

Entergy Arkansas, Inc.

Proposed Transmission Reliability Projects

Entergy Transmission Planning Summit

New Orleans, LA

July 13, 2006



2007 - 2008 EAI Transmission Reliability Projects

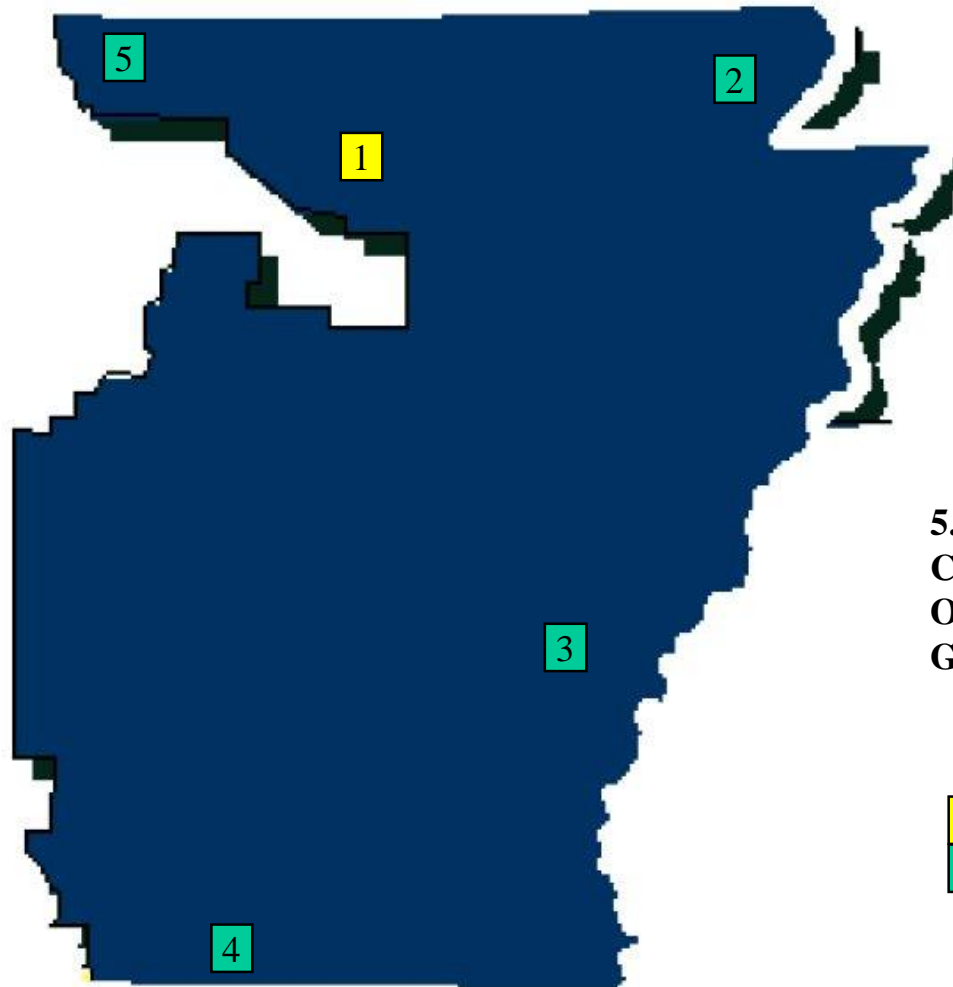
1.) Hilltop: New Ring Bus at Intersection of EAI and SPA lines

2.) Reconductoring of Corning - Texas Eastern #8 115 kV line

3.) 21.6 MVAR Capacitor Bank at Dewitt

4.) New 345 / 115 kV Substation near Sarepta and 21.6 MVAR Capacitor Bank at Emerson

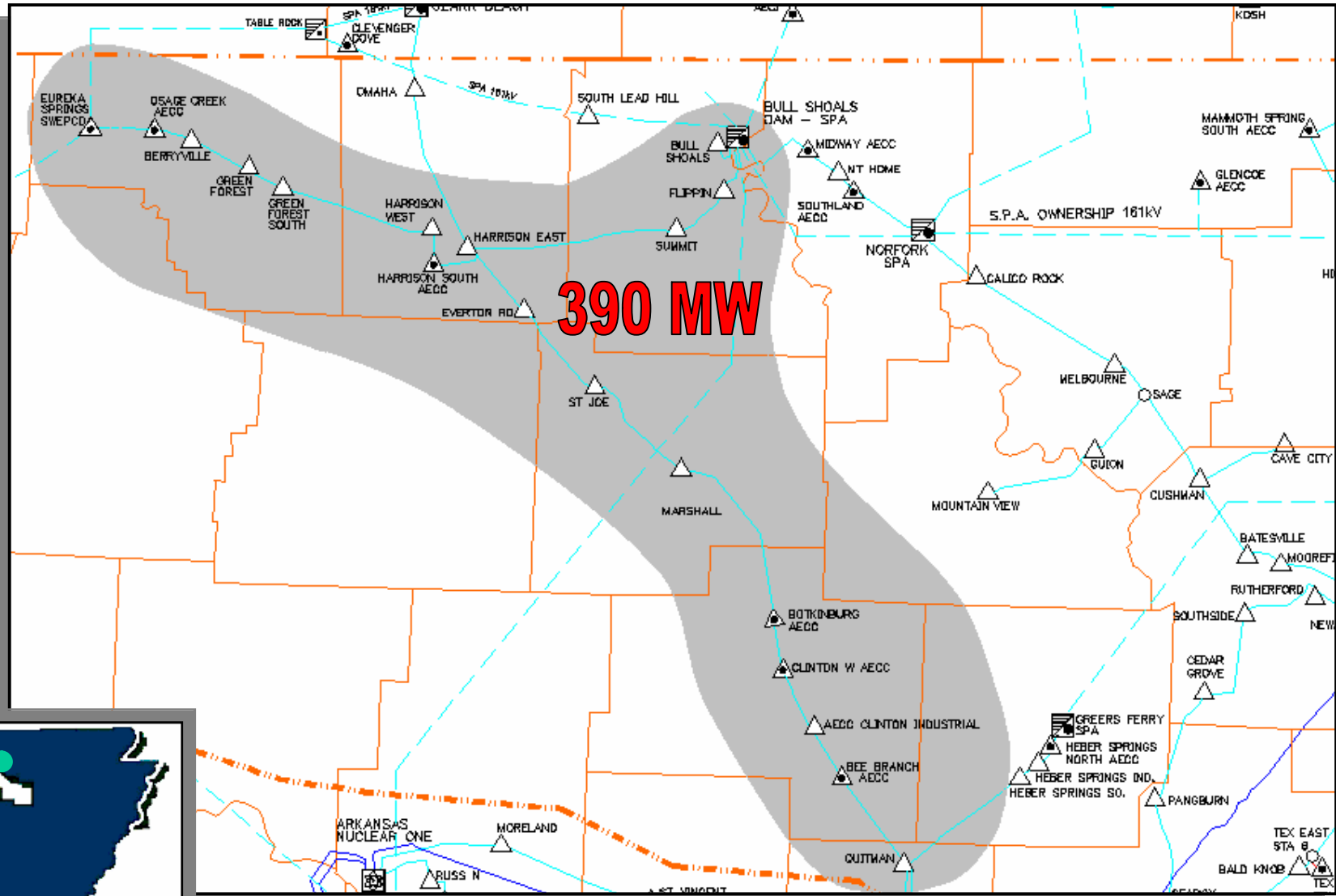
5.) New 161 kV Line Construction from Osage Creek - Grandview



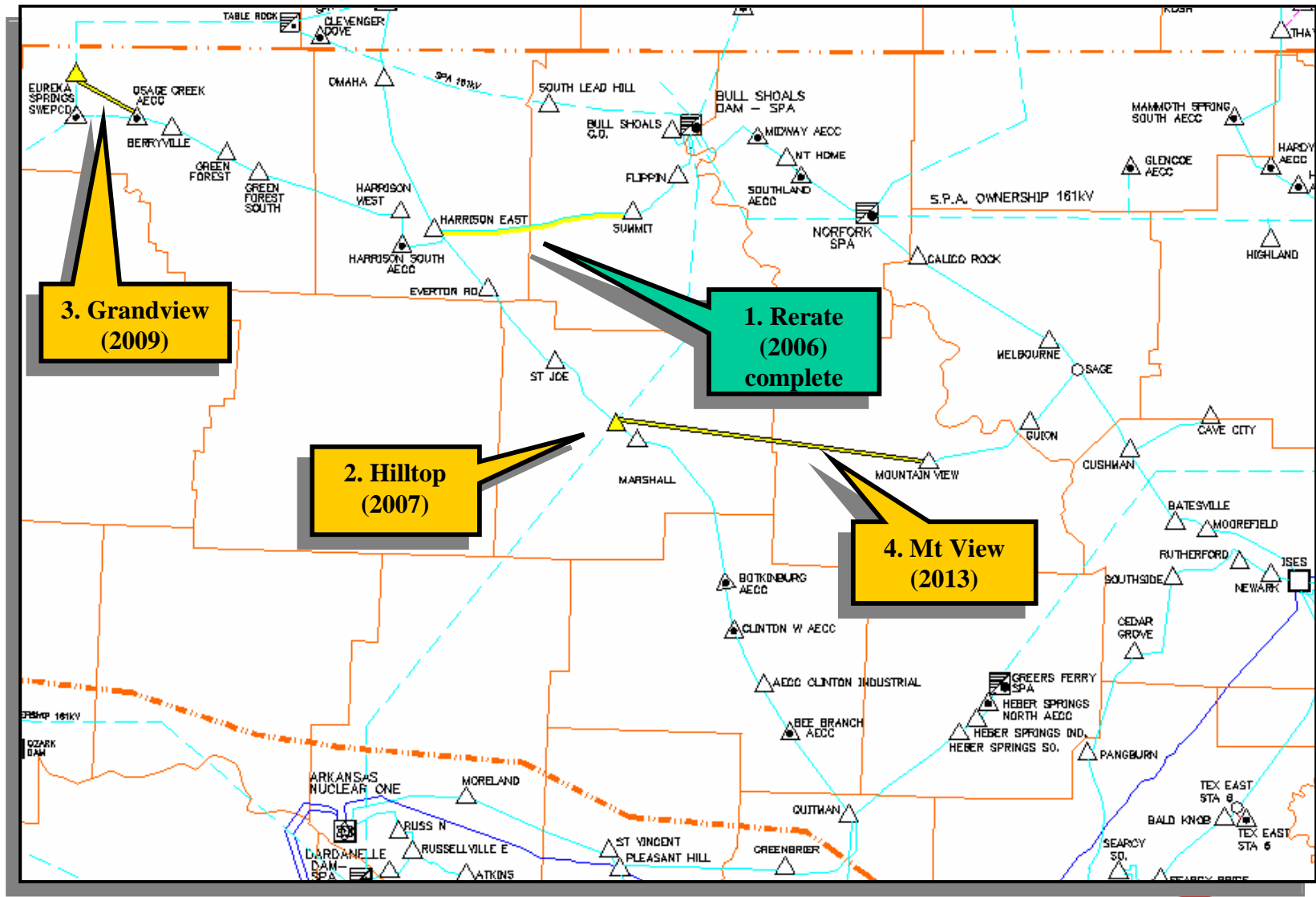
Carryover from 2006
2007/2008 Projects



Northwest Arkansas



NW Arkansas Long Term Plan



Hilltop: 161 kV Ring Bus Between EAI and SPA Lines

2007

Scenario:

- The 161 kV transmission system in northwest Arkansas is generally served by generation located at Arkansas Nuclear One (ANO) and Independence SES (ISES).
- There are also units at Table Rock, Ozark Beach, Norfork and Bull Shoals Dam which provide some support during the summer peak, but availability of these resources is limited by the availability of water on their respective sources.
- Three major transmission lines which originate at Harrison East and cause undervoltages and thermal overloads:
 - Harrison East – Eureka Springs 161 kV
 - Harrison East – Bull Shoals Dam 161 kV
 - Harrison East – Quitman 161 kV

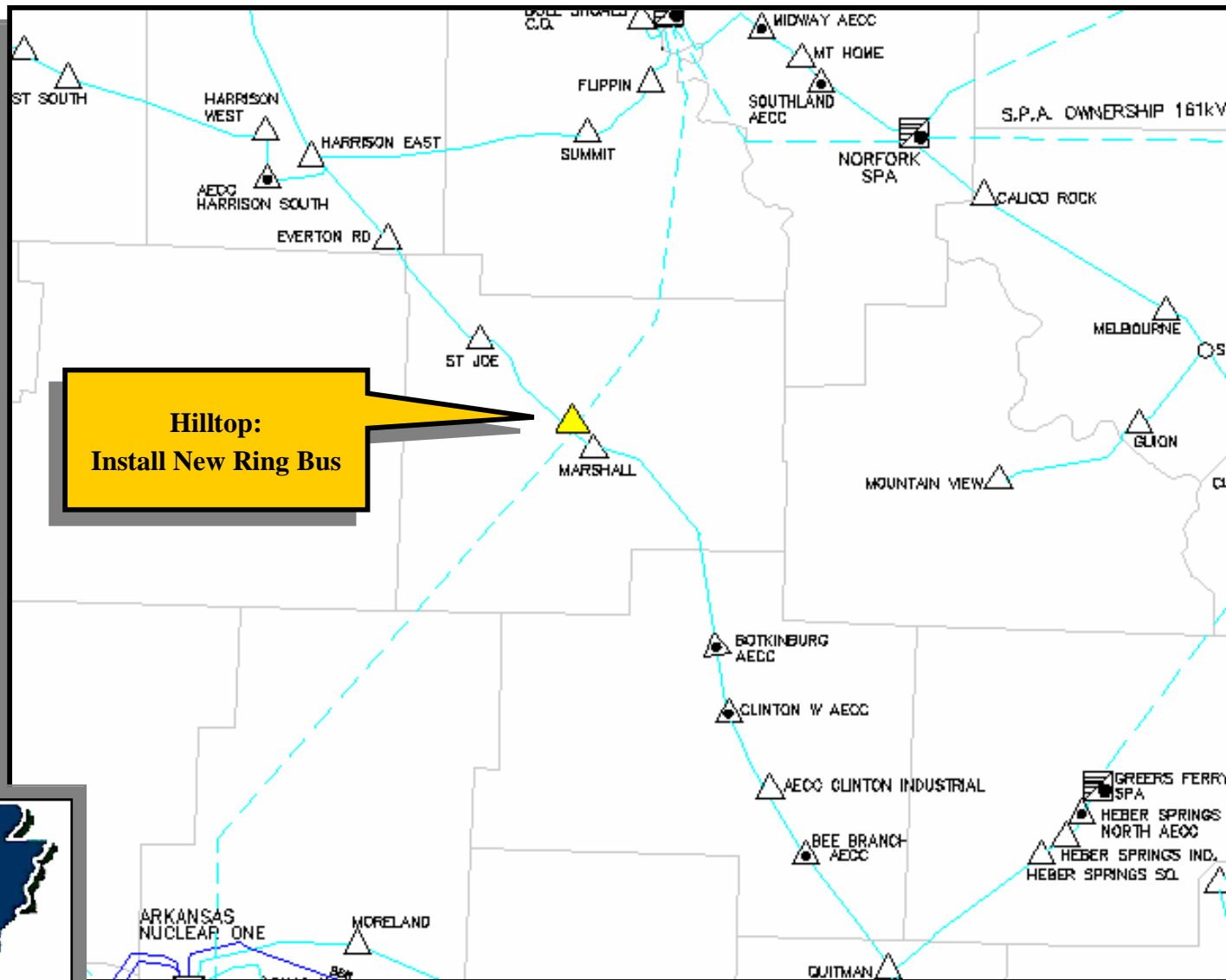
Proposed Solution:

- Build a four-breaker ring bus, Hilltop, where the SPA line from Dardanelle - Bull Shoals crosses the APL line from Harrison East - Quitman.

Estimated Cost: \$8.5 MM



Marshall Area



Texas Eastern Station #8 – Corning 115kV Line Rebuild

Scenario:

- Previous construction has increased the conductor size on selected spans to 1,590 mcm and 666 mcm, but a majority of the line is 336 mcm or smaller (e.g., 4/0 copper), and substation equipment limits the ampacity of the line.
- Low voltage will occur at Corning under certain single contingency scenarios.
- Low voltage also causes greater current to flow and will cause an overload on the Corning to TE #8 line segment.

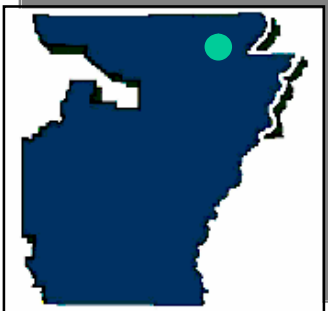
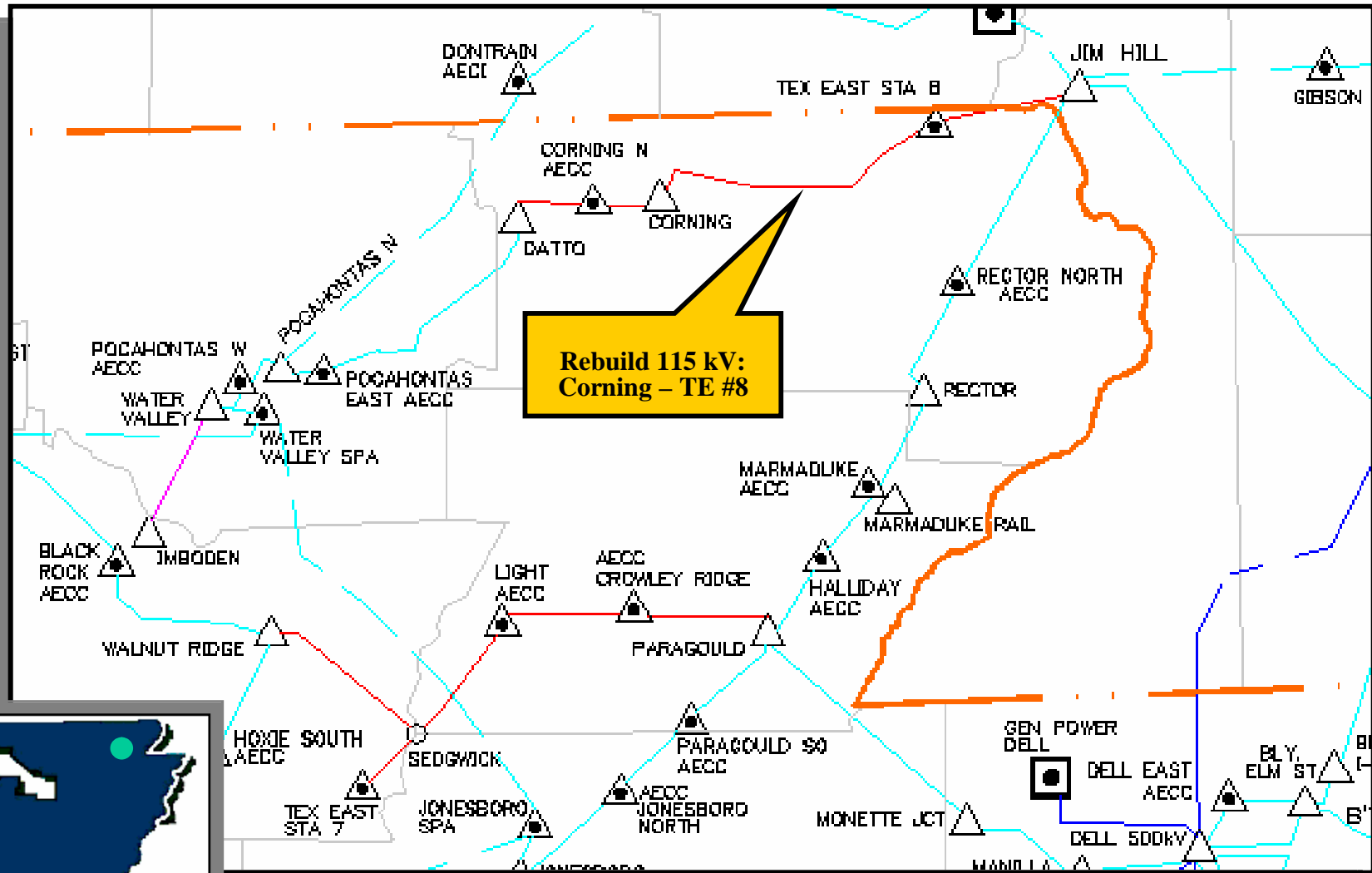
Proposed Solution:

- Rebuild the line segment from TE #8 to Corning with 666 mcm, to increase the line rating to 176 MVA.

Estimated Cost: \$8 MM



Datto - Jim Hill Area



Dewitt: 21.6 MVAR Capacitor Bank

Scenario:

- Loss of the Helena Industrial - Ritchie SES 115 kV line segment causes low voltages at various substations
- Loss of the Stuttgart Ricusky 230/115 kV autotransformer causes low voltages at various substations and overloads on the Woodward – Alzheimer and the Alzheimer – Wabaseka 115 kV line segments

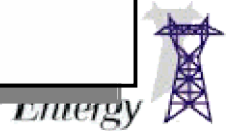
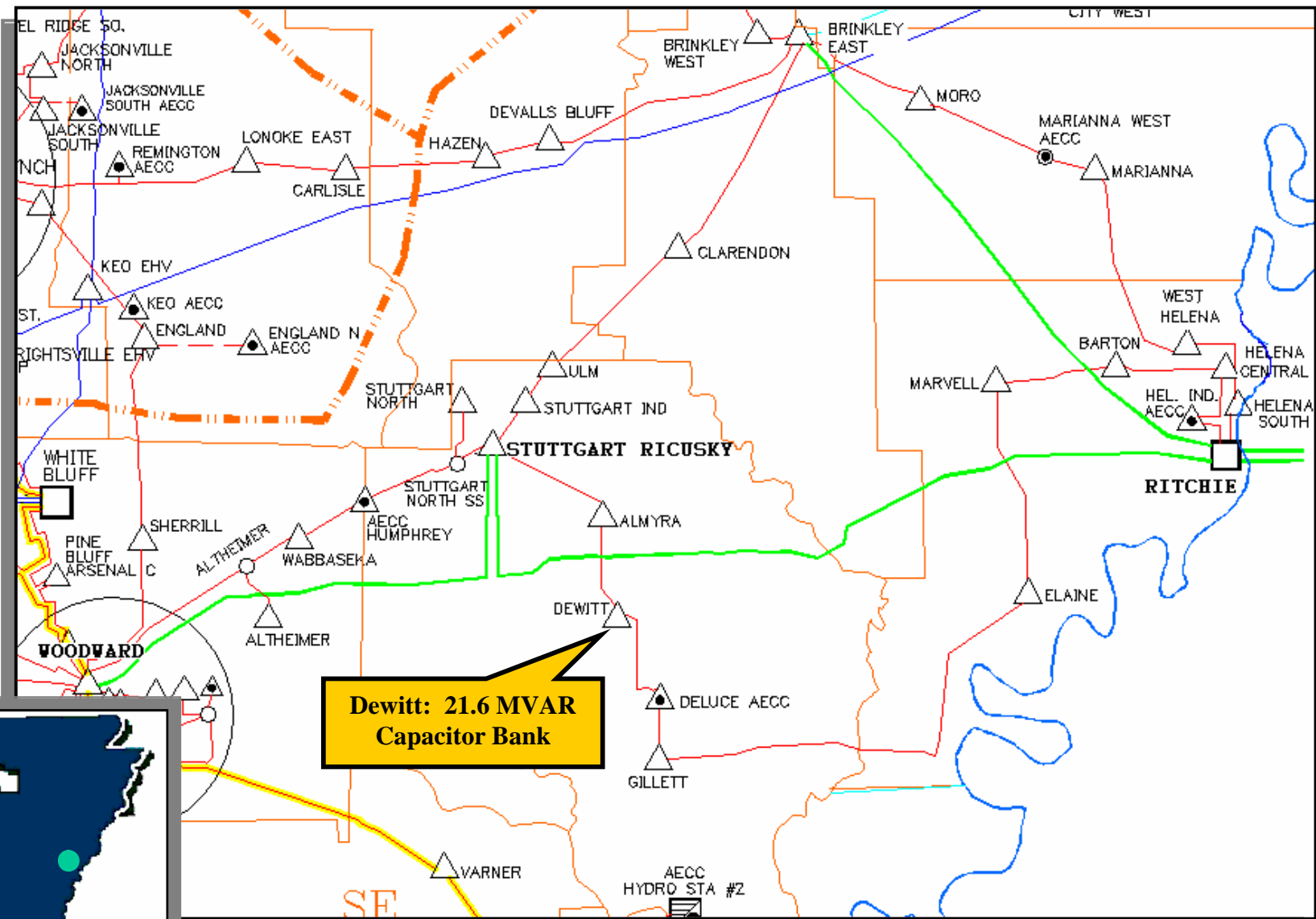
Proposed Solution:

- Install a 21.6 MVAR capacitor bank at Dewitt.
 - Correct Distribution power factor at Dewitt, Almyra, Marvell, Gillett, Helena Central, and Ulm substations.

Estimated Cost: \$700K



Stuttgart Area



Sarepta: New 345/115 kV Auto and Capacitor Bank

Scenario:

- The following single contingencies cause low voltage in the extreme southwestern corner of the EAI service territory:
 - Loss of the Magnolia East - McNeil line segment
 - Loss of the Magnolia Steel - Magnolia East line segment
 - Loss of the Magnolia Steel - Kerlin S.S. line segment
- The low voltage concerns also propagate into north Louisiana (Lucky substation).
- Capacitor bank additions do not provide sufficient improvement to this region.
- The transmission grid performance can be improved by delivering a high voltage source into the Emerson area. Emerson resides very close to a 345 kV line from El Dorado to Longwood (AEP-West).

Proposed Solution:

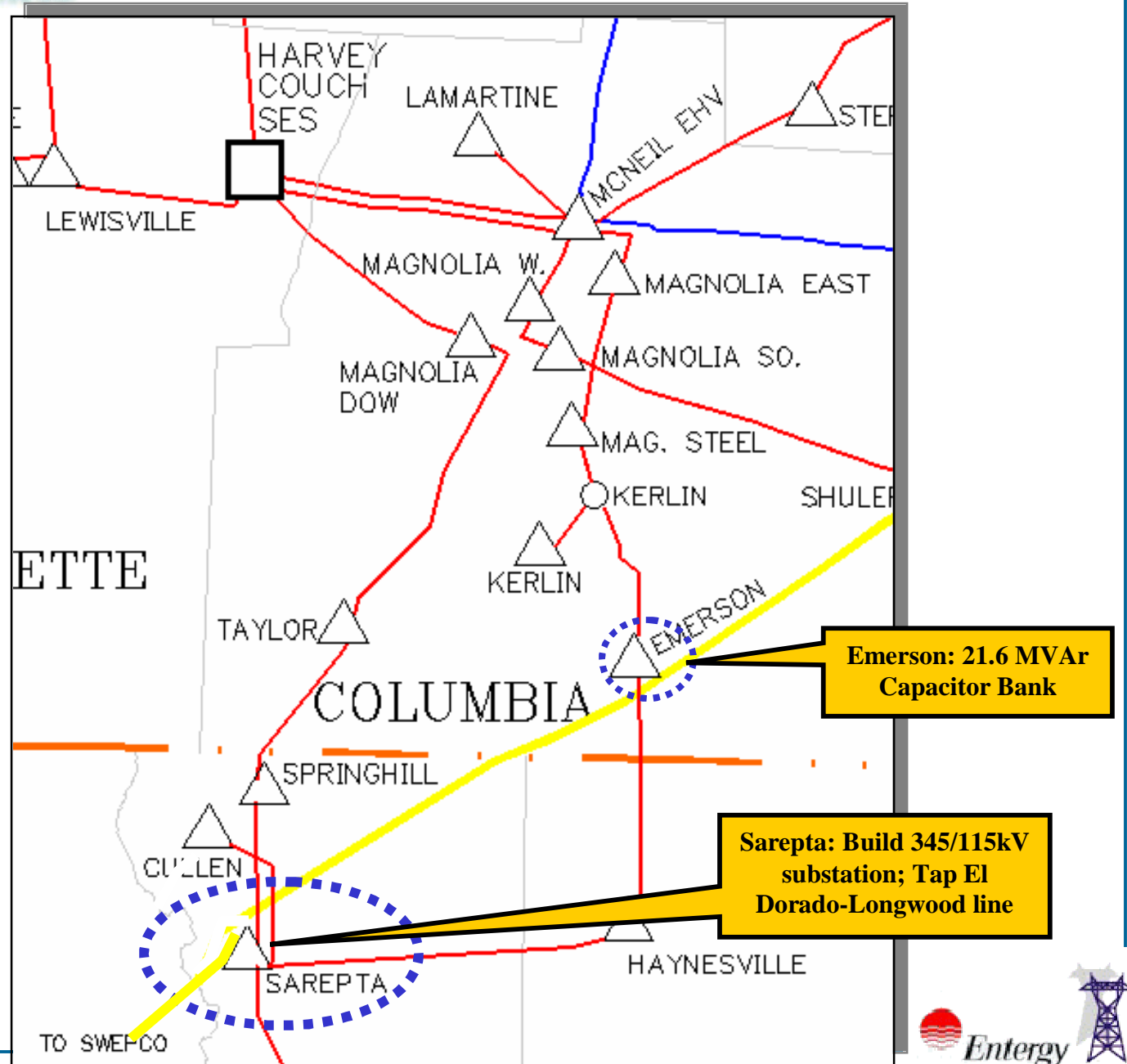
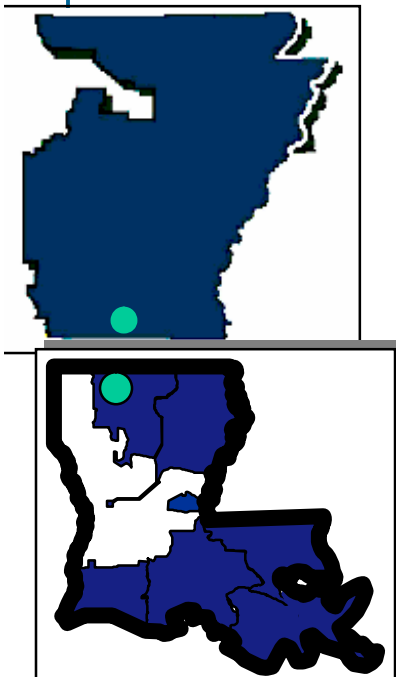
- Build a new 345/115 kV tie at Sarepta 115 kV substation and install a 21.6 MVAR capacitor bank at Emerson.
- This project's alternative solution is to construct a new 345/115 kV substation, Mohawk, where the Emerson -Haynesville 115 kV crosses the Longwood – El Dorado 345 kV line.
- Proposed In-Service Date: 2008

Estimated Cost: \$12.6 MM



Transmission Business

Emerson/ Sarepta Area



Osage Creek-Grandview

Scenario:

- By 2010, it is estimated that approximately 227 MW of load will be served between Harrison East and Eureka Springs.
- Nearly 110 MW of the load will be located at Osage Creek, at the extreme northwest end of the line.
- Loss of the Harrison East – Harrison South transmission line segment causes thermal overloads on the Eureka – Osage Creek (AECC) line segment.
- Loss of this line also causes low voltage on the Osage bus.

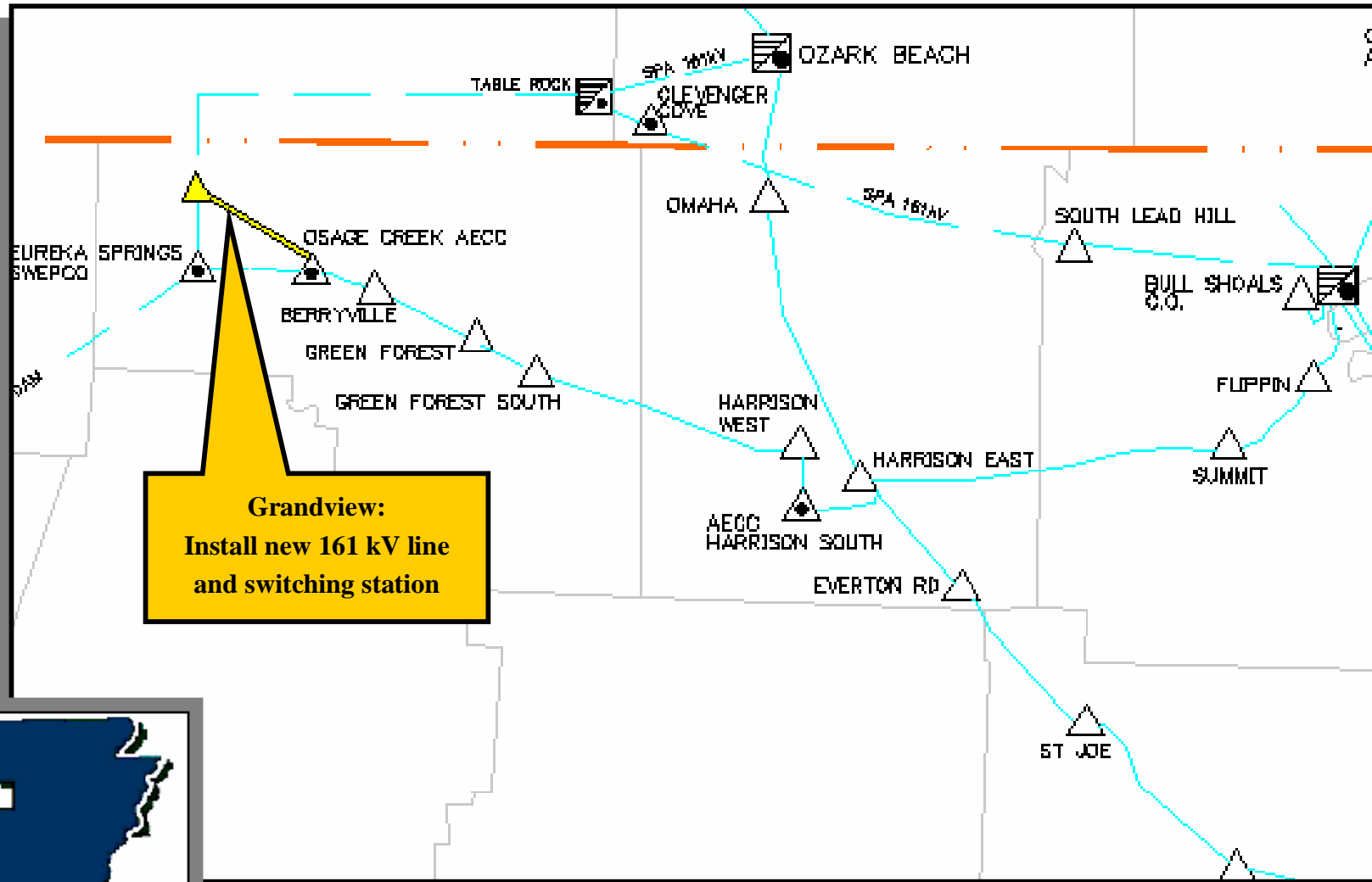
Proposed Solution:

- Construct a new switching station, Grandview, on the transmission line from Table Rock Dam – Eureka Springs. Build a new line between Grandview and Osage Creek.

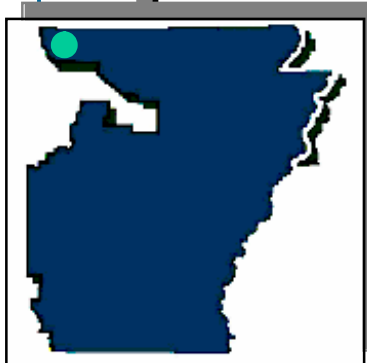
Estimated Cost: \$7.3 MM



Osage Creek-Grandview



Grandview:
Install new 161 kV line
and switching station



2009-2011 EAI Transmission Expansion Projects

1.) New 161 kV Line
Construction from Osage
Creek -Grandview

2.) 21.6 MVAR Capacitor
Bank at Poyen

3.) 21.6 MVAR Capacitor
Bank at Warren East

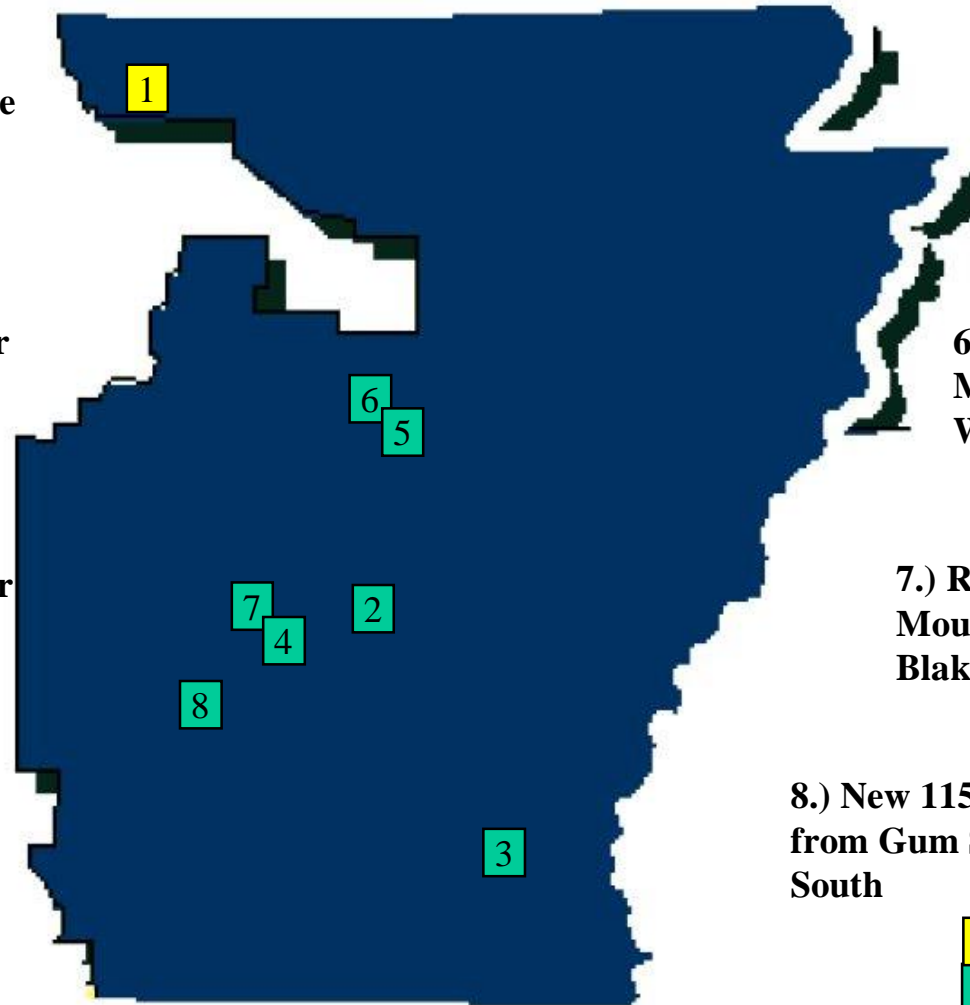
4.) New 115 kV Line
Construction from HS
Mt Ida – HS Milton

5.) Reconductoring of
Conway South –
Conway West 161 kV
Line

6.) Reconductoring of
Morrilton East - Conway
West 161 kV Line

7.) Reconductoring of
Mountain Pine South -
Blakely Dam 115 kV Line

8.) New 115 kV Line Construction
from Gum Springs - Murfreesboro
South



Carryover from 2008
2009-2011 Projects



Install 21.6 MVAR Capacitor Bank at Poyen

Scenario:

- The 115 kV line from HS EHV East – Malvern N is 6.6 miles long.
- Loss of the Malvern North – HS EHV East 115 kV line segment causes low voltages at various substations.
- Loss of the Gifford – Malvern North 115 KV line segment causes low voltage at Poyen, and Gifford substations.

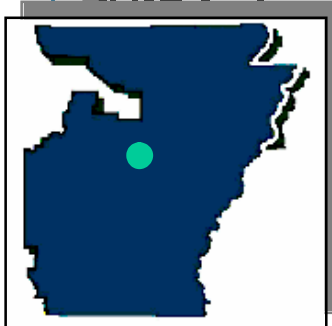
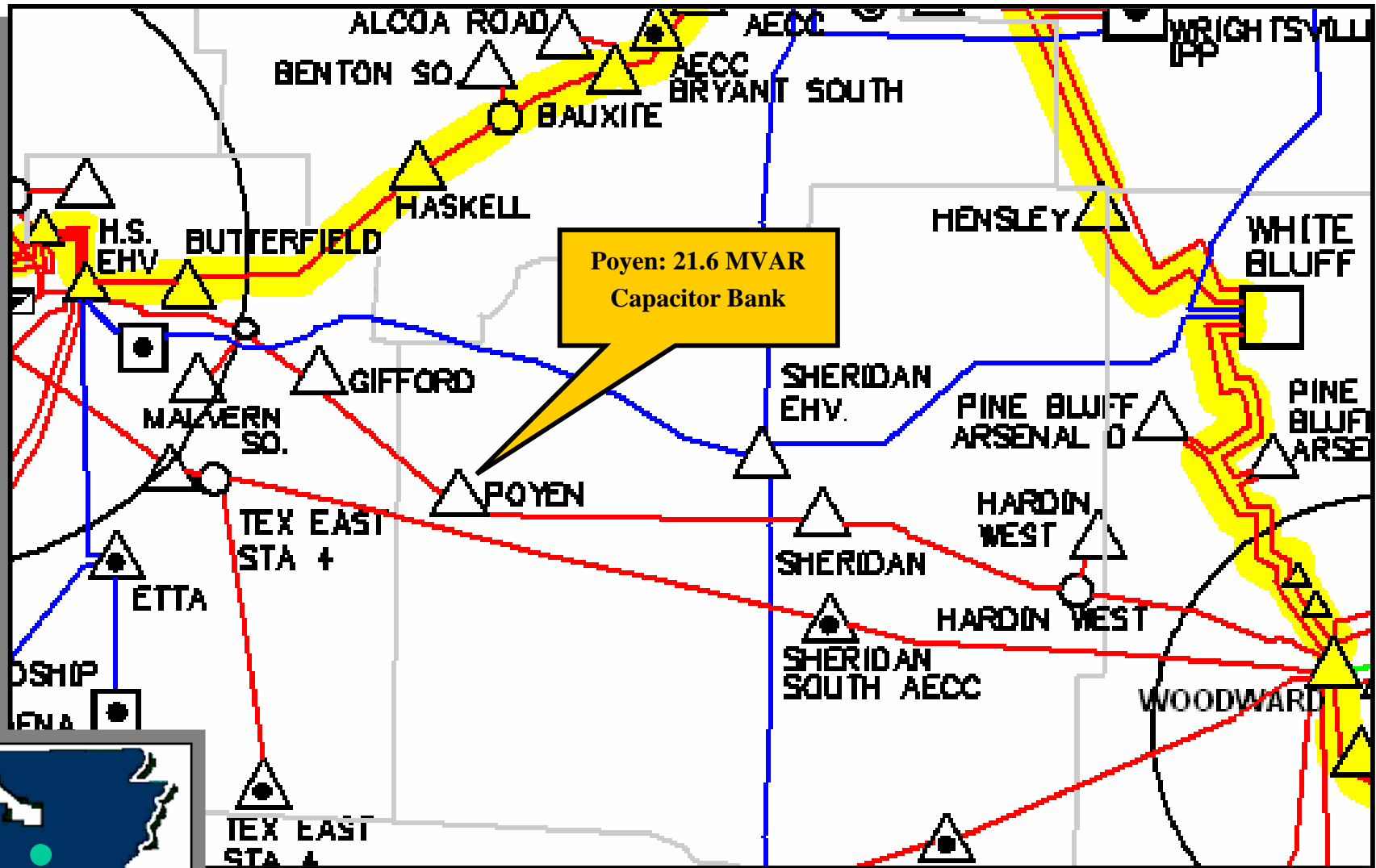
Proposed Solution:

- Install a 21.6 MVAR Capacitor Bank at Poyen 115 kV substation.

Estimated Cost: \$660 K



Sheridan Area



Install 21.6 MVAR Capacitor Bank at Warren East

Scenario:

- The Warren East is a substation which is located in southeastern Arkansas, northeast of El Dorado.
- This is a long radial line fed from Monticello East and El Dorado EHV which is approximately 61 miles.
- Loss of any of the line segment along this line causes low voltages.
- Loss of the 500/115 kV at El Dorado EHV also causes low voltages.

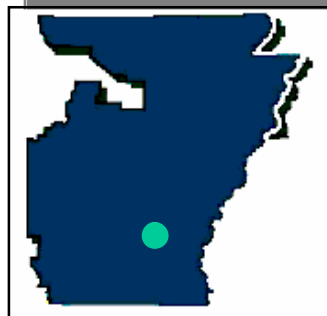
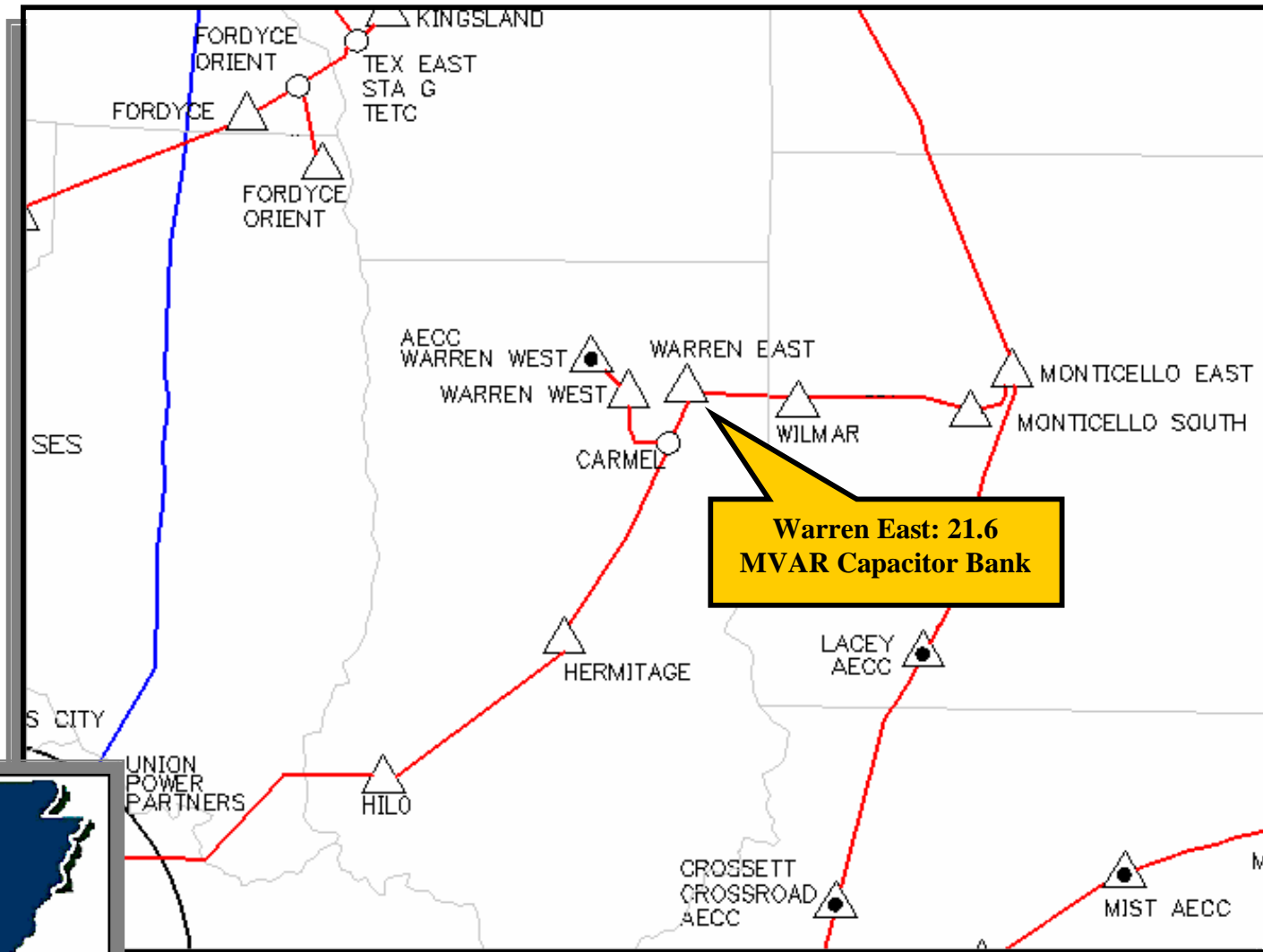
Proposed Solution:

- Install a 21.6 MVAR capacitor bank at the Warren East substation.

Estimated Cost: \$650 K



Warren Area



New Hot Springs Mt Ida – Hot Springs Milton 115 kV Line

Scenario:

- Loss of the Mountain Pine South – Blakely 115 kV line segment causes:
 - An overload on the HS South - HS West 115 kV line segment
 - An overload on the Carpenter Dam – HS South 115 kV line segment
- Loss of the Carpenter Dam– HS South 115 kV line segment causes low voltages at various substations.
- Loss of Bismarck – HS EHV West 115 kV line segment causes low voltages at various substations.

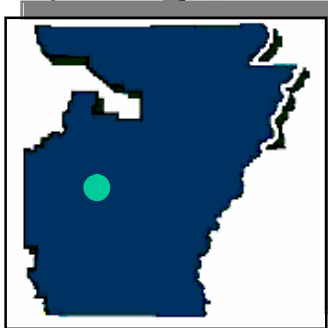
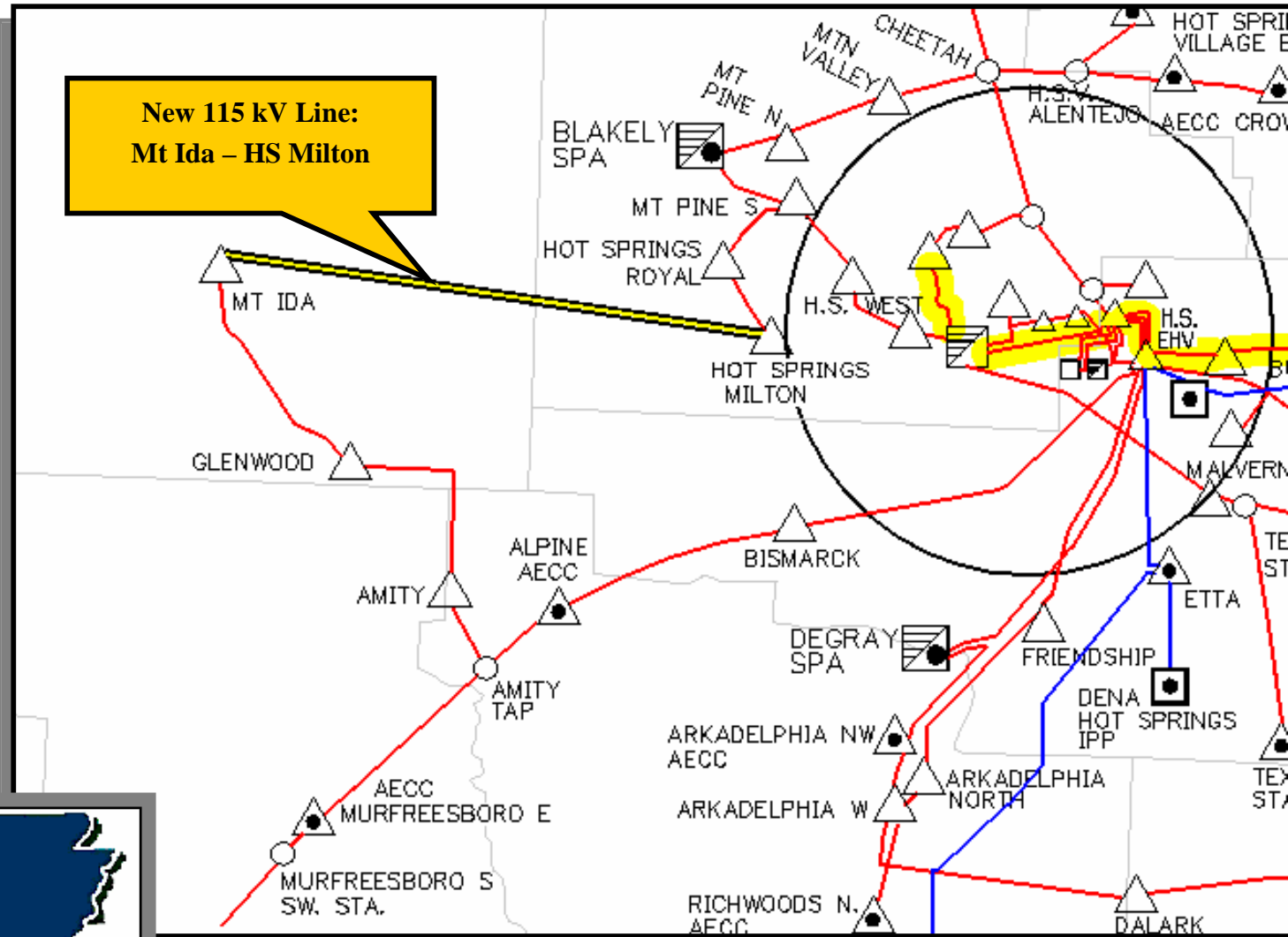
Proposed Solution:

- Build a new 115 kV line from HS Mt Ida - HS Milton with 1,272 ACSR or equivalent conductor, and upgrade switches to 1,200 Amp.

Estimated Cost: \$15 MM



Hot Springs Area



Conway South - Conway West 161 kV Line Rebuild

Scenario:

- The Conway West 161 kV line is 5 miles long and is constructed of 666 ACSR conductor.
- Loss of the Pleasant Hill-Greenbrier 115 kV line segment causes overloads on the Conway South-Conway West 115 kV line segment
- Loss of the Conway West - Lake Conway 115 kV line segment causes overloads on the Gleason – Morrilton E 161 kV line segment.

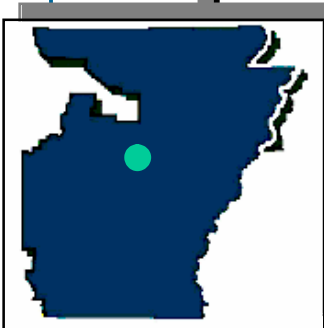
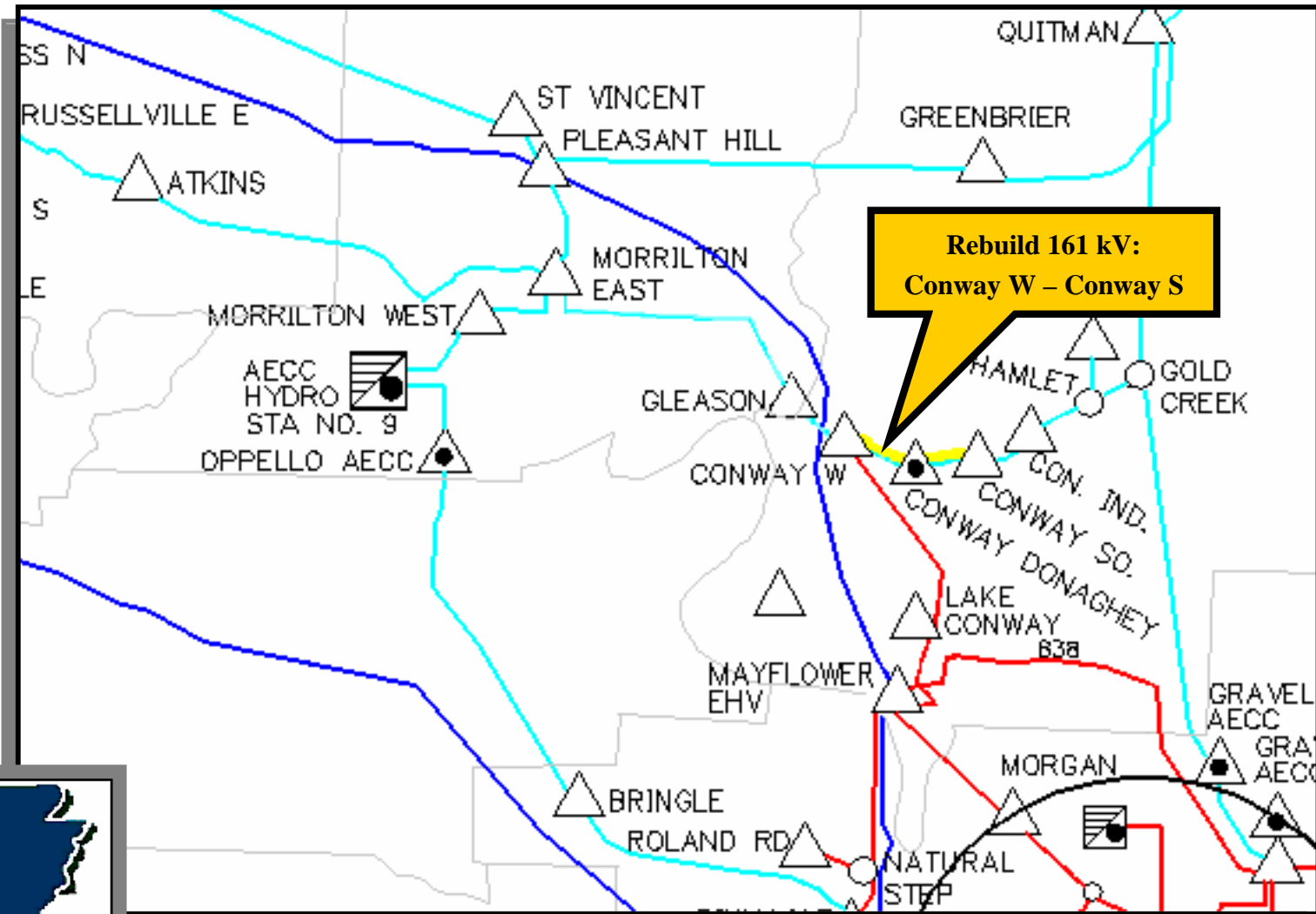
Proposed Solution:

- Rebuild Conway South - Conway West 161 kV line segment using 1,272 ACSR or equivalent conductor.

Estimated Cost: \$4.5 MM



Conway Area



Morrilton East - Conway West 161 kV Line Rebuild

Scenario:

- The Morrilton East – Conway West 161 kV line is 15.35 miles long and is constructed of 666 ACSR conductor
- Loss of the Lake Conway - Mayflower 115 kV line segment causes overload to the Morrilton East - Gleason 161 kV line segment and the Gleason - Conway West 116 kV line segment
- Loss of the Conway West - Lake Conway line segment and the Conway West 161 / 115 kV line segment also causes overloads

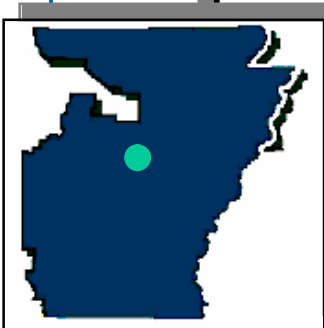
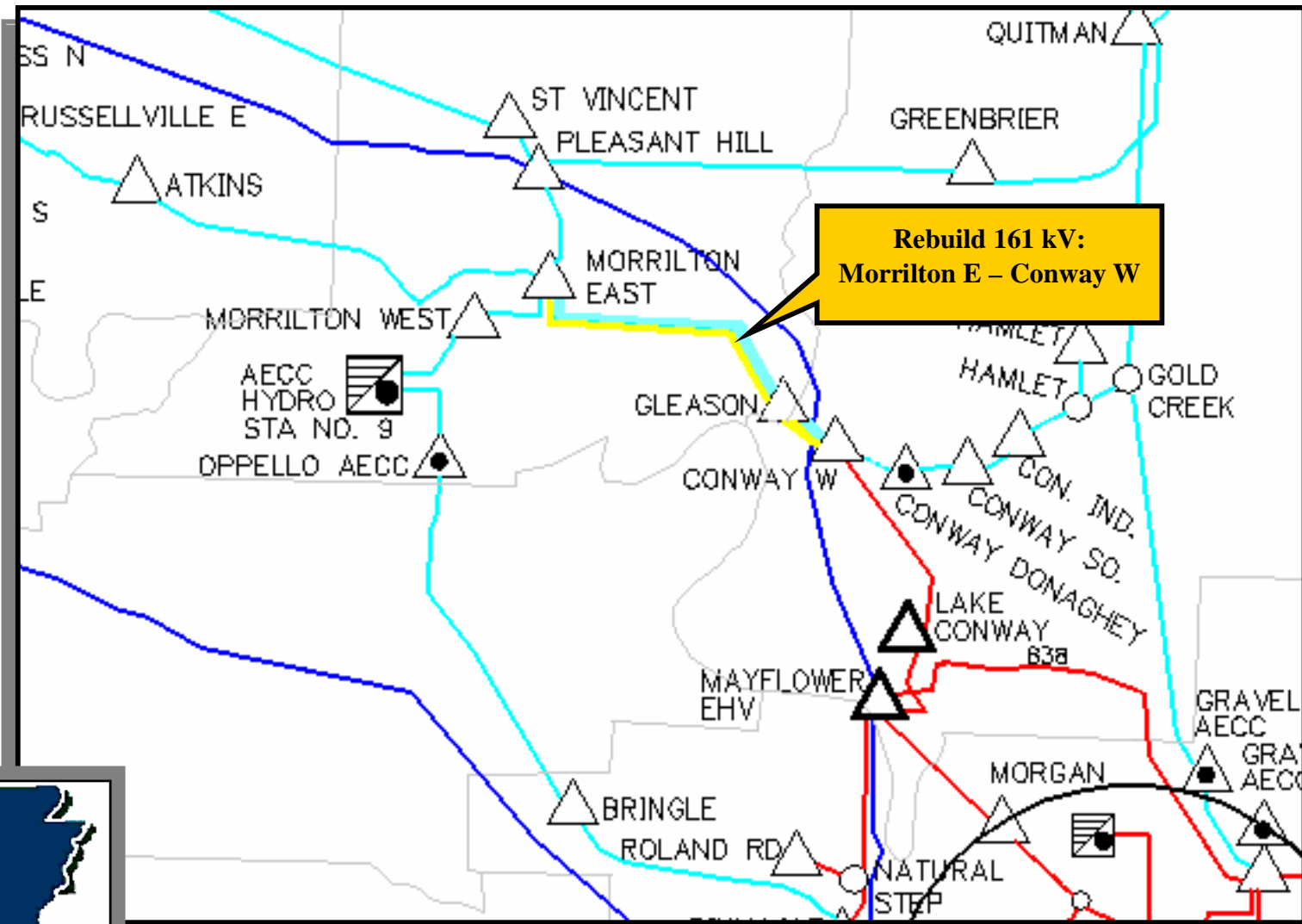
Proposed Solution:

- Rebuild the Morrilton East - Conway West 161 kV line segment using 1,272 ACSR or equivalent conductor.

Estimated Cost: \$8.3 MM



Conway Area



Blakely Dam - Mountain Pine South 115 kV Line Rebuild

Scenario:

- The Blakely Dam – Mountain Pine South 115 kV line segment is 2.92 miles and consist of 666 ACSR conductor
- Loss of the Carpenter Dam - Hot Springs South 115 kV Line segment causes:
 - an overload on the Mountain Pine - Blakely Dam segment
 - low voltage at Hot Springs South
- Line switches at the Blakely Dam prevent any greater throughput through the SPA substation.

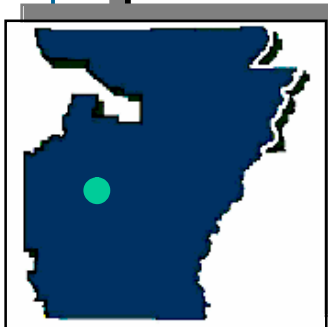
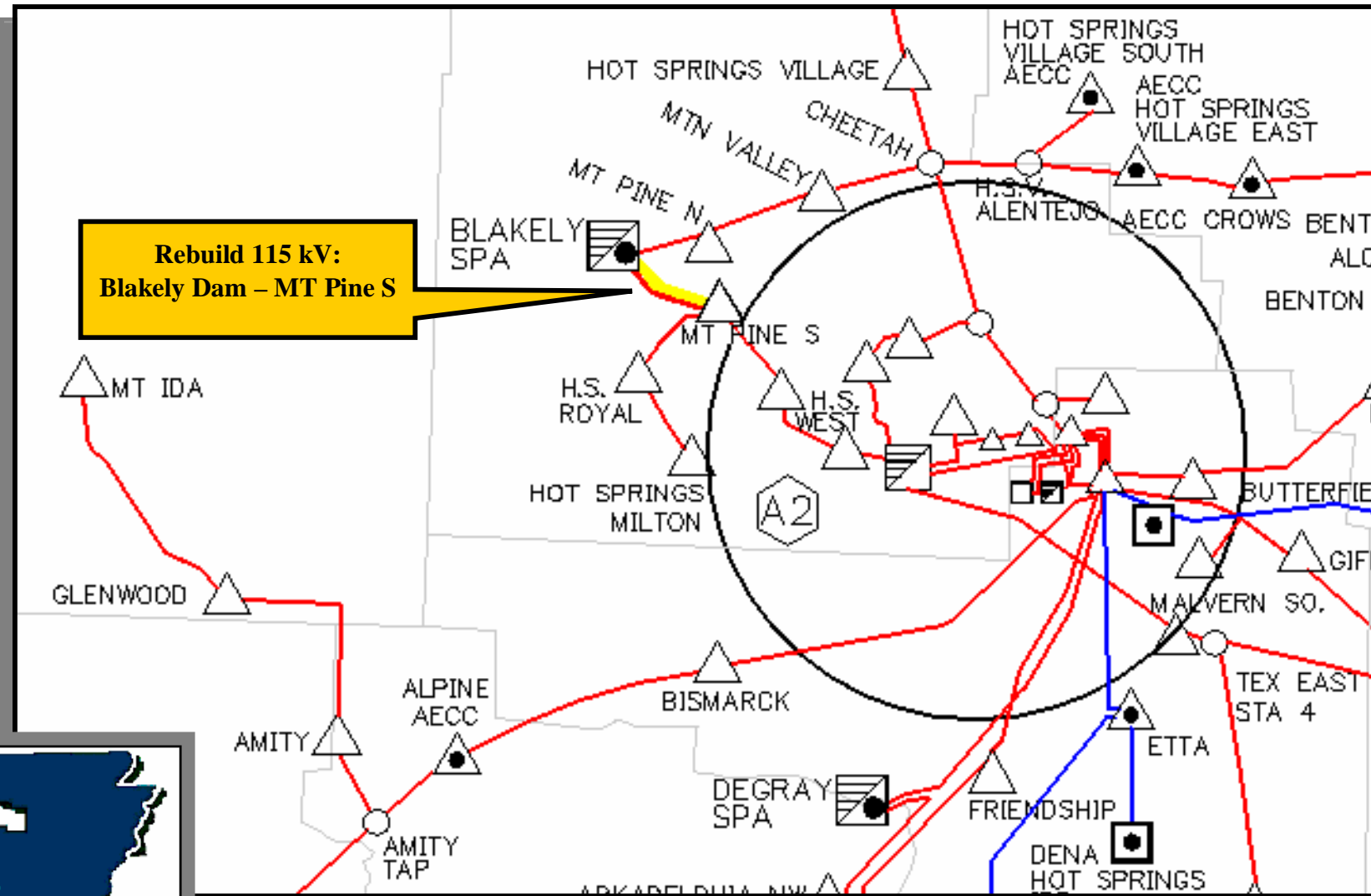
Proposed Solution:

- Upgrade the Blakely Dam – Mountain Pine South line segment to 1,272 ACSR or equivalent conductor and upgrade switches to 1,200 Amp.

Estimated Cost: \$2.4 MM



Mountain Pine Area



New Switching Station (Gum Springs) and New 115 kV Line Construction

Scenario:

- The Woodward - Degray 115 kV transmission line crosses the Friendship - Couch 115 kV transmission line near Curtis, between Arkadelphia and Richwoods.
- There are low voltages in the Murfreesboro South region under single contingency scenarios.

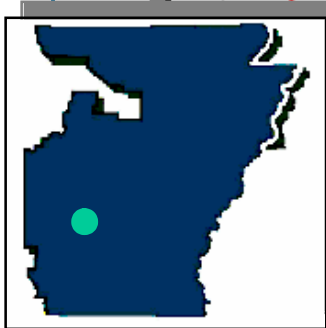
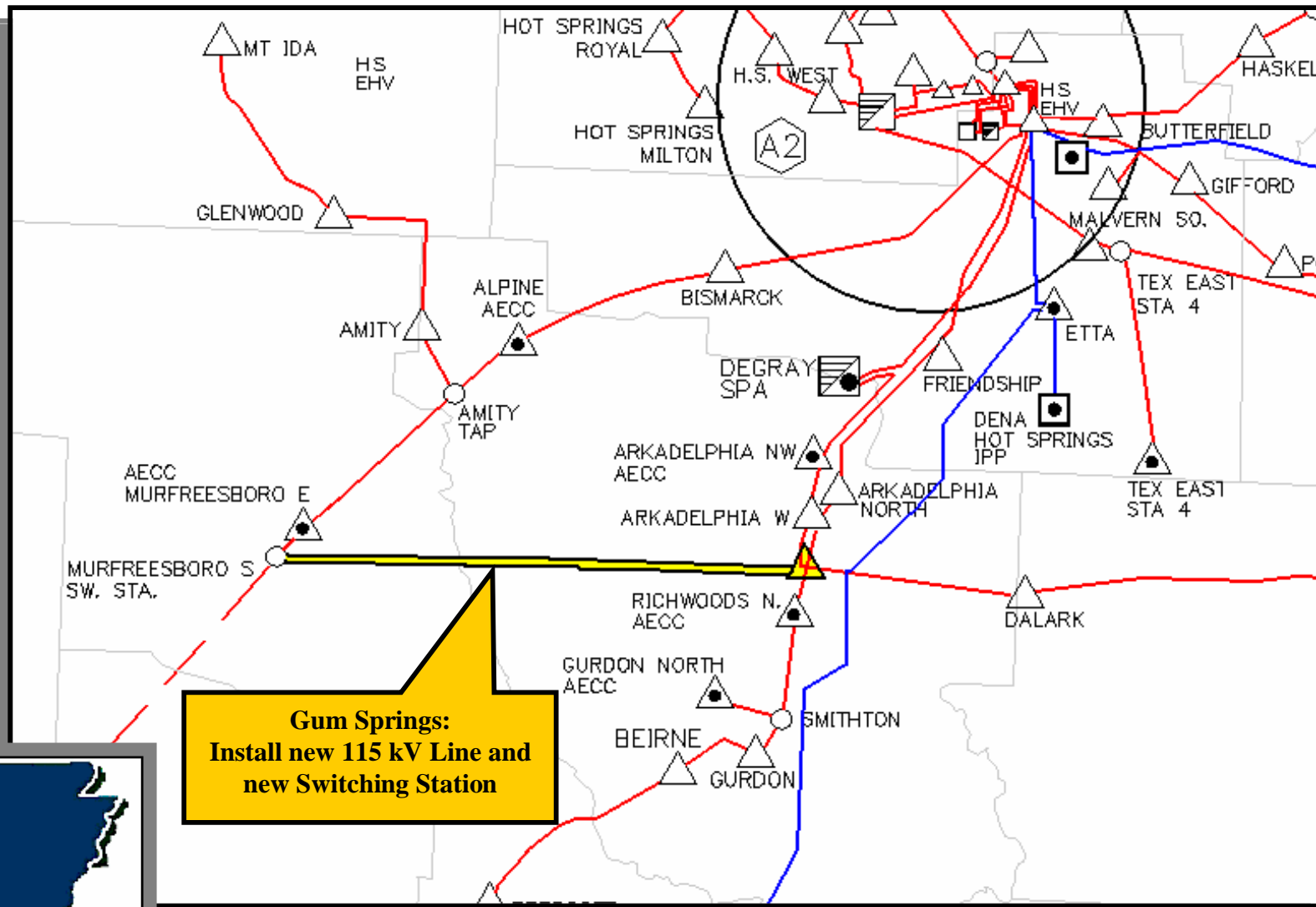
Proposed Solution:

- Build a switching station, Gum Springs, at the intersection of the Woodward-Degray line and the Friendship-Couch line. Construct a new 115 kV line from Gum Springs to Murfreesboro South using 1,272 ASCR or equivalent conductor.

Estimated Cost: \$12.5 MM



Curtis Area



Transmission System Target Areas 2012 and Beyond

