments, eight Preliminary Alternative Route Segments were removed from consideration due to additional routing constraints (see Figures 2-12 through 2-20). All changes made to Preliminary Alternative Route Segments are described below, and each is depicted to demonstrate the original Preliminary Alternative Route Segment and, if applicable, the proposed new, or rerouted, Alternative Route Segment (see Figures 2-3 through 2-20). The Project Team has sent letters to notify the eight additional landowners directly affected by the transmission line as a result of reroutes. A copy of the information sent to these landowners is provided in Appendix D.

Reroute (Segment X)

This reroute resolved the potential interference with the planned mechanical irrigation in this area. A comment was received that the landowner planned to add mechanical irrigation within the section south and west of the intersection of County Road 195 and County Road AA. The original preliminary segment bisected this property diagonally and the line was re-routed to follow the south and east section lines. The original proposed segment and the adjusted proposal are depicted on Figure 2-3.

Reroute (Segment BB)

The originally proposed route and the adjusted route are approximately 5.25 miles north of Floydada, and east of State Highway 207. The original segment crossed Highway 207 approximately 1 mile north of FM 786. Approximately 1 mile to the east of Highway 207, the line angled north slightly to line up with half section lines to the east of this area. Based on comments received, the team adjusted this segment to angle south rather than north, and follow half section lines in this area. This reroute added a 45 degree angle structure and one 90 degree angle structure to the proposed route. The original proposed segment and the adjusted proposal are depicted on Figure 2-4.

Reroute (Segment AI)

In this area (between 2.5 and 8.5 miles east of Silverton), several comments were received from landowners expressing a preference to route the segment east-west along County Road L (approximately 1 mile south of the originally proposed segment). As a result of this input, the proposed reroute turns south after crossing Ranch Road (RR) 3365 (approximately 2.8 miles east-northeast from the center of Silverton). The line continues south for approximately 1 mile adjacent to the ranch road. It then turns east along the north side of County Road L. The segment then is adjacent to County Road 22 north for 0.5-mile and then continues east for 1 mile along the half section line rejoining the originally proposed segment. This route adds three 90 degree angles over the original proposal and eliminates two 45 degree angle structures. The original proposal and the reroute are depicted on Figure 2-5.

Reroute (Segment UU)

In this area, approximately 18 miles south by southeast of Memphis, and approximately 6 miles south of the Prairie Dog Town Fork of the Red River, a 3-mile section of Segment UU was relocated to parallel section lines for a 2-mile portion and to be adjacent to an existing

transmission line in the area for approximately 1.75 miles. The originally proposed segment and the reroute in this area are depicted on Figure 2-6.

Reroute (Segment AR)

In this area, about 4 miles north of the Childress Airport, the area is primarily open, or range land, with landowners owning large contiguous areas with plans to utilize the area for its open space. To help preserve the potential for the relatively undisturbed areas, the proposed segment was moved to the south approximately one mile. The originally proposed segment and the reroute in this area are depicted on Figure 2-7.

Reroute (Segment AU)

Segment AU parallels State Highway-70 across Mulberry Creek (i.e., a tributary to the Prairie Dog Town Fork of the Red River). The originally proposed segment was adjacent to the highway along the north and west side of the highway crossing. Based on comments from the landowners in this area, and plans for building a residence to the south and west of the crossing, the planned location of the segment was moved to the south and east of the existing highway crossing. The proposed reroute of this segment crosses the State Highway 70 from the west side to the east side prior to the intersection with County Road 1 approximately 0.7 mile south of the river crossing. North of the river crossing, the line crosses the highway headed north at a point just east of the intersection with County Road 3. The proposed segment then parallels County Road 3 approximately 0.75 mile north to the section line, and then turns east rejoining the original segment in approximately 1.4 miles. The original proposal and the reroute are depicted on Figure 2-8.

Reroute (Segment BF)

In this area, 5 miles south of Wellington, and along the west side of Highway 83, information provided by the landowner indicated there is an existing television broadcast tower. The tower is located approximately three quarters of a mile east of Highway 83 just south of County Road Sb. The tower is used to broadcast a local television channel and may also be used for cell phone and other purposes. The original segment paralleled the section line just to the north of this tower. In response to the landowner's request, the segment was rerouted along a half section line south of the property, providing more than 0.4 miles (greater than 2,000 feet) separation between the segment and the tower. The proposed segment turns north (adding a 90 degree structure to the route) after crossing to the east side of Highway 83. There, the segment continues north almost 0.5 mile to rejoin the original segment just south of County Road Sb. The original proposal and the reroute are depicted on Figure 2-9.

Reroute (Segment CP, EP, CM)

In this area, approximately 7 miles north of Wellington, portions of two proposed segments were adjusted in response to public comments that were received. Originally, a segment crossed the Salt Fork of the Red River approximately one half mile to the west of Highway 83. As part of the segment adjustment, segment EP now crosses the Salt Fork approximately 1 mile to the east of Highway 83. The original proposal and the reroute are depicted on Figure 2-10.

Reroute (Segment EA)

In this area, a portion of a diagonally running segment was re-routed to be parallel to section lines. As a result of this reroute, three proposed segments were removed from further consideration and were deleted. The original proposal and the reroute are shown on Figure 2-11.



























