January 2020

CPS ENERGY

Midtown 138 kV
Transmission Line and Substation Project
Environmental Assessment and Site Analysis
Bexar County, Texas

PROJECT NUMBER:
156816

PROJECT CONTACT:
Lisa Barko Meaux
EMAIL:
lisa.barko@powereng.com
PHONE:
281-765-5507

POWER ENGINEERS

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Midtown 138 kV Transmission Line and Substation Project

PREPARED FOR: *CPS ENERGY*

PREPARED BY: *POWER ENGINEERS, INC.*
HOUSTON, TEXAS

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ACRONYMS AND ABBREVIATIONS

AM radio	Amplitude modulation radio
amsl	above mean sea level
BEG	Bureau of Economic Geology
BGEPA	Bald and Golden Eagle Protection Act
BMP(s)	Best Management Practice(s)
BP	Before Present
CFR	Code of Federal Regulations
CLF	civilian labor force
CMP	Costal Management Program
CMZ	Coastal Management Zone
CGP	Construction General Permit
CR	County Road
CWA	Clean Water Act
DoD	Department of Defense
EA	Environmental Assessment and Alternative Route Analysis
EMF	Electromagnetic Field
ESA	Endangered Species Act
ESSS	Ecologically Significant Stream Segments
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FM	Farm-to-Market Road
FM radio	Frequency modulation radio
FPPA	Farmland Protection Policy Act
GIS	Geographic Information Systems
HPA	high probability area
IH	Interstate Highway
IPaC	Information for Planning and Consultation
kV	kilovolt
MBTA	Migratory Bird Treaty Act
NCED	National Conservation Easement Database
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
NOI	Notice of Intent
OTHM	Official Texas Historical Marker
POWER	POWER Engineers, Inc.
ROW	right-of-way
RRC	Railroad Commission of Texas
SAL	State Antiquities Landmark
SH	State Highway
SWPPP	Stormwater Pollution Prevention Plan
TAC	Texas Administrative Code
TARL	Texas Archeological Research Laboratory
TASA	Texas Archeological Sites Atlas
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission

THSA	Texas Historical Sites Atlas
TLC	Texas Land Conservancy
TPWD	Texas Parks and Wildlife Department
TSS	Texas Speleological Survey
TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
TXNDD	Texas Natural Diversity Database
TXSDC	Texas State Data Center
US	United States
USACE	United States Army Corps of Engineers
USCB	United States Census Bureau
U.S.C.	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
US Hwy	United States Highway

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1.0 DESCRIPTION OF THE PROPOSED PROJECT

1.1 Scope of the Project

CPS Energy is proposing to construct a new substation which includes gas-insulated switchgear in the north central portion of the City of San Antonio, east of the intersection of San Pedro Avenue and the Union Pacific Railway, on Belknap Place in Bexar County. The proposed Midtown Substation will provide additional electric capacity to support community growth and to improve the reliability of electric services to homes and businesses in that area. The new substation will cover an area of approximately two acres and will be connected to CPS Energy's existing Comal to Olmos 138 kV transmission line by two single-circuit transmission lines (the Project). The total linear length of the two single circuits will be approximately 0.07 mile and typically requires a right-of-way (ROW) width of approximately 75 feet (ft). The Project is scheduled to be in service by January 2023. Figure 1-1 shows the location of the study area for the project.

CPS Energy contracted with POWER Engineers, Inc. (POWER) to prepare this Environmental Assessment and Site Analysis (EA). This EA is intended to provide information and address issues concerning the natural, human, and cultural environment within the study area. This EA discusses the environmental and land use constraints identified within the project study area, documents transmission line routing and substation siting methodologies, documents public involvement, and provides an evaluation of the substation site and proposed transmission route from an environmental and land-use perspective. This EA may also be used in support of any local, state, or federal permitting activities that might be required prior to construction of the Project.

To assist POWER in its evaluation of the project, CPS Energy provided POWER with the project endpoints and information regarding the need for the project, proposed construction practices, transmission line design, clearing methods, right-of-way (ROW) requirements, and maintenance procedures for the project.

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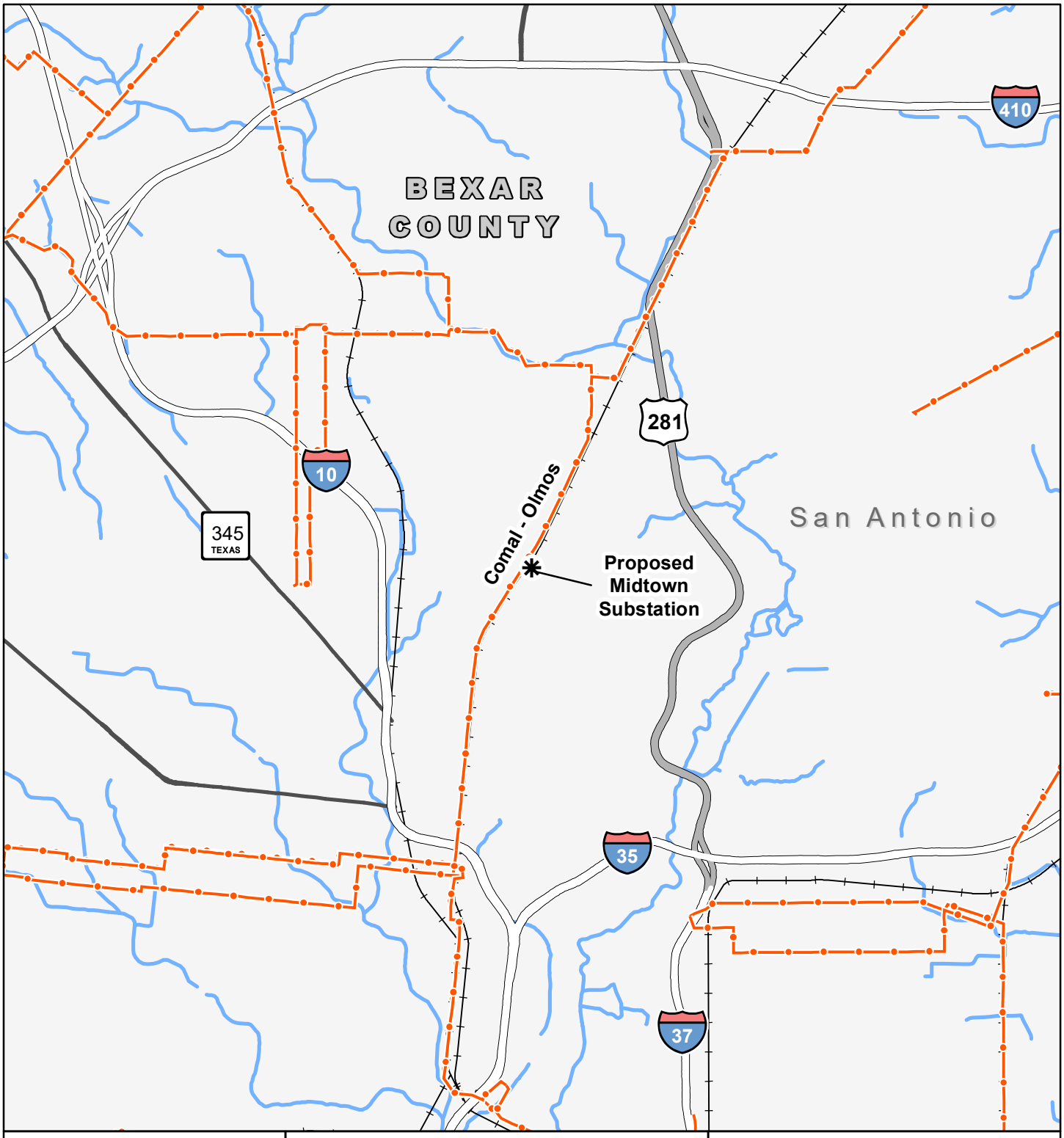

Date: 1/2/2020

Project Features

- Proposed Project Substation

Existing Utility Features

- 138 kV Transmission Line

Surface Waters

- River / Stream

Transportation

- Interstate Highway
- US Highway
- State Highway
- Railroad

Administrative Features

- San Antonio Metro Area

MIDTOWN 138 kV
TRANSMISSION LINE AND
SUBSTATION PROJECT

Figure 1-1
Project Vicinity

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1.2 Purpose and Need

1.2.1 Capacity

The Midtown area is established and growing. Load forecast indicate that the load in this area will equal the existing electrical capacity by the year 2024. To support the increasing need for electricity, CPS Energy needs to increase the electrical capacity. As a result, a substation must be constructed.

1.2.2 Distribution System

Networks of distribution lines connect substations to businesses and homes. The existing distribution capacity is nearing its limits, so much an additional substation and distribution lines must be built. The length of new lines should be minimized to reduce costs, construction impacts to customers, and environmental impacts. Furthermore, shorter lines help the continual need to improve reliability and power quality.

1.2.3 Reliability and Power Quality

As a distribution line is extended over a longer distance and as more customers are connected to the line, the reliability and quality of the electric service can decline. The longer the line, the more opportunity of electrical disturbances due to weather related events and environmental factors.

Spreading the electric load (customers) among shorter distribution lines generally improves the reliability and the quality of power that customers receive. Furthermore, since it will be close to the customers being served, the new substation will improve distribution reliability and power quality in ways that cannot be achieved with the existing substations.

1.3 Description of Proposed Design

A general description of the proposed installation is provided below.

1.3.1 Substation Design

The substation will be designed as a three-unit site with one initial 138/13 kV transformer and a 13 kV 4-feeder distribution switchgear. The substation will be looped into the existing CPS Energy Comal to Olmos 138 kV transmission line, requiring two 138 kV line terminals. The substation will include one, 138 kV circuit switcher and a 2,000-ampere main bus design. Figure 1-2 shows an example of a gas-insulated substation, while Figure 1-3 shows an example of a high-voltage transmission line.

1.3.2 Construction Schedule

CPS Energy anticipates constructing the substation and transmission line between mid-2021 and mid-2023. The schedule will be refined as the engineering designs progress. It is anticipated the substation and transmission line will be constructed by a combination of contractor and CPS Energy crews. Normal working hours will be Monday-Friday, 8:00 a.m. to 5:00 p.m., with the possibility of working on Saturdays and Sundays, as needed, to maintain construction schedules.

1.4 Construction Considerations

Projects of this type require clearing, structure assembly and erection, conductor and shield wire installation, and clean up when the project is completed. The following criteria will be taken into consideration (these criteria are subject to adjustment befitting the rules and judgments of any public agencies whose lands may be crossed by the proposed line):

1. Clearing and grading of construction areas such as storage areas, setup sites, etc., will be minimized to the extent practicable. These areas will be graded in a manner that will minimize erosion and conform to the natural topography.
2. Soil that has been excavated during construction and not used will be evenly backfilled onto a cleared area or removed from the site. The backfilled soil will be sloped gradually to conform to the terrain and the adjacent land. If natural seeding will not provide ground cover in a reasonable length of time, appropriate reseeding will be performed.
3. Soil disturbance during construction will be minimized and erosion devices will be constructed where necessary. The project will comply with Texas Commission on Environmental Quality (TCEQ) and the City of San Antonio requirements for stormwater discharges.
4. Clearing and construction activities will be performed in a manner to minimize damage to the natural condition of the area. Where feasible, existing service and access roads will be used. If required, side drainage ditches and culverts will be provided to prevent soil or road erosion. If necessary, construction of access roads and drainage structures required for the project will comply with any applicable state or federal permit requirements.
5. Tension stringing of conductors may be employed to reduce the amount of vegetation clearing before final conductor locations are established.
6. An archaeological survey of the impacted areas will be conducted prior to construction under a Texas Antiquities Permit. If any archeological materials are uncovered during construction, construction will cease in the immediate area of the discovery. Further action and evaluation of

the deposits will then be coordinated through the Texas Historical Commission and the COSA Office of Historic Preservation.

1.4.1 Gas Insulated Substations

Gas-insulated high-voltage substations (GIS) are comprised of compact metal encapsulated switchgear consisting of high-voltage components such as circuit-breakers, disconnect switches, grounding switches, instrument transformers, surge arresters, and line terminations. GIS is used where space is limited, for example, substation extensions, in urban areas, on roofs, on offshore platforms, industrial plants, and hydro power plants. Conventional air insulated substations (AIS) occupy large areas and usually include tall entrance structures and lightning masts. Such substations have a visual impact on the surrounding landscape. GIS substations, in comparison, are more compact and can be installed indoors, thus they can easily be designed to blend into existing surroundings or be hidden without negatively impacting the landscape. The compact features of GIS make it a perfect choice for areas in which aesthetics and size restrictions are of importance.

Civil works include site preparation, foundations, and in case of GIS, building construction. GIS substations require much less space than AIS. This is due to the different type of construction required for GIS, as a building is needed to house the equipment. Building installations require a more qualified labor force compared to outdoor foundations. This is less noticeable in large cities where building construction is more common.

AIS installations are erected from several separate components. They are well known and relatively easy to install. Most, if not all, components do not require manufacturer representation during the assembly process. However, the mere number of components plus large amount of bus work requires substantial time and effort. GIS installations are based on common pre-assembled modules. They are assembled predominantly in a factory environment and shipped in large assembly units. This allows for speedy installation at a site compared to AIS.

The GIS building must be equipped with all services and a bridge crane for installation purposes, before installation begins. A bridge crane may not be necessary if the building has enough space to allow for GIS installation using roller platforms and fork lifts. Significant time is required to perform the filling operations of the gas compartments with SF6 gas.

The cost of the building can vary greatly depending on the required design and architecture.

Additionally, manufacturer supervision is necessary during installation. Despite the more stringent requirements of GIS installations, it is faster compared to AIS, due to shorter installation time. The commissioning and testing time for GIS is very similar to that of an AIS.

1.4.2 Clearing and ROW Preparation

Clearing plans, methods, and practices are extremely important to minimize the potential adverse effects of transmission lines on the environment. The ROW will not be clear cut. Only trees and vegetation that may interfere with the construction, operation, and maintenance of the transmission line will be removed. Available methods of tree and brush disposal are mulching and salvaging. Landowners' preferences will be considered. If necessary, the selection of the disposal method will conform with applicable regulations. CPS Energy will abide by the COSA tree ordinance and a tree permit will be procured.

1.4.3 Structure Assembly and Erection

Survey crews will stake or otherwise mark structure locations. Construction crews will install structures by excavating holes and placing a reinforced concrete foundation. After the foundations have cured sufficiently, crews will set the structures and install the conductor and shield wire suspension assemblies. Since a large amount of vehicular traffic will occur during this operation, construction crews will take care to minimize impacts to the ROW by minimizing the number of pathways traveled.

1.4.4 Conductor and Shield Wire Installation

Conductors and shield wires are installed via a tensioning system. A rope is first threaded through the stringing blocks or dollies for each conductor and shield wire. Conductor and shield wires are then pulled by the ropes and held tight by a tensioner to keep the wires from coming in contact with the ground and other objects that could be damaging to the wire. In addition, guard structures (temporary wood-pole structures) will be installed where the transmission line crosses overhead electric power lines, overhead telephone lines, roadways, or other areas requiring sag. The wire is then taken out of the blocks and placed in the suspension and dead-end clamps for permanent attachment.

1.4.5 Cleanup

The cleanup operation typically involves the leveling of all disturbed areas, the removal of all debris, and the restoration of any items damaged by construction of the project. Upon completion of the construction work, the contractor will promptly remove from the site all scrap, trash, excavated materials, waste materials, and debris resulting from constriction of the substation and transmission line. All contractor-

owned equipment and materials will also be removed from the site, and waste disposal will be conducted in a legal manner.

1.5 Maintenance Considerations

CPS Energy will periodically inspect the substation, transmission line ROW, structures, and line to provide safe and reliable facilities. The major maintenance item will be the removal or trimming of trees that pose a potential danger to the conductors or structures. Preservation of both the environmental and natural resource conservation factors designed and built into transmission system siting requires a thoughtful, comprehensive program for maintaining the facility. The following factors are incorporated into CPS Energy's program for this project.

1. Native vegetation, particularly that of value to fish and wildlife, which has been saved through the construction process and that does not have the potential to grow close enough to the transmission line that the vegetation poses a hazard to the safe operation and maintenance of the transmission line, will be allowed to grow in selected parts of the ROW. Likewise, if ecologically appropriate, native grass cover and low-growing shrubs will be left in the areas immediately adjacent to transmission structures. If grading is necessary, the area will be graded to the proper slope to prevent soil erosion.
2. Once a cover of vegetation has been established, it will be maintained to assure public safety and a reliable, functioning transmission system.
3. If used, United States Environmental Protection Agency (USEPA)-approved herbicides will be carefully selected to have a minimal effect on desirable indigenous plant life, and selective application will be used whenever appropriate.
4. Maintenance inspection intervals will be established by CPS Energy, and routine maintenance will be encouraged when access roads fare firm or dry.
5. Ground maintenance inspection activities of the transmission line facility will include observation of soil erosion problems, fallen timber, and conditions of the vegetation that require attention. Where necessary, on the basis of erosion control, native shrubs or grasses may be planted.
6. Public acceptance of ROW is generally broadened when compatible multiple use of the ROW is allowed. Transmission line ROW can be made available for appropriate types of multiple-use concepts, such as gardening, as long as the activity does not impact public safety or inhibit the safe operation and maintenance of the electrical system. Landowners should coordinate with the utility if another use of the ROW is being considered.

7. The results of natural resources and cultural resources assessments will be followed as necessary during maintenance of the ROW, unless these assessments create and unsafe condition.

1.6 Agency Actions

The proposed substation and transmission line are located within the City of San Antonio. CPS Energy will obtain the necessary permit(s) from the appropriate controlling city or state governing entities. Since more than one acre will be cleared or disturbed during construction, a Notice of Intent (NOI) to operate under the Construction General Permit (CGP) will be submitted to TCEQ and a Storm Water Pollution Prevention Plan (SWPPP) will be prepared and a construction notice will be submitted by CPS Energy to the San Antonio Water Systems. The controls specified in the SWPPP will be monitored in the field. Permits or regulatory approvals may also be required from the TCEQ, Texas Historical Commission (THC), United States Army Corps of Engineers (USACE), and the United States Fish and Wildlife Service (USFWS). Following the identification of environmental and ROW concerns, appropriate measures will be taken during engineering to incorporate special provisions in construction documents, specifications, or other instructions. Following completion of the design, a preconstruction conference will be held, which will include a review of these provisions. Physical inspections of the project will be performed to assure all appropriate measures have been taken during construction.

MIDTOWN 138 KV TRANSMISSION LINE AND SUBSTATION PROJECT

Figure 1-2

Gas-Insulated Substation

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MIDTOWN 138 KV TRANSMISSION LINE AND SUBSTATION PROJECT

Figure 1-3

Typical 138-kV Pole Transmission Structure

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2.0 ALTERNATIVE SUBSTATION AND ROUTE SELECTION METHODOLOGY

2.1 Objective of Study

The objective of this EA was to develop and evaluate a substation site and transmission line route that follow CPS Energy's previously established general procedures and methodology in the siting/routing of substations and transmission lines. The study methodology utilized by POWER for this EA included study area delineation based on the project endpoints; identification and characterization of existing land use and environmental constraints; and identification of areas for potential substation siting and routing opportunities located within the study area. POWER identified potentially affected resources and considered each during the substation site and transmission line route development process. Regulatory agency and local officials' input were also considered during the substation site and transmission line route development process.

The substation site and transmission line route were analyzed using evaluation criteria to determine potential impacts to existing land use and environmental resources. In addition, CPS Energy considered engineering and construction constraints, grid reliability and security issues, and estimated costs to evaluate the substation site and transmission line route that they believe best addresses the project needs and for CPS Energy Board approval.

2.2 Study Area Delineation

To locate potential sites for the new substation, CPS Energy and POWER first identified a study area large enough to capture a number of sites that satisfy the project need. CPS Energy and POWER identified potential sites within the study area based on the following criteria:

Size of the site, based on needed capacity. To relieve the growing demand on existing substations and to provide a reliable electric supply in the Midtown area, approximately two acres will be needed to construct the new substation.

Location of the site, based on available electric supply. The existing Comal to Olmos 138 kV transmission line is the only convenient electric supply that is available to feed the new substation. Thus, the study area had to be large enough to encompass the existing transmission line and satisfy the project need requirements. The study area is approximately 0.96 mile long by 1.66 miles wide, and encompasses approximately 1.59 square miles in Bexar County (see Figure 2-1).

2.3 Data Collection and Constraints Mapping

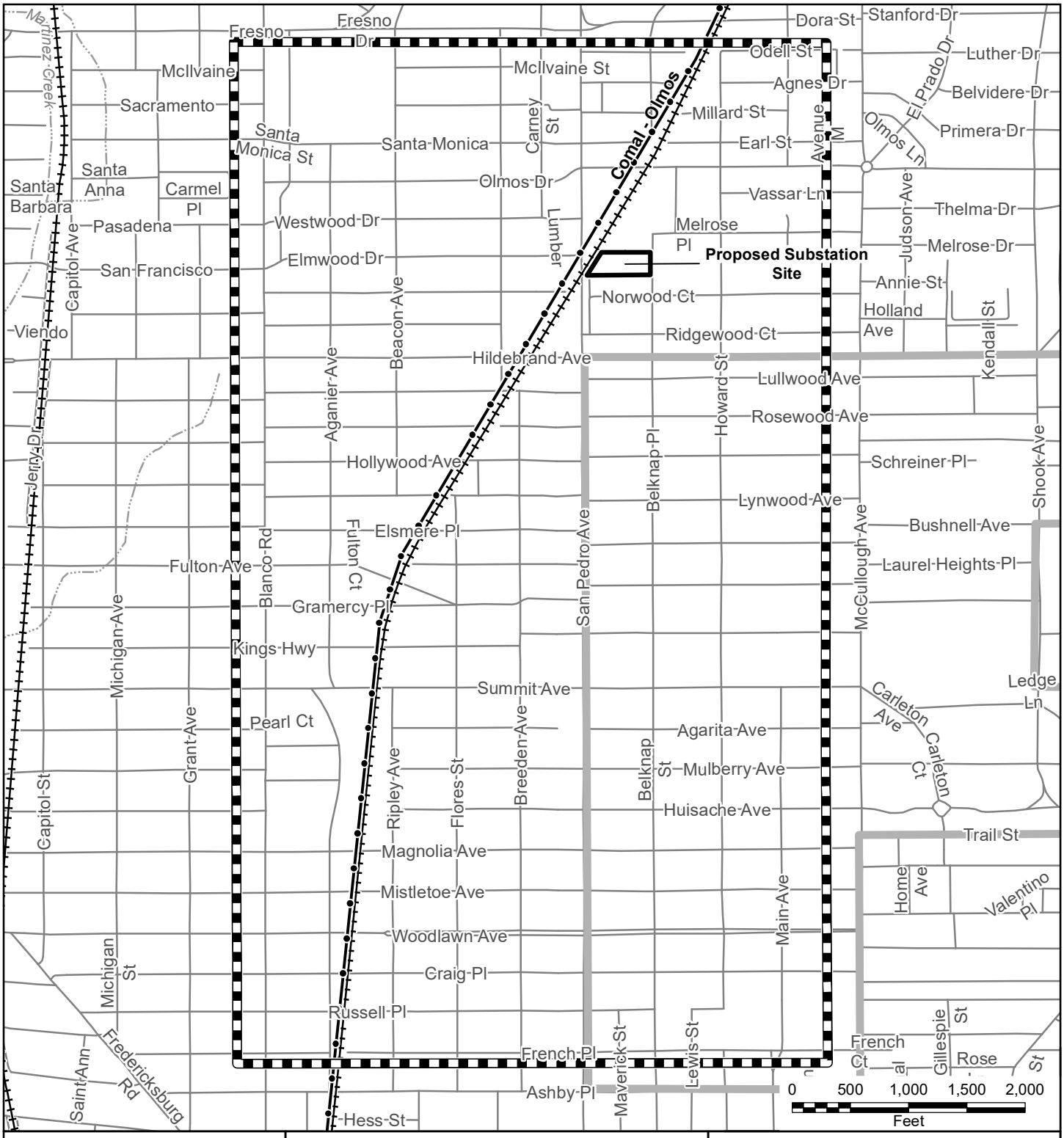
After delineation of the study area, a constraint map was prepared and used to initially display resource data and constraints for the project area. The constraint map provides a broad overview of various resource locations indicating obvious routing constraints and areas of potential routing opportunities.

Several methodologies were utilized to collect and review environmental and land use data including incorporation of readily available Geographic Information System (GIS) coverage with associated metadata; review of maps and published literature; and review of files and records from numerous federal, state, and local agencies. Data collected for each resource area was mapped within the study area utilizing GIS layers. The conditions of the existing environment are discussed throughout Section 3.0 of this document. Section 5.0 and Appendix A provide information regarding correspondence with agencies and officials.

Maps and/or data layers reviewed include (but were not limited to) United States Geological Survey (USGS) 7.5 minute topographic maps, NWI maps, Texas Department of Transportation (TxDOT) county highway maps, and recent aerial photography. USGS topographic maps and recent aerial photography were used as the background for the environmental and land use constraints maps (see Appendix C [map pocket]).

Data typically displayed on the constraint map includes, but is not limited to:

- Major land jurisdictions and uses
- Major roads including local roads, county roads, Farm-to-Market (FM) Roads, United States Highways (US Hwy), State Highways (SH), and Interstate Highways (IH)
- Existing transmission line and pipeline corridors
- Airports, private airstrips and communication facilities
- Recreational areas
- Major political subdivision boundaries
- Lakes, reservoirs, rivers, streams, canals and ponds
- Federal Emergency Management Agency (FEMA) 100-year floodplains
- National Wetland Inventory (NWI) mapped wetlands
- Mobile irrigation systems
- Wells (including water and oil and gas)
- Cemeteries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Fresno Dr
McIlvaine
McIlvaine St
Sacramento
Santa Monica St
Santa Monica
Santa Barbara
Santa Anna
Carmel Pl
Pasadena
Westwood Dr
Elmwood Dr
San Francisco
Viendo
Capitol Ave
Olmos Dr
Carney St
Lumber
Comal - Olmos
Dora St
Odell St
Agnes Dr
Millard St
Earl St
Vassar Ln
Melrose Pl
Proposed Substation Site
Norwood Ct
Ridgewood Ct
Hildebrand Ave
Avenue M
Olmos Ln
El Prado Dr
Stanford Dr
Luther Dr
Belvidere Dr
Primera Dr
Judson Ave
Thelma Dr
Melrose Dr
Annie St
Holland Ave
Kendall St
Lullwood Ave
Rosewood Ave
Schreiner Pl
Shook Ave
Lynwood Ave
Bushnell Ave
Laurel Heights Pl
McCullough Ave
Howard St
Belknap Pl
San Pedro Ave
Aganier Ave
Beacon Ave
Hollywood Ave
Elsmere Pl
Fulton Ct
Blanco Rd
Fulton Ave
Gramercy Pl
Kings Hwy
Summit Ave
Pearl Ct
Michigan Ave
Grant Ave
Capitol St
Ripley Ave
Flores St
Breeden Ave
Belknap St
Agarita Ave
Mulberry Ave
Huisache Ave
Magnolia Ave
Mistletoe Ave
Woodlawn Ave
Craig Pl
Russell Pl
French Pl
Ashby Pl
Hess St
Michigan St
Fredericksburg Rd
Saint Ann
Maverick St
Lewis St
Main Ave
Carleton Ave
Carleton Ct
Ledge Ln
Trail St
Home Ave
Valentino Pl
French Ct
Gillespie St
Rose St
Jerry Dr
Mariner Creek
0 500 1,000 1,500 2,000
Feet
TEXAS
Kendall
Comal
Guadalupe
Medina
Bexar
Wilson
Alascosa
Date: 1/2/2020
Project Components
Study Area Boundary
Proposed Substation Site
Existing Utilities
Existing Transmission Line
Transportation
Local Road
Railroad
Administrative Boundaries
Monte Vista Historic District
Surface Water
River / Stream
MIDTOWN 138 kV TRANSMISSION LINE AND SUBSTATION PROJECT
Figure 2-1
Study Area
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2.4 Agency Consultation

A list of federal, state and local regulatory agencies, elected officials and organizations was developed to receive a consultation letter regarding the project. The purpose of the letter was to inform the various agencies and officials of the project and provide them with an opportunity to provide information regarding resources and potential issues within the study area. A list of agencies contacted and a summary of responses are included in Section 5.0. Copies of all correspondence with the various state/federal regulatory agencies and local/county officials and departments are included in Appendix A.

2.5 Field Reconnaissance

Reconnaissance surveys of the study area (from public viewpoints) were conducted by POWER personnel to confirm the findings of the research and data collection activities, identify changes in land use occurring after the date of the aerial photography, and to identify potential unknown constraints that may not have been previously noted in the data. Reconnaissance surveys of the study area were conducted on May 13, 2019, and again on September 19, 2019.

2.6 Selection of Substation Site and Transmission Line Route

CPS Energy and POWER initially identified and evaluated six alternative substation site options which ranged from approximately two to four acres using the substation siting criteria provided by CPS Energy and the environmental and land use constraints map while also considering resource sensitivity.

Factors considered in identifying the initial six substation sites included proximity to the electric load growth, availability of existing distribution facilities, suitable access roads, the ability to locate the substation site on a parcel approximately three acres; and also, consideration of the site's compatibility with nearby environmental features and land uses. Existing aerial photography and USGS topographic maps were used in conjunction with constraints superimposed to identify optimal locations of the substation sites and transmission line route centerlines with close proximity to the existing Comal to Olmos 138 kV transmission line.

Because of the high concentration and density of existing development within the study area, during the substation siting and evaluation process, CPS Energy evaluated and considered the benefits of gas-insulated switchgear technology compared to typical air-insulated substation equipment. Because of the smaller footprint size afforded by use of gas-insulated switchgear technology, approximately two acres verse three acres, and other cost considerations, CPS Energy made the decision to use gas-insulated switchgear technology for the high-voltage side of the substation to meet the project needs and to minimize the overall impacts to the area and community.

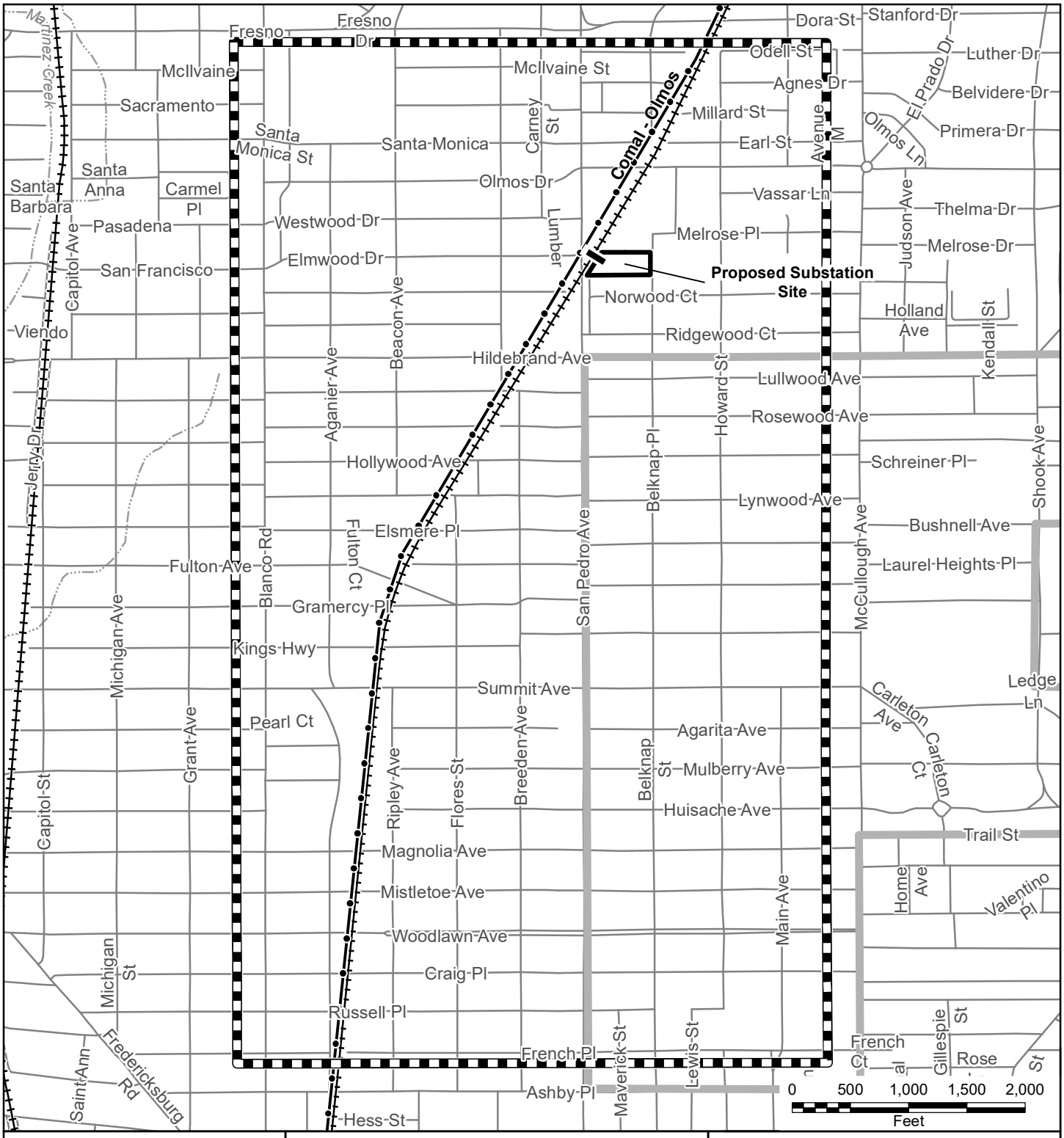
Land associated with one of the six substation sites under evaluation became available for purchase. When this site was compared with the other five substation sites, combined with the use of a gas-insulated switchgear technology with a smaller footprint (two acres), the readily available substation site appeared more superior and also met all of the above substation siting criteria. The other five sites would have required the displacement of residents or commercial business, while this one site does not if purchased by CPS Energy.

Using the constraints map and in accordance with CPS Energy's transmission line routing manual, CPS Energy and POWER identified a route to connect the proposed gas-insulated substation site to the existing Comal to Olmos 138 kV transmission line. It was CPS Energy and POWER's intent to identify a substation site and transmission line route while considering such factors as community values, parks and recreational areas, historical and aesthetic values, environmental integrity, route length, and prudent avoidance. CPS Energy and POWER continually reviewed the substation site and transmission line route throughout the development process.

2.7 Public Meeting

The substation site and transmission line route segment were then presented to the public at an open house meeting held on September 19, 2019. The substation site and transmission line route segment presented at the public open house meeting are shown on Figure 2-2.

Based on input, comments, and information received by CPS Energy and POWER from the public open house meeting, POWER conducted a public open house post meeting analysis. The purpose of the public open house post meeting analysis was to identify and evaluate the comments and additional information received at and following the public open house meeting. Information obtained during the analysis was used to determine any issues which would warrant modifications to the substation site or transmission line route. The substation site and resulting transmission line route following the public open house meeting is shown on Figure 2-3. A summary of the responses obtained from the open house meeting is presented in Section 6.0. Copies of the public notice letter with map, brochure, frequently asked questions, questionnaire, and open house exhibits are located in Appendix B.



MIDTOWN 138 kV TRANSMISSION LINE AND SUBSTATION PROJECT

Figure 2-2
Substation Site and Transmission Route Presented at Open House Meeting

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2.8 Substation Site and Transmission Line Route Evaluation

In evaluating the substation site and transmission line route, a variety of environmental criteria were considered. These criteria were selected because of their relevance to public and regulatory environmental concerns associated with the construction of a substation and associated transmission line(s) in an urban setting. The environmental criteria evaluated for this report are presented in Table 2-1. The substation site and transmission line route are shown in relation to environmental and other land use constraints on an aerial photographic base map in Appendix C, and constitute, for the purposes of this analysis, the only substation site and transmission line route addressed in this report. The analysis of the substation site and transmission line route involved inventorying and tabulating the number or quantity of each environmental criterion near the substation site and located along the transmission line route (e.g., number of habitable structures within 300 feet, length parallel to roads). The number or amount of each factor was determined by POWER using GIS layers, maps, recent aerial photography, and field verification from publicly accessible areas where practical. Potential environmental impacts are addressed in Section 4.0 of this document.

The advantages and disadvantages of the substation site and transmission line route were then evaluated. POWER conducted an environmental evaluation that was a comparison of the substation site and transmission line route from a strictly environmental viewpoint based upon the measurement of land use, aesthetics, ecology, and cultural resource criteria addressed in Section 4.0. CPS Energy used this information along with consideration of landowner and agency concerns, engineering requirements, ROW easement procurement issues, construction issues, maintenance, operational factors, and cost to recommend and present the substation site and transmission line route for CPS Energy Board approval.

TABLE 2-1 LAND USE AND ENVIRONMENTAL EVALUATION CRITERIA

Evaluation Criteria
Land Use
Length of primary route (miles)
Number of habitable structures[1] within 300 feet of ROW centerline and substation site
Length of ROW using existing transmission line ROW[2]
Length of ROW parallel and adjacent to existing transmission line ROW
Length of ROW parallel and adjacent to other existing ROW (roads, highways, utilities, etc.)
Length of ROW parallel and adjacent to apparent property lines[3]
Length of ROW parallel and adjacent to pipelines
Length of ROW across parks/recreational areas[4]
Number of additional parks/recreational areas[4] within 1,000 feet of ROW centerline and substation site
Length of ROW across cropland
Length of ROW across pasture/rangeland
Length of ROW across land irrigated by traveling systems (rolling or pivot type)
Length of route across conservation easements and/or mitigation banks
Length of route across gravel pits, mines, or quarries
Number of pipeline crossings
Number of electric transmission line crossings
Number of IH, US and state highway crossings

Number of FM or RM road crossings
Number of cemeteries within 1,000 feet of the ROW centerline and substation site
Number of FAA registered public/military airports[5] with at least one runway more than 3,200 feet in length located within 20,000 feet of ROW centerline and substation site
Number of FAA registered public/military airports[5] having no runway more than 3,200 feet in length located within 10,000 feet of ROW centerline and substation site
Number of private airstrips within 10,000 feet of the ROW centerline and substation site
Number of heliports within 5,000 feet of the ROW centerline and substation site
Number of commercial AM radio transmitters within 10,000 feet of the ROW centerline and substation site
Number of FM radio transmitters, microwave towers, and other electronic installations within 2,000 feet of ROW centerline and substation site
Number of existing water wells within 200 feet of the ROW centerline and substation site
Number of oil and gas wells within 200 feet of the ROW centerline (including dry or plugged wells) and substation site
AESTHETICS
Estimated length of ROW within foreground visual zone[6] of IH, US and state highways
Estimated length of ROW within foreground visual zone[6] of FM/RM roads
Estimated length of ROW within foreground visual zone[6][7] of parks/recreational areas[4]
ECOLOGY
Length of ROW through upland woodlands/brushland
Length of ROW through bottomland/riparian woodlands
Length of ROW across NWI mapped forested or scrub/shrub wetlands
Length of ROW across NWI mapped emergent wetlands
Length of ROW across known habitat of federally listed endangered or threatened species
Length of ROW across open water (lakes, ponds)
Number of stream and river crossings
Length of ROW parallel (within 100 feet) to streams or rivers
Length of ROW across Edwards Aquifer Recharge Zone
Length of ROW across FEMA mapped 100-year floodplain
CULTURAL RESOURCES
Number of recorded historic or prehistoric sites crossed by ROW and substation site
Number of additional recorded historic or prehistoric sites within 1,000 feet of ROW centerline and substation site
Number of NRHP listed sites crossed by ROW and substation site
Number of additional NRHP listed sites within 1,000 feet of ROW centerline and substation site
Length of ROW across areas of high archeological/historical site potential

Notes:

[1] Single-family and multi-family dwellings, and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, schools, or other structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis within 300 feet of the centerline of a transmission project of 230-kV or less.

[2] Included instances of proposed double-circuiting or overbuilding existing transmission or distribution lines.

[3] Apparent property boundaries created by existing roads, highways, or railroad ROWs are not "double-counted" in the length of ROW parallel to apparent property boundaries criteria.

[4] Defined as parks and recreational areas owned by a governmental body or an organized group, club, or church within 1,000 feet of the centerline of the project.

[5] As listed in the Chart Supplement South Central US (FAA 2019b formerly known as the Airport/Facility Directory South Central U.S.) and FAA 2019a.

[6] One-half mile, unobstructed. Lengths of ROW within the foreground visual zone of interstates, US and state highway criteria are not "double-counted" in the length of ROW within the foreground visual zone of FM roads criteria.

[7] One-half mile, unobstructed. Lengths of ROW within the foreground visual zone of parks/recreational areas may overlap with the total length of ROW within the foreground visual zone of interstates, US and state highway criteria and/or with the total length of ROW within the foreground visual zone of FM roads criteria.

3.0 NATURAL RESOURCES/ENVIRONMENTAL INTEGRITY

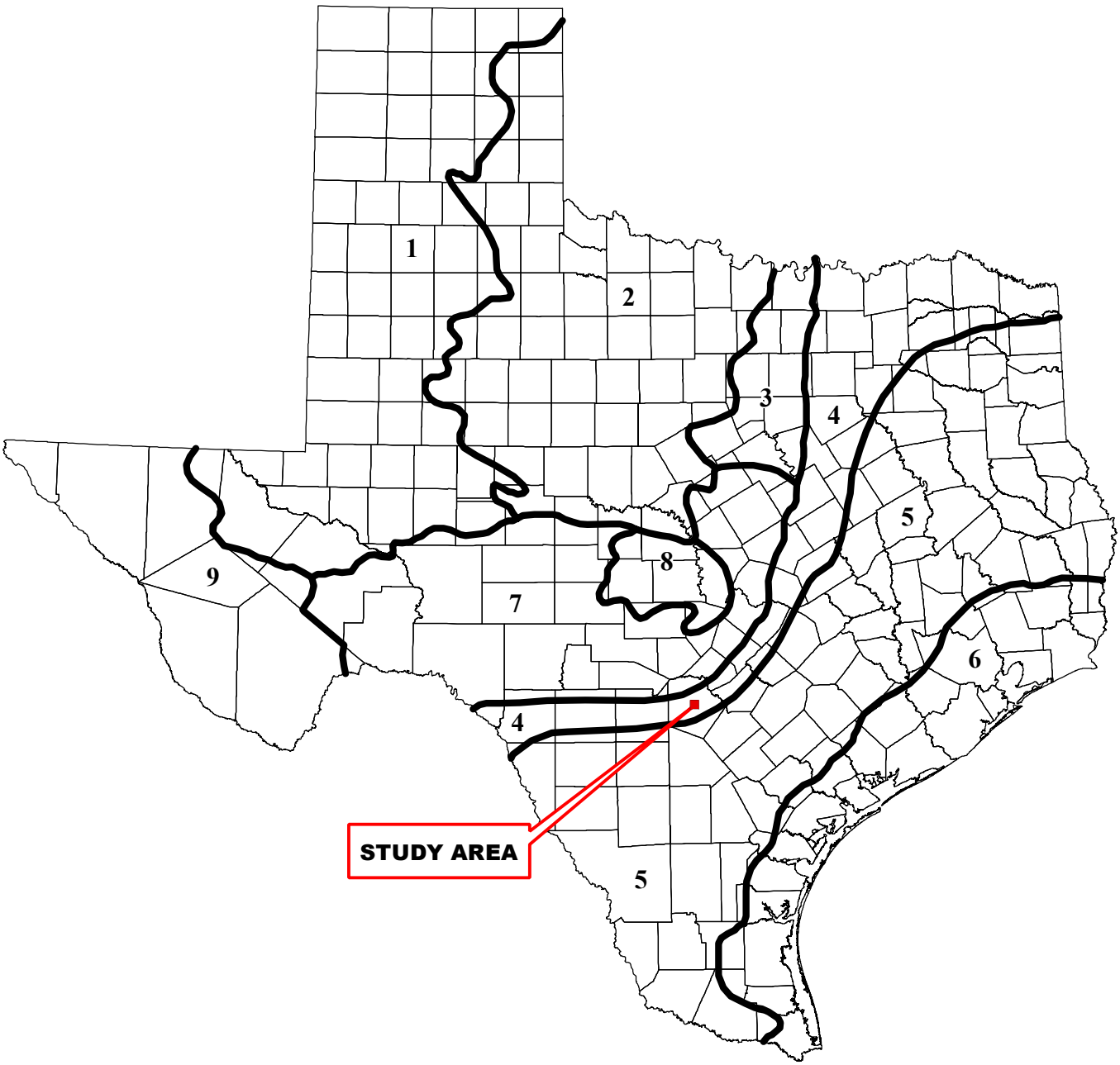
3.1 Environmental Integrity

Resource inventory data were collected for physiography, geology, soils, surface waters, wetlands, and ecological resource areas. These data were obtained from readily available sources and mapped within the study area utilizing GIS layers. Additional data collection activities consisted of file and record reviews conducted with the various state and federal regulatory agencies, a review of published literature, and review of various maps and aerial photographs. Maps and data layers reviewed include USGS 7.5 minute topographic maps, aerial imagery, Bureau of Economic Geology (BEG) Geologic Atlas, NWI maps, TxDOT county highway maps, and county appraisal district land parcel boundary maps.

3.1.1 Physiography and Geology

As shown in Figure 3-1, the study area is located within the Balcones Escarpment/Blackland Prairies physiographic subprovince (BEG 1996). The Balcones Escarpment/Blackland Prairies is generally characterized by gently rolling terrain over chalk and marl bedrock. Elevations within the Balcones Escarpment/Blackland Prairies range between 1,000 feet above mean sea level (amsl) within the western and northern portions, to 450 feet amsl towards the southeast (BEG 1996). Elevations observed within the study area are variable ranging between approximately 700 to 800 feet amsl (USGS 2019a).

The BEG (1981) geologic atlas map was reviewed for geologic formations that occur within the study area. Underlying formations include the Cretaceous-aged Navarro Group and Marlbrook Marl, Pecan Gap Chalk, and Austin Chalk rock units (USGS 2019b; BEG 1981). The Navarro Group and Marlbrook Marl formation is generally comprised of marl, clay, sandstone, and siltstone in the upper part and clay in the lower part. Total thickness for this rock unit is approximately 980 feet. The Pecan Gap Chalk formation is primarily composed of chalk and chalky marl, becoming more calcareous further west. Thickness ranges from 100 to 400 feet and becomes thinner further west towards Medina County, Texas. The Austin Chalk formation is comprised of chalk and marl and contains local areas with high amounts of limestone abundant in fossils. Thickness ranges from 350 to 580 feet and becomes thicker westward. (BEG 1981; USGS 2019b).



0 50 100 200

Miles

Source: Texas Bureau of Economic Geology, 1996

Date: 1/2/2020

Legend

Physiographic Region Bounday

1 High Plains
2 North-Central Plains
3 Grand Prairie
4 Blackland Prairies
5 Interior Coastal Plains
6 Gulf Coastal Prairies
7 Edwards Plateau
8 Central Texas Uplift
9 Trans-Pecos Basin and Range

County Boundary

MIDTOWN 138 kV
TRANSMISSION LINE AND
SUBSTATION PROJECT

Figure 3-1
Location of the Study Area In Relation to the Physiographic Regions of Texas

Significant Geological Features

Several geological features potentially affecting construction and operation of the substation and a transmission line were reviewed within the study area. Geological related issues reviewed include karst areas with known karst/cave locations, fault lines, historical mining sites, and subsurface contamination.

Karst features and caves within the geology of the area form due to the dissolution of limestone, creating underground fissures and caverns (Griffith et al. 2007). The study area is located in the Balcones Fault Zone Karst. Because of the limestone geology of the Balcones Escarpment, karst features may be common in this region and may occur within the study area (Texas Speleological Survey [TSS] 2007). Review of TSS data did not indicate any known cave locations in the study area (TSS 1962); however, undocumented cave formations have the potential to occur in the area. According to USFWS Ecological Services, the study area for the project intersects Karst Zones 2, 3, and 5. Due to the potential of karst occurrences within the study area, an initial karst zone survey will be completed prior to construction of the project. During construction, all karst-related construction protocols will be followed. If any karst features are encountered during construction activities, construction will cease to allow for professional evaluation of the feature.

Review of the Geologic Atlas of Texas (BEG 1981; USGS 2019b) maps identified two normal faults located on either side of and parallel to the Union Pacific Railway that bisects the study area. One unspecified fault occurs within the far southeast corner of the study area (USGS 2019b).

Subsurface contamination (soils or groundwater) from previous commercial activities or dumps/landfills may require additional considerations during routing and/or may create a potential hazard during construction activities. Review of the Superfund/National Priority List (USEPA 2019a) and Texas' Index of Superfund sites (TCEQ 2019a) indicate that one TCEQ superfund site is located approximately 0.50 mile south of the study area. Remediation of contaminated soils was completed in 2015, and the site is currently monitored by TCEQ (2019b). Several Leaking Petroleum Storage Tanks occur scattered throughout the study area (TCEQ 2019d). No active landfill sites were identified within the study area (TCEQ 2019c).

Review of the Railroad Commission of Texas ([RRC] 2016, 2019a, and 2019b) and BEG (2019) data did not indicate any historical or current coal/uranium mining activities within the study area.

3.1.2 Soils

Soil Associations

Natural Resources Conservation Service (NRCS) Web Soil Survey data was reviewed for Bexar County. Descriptions of soil associations occurring within the study area are summarized in Table 3-1. A soil association

is a group of soils defined as a single unit that is geographically associated in a characteristic repeating pattern (NRCS 2019). The NRCS responded to POWER's solicitation for information in a letter dated July 2, 2018 stating, "The major concerns within the study area involve soils with high shrink-swell potential and depth to restrictive bedrock layer. High shrink-swell potential is estimated as linear extensibility (LE). An LE greater than 6.0 is considered high shrink-swell potential. The Houston Black and Branyon soils have a very high shrink-swell potential. Additionally, the remaining soils (Austin and Eckrant) are shallow and very shallow, respectively, to limestone bedrock. These limitations may require additional consideration in equipment required for construction as well as site selection." (see Appendix A).

TABLE 3-1 MAPPED SOIL UNITS WITHIN THE STUDY AREA

MAP UNIT NAME	LANDFORM	HYDRIC STATUS	PRIME FARMLAND CLASSIFICATION
Austin silty clay, 1 to 3 percent slopes	Backslopes of ridges on dissected plateaus	No	Yes, of statewide importance
Austin silty clay, 2 to 5 percent slopes, eroded	Backslopes of ridges on dissected plateaus	No	No
Houston Black clay, 1 to 3 percent slopes	Backslopes of ridges on dissected plateaus	No	Yes
Branyon clay, 1 to 3 percent slopes	Stream terraces and dissected plains	No	Yes
Eckrant cobbly clay, 1 to 8 percent slopes	Backslopes of ridges on dissected plateaus	No	No
Eckrant cobbly clay, 5 to 15 percent slopes	Backslopes of ridges on dissected plateaus	No	No

Source: NRCS 2019.

Hydric Soils

The National Technical Committee for Hydric Soils defines hydric soils as soils formed under conditions of saturation, flooding, or ponding long enough during growing seasons to develop anaerobic conditions in the upper soil horizons. These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support growth and reproduction of hydrophytic vegetation (NRCS 2019).

Map units dominantly comprised of hydric soils might have small inclusions of non-hydric soils in higher areas of the landform. Conversely, map units dominated by non-hydric soils might have small inclusions of hydric soils in lower areas of the landform. According to NRCS (2019) Web Soil Survey data there are no mapped hydric soils listed within the study area. Additionally, there are no minor soil components mapped as hydric within soil associations designated as non-hydric (NRCS 2019).

Prime Farmland

The Secretary of Agriculture within 7 United States Code (U.S.C.) Section 4201 defines prime farmland soils as those soils that have the best combination of physical and chemical characteristics for producing food, feed,

forage, fiber, and oilseed crops. Prime farmlands have the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed with acceptable farming methods. Additional potential prime farmlands contain soils that meet most of the prime farmland requirements but lack the installation of water management facilities or sufficient natural moisture. The United States Department of Agriculture (USDA) would consider these soils as prime farmland if such practices were installed.

Construction of transmission line projects are typically not subject to requirements of the Farmland Protection Policy Act (FPPA) because federal funding is not associated with these projects. The NRCS does not consider construction of transmission lines a conversion of important farmlands, as land can still be used for farming after construction is complete. The entire study area is highly developed with residential and commercial buildings, and no active agricultural lands are anticipated to occur within the study area.

3.1.3 Surface Water

The study area is located within the San Antonio River Basin and within the Sand Pedro and Olmos Creek-San Antonio Sub-Basins. No major named, or unnamed surface waters occur within the study area. The nearest named surface waters are Martinez Creek, located approximately 0.40 mile west of the study area, and the San Antonio River, located approximately 0.75 mile east of the study area (USEPA 2019b). Review of the 2017 Texas Water Development Board (TWDB) *State Water Plan* and the 2016 *Regional Water Plan for South Central Texas* did not indicate any proposed surface water developments within the study area (TWDB 2016; South Central Texas Regional Water Planning Group 2015).

Special Status Waters

Under 31 Texas Administrative Code (TAC) Section 357.43 and 31 TAC Section 358.2, Texas Parks and Wildlife Department (TPWD) has designated Ecologically Significant Stream Segments (ESSS) based on habitat value, threatened and endangered species, species diversity, and aesthetic value criteria (TPWD 2019a). No designated ESSS were identified within or near the study area (TPWD 2019a).

In accordance with Section 303(d) and 304(a) of the Clean Water Act (CWA), the TCEQ identifies surface waters for which effluent limitations are not stringent enough to meet water quality standards and for which the associated pollutants are suitable for measurement by total maximum daily load. Review of TCEQ's (2016) *Texas Integrated Report of Surface Water Quality* does not indicate any surface waters within the study area that do not meet their water quality standards.

3.1.4 Groundwater

The major ground water aquifer mapped within the study area is the Edwards Aquifer. The Edwards Aquifer is highly permeable and contained within partially dissolved limestone. The freshwater saturated thickness averages approximately 560 feet in the south, with overall thickness ranging from 200 to 600 feet. Water is fresh, hard, and primarily used for municipal, recreation, and irrigation needs. The Edwards Aquifer is the primary water source for the Hill Country region and provides spring flow for endangered species habitat, as well as recreational purposes and downstream uses in the Guadalupe, Nueces, and San Antonio river basins (TWDB 2011). No other ground water resources such as water wells and natural springs were identified within the study area (TWDB 2019a).

3.1.5 Floodplains

FEMA's Flood Insurance Rate Maps and National Flood Hazard Layer reviewed for the study area. The 100-year flood (1.0% flood or base flood) represents a flood event that has a one percent chance of being equaled or exceeded for any given year. No portion of the study area occurs within the 100-year floodplain (FEMA 2019).

3.1.6 Wetlands

NWI mapped wetland data are based on topography and interpretation of infrared satellite data and color aerial photographs and are classified under the Cowardin System (Cowardin et al. 1979). No NWI wetlands are mapped within the study area (USFWS 2019a).

3.1.7 Coastal Management Program

POWER reviewed the applicability of the Coastal Management Program (CMP) and Coastal Management Zone (CMZ) boundary to the Project, and the study area is not located within the CMZ boundary as defined in 31 TAC § 503.1 and this excludes the Project from CMP conditions.

3.1.8 Vegetation

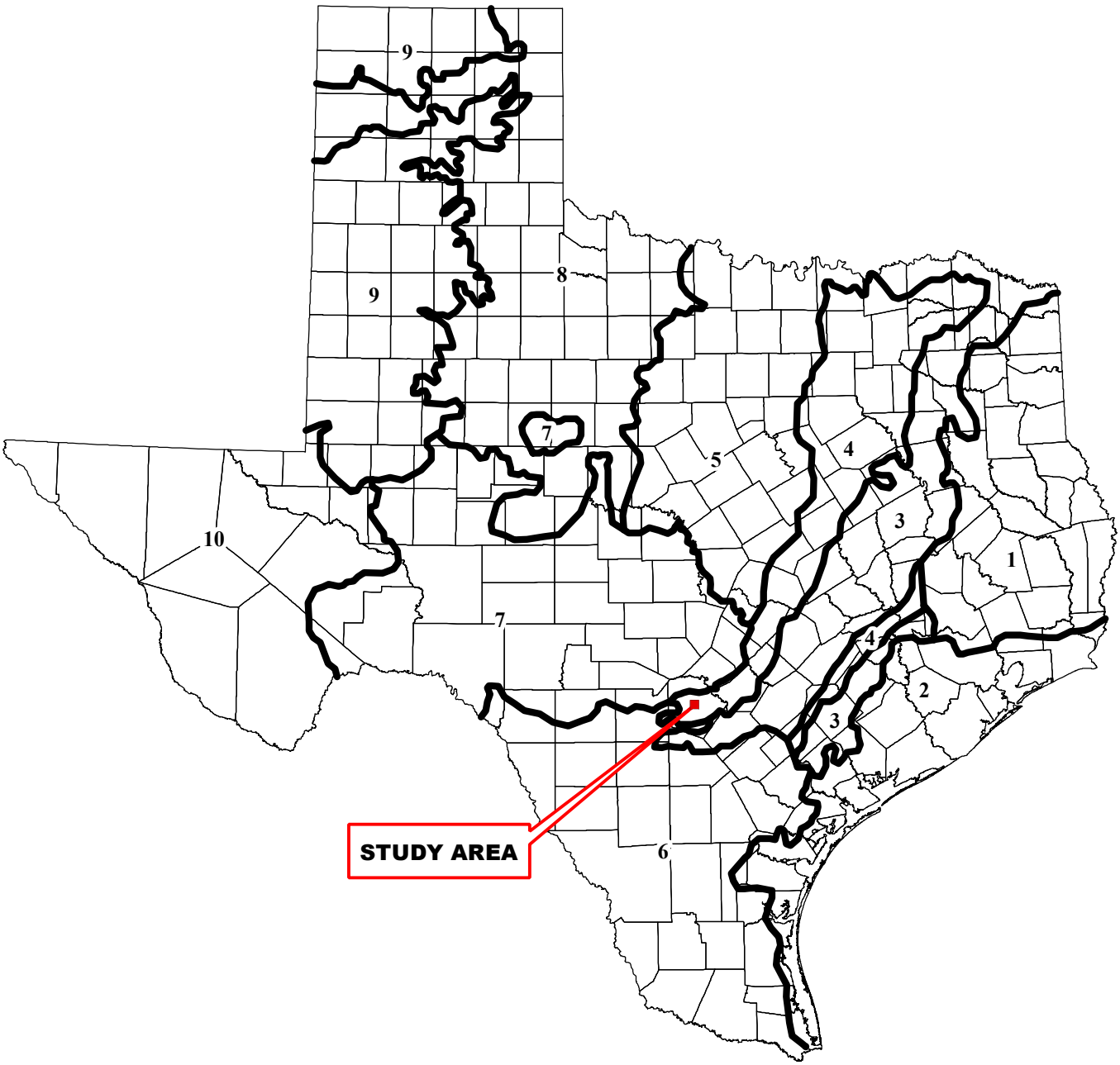
Data and information on ecological resources within the study area were obtained from a variety of sources, including aerial photograph interpretation, field reconnaissance surveys, correspondence with the USFWS, TPWD and published literature and technical reports. All biological resource data for the study area was mapped utilizing GIS software.

Ecological Region

The study area is located within the USEPA Texas Blackland Prairies Level III Ecoregion and within the Northern Blackland Prairies Level IV Ecoregion (Griffith et al. 2007). As shown in Figure 3-2, the study area is located within the Blackland Prairies Vegetational Area (Gould et al. 1960). A general description of this historical climax vegetation community is included below. Plant species composition and density for vegetation communities are dependent on location, hydrology, soils, and disturbance history or land management activities.

Blackland Prairies Ecoregion

The Blackland Prairies Ecoregion is characterized as tallgrass prairies on gently rolling plains with fertile dark clay soils. Historically, periodic fires swept through the prairies and maintained an open landscape. Dominant grass species included Indiangrass (*Sorghastrum nutans*), little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), switchgrass (*Panicum virgatum*), eastern gamagrass (*Tripsacum dactyloides*), and sideoats grama (*Bouteloua curtipendula*). Today much of the native Blackland Prairie vegetation type has been converted to agricultural use where livestock grazing and cotton, milo, wheat, and corn production are economically important (TPWD 2019b). The major cities of San Antonio, Austin, and Dallas have established within this vegetational area. Within the study area, this vegetation type has been completely extirpated by urban development.



N

0 50 100 200

Miles

Source: Gould, F.W., Hoffman, G.O., and Rechenthin, C.A. 1960, modified

Date: 1/2/2020

Legend

Vegetational Areas Boundary

1 Pineywoods
2 Gulf Prairies and Marshes
3 Post Oak Savannah
4 Blackland Prairies
5 Cross Timbers and Prairies
6 South Texas Plains
7 Edwards Plateau
8 Rolling Plains
9 High Plains
10 Trans-Pecos

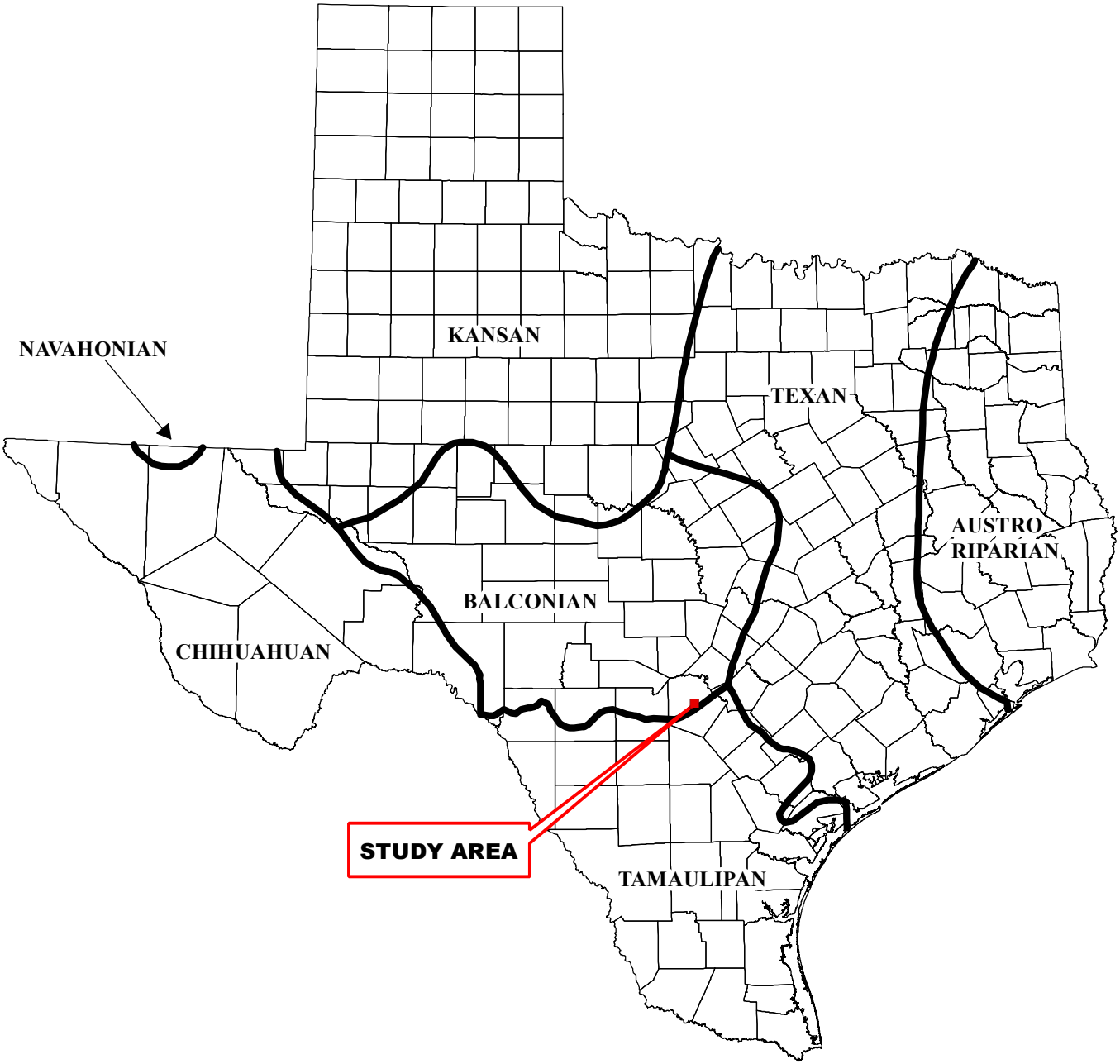
County Boundary

MIDTOWN 138 kV
TRANSMISSION LINE AND
SUBSTATION PROJECT

Figure 3-2
Location of the Study Area
In Relation to the
Vegetational Areas of Texas

3.1.9 Wildlife and Fisheries

The study area occurs within the Balconian Biotic Province (see Figure 3-3) as described by Blair (1950). The Balconian province's faunal composition is characterized as an intermixed representation of Austroriparian, Tamaulpian, Chihuahuan, and Kansan province species. At the time of publication, species diversity within the Balconian Biotic Province included 20 different anuran (frogs and toads), five urodele (salamanders and newts), 11 turtle, 22 lizard, 40 snake, and two mammal species (Blair 1950). Due to urbanized conditions within the study area, common wildlife species for the area will include generalist species adapted to urban environments.



N

0 50 100 200

Miles

Source: Blair, 1950, modified

Date: 1/2/2020

Legend

Biotic Province Boundary

County Boundary

MIDTOWN 138 kV
TRANSMISSION LINE AND
SUBSTATION PROJECT

Figure 3-3
Location of the Study Area
In Relation to the
Biotic Provinces of Texas

Amphibians

Amphibian species (frogs, toads, and salamanders) that may occur within the study area are listed in Table 3-2. Frogs and toads may occur in all vegetation types, while salamanders are typically restricted to hydric habitats (Tipton et al. 2012).

TABLE 3-2 AMPHIBIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME
Frogs/Toads	
American bullfrog	*Lithobates catesbeianus*
Barking frog	*Eleutherodactylus augusti*
Blanchard's cricket frog	*Acris blanchardi*
Cliff chirping frog	*Eleutherodactylus marnokii*
Cope's gray treefrog	*Hyla chrysoscelis*
Couch's spadefoot	*Scaphiopus couchi*
Eastern green toad	*Anaxyrus debilis debilis*
Gray treefrog	*Hyla versicolor*
Green treefrog	*Hyla cinerea*
Gulf Coast toad	*Incilius nebulifer*
Hurter's spadefoot	*Scaphiopus hurterii*
Red-spotted toad	*Anaxyrus punctatus*
Rio Grande chirping frog	*Eleutherodactylus cystignathoides*
Rio Grande leopard frog	*Lithobates berlandieri*
Rocky Mountain toad	*Anaxyrus woodhousii woodhousii*
Southern leopard frog	*Lithobates sphenocephala*
Spotted chorus frog	*Pseudacris clarkii*
Strecker's chorus frog	*Pseudacris streckeri*
Texas toad	*Anaxyrus speciosus*
Western narrow-mouthed toad	*Gastrophryne olivacea*
Salamanders	
Black-spotted newt	*Notophthalmus meridionalis*
Comal blind salamander	*Eurycea tridentifera*
Small-mouthed salamander	*Ambystoma texanum*
Tiger salamander	*Ambystoma tigrinum*
Western slimy salamander	*Plethodon albagula*

Source: Dixon 2013.

Reptiles

Reptiles (turtles, lizards and snakes) that may occur in the study area are listed in Table 3-3. These include species that are more commonly observed near water (e.g., aquatic turtles) and those that are more common in terrestrial habitats (Dixon 2013).

TABLE 3-3 REPTILIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME
Turtles	
Cagle's map turtle	*Graptemys caglei*
Guadalupe spiny softshell	*Apalone spinifera guadalupensis*
Red-eared slider	*Apalone spinifera guadalupensis*
Snapping turtle	*Chelydra serpentina*
Texas cooter	*Pseudemys texana*
Texas tortoise	*Gopherus berlandieri*
Lizards	
Brown anole	*Anolis sagrei*
Green anole	*Anolis carolinensis*
Ground skink	*Scincella lateralis*
Mediterranean gecko	*Hemidactylus turcicus*
Rose-bellied lizard	*Sceloporus variabilis*
Texas spiny lizard	*Sceloporus olivaceus*
Texas spotted whiptail	*Cnemidophorus gularis*
Snakes	
Checkered gartersnake	*Thamnophis marcianus*
Cottonmouth	*Agkistrodon piscivorus*
Diamond-backed water snake	*Nerodia rhombifer*
Flat-headed snake	*Tantilla gracilis*
Great Plains rat snake	*Pantherophis emoryi*
Long-nosed snake	*Rhinocheilus lecontei*
Plains blind snake	*Leptotyphlops dulcis dulcis*
Rough earthsnake	*Haldea striatula*
Rough greensnake	*Opheodrys aestivus*
Schott's whipsnake	*Coluber schotti*
Texas brownsnake	*Storeria dekayi*
Texas coral snake	*Micrurus tener*
Texas patch-nosed snake	*Salvadora grahamiae lineata*
Texas rat snake	*Pantherophis obsoletus*
Western coachwhip	*Coluber flagellum testaceus*
Western diamond-backed rattlesnake	*Crotalus atrox*
Western ribbonsnake	*Thamnophis proximus*

Source: Dixon 2013.

Birds

Texas Ornithological Society (Lockwood and Freeman 2014) data and TPWD ecoregion specific avian check lists (Lockwood 2008) were reviewed for species distribution and life history information. Avian species potentially occurring within the study area include year-round residents and summer, and/or winter migrants as shown in Table 3-4. Additional transient bird species may migrate within or through the study area in the spring and fall

and/or use the area to nest (spring/summer) or overwinter. The likelihood for the occurrence of each species depends upon availability of suitable habitat and season.

TABLE 3-4 AVIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME	RESIDENT	SUMMER	WINTER
ACCIPITRIFORMES: Accipitridae				
Cooper's hawk	*Accipiter cooperii*		X	X
Northern harrier	*Circus cyaneus*			X
Red-shouldered hawk	*Buteo lineatus*	X		
Red-tailed hawk	*Buteo jamaicensis*	X		
Sharp-shinned hawk	*Accipiter striatus*			X
Swainson's hawk	*Buteo swainsoni*		X	X
Zone-tailed hawk	*Buteo albonotatus*		X	
ACCIPITRIFORMES: Cathartidae				
Black vulture	*Coragyps atratus*	X		
Turkey vulture	*Cathartes aura*	X		
APODIFORMES: Apodidae				
Chimney swift	*Chaetura pelagica*		X	
APODIFORMES: Trochilidae				
Black-chinned hummingbird	*Archilochus alexandri*		X	
Buff-bellied hummingbird	*Amazilia yucatanensis*		X	
Ruby-throated hummingbird	*archilochus colubris*		X	
Rufous hummingbird	*Selasphorus rufus*			X
CAPRIMULGIFORMES: Caprimulgidae				
Common nighthawk	*Chordeiles minor*		X	
Common poorwill	*Phalaenoptilus nuttallii*		X	
CHARADRIIFORMES: Charadriidae				
Killdeer	*Charadrius vociferus*	X		
COLUMBIFORMES: Columbidae				
Eurasian collared-dove	*Streptopelia decaocto*	X		
Inca dove	*Columbina inca*	X		
Mourning dove	*Zenaida macroura*	X		
Rock pigeon	*Columba livia*	X		
White-winged dove	*Zenaida asiatica*	X		
CORACIIFORMES: Alcedinidae				
Belted kingfisher	*Megaceryle alcyon*			X
Green kingfisher	*Chloroceryle americana*	X		
CUCULIFORMES: Cuculidae				
Greater roadrunner	*Geococcyx californianus*	X		
Yellow-billed cuckoo	*Coccyzus americanus*		X	
FALCONIFORMES: Falconidae				
American kestrel	*Falco sparverius*			X
Crested caracara	*Caracara cheriway*	X		
PASSERIFORMES: Bombycillidae				
Cedar waxwing	*Bombycilla cedrorum*			X
PASSERIFORMES: Cardinalidae				
Blue grosbeak	*Passerina caerulea*		X	
Dickcissel	*Spiza americana*		X	

TABLE 3-4 AVIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME	RESIDENT	SUMMER	WINTER
Indigo bunting	*Passerina cyanea*		X	
Northern cardinal	*Cardinalis cardinalis*	X		
Painted bunting	*Passerina ciris*		X	
Summer tanager	*Piranga rubra*		X	
PASSERIFORMES: Corvidae				
American crow	*Corvus brachyrhynchos*			X
Blue jay	*Cyanocitta cristata*	X		
Common raven	*Corvus corax*	X		
PASSERIFORMES: Emberizidae				
Cassin's sparrow	*Peucaea cassinii*	X		
Chipping sparrow	*Spizella passerina*	X		
Clay-colored sparrow	*Spizella pallida*			X
Dark-eyed junco	*Junco hyemalis*			X
Eastern towhee	*Pipilo erythrophthalmus*			X
Field sparrow	*Spizella pusilla*	X		
Grasshopper sparrow	*Ammodramus savannarum*		X	
Harris's sparrow	*Zonotrichia querula*			X
Lark bunting	*Calamospiza melanocorys*			X
Lark sparrow	*chondestes grammacus*		X	
Lincoln's sparrow	*Melospiza lincolnii*			X
Savannah sparrow	*Passerculus sandwichensis*			X
Song sparrow	*Melospiza melodia*	X		X
Spotted towhee	*Pipilo maculatus*			X
Vesper sparrow	*Pooecetes gramineus*			X
White-crowned sparrow	*Zonotrichia leucophrys*			X
White-throated sparrow	*Zonotrichia albicollis*			X
PASSERIFORMES: Fringillidae				
American goldfinch	*Spinus tristis*			X
House finch	*Haemorhous mexicanus*	X		
Lesser goldfinch	*Spinus psaltria*		X	
Pine siskin	*Spinus pinus*			X
PASSERIFORMES: Hirundinidae				
Baltimore oriole	*Icterus galbula*		X	X
Bank swallow	*Riparia riparia*			X
Barn swallow	*Hirundo rustica*		X	
Brown-headed cowbird	*Molothrus ater*	X		
Bullock's oriole	*Icterus bullockii*		X	
Cave swallow	*Petrochelidon fulva*		X	
Cliff swallow	*Petrochelidon pyrrhonota*		X	
Common grackle	*Quiscalus quiscula*	X		
Eastern meadowlark	*Sturnella magna*	X		
Great-tailed grackle	*Quiscalus mexicanus*	X		
Orchard oriole	*Icterus spurius*		X	
PASSERIFORMES: Icteridae				
Purple martin	*Progne subis*		X	
Red-winged blackbird	*Agelaius phoeniceus*	X		
Tree swallow	*Tachycineta bicolor*		X	

TABLE 3-4 AVIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME	RESIDENT	SUMMER	WINTER
PASSERIFORMES: Laniidae				
Loggerhead shrike	*Lanius ludovicianus*	X		X
PASSERIFORMES: Mimidae				
Gray catbird	*Dumetella carolinensis*			X
Long-billed thrasher	*Toxostoma longirostre*	X		
Northern mockingbird	*Mimus polyglottos*	X		
PASSERIFORMES: Motacillidae				
American pipit	*Anthus rubescens*			X
PASSERIFORMES: Paridae				
Black-crested titmouse	*Baeolophus atricristatus*	X		
Carolina chickadee	*Poecile carolinensis*	X		
PASSERIFORMES: Parulidae				
Black-and-white warbler	*Mniotilta varia*		X	
Black-throated green warbler	*Septophaga virens*		X	
Canada warbler	*Cardellina canadensis*			X
Common yellowthroat	*Geothlypis trichas*			X
Hooded warbler	*Setophaga citrina*		X	
Magnolia warbler	*Setophaga magnolia*			X
Mourning warbler	*Geothlypis philadelphia*			X
Northern parula	*Setophaga americana*		X	
Orange-crowned warbler	*Oreothlypis celata*			X
Pine warbler	*Setophaga pinus*			X
Tennessee warbler	*Oreothlypis peregrina*			X
Wilson's warbler	*Cardellina pusilla*			X
Yellow warbler	*Setophaga petechia*			X
Yellow-rumped warbler	*Setophaga coronata*			X
PASSERIFORMES: Passeridae				
House sparrow	*Passer domesticus*	X		
PASSERIFORMES: Polioptilidae				
Blue-gray gnatcatcher	*Polioptila caerulea*		X	
PASSERIFORMES: Regulidae				
Golden-crowned kinglet	*Regulus satropa*			X
Ruby-crowned kinglet	*Regulus calendula*			X
PASSERIFORMES: Remizidae				
Verdin	*Auriparus flaviceps*	X		
PASSERIFORMES: Sturnidae				
European starling	*Sturnus vulgaris*	X		
PASSERIFORMES: Troglodytidae				
Bewick's wren	*Thryomanes bewickii*	X		
Cactus wren	*Campylorhynchus brunneicapillus*	X		
Carolina wren	*Thryothorus ludovicianus*	X		
House wren	*Troglodytes aedon*			X
Winter wren	*Troglodytes hiemalis*			X
PASSERIFORMES: Turdidae				
American robin	*Turdus migratorius*		X	
Eastern bluebird	*Sialia sialis*	X		
Swainson's thrush	*Catharus ustulatus*		X	

TABLE 3-4 AVIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME	RESIDENT	SUMMER	WINTER
PASSERIFORMES: Tyrannidae				
Brown-crested flycatcher	*Myiarchus tyrannulus*		X	
Eastern phoebe	*Sayornis phoebe*		X	
Eastern wood-pewee	*Contopus virens*		X	
Great crested flycatcher	*Myiarchus crinitus*		X	
Least flycatcher	*Empidonax minimus*		X	
Say's phoebe	*Sayornis saya*			X
Scissor-tailed flycatcher	*Tyrannus forficatus*		X	
Vermilion flycatcher	*Pyrocephalus rubinus*		X	
Western kingbird	*Tyrannus verticalis*		X	
PASSERIFORMES: Vireonidae				
Bell's vireo	*Vireo bellii*		X	
Blue-headed vireo	*Vireo solitarius*			X
Hutton's vireo	*Vireo huttoni*		X	X
Warbling vireo	*Vireo gilvus*		X	
White-eyed vireo	*Vireo griseus*		X	
Yellow-throated vireo	*Vireo flavifrons*		X	
PELECANIFORMES: Ardeidae				
Great blue heron	*Ardea herodias*	X		
Great egret	*Ardea alba*		X	
PICIFORMES: Picidae				
Downy woodpecker	*Picoides pubescens*			X
Golden-fronted woodpecker	*Melanerpes aurifrons*	X		
Ladder-backed woodpecker	*Picoides scalaris*	X		
Northern flicker	*Colaptes auratus*			X
Yellow-bellied sapsucker	*Sphyrapicus varius*			X
PODICIPEDIFORMES: Podicipedidae				
STRIGIFORMES: Strigidae				
Barn owl	*Tyto alba*	X		
Barred owl	*Strix varia*	X		
Great horned owl	*Bubo virginianus*	X		

Source: Lockwood 2008; Lockwood and Freeman 2014.

Mammals

Mammals that may occur in the study area are listed in Table 3-5. The occurrence of each species within the study area is dependent on available suitable habitat.

TABLE 3-5 MAMMALIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME
Mammals	
Big brown bat	*Eptesicus fuscus*
Big free-tailed bat	*Nyctinomops macrotis*
Black rat	*Rattus rattus*
Black-tailed jackrabbit	*Lepus californicus*
Bobcat	*Lynx rufus*

TABLE 3-5 MAMMALIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME
Mammals	
Brazilian free-tailed bat	*Tadarida brasiliensis*
Cave myotis	*Myotis velifer*
Common gray fox	*Urocyon cinereoargenteus*
Common raccoon	*Procyon lotor*
Coyote	*Canis latrans*
Eastern cottontail	*Sylvilagus floridanus*
Eastern fox squirrel	*Sciurus niger*
Eastern gray squirrel	*Sciurus carolinensis*
Eastern mole	*Scalopus aquaticus*
Eastern pipistrelle	*Pipistrellus subflavus*
Eastern red bat	*Lasiurus borealis*
Eastern spotted skunk	*Spilogale putorius*
Eastern woodrat	*Neotoma floridana*
Feral pig	*Sus scrofa*
Fulvous harvest mouse	*Reithrodontomys fulvescens*
Ghost-faced bat	*Mormoops megalophylla*
Gulf Coast kangaroo rat	*Dipodomys compactus*
Hispid cotton rat	*Sigmodon hispidus*
Hispid pocket mouse	*Chaetodipus hispidus*
Hoary bat	*Aeorestes cinereus*
Hog-nosed skunk	*Conepatus leuconotus*
House mouse	*Mus musculus*
Lacey's white-ankled deermouse	*Peromyscus laceianus*
Least shrew	*Cryptotis parva*
Merriam's pocket mouse	*Perognathus merriami*
Nine-banded armadillo	*Dasypus novemcinctus*
North American deermouse	*Peromyscus maniculatus*
Northern pygmy mouse	*Baiomys taylori*
Northern yellow bat	*Dasypterus intermedius*
Norway rat	*Rattus norvegicus*
Plains harvest mouse	*Reithrodontomys montanus*
Red fox	*Vulpes vulpes*
Rio Grande ground squirrel	*Ictidomys parvidens*
Southern plains woodrat	*Neotoma micropus*
Striped skunk	*Mephitis mephitis*
Texas deer mouse	*Peromyscus attwateri*
Virginia opossum	*Didelphis virginiana*
Western spotted skunk	*Spilogale gracilis*
White-footed mouse	*Peromyscus leucopus*
White-tailed deer	*Odocoileus virginianus*

Source: Schmidly and Bradley 2016.

Aquatic Resources

No perennial or intermittent streams and creeks occur in the study area. Shallow roadside ditches may be present. Because roadside ditches are ephemeral drainages, persistent flow is unlikely to be sufficient to support any substantial lotic species assemblage.

3.1.10 Threatened and Endangered Species

Information on sensitive wildlife and vegetation resources within the study area were obtained from a variety of sources, including correspondence with the USFWS and TPWD. Additional information was obtained from published literature and technical reports. Available biological resource data for the study area were mapped using GIS.

For the purpose of this EA, emphasis was placed on obtaining known occurrences of special status species and unique vegetation communities that have been previously documented within the study area. Special status species include those listed by the USFWS as threatened, endangered, proposed, or candidate; and those listed by TPWD as threatened, endangered or as a rare species. Spatial data of known occurrences for listed species and/or sensitive vegetation communities was obtained from the TPWD's Texas Natural Diversity Database (TXNDD) on April 04, 2019 (TXNDD 2019). The TXNDD data does not preclude the potential for a species to exist within the study area. Only a thorough review of habitats and/or a species-specific survey within the study area can determine the presence or absence of a special status species.

A USFWS Information for Planning and Consultation (IPaC) Official Species List (USFWS 2019b; Consultation Code: 02ETAU00-2019-SLI-0888) and Resource List was received on April 8, 2019. This USFWS (2019b) report identifies potentially occurring federal-listed threatened, endangered, and candidate species and habitats within the study area. By definition, a threatened species is defined as likely to become endangered within the near foreseeable future throughout all or a significant portion of its range. An endangered species is in danger of extinction throughout all or a significant portion of its range. Candidate species are those that have sufficient information regarding their biological vulnerability and threat(s) to support listing as threatened or endangered and are likely to be proposed for listing in the near foreseeable future (USFWS 2019c).

The Endangered Species Act (ESA) also provides for the conservation of "designated critical habitat," which is defined as the areas of land, water, and air space that an endangered species needs for survival. These areas include sites with food and water, breeding areas, cover or shelter sites, and sufficient habitat to provide for normal population growth and behavior for the species. Designated critical habitat for the Robber Baron Cave

Meshweaver (*Cicurina baronia*) was identified adjacent to and outside of the east boundary of the study area (USFWS 2019b).

Threatened and Endangered Plant Species

USFWS (2019b) IPaC species list for the study area and TPWD (2019c) county listings were reviewed for special status plant species potentially occurring within the study area. One federally- / state-listed endangered plant species, Texas wild-rice (*Zizania texana*), was identified as having the potential to occur within the study area. Additionally, one candidate plant species, the Bracted twistflower (*Streptanthus bracteatus*), was identified as having the potential to occur within Bexar County (USFWS 2019b; TPWD 2019c; TXNDD 2019). A brief description of these species' life history, habitat requirements, and likelihood for occurrence within the study area are summarized below.

Texas Wild-rice

Texas wild-rice is endemic to Texas and only known to occur in portions of the Upper San Marcos River within Hays County (Poole et al. 2007). This species occurs in the spring-fed San Marcos River within clear, cool, shallow swift water. Sediments are typically coarse sandy soils and this species flowers year-round (Poole et al. 2007; TPWD 2019b). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Bracted Twistflower

Bracted twist flower is endemic to the Edwards Plateau ecoregion. It is a short annual, growing to about eight inches tall. The entire plant is glabrous with pink to purple flowers. Bracted twist flower occurs on shallow, well-drained gravelly clays and clay loams over limestone in openings of oak juniper woodlands, as well as in canyon bottoms. It can be found growing amidst dense shrub areas; however, plants are often more robust in sites with plentiful sunlight. Populations of this species may change extensively between years depending on the amount winter rainfall. The primary causes for its decline are residential development and browsing by white-tailed deer (Poole et al. 2007). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Threatened and Endangered Wildlife Species

USFWS (2019b) IPaC species report for the study area and TPWD (2019c) county listings were reviewed for special status animal species potentially occurring within the study area. Federally- and/or state-listed, and candidate status animal species potentially occur within Bexar County (Table 3-6). Federal status species listed in the TPWD Annotated County Lists of Rare Species have been included in Table 3-6 for consistency. Although only federally-listed threatened or endangered species are protected under the ESA, state-listed species may receive protection under other federal and/or state laws, such as the Migratory Bird Treaty Act (MBTA), Bald and

Golden Eagle Protection Act (BGEPA), Chapters 67, 68, and 88 of the Texas Parks and Wildlife Code, and Sections 65.171–65.184 and 69.01–69.14 of Title 31 of the TAC. Brief descriptions of life history, habitat requirements, and documented occurrences within the study area are summarized below for each species.

TABLE 3-6 LISTED THREATENED AND ENDANGERED ANIMAL SPECIES FOR BEXAR COUNTY

SPECIES		LEGAL STATUS	
Scientific Name	Common Name	USFWS[1]	TPWD[2]
Amphibians			
Black-spotted newt	*Notophthalmus meridionalis*	-	T
Cascade Caverns salamander	*Eurycea latitans*	-	T
Comal blind salamander	*Eurycea tridentifera*	-	T
Mexican treefrog	*Smilisca baudinii*	-	T
San Marcos salamander	*Eurycea nana*	T	T
Texas blind salamander	*Typhlomolge rathbuni*	E	-
Arachnids			
Bracken Bat Cave meshweaver	*Cicurina venii*	E	-
Cokendolpher Cave harvestman	*Texella cokendolpheri*	E	-
Government Canyon Bat Cave meshweaver	*Cicurina vespera*	E	-
Government Canyon Bat Cave spider	*Neoleptoneta microps*	E	-
Madla Cave meshweaver	*Cicurina madla*	E	-
Robber Baron Cave meshweaver	*Cicurina baronia*	E	-
Birds			
Bald eagle	*Haliaeetus leucocephalus*	DL	T
Black-capped vireo	*Vireo atricapilla*	DL	E
Golden-cheeked warbler	*Dendroica chrysoparia*	E	E
Interior least tern	*Sternula antillarum athalassos*	E	E
Piping plover	*Charadrius melodus*	T	T
Reddish egret	*Egretta rufescens*	-	T
Tropical parula	*Setophaga pitiayumi*	-	T
White-faced ibis	*Plegadis chihi*	-	T
Whooping crane	*Grus americana*	E	E
Wood stork	*Mycteria americana*	-	T
Zone-tailed hawk	*Buteo albonotatus*	-	T
Crustaceans			
Peck's Cave amphipod	*Stygobromus pecki*	E	-
Fishes			
Fountain darter	*Etheostoma fonticola*	E	-
Sharpnose shiner	*Notropis oxyrhynchus*	E	-
Smalleye shiner	*Notropis buccula*	E	-
Toothless blindcat	*Trogloglanis pattersoni*	-	T
Widemouth blindcat	*Satan eurystomus*	-	T

TABLE 3-6 LISTED THREATENED AND ENDANGERED ANIMAL SPECIES FOR BEXAR COUNTY

SPECIES		LEGAL STATUS	
Scientific Name	Common Name	USFWS[1]	TPWD[2]
Insects			
Beetle (no designated common name)	*Rhadine exilis*	E	-
Beetle (no designated common name)	*Rhadine infernalis*	E	-
Comal Springs dryopid beetle	*Stygoparnus comalensis*	E	-
Comal Springs riffle beetle	*Heterelmis comalensis*	E	-
Helotes mold beetle	*Batrisodea venyivi*	E	-
Mammals			
Black bear	*Ursus americanus*	-	T
White-nosed coati	*Nasua narica*	-	T
Mollusks			
Golden orb	*Quadrula aurea*	C	T
Texas fatmucket	*Lampsilis bracteata*	C	-
Texas pimpleback	*Quadrula petrina*	C	-
Reptiles			
Cagle's map turtle	*Graptemys caglei*	-	T
Texas horned lizard	*Phrynosoma cornutum*	-	T
Texas indigo snake	*Drymarchon melanurus erebennus*	-	T
Texas tortoise	*Gopherus berlandieri*	-	T
Timber rattlesnake	*Crotalus horridus*	-	T

[1] USFWS 2019b, [2] TPWD 2019c.
E - Federal and/or State-Listed Endangered
T - Federal and/or State-Listed Threatened
C - Candidate for Listing
DL - Delisted

Federal Listed Species

Amphibians

San Marcos Salamander

The San Marcos salamander requires clear, constant flowing water with aquatic vegetation over sand and gravel substrates. Its reddish-brown color allows it to camouflage well with aquatic vegetation. The San Marcos salamander is restricted to the outflows of Spring Lake and the riffle just below Spring Lake dam near the City of San Marcos (Tipton et al. 2012). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Texas Blind Salamander

The Texas blind salamander is white, like many other species adapted to living in aquatic caves of the Edwards Aquifer, and measures up to five inches in length. Similar to the San Marcos salamander, the Texas blind salamander requires constant flow of clear water. This subterranean species is only seen above ground when

strong water flows bring it to the surface. The Texas blind salamander is only known to occur in the Balcones Escarpment near the City of San Marcos within the subterranean streams of Purgatory Creek (Tipton et al. 2012). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Arachnids

Braken Bat Cave Meshweaver

The Braken Bat Cave meshweaver is a species of eyeless spider endemic to Texas and is one of the nine invertebrate species endemic to the karst caves of Bexar County. This invertebrate species is a troglobite, which is an organism that spends its entire life in subterranean environments (NatureServe 2019). Threats to this species include habitat loss from quarrying operations, cave filling, and habitat degradation via pollution, and alterations in water flow (USFWS 2012). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Cokendolpher Cave Harvestman

The Cokendolpher Cave harvestman is a species of eyeless spider also referred to as the Robber Baron Cave harvestman. It is a troglobite (NatureServe 2019) endemic to Bexar County, Texas, where it has only been documented in Robber Baron Cave, a cave which runs underneath a heavily urbanized area. Threats to this species include habitat loss from quarrying operations, cave filling, and habitat degradation via pollution, and alterations in water flow (USFWS 2012). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Government Canyon Bat Cave Meshweaver

The Government Canyon Bat Cave meshweaver is a spider endemic to Bexar County, Texas. It is a troglobite (NatureServe 2019) that has only been documented in Bexar County at Government Canyon Bat Cave located within Government Canyon State Natural Area. Threats to this species include habitat loss from quarrying operations, cave filling, and habitat degradation via pollution, and alterations in water flow (USFWS 2012). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Government Canyon Bat Cave Spider

The Government Canyon Bat Cave spider is endemic to Bexar County, Texas. It is a troglobite (NatureServe 2019) that has only been documented in Bexar County at Government Canyon Bat Cave and Surprise Sink located within Government Canyon State Natural Area. Threats to this species include habitat loss from quarrying operations, cave filling, and habitat degradation via pollution, and alterations in water flow (USFWS 2012). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Madla Cave Meshweaver

The Madla Cave meshweaver is an eyeless spider endemic to Bexar County, Texas. It is a troglobite (Natureserve 2019) that has only been observed in eight caves including the Hills and Dales Pit and Robbers Cave within the University of Texas at San Antonio main campus. Threats to this species include habitat loss from quarrying operations, cave filling, and habitat degradation via pollution, and alterations in water flow (USFWS 2012). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Robber Baron Cave Meshweaver

The Robber Baron Cave meshweaver is an eyeless spider endemic to Bexar County, Texas. It is a troglobite (NatureServe 2019) that has only been observed in Robber Baron Cave within the Alamo Heights karst region. Threats to this species include habitat loss from quarrying operations, cave filling, and habitat degradation via pollution, and alterations in water flow (USFWS 2012). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Birds

Golden-cheeked Warbler

The golden-cheeked warbler's entire nesting range is confined to habitat in 33 counties located in Central Texas. Nesting typically occurs from March to May in mature juniper-oak woodland areas with a moderate to high density of mature Ashe juniper trees mixed with deciduous trees creating dense foliage in the upper canopy (Pulich 1976; Campbell 2003). These juniper-oak woodland types are typical in moist areas located along steep-sided slopes, drainages, and bottomlands, but this species will also occur in upland oak-juniper woodlands on flat topography (Pulich 1976). The warbler migrates to overwinter in southern Mexico and northern Central America. This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Interior Least Tern

The interior least tern is a subspecies that nests inland along sand and gravel bars within braided streams and rivers. It is also known to nest on man-made structures (inland beaches, wastewater treatment plants, gravel quarries, etc.). Breeding may begin as early as April and ends by late August. The USFWS recognizes any nesting least tern located 50 miles or greater from a coastline as being an interior least tern (Campbell 2003; TPWD 2014). This species is not anticipated to occur within the study area due to lack of suitable habitat.

Piping Plover

The piping plover is a small migratory shorebird that nests within the Great Lakes, Northern Great Plains or Atlantic Coast (TPWD 2019c). Primary fall migration to Texas is from July to early September, while spring migration occurs from March to early May. Piping plovers are common to locally uncommon winter residents

along the Gulf of Mexico coastline (Lockwood and Freeman 2014). This species is not anticipated to occur within the study area due to lack of suitable habitat.

Whooping Crane

The study area is located outside of the Texas portion of the primary central migratory corridor for the whooping crane. The primary migration path includes a 220-mile wide corridor that begins at their nesting site at Wood Buffalo National Park in Canada and continues south to their wintering grounds at the Aransas National Wildlife Refuge along the Texas coast. The migratory corridor contains 95 percent of all confirmed whooping crane stopover sightings, during migration. Whooping cranes overwinter in Texas from November through March. During migration, they typically fly at altitudes greater than 1,000 feet but will roost and feed in areas away from human disturbance during nightly stopovers. Stopover areas include large rivers, lakes and associated wetlands, playa lakes, pastureland, and cropland (USFWS 2009). This species is not anticipated to occur within the study area due to lack of suitable habitat.

Crustaceans

Peck's Cave Amphipod

Little is known about the life history of Peck's Cave amphipod, except that it is an eyeless cave obligate. This species has only been observed at spring openings of Comal and Hueco springs in the Edwards Aquifer area (NatureServe 2019). This species is not anticipated to occur within the study area due to lack of suitable habitat.

Fishes

Fountain Darter

The fountain darter is a species of perch that is endemic to Texas (Thomas et al. 2007). It inhabits clear waters with aquatic vegetation and constant water temperatures. Diet consists of small crustaceans and insect larvae. Females lay their eggs year-round and utilize calmer waters of the river. Fountain darters are often associated with algae mats (Thomas et al. 2007). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Sharpnose Shiner

The sharpnose shiner is endemic to the Brazos, Wichita, and Colorado river systems. The current known distribution for this species includes the Brazos River system upstream of Possum Kingdom Reservoir. This species is generally found in river runs and pools and is thought to prefer large turbid waters with sand, gravel, and clay-mud bottoms (NatureServe 2019). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Smalleye Shiner

The smalleye shiner is endemic to the Brazos River system, although the current known distribution for this species includes the Brazos River system upstream of Possum Kingdom Reservoir and may be found in portions of the Colorado River above Lake Buchanan as a result of introductions. This species typically inhabits river channels or medium to large prairie streams with sandy substrate and turbid to clear water (NatureServe 2019). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Insects

Unnamed Beetle (Rhadine exilis)

This unnamed beetle species is endemic to Bexar County, Texas. It is an eyeless cave obligate that has been documented in about 50 different caves (NatureServe 2019). *Rhadine exilis* is known only from Edwards Limestone caves in the southern portion of Camp Bullis Military Base (Reddell and Cokendolpher 2004). Threats to this species include habitat loss from quarrying operations, cave filling, and habitat degradation via pollution, and alterations in water flow (USFWS 2012). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Unnamed Beetle (Rhadine infernalis)

This unnamed beetle species is endemic to Bexar County, Texas. It is an eyeless cave obligate that has been documented in about 50 different caves (NatureServe 2019). *Rhadine infernalis* is known only from three caves in the extreme southwest portion of Camp Bullis Military Base (Reddell and Cokendolpher 2004). Threats to this species include habitat loss from quarrying operations, cave filling, and habitat degradation via pollution, and alterations in water flow (USFWS 2012). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Comal Springs Dryopid Beetle

The Comal Springs dryopid beetle is translucent, with a rust-colored exoskeleton. It is eyeless and measures approximately three to four millimeters long. The larvae may inhabit the ceilings of spring openings where organic soil and roots are present, whereas the adults are completely aquatic. Diet of the Comal Springs dryopid beetle is unknown; however, it may be similar to that of other dryopid beetles, which includes detritus and aquatic plants. It has only been collected from Comal Springs and Fern Bank Springs of the Edwards Aquifer (USFWS 2007). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Comal Springs Riffle Beetle

The Comal Springs riffle beetle is approximately two millimeters long, with a reddish-brown exoskeleton. Diet consists of detritus and microorganisms. The species is restricted to springs within the Edwards Aquifer and are

only known to occur near headwaters of the Comal and San Marcos rivers (USFWS 2007). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Helotes Mold Beetle

The helotes mold beetle is endemic to karst features within Texas. It has been documented in eight caves near Helotes, Texas, northwest of San Antonio. This species is a cave obligate, growing up to 2.4 millimeters long and is believed to be predatory in nature (USFWS 2012). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Federal Candidate Species

Golden Orb

The golden orb is a freshwater mussel endemic to central and south Texas. The shell is orange, yellow, or yellowish brown with occasionally green rays. This mussel species inhabits sandy, gravely, and muddy bottoms of lentic and lotic water bodies with depths varying from a few centimeters to over three meters. The golden orb is currently restricted to five rivers, but is historically known from the Colorado, Brazos, Frio, San Antonio, Guadalupe, and Nueces River systems (NatureServe 2019). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Texas Fatmucket

The Texas fatmucket is a freshwater mussel endemic to central Texas. This species is currently known to inhabit the Colorado and Guadalupe river basins. The Texas fatmucket has a tan to brown shell with stripes of dark brown, green-brown, or black, that is oval to rhomboidal in shape. It is believed to be intolerant of impoundments and inhabits moderately flowing streams and small rivers of the Edwards Plateau. The Texas fatmucket primarily occupies water bodies with sandy or gravely substrates but sometimes occurs in muddy substrates (NatureServe 2019). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Texas Pimpleback

The Texas pimpleback is a freshwater mussel endemic to central Texas in the Colorado and Guadalupe river basins. The shell is glossy tan to brown, with occasionally occurring bright green and yellow markings. This species inhabits mud, gravel, and sand substrates of rivers with low flow (NatureServe 2019). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Federal Delisted Species

Black-capped Vireo

The black-capped vireo was federally delisted effective May 16, 2018. The black-capped vireo nests from northern Tamaulipas through west and central Texas and isolated portions of Oklahoma (Graber 1961; Campbell 2003). Suitable nesting areas typically consist of a patchy network of dense, low shrubland cover with branches extending to the ground. Shrub sized broad-leaved vegetation will, in general, cover 30 to 60 percent or greater of the area and be approximately six feet tall or more (Campbell 2003). Habitat vegetation is typically within early succession stages or located on shallow, poor, or eroded soils which encourage the growth of patchy low shrublands (Graber 1961). The vireo nests from March to July with the young fledging in three to four weeks (Graber 1961; Campbell 2003). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Bald Eagle

The bald eagle was delisted in 2007 by the USFWS, because the population has recovered beyond the ESA criteria for listing. The status of the bald eagle population is currently monitored by USFWS and the species is still protected under the MBTA and the BGEPA. Bald eagles may nest and/or winter in Texas. Nests are built in tree tops or on cliffs near rivers or large lakes. The bald eagle primarily preys on fish but will also eat birds, small mammals, and turtles and will often scavenge or steal carrion (Campbell 2003). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

State Listed Species

Amphibians

Black-spotted Newt

The black-spotted newt inhabits wet or seasonally wet areas, such as creeks, ponds, canals, ditches, or shallow depressions. There appears to be no distinct breeding season for black-spotted newts and their breeding may depend entirely on the availability of water. Adults feed on small insects, worms, mollusks, and smaller amphibians (NatureServe 2019). During dry periods, the black-spotted newt aestivates in the ground (TPWD 2019c). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Cascade Caverns Salamander

The Cascade Caverns salamander is a small, subaquatic amphibian endemic to Texas. Its range includes springs and caves within the Edwards Aquifer area (TPWD 2019c). The salamander is pale brown to yellowish in color and grows up to four inches in length. Cave-dwelling forms of the Cascade Caverns salamander have greatly reduced nonfunctional eyes and little skin pigmentation. Other populations of this species have more skin

pigmentation and functional eyes (Powell et al. 2016). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Comal Blind Salamander

The Comal blind salamander is small aquatic salamander that is whitish and/or yellowish in color and measures approximately three inches in length. This species has a relatively large head that extends to nearly one-third of its body length and has dark pink external gills. It has been identified in limestone caves and sinkholes in Comal and Bexar counties (Sweet 1977). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Mexican Treefrog

The Mexican treefrog is nocturnal and seeks shelter under loose tree bark or in damp soil during the heat of the day. It breeds during May to October during rainy periods and lays eggs in temporary rain pools, ponds, canals, and flooded fields (TPWD 2019c). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Birds

Reddish Egret

The reddish egret is a wading bird with blue legs and a pink bill. This species may occur as white (white phase) or as gray with a rusty colored head and neck (dark phase). The reddish egret is a permanent resident of the Texas Gulf Coast and inhabits brackish marshes, shallow salt ponds, and tidal flats (Alsop 2002). They nest on the ground or in trees and bushes on dry coastal islands in brushy thickets of yucca and prickly pear (TPWD 2019c). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Tropical Parula

The tropical parula inhabits dense or open woods, undergrowth, brush, and trees along edges of rivers and resacas. This species is a breeding resident in Texas and feeds on insects and berries (Alsop 2002). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

White-faced Ibis

The white-faced ibis prefers freshwater marshes, swamps, ponds, rivers, sloughs, and irrigated rice fields, but will also use brackish and saltwater habitats. This species is a colonial nester and forages on insects, newts, leeches, earthworms, snails, crayfish, frogs, and fish (TPWD 2019c). White-faced ibis commonly breed and winter along the Texas Gulf Coast (Arvin 2007). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Wood Stork

The wood stork inhabits prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including saltwater areas. This species usually roosts communally in tall snags, sometimes in association with other wading birds and formerly nested in Texas (TPWD 2019c). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Zone-tailed Hawk

The zone-tailed hawk inhabits arid open country, including open deciduous or pine-oak woodland, mesa or mountain country (often near watercourses), wooded canyons, and tree-lined rivers along middle-slopes of desert mountains. This species nests in a wide range of habitats and sites, including small trees in lower desert, giant cottonwoods in riparian areas, and mature conifers in high mountain regions (TPWD 2019c). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Fishes

Toothless Blindcat

The toothless blindcat is a small, eyeless fish endemic to Texas. This species is restricted to freshwater pools within caves located in the Upper San Antonio River and Medina watersheds. Diet of the toothless blindcat may consist of detritus and fungi (NatureServe 2019). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Widemouth Blindcat

The widemouth blindcat is a small, white to pink eyeless fish endemic to Texas. This species is restricted to freshwater pools within caves located in the Upper San Antonio River and Medina watersheds. Diet of the widemouth blindcat consists of shrimp, amphipods, and isopods (NatureServe 2019). This species is not anticipated to occur within the study area due to the lack of suitable habitat.

Mammals

American Black Bear

The American black bear is listed as threatened due to similarities with the Louisiana black bear (*Ursus americanus luteolus*), which has now been federally delisted. The American black bear is a stocky, large, omnivore with black to cinnamon brown fur that consumes insects, roots, and tubers. Preferred habitat in Texas includes bottomland hardwood forest and large tracts of inaccessible forested areas (TPWD 2019c). The American black bear historically inhabited large tracts of forest and woodland throughout Texas and was once thought to be extirpated from the state. In recent years, sightings have increased near the Chisos Mountains in

west Texas and the Texas Panhandle by bears dispersing from Mexico and New Mexico (Schmidly and Bradley 2016). This species is not anticipated to occur within the study area, due to a lack of suitable habitat.

White-nosed Coati

The white-nosed coati is a member of the raccoon family (*Procyonidae*) that inhabits cropland/hedgerows, mesquite grasslands, oak scrub, riparian corridors, and canyons of South and West Texas. Denning occurs in snags or hollow trees. Adult males are solitary while females and young males travel in groups of 12 or more. White-nosed coatis are most active during mornings and evenings at which times they forage canopies and the ground for fruits, insects, birds, and small mammals (Schmidly and Bradley 2016; Nature Serve 2019). This species is not anticipated to occur within the study area due to a lack of suitable habitat.

Reptiles

Cagle's Map Turtle

The Cagle's map turtle habitat range is limited to the Guadalupe and San Antonio river basins, inhabiting the Guadalupe, San Antonio and San Marcos rivers and associated tributaries. Like most other turtles, this species basks in the sun on brush piles along river and stream banks. Female Cagle's map turtles are larger than their male counterparts, averaging up to seven inches in diameter, while males grow up to five inches in diameter (Conant and Collins 1991; Dixon 2013). This species is not anticipated to occur within the study area due to a lack of suitable habitat.

Texas Horned Lizard

The Texas horned lizard inhabits open, arid to semiarid regions with sparse vegetation including open desert, grasslands, and shrubland containing bunch grasses, cacti and yucca. Preferred soils vary from pure sands and sandy loams to coarse gravels, conglomerates, and desert pavements (Henke and Fair 1998). Texas horned lizards are active between early spring to late summer and thermo-regulate by basking or burrowing into the soil. During winter inactivity periods, this species aestivates beneath the surface six to 12 inches deep under rocks, leaf litter, or abandoned animal burrows. Populations are thought to have decreased because of land use conversions, increased pesticide/herbicide use, collection, and increased fire ant populations. The Texas horned lizard forages primarily on the red harvester ant (*Pogonomyrmex barbatus*), but also consumes grasshoppers, beetles, and grubs (Dixon 2013; Henke and Fair 1998). This species is not anticipated to occur within the study area due to a lack of suitable habitat.

Texas Indigo Snake

The Texas indigo Snake is one of the largest snake species in Texas. It inhabits dense riparian corridors in thornbush-chaparral woodlands of South Texas, south of the Guadalupe River and Balcones Escarpment. They

also inhabit irrigated and suburban croplands as long as they have moist burrows for shelter (TPWD 2019c). This species preys on rodents, frogs, snakes and birds (Werler and Dixon 2006). This species is not anticipated to occur within the study area due to a lack of suitable habitat.

Texas Tortoise

The Texas tortoise is a long-lived species with a shell that has characteristically yellowish-orange, bluntly-horned scutes (shell plates). Habitat preferences include arid brush, scrub woods, and grass-cactus associations with grassy understories (NatureServe 2019). The tortoise is active during March to November and when inactive, it occupies shallow depressions at the base of bushes or cactus, underground burrows, or under other suitable objects such as trash. This species feeds on fruits of prickly pear and other mostly succulent plants (TPWD 2019c). This species is not anticipated to occur within the study area due to a lack of suitable habitat.

Timber Rattlesnake

The timber rattlesnake utilizes moist lowland forest and hilly woodland areas near surface waters or inhabits dense ground cover in swamps, floodplains, upland pine, deciduous woodlands, riparian zones, abandoned farmland, and limestone bluffs. The species frequently utilizes fallen hollow logs and stumps as habitat and forages primarily on small mammals (TPWD 2019c; Werler and Dixon 2006). This species is not anticipated to occur within the study area due to a lack of suitable habitat.

3.2 Human Resources/Community Values

3.2.1 Land Use

Jurisdiction does not necessarily represent land ownership. Potential conflicts that could arise from crossing jurisdictional boundaries were evaluated in this study. The study area is located within the jurisdictional boundary of Bexar County, and is entirely within the city of San Antonio.

The study area covers approximately 1.59 square miles in Bexar County. Land uses within the study area were identified and placed into the following categories: urban/developed, planned land use, agriculture, oil and gas facilities, transportation/aviation/utility features, communication towers, and parks and recreation areas. The primary sources of land use information were obtained from interpretation of aerial photographs, USGS topographical maps, and vehicular reconnaissance surveys from accessible public viewpoints. Planned land use features were limited to known features obtained from governmental entities and mobility authorities.

Residential Areas

The urban/developed classification represents concentrations of surface disturbing land uses, which include habitable structures and other developed areas characterized with low, medium and high intensities. The various levels of development include a mix of institutional, commercial, and/or industrial land uses. Developed low, medium, and high intensity areas were identified using aerial photograph interpretation and reconnaissance surveys. These classifications are described below:

- **Developed Low Intensity** areas typically include rural settings with single-family housing units.
- **Developed Medium Intensity** areas typically include single-family housing units that are grouped in residential subdivisions and might include peripheral commercial structures.
- **Developed High Intensity** includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses, and commercial/industrial parks. Areas with the highest concentration of development are typically located within or near the towns and communities in the study area.

The entire study area is located within the city of San Antonio, which is an urban setting. The study area is predominantly residential, with some industrial and commercial development along the existing railroad which runs through the center of the study area. The habitable structures in the study area would be considered high intensity development. Habitable structures were identified using aerial photographs (DigitalGlobe 2019), Google Earth, and reconnaissance surveys. For this routing study, POWER applied the Public Utility Commission of Texas' definition of a habitable structure which defines habitable structures as "structures normally inhabited by humans or intended to be inhabited by humans 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."

Schools

The study area is located within the San Antonio Independent School District. Four public schools were identified within the study area (TEA 2019). In addition, four private schools were identified within the study area (City of San Antonio 2019a).

Planned Land Use

The planned land use component identifies objectives and/or policies regarding land use goals and plans, including conservation easements, managed lands, and proposed developments. Cities and counties typically prepare comprehensive land use plans to provide strategic direction by goals and objectives for the individual city

or county. City and county websites were reviewed and correspondence was submitted to local and county officials to identify potential planned land use conflicts. The City of San Antonio has established zoning districts to provide information on how to property may be developed. Two Neighborhood Conservation Districts were identified within the study area: the Beacon Hill Area and the Alta Vista Neighborhood Conservation Districts. The City of San Antonio also has a comprehensive plan, *SA Tomorrow*, intended to provide guidance in future decisions related to land use, infrastructure improvements, transportation, and more (City of San Antonio 2019b and 2019c).

Conservation Easements

A conservation easement is a restriction property owners voluntarily place on specified uses of their property to protect natural, productive, or cultural features. The property owner retains legal title to the property and determines the types of uses to allow or restrict. The property can still be bought, sold, and inherited, but the conservation easement is tied to the land and binds all present and future owners to its terms and restrictions. Conservation easement language will vary as to the individual property owner's allowances for additional developments on the land. The land trusts facilitate the easement and ensure compliance with the specified terms and conditions.

A review of numerous non-governmental groups (e.g., the Nature Conservancy, Texas Land Conservancy [TLC] and the National Conservation Easement Database [NCED]) that are land trusts and databases for conservation easements within Texas indicated no conservation easements within the study area (Nature Conservancy 2019; TLC 2019; NCED 2019).

3.2.2 Agriculture

Agriculture is a significant segment of the economy throughout Texas, and the study area county has an active agricultural sector. According to the USDA's National Agricultural Statistics Service's 2012 Census of Agriculture, the total market value for agricultural products sold for Bexar County was $72,387,000, a 14 percent decrease from the 2007 market value of $84,223,000. Livestock sales accounted for 24 percent of agricultural sales in Bexar County, while crop sales accounted for 76 percent of agricultural sales. The number of farms in Bexar County decreased slightly from 2,496 in 2007 to 2,457 in 2012 (a decrease of two percent) (USDA 2012).

The study area is located within the city of San Antonio and there were no identified agriculture areas.

3.2.3 Transportation/Aviation

Transportation

Federal, state, and local roadways were identified using TxDOT county transportation maps, STRAT map data, and field reconnaissance surveys. The roadway transportation system within the study area does not include any US Hwys, SHs or FM roads. Numerous local roads were identified in the study area, including San Pedro Avenue, West Woodlawn Avenue, and Hildebrand Avenue (TxDOT 2019a).

TxDOT's "Project Tracker," which contains detailed information by county for every project which is or could be scheduled for construction, was reviewed to identify any state roadway projects planned within the study area. The TxDOT Project Tracker indicated no state roadway projects planned within the study area (TxDOT 2019b). A review of the City of San Antonio Transportation and Capital Improvements did not indicate any city roadway projects planned within the study area (City of San Antonio 2019d).

One Union Pacific railroad was identified within the study area. The railroad is oriented in a north-south direction through the central portion of the study area (USDOT 2019).

Aviation

POWER reviewed the San Antonio Sectional Aeronautical Chart (FAA 2019a) and the Chart Supplement for the South Central US (formerly the Airport/Facility Directory) (FAA 2019b) to identify FAA registered facilities within the study area subject to notification requirements listed in 14 Code of Federal Regulations (CFR) Part 77.9. Facilities subject to notification requirements listed in 14 CFR Part 77.9 include public-use airports listed in the Airport/Facility Directory (currently the Chart Supplement), public-use or military airports under construction, airports operated by a federal agency or Department of Defense (DoD), or an airport or heliport with at least one FAA-approved instrument approach procedure.

The Chart Supplement for the South Central US used in conjunction with the San Antonio Sectional Aeronautical Chart, contains all public-use airports, seaplane bases and public-use heliports, military facilities, and selected private-use facilities specifically requested by the DoD for which a DoD Instrument Approach Procedure has been published in the US Terminal Procedures Publication.

No public-use or military FAA registered airports were identified within the study area (FAA 2019b).

No public-use heliports or heliports with an instrument approach procedure are listed for the study area in the Chart Supplement for the South Central US (FAA 2019b).

In addition, POWER also reviewed the FAA database (FAA 2019c), USGS topographic maps, recent aerial photography, and conducted field reconnaissance from publicly accessible areas to identify private-use airstrips and private-use heliports not subject to notification requirements listed in 14 CFR Part 77.9. There were no private-use airstrips and no private-use heliports identified within the study area.

3.2.4 Communication Towers

Review of the Federal Communication Commission (FCC) database indicated that there are no amplitude modulation radio (AM radio) transmitters. However, there are two frequency modulation radio (FM radio) transmitters/microwave towers/other electronic installations identified within the study area (FCC 2019).

3.2.5 Utility Features

Utility features reviewed include existing electrical transmission lines, distribution lines, pipelines, water and gas/oil wells, and water and gas/oil storage tanks. Data sources used to identify existing electrical transmission and distribution lines include utility company and regional system maps, aerial imagery, USGS topographic maps, additional available planning documents, and field reconnaissance surveys. Existing transmission lines identified include one 138-kV transmission line, running north-south through the central portion of the study area. Distribution lines are prevalent throughout the study area; however, these features were not mapped or inventoried.

Data was obtained from the RRC (RRC 2019b) which provided a GIS layer for existing oil and gas wells, pipelines, and supporting facilities. Data point categories were reviewed and included the following types: permitted locations, oil, gas, injection/disposal, shut-in, water supply, and sidetrack well surface locations. The 2019 RRC dataset along with aerial photograph interpretation and field reconnaissance were used to identify and map existing oil and gas related facilities. No oil and gas wells were identified within the study area.

No pipelines were identified within the study area, and water wells are located throughout the study area (TWDB 2019b; RRC 2019b).

3.2.6 Socioeconomics

This section presents a summary of economic and demographic characteristics for these counties and describes the socioeconomic environment of the study area. Literature sources reviewed include publications of the United States Census Bureau (USCB), and the Texas State Data Center (TXSDC).

Population Trends

Bexar County experienced a population increase between 2000 and 2010 of 19 percent. By comparison, population at the state level increased by nearly 21 percent during the 2000s (USCB 2000 and 2010).

According to TXSDC projections, Bexar County is projected to experience population growth of 41 percent during the next 30 years, from 2010 to 2040. By comparison, the population of Texas is expected to experience population increase of 38 percent over the next three decades (TXSDC 2018). Table 3-7 presents the past population trends and projections for the study area county and for the state of Texas.

TABLE 3-7 POPULATION TRENDS

STATE/COUNTY	PAST		PROJECTED		
	2000	2010	2020	2030	2040
Texas	20,851,820	25,145,561	29,677,772	34,894,429	40,686,490
Bexar County	1,392,931	1,714,773	2,093,427	2,502,208	2,912,144

Sources: USCB 2000 and 2010; TXSDC 2018.

Employment

From 2000 to 2017, the civilian labor force (CLF) in the study area county increased by 33 percent (318,787 people). By comparison, the CLF at the state level grew by 29 percent (4,087,709 people) over the same time period (USCB 2000 and 2017). Table 2-4 presents the CLF for the study area counties and the state of Texas for the years 2000 and 2017.

Between 2000 and 2017, Bexar County experienced a decrease in its unemployment rate from 5.9 percent in 2000, to 5.4 percent in 2017. By comparison, the state of Texas also experienced a decrease in the unemployment rate over the same period. The state's unemployment rate decreased from 6.1 percent in 2000, to 5.1 percent in 2017 (USCB 2000 and 2017). Table 3-8 presents the employment and unemployment data for the study area counties and the state of Texas for the years 2000 and 2017.

TABLE 3-8 CIVILIAN LABOR FORCE AND EMPLOYMENT

STATE/COUNTY	2000	2017
Texas		
Civilian Labor Force	9,830,599	13,918,308
Employment	9,234,372	13,201,891
Unemployment	596,187	716,417
Unemployment Rate	6.1%	5.1%
Bexar County		
Civilian Labor Force	633,001	951,788
Employment	595,911	900,337
Unemployment	37,090	51,451
Unemployment Rate	5.9%	5.4%

Source: USCB 2000 and 2017.

Leading Economic Sectors

The major occupations in Bexar County in 2017 are listed under the category of management, business, science, and arts occupations, followed by sales and office occupations (USCB 2017). Table 3-9 presents the number of persons employed in each occupation category during 2017 in the study area county.

TABLE 3-9 OCCUPATIONS IN BEXAR COUNTY

OCCUPATION	BEXAR COUNTY
Management, business, science, and arts occupations	319,947
Service occupations	172,444
Sales and office occupations	228,895
Natural resources, construction, and maintenance occupations	83,808
Production, transportation, and material moving occupations	95,243

Source: USCB 2017.

In 2000 and 2017, the industry group employing the most people in Bexar County was educational services, and health care and social assistance (USCB 2000 and 2017). Table 3-10 presents the number of persons employed in each of the industries in the study area counties for the years 2000 and 2017.

TABLE 3-10 INDUSTRIES IN BEXAR COUNTY

INDUSTRY GROUP	BEXAR COUNTY	
	2000	2017
Agriculture, forestry, fishing and hunting, and mining	2,776	8,901
Construction	44,648	73,088
Manufacturing	40,775	51,975
Wholesale trade	21,073	22,981
Retail trade	74,893	106,729
Transportation and warehousing, and utilities	29114	42,189
Information	20,900	15,563
Finance and insurance, and real estate and rental and leasing	54,432	82,437
Professional, scientific and management, and administrative and waste management services	58,793	101,849
Educational services, and health care and social assistance	127,659	208,751
Arts, entertainment, and recreation, and accommodation and food services	57,456	104,216
Other services, except public administration	30,044	42,183
Public administration	33,348	39,475

Source: USCB 2000 and 2017.

3.2.7 Community Values

The term "community values" is included as a factor for the consideration of transmission line routing; however, the term has not been formally defined. Typically, the information concerning the following items is related to community values:

- Public open-house meeting.
- Approval or permits required from other governmental agencies.
- Brief description of the area traversed.
- Habitable structures within 300 feet of the centerline for transmission lines of 230 kV or less.
- AM and FM radio, microwave, and other electronic installations in the area.
- FAA-registered public use airstrips, private airstrips, and heliports located in the area.
- Irrigated pasture or croplands utilizing center-pivot or other traveling irrigation systems.
- Parks and recreation areas.
- Historical and archeological sites.

In addition, POWER also evaluated the proposed project for community values and resources that might not be specifically listed, but that might be of importance to a particular community as a whole. The term "community values" is not formally defined; however, POWER has used the following as a working definition: the term "community values" is defined as *a shared appreciation of an area or other natural resource by a national, regional, or local community*. Examples of a community resource would be a park or recreational area, historical or archeological site, or a scenic vista (aesthetics). POWER mailed consultation letters to various local elected and appointed officials, and assisted CPS Energy personnel in hosting one public open house meeting to identify and collect information regarding community values and community resources.

3.3 Recreational and Park Areas

POWER recognizes parks and recreational areas as those owned by a governmental body or an organized group, club, or church. Federal and state database searches and county/local maps were reviewed to identify any parks and/or recreational areas within the study area. Reconnaissance surveys were also conducted to identify any additional park or recreational areas.

3.3.1 National/State/County/Local Parks

No national or state parks were identified within the study area (National Parks Service [NPS] 2019a; TPWD 2019d).

No local parks were identified within the study area (City of San Antonio 2019e).

3.3.2 Wildlife Viewing Trails

Review of the TPWD *Great Texas Wildlife Trails Heart of Texas East* indicates that there is one wildlife viewing loop, Alamo Loop, located within the study area. No sites of interest area located within the study area (TPWD 2019e).

3.4 Aesthetic Values

POWER incorporates aesthetics as a consideration when evaluating proposed electric transmission facilities. There are currently no formal guidelines provided for managing visual resources on private, state, or county owned lands. For the purposes of this study, the term aesthetics is defined by POWER to accommodate the subjective perception of natural beauty in a landscape and measure an area's scenic qualities. The visual analysis was conducted by describing the regional setting and determining a viewer's sensitivity. Related literature, aerial photograph interpretation, and field reconnaissance surveys were used to describe the regional setting and to determine the landscape character types for the area.

Consideration of the visual environment includes a determination of aesthetic values (where the major potential effect of a project on the resource is considered visual) and recreational values (where the location of a substation and a transmission line could potentially affect the scenic enjoyment of the area) that would help define a viewer's sensitivity. POWER considered the following aesthetic criteria that combine to give an area its aesthetic identity:

- Topographical variation (hills, valleys, etc.).
- Prominence of water in the landscape (rivers, lakes, etc.).
- Vegetation variety (woodland, meadows).
- Diversity of scenic elements.
- Degree of human development or alteration.
- Overall uniqueness of the scenic environment compared with the larger region.

The study area is primarily urban. The predominant land use within the study area is residential, with some commercial and industrial use. The majority of the study area has been impacted by land improvements associated with residential structures, commercial and industrial activities, local roadways, and various utility corridors. Overall, the study area viewscape consists of high intensity urban development.

No known high quality aesthetic resources, designated views, or designated scenic roads or highways were identified within the study area. The study area is located within the 28-county Texas Independence Trail Region. There are no sites of interest along the trail within the study area (THC 2019a).

A review of the NPS website did not indicate any Wild and Scenic Rivers, National Monuments, National Memorials, National Historic Sites, National Historic Trails, or National Battlefields within the study area (NWSRS 2019; NPS 2019b and 2019c).

Based on these criteria, the study area exhibits a moderate degree of aesthetic quality for the region. The majority of the study area maintains the feel of an urban city. Although some portions of the study area might be visually appealing, the aesthetic quality of the study area overall is not distinguishable from that of other adjacent areas within the region.

3.5 Historical (Cultural Resource) Values

The THC is the state agency responsible for preservation of the state's cultural resources. The THC, working in conjunction with the Texas Archeological Research Laboratory (TARL), maintains records of previously recorded cultural resources as well as records of previous field investigations. Information from the THC's restricted-access Texas Archeological Sites Atlas (TASA) and Texas Historical Sites Atlas (THSA) was acquired, in addition to GIS shapefiles acquired from TARL, to identify and map locations of previously recorded cultural (archeological and historical) resources within the study area. TxDOT's historic bridges database was also reviewed for bridges that are listed or determined eligible for listing on the National Register of Historic Places (NRHP). At the national level, NPS websites and data centers were reviewed to identify locations and boundaries for nationally designated historic landmarks, trails and battlefield monuments.

Together, archeological and historical sites are often referred to as cultural resources. Under the NPS standardized definitions, cultural resources include districts, sites, buildings, structures, or objects important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. For this study, cultural resources have been divided into three major categories: archeological resources, historical resources, and cemeteries. These three categories correlate with the organization of cultural resource records maintained by the THC and TARL.

Archeological resources are sites where human activity has measurably altered the earth and left deposits of physical remains (e.g., burned rock middens, stone tools, petroglyphs, house foundations, trails, trash scatters). Most archeological sites in Texas are Native American (prehistoric), Euro/African American, or Hispanic in origin. Much of the study area has not been studied intensively for archeological resources. Therefore, high

probability areas (HPAs) for prehistoric and historic archeological resources were determined based on proximity to perennial water sources, certain topographic features, and the presence of structures on historic maps in currently undeveloped areas.

Historical resources include standing buildings or structures (e.g., houses, barns and out buildings), and may also include dams, canals, bridges, transportation routes, silos, etc., and districts that are non-archeological in nature and generally more than 50 years of age.

Cemeteries are locations of intentional human interment and may include large public burial grounds with multiple individuals, small family plots with only a few burials, or individual grave sites. In some instances, cemeteries may be designated as Historic Texas Cemeteries by the THC or recognized with an Official Texas Historical Marker (OTHM). Cemeteries may also be documented as part of the THC Record-Investigate-Protect Program.

3.5.1 Cultural Background

Prehistory

The study area is located within the central and southern cultural resource planning region as shown on Figure 3-4 (Mercado-Allinger et al. 1996). Bexar County is near the border between the South Texas and Central Texas archeological regions, and the Central Texas and the Savannah and Prairie archeological regions (Pertulla 2004). Although the archeological record within and near the study area is likely to reflect influence and shared traits from all three of the archeological regions, the following discussion focuses on the cultural chronology of central Texas, as presented by Collins (2004).

The prehistory of the prehistoric occupation of central Texas is most often divided into three broad periods spanning at least the last 11,500 years. These periods include the Paleoindian period, beginning around 11,500 years before present (BP) lasting approximately 2,700 years. Following the Paleoindian period is the long-lasting Archaic period, which subsumes almost two-thirds of the prehistoric occupation of central Texas from about 8,800 BP until 1,250 BP. The final period before Euroamerican contact is the Late Prehistoric period, which ended with the first Spanish expedition into the region in the mid-1500s.

0 50 100 200

Miles

Source: Mercado - Allinger et. al., 1996

Date: 1/2/2020

Legend

Cultural Resource Planning Region Boundary

County Boundary

MIDTOWN 138 kV
TRANSMISSION LINE AND
SUBSTATION PROJECT

Figure 3-4
Location of the Study Area In Relation to the Cultural Resources Planning Regions of Texas

Paleoindian Period (12,000 to 8,800 BP)

There are few well persevered and documented Paleoindian sites in central Texas. These sites are usually deeply buried making them difficult to locate. However, the information available from this period in the region indicates an area where small mobile groups had access to springs across the landscape and easy access to chert stone to manufacture tools to process edible plants and hunt the available animals in the region (City of San Antonio Office of Historic Preservation [OHP] 2019a).

The Paleoindian period in central Texas is divided into the early and late sub-periods based on the point types predicament used in the hunting of large game (OHP 2019a). The early Paleoindian period, also called the Clovis cultural horizon, began about 11,500 years ago and is the earliest known cultural sequence in the region. Corresponding with the waning years of the Pleistocene era, the early period was characterized by a comparatively cooler, wetter environment. Despite the popular misconception that these early populations were primarily hunters, evidence from the Gault Site in central Texas suggests that their diet was more generalized (Collins 2002). Archeological evidence indicates that these early hunting and gathering populations subsisted on a well-diversified resource base that included not only the last of the mammoth, but also smaller animals, fish, and a variety of reptiles. Artifacts associated with early Paleoindian period sites include large, fluted Clovis spear points, bone and ivory points, and stone bolas. Many of the artifacts were made from exotic stone suggesting a wide-ranging hunting and gathering territory. When the Pleistocene era came to an end around 10,900 BP and the mammoth populations had all but disappeared, prehistoric populations began to focus their hunting efforts on bison, one of the hallmarks of the transition for the early to the late Paleoindian period (Collins 2004).

The late Paleoindian period in central Texas extended from about 10,900 to 8,800 BP. Although the subsistence base now emphasized large game over the more diversified resource base of the early period, small animals, fish, reptiles, and plants remained important food sources. Small groups continued to hunt, gather plants, and obtain raw material for stone tool manufacture over a broad territory. The hallmark Clovis spear points of the early Paleoindian period gave way to the shorter, fluted Folsom points. There was a greater variety of smaller dart points (Collins 2004) including the St. Mary's Hall point, from the St Mary's Hall site (41BX229) and the Brackenridge Park site (41BX1396) in Bexar County (OHP 2019a).

Archaic Period (8,800 to 1,250 BP)

The Archaic period is subdivided into Early (ca. 8,800 to 6,000 BP), Middle (ca. 6,000 to 4,000 BP), and Late (4,000 to 1,250 BP) sub-periods. The transition from the late Paleoindian period to the Early Archaic is gradual and is generally characterized as a time when broad territorial hunting and gathering became more localized and artifact assemblages began to show greater diversity than during the late Paleoindian period (Collins 2004). The

Brackenridge Park site is considered a transition site having both Paleoindian and Early Archaic tool types. The Higgins site (41BX184) and the Panther Springs site (41BX228), both in Bexar County, also have evidence of early Archaic occupations. Projectile points during this period were much more varied than in the Paleoindian and task-specific tools begin to appear, including Clear Fork tools and Guadalupe bifaces (OHP 2019b). Hallmarks of the Early Archaic include the greater use of groundstone tools and the widespread occurrence of heat-altered rocks, which may have functioned as hearths, ovens, or other features. Although there is a paucity of subsistence data for the Early Archaic in central Texas, there is some evidence that deer, various small animals, fish, and roasted plant bulbs were part of the diet, and bison is absent from the archeological assemblages dating to this sub-period (Collins 2004).

During the early portion of the Middle Archaic, bison hunting is evident in the archeological record. However, by around 5,000 BP, bison are once again absent from the archeological record in central Texas, concomitant with the onset of the driest conditions faced by humans in central Texas (Collins 2004). Near the study area, the Middle Archaic is subdivided further into Clear Fork (early) and Round Rock (late) intervals. In general, projectile points crafted during the Middle Archaic are large and straight-stemmed and sometimes found in large quantities at Middle Archaic sites. This greater density of tools may indicate an increase in population (OHP 2019b). Burned rock middens were prolific in central Texas during this time and in many instances appear to have been used for processing plants adapted to the drier climate such as sotol, a semi-succulent plant used for both food and fiber products (Collins 2004).

The onset of the Late Archaic occurred when central Texas was at its driest, around 4,000 BP. Burned rock middens continued to be a common site type in the earliest years of the sub-period, even increasing in frequency in the eastern region of central Texas. As the desert plants were replaced by plants adapted to a moister climate around 3,500 to 2,500 years ago the number of burned rock middens in east-central Texas decreased, but did not entirely disappear. West-central Texas remained dry and burned rock middens continued to be used to process the plant foods at the same intensity as during the Middle Archaic. There is also evidence of increasing population during the Late Archaic (Collins 2004). Cemeteries are commonly found in central Texas during the Late Archaic including several in Bexar County. Burial goods found with the human remains at these cemeteries, such as worked conch shells, indicate regional trade with coastal communities (OHP 2019b).

Late Prehistoric Period (1,250 to 300 BP)

The onset of the Late Prehistoric period has been arbitrarily set by some archaeologists around 1,250 BP, but may have started as recently as 800 BP. Little changed in subsistence patterns during the late Prehistoric; the hunting and gathering strategy continued as did the processing of plants in burned rock middens. The most notable shift

from the Late Archaic to the Late Prehistoric was the introduction and subsequent prevalence of arrow points over dart and spear points in the archeological record. There also appears to be an increase in intergroup violence, possibly as a result of increasing population pressure, as evidenced by numerous skeletal remains exhibiting fatal arrow wounds. Pottery and evidence for small-scale agriculture begin to appear in the archeological assemblages dating to the latter part of the late Prehistoric period (Collins 2004).

Shortly before the arrival of Europeans to Central Texas, native groups were living in small band-sized encampments and large, diffuse camps comprised of people with multiple tribal affiliations. Hunting focused on bison, but also included deer and antelope. Group mobility patterns were governed by the seasonal movements of the native animals and availability of resources, and, later affected by the newly introduced horse. The presence of Caddoan ceramics at several central Texas sites indicates a long pattern of Hasinai Caddo interaction with groups indigenous to central Texas (Collins 2004).

Historic Period (ca. 500 to 50 years ago)

Direct European contact in this region began with exploratory expeditions in the late seventeenth and early eighteenth centuries. The earliest contact came in 1691 when Domingo Terán de los Ríos and Damián Massanet travelled through on an expedition to East Texas (Jasinski 2019). During this expedition, the Spanish explorers encountered an indigenous population that came to be known as Payaya and established the name of San Antonio de Padua for an indigenous village and nearby river. In 1709, another expedition led by Antonio de san Buenaventura y Olivares and Isidro Félix de Espinosa came through the region (Chipman 2019a), after which the area was frequently revisited by exploratory expeditions (Chipman 2019b).

Beginning in 1718 and continuing through the 1720s, Spanish occupation intensified as population increased following the construction of the presidio of San Antonio de Bexar and multiple missions (Handbook of Texas Online 2019). Olivares founded the Mission San Antonio de Valero on May 1st at its original location west of San Pedro Springs. Days later, the presidio of San Antonio de Béxar was founded near the mission by Martín de Alcarón, governor of Coahuila y Texas (Jasinski 2019). Both the presidio and the mission were relocated to their latest locations in 1722 and 1724, respectively, with the presidio on the west bank of the San Antonio River directly across from the mission on the east bank. Additional missions were established as the population of the area steadily rose (Schoelwer 2019). San Pedro Springs, the site where Spanish explorers encountered the indigenous tribe of the Payayas and subsequently established the San Fernando de Bexar settlement was deemed public land in a 1729 royal charter. This function persisted when, in 1851, the boundaries of NRHP-listed San Pedro Springs Park were established in the study area (Turner 1979).

Development of the area continued to intensify as construction projects grew to support the population and the responsibilities of the newly established government. The San Fernando de Béxar settlement was founded in 1731, the first civil government in Texas. San Pedro Springs, the site where Spanish explorers encountered the indigenous tribe of the Payayas and subsequently established the San Fernando settlement. In 1729, a royal charter granted the San Pedro Springs and surrounding areas as public land. This function persisted when, in 1851, the boundaries of San Pedro Springs Park were established (Turner 1979). The Comandancía, later known as the Spanish Governor's Palace, was completed in 1749, and the Church of San Fernando, ultimately known as the San Fernando Cathedral, was completed in 1755. By 1773, San Fernando became the capital of Spanish Texas (de la Teja 2019).

San Fernando de Béxar initially consisted of military personnel and civilians including Mexican frontiersman, resident families, and Native Americans living at the missions. Later, it evolved into a *castas*, or an organization of social hierarchy based on racial divisions. This society was typical in North American Spanish colonies and consisted of Europeans and European descendants, Native Americans, African descendants, and mixed-race groups (Jasinski 2019).

During the late eighteenth and early nineteenth centuries San Fernando suffered a hostile period. Surrounding Native American communities such as the Apache and Comanche put pressure on communication networks and the surrounding farmland, and there were military upheavals in the city as well (de la Teja 2019). In 1811, Captain Juan Bautista de las Casas assumed governorship of Texas in what was known as the Casas Revolt. The revolt was short-lived, however, and ended with the incumbent governor, Manuel María de Salcedo re-instated, and the city was recaptured in 1813 (Caldwell 2019). This tumultuous period eventually led to the re-organization of the provinces of Texas and Coahuila into one state governed out of Saltillo (de la Teja 2019). During the initial stages of the Texas Revolution, San Fernando de Béxar was besieged and occupied by rebel forces. By 1837, it had been renamed San Antonio and was county seat of Bexar County (de la Teja 2019).

The impetus for the Texas Revolution began when several Mexican states rebelled against President Antonio Lopez de Santa Anna's reformation that replaced the constitution of 1824 with a new government. Coahuila y Tejas were among the rebelling states, and on February 23, 1836, the Mexican army under Santa Anna retaliated against the Texian rebels by laying siege to San Antonio. The resulting became known as the Battle of the Alamo. This rebellion ultimately ended on April 21, 1836 with the independence of Texas and the subsequent removal of Mexican forces from San Antonio (Barker and Pohl 2019).

Following the war for independence, San Antonio became the seat of Bexar County within the Republic of Texas. Hostilities with Comanches persisted, such as the Council House Fight in 1840 (Dickson Schilz 2019), and San Antonio was seized twice by Mexico in 1842 (Jasinski 2019). Hostilities with Mexico only intensified after Texas was annexed by the US in 1845 and the Mexican-American War began in 1846. The US military established a headquarters in San Antonio in 1848, but was forced to surrender it to militia forces in 1861 when Texas seceded from the Union at the outset of the American Civil War (Jasinski 2019).

After the Civil War, San Antonio became a prosperous hub supporting multiple industries and growing in population. Cattle trail drives were an integral part of the San Antonio economy, as well as the wool from the nearby hill country. In 1877, the Galveston, Harrisburg and San Antonio Railway reached San Antonio. A second railroad, the International-Great Northern, reached San Antonio in 1881. The railroads fueled local industries, and five additional railroads connected San Antonio to distant markets by 1900. During this time of rapid growth, residential development expanded, into the study area, including what is now the Monte Verde Historic District.

This District covers approximately 100 blocks of residential development dating from the 1890s to the 1930s (Pfeiffer and Pemberton-Haugh 1998). Construction in the area was spurred by the San Pedro street railway, which led from downtown San Antonio into the area (Pfeiffer and Pemberton-Haugh 1998). Many notable architects constructed homes during this period, including the NRHP-listed Atlee B. Ayres' house (Pfeiffer and Pemberton-Haugh 1998; Everett 2019; THC 2019a). Other homes and subsequent residential subdivisions that were constructed along this thoroughfare are now incorporated in the Neighborhood Conservation Districts of Alta Vista and Beacon Hill (BHANA 2019).

Architect Jay E. Adams platted Laurel Heights Addition within what would become Alta Vista and Beacon Hill Neighborhood Conservation Districts after he finished his first residential subdivision across San Pedro Avenue in what is now the Monte Vista Historic District. The borders of the Laurel Heights Addition were W. Summit to the north, Russell Place to the south, San Pedro Avenue to the east, and Blanco Road to the west. The Missouri Pacific Railroad bisected the addition to form Beacon Hill west of the railroad and Alta Vista to the east. These locations offered access to San Pedro Springs Park as well as trolley access downtown for work or shopping (BHANA 2019).

During the 1920s, commercial development commenced in the study area, resulting in the MidTown Business District. The first commercial building in the MidTown Business District, constructed in 1924, was the Blanco Road Drug Shop. Many more shops were founded during the 1920s and 1930s demonstrating the economic resilience of San Antonio during the Great Depression (BHANA 2019).

3.5.2 Literature and Records Review

Historical and archeological data for the study area were reviewed online through the THSA, TASA, and TARL. GIS shapefiles identifying the locations of previously recorded archeological sites were requested from TARL. GIS data from TARL were used to map cultural resource site locations within the study area. Previously recorded cultural resource site data available online from the THSA and TASA were obtained to identify locations of archeological sites, designated historical sites, State Antiquities Landmarks (SALs), cemeteries, Historic Texas Cemeteries, and OTHMs within the study area, as well as previously conducted cultural resource investigations. The OHP Address Search was reviewed for local significant landmarks designated by the city (OHP 2019c). Historic topographical maps were reviewed to identify any historic-aged standing structures within 0.5 mile of the proposed substation (USGS 1953a, 1953b; 1967a, 1967b). The TxDOT historic bridges database was also reviewed for bridges that are listed or determined eligible for listing on the NRHP (TxDOT 2019c). The NPS databases and websites pertaining to NRHP, National Historic Trails, and National Historic Landmark properties were also reviewed to locate and define boundaries for historic properties recorded at the national level (NPS 2019a, 2019b, and 2019c). The results of the review are summarized in Table 3-11.

TABLE 3-11 RECORDED CULTURAL RESOURCES WITHIN THE STUDY AREA

ARCHEOLOGICAL SITES	NRHP-LISTED RESOURCES	NRHP DETERMINED - ELIGIBLE RESOURCE	STATE ANTIQUITIES LANDMARKS	CEMETERIES	OTHM
0	5	0	0	0	6

Source: THC 2019a and 2019b.

The review of the TASA (THC 2019a and 2019b), and TARL data indicates that no archeological sites, cemeteries, SALs, or TxDOT NRHP-eligible or listed bridges have been previously recorded in the study area. Review of the THC and NPS data indicated that five NRHP-listed resources are within the study area, including one NRHP historic district and four NRHP properties. The Monte Vista Residential Historic District is a collection of suburban residential architecture of the nineteenth and early twentieth centuries. The subdivision and others around San Pedro Springs Park were developed to take advantage of the development of the street car network and, eventually, automobile transportation. The range of architectural styles in the district reflects local architects' interpretations of period revival designs, and the subdivision attracted businessmen, professionals, and wealthy ranchers. The district contains 1,719 contributing elements including three of the four individually listed NRHP properties in the study area: the Thomas H. Franklin House, the Hiram Partee House, and the Livingston--Hess House (NRHP 1998).

The Thomas H. Franklin House is a rare example of transitional Queen Ann-Shingles style residence in San Antonio and has both Queen Ann and Classical revival elements. The structure is a two-story structure with

asymmetrical wood frame, multi-gabled roof, and wrap-around double gallery. The house is one of few residences designed by James Riely Gordon, and was designed for prominent San Antonio attorney Thomas H. Franklin. Completed in 1891, a two-story porte cochre, a rear wing, and a detached carriage house were added three years later. Franklin lived in the residence until his death in 1932 (NRHP 1984a).

The Hiram Partee House is a two-story masonry structure with a stucco exterior and a hipped Spanish tile roof. The house is rectangular with projecting ells on the west and south facades and three rectangular chimneys that are capped in red tile. Despite being converted into medical offices, the floor plan remains relatively unchanged from when it served as a residence. Built in 1920, the house was designed by Atlee B. Ayres, one of San Antonio's most prominent architects. The Hiram Partee House is an example of his interest in architecture that was suited to the Texas climate (NRHP 1984b).

The Livingston--Hess House is a regionally adapted Prairie Style brick veneer two-story house and basement with contrasting white cast stone dealing. The house was designed in 1915 for businessman Charles Livingston, who died in 1916. The house features architectural elements from earlier periods, such as projecting gables influenced by the Victorian era. The house also features a two-car garage. Designed by local architect Ernest P. Behles, who adapted the Prairie School architectural style of Frank Lloyd Write (NRHP 1996a).

The David J. and May Bock Woodward House is just outside of the Monte Vista Residential Historic District. The structure is a Classic Revival single dwelling home, built between 1904 and 1905, and converted into a club house in 1926. The building is a red brick structure with four colossal Corinthian columns on the main façade that support a curved flat-roofed portico. The house features a large gabled roof with intersections, front, side, and rear gables. The structure was the private residence of the David J. Wood family until it was purchased in 1926 by the Women's Club of San Antonio. The Women's Club added a large dining area at the back of the house and altered various aspects of the interior leaving the exterior of the house relatively unchanged. The style of the building is similar to those found in the neighboring historic district (NRHP 1996b).

Six OTHMs (Table 3-12) are recorded in the study area. Three of these have been designated Recorded Texas Historic Landmarks: the St. Anthony Catholic School, the Christ Episcopal Church, and the Jay Adam's House. The three remaining OTHMs commemorate the NRHP-listed David J. and May Bock Woodward House, The Woman's Club of San Antonio, and the Monte Vista Historic District (THC 2019a).

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TABLE 3-12 OFFICIAL TEXAS HISTORICAL MARKERS WITHIN THE STUDY AREA

NAME	COUNTY	DESIGNATION
St. Anthony Catholic School	Bexar	Recorded Texas Historic Landmark
Christ Episcopal Church	Bexar	Recorded Texas Historic Landmark
Jay Adams House	Bexar	Recorded Texas Historic Landmark
The Woman's Club of San Antonio	Bexar	-
Monte Vista Historic District	Bexar	-
David J. and May Bock Woodward House	Bexar	-

Source: THC 2019a

The study area is in a densely urbanized area and the recorded cultural resources therein consist of historic structures. These suburban areas within the study area include suburbs and residences that were influenced in design by the emerging use of rail cars and automobiles. Though the use of these buildings has changed over time, many are contributing elements significant to the history of community planning in the City of San Antonio and are tied to locally significant architects and other prominent individuals. The City of San Antonio Landmarks are listed in Table 3-13.

TABLE 3-13 CITY OF SAN ANTONIO LANDMARKS

NAME
Historic Site 602, 606 W French Place
Historic Site Gould-Onderdonk House
Historic Site McIlvanie House
Historic Site 3510 N Main Ave
Historic Site Young Apartment Complex
Historic Site La Quinta de las Piedras
Historic Site Livingston / Hess House
Historic Site 429 W Mistletoe
Historic Site 527 W Woodlawn
Historic Site 2814, 2816, 2822 N Flores St
Historic Site Shiner House
Historic Site Woodward David J and May Bock House
Historic Site Partee Hiram - House and Wilen Building
Historic Site Franklin H. Thomas House
Historic Site Christ Episcopal Church

Source: OHP 2019c.

3.5.3 Previous Investigations

According to the TASA (THC 2019b), there has been one previously conducted cultural resource investigation within the study area. This survey included five areas proposed for flood water improvements for the Bexar County Flood Control Capital Improvement Program (Miller et al. 2011).

3.5.4 High Probability Areas

Review of the previously recorded cultural resource data indicates that the study area has not been entirely examined during previous archeological and historical investigations. Consequently, the records review results do not include all possible cultural resources sites within the study area. To further assess and avoid potential impacts to cultural resources, HPAs for prehistoric archeological sites and historic cultural resources were defined during the route analysis process. HPAs were designated based on a review of the site and survey data within the study area, as well as soils and geologic data, and topographic variables.

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4.0 ENVIRONMENTAL IMPACTS

Potential impacts of the project that could occur from, and are unique to, the construction and operation of a substation and transmission line route are discussed separately in this section of the EA. Evaluation of the potential impacts of the substation and transmission line route identified in Section 2.0 were conducted by tabulating the data for each of the 46 evaluation criteria in Table 2-1. The data tabulations for land use and environmental criteria for the route are presented in Table 4-1.

4.1 Impacts on Natural Resources/Environmental Integrity

4.1.1 Impacts on Physiography and Geology

Construction of the proposed substation and transmission line route is not anticipated to have any significant adverse effects on the physiographic or geologic features and resources of the area. Erection of the structures will require the excavation and/or minor disturbance of small quantities of near-surface materials but should have no measurable impacts on the geologic resources or features along the proposed route.

The proposed route is located within Karst Zone 3, an area that probably does not contain listed invertebrate karst species. Karst features and formations may occur and be encountered during construction. An initial site-specific karst survey will be conducted prior to construction to better determine the potential for occurrence of karst features.

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Table 4-1

Environmental and Land Use Data For Route Evaluation

Midtown

Evaluation Criteria

Land Use		**Route**
1	Length of alternative route (miles)	0.08
2	Number of habitable structures[1] within 300 feet of ROW centerline and substation site	49
3	Number of habitable structures[1] potentially to be relocated/removed2	0
4	Length of ROW using existing transmission line ROW	0
5	Length of ROW parallel and adjacent to existing transmission line ROW	0.00
6	Length of ROW parallel to other existing ROW (roadways, highways, utilities, etc.)	0.00
7	Length of ROW parallel and adjacent to apparent property lines[2]	0.00
8	Length of ROW parallel and adjacent to pipelines	0.00
9	Length of ROW across parks/recreational areas[3]	0
10	Number of additional parks/recreational areas[3] within 1,000 feet of ROW centerline and substation site	0
11	Length of ROW across cropland	0
12	Length of ROW across pasture/rangeland	0
13	Length of ROW across land irrigated by traveling systems (rolling or pivot type)	0
14	Length of route across conservation easements and/or mitigation banks	0
15	Length of route across gravel pits, mines, or quarries	0
16	Number of pipeline crossings	0
17	Number of transmission line crossings	0
18	Number of IH, US and state highway crossings	0
19	Number of FM or RM road crossings	0
20	Number of cemeteries within 1,000 feet of the ROW centerline and substation site	0
21	Number of FAA registered airports[4] with at least one runway more than 3,200 feet in length located within 20,000 feet of ROW centerline and substation site	0
22	Number of FAA registered airports[4] having no runway more than 3,200 feet in length located within 10,000 feet of ROW centerline and substation site	0
23	Number of private airstrips within 10,000 feet of the ROW centerline and substation site	0
24	Number of heliports within 5,000 feet of the ROW centerline and substation site	0
25	Number of commercial AM radio transmitters within 10,000 feet of the ROW centerline and substation site	0
26	Number of FM radio transmitters, microwave towers, and other electronic installations within 2,000 feet of ROW centerline and substation site	2
27	Number of existing water wells within 200 feet of the ROW centerline and substation site	0
28	Number of oil and gas wells within 200 feet of the ROW centerline (including dry or plugged wells) and substation site	0
Aesthetics		
29	Estimated length of ROW within foreground visual zone[4] of IH, US and state highways	0.00
30	Estimated length of ROW within foreground visual zone[4] of FM/RM roads	0.00
31	Estimated length of ROW within foreground visual zone[4][5] of parks/recreational areas[3]	0
Ecology		
32	Length of ROW across upland woodlands/brushlands	0.00
33	Length of ROW across bottomland/riparian woodlands	0.00
34	Length of ROW across NWI mapped forested or scrub/shrub wetlands	0.00
35	Length of ROW across NWI mapped wetlands	0.00
36	Length of ROW across known habitat of federally listed endangered or threatened species	0.00
37	Length of ROW across open water (lakes, ponds)	0.00
38	Number of stream and river crossings	0
39	Length of ROW parallel (within 100 feet) to streams or rivers	0
40	Length of ROW across Edwards Aquifer Recharge Zone	0.00
41	Length of ROW across FEMA mapped 100-year floodplain	0.00
Cultural Resources		
42	Number of recorded cultural resource sites crossed by ROW and substation site	0
43	Number of additional recorded cultural resource sites within 1,000 feet of ROW centerline and substation site	0
44	Number of NRHP listed properties crossed by ROW and substation site	0
45	Number of additional NRHP listed properties within 1,000 feet of ROW centerline and substation site	0
46	Length of ROW across areas of high archeological site potential	0.00

[1] Single-family and multi-family dwellings, and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, schools, or other structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis within 300 feet of the centerline of a transmission project of 230-kV or less.

[2] CPS Energy will potentially relocate/remove habitable structures within 50 feet of the centerline.

[3] Includes instances of proposed double-circuiting or overbuilding existing transmission or distribution lines.

[4] Apparent property boundaries created by existing roads, highways, or railroad ROWs are not “double-counted” in the length of ROW parallel to apparent property boundaries criteria.

[5] Defined as parks and recreational areas owned by a governmental body or an organized group, club, or church within 1,000 feet of the centerline of the project.

[6] As listed in the Chart Supplement South Central US (FAA 2019b formerly known as the Airport/Facility Directory South Central US) and FAA 2019a.

[7] One-half mile, unobstructed. Lengths of ROW within the visual foreground zone of interstates, US and state highway criteria are not “double-counted” in the length of ROW within the visual foreground zone of FM roads criteria.

[8] One-half mile, unobstructed. Lengths of ROW within the visual foreground zone of parks/recreational areas may overlap with the total length of ROW within the visual foreground zone of interstates, US and state highway criteria and/or with the total length of ROW within the visual foreground zone of FM roads criteria.

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4.1.2 Impacts on Soils

Activities associated with the construction, operation, and maintenance of electrical transmission lines typically do not adversely impact soils when appropriate mitigative measures are implemented during the construction phase. Potential impacts to soils for this project include erosion and compaction. The proposed transmission line route does not cross any mapped prime farmland soils.

The highest risk for soil erosion and compaction is primarily associated with the clearing and construction phases of the project. In accordance with CPS Energy standard construction specifications, ROW clearing of woody vegetation would be conducted within the primary ROW, as necessary. Areas with vegetation removed would have the highest potential for soil erosion and the movement of heavy equipment down the cleared ROW creates the greatest potential for soil compaction. Prior to construction, CPS Energy would develop a SWPPP to minimize potential impacts associated with soil erosion, compaction, and off ROW sedimentation. Implementation of this plan would incorporate temporary and permanent Best Management Practices (BMPs) to minimize soil erosion on the ROW during significant rainfall events. The SWPPP would also establish the criteria for mitigating soil compaction and re-vegetation to ensure adequate soil stabilization during the construction and post construction phases. Areas with a high erosion potential, including steep slopes and areas with shallow topsoil, might require seeding and/or implementation of permanent BMPs (i.e., soil berms or interceptor slopes) to stabilize disturbed areas and minimize soil erosion potential. The ROW will be inspected during and post construction to ensure that potential high erosion areas are identified and appropriate BMPs are implemented and maintained.

Minimal clearing is anticipated and potential impacts to soils, primarily erosion and compaction, would be minimized with the development and implementation of a SWPPP.

4.1.3 Impacts on Surface Water

No major surface waters (streams, rivers, lakes, and ponds) were identified within the study area, and the Project would have no impact on surface waters.

4.1.4 Impacts on Ground Water

The construction, operation, and maintenance of the proposed substation and transmission line route are not anticipated to adversely affect groundwater resources within the study area. The proposed transmission line route does not occur within the Edwards Aquifer Recharge Zone.

During construction activities, a potential impact for groundwater resources is related to fuel and/or other chemical spills. Avoidance and minimization measures of potential contamination of water resources will be identified in the SWPPP. CPS Energy will take all necessary and available precautions to avoid and minimize the occurrence of such spills. Any accidental spills would result in a prompt response in accordance with state and federal regulations.

4.1.5 Impacts on Floodplains

No portion of the study area occurs within the 100-year floodplain, and the Project will have no impact on floodplains.

4.1.6 Impacts on Wetlands

No NWI wetlands are mapped within the study area, and the Project will have no impacts on wetlands.

4.1.7 Impacts on Coastal Natural Resources Areas

The study area is not located within the CMZ boundary as defined by 31 TAC § 503.1, which excludes the Project from CMP conditions.

4.1.8 Impacts on Vegetation

Potential impacts to vegetation would result from clearing the ROW of woody vegetation and/or mowing/clearing of herbaceous vegetation. These activities facilitate ROW access for structure construction, line stringing, and future maintenance activities of the proposed substation and transmission line route.

Impacts to vegetation would be limited to the transmission ROW and footprint of the substation. The clearing activities would be completed while minimizing the impacts to existing groundcover vegetation when practical. Future ROW maintenance activities might include periodic mowing and/or herbicide applications to maintain an herbaceous vegetation layer within the ROW.

The entire study area is highly developed with residential and commercial buildings. No upland woodlands/brushlands or bottomland/riparian woodlands occur within the study area and no significant impacts to vegetation are anticipated for this project. The proposed transmission line route may cross sparsely vegetated roadsides that would require minimal clearing.

4.1.9 Impacts on Wildlife and Fisheries

The primary impacts of construction activities on wildlife species are typically associated with temporary disturbances from construction activities, and with the removal of vegetation (habitat modification). Increased noise and equipment movement during construction might temporarily displace mobile urban wildlife species from the immediate workspace area. These impacts are considered short-term and normal wildlife movements would be expected to resume after construction is completed.

Construction activities might impact small, immobile, or fossorial (living underground) animal species through incidental impacts or from the alteration of local habitats. Incidental impacts of these species might occur due to equipment or vehicular movement on the ROW by direct impact or due to the compaction of the soil if the species is fossorial. Potential impacts of this type are not typically considered significant and are not likely to have an adverse effect on any species population dynamics.

ROW clearing activities are not anticipated to significantly impact nesting bird species. Increases in noise and equipment activity levels during construction could potentially disturb breeding or other activities of species nesting in areas immediately adjacent to the ROW. CPS Energy proposes to complete all ROW clearing and construction activities compliant with the MBTA to avoid or minimize disturbance to bird species to the extent practical.

Transmission lines can also present additional hazards to birds due to electrocutions and/or collisions. Measures can be implemented to minimize this risk with transmission line engineering designs. The electrocution risk to birds should not be significant since the engineering design distance between conductors, conductor to structure, or conductor to ground wire for the proposed transmission line is greater than the wingspan of any bird typically within the area (i.e., greater than eight feet). The risk for avian collisions with the shield wire could also be minimized by installing bird flight diverters or other marking devices on the line within high bird use areas.

No aquatic habitats occur within the proposed route ROW and no impacts to aquatic habitats are anticipated for the Project. Construction of the proposed substation and transmission line route are not anticipated to have significant impacts to urban wildlife within the study area. While highly mobile animals might temporarily be displaced from habitats near the substation site and ROW during the construction phase, normal movement patterns should return after project construction is complete.

4.1.10 Impacts to Threatened and Endangered Species

In order to determine potential impacts to threatened or endangered species, a review using available information was completed. Known occurrence data from TXNDD for the study area and project scoping comments from TPWD and USFWS were reviewed. A USFWS IPaC consultation, TPWD county listings, and USFWS designated critical habitat locations were included in the review.

The TXNDD data provides an historical record of the species and other rare resources that could potentially occur in the study area. The absence of species within the TXNDD database is not a substitute for a species-specific field survey. If necessary, a field survey can be completed on the proposed route to determine if suitable habitat is present prior to construction.

Threatened and Endangered Plant Species

The proposed route does not cross any known habitat of federally listed plant species. The entire study area is highly developed with residential and commercial buildings, and no habitats for federal listed plant species are anticipated to occur within the study area. The Project is not anticipated to have adverse effects on listed plant species.

Threatened and Endangered Wildlife Species

The proposed route does not cross any known habitat of federally listed wildlife species. The entire study area is highly developed with residential and commercial buildings, and no habitats for any federal or state listed wildlife species in Table 3-8 are anticipated to occur within the study area. The Project is not anticipated to have adverse effects on listed wildlife species.

4.2 Impacts on Human Resources/Community Values

4.2.1 Impacts on Land Use

The magnitude of potential impacts to land use resulting from the construction of a substation and a transmission line route is determined by the amount of land (land use type) temporarily or permanently displaced by the actual substation footprint and ROW and by the compatibility of the facility with adjacent land uses. During construction, temporary impacts to land uses within the ROW might occur due to the movement of workers, equipment, and materials through the area. Construction noise and dust, as well as temporary disruptions of traffic flow, might also temporarily affect local residents and businesses in the area immediately adjacent the substation site and ROW. Coordination between CPS Energy, their respective contractors, and landowners regarding access and construction scheduling should minimize these disruptions.

The evaluation criteria used to compare potential land use impacts include overall route length, route length parallel to existing linear features (including apparent property boundaries), route proximity to habitable structures, route proximity to park and recreational areas, and route length across various land use types. An analysis of the existing land use within and adjacent to the proposed ROW is required to evaluate the potential impacts. All data for the route is presented in Table 4-1.

Transmission Line Route Length

The length of a transmission line route can be an indicator of the relative magnitude of land use impacts. Generally, all other things being equal, the shorter the route, the less land is crossed, which usually results in the least amount of potential impacts. The total length of the route is approximately 0.08 mile.

Compatible ROW

Several criteria were used to evaluate the use of existing transmission line ROW, length parallel and adjacent to existing transmission line ROW, length of route parallel to other existing linear ROWs, and length of ROW paralleling apparent property lines. It should also be noted that if a segment parallels more than one existing linear corridor it was only tabulated once (e.g., a segment that parallels both an apparent property line and a roadway, will only be tabulated as paralleling the roadway).

The transmission line route does not utilize existing transmission line ROW.

The transmission line route does not parallel any length of existing transmission line ROW.

The transmission line route does not parallel other existing linear features, including roadways, highways, and utilities.

The transmission line route does not parallel apparent property boundaries.

Typically, a more representative account for the consideration of whether new transmission line routes are parallel to existing compatible ROWs, apparent property lines, or other natural or cultural features is demonstrated with the percentage of the total route length parallel to any of these features. These percentages can be calculated for the route by adding up the total length parallel to existing transmission lines, other existing ROW, and apparent property lines and then dividing the result by the total length of the transmission line route. The percentage of the transmission line route paralleling existing linear features is 14 percent.

Developed and Residential Areas

Typically, one of the most important measures of potential land use impacts is the number of habitable structures located in the vicinity of each alternative route. POWER determined the number of habitable structures located within 300 feet of the substation site and the centerline of the transmission line route through the use of GIS software, interpretation of aerial photography, and verification during reconnaissance surveys.

There are 49 habitable structures located within 300 feet of the substation site and transmission line route centerline. None of these habitable structures are potentially to be relocated/removed. All known habitable structure locations are shown on Figure 2-3 (map pocket).

Lands with Conservation Easements

As discussed in Section 3.2.1, there is no property within the study area with a known conservation easement; therefore, the proposed project would have no significant impact on lands with conservation easements. Further, CPS Energy will coordinate with landowners during substation and transmission line construction and operation for continued operation of ongoing or existing land management activities.

4.2.2 Impacts on Agriculture

No agricultural land was identified within the study area. The proposed project would have no significant impact on cropland, pastureland/rangeland, or lands with mobile irrigation systems (rolling or pivot).

The route does not cross any length of cropland, pastureland/rangeland, or lands with known mobile irrigation systems (rolling of pivot).

4.2.3 Impacts on Transportation/Aviation Features

Transportation Features

Potential impacts to transportation could include temporary disruption of traffic or conflicts with future proposed roadways and/or utility improvements. Traffic disruptions would include those associated with the movement of equipment and materials to the substation site and ROW, and slightly increased traffic flow and/or periodic congestion during the construction phase of the proposed project. In the rural portions of the study area, these impacts are typically considered minor, temporary, and short-term. In the urban portions of the study area, the temporary impacts to traffic flow can be significant during construction. CPS Energy will coordinate with the agencies in control of the affected roadways to address these traffic flow impacts. As mentioned in Section 3.2.3, there are no roadway projects within the study area.

The route does not cross any US Hwys, SHs, or FM roads.

Aviation Facilities

According to FAA regulations, Title 14 CFR Part 77, the construction of a transmission line requires FAA notification if tower structure heights exceed the height of an imaginary surface extending outward and upward at a slope of 100:1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of a public or military airport having at least one runway longer than 3,200 feet. The FAA also requires notification if tower structure heights exceed a 50:1 slope for a horizontal distance of 10,000 feet from the nearest runway of a public or military airport where no runway is longer than 3,200 feet in length, and if tower structure heights exceed a 25:1 slope for a horizontal distance of 5,000 feet for heliports.

There are no public or military FAA registered airports with at least one runway longer than 3,200 feet located within 20,000 feet of the substation site or transmission line route. There are also no FAA registered airports where no runway longer than 3,200 feet is located within 10,000 feet of the substation site or transmission line route; and there are no heliports within 5,000 feet of the substation site or route.

CPS Energy will make a final determination of the need for FAA notification, based on specific route location and structure design of the approved route. The result of this notification, and any subsequent coordination with the FAA, could include changes in the line design and/or potential requirements to mark the conductors and/or light the structures.

There are no known private airstrips located within 10,000 feet of the substation site or route.

4.2.4 Impacts on Communication Towers

Neither the substation or the route would have any significant impact on electronic communication facilities or operations in the study area. No commercial AM radio towers were identified within 10,000 feet of the substation site or the route centerline. However, there are two other electronic communication facilities located within 2,000 feet of the substation site and transmission line route centerline.

The communication facility locations are shown on Figure 2-3 (map pockets).

4.2.5 Utility Features

The transmission line route does not cross any known existing pipelines. Additionally, no oil and gas facilities were identified within the study area. Therefore, the proposed project would have no significant impacts to these existing utility features. The transmission line route will not cross any existing transmission lines but will connect

to the existing CPS Energy Comal to Olmos 138 kV transmission line. The proposed project would have no significant impacts to existing electric utility features.

Several water wells were identified within the study area and mapped. No water wells were identified within 200 feet of the substation site or the ROW centerline of the transmission line route.

CPS Energy will coordinate with the appropriate entities to obtain necessary permits or permission as required.

4.2.6 Impacts on Socioeconomics

Construction and operation of the proposed gas-insulated substation and transmission line route is not anticipated to result in a significant change in the population or employment rate within the study area. For this project, some short-term employment would be generated. CPS Energy normally uses contract labor supervised by each entity's respective employees during the clearing and construction phases of transmission line projects. Construction workers for the project would likely commute to the work site on a daily or weekly basis instead of permanently relocating to the area. The temporary workforce increase would likely result in an increase in local retail sales due to purchases of lodging, food, fuel, and other merchandise for the duration of construction activities. No additional staff would be required for substation or line operations and maintenance.

4.2.7 Impacts on Community Values

Adverse effects upon community values are defined as aspects of the proposed project that would significantly and negatively alter the use, enjoyment, or intrinsic value attached to an important area or resource by a community. This definition assumes that community concerns are applicable to this specific project's location and characteristics, and do not include objections to electric transmission lines or substations in general.

Potential impacts to community resources can be classified into direct and indirect effects. Direct effects are those that would occur if the location and construction of a substation and transmission line result in the removal or loss of public access to a valued resource. Indirect effects are those that would result from a loss in the enjoyment or use of a resource due to the characteristics (primarily aesthetic) of the proposed substation, transmission line, structures, or ROW.

4.3 Impacts on Parks and Recreation Areas

Potential impacts to parks or recreation areas include the disruption or preemption of recreation activities. As previously mentioned in Section 3.3, no parks or recreational areas were identified within the study area; therefore, no significant impacts to the use of the parks and recreation facilities located within the study area are

anticipated from the substation site or transmission line route. The routes does not cross and is not located within 1,000 feet of any parks and recreation facilities.

4.4 Impacts on Aesthetic Values

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

Construction of the proposed substation and transmission line project could have both temporary and permanent aesthetic impacts. Temporary impacts would include views of the actual assembly and erection of the tower structures. Permanent impacts from the project would involve the views of the ROW, tower structures, and lines from public viewpoints including roadways.

Since no designated landscapes protected from legislation or most forms of development exist within the study area, potential visibility impacts were evaluated by estimating the length of the route that would fall within the foreground visual zones (one-half mile with unobstructed views) of major highways, FM roads, and parks or recreational areas. The route length within the foreground visual zone of US Hwys, SHs, FM roads, and parks or recreational areas were tabulated and are discussed below.

The transmission line route does not have any portion of its length located within the foreground visual zone of US Hwys and SHs.

The transmission line route does not have any portion of its length located within the foreground visual zone of FM roads.

The transmission line route does not have any portion of its length located within the foreground visual zone of parks or recreational areas.

Overall, the character of the urban landscape within the study area includes residential, commercial, and industrial areas. The high-intensity development within the study area has already impacted the aesthetic quality within the region from public viewpoints. The construction of the substation and transmission line route is not anticipated to

significantly impact the aesthetic quality of the landscape. In addition, CPS Energy is proposing to construct a wall surrounding a portion of the substation site.

4.5 Impacts on Historical (Cultural Resources) Values

Methods for identifying, evaluating, and mitigating impacts to cultural resources have been established for federal projects or permitting actions, primarily for purposes of compliance with the National Historic Preservation Act. Similar methods are often used when considering cultural resources affected by state-regulated undertakings. In either case, this process generally involves identification of significant (i.e., national- or state-designated) cultural resources within a project area, determining the potential impacts of the project on those resources, and implementing measures to avoid, minimize, or mitigate those impacts.

Impacts associated with the construction, operation, and maintenance of transmission lines can affect cultural resources either directly or indirectly. Construction activities associated with any proposed project can adversely impact cultural resources if those activities alter the integrity of key characteristics that contribute to a property's significance as defined by the standards of the NRHP or the Antiquities Code of Texas. These characteristics might include location, design, setting, materials, workmanship, feeling, or association for architectural and engineering resources or archeological information potential for archeological resources.

4.5.1 Direct Impacts

Typically, direct impacts could be caused by the actual construction of the substation and line or through increased vehicular and pedestrian traffic during the construction phase. Absent best management practices, proper mitigation, and avoidance measures, historic buildings, structures, landscapes, and districts are among the types of resources that could be adversely impacted by the construction of a substation and transmission line. Additionally, an increase in vehicular and/or pedestrian traffic might damage surficial or shallowly buried sites. Direct impacts might also include isolation of a historic resource from or alteration of its surrounding environment.

4.5.2 Indirect Impacts

Indirect impacts include those affects caused by the project that are farther removed in distance or that occur later in time but are reasonably foreseeable. These indirect impacts might include introduction of visual or audible elements that are out of character with the resource or its setting. Indirect impacts might also occur as a result of alterations in the pattern of land use, changes in population density, accelerated growth rates, or increased pedestrian or vehicular traffic. Absent best management practices, proper mitigation, and avoidance measures, historic buildings, structures, landscapes, and districts are among the types of resources that could be adversely impacted by the indirect impact of a substation and transmission line.

The preferred form of mitigation for direct and indirect impacts to cultural resources is avoidance through project modifications. Additional mitigation measures for direct impacts might include implementing a program for data recovery excavations if an archeological site cannot be avoided. Indirect impacts on historical properties and landscapes can be lessened through careful design and landscaping considerations, such as using vegetation screens or berms if practicable. Additionally, relocation might be possible for some historic structures.

4.5.3 Summary of Cultural Resource Impacts

A review of the THSA and TASA (THC 2019b and 2019c) records and NPS data (NPS 2018a, 2018b and 2018c) described in Section 2.6, indicated that no archeological sites, NHLs, NRHP-listed properties, or SALs have been recorded within 1,000 feet of the substation site or transmission line route. No cemeteries were identified within 1,000 feet of the substation site or transmission line route on USGS quadrangles or TASA cemetery database (THC 2019b).

No systematic cultural resource surveys have been conducted along the proposed substation site and transmission line route. Thus, the potential for undiscovered cultural resources does exist at the proposed substation site and along the transmission line route. To assess this potential, a review of geological, soils, and topographical maps was undertaken by a professional archeologist to identify areas at the substation site and along the transmission line route where unrecorded prehistoric archeological resources have a higher probability to occur. No HPAs were identified at the substation site or along the route. The substation site and transmission line route are in a heavily urbanized area with little potential for archaeological site preservation. A review of historic topographical maps (USGS 1953a, 1953b, 1967a, 1967b) and historic Sanborn Map Company maps (UTPCL 2019) indicate the period of development within a half mile of the proposed substation largely dates from the mid-1920s to the 1950s. There are currently standing structures at the location of the proposed substation that appear to have been there since 1995. An additional structure was constructed in 2002. The remaining structures currently standing appear to have been constructed in 2003 (Google Earth 1995, 2002, 2003, 2019). Therefore, a cultural resources field survey for potential impacts to historic-aged standing structures and undocumented archeological sites may be required under the Antiquities Code of Texas.

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5.0 AGENCY CORRESPONDENCE

A list of federal, state and local regulatory agencies, elected officials and organizations was developed to receive a consultation letter regarding the proposed project. The purpose of the letter was to inform the various agencies and officials of the proposed project and provide them with an opportunity to provide information regarding resources and potential issues within the study area. Various federal, state and local agencies and officials that may have potential concerns and/or regulatory permitting requirements for the proposed project were contacted. POWER utilized websites and telephone confirmations to identify local officials. Copies of all correspondence with the various state/federal regulatory agencies and local/county officials and departments are included in Appendix A.

Federal, state and local agencies/officials contacted include:

- Federal Aviation Administration (FAA)
- Federal Emergency Management Agency (FEMA) – Region 6
- National Park Service (NPS)
- Natural Resource Conservation Service (NRCS) – Texas Office
- US Army Corps of Engineers (USACE) – Fort Worth District
- US Department of Defense Siting Clearinghouse
- US Environmental Protection Agency (USEPA) – Region 6
- US Fish and Wildlife Service (USFWS)
- Applicable United States Congressman
- Applicable Texas Senators
- Applicable Texas House Members
- Railroad Commission of Texas (RRC)
- Texas Commission on Environmental Quality (TCEQ)
- Texas Department of Transportation (TxDOT) – Aviation Division, Environmental Affairs Division, Planning & Programming, and San Antonio District Engineer
- Texas General Land Office
- Texas Historical Commission (THC)
- Texas Parks and Wildlife Department (TPWD)
- Texas Water Development Board (TWDB)
- Bexar County Judge and Commissioners Court
- Bexar County Economic Development

- Bexar County Floodplain Administrator
- Bexar County Manager
- City of San Antonio Officials
- Alamo Area Council of Governments
- Alamo Soil and Water Conservation District
- Edwards Aquifer Authority Chairman
- San Antonio River Authority
- San Antonio Independent School District
- City of Olmos Park Officials
- The Nature Conservancy - Texas

In addition to letters sent to the agencies listed, POWER requested and reviewed TXNDD Element Occurrence Records from TPWD (TXNDD 2019). POWER also requested and reviewed previously recorded archeological site information from TARL and reviewed the THC's TASA for additional cultural resource information. As of the date of this document, written responses to letters sent in relation to the study area that were received are listed and summarized below.

The DoD Siting Clearinghouse responded with a letter dated August 16 and September 5, 2019, stating that the proposed project located in Bexar County, Texas, will have minimal impact on military operations conducted in this area.

The FAA responded with a letter dated June 14, 2019, stating that if CPS Energy is planning to sponsor any construction or alterations that may affect navigable airspace, they must file FAA Form 7460-1.

FEMA responded with a letter dated June 5, 2019, stating that they request that the community floodplain administrator be contacted for their review and possible permit requirements for this project.

The NRCS responded with a letter dated July 2, 2019, stating that they reviewed the proposed site and enclosed a Custom Soil Resources Report. The letter also states that the major concern within the study area involve soils with high shrink-swell potential and depth to restrictive bedrock layer.

The USACE responded with a letter dated June 6, 2019, stating that they had assigned a regulatory project manager and assigned Project Number SWG-2019-00207. They also gave the website address for guidance on submittals and mitigation.

The USACE responded with an email dated June 10, 2019, stating that they regulate the waters of the US, including wetlands. They recommend an environmental survey and a wetland delineation be conducted. USACE also recommended a cultural survey and coordination with the THC.

The TPWD provided a response letter dated July 19, 2019, providing a list of regulations pertaining to the project and a number of recommendations for the project to comply with these regulations.

The THC responded with a letter dated July 1, 2019, stating that the proposed study area includes portions of the Monte Verde Historic District, which is listed on the NRHP and several properties individually listed in the NRHP. The letter also states that no historic archeological properties will be affected by the project. However, if buried cultural materials are encountered during construction or ground disturbance activities, work should cease in the immediate area. The THC also mentioned that further consultation may be required if the project is located on property owned by a political Subdivision of the State.

The Texas General Land Office responded with a letter dated June 6, 2019, stating that the Texas General Land Office does not appear to have any environmental or land use constraints, but requested contact when a final route has been selected in order to determine if the project crosses any streambeds or Permanent School Fund land that would require an easement.

The Office of State Representative Diego Bernal responded with a letter dated June 5, 2019, stating they did not have any information regarding environmental and land use constraints. They requested that they be kept informed about the project and the neighborhood attitudes toward the project.

The City of San Antonio Environmental Site Assessment Team responded with an email dated June 11, 2019, stating that they had no responsive documents to the request.

The Alamo Area Council of Governments responded with an email dated June 19, 2019, stating that they had no Closed Landfill Inventory sites within the study area.

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6.0 PUBLIC INVOLVEMENT

CPS Energy hosted a public open house meeting within the community to solicit comments, concerns and input from residents, landowners, public officials, and other interested parties. The purpose of this meeting was to:

- Promote a better understanding of the proposed project, including the purpose, need, potential benefits and impacts, and the CPS Energy Board approval process.
- Inform the public with regard to the routing and siting procedure, schedule, and decision-making process.
- Ensure that the decision-making process adequately identifies and considers the values and concerns of the public and community leaders.

The public open house meeting was held on September 19, 2019 from 5:30 p.m. to 7:30 p.m. at Temple Beth-El, 211 Belknap Place, San Antonio, Texas. Invitation letters were sent to residents and landowners within 350 feet of the substation site and route. CPS Energy mailed 98 invitation letters to residents and landowners. Each resident and landowner that received an invitation letter also received a map of the study area depicting the substation site and route as well as an information brochure about the project.

At the meeting, engineers, GIS analysts, and land use specialist were available from CPS Energy and POWER to answer questions regarding the project. Staffed information stations were set up that provided display boards with the purpose and need, pictures of typical 138-kV pole types, an air-insulated substation and a gas-insulated substation, a list of agencies contacted, land-use and environmental criteria for transmission lines, and an environmental and land use constraints map on an aerial photograph base. Two GIS interactive stations operated by GIS analysts were also provided. These computer stations allowed attendees to view more-detailed digital maps of the substation site and route and submit comments digitally and spatially. The information station format is advantageous because it facilitates one-on-one discussions and encourages personalized landowner interactions.

Each individual in attendance was asked to sign their name on the sign-in sheet and attendees received three handouts. The first handout was an information brochure that provided general information about the proposed project. The second handout was a questionnaire that solicited comments on the proposed project and an evaluation of the information presented at the public open house meeting. Individuals were asked to fill out the questionnaire after visiting the information stations and speaking with CPS Energy and POWER personnel. The third handout was a Frequently Asked Questions document providing an overview of the project as well as a description of the regulatory process. Copies of the public notice letter with map, brochure, questionnaire, Frequently Asked Questions and open house exhibits are located in Appendix B.

A total of 27 individuals attended the public open house meeting according to the sign-in sheet with 12 submitting questionnaire responses at or after the public open house meeting. Results from the questionnaires were reviewed and analyzed. Table 6-1 summarizes general response information from questionnaires.

TABLE 6-1 GENERAL RESPONSE SUMMARY FROM QUESTIONNAIRES

GENERAL INFORMATION RESPONSES	PERCENTAGE (%) OF RESPONDENTS
Was the need for the project clearly explained?	
Strongly Agree	0%
Agree	67%
Neutral Disagree	0%
Strongly Disagree	25%
The project team responded to and answered questions about the project.	
Strongly Agree	0%
Agree	50%
Neutral Disagree	25%
Strongly Disagree	17%
The exhibits at the open house were helpful.	
Strongly Agree	0%
Agree	33%
Neutral Disagree	42%
Strongly Disagree	25%

Respondents were then presented with a list of 13 factors that are taken into consideration for a routing study (see a complete list of the criteria on the questionnaire in Appendix B). They were asked to rank each of these criteria, with **1** being the most important factor and **5** being the least important factor. Of those attendees that ranked the criteria, the three criteria that were ranked by the respondents as being the most important are listed in descending order:

- Impact to residences — Most Important: 7 (58%)
- Proximity to schools, churches, cemeteries — Most Important: 1 (8%)
- Impact to woodlands/grasslands/wetlands — Most Important: 1 (8%)

Respondents were asked if there are other factors that should be considered when identifying and evaluating the substation site and route. Written responses included:

- Concerns about the impact to the community.
- Concerns about health impacts.

- Concerns about storm water runoff.
- Concerns about property values.
- Suggests situating the site in a more commercial/industrial area.
- Suggests considering future construction.

Respondents were then asked if there are other features that should be added to the Land Use and Environmental Constraints map. Written responses included:

- Concerns about effect on financial status of owner.
- Concerns about radiation output.
- Suggests showing the radius of EMF [electromagnetic field] impact on neighborhood.
- Concerns about health and safety.
- Suggests showing the technology specifics of the actual site.
- Suggests building the site at the underpass of San Pedro and the railroad.

When asked which of four situations applied to them, written responses were as follows:

- Seven indicated that a potential segment is near their home/business.
- Two indicated that a potential segment crosses their property.
- Nine indicated that a potential substation site is near to their property.
- One answered “Other.”

The questionnaire then provided a space for respondents to include any additional information for the project team to take into consideration when evaluating the project. Written responses included:

- Suggests considering other potential sites.
- Concerns about flooding.
- Requests a wall to hide the substation from the street.

Following the open house, CPS Energy had additional community outreach. District 1 Councilman Roberto Treviño’s office coordinated a meeting between the CPS Energy project team and members of the Monte Vista Terrace neighborhood association (MVTNA). The purpose of the meeting is to give the community the opportunity to voice their concerns about the project to the CPS Energy project team. The meeting was held on

October 29, 2019 at the field office of Councilman Roberto Treviño located at 1310 Vance Jackson, San Antonio, TX 78201 from 7:30 – 8:30 pm.

At the MVTNA meeting, CPS Energy gave a presentation of the same information that was available at the open house. After the presentation, the community was given the opportunity to ask questions and express their feedback and concerns to the project team. Below are the additional project concerns and design changes that the community requested the project team to consider.

- Concerns with light pollution from the substation lights.
- Concerns with noise emitted from the substation equipment.
- Concerns with radio interference from the substation and transmission line.
- Consider a spatial buffer.
- Consider a dog park (pocket park).
- Consider a vegetative wall.
- Consider shifting the substation onto neighboring property (HEB employee parking lot).

The project team worked diligently in evaluating the community's concerns and considerations. Most importantly, CPS Energy coordinated with H-E-B representatives to develop a substation design that allows for a spatial buffer between the adjacent residents by moving the substation equipment partially onto the H-E-B neighboring property.

The CPS Energy project team had a follow up meeting with the MVTNA on January 28, 2020. CPS Energy presented a new substation layout, which included utilizing a portion of H-E-B's employee parking lot. This layout will require an even land swap between CPS Energy and H-E-B. In addition, CPS Energy discussed their plans to mitigate the community's other concerns and considerations. Overall the community members in attendance were appreciative of the efforts between CPS Energy and H-E-B. However, the attendees did express additional concerns with the new substation layout which are listed below:

- Asphalt color
- Landscaping/Trees/Grass
- Storm water drainage
- Lighting from H-E-B parking lot

These same concerns were echoed at the Board Public Input meeting held on Tuesday, February 4, 2020 at the Temple Beth-el of San Antonio located at 211 Belknap Place, San Antonio, Texas 78212. Additionally, the community asked that the project team evaluate the width of the substation driveway and requested a project liaison to be able to communicate with during the duration of the project.

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7.0 LIST OF PREPARERS

This EA and Alternative Route Analysis was prepared for CPS Energy by POWER. A list of the POWER employees with primary responsibilities for the preparation of this document is presented below.

RESPONSIBILITY	NAME	TITLE
Project Director	Rob R. Reid	Sr. Project Manager II / Vice President
Project Manager	Lisa Barko Meaux	Project Manager III
Hydrology	Steve Hicks Aaron Hoefer Sairah Teta	Senior Biologist I Environmental Specialist III Biologist I
Ecology	Steve Hicks Aaron Hoefer Sairah Teta	Senior Biologist I Environmental Specialist III Biologist I
Land Use	Denise Williams Emily Innes	Project Lead I Environmental Specialist I
Aesthetics	Denise Williams Emily Innes	Project Lead I Environmental Specialist I
Public Involvement	Lisa Barko Meaux Denise Williams	Project Manager III Project Lead I
Cultural Resources	Darren Schubert Emily Duke	Cultural Resource Specialist II Cultural Resource Field Rep II
Maps/Figures/Graphics	Gray Rackley Evan Doss Chris Skubal Jennifer Knowles Kevin Garcia	Senior GIS Analyst I GIS Analyst II GIS Technician II GIS Analyst II GIS Technician I

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