

ALTERNATIVE SITE ANALYSIS

FOR CONSTRUCTION OF THE SOUTHLINE SUBSTATION AND TRANSMISSION LINE CUT-IN

ENERGY TEXAS, INC.

SWG-2022-00346

LIBERTY COUNTY, TEXAS

PREPARED BY

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Table of Contents

Contents

1.0	Purpose and Need For Action	1
1.1.	Introduction	1
1.2.	Proposed Action	1
1.3.	Need for Action	2
1.4.	Scope of Environmental Analysis	2
1.5.	Decision to be Made.....	2
1.6.	Timing	2
1.7.	Permits and Notifications	2
2.0	Siting Criteria.....	3
3.0	Alternatives Considered.....	6
3.1.	Alternatives Development.....	6
3.2.	Description of Alternatives	8
3.2.1.	No Action Alternative:.....	8
3.2.2.	Alternative 1 (Off Site):	8
3.2.3.	Alternative 2 (Off Site):	9
3.2.4.	Alternative 3 (On Site):.....	9
3.2.5.	Alternative 4 (On Site):.....	10
3.2.6.	Alternative 5 (On Site – Preferred Option).....	10
3.2.7.	Conclusion	11
3.3.	Mitigation Measures.....	12
3.4.	Best Management Practices	14
4.0	Appendices.....	14
	Section A – Preferred Option Permit Drawings	I

Section B – Alternative 1 Detail.....II
Section C – Alternative 2 Detail..... III
Section D – Alternative 3 Detail..... IV
Section E – Alternative 4 Detail V
Section F – Alternative 5 Detail VI

1.0 PURPOSE AND NEED FOR ACTION

1.1. Introduction

Entergy Texas, Inc. (Entergy) currently serves an area of approximately 230 square miles in Cleveland, Texas and surrounding areas in Liberty County. Entergy is forecasting an overload to their existing Cleveland 138kV Substation due to the rapidly growing Cleveland area. By summer of 2023, peak loads are expected to reach or exceed 114 percent and could possibly increase to 128 percent with additional contract loads for industrial services. To mitigate the forecasted overload at the Cleveland substation, Entergy is proposing to construct the Southline 138kV substation. This would allow Entergy to shift area load from the Cleveland substation and reduce dependence on mobile substations during outages and maintenance. It also allows Entergy to strategically position the new substation within the future high growth area. The proposed substation and transmission line cut-in would be constructed adjacent to an existing Entergy transmission line easement located south of the proposed substation boundary. The proposed project is located southwest of the intersection of Texas State Highway (SH) 105 W and State Highway 105, approximately 2.65 miles west of Cleveland, Texas.

1.2. Proposed Action

The proposed action is permit issuance from the U. S. Army Corps of Engineers (USACE) to Entergy for construction of the proposed substation, detention pond, access road, and transmission line cut-in. Entergy proposes to construct a 358-ft. by 325-ft. (2.26 acres) substation, an access road approximately 2,124-ft. in length by 20-ft. in width, a detention pond approximately 0.35 acres, three laydown areas for storage of equipment during construction (1.05 acres), and transmission line cut-in. To tie-in to the existing transmission line, an approximate 196-ft. by 104-ft. temporary workspace will be required (**Appendix A, Section A**). The proposed substation and transmission line cut-in will be constructed by clearing and grubbing an area, approximately 6.22 acres in size, adjacent to an existing Entergy transmission line easement located south of the proposed substation boundaries. The proposed access road construction will require installation of three culverts, approximately 59-ft. to 75-ft. in length. Earthen fill and limestone will be hauled in to construct the proposed substation and access road. Excavation and the deposition of earthen fill in addition to the installation of a culvert (± 31 -ft.) will be required to construct a retaining berm and the vegetated detention pond. Six transmission line poles will be installed within the existing easement.

1.3. Need for Action

The purpose of this project is to construct the Southline Substation to eliminate a forecasted overload on the existing Transformer #1 (T1) at the nearby Cleveland 138kV Substation. The need for action will minimize risk of equipment failure and interruption of service due to overload/undervoltage of equipment capacity to critical customers. The proposed project will provide long term service capacity and enhanced reliability to the rapidly growing Cleveland area. Growth potential includes residential, facilities, and commercial/industrial operations. A detailed description of the above actions is presented in **Section 2.2** of this document.

1.4. Scope of Environmental Analysis

This alternative analysis was prepared based on 33 CFR § 320.4 - General policies for evaluating permit applications. This alternative analysis is designed to ensure careful consideration of environmental aspects of a proposed action and to make information available to decision-makers and the public before final decisions are made and actions are taken.

The alternative analysis for this proposed project presents a site-specific proposed action and alternatives to meet the desired future condition of Waters of the U.S. within and adjacent to the site.

1.5. Decision to be Made

The decision to be made will be whether to implement the preferred action alternative (preferred option), modify that action alternative, or select another alternative action (including the no-action alternative). Additionally, a determination will be made as to whether the proposed action or alternative will significantly affect the environment.

1.6. Timing

Construction activities would begin once the USACE permit authorization is issued. The anticipated construction time for the entire project would be approximately twelve months. Construction activities, at a minimum, would occur eight hours per day, five to six days a week.

1.7. Permits and Notifications

Activities resulting in the excavation and/or filling of waters of the United States, including wetlands, are regulated under Section 404 of the Clean Water Act (CWA) and by Executive Order (EO) 11990, *Protection of Wetlands*. The U. S. Army

Corps of Engineers (USACE) administers the permit program associated with Section 404. The USACE issues permits for impacts to waters of the United States. Entergy is pursuing an Individual Permit (Standard Permit) with the Corps of Engineers, Galveston District.

The proposed action will require a CWA §401 Water Quality Certification (WQC) under a Tier I (small) project. Anticipated impacts to waters of the United States are less than three acres. Entergy will submit a TCEQ Notice of Intent for stormwater discharges associated with construction activities under the General Permit to Discharge under the Texas Pollutant Discharge Elimination System (TPDES) No. TXR150000. A stormwater pollution prevention plan (SWPPP) will be developed for the proposed project site.

Activities occurring within the Texas Department of Transportation (TxDOT) right-of-way (ROW) will require a ROW construction permit. Entergy will pursue a permit to construct an access driveway on state highway facilities for the proposed substation access located on TX State Highway 105.

2.0 SITING CRITERIA

For the location to meet the need of the project, siting of the proposed substation proximate to the area of load demand and within Entergy's service boundary was necessary. As part of Entergy's analysis conducted on potential sites within their service boundary and Cleveland area, five sites were evaluated and selected based on the established criteria in Table 1 below. The analysis provided a screening process to identify potential sites for the proposed substation. A total of five sites were identified within existing Mutually Supportive Substation Grouping (MSSG) area, Entergy's service boundary, and feeder exit accessibility to be considered for placement of the substation. The evaluation criteria included several variables:

- Estimated total site disturbance
 - Entergy service boundary positioning such that new assets sit within Entergy territory
 - Construction right-of-way costs
 - Close proximity to existing transmission line
 - Within distribution feeder network
 - Logistics and feeder exit accessibility
 - Within load growth area
 - Landowner cooperation and willingness to sell property
 - Mutually Supportive Substation Grouping (MSSG) which insures efficient use of service capacity and acceptable lengths of feeders and customer counts per feeder
 - Potential wetland impacts
 - Flooding risk
-

Table 1 Location Alternatives Criteria Comparison					
Category	Alternative 1 (Off Site)	Alternative 2 (Off Site)	Alternative 3 (On Site)	Alternative 4 (On Site)	Alternative 5 (On Site - Preferred)
Siting Criteria					
Estimated Total Site Disturbance	5.48 acres	6.42 acres	5.88 acres	6.42 acres	6.22 acres
Within Entergy's Service Boundary	Yes	Yes	Yes	Yes	Yes
Construction Right-of-Way Costs	Yes	Yes	Yes	Yes	Yes
Close proximity to existing transmission line	Site Optimal due to proximity to existing transmission line: Cleveland - Jayhawker Creek 138 kV	Site Optimal due to proximity to existing transmission line: Cleveland - Jayhawker Creek 138 kV	Site Optimal due to proximity to existing transmission line: Cleveland - Jayhawker Creek 138 kV	Site Optimal due to proximity to existing transmission line: Cleveland - Jayhawker Creek 138 kV	Site Optimal due to proximity to existing transmission line: Cleveland - Jayhawker Creek 138 kV
Within Area of Distribution Feeder Network	Site Optimal to allow orientation Southline 138kV-34.5kV low-side feeder breakers to exit to the north onto SH 105 W and support future area distribution feeder network infrastructure.	Site Optimal to allow orientation Southline 138kV-34.5kV low-side feeder breakers to exit to the north onto SH 105 W and support future area distribution feeder network infrastructure.	Site Optimal to allow orientation Southline 138kV-34.5kV low-side feeder breakers to exit to the east onto SH 105 and support future area distribution feeder network infrastructure.	Site Optimal to allow orientation Southline 138kV-34.5kV low-side feeder breakers to exit to the east onto SH 105 and support future area distribution feeder network infrastructure.	Site Optimal to allow orientation Southline 138kV-34.5kV low-side feeder breakers to exit to the east onto SH 105 and support future area distribution feeder network infrastructure.
Logistics and feeder exit accessibility	Future TxDOT road widening project on SH 105 W could disrupt ease of access to the substation for maintenance.	Problematic site location due to proximity to existing pipeline right-of-way and future TxDOT road widening project on SH 105W. Potential stress and encroachment to existing pipelines create risk for safety and disruptions for maintenance to Entergy's infrastructure.	Site located off of SH 105 and adjacent to existing transmission line ROW. Optimal for accessibility for maintenance.	Site located off of SH 105 and adjacent to existing transmission line ROW. Optimal for accessibility for maintenance.	Site located off of SH 105 and adjacent to existing transmission line ROW. Optimal for accessibility for maintenance.

Table 1 Location Alternatives Criteria Comparison					
Category	Alternative 1 (Off Site)	Alternative 2 (Off Site)	Alternative 3 (On Site)	Alternative 4 (On Site)	Alternative 5 (On Site - Preferred)
Within Load Growth Area	Yes, site would serve load growth area within Cleveland area; including New Pinewood Trails Subdivision and BNSF development on SH 105 expected to add 25MVA of new load to Entergy's facilities. Provides partial contingency to other area substations and reduces dependence on mobile Cleveland substation.	Yes, site would serve load growth area within Cleveland area; including New Pinewood Trails Subdivision and BNSF development on SH 105 expected to add 25MVA of new load to Entergy's facilities. Provides partial contingency to other area substations and reduces dependence on mobile Cleveland substation.	Yes, site would serve load growth area within Cleveland area; including New Pinewood Trails Subdivision and BNSF development on SH 105 expected to add 25MVA of new load to Entergy's facilities. Provides partial contingency to other area substations and reduces dependence on mobile Cleveland substation.	Yes, site would serve load growth area within Cleveland area; including New Pinewood Trails Subdivision and BNSF development on SH 105 expected to add 25MVA of new load to Entergy's facilities. Provides partial contingency to other area substations and reduces dependence on mobile Cleveland substation.	Yes, site would serve load growth area within Cleveland area; including New Pinewood Trails Subdivision and BNSF development on SH 105 expected to add 25MVA of new load to Entergy's facilities. Provides partial contingency to other area substations and reduces dependence on mobile Cleveland substation.
Landowner Cooperation & Willingness to Sell	No	No	Yes	Yes, Entergy has obtained purchase agreement	Yes, Entergy has obtained purchase agreement
Mutually Supportive Substation Grouping (MSSG): efficiency and service capacity for acceptable feeder line lengths to serve customers	Site is situated in area of transmission service needed; between Entergy Cleveland and Jayhawker Substations for acceptable lengths of feeders to service approximately 8,300 customers by new source.	Site is situated in area of transmission service needed; between Entergy Cleveland and Jayhawker Substations for acceptable lengths of feeders to service approximately 8,300 customers by new source.	Site is situated in area of transmission service needed; between Entergy Cleveland and Jayhawker Substations for acceptable lengths of feeders to service approximately 8,300 customers by new source.	Site is situated in area of transmission service needed; between Entergy Cleveland and Jayhawker Substations for acceptable lengths of feeders to service approximately 8,300 customers by new source.	Site is situated in area of transmission service needed; between Entergy Cleveland and Jayhawker Substations for acceptable lengths of feeders to service approximately 8,300 customers by new source.

Table 1 Location Alternatives Criteria Comparison					
Category	Alternative 1 (Off Site)	Alternative 2 (Off Site)	Alternative 3 (On Site)	Alternative 4 (On Site)	Alternative 5 (On Site - Preferred)
Environmental					
Potential Wetland Impacts	Moderate wetland impacts anticipated on site. 0.82 acres loss, 0.11 acres conversion (PSS) 0.26 acres loss, 0.27 acres conversion (PEM)	Minimal to no wetland impacts on site.	High wetland impacts. Other Waters impacts causing loss of functions to 525 linear feet from fill activity in addition to permanent loss of 2.23 acres (PFO) and 0.12 acres (PEM) wetlands.	Wetland impacts high on site. Total loss of PFO wetlands (1.63 acres), conversion of PFO wetlands (0.38 acres), and PEM wetlands (0.003 acres). Temporary impacts to streams (0.03 acres) from clearing activity.	Wetland impacts high on site. Total loss of PFO wetlands (1.63 acres), conversion of PFO wetlands (0.134 acres), and PEM wetlands (0.004 acres). Temporary impacts to streams (0.03 acres) from clearing activity.
Flooding Risk	Site designated as area FEMA Flood Zone X; of minimal flooding hazard	Site designated as area FEMA Flood Zone X, of minimal flooding hazard; approximately 815-ft. north from area within FEMA Special Flood Hazard Area Zone A	Site designated as area FEMA Flood Zone X; of minimal flooding hazard	Site designated as area FEMA Flood Zone X; of minimal flooding hazard	Site designated as area FEMA Flood Zone X; of minimal flooding hazard

Based on this criterion, the alternative sites were evaluated and compared for a selection of the proposed preferred project area.

3.0 ALTERNATIVES CONSIDERED

The alternatives considered for the proposed action were based on the above siting criteria discussed in Section 2.0.

3.1. Alternatives Development

The purpose and need for the proposed action are examined and documented in Section 1.3. Alternatives were developed to respond to issues identified by the USACE as discussed in Section 1.5.

Overall Substation Selection

The development plan for this action is to focus on the need to eliminate the expected overload on the Cleveland T1 transformer and contingency load at risk

for the loss of either Cleveland transformers T1 or T5. Entergy strategically selected the location based on the willingness of landowner cooperation and property purchase, environmental concerns, within the existing transmission line network, and Mutually Supportive Substation Grouping (MSSG), and distribution feeder and accessibility for maintenance. Entergy will construct the substation, access road, and transmission line cut-in in the most efficient and environmentally friendly manner possible.

Entergy identified an area within their Cleveland transmission line network for development of the substation which would minimize and provide contingency to address forecasted overload and expected future load growth in Cleveland, TX. The central area (off-site alternatives, preferred option, and on-site alternatives) are located south along TX SH-105 adjacent to an existing transmission line right-of-way. The preferred and on-site options are within a tract of land with undeveloped bottomland forest with a transecting existing transmission line ROW. One off-site alternative is located west of the preferred option on an adjacent tract of land managed as native pastureland. The secondary off-site alternative is located south of TX SH 105 W approximately 0.80 miles west from the intersection of SH 105 and is situated on undeveloped mixed pine/hardwood forest with bisecting transmission and pipeline corridors.

Numerous criteria must be considered to properly and legally place the substation. Criteria such as landowner cooperation and willingness to sell property, environmental concerns, relative location to large and critical customers, existing transmission lines and roadways, Public Utility Commission of Texas (PUCT) selection of transmission route if a Certificate of Convenience and Necessity (CCN) is required, Entergy's service boundary, and existing (MSSG) and feeder exit accessibility and design all have to be considered for placement of the substation.

Entergy is subject to the rules and laws by the PUCT under the Texas Administrative Code (TAC) Title 16, Part II. Specifically, substantive rules applicable to electric service providers including distribution and transmission utilities are legally required to make every reasonable effort to prevent interruptions of service, reasonable efforts to manage emergencies resulting from failure of service and maintain critical loads for protection of public safety infrastructure and reliability. Entergy located tracts of land within their existing Entergy transmission network near Cleveland, TX where the identified T1 load level is forecasted to reach peak capacity during summer of 2023. Placement opportunities are limited to the following: landowner cooperation and property purchase, Entergy service boundary, within distribution feeder, and use of service capacity to customers. The existing transmission ROW and within to load growth drivers in the Cleveland area resulted in limited opportunities for placement of the substation.

Two off-site alternatives, two on-site alternatives, a no-action alternative, and the preferred option were considered and evaluated (**Appendix A**).

3.2. Description of Alternatives

All alternative site locations satisfy the criteria to be within Entergy's service boundary, close proximity to existing transmission line, within to distribution feeder network, located within the load growth area, fit within the Mutually Supportive Substation Grouping (MSSG), and within areas designated by the Federal Emergency Management Agency (FEMA) as minimal flooding hazard.

3.2.1. No Action Alternative:

The "no-action" alternative is required by the NEPA and it serves as the benchmark for other alternatives to show change or effect on the environment. Under this alternative, the USACE would not authorize a Section 404 permit and the substation, transmission line cut-in, detention pond, and access road would not be constructed within wetlands. This alternative would deny Entergy the ability to resolve the forecasted overload to existing electrical infrastructure, creating reliability risk, and future load growth in the area. It would also deny the public a valuable resource and ability for Entergy to bolster transmission to avoid disruptions for critical service for community and industrial development.

3.2.2. Alternative 1 (Off Site):

Alternative 1, as shown in Appendix A, Section B, would require a 279-ft. by 330-ft. substation which would predominantly be placed within an area used as native pastureland. Habitat impacts for construction of the access road, substation, transmission line cut-in and clearing and grading is approximately 5.48 acres. This alternative would cause the permanent loss of wetland functions to 0.82 acres of palustrine scrub-shrub (PSS) wetlands and 0.26 acres of palustrine emergent (PEM) wetlands based on desktop review of historical imaginary and visual assessment from the adjacent property to the east. It would also require conversion of 0.11 acres of PSS wetlands to PEM wetlands to clear and grub an area surrounding the proposed substation for storm resiliency. Additional temporary impacts to 0.27 acres of PEM wetlands would occur for transmission line cut-in installation. Portions of the site have vegetative communities similar to the adjacent preferred site option. This alternative would be optimal due to road proximity and relative location to an existing transmission line right-of-way. However, the Texas Department of Transportation plans to improve SH 105 W by widening the existing roadway, which has the potential risk to disrupt maintenance and accessibility to the exiting roadway.

This alternative would have lesser adverse impacts to Waters of the U.S. compared to Alternatives 3 and 4 (preferred option). However, Entergy was not successful in negotiating a property purchase with the landowner. This alternative is eliminated due to a lack of landowner cooperation to sell property for the proposed project.

3.2.3. Alternative 2 (Off Site):

Alternative 2, as shown in Appendix A, Section C, would also require a 279-ft. by 330-ft. substation site with a new access road off existing SH 105 W. The proposed transmission line cut-in would traverse north and tie into an existing transmission line ROW. Based on aerial review and data generated from the U. S. Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI), this surface location does not appear to impact Waters of the U.S. The proposed access road for this alternative location would cross an existing pipeline ROW. The installation of substation structures below normal ground surface could create a safety risk and maintenance disruptions with encroachment of the substation to the active Tennessee Gas Pipeline Company natural gas pipelines. Accessibility to the substation could also be impacted by the future Texas Department of Transportation project to improve SH 105 W by widening the existing roadway. This alternate location is located within an area FEMA Flood Zone X, of minimal flooding hazard and approximately 815-ft. north from area within FEMA Special Flood Hazard Area Zone A. This site is the least damaging practical alternative due to potential avoidance of Waters of the U.S. However, Entergy was not successful in negotiating a property purchase with the landowner. This alternative is eliminated due to a lack of landowner cooperation to sell property for the proposed project.

3.2.4. Alternative 3 (On Site):

Alternative 3, as shown in Appendix A, Section D, would also require a 279-ft. by 330-ft. substation which would predominantly be placed within an area of undeveloped bottomland hardwood forest. Habitat impacts for construction of the access road, substation, transmission line cut-in and clearing and grading is approximately 5.88 acres. This alternative would cause the permanent loss of wetland functions to 2.23 acres of palustrine forested (PFO) wetlands and 0.12 acres of palustrine emergent (PEM) wetlands based on combination of desktop review from the USFWS NWI and on-site visual assessment. A wetland delineation was conducted within the existing transmission line ROW and PEM wetlands were identified within the transmission line cut-in area. It would also require conversion of 2.09 acres of PFO wetlands to PEM wetlands due to clearing and grubbing of the area surrounding the proposed substation and access road for storm resiliency. Additional temporary impacts to 0.81 acres of PEM wetlands would occur for transmission line cut-in installation and construction of the proposed access road. Finally, placement of the substation would cause the loss of functions to a potential

stream (Other Water) that transects the substation. Total footage of impacts to this potential stream is approximately 525-ft. This alternative site is located within the same property parcel as the preferred option and is bisected by an existing transmission line ROW. The vegetative community appears to be identical to the northern forested portion of the property.

This alternative site would cause the greatest loss of wetland functions; therefore, this alternative was eliminated as a viable option.

3.2.5. Alternative 4 (On Site):

Alternative 4, as shown in Appendix A, Section E, would require a substation 360-ft. by 310-ft. in size, access road approximately 2,195-ft. by 25-ft., a detention pond 215-ft. by 52-ft. in size, and transmission line cut-in within an area of undeveloped bottomland hardwood forest. Based on field data collected during wetland delineations conducted in December 2021 and February 2022, this alternative would cause the loss of wetland functions to 1.63 acres of PFO wetlands from discharge of fill material imported to construct the substation, and the creation of a detention pond, and an access road. The placement of transmission line poles would cause the loss of wetland functions to 0.003 acres of PEM wetlands. The conversion of 0.38 acres of wetland functions from PFO wetlands to PEM wetlands will occur due to clearing and grubbing of the area necessary for workspace and storm resilience. Additionally, temporary impacts to 0.19 acres of PEM wetlands will occur within the transmission line cut-in workspace and 0.03 acres of Other Waters from installation of access road culverts and temporary workspace. Although unavoidable impacts to wetlands will occur from this alternative, it is considered an alternative option due to the opportunity for property purchase and accessibility to the existing transmission line ROW. This alternative was previously selected as the preferred option and approved by the USACE. However, it was identified that proposed detention pond design would not perform adequately to support stormwater runoff and prevent potential flooding to comply with post-construction stabilization requirements and runoff rates. Due to project design modifications to the permitted project, this alternative is no longer the most viable, least environmentally damaging practicable alternative (LEDPA).

3.2.6. Alternative 5 (On Site – Preferred Option)

Alternative 5, preferred as shown in Appendix A, Section F, would require a new substation approximately 358-ft. x 325-ft. (2.26 acres) in size, an access road approximately 2,124-ft. x 20-ft., a detention pond approximately 0.35 acres, three laydown areas for storage of equipment during construction (1.05 acres), and a transmission line cut-in area. The proposed substation and transmission line cut-in will be constructed by clearing and grubbing an area, approximately 6.22 acres in

size, within undeveloped bottomland hardwood forest and adjacent to an existing Entergy transmission line easement located south of the proposed substation boundaries. Based on field data collected during wetland delineations conducted in December 2021 and February 2022, this alternative would cause the loss of wetland functions to 1.63 acres of PFO wetlands from discharge of fill material imported to construct the substation, and the creation of a detention pond, and an access road. The placement of transmission line poles would cause the loss of wetland functions to 0.004 acres of PEM wetlands. The conversion of 0.134 acres of wetland functions from PFO wetlands to PEM wetlands will occur due to clearing and grubbing of the area necessary for workspace and storm resilience. Additionally, temporary impacts to 0.23 acres of PEM wetlands will occur within the transmission line cut-in workspace and 0.03 acres of Other Waters from installation of access road culverts and temporary workspace. Project design modifications to Alternative 4 (permitted, previous preferred option) were necessary to revise the size of the detention pond due to the insufficient design to support the volume of stormwater runoff from the site. An additional detention pond was designed adjacent to the original proposed detention pond. The site alignment was also shifted approximately 40 feet west within the available property due to the revised design of the detention ponds. Clearing and grubbing limits were decreased to enable a reduction of PFO wetland impacts. Although unavoidable impacts to wetlands will occur from this alternative, it is considered the preferred, LEDPA option due to the opportunity for property purchase, reduced project area disturbance from Alternative 4, and accessibility to the existing transmission line ROW.

3.2.7. Conclusion

Placement of the substation, access road, detention pond and transmission line cut-in within the preferred footprint would not constitute the least damaging practicable alternative based on established alternatives. However, Entergy was not allowed the opportunity to purchase property associated with the least damaging practicable alternatives (Alternatives 1 & 2). Based on numerous criteria considered to properly and legally place the proposed substation, on-site alternatives 4 and 5 would allow Entergy to mitigate the forecasted overload at the Cleveland Substation.

Alternative 5 site would have the same total loss of wetland functions in PFO wetlands for construction and temporary impacts to streams as Alternative 4 site. There would be an increase of temporary impacts of PEM wetlands within the transmission line cut-in by 0.04 acres and an increase of 0.001 acres of total loss of wetland functions in PEM wetlands for transmission pole installation for Alternative 5 site. Alternative 5 site alignment would reduce the total project area disturbance due to a reduction in the clearing and grubbing limits by approximately

0.25 acres and reduce the overall wetland impacts from Alternative 4 site. Additionally, Alternative 5 was chosen as the LEDPA because it has the least amount of wetland impacts on available land, can support the temporary storage of stormwater runoff from the site, and serves the needs of the proposed project. This alternative location can be referenced in **Appendix A, Section F**.

3.3. Mitigation Measures

As part of the §404 permit process, the USACE is required to evaluate all mitigation options. The CEQ regulations define mitigation as:

- Avoiding impacts all together by not taking an action or parts of an action;
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment, reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- Compensating for the impact by replacing or providing substitute resources or environments.

Mitigation measures associated with the proposed action include minimization of impacts and reducing or eliminating the impact over time by maintenance operations.

Impacts were minimized through preferred substation selection. Implementation of BMPs during construction will reduce noise, dust emissions, and erosion, as well as minimize adverse effects to the human and natural environment. Compensatory mitigation for unavoidable impacts within jurisdictional wetlands will be coordinated with USACE and the Internal Review Team. Per 33 CFR 332.4(c)/40 CFR 230.92.4(c), Entergy is proposing to secure credits from an approved mitigation bank, which requires review of components 4 (baseline information) and 5 (determination of credits).

Additionally, Entergy utilized the mitigation rule hierarchy to research potential compensatory mitigation sites within the East Fork San Jacinto River HUC. Based on RIBITS, mitigation bank credits (third party mitigation) are available for in-kind within the East Fork San Jacinto River HUC watershed. Riverine forested biological, chemical, and physical credits are available within the primary watershed.

Approximately 0.134 acres of palustrine forested (PFO) wetlands will be converted to an emergent wetland type, and approximately 1.63 acres of PFO wetlands and 0.004 acres of palustrine emergent (PEM) wetlands will have a permanent loss of

wetland functions due deposition of fill material and excavation during construction of the substation, detention pond, access road, and for pole installation at the preferred option location. Conversion impacts to PFO wetlands will result from clearing and grubbing activities within 25-ft. of the substation for storm resilience. The temporary impacts to Other Waters from access road culvert installation and clearing and grubbing activities will equate to 0.03 acres. Loss of functions to Other Waters are not anticipated from culvert installation. The temporary workspace within the existing transmission line cut-in will impact 0.23 acres of PEM wetlands and will be returned to pre-construction contours and restored by natural re-vegetation upon completion of construction activities. The restored area will be monitored during construction and restoration will be documented to determine success of natural re-vegetation (i.e., regrowth of previously existing grasses and shrubs based on the existing seed source at the site).

With respect to the term “natural restoration” and criteria to judge that this condition has been reached, Entergy is confident that regrowth of previously existing grasses and shrubs is highly likely based on the existing seed source at the site. If the restored area does not have 70% aerial coverage of vegetation, the applicant will coordinate with the USACE on replanting with native grasses.

Palustrine forested wetland habitats within the preferred option were dominated by Loblolly pine (*Pinus taeda*), Red maple (*Acer rubrum*), Water oak (*Quercus nigra*), Sweet bay magnolia (*Magnolia virginiana*), Sweet gum (*Liquidambar styraciflua*), Dwarf palmetto (*Sabal minor*), Possumhaw (*Ilex decidua*), Chinese tallow (*Triadica sebifera*), Wax myrtle (*Morella cerifera*), Redtop panicgrass (*Coleataenia rigidula*), Swamp sunflower (*Helianthus angustifolius*), Climbing dogbane (*Thyrsanthella difformis*), Evening trumpetflower (*Gelsemium sempervirens*), Heller’s rosette grass (*Dichanthelium oligosanthos*), American holly (*Ilex opaca*), Winged elm (*Ulmus alata*), Eastern baccharis (*halimifolia*), and Little bluestem (*Schizahyrium scoparium*).

Palustrine emergent wetland habitats within the preferred option were dominated by Dwarf palmetto (*Sabal minor*), Redtop panicum (*Coleataenia rigidula*), Swamp sawgrass (*Cladium mariscus*), Blunt spikerush (*Eleocharis cobtusa*), Needle leaf witch grass (*Dicanthelium aciculare*), Heller’s rosette grass (*Dichanthelium oligosanthos*), Yellow nutsedge (*Cyperus esculentus*), Deeprooted sedge (*Cyperus entrerianus*), Eastern baccharis (*Baccharis halimifolia*), Bermuda grass (*Cynodon dactylon*), and Southern dewberry (*Rubus trivialis*).

The Earth Partners have available in-kind credits at Tarkington Bayou Mitigation Bank (TBMB). TBMB is located inside the primary service area of the East Fork San Jacinto River HUC. Entergy will be requesting approval to purchase wetland credits from TBMB for compensatory in-kind mitigation credits for unavoidable

loss and conversion of wetland functions to PFO wetlands for placement of the proposed substation, detention pond, and access road. This credit purchase should satisfy the mitigation needs under the in-kind wetland approach for PFO impacts. Upon USACE approval, Entergy proposes a mitigation bank credit purchase with a 1.0 credit multiplier to offset losses to the following:

- PFO Wetlands: TSSW (Phy) – 0.8 FCU’s, MPAC (Bio) – 1.4 FCU’s, RSEC (Chem) – 0.9 FCU’s.
- PEM Wetlands TSSW (Phy) – 0.1 FCU’s, MPAC (Bio) – 0.1 FCU’s, RSEC (Chem) – 0.1 FCU’s.
- Entergy proposes to purchase 1.2 TSSW, 1.2 MPAC, and 1.2 RSEC FCU’s from the TBMB to satisfy mitigation measures which includes loss and conversion of PFO wetland functions from placement of the substation, detention pond, and access road.
- Entergy proposes to purchase 0.1 TSSW, 0.1 MPAC, and 0.1 RSEC FCU’s from the TBMB to satisfy mitigation measures which includes loss of PEM wetland functions from placement proposed transmission poles.
- Entergy is not proposing to mitigate for temporary impacts to PEM wetlands and Other Waters.

No secondary impacts to downstream flows, hydrology, or water quality are anticipated as a result of the proposed project. Entergy will prepare a Storm Water Pollution Prevention Plan (SWPPP) and obtain a Notice of Intent for stormwater discharges from the Texas Commission on Environmental Quality (TCEQ). The SWPP Plan will identify potential sources of pollution, which may reasonably be expected to affect the quality of storm water runoff from construction of the site. The Plan will describe the implementation of Best Management Practices (BMPs) which will be used to reduce the pollutants in storm water runoff associated with construction activities at the construction site.

3.4. Best Management Practices

Best Management Practices (BMPs) include both planning and operational measures. Planning measures include pre-project coordination with contractors to identify site specific BMPs, along with regular site inspection to minimize potential problems. Implementation of BMPs will minimize impacts associated with public safety, water quality, hazardous materials storage and handling, air quality, and noise.

4.0 APPENDICES



CREDIT TRANSFER LETTER

January 23, 2023

Broc Adams
U.S. Army Corps of Engineers
Regulatory Branch
Jadwin Building
2000 Fort Point Road
Galveston, TX 77550

RE: SWG-2020-00346 – Entergy Texas Inc

Dear Mr. Adams:

Tarkington Bayou Mitigation LLC's Tarkington Bayou Mitigation Bank has made arrangements with Entergy Texas Inc to provide 4.2 credits in the form of the following functional capacity units:

- Riverine Forested FCUs:
 - 1.4 physical (i.e. temporary storage and detention of surface water)
 - 1.4 chemical (i.e. removal and sequestration of elements and compounds)
 - 1.4 biological (i.e. maintenance of plant and animal communities)

for unavoidable impacts associated with work authorized by the Department of the Army permit number SWG-2020-00346.

Tarkington Bayou, LLC's Tarkington Bayou Mitigation Bank assumes the responsibility for the permittee's compensatory mitigation requirements (i.e. to implement, assure performance, and provide long-term management of the compensatory mitigation project) in accordance with provisions of the Mitigation Banking Instrument governing this bank.

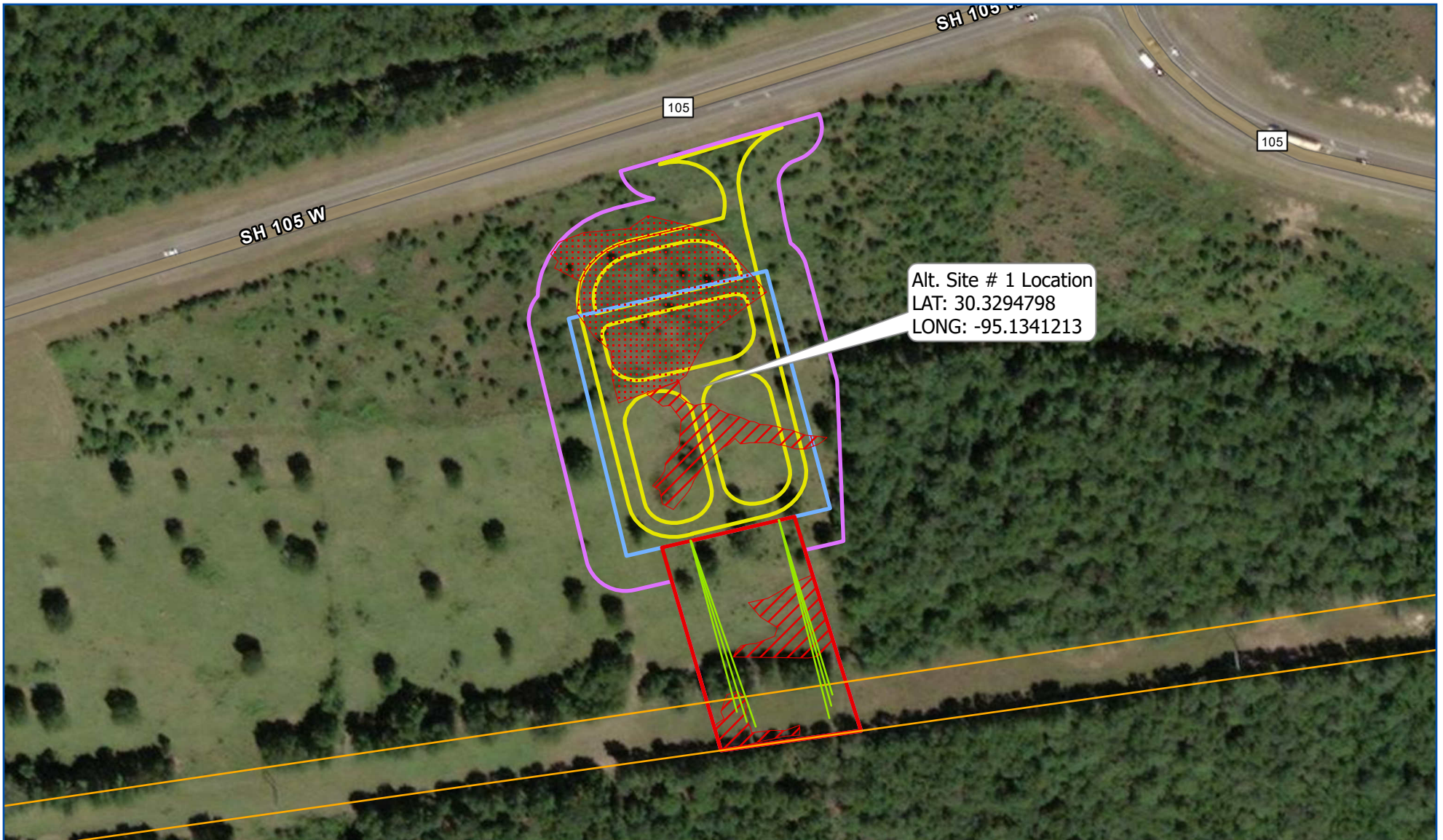
Respectfully,
DocuSigned by:

David Tepper
73467265B29841F...

David Tepper
The Earth Partners, LP

CC: S Teala Johnson, Entergy

Section B – Alternative 1 Detail



Alt. Site # 1 Location
 LAT: 30.3294798
 LONG: -95.1341213



0 125 250 Feet



Legend

- Transmission Lines
- Existing Transmission Line ROW
- Transmission Line Cut-in
- Clearing/Grubbing Limits (5.48-acres)
- Substation Limits (2.40-acres)
- Access Road (20-ft. width)
- PSS Wetlands (0.82-acres loss, 0.11-acres conversion)
- PEM Wetlands (0.26-acres loss, 0.27-acres temporary)



FOR PERMITTING ONLY - This document is not to be used for construction, bidding, recordation, conveyance or sales..

ENTERGY TEXAS, INC.
 ALTERNATIVE SITE #1 OFF SITE

LIBERTY COUNTY, TEXAS

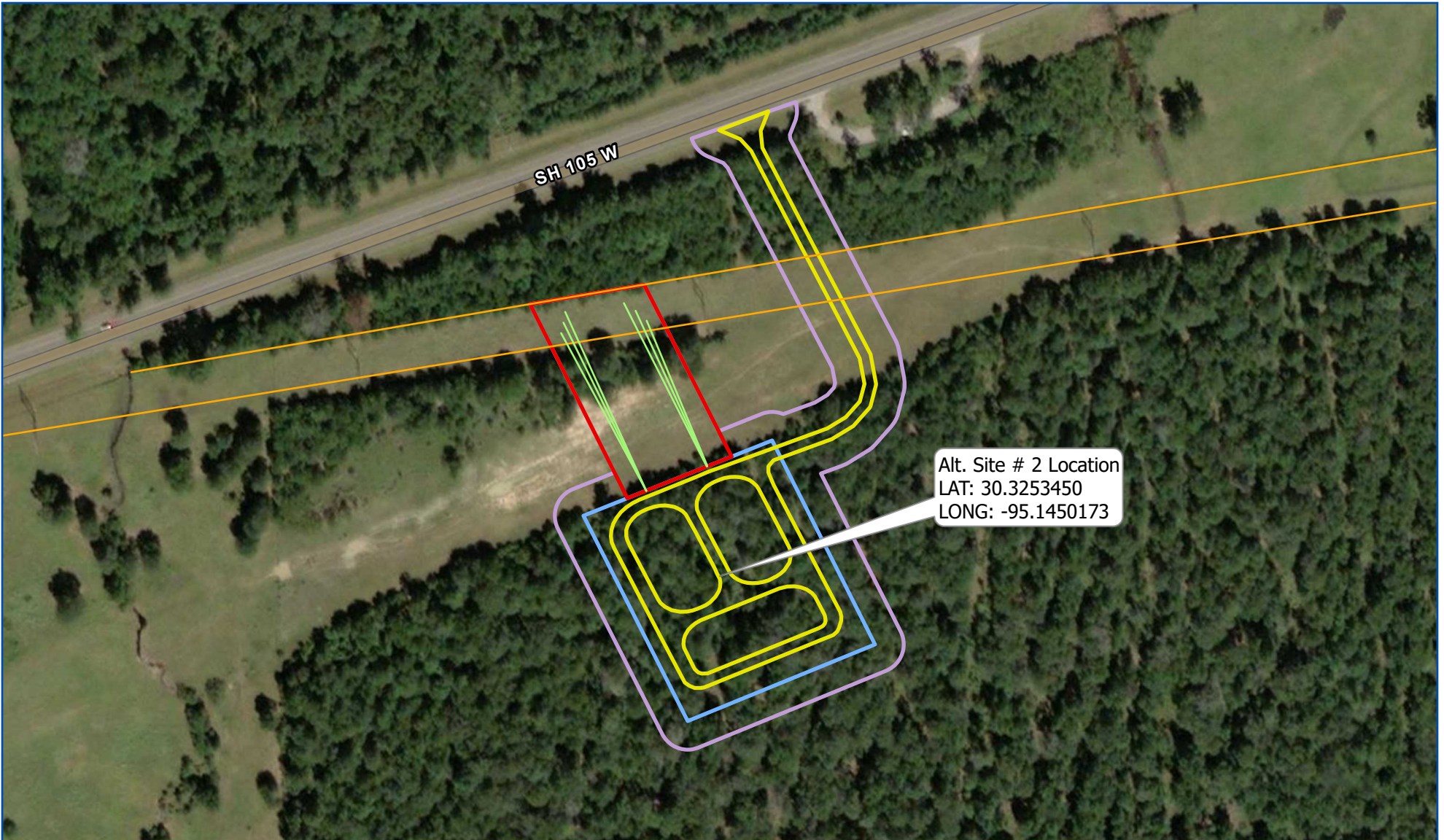
DRAWN BY: LT

DATE: 05/05/2022

PROJ. MGR: MF

Path: \\AZFILER01\surveydata\2021\2213920\ENVIRONMENTAL\Permitting\Alternative Analysis\Southline Substation Alternatives\Southline Substation Alternatives.aprx

Section C – Alternative 2 Detail



Alt. Site # 2 Location
 LAT: 30.3253450
 LONG: -95.1450173



0 125 250 Feet



Legend

- Transmission Lines
- Existing Transmission Line ROW
- Transmission Line Cutin
- Access Road (20-ft. width)
- Substation Limits (2.40-acres)
- Clearing/Grubbing Limits (6.25-acres)



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ENTERGY TEXAS, INC.

ALTERNATIVE SITE #2 OFF SITE

LIBERTY COUNTY, TEXAS

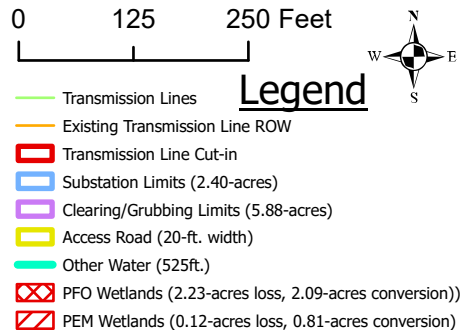
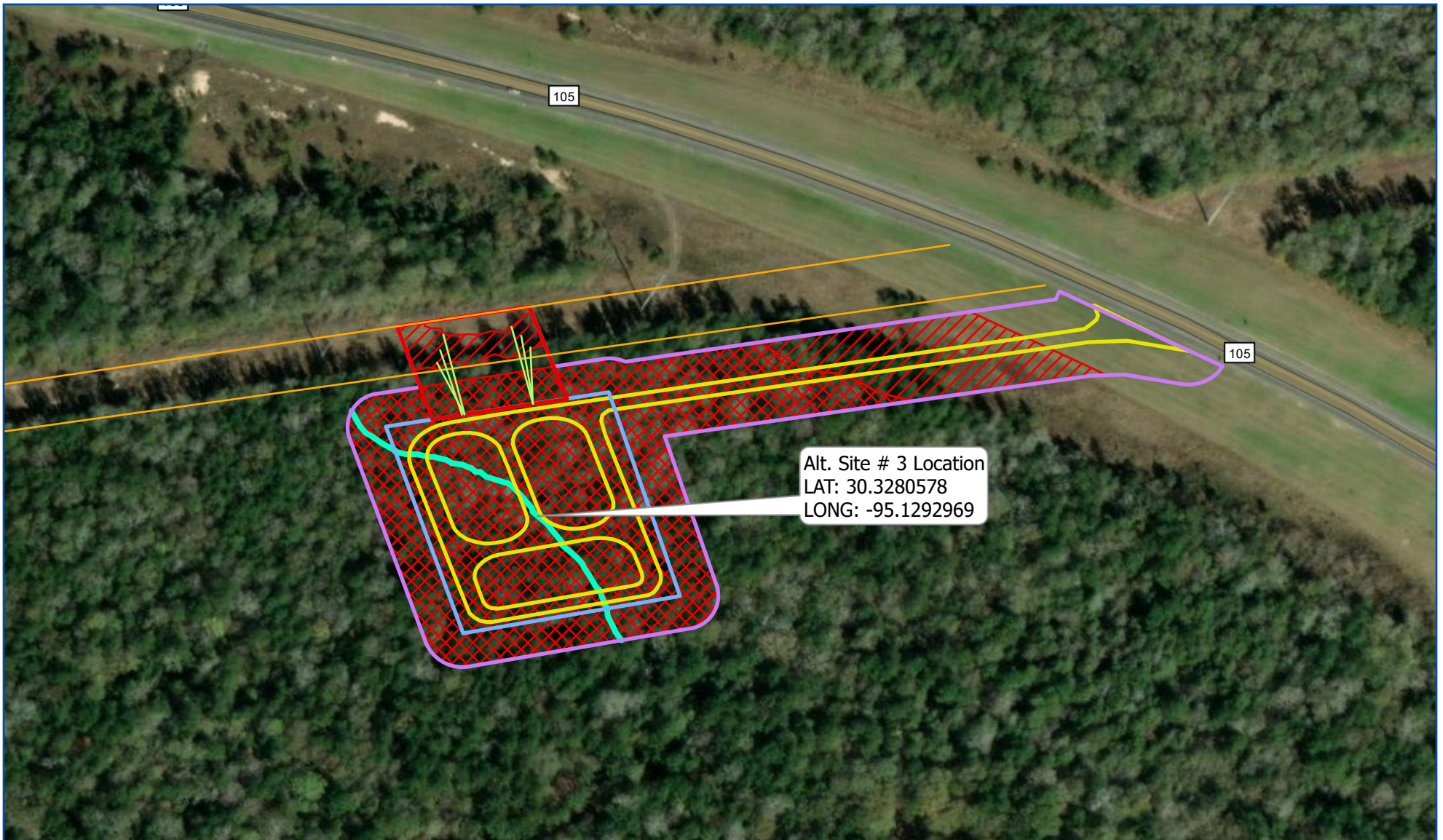
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PROJ. MGR: MF

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Section D – Alternative 3 Detail



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ENTERGY CORPORATION

ALTERNATIVE SITE #3 ON SITE

LIBERTY COUNTY, TEXAS

DRAWN BY: LT

DATE: 05/05/2022

PROJ. MGR: MF

Path: T:\2021\2213920\ENVIRONMENTAL\Permitting\Alternative Analysis\Southline Substation Alternatives\Southline Substation Alternatives.aprx

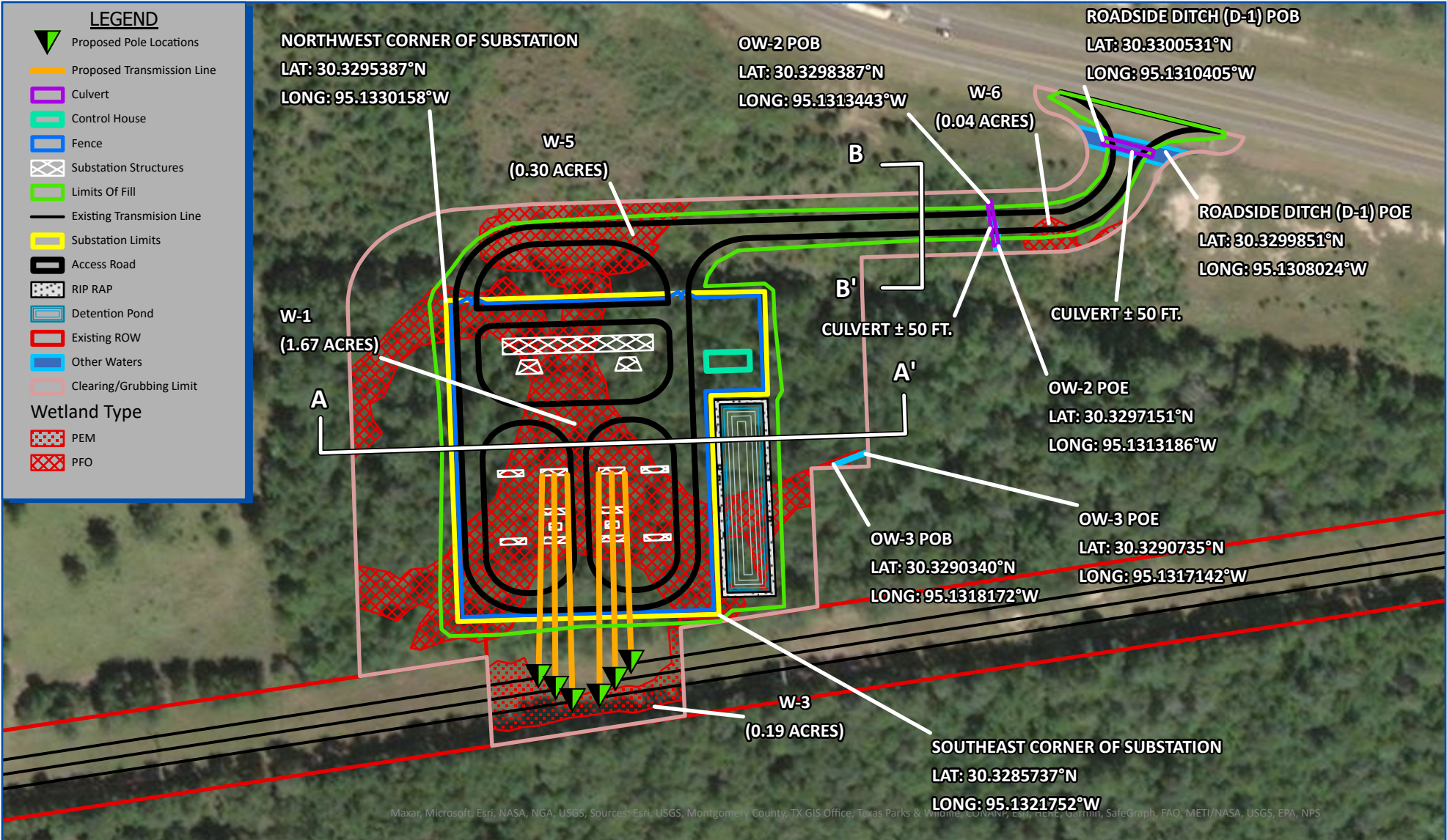
Section E – Alternative 4 Detail

LEGEND

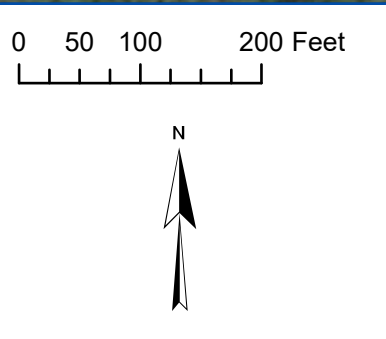
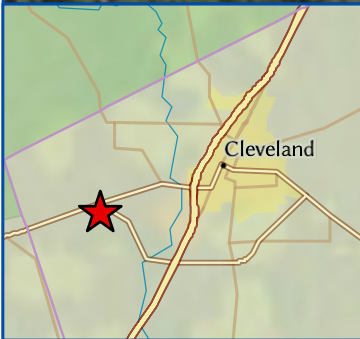
- Proposed Pole Locations
- Proposed Transmission Line
- Culvert
- Control House
- Fence
- Substation Structures
- Limits Of Fill
- Existing Transmission Line
- Substation Limits
- Access Road
- RIP RAP
- Detention Pond
- Existing ROW
- Other Waters
- Clearing/Grubbing Limit

Wetland Type

- PEM
- PFO



Maxar, Microsoft, Esri, NASA, NGA, USGS, Sources: Esri, USGS, Montgomery County, TX GIS Office, Texas Parks & Wildlife, Southline, Esri, Texas, ArcGIS, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS



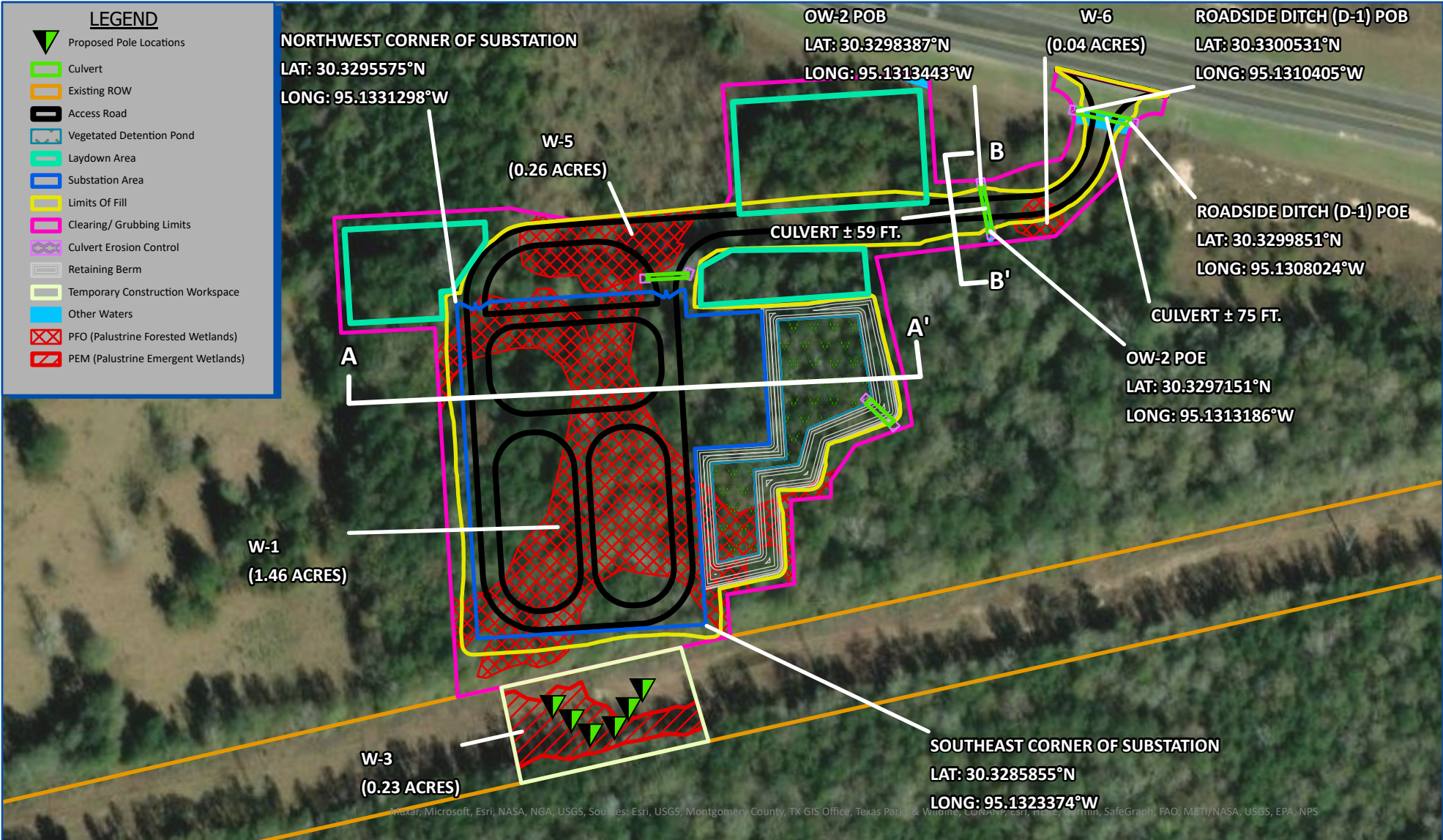
FOR PERMITTING ONLY - This document is not to be used for construction, bidding, recordation, conveyance or sales..

SHEET 4 OF 5		
ENTERGY TEXAS, INC.		
ALTERNATIVE SITE #4 ON SITE		
LIBERTY COUNTY, TX		
DRAWN BY: ETB	DATE: 4/18/2022	PROJ. MGR: MF
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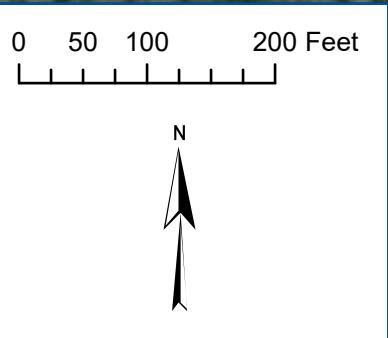
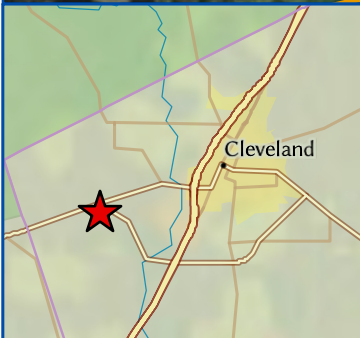
Section F – Alternative 5 Detail

LEGEND

-  Proposed Pole Locations
-  Culvert
-  Existing ROW
-  Access Road
-  Vegetated Detention Pond
-  Laydown Area
-  Substation Area
-  Limits Of Fill
-  Clearing/ Grubbing Limits
-  Culvert Erosion Control
-  Retaining Berm
-  Temporary Construction Workspace
-  Other Waters
-  PFO (Palustrine Forested Wetlands)
-  PEM (Palustrine Emergent Wetlands)



Maxar, Microsoft, Esri, NASA, NGA, USGS, Source: Esri, USGS, Montgomery County, TX GIS Office, Texas Parks & Wildlife, Google, Bing, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS



FOR PERMITTING ONLY - This document is not to be used for construction, bidding, recordation, conveyance or sales..

PERMIT PLATS: DETAIL

SHEET 5 OF 5

ENTERGY TEXAS, INC.

ALTERNATIVE SITE #5 ON SITE
(PREFERRED OPTION)

LIBERTY COUNTY, TX

DRAWN BY: ETB

DATE: 4/18/2022
REVISION DATE: 12/16/2022

PROJ. MGR: MF

Path: T:\2021\2213920\ENVIRONMENTAL\Permitting\Southline Substation Permit Plats\Southline Substation Permit Plats.aprx