



TRANSMISSION LINE & SUBSTATION PROJECTS
COMPANY: EAI, ELL, ETI
PROJECT NAME: AEPW TO EAI 1117 MW TRANSFER

REQUESTED ON: 01/12/2012

COMPLETED ON: 04/13/2012

CLASS 5
SCOPE AND ESTIMATE

Rev 0

Rev	Issue Date	Description of Revision	Prepared By
0	04/13/12	Approved Draft	Transmission Project Development
D	04/12/12	Final Draft for Review	Transmission Project Development
C	04/10/12	Complied with PMC Comments	Transmission Project Development
B	03/29/12	Compiled Document	Transmission Project Development

DISCLAIMER

*This Class 5 estimate has been prepared without the benefit of detailed engineering or study data. The solution set reflects the current understanding of the proposed project. **The estimate should not be considered to be more than - 50%+100% accurate and is intended to be used as a screening tool by the Customer.** There are many variables which are unknown at this time and which will be addressed during detailed scoping. These variables could significantly change the scope of work and this cost estimate. In order to proceed with the project, a Project Execution Plan should be developed which will result in a more definitive scope of work and cost estimate. Please note the major assumptions used in preparation of this preliminary scope and estimate which are listed in section 2.*

1. PROJECT SUMMARY

1.1. Background on Customer Need and Location

The FERC Order 890 calls for a coordinated, open and transparent planning process. In particular, the Order required Transmission Providers to engage in planning processes on both a local and regional level and to meet the Commission's nine planning principles which include information exchange and regional coordination.

The Entergy OATT Attachment K satisfies FERC Order 890's regional planning process requirements. In particular, Section 13 of Attachment K (and the SPP OATT Attachment O) provide for the creation of the Entergy SPP RTO Regional Planning Process (ESRPP) to identify system enhancements that may relieve regional congestion between Entergy and Southwest Power Pool. The process includes sharing of system plans to ensure that they are simultaneously feasible and otherwise use consistent assumptions and data. The main objectives of the ESRPP are to:

- improve regional transfer capability, improve regional optimization, and relieve constraining flowgates.
- to provide a more robust transmission system capable of more economic delivery of power across the region

To facilitate this process, the ICT coordinates with Entergy, SPP and its respective members by sharing system plans, addressing requests for regional studies, and identifying opportunities for regional optimization of the Construction Plan. To the extent other adjoining transmission owners have seams agreements or joint planning processes with Entergy, the ICT will identify any opportunities for regional optimization of Entergy's Construction Plan with the construction plans of those adjoining transmission owners. The ICT also reviews such optimization opportunities with the Entergy, other affected transmission owners, Interested Government Agencies, stakeholders, and other interested parties.

The ICT conducts up to five stakeholder requested studies intended to identify system enhancements that may relieve regional congestion in the ESRPP process. ESRPP projects are studied through load flow and transfer analyses to determine their scope and benefit. Upgrades are studied in a long-term Entergy/SPP RTO combined model. Upgrades generally focus on EHV expansion, rather than upgrading the underlying system.

The following two-step process is used to study up to five different projects annually.

- Step 1 (high-level): Projects are identified such that they increase transfer capability between a control area in SPP and a control area in Entergy
- The evaluation will consist of a high level transfer study and identification of constraints and likely transmission enhancements to resolve the identified constraints.

- The ICT also provides approximate costs and timelines associated with the identified transmission enhancements to facilitate the stakeholders' determination of whether they have sufficient interest to pursue the more detailed Step 2 evaluation
- Step 2 (detailed): This step involves more detailed full-AC analysis of the project with the transfer baked into the loadflow model in the subsequent year's planning cycle. This step is performed by Entergy.
- May include additional coordination with external processes, impacted stakeholders and TOs.
- Entergy also develops detailed cost estimates and timelines associated with these final transmission enhancements.

The transmission projects whose class 5 cost estimates are included in this document were identified as upgrades necessary to alleviate thermal and voltage constraints observed in the ESRPP 2011 Step 2 process for the transfer scenario of a 1117 MW AEPW to Entergy Arkansas transfer. The Class 5 estimates provided in this document will be used in the final report for the ESRPP 2011 study and for the fulfillment of Entergy's obligations for the providing these cost estimates for this step 2 study scenario.

1.2. Planning Studies

Based on the load flow analysis, the projects shown in Table 1.2 were identified. These projects will be required for the requested transfer.

1.3. Proposed Solution

Each project identified in Table 1.2 was reviewed and a scope and estimate were developed. The detail project descriptions are shown in the appendix.

1.4. Cost Estimate

A cost estimate summary for the projects is shown in Table 1.4 with an Appendix Reference Number. The estimates shown in the table do not include a Tax Gross Up (TGU) allocation which may apply. Any project that will be subject to a TGU will be charged the rate applicable to the jurisdiction the project is constructed.

These estimates are based on the assumptions detailed with in this report. There may be additional costs, outside the stated accuracy range (-50% +100%) that are required based on final construction considerations.

1.5. Duration Schedule

Each project was review and high level durations were developed. Table 1.5 is a duration summary for of each project. For additional details, see the individual project.

1.6. Projects Included in Construction Plan

Projects that have been identified in the Entergy Delivery Construction Plan are identified in Table 1.6.

2. GENERAL ASSUMPTIONS AND RISK

The assumptions and risks for each project are detailed with each project detailed in the appendices.

**Table 1.2
Project Identification**

S. No	Name of the project	Rating based on worst case flow*	Rating used in load flow for new project
1	Construct Quarry 345 kV switch station & Cut-in from Crockett & Grimes		
2	Install 345/138 kV Auto at Rivtrin + add 138 kV terminal + 345 kV terminal		525 MVA
3	Construct Quarry to Rivtrin 345 kV line		1326 MVA
4	Construct 500 kV Messick switching station		
5	Install 500/230 kV Auto at Messick switching station		855 MVA
6	Install 500/345 kV Auto at Messick switching station		1959 MVA
7	Construct Dolet Hills to Messick 345 kV line		1195 MVA
7A	Install Dolet Hill 345 kV terminal		
8	Construct 230kV line from Lake Village Bagby to Reed Switch Station but operated at 115 kV		260 MVA
8a	Install new 115 kV terminal at LV Bagby		
8b	Convert Reed to a breaker station		

Projects high-lighted in **Green** are ETI projects.

Projects high-lighted in **Rose** are projects by others

Projects not high-lighted are EAI projects

**Table 1.4
Project Cost Summary**

S. No	Name of the project	Estimate	Reference
1	Construct Quarry 345 kV switch station	\$14,375,000	A-1
2	Install 345/138 kV Auto at Rivtrin + add 138 kV terminal + 345 kV terminal	\$33,079,000	A-2
3	Construct Quarry to Rivtrin 345 kV line	\$20,687,000	A-3
4	Construct 500 kV Messick switching station	\$49,742,000	B-1
5	Install 500/230 kV Auto at Messick switching station	\$3,473,000	B-2
6	Install 500/345 kV Auto at Messick switching station	\$5,377,000	B-3
7	Construct Dolet Hills to Messick 345 kV line	\$109,480,000	B-4
7A	Install Dolet Hill 345 kV terminal	Others	N/A
8	Construct 230 kV line from Lake Village Bagby to Reed Switch Station but operated at 115 kV	\$34,544,000	C-1
8a	Install new 115 kV terminal at LV Bagby	\$1,789,000	C-2
8b	Convert Reed to a breaker station	\$6,228,000	C-3

**Table 1.5
Project Duration Summary**

S. No	Name of the project	Duration	Ref
1	Construct Quarry 345 kV switch station	39 Months	A
2	Install 345/138 kV Auto at Rivtrin + add 138 kV terminal + 345 kV terminal		
3	Construct Quarry to Rivtrin 345 kV line		
4	Construct 500 kV Messick switching station	37 Months	B
5	Install 500/230 kV Auto at Messick switching station		
6	Install 500/345 kV Auto at Messick switching station		
7	Construct Dolet Hills to Messick 345 kV line	Owner	Owner
7A	Install Dolet Hill 345 kV terminal		
8A	Construct 235 kV line from Lake Village Bagby to Reed Switch Station but operated at 115 kV	49 Months	C-1
8B	Install new 115 kV terminal at LV Bagby	36 Months	C-2
8C	Convert Reed to a breaker station	38 Months	C-3

**Table 1.6
Energy Delivery Construction Plan ID**

Reference	Name of the project	ID
A	Construct Quarry 345 kV switch station	<i>Not in Construction Plan</i>
	Install 345/138 kV Auto at Rivtrin + add 138 kV terminal + 345 kV terminal	
	Construct Quarry to Rivtrin 345 kV line	
	Construct 500 kV Messick switching station	
B	Install 500/230 kV Auto at Messick switching station	<i>Not in Construction Plan</i>
	Install 500/345 kV Auto at Messick switching station	
	Construct Dolet Hills to Messick 345 kV line	
C-1	Construct 235 kV line from Lake Village Bagby to Reed Switch Station but operated at 115 kV	12-EAI 008-CP
C-2	Install new 115 kV terminal at LV Bagby	12-EAI 008-CP
C-3	Convert Reed to a breaker station	12-EAI 008-CP

3. ATTACHMENTS

Reference	Name of the project
A	Construct Quarry 345 kV switch station
	Install 345/138 kV Auto at Rivtrin + add 138 kV terminal + 345 kV terminal
	Construct Quarry to Rivtrin 345 kV line
B	Construct 500 kV Messick switching station
	Install 500/230 kV Auto at Messick switching station
	Install 500/345 kV Auto at Messick switching station
	Construct Dolet Hills to Messick 345 kV line
C-1	Construct 235 kV line from Lake Village Bagby to Reed Switch Station but operated at 115 kV
C-2	Install new 115 kV terminal at LV Bagby
C-3	Convert Reed to a breaker station

ESRPP
AEPW to EAI

Project Summary

Appendix
A

Appendix A

Project Estimate Scope:

Construct Quarry 345kV Switching Station

Install 345/138kV Autoxmfr at Rivtrin (add 138kV & 345kV terminal) 525 MVA Construct Quarry to Rivtrin 345kV Line 1326 MVA

Requirements:

Install a 345/138kV autotransformer (600 MVA) and add a 345kV terminal and 138kV terminal at Rivtrin 138kV. Build a new 345kV three breaker ring bus switching station. Build a new 345kV line from Quarry to Rivtrin rated for at least 1326 MVA (2220 amps).

Description of existing:

Line 119 CROCKETT – GRIMES 345kV triple bundled 1024.5 MCM 24/13 ACAR on steel lattice towers.

Six breaker ring bus at Rivtrin 138kV rated at 1252 amps.

Constraints:

Proposed Solution:

Install four single phase 345/138kV autotransformers (200 MVA ea) and convert the existing six breaker ring bus to a breaker and a half scheme at Rivtrin 138kV; relocate existing 138kV lines to the new terminal locations on the expanded bus. Build the new Quarry 345kV three breaker ring bus switching station near the intersection of the Crockett to Grimes 345kV line and the Rivtrin to Pee Dee 138kV line. Build 9.4 miles of new 345kV line from Quarry to Rivtrin with bundled 1272 MCM ACSR conductor.

General Assumptions & Risks

- No detailed engineering studies have been performed.
- A Certificate of Compliance & Need (CCN) is required.
- Estimate Based on one route; upon funding CCN may require an alternate route.
- ROW is assumed to be available for acquisition.
- Site is on relatively flat land.
- Site may be in flood plain, wetlands, and/or contain contaminated soil
- Unknown underground factors will add mitigation costs and may impact schedule
- Entergy will not perform work on customer owned facilities and is not included
- Schedule milestones after design and constructability review and environmental and regulatory compliance has been determined. Best guess on SWPPP creation, implementation and monitoring can vary greatly dependant on outcome of environmental studies
- Wetland mitigation is undetermined until all environmental analysis is complete.
- Project duration does not begin until all relevant agreements are executed.
- It is assumed there is no value in retired equipment and all equipment will be disposed of without benefit of salvage credit.

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- The overheads are Based on 2013-2016 with all work being done completed in 2016.
- Project delays or overhead changes will affect final removed cost.
- Large transformers(other equipment) may require special transport to substation site
- Rising steel, copper, fuel and other market conditions could greatly affect estimated cost.

Estimate

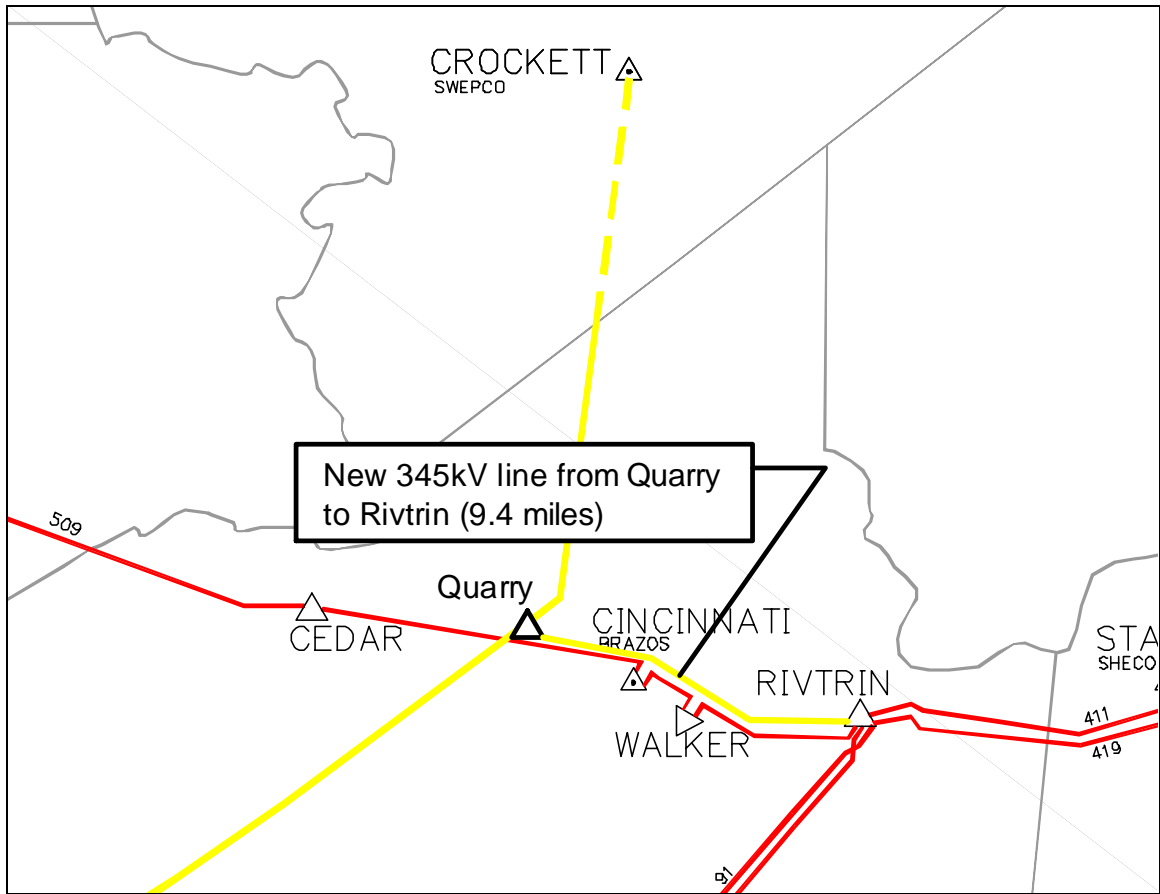
Item	Estimate
Quarry 345kV SS	\$12,782,000
Rivtrin 345/138kV	\$31,527,000
Quarry to Rivtrin 345kV Line	\$20,687,000
L-119 Cut-In (From Crockett to Quarry)	\$797,000
L-119 Cut-In (From Grimes to Quarry)	\$796,000
138kV Line work at Rivtrin	\$1,552,000
Full Financial	\$68,141,000
Total Estimate Range (-50% +100%)	\$34.1 - \$136.3 Million

Duration Schedule

- A detailed schedule will be prepared subsequent to customer approval to proceed with the project. The following are rough durations:
- All construction work requiring outages will be performed during acceptable periods of system load flow, which most often is the off-peak load season. Line outages will be discussed with the SOC and TOC and the assumption is made that line outages will be executed as planned. However, last minute denial of outages by the SOC/TOC along with resulting schedule delay is possible.
- Substation construction will be coordinated with the transmission line outages when possible.
- Construction resources are available when required.
- Transmission Line and Substation projects will begin subsequent to Definition phase Project Execution Plan.
- This schedule does not account for adverse weather conditions.
- Schedule durations are high level estimates at this time. A detailed schedule will be prepared upon project approval.

Appendix A

Task	Months
Definition	6
Regulatory	13
Substation Work	18
T-Line Work	12
Less Parallel Tasks	12
Total Duration	37



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Project Summary

Appendix
B

Appendix B

Project Estimate Scope:

Construct Messick Autoxfmr Substation (500/230kV & 500/345kV) and Dolet Hills to Messick 345kV Line

Requirements:

Build a new Messick 500/345/230kV Auto-Substation in the area of the CLECO Messick Switch Station, in Red River Parish, Louisiana. The station will be configured for as a four breaker ring on both the 500 kV and 230 kV bus. Planning has advised a bank of three 500/230kV auto-transformers for a total capacity of 855 MVA will be required (three 285 MVA auto-transformers with installed spare) and another bank of three 500/345kV auto-transformers for a total capacity of 1959 MVA will be required (three 653 MVA auto-transformers with installed spare). A new 345kV line will be built from Messick to Dolet Hills (approx. 25 miles) to a rating of 1195 MVA.

Description of existing:

The existing Mt Olive to Hartburg 500 kV line crosses the CLECO Messick to Carroll 230 kV line at GPS coordinates 31°59' 1.28" N, 93° 11' 16.2" W. (Near Highway Junction US 71/84 and Louisiana Road #507, in Red River Parish) between structures #280 & 281 on line #204.2.

The property to the southwest of the 500/230 kV line appears to be wooded as viewed from satellite photos.

Constraints:

This area may have some wetland issues to develop due to the proximity to a creek. No wet lands were identified on the "topo" maps.

Proposed Solution:

The substation will be proposed to be built similar to the EAI Pleasant Hills 500/161 kV station with a 500 kV tap in-line with the existing 500 kV line. A substation footprint will be assumed to be 1500' x 1500' to allow for expansion of the substation. The property will be cleared & leveled for the station. An access road will be required from US 71/84 to the station.

New structures will be placed in the 500 kV line to direct the line into the substation. Similarly, new structures will be added to the 230 kV line to bring the lines into the substation. The 230 kV structures and line would be built by others.

A four breaker 500 kV 3000 amp ring bus configuration will be provided. Four 500/230 kV 160/213/266MVA autotransformers will be installed with an installed spare transformer. Four 500/345 kV 392/522/653MVA autotransformers will be installed with an installed spare transformer. Reactors are not required at this station. The 345kV bus will be arranged as a three breaker 3000 amp ring bus with only two breakers installed initially. The 230 kV bus will be arranged as a four breaker 3000 amp ring bus with three breakers installed. Dead-end structures will be installed for the 230 kV line connections by others.

Build a new 345kV line from Messick to Dolet Hills (25 miles) to a rating of 1195 MVA.

Appendix B

General Assumptions & Risks

- The ROW/property will be obtained from the existing land owners for fair market value.
- The ROW/property will not have any environmental constraints.
- An individual 404 permit with the Corps of Engineers will be required and will take from 9-12 months to obtain.
- The proposed site is not considered a wetlands area.
- An SWPPP permit will be required and maintained.
- Oil retention facilities will be provided around the auto-transformers.
- Approximately 51 acres will be cleared.
- An access road ~1700 ft. will be built to Parish Road #507.
- Parish Road #507 will support the delivery of the auto-transformers and will not require any upgrades.
- No detailed engineering studies have been performed (including N-1 contingencies created by the construction outage).
- No nuclear plants will be affected by this project.
- Estimate Based on one route.
- Entergy will not perform work on customer owned facilities and is not included.
- Schedule milestones after design and constructability review and environmental and regulatory compliance has been determined.
- Wetland mitigation is undetermined until all environmental analysis is complete.
- Project duration does not begin until all relevant agreements are executed.
- The overheads are Based on 2013-2016 with all work being completed in 2016.
- Project delays or overhead changes will affect final removed cost.
- Unknown underground factors will add mitigation costs and may impact schedule
- Large transformers(other equipment) may require special transport to substation site
- Rising steel, copper, fuel and other market conditions could greatly affect estimated cost.

Estimate

Item	Estimate
Messick 500kV	\$49,742,000
Messick 230kV	\$3,473,000
Messick 345kV	\$5,377,000
Dolet Hills to Messick 345kV Line	\$109,480,000
Full Financial	\$168,072,000
Total Estimate Range (-50% +100%)	\$84.0 - \$336.1 Million

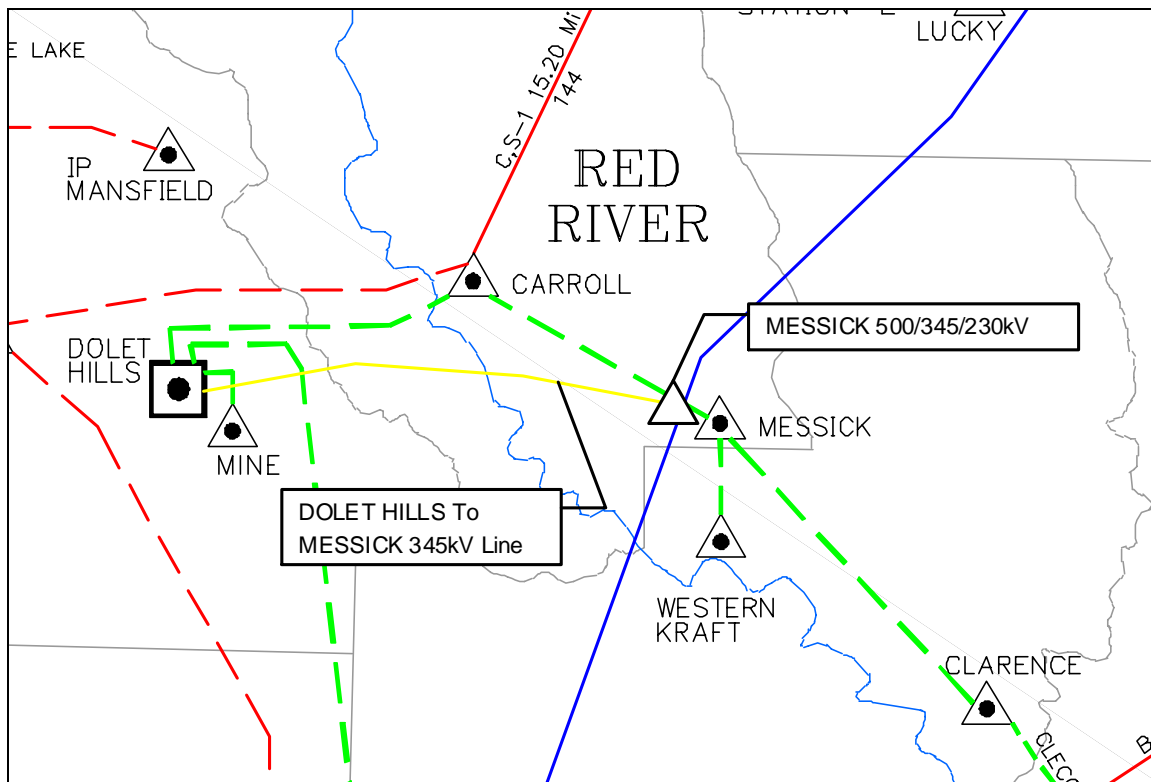
Duration Schedule

- A detailed schedule will be prepared subsequent to customer approval to proceed with the project. The following are rough durations:

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- All construction work requiring outages will be performed during acceptable periods of system load flow, which most often is the off-peak load season. Line outages will be discussed with the SOC and TOC and the assumption is made that line outages will be executed as planned. However, last minute denial of outages by the SOC/TOC along with resulting schedule delay is possible.
- Substation construction will be coordinated with the transmission line outages when possible.
- Construction resources are available when required.
- Transmission Line and Substation projects will begin subsequent to Definition phase Project Execution Plan.
- This schedule does not account for adverse weather conditions.
- Schedule durations are high level estimates at this time. A detailed schedule will be prepared upon project approval.

Task	Months
Definition	6
Regulatory	9
Substation Work	24
T-Line Work	18
Less Parallel Tasks	18
Total Duration	39



ESRPP
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Project Summary

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Project Estimate Scope

Construct new 230 kV line from Lake Village Bagby Substation to Reed Switch Station but operate at 115 kV & 260 MVA.

Requirements:

A new 115 kV line will be built between Lake Village Bagby to Reed. The line will be built with 230 kV insulators and clearances. The line must be rated for at least 260 MVA (1306 amps).

Description of existing:

This is a new line and not existing.

Constraints:

Obtaining ROW will require property condemnation for the new 120 ft ROW. A Certificate of Environmental Compliance and Public Need (CECPN) will be required. An Environmental Impact Study will have to be developed for the CECPN application. The Bayou Bartholomew water shed should be avoided to simplify the environmental requirements.

The 115 kV radial line to Lake Chicot Pump Station will be crossed with the installation of the new line.

Proposed Solution:

A new 100-ft ROW east of the existing ROW ~ 25 miles long will be obtained through the CECPN process. Most of this routing will be through farm land. Approximately 315 acres will be required for the ROW. A routing study, environmental impact study, and a CECPN permit will be required.

The new 115 kV line will be rated for 260 MVA (1306 amps) with single steel pole structures and insulated for 230 kV.

General Assumptions & Risks

- A summary of the environmental risks is attached.
- New terminals will be added at Lake Village Bagby and Reed Switch Station for the new line.
- The additional property can be obtained through negotiations or land condemnation.
- Site conditions have not been addressed
- No detailed studies have been performed
- Estimate based on one route. Upon funding a route study will identify alternate routes.
- ROW availability has not been addressed
- Detailed studies (such, soil borings & other geo-technically) have not been completed.
- Milestones will be developed after the design and constructability reviews have been completed and environmental and regulatory compliance has been

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determined. Best guess on SWPPP creation, implementation and monitoring can vary greatly dependant on outcome of environmental studies

- Wetland mitigation is undetermined until all environmental analysis is complete.
- Project delays or overhead changes will affect final removed cost.
- Unknown underground factors will add mitigation costs and may impact schedule
- Site may be in flood plain, wetlands, Soil Contamination
- Rising steel, copper, fuel and other market conditions could greatly affect estimated cost.
- Cost estimate assumes no substation upgrades are required at remote ends of new line.

Estimate	
Item	Estimate
Substation Costs	N/A
T-Line Cost	\$34,544,000
Full Financial	
Total Estimate Range (-50% +100%)	M

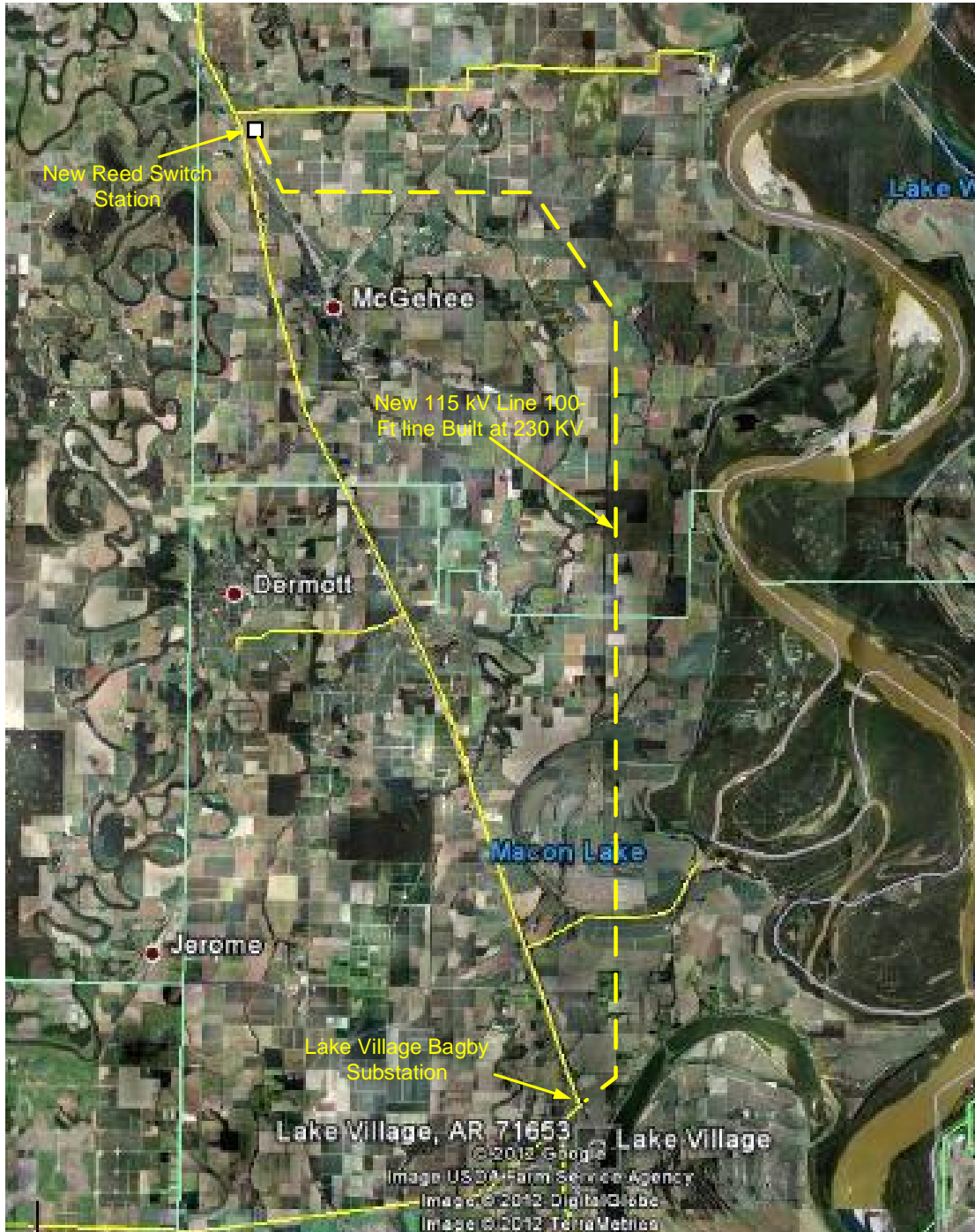
Duration Schedule

- A detailed schedule will be prepared subsequent to customer approval to proceed with the project.
- All construction work requiring outages will be performed during acceptable periods of system load flow, which most often is the off-peak load season. Line outages will be discussed with the SOC and TOC and the assumption is made that line outages will be executed as planned. However, last minute denial of outages by the SOC/TOC along with resulting schedule delay is possible.
- Substation construction will be coordinated with the transmission line outages when possible.
- Construction resources are available when required.
- Transmission Line and Substation projects will begin subsequent to Definition phase Project Execution Plan.
- This schedule does not account for adverse weather conditions.
- Schedule durations are high level estimates at this time. A detailed schedule will be prepared upon project approval.

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Task	Months
Definition	4
Regulatory	12
Other Approvals & Permitting	9
Substation Work	N/A
T-Line Work including ROW	24
Less Parallel Tasks	0
Total Duration	49

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Class 5

Environmental Support & Risk Summary

Lake Village Bagby to Reed Switching Station Preliminary Budget Estimate

Date: 2-28-12

This preliminary budget estimate is based upon provided information related to the preliminary route selection as identified by desk-top analyses. The following efforts for environmental permitting, related activities and associated costing are provided.

- Assume the new route areas being considered somewhat parallel the existing t-line originating at the Lake Village Bagby Substation and terminating Reed Switch Station location in Arkansas approximately between the coordinates of 32 degrees, 20' 48.44" N, -91 degrees 17' 28.20" W and 33 degrees 41' 41.14" N, -91 degrees 26' 57.11" W. This proposed t-line resides in Desha and Chicot Counties, Arkansas.
- Assume that the environmental assessment and route analysis has not been completed and these estimates are based upon the preliminary route information that was provided along the east side of the existing 230 kV line. At this point in the analysis the proposed ROW will exist for approximately 26.0 miles and will be 100 ft. in width with a surface area of about 315 acres.
- Assume that no NEPA triggers exist that would require preparation of an Environmental Assessment (EA) or Environmental Impact Statement (EIS).
- Perform Phase I Transaction Screen Environmental Site Assessment (ESA) in accordance with standards developed and published by American Society of Testing Materials (ASTM) International as ASTM Transaction Screen Standards (Designation E 1528-06). This should be conducted prior to purchase of the property necessary to construct proposed t-line to determine if the real property is subject to "recognized environmental conditions" (RECs). This will not satisfy all appropriate inquiries for Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) for Landowner Liability Protections (LLPs) and is intended only for limited environmental due diligence. *Estimated cost - \$18,000.*
- Perform Wetland Delineations of the selected route and obtain U.S. Army Corps of Engineers (USACE) nationwide permit (NW-12). Based on desk-top analysis of USFWS wetland status maps and USGS topo maps for Arkansas, the landscape of the proposed ROW has been identified as dominated by area agricultural practices and fairly limited timber production. While some upland habitats exist, close proximity of the proposed ROW to high quality mapped jurisdictional wetlands and/or streams including No. 35 Canal, Macon Bayou, No. 43 Canal, Macon Lake and Clay Bayou offer concerns for impacts to these areas during construction. A total of 28 waterbody crossings have been identified in the project footprint. Performance of on-the-ground surveys to determine the

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- extent and potential impact to jurisdictional wetlands and/or other waters of the US (WOUS) will be required. A USACE's permit (NW-12) is available for utility line activities. The nature of the efforts necessary to secure a nationwide permit will include field survey and delineation, delineation report, consultation with Clean Water Act (CWA) commenting agencies, development of a Wetland Impact Mitigation Plan (including the negotiation of credits with an approved mitigation bank) if required and the preparation and submittal of the permit application to the USACE. The estimated time for the USACE permit acquisition is six to seven months for a NW-12. Depending upon route and permanent changes to wetland function resulting from ROW development, acreage threshold triggering an individual wetland permit (IP) could be exceeded resulting in up to one year for permit acquisition. *Estimated cost - \$42,000.*
- A Section 106 review, consultation and concurrence will be required in accordance with the state of Arkansas Historic Preservation Program. While some of the route footprint has been previously disturbed from years of agricultural practices, the possibility exists that site conditions may require a cultural resources survey on some portion of the line route. At the very least, a cultural resource review would be necessary. If any concerns were revealed, then a Cultural Resource Study would be required prior to construction and/or a survey during the construction effort. *Estimated cost for cultural resources survey - \$21,000 (minimal effort).*
 - Based on desk-top analysis of the approximately 26.0 mile length and 100 ft. width of the proposed ROW footprint for the t-line effort, approximately 22.0 acres of potential permanent wetland impacts exist along the ROW. Research of the available wetlands mitigation banking properties within the basin revealed limited credit availability with an average cost of approximately \$5,500.00 per credit. Based upon the area of impact, an estimated 210 wetland credits could be required. *Estimated cost - \$1,115,500*
 - Interagency consultation relative to the subject property with the U.S. Fish and Wildlife Service (USFWS) regarding any federally listed, endangered, threatened or candidate species and the Arkansas Game and Fish Commission regarding any species of special concern for critical habitat should be conducted. While there does not appear to be any impacted USFWS or State management areas, both will focus on the black bear and bald eagle especially since several large forested areas exist along the proposed ROW. *Estimated cost - \$2,500*
 - Natural Resources Conservation Service (NRCS) should be contacted regarding the presence of any government programs and/or prime farmland soils located on the property. *Estimated cost - \$600*
 - Arkansas Department of Environmental Quality (ADEQ) requires compliance with applicable regulations for coverage under the Construction Storm Water General NPDES Permit. This includes the Construction Notice of Intent (CNOI) and the development and

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- implementation of a Storm Water Pollution Prevention Plan (SWPPP) to provide a site-specific description of the best management practices to prevent contamination of the site storm flows from potential pollutants associated with construction activities. The plan also outlines implementation, inspection and maintenance requirements. *Estimated cost for SWPPP plan development and ADEQ approval-\$17,500.00.*
- 48-week SWPPP inspection period for entire construction time and continued monitoring after construction until the site is stabilized (18 weeks of clearing, 24 weeks for line construction and 6 weeks of inspections after construction). *Estimated cost - \$86,400 (\$1800.00/week X 48 weeks).*
 - Installation of Best Management Practices (BMPs) in accordance with SWPPP. Cost for silt fence installation and removal (\$9.00 linear ft. X 3750 linear ft.) = \$33,750.00. Cost for four stabilized construction entrances = \$80,000.00 at non-highway locations. Since no highway crossings have been identified, no cost for water truck and sweeper are offered. Cost for site stabilization of approximately 30% of the total project area (\$500.00/acre X 95 ac.) = \$47,500.00 seed and (\$1000.00/ac. X 95 ac.) = \$95,000.00 mulch. Cost for 6500 hay bales X \$7.00 = \$45,500.00. Cost for 28 culvert crossings X \$10,000.00 = \$280,000.00. Cost for 250 (16 ft. X 12 ft.) mat is approximately \$200.00 per mat per month for rent, install, pick-up and ship-back. For 250 mats for the project duration computed at 10.5 mos. (clearing/construction) the cost is \$525,000.00 (\$200 X 10.5 X 250). If the project were properly staged, this cost could be less. Cost for 90 yards of additional gravel = \$3000.00. *Estimated cost - \$1,109,750*
 - Migratory Bird Treaty Act protection covers most bird species found in the project area. Construction to Avian Powerline Interaction Committee (APLIC) standards as described in Entergy's Avian Protection Plan is required. Review of the area indicates concerns for wintering waterfowl and other water birds utilizing the wet habitats. Potential for ROW crossing lengths associated with these areas, at a minimum, total to approximately 2.0 miles. Avian impact collision mitigation requirements are recommended for these areas at a placement of 1/15ft. of line length. This 2.0 mi. length equates to 1056 flappers (2.0 mi. X 5280 ft. /mi) = 10,560 ft. /15 = 704 flappers @ \$25.00 each for a total of \$17,600.00. *Estimated cost - \$17,600 (cost for product). Installation will occur during construction when the lines are clipped in.*
 - Arkansas Department of Transportation (ADOT) requires a crossing permit for any utilities that are to be installed across a highway right-of-way. The permit must be applied for prior to construction activities entering the right-of-way of a state highway. No highway crossings were noted. *No cost projected.*
 - *Total estimated costs associated with these identified environmental concerns have been included and = \$2,430,850*

ESRPP
AEPW to EAI

Project Summary

Appendix
C-2

Project Estimate Scope

Add a 115 kV line terminal at Lake Village Bagby for a new “230 kV built” line to Reed Switch Station (Reed upgraded to breaker station).

Requirements:

A new 115 kV terminal is required to connect the new line to the operating bus at Lake Village Bagby. The terminal will be rated for at least 260 MVA (1303 amps). The new 115 kV line, will be built to 230 kV standards. However the line terminal will only be operated at 115 kV.

Description of existing:

The Lake Village Bagby Substation has three 115 kV lines (Crossett North, Dumas, & Oak Grove (LA)) and a single 230 kV line to Gerald Andrus. A 448 MVA auto-transformer 230/115 kV provides a 115 kV source from Gerald Andrus. The 230 kV transformer has a 3000 amp breaker on the 115 kV side and no 230 kV breaker. A 30 MVAR capacitor bank is attached to the 115 kV bus.

Constraints:

There is no space in the control house for additional equipment.

Proposed Solution:

The substation will be expanded on the north end ~ 100-ft to provide for another 115 kV bay. The control house will be expanded to provide for additional equipment space. The new bay will be built for 2000 amp service. A new line trap will be installed for relay communications with the new breakers at Reed Switch Station. The existing Dumas 115 kV line will be relocated to the new terminal.

The new 115 kV line will be terminated at the former Dumas terminal. The air break switches, line bay bus and risers will be upgraded to 2000 amp. A 2000 amp line trap will also be installed

General Assumptions & Risks

- The substation can be expanded without obtaining any additional property.
- No detailed studies have been performed.
- Detailed interconnection studies (such as relay impact, ground resistivity, soil borings & other geo-technically) have not been completed.
- Schedule project milestones will be developed after the design and constructability review has been completed and environmental and regulatory compliance has been determined.
- It is assumed there is no value in retired equipment and all equipment will be disposed of without benefit of salvage credit.
- Project delays or overhead changes will affect final removed cost.
- Unknown underground factors will add mitigation costs and may impact schedule

Appendix C-2

- Site may be in flood plain, wetlands, Soil Contamination
- Large transformers(other equipment) may require special transport to substation site
- Rising steel, copper, fuel and other market conditions could greatly affect estimated cost.

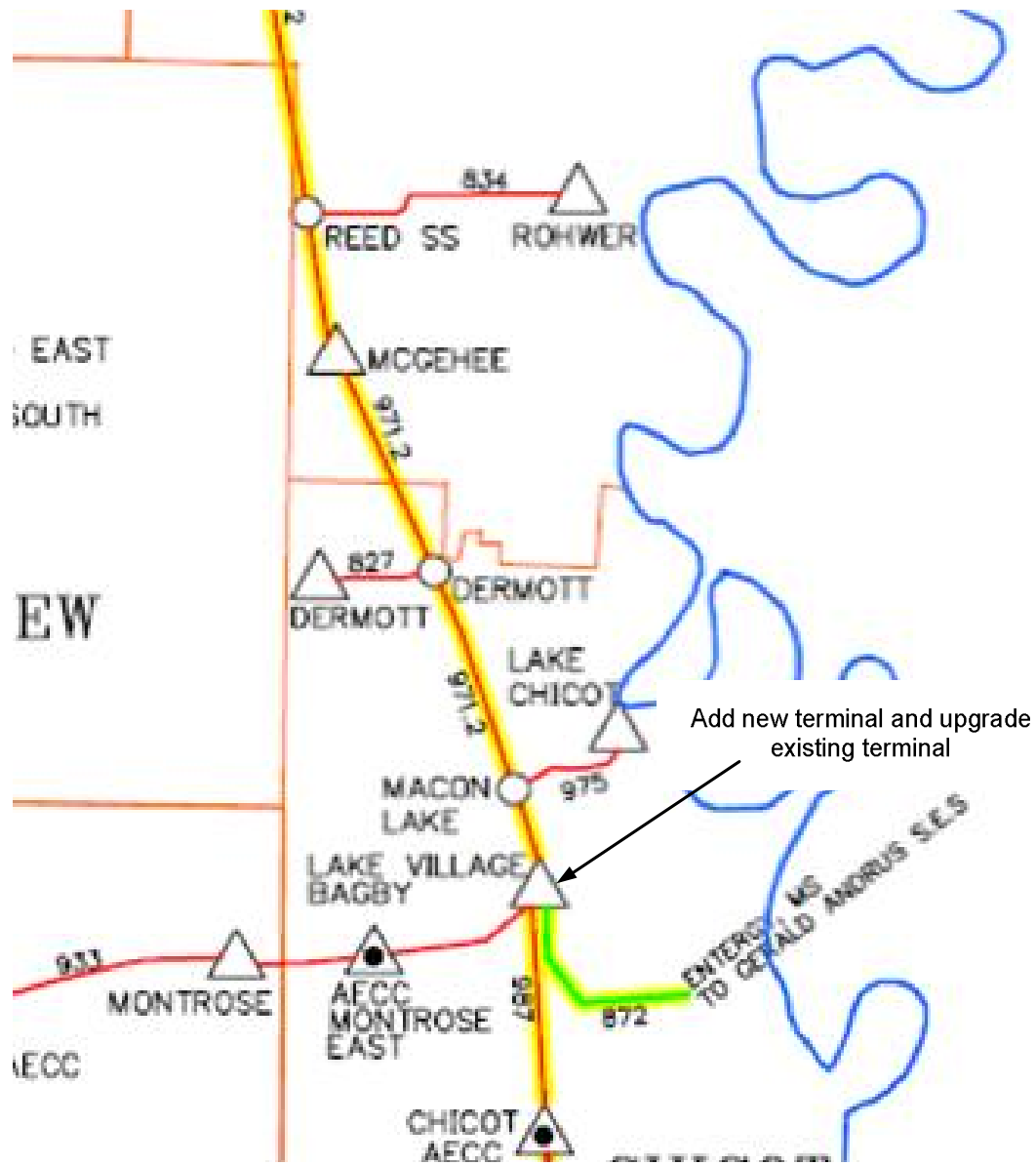
Estimate	
Item	Estimate
Substation Costs	\$1,789,000
T-Line Cost (Included in new line costs)	N/A
Full Financial	\$1,789,000
Total Estimate Range (-50% +100%)	\$0.89 - \$3.58 Million

Duration Schedule

- A detailed schedule will be prepared subsequent to project approval.
- All construction work requiring outages will be performed during acceptable periods of system load flow, which most often is the off-peak load season. Line outages will be discussed with the SOC and TOC and the assumption is made that line outages will be executed as planned. However, last minute denial of outages by the SOC/TOC along with resulting schedule delay is possible.
- Substation construction will be coordinated with the transmission line outages when possible.
- Construction resources are available when required.
- Transmission Line and Substation projects will begin subsequent to Definition phase Project Execution Plan.
- This schedule does not account for adverse weather conditions.
- Schedule durations are high level estimates at this time. A detailed schedule will be prepared upon project approval.

Task	Months
Definition	6
Regulatory & Permitting	19
Substation Work	12
T-Line Work	12
Less Parallel Tasks	10
Total Duration	36

Appendix C-2



ESRPP
AEPW to EAI

Project Summary

Appendix
C-3

Project Estimate Scope

Upgrade Reed Switch Station

Requirements:

The Reed Switch Station provides a single tap point for a 115 kV line to serve Potlatch Paper Company. To add a new node to this station, the station will be converted to allow a dual breaker ring configuration; a 115 kV ring and a 230 kV ring. The 115 kV breaker ring will be installed first with nodes for: Rohwer, Dumas, the existing Lake Village Bagby and the new LV Bagby line. Space for a future 230 kV breaker ring and 230/115 kV autotransformer bank will be provided.

Description of existing:

The existing Reed Switch station has three motor operated 1200 amp Load Drop Switches (LDS) to isolate the lines. A fenced “switch station” does not exist.

Constraints:

Potlatch Paper Company is at Rohwer Substation and will require an outage to transfer the line from the switch station to the new terminal. This will require coordination with this customer to optimize the outage.

Proposed Solution:

To provide for the existing 115 kV customers and allow a future 230/115 kV auto-transformer, property must be obtained for a 115 kV four breaker ring, four auto-transformers, and a four breaker 230 kV ring. The four breaker 115 kV ring would be installed first. The terminals for the 115 kV ring would be: Potlatch, Dumas, existing Lake Village Bagby, and the new 230 kV rated 115 kV line to LV Bagby. This arrangement will allow the 230 kV breakers and auto to be installed at a later date and not require an additional outage on Potlatch.

General Assumptions & Risks

- Assumed that the property can be obtained for the substation.
- Site conditions have not been addressed in this document
- No detailed studies have been performed in this document
- Detailed interconnection studies (such as relay impact, ground resistivity, soil borings & other geo-technically) have not been completed.
- Schedule project milestones will be developed after the design and constructability review has been completed and environmental and regulatory compliance has been determined.
- It is assumed there is no value in retired equipment and all equipment will be disposed of without benefit of salvage credit.
- Project delays or overhead changes will affect final removed cost.
- Unknown underground factors will add mitigation costs and may impact schedule

Appendix C-3

- Assumed the site is not in flood plain, wetlands, or have Soil Contamination areas
- Assumes breakers (other equipment) will not require special transport to substation site.
- Rising steel, copper, fuel and other market conditions could greatly affect estimated cost.

Estimate	
Item	Estimate
Substation Costs	\$6,228,000
T-Line Cost	N/A
Full Financial	\$6,228,000
Total Estimate Range (-50% +100%)	\$3.1 - \$12.5 Million

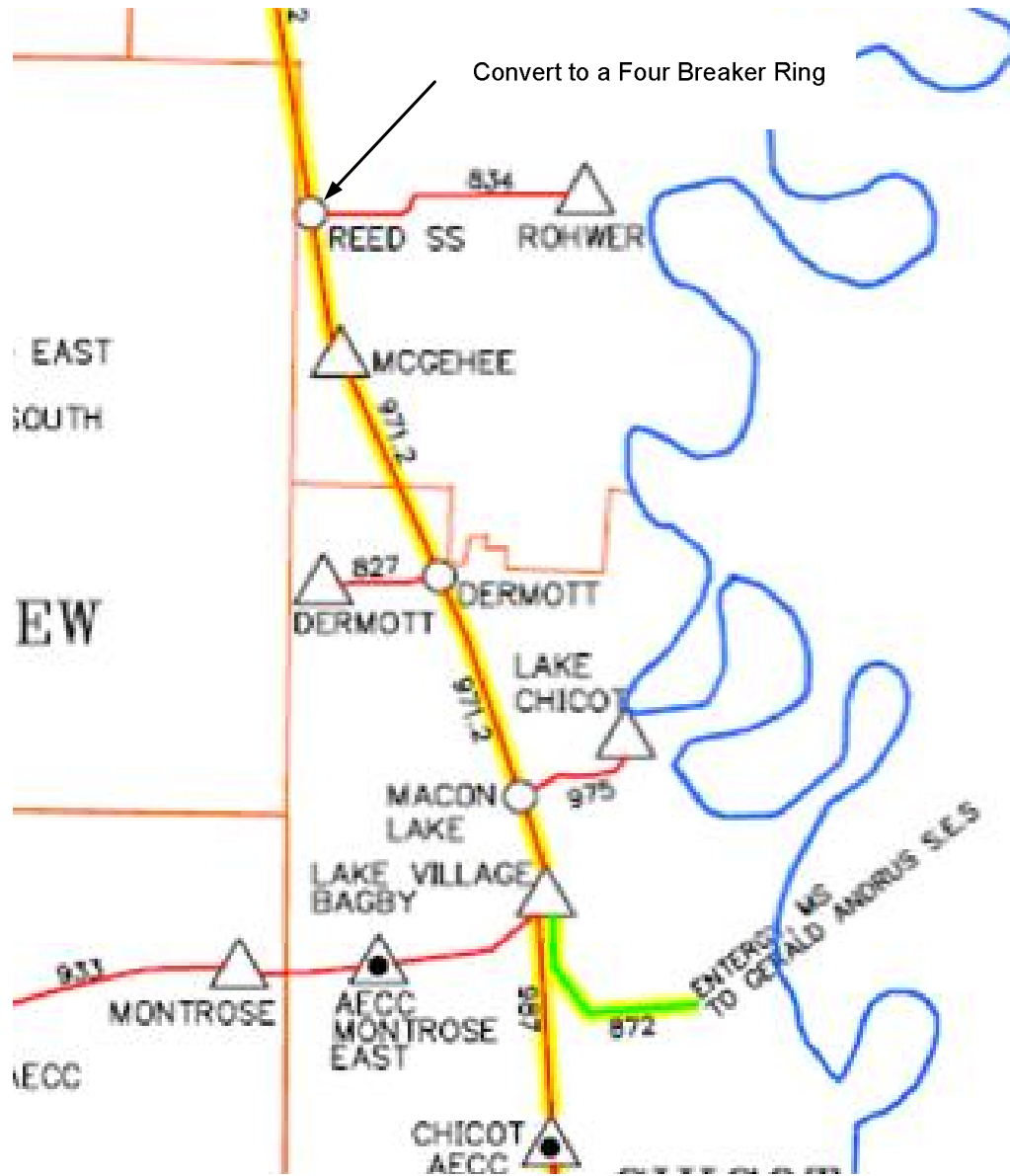
Duration Schedule

- A detailed schedule will be prepared subsequent to project approval.
- All construction work requiring outages will be performed during acceptable periods of system load flow, which most often is the off-peak load season. Line outages will be discussed with the SOC and TOC and the assumption is made that line outages will be executed as planned. However, last minute denial of outages by the SOC/TOC along with resulting schedule delay is possible.
- Substation construction will be coordinated with the transmission line outages when possible.
- The assumption is made that construction resources will be available when required.
- Transmission Line and Substation projects will begin subsequent to Definition phase Project Execution Plan.
- This schedule does not account for adverse weather conditions.
- Schedule durations are high level estimates at this time. A detailed schedule will be prepared upon project approval.

Task	Months
Definition	6
Regulatory & Permitting	18
Substation Work	12
T-Line Work	12
Less Parallel Tasks	10
Total Duration	38

Appendix C-3

Reed Switch Station Location



Appendix C-3

