



West Texas Sensitivity (WTS) Study – Preliminary Results

RPG
June 25, 2013

West Texas Sensitivity Study

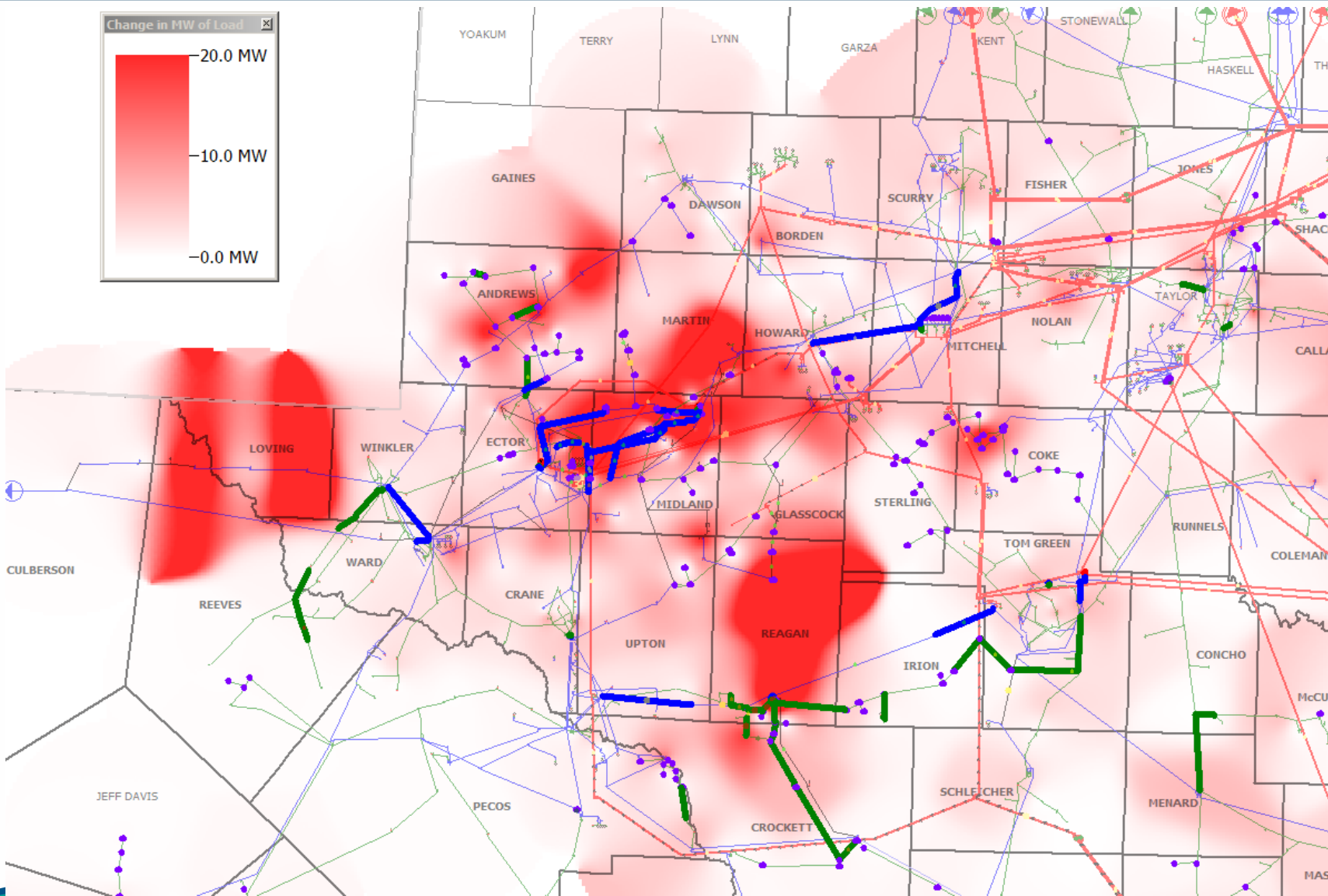
- ERCOT is conducting a study to analyze the system needs in west Texas due to the oil and gas load growth
- Reliability Analysis/ Assumptions:
 - 2015 and 2017 steady-state reliability and economic analysis
 - final summer peak cases from the 2012 5YTP with an updated load forecast from the TDSPs
 - Cases include all recently approved RPG projects in the area

	2017 Summer Peak (2012 5YTP case) MW	2017 Summer Peak (WTS Normal) MW	2017 Summer Peak (WTS High) MW
West	2362	2585	2696
Far West	2192	3569	3944

- Reliability analysis assumes zero MW wind output for West zone and 10% output for the Coastal zone



2017 WTS loads compared to 2012 5YTP- 2017 case

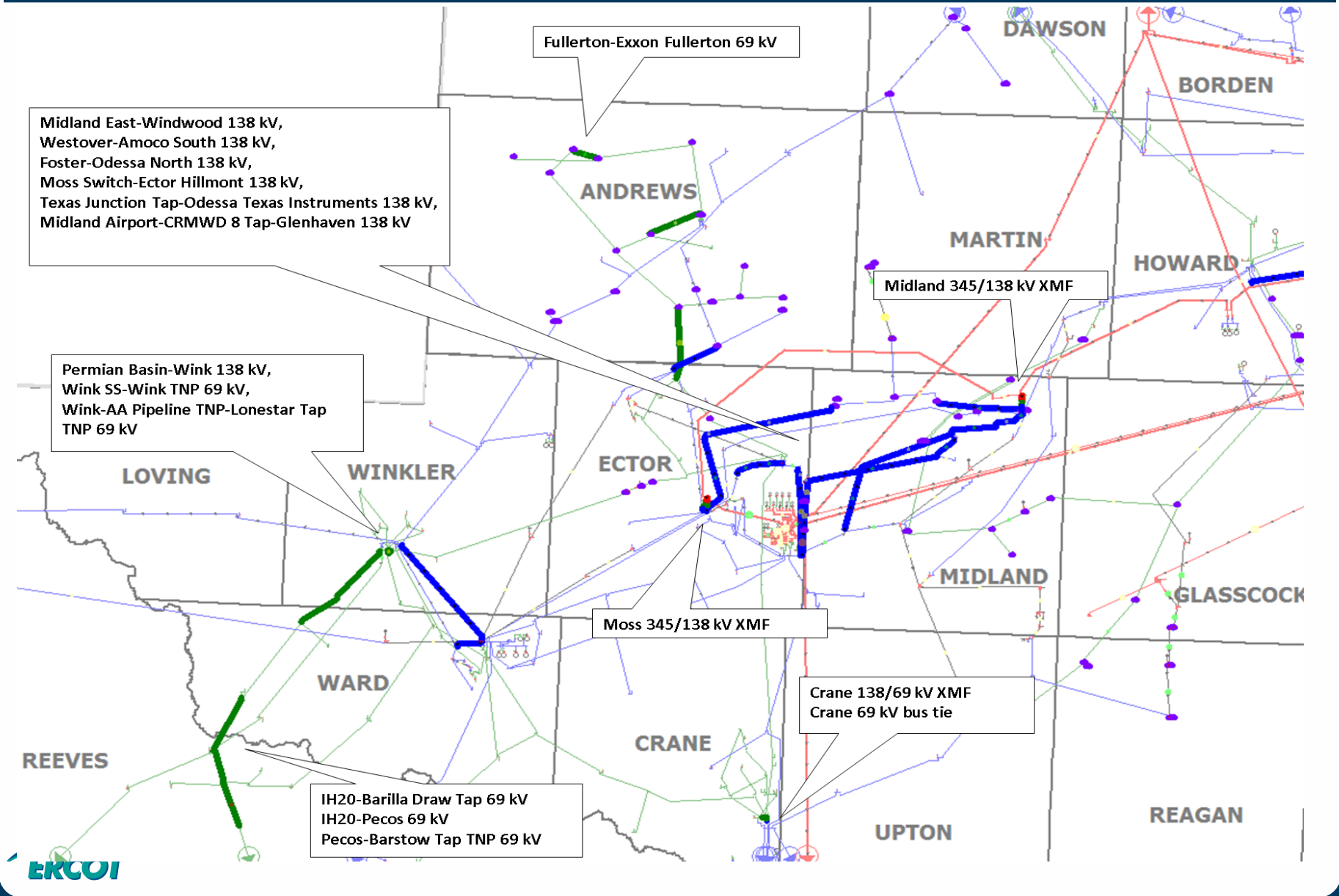


2017 West Texas Normal Load Case Study

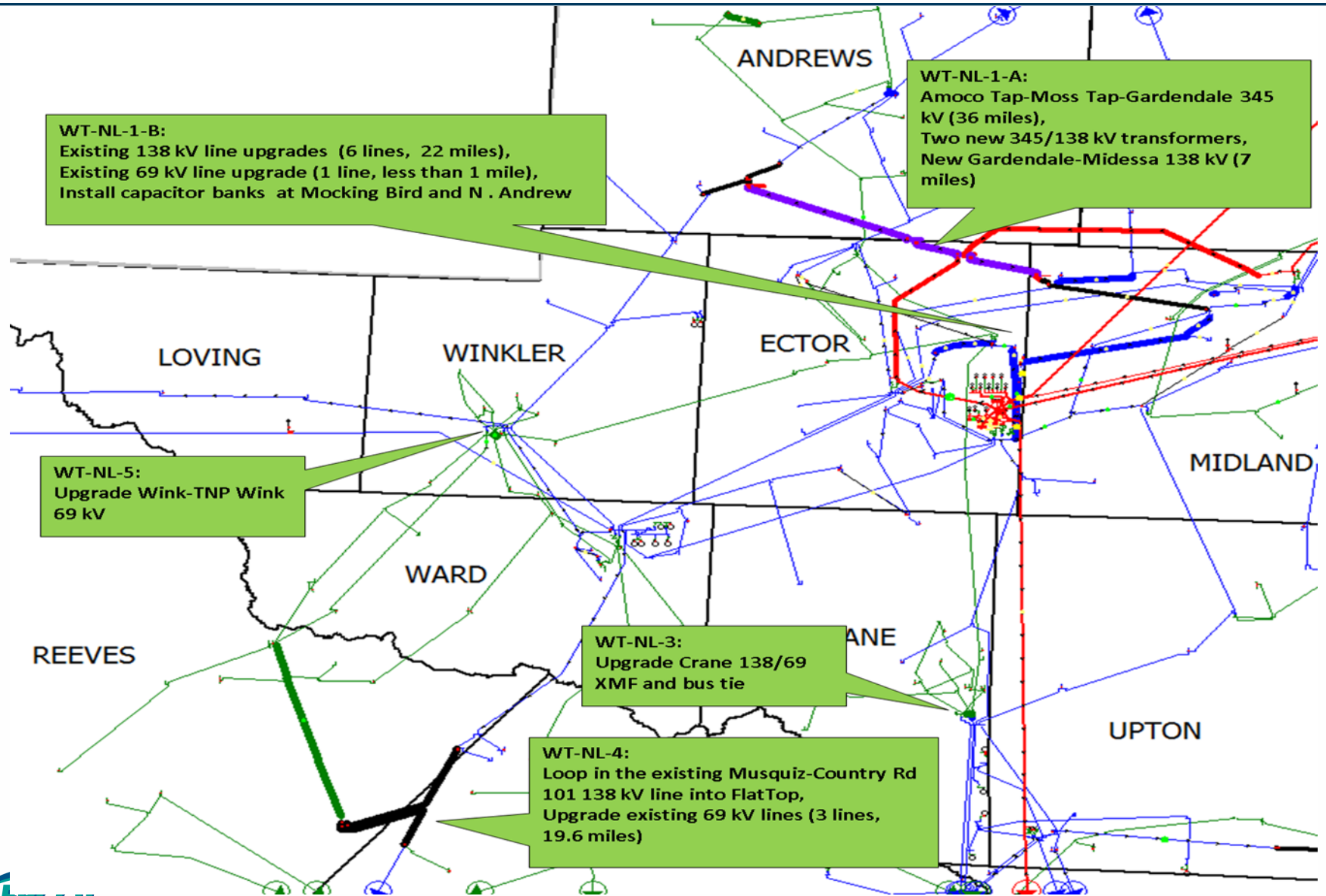
- Purpose of study:
 - To identify system problem
 - To find potential solutions to meet the system need
- **The results are preliminary, pending TSP comments and the results of ongoing reliability analysis**



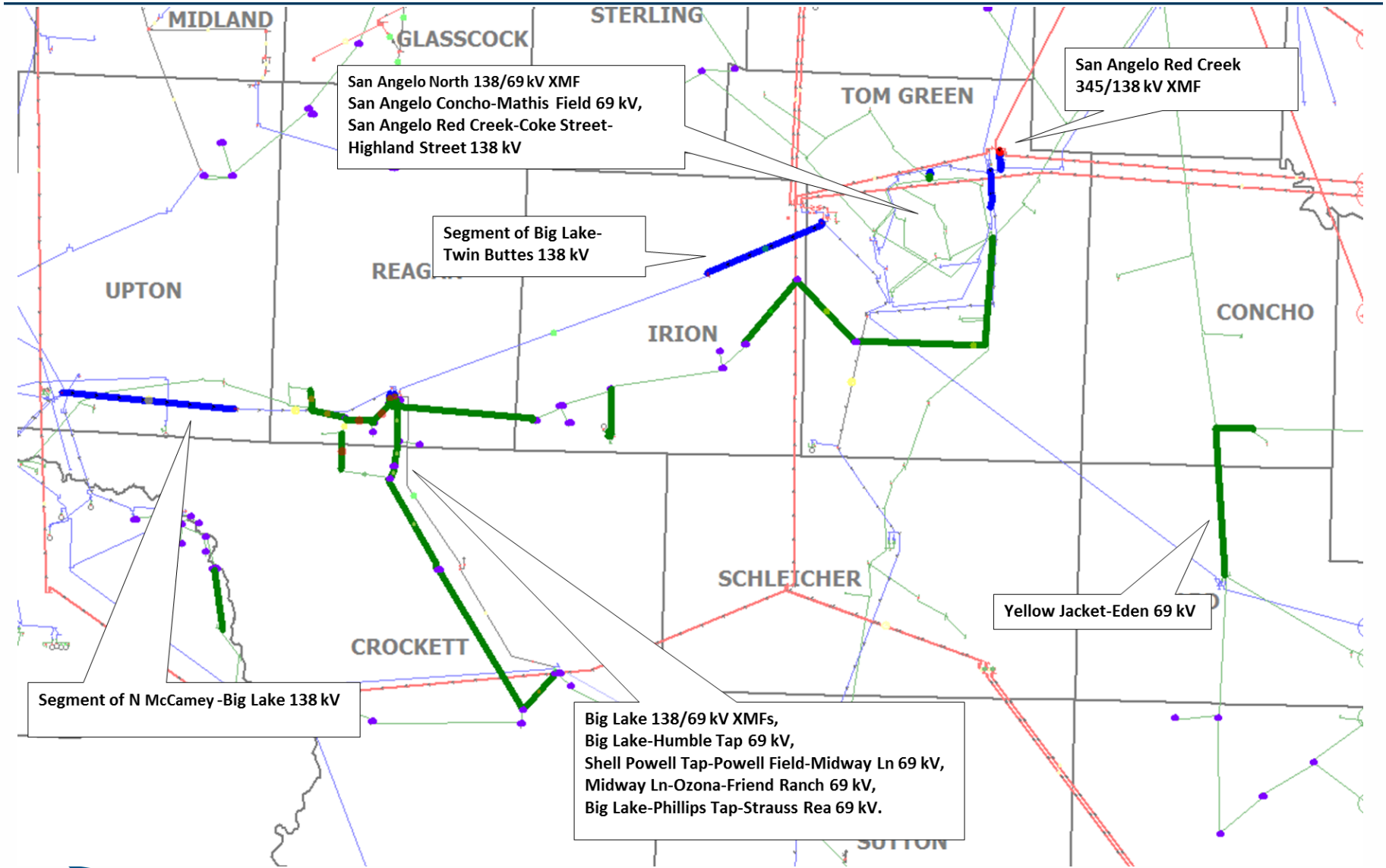
2017 WTS Overloads (Northwest of WT)



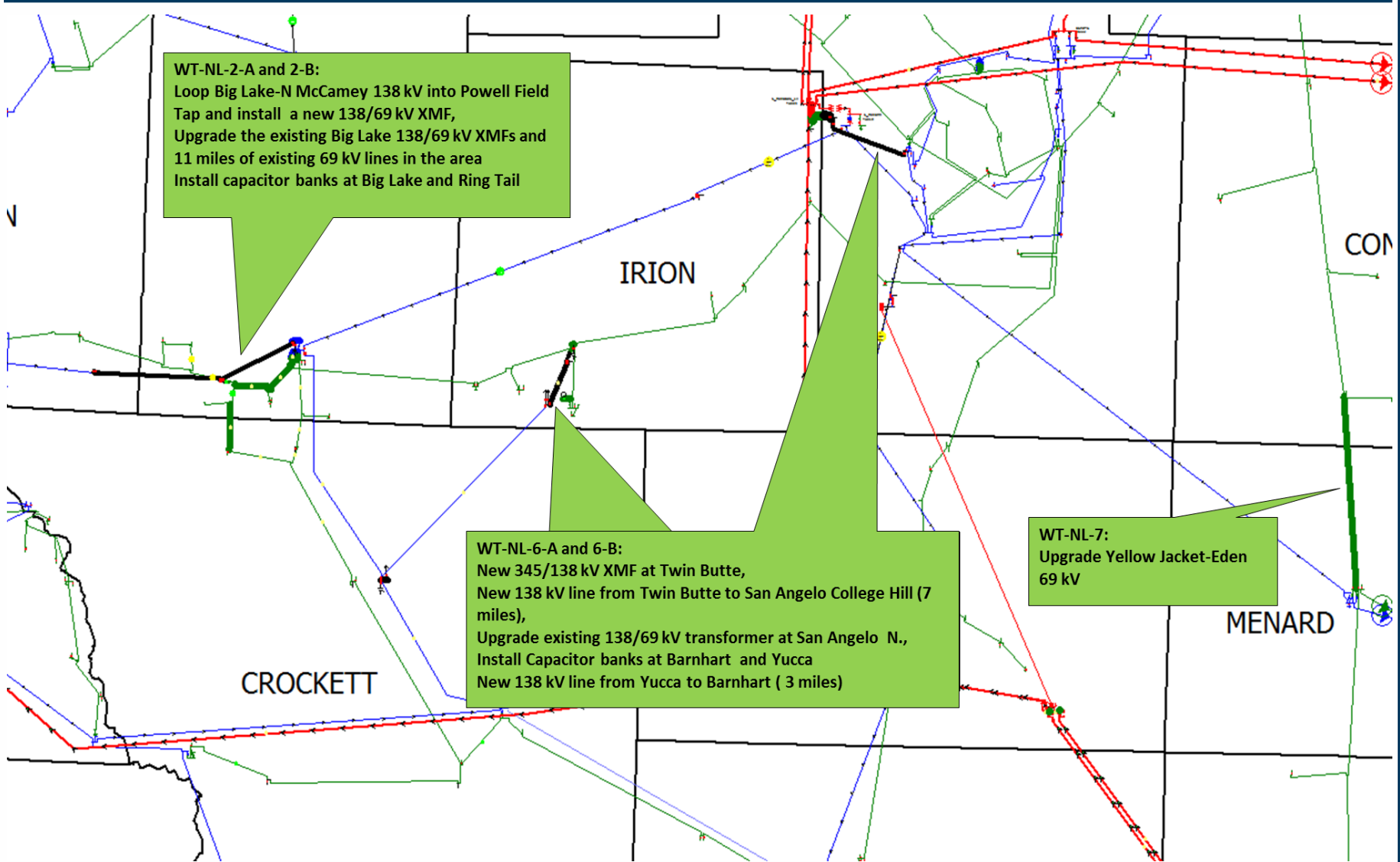
2017 WTS Potential Options (Northwest of WT)



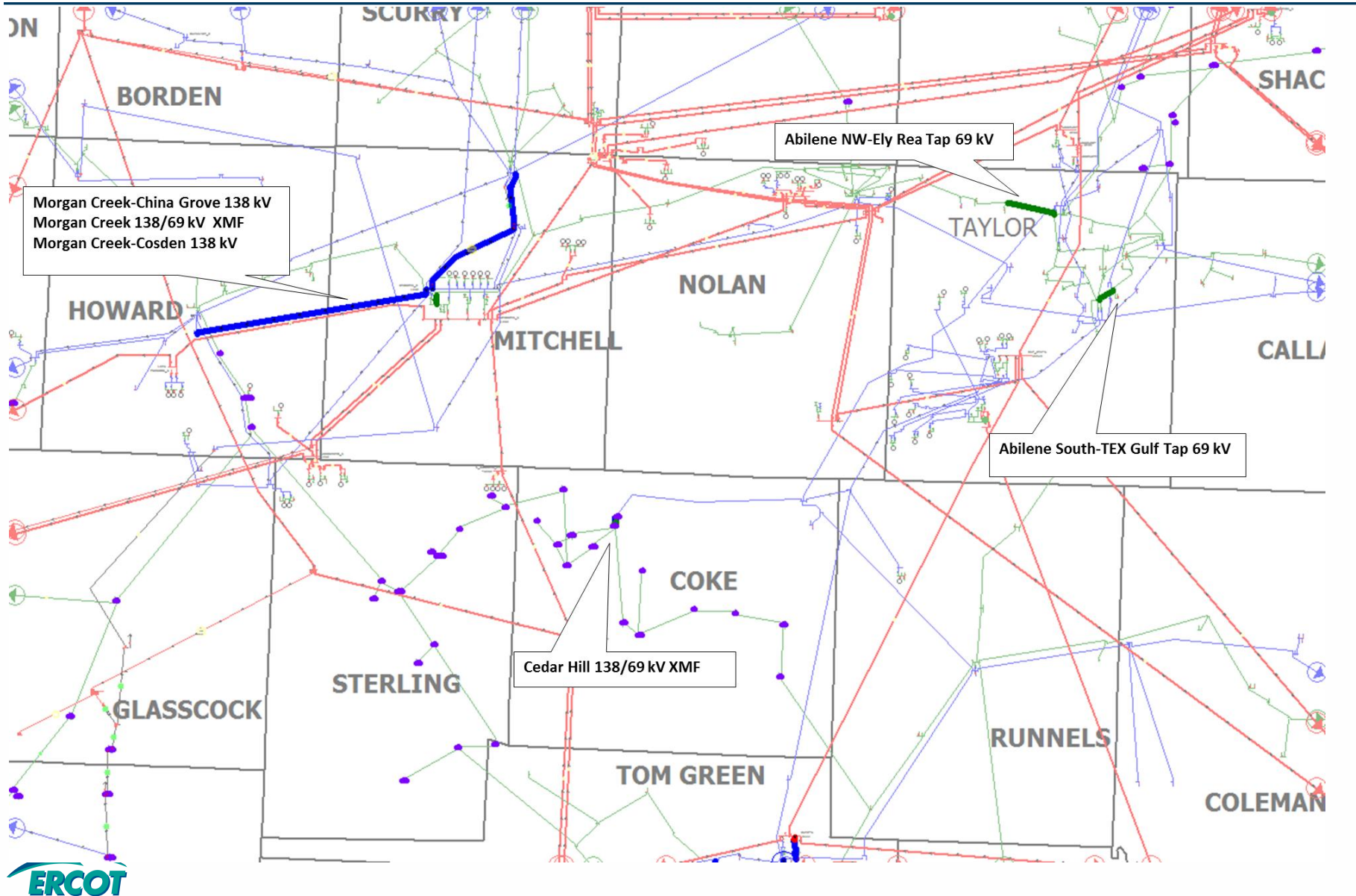
2017 WTS Overloads (South of WT)



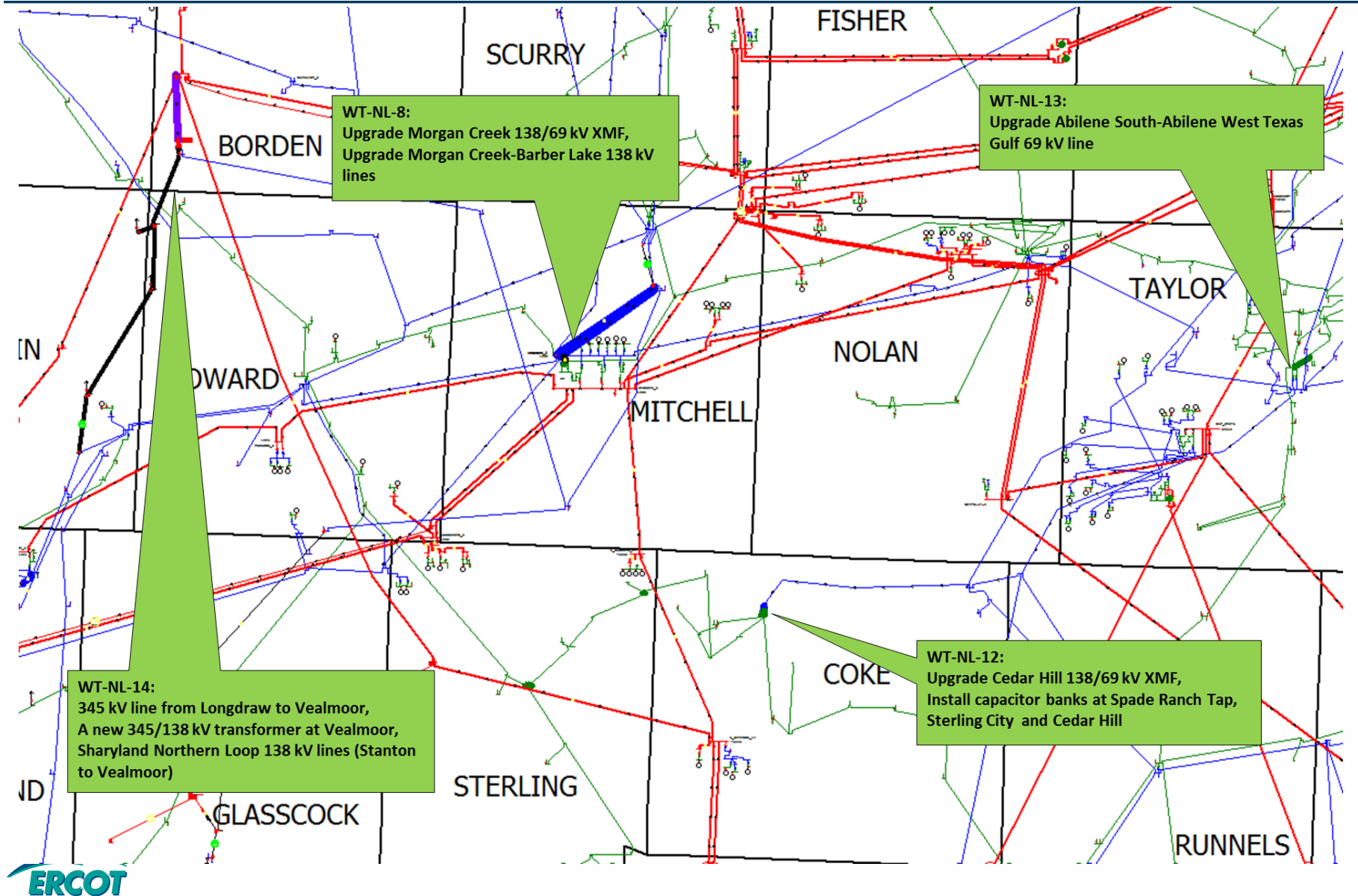
2017 WTS Potential Options (South of WT)



2017 WTS Overloads (Northeast of WT)



2017 WTS Potential Options (Northeast of WT)

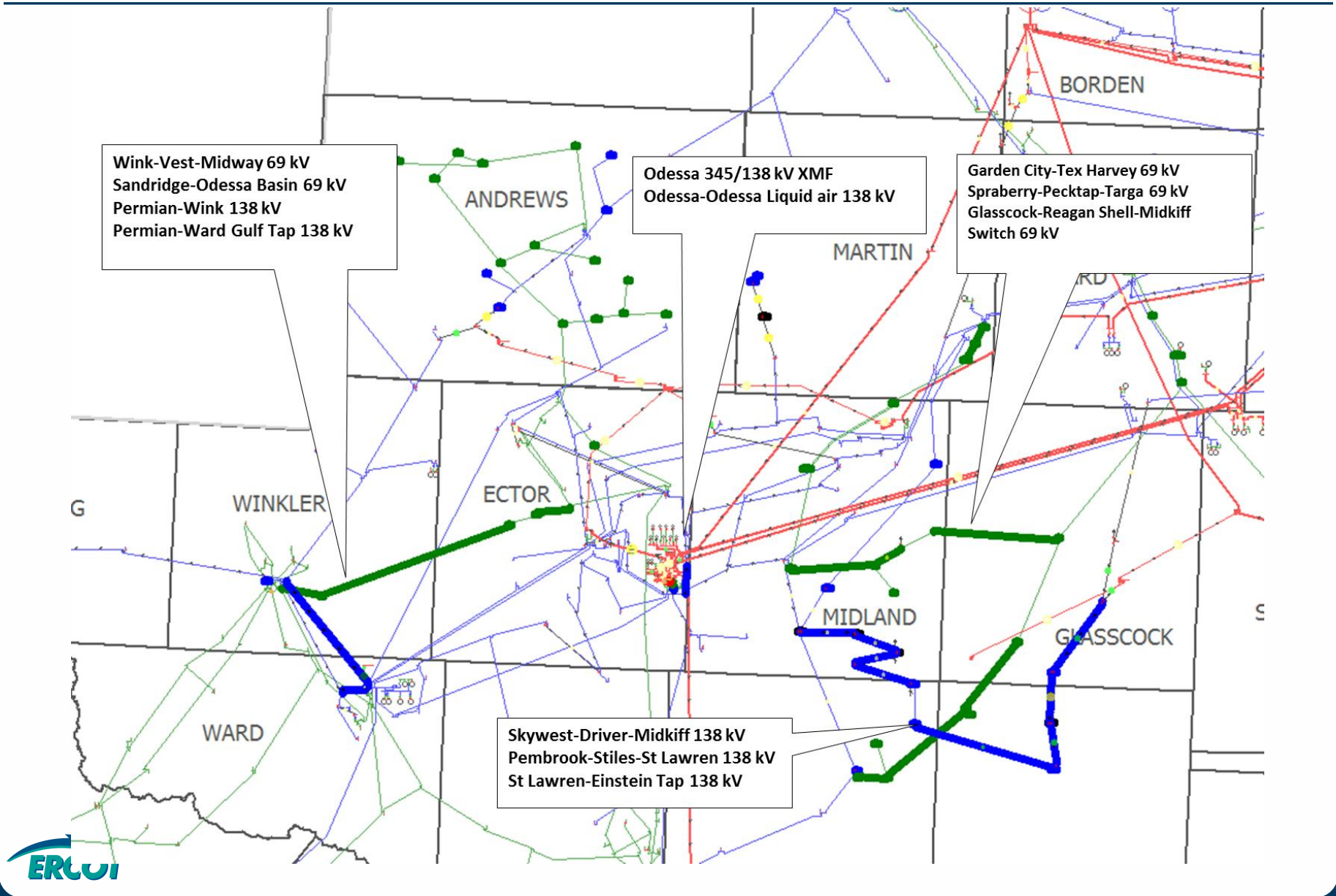


2017 West Texas High Load Case Study

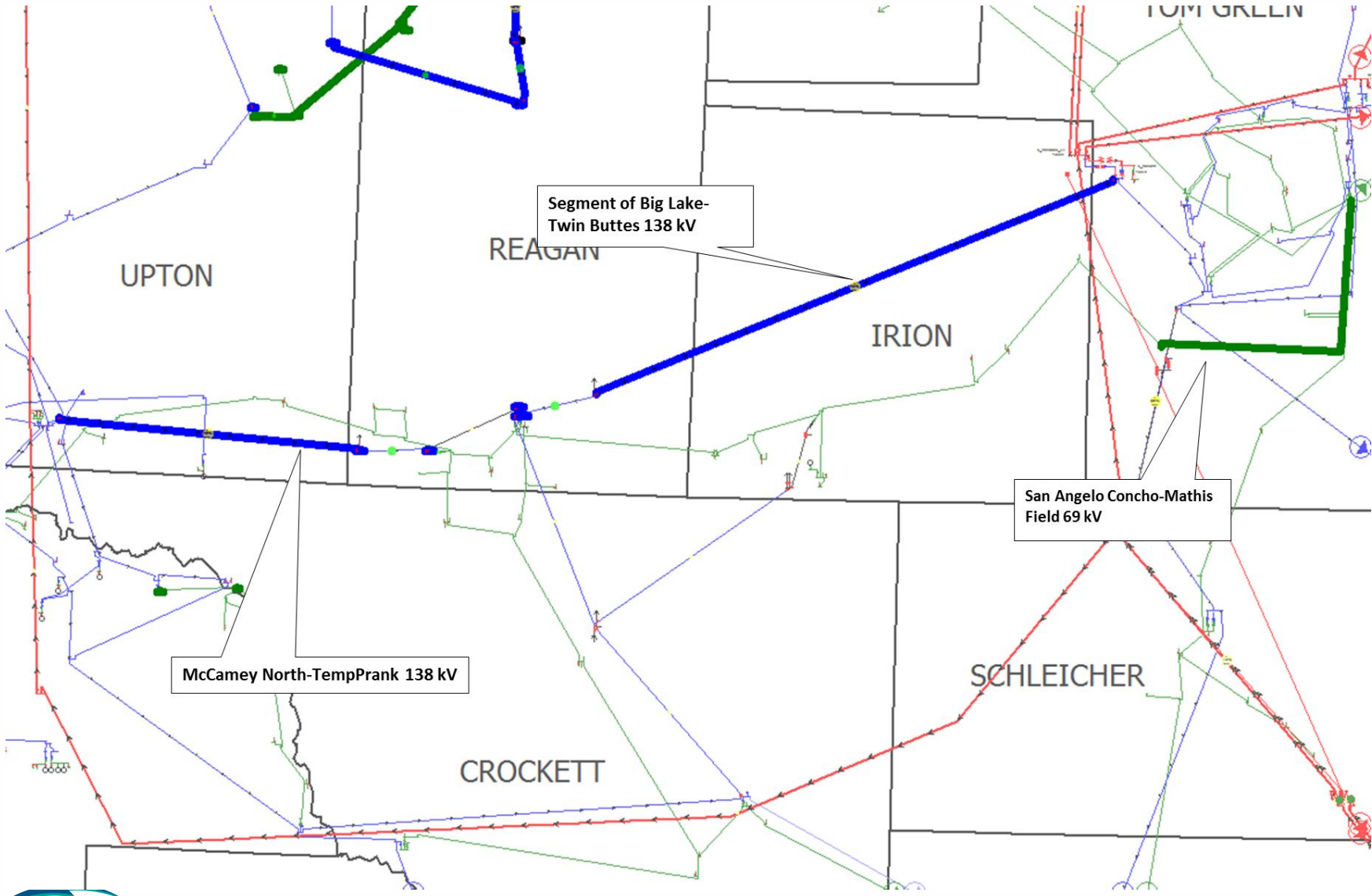
- Purpose of Studying 2017 High Load Case
 - Check strength of the 2017 projects found in normal load case
 - Identify potential additional projects to meet system need under high load condition
 - Not intend to propose projects based on the issues identified in high load case



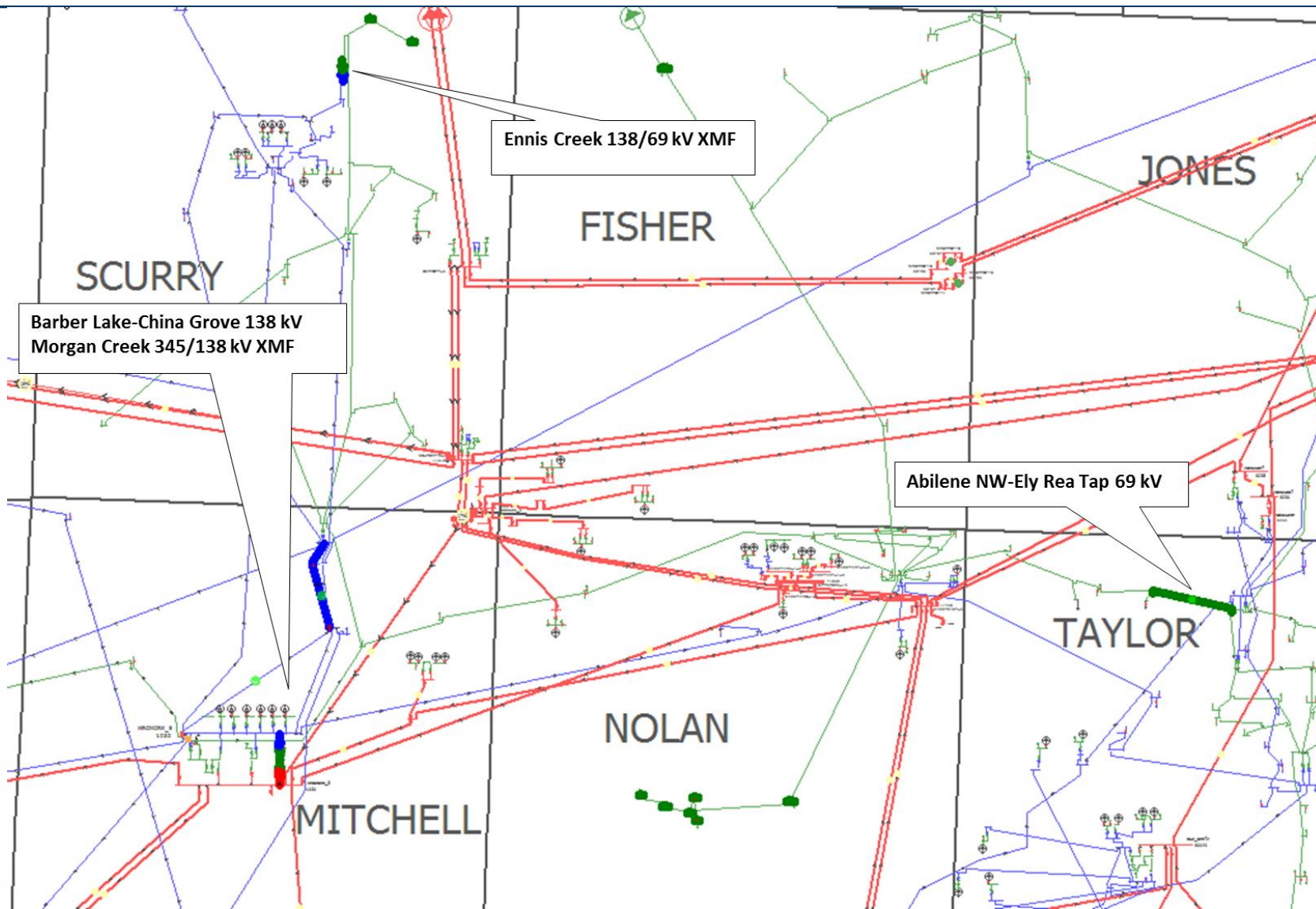
2017 WTS Overloads in High Load Case (NW of WT)



2017 WTS Overloads in High Load Case (South of WT)



2017 WTS Overloads in High Load Case (NE of WT)



Next Step and Other Potential Issue

- Next Step
 - Explore feasibility of solutions with TSPs
 - Solicit project alternatives
 - Complete 2015 and 2017 reliability analysis
 - Perform reliability sensitivity analysis
 - A-1, N-1 criterion
 - Perform congestion (economic) analysis
 - Draft report of West Texas Sensitivity Study
- Other Potential Issue
 - Timing of projects
 - Tradeoffs between new line construction and rebuild/reconductor
 - Operational flexibility
 - Outage time/availability
 - Regulatory filings
 - Constructability (energized reconductor, temporary configuration, etc)



Questions?



2017 WTS Potential Options (Northwest of WT)

Project Index	Project Description
WT-NL-1-A (Midland-Ector-Andrew County Reliability Project)	<ol style="list-style-type: none"> 1. Construct a new 345 kV substation ("New-MossTap") adjacent to the existing Moss-Midland 345 kV line. 2. Loop the existing Moss-Midland 345 kV line into the new New-MossTap 345 kV substation. 3. Expand the Gardendale 138 kV substation to accommodate 345/138 kV facilities. 4. Connect a 345 kV line from the new 345 kV substation to Gardendale. 5. Install a new 345/138 kV transformer at Gardendale. 6. Construct a new 138 kV line from Gardendale to Midessa. 7. Construct a new 345/138 kV substation ("New-AmocoTap") adjacent to the existing Amoco-Arena 138 kV line and install a new 345/138 kV transformer at New-AmocoTap. 8. Connect a 345 kV line from the new New-MossTap 345 kV substation to the AmocoTap 9. Loop the existing Amoco-Arena 138 kV line into the new New-AmocoTap 345/138 kV substation.
WT-NL-1-B (Midland-Ector-Andrew County Reliability Project)	<ol style="list-style-type: none"> 1. Upgrade Midland East-Windwood 138 kV line 2. Upgrade Westover-Amoco South Foster 138 kV line 3. Upgrade Odessa North-Amoco South Foster 138 kV line 4. Upgrade Fullerton-Exxon Fullerton 69 kV line 5. Upgrade CRMWD 8 Tap-Glenhaven 138 kV line 6. Upgrade CRMWD 8 Tap-Midland Airport 138 kV line 7. Upgrade Odessa EHV Switch-Odessa 138 kV line 8. Upgrade Texaco Tap-Gardendale 138 kV line 9. Install 36.8 Mvar capacitor bank at North Andrew 138 kV substation 10. Install 36.8 Mvar capacitor bank at Mocking Bird
WT-NL-3 (Crane County)	<ol style="list-style-type: none"> 1. Upgrade the existing 138/69 kV transformer at Crane 2. Upgrade the existing 69 kV bus tie at Crane
WT-NL-4 (Reeves County)	<ol style="list-style-type: none"> 1. Upgrade the existing IH 20 Switching Station-Barilla Draw Field Tap 69 kV line (terminal equipment) 2. Expand the existing Flattop 69 kV substation to accommodate new 138/69 kV facilities 3. Loop the existing Country Rd 101 SW-Musquiz 138 kV line into the expanded Flattop substation and install a new 138/69 kV transformer at Flattop 4. Upgrade the existing IH 20 Switching Station-Pecos 69 kV line (terminal equipment) 5. Upgrade the Barilla Draw Field Tap-Flattop 69 kV line
WT-NL-5 (Winkler County)	<ol style="list-style-type: none"> 1. Upgrade the Wink SS-Wink 69 kV line (terminal equipment)



2017 WTS Potential Options (South of WT)

Project Index	Project Description
WT-NL-2-A (Reagan-Crockett County Reliability Project)	<ol style="list-style-type: none"> 1. Close normally-open Powell Field-Powell Field Junction 69 kV line 2. Close normally-open Illinois #4-Pandale 69 kV line 3. Expand the existing Powell Field Tap 69 kV substation to accommodate 138/69 kV facilities and install new 138/69 kV transformer. 4. Loop the existing Big Lake-61008(TEMPRANK4A)-North McCamey 138 kV line into the expanded Powell Field Tap substation 5. Open the existing phase shifter at Big Lake and close normally-open the 138 kV bus tie at Big Lake
WT-NL-2-B (Reagan-Crockett County Reliability Project)	<ol style="list-style-type: none"> 1. Upgrade the two existing 138/69 kV transformers at Big Lake 2. Upgrade the existing Big Lake-Kemper Exxon Tap 69 kV line 3. Upgrade the existing Kemper Exxon Tap-Powell Field 69 kV line 4. Upgrade the existing Shell Powell Tap-Powell Field 69 kV line 5. Install 40 Mvar capacitor bank at Big Lake 138 kV bus 6. Install 20 Mvar capacitor bank at Ringtail 138 kV bus
WT-NL-6-A (Tom Green -Irion County)	<ol style="list-style-type: none"> 1. Expand the existing Barnhart Phillips Tap 69 kV substation to accommodate new 138/69 kV facilities 2. Construct a new 138 kV line from Barnhart Phillips Tap to Yucca 138 kV substation 3. Install a new 138/69 kV transformer at Barnhart Phillips Tap 4. Install a new second 345/138 kV transformer at Twin Buttes 5. Construct a new 138 kV line from the Twin Buttes (new transformer) to San Angelo College Hill 6. Upgrade the existing 138/69 kV transformer at San Angelo North
WT-NL-6-B (Tom Green -Irion County)	<ol style="list-style-type: none"> 1. Install 10 Mvar capacitor bank at Barnhart Phillips Tap 69 kV bus 2. Install 10 Mvar capacitor bank at Yucca0A 69 kV bus
WT-NL-7 (Menard-Concho County)	<ol style="list-style-type: none"> 1. Upgrade the existing Yellow Jacket-Eden 69 kV line



2017 WTS Potential Options (Northeast of WT)

Project Index	Project Description
WT-NL-8 (Mitchell County)	<ol style="list-style-type: none">1. Upgrade the existing Morgan Creek-Barber Lake 138 kV lines2. Upgrade the existing Morgan Creek 138/69 kV transformer
WT-NL-12 (Coke County)	<ol style="list-style-type: none">1. Upgrade Cedar Hill 138/69 kV transformer2. Install 12 Mvar capacitor bank at Spade Ranch Tap 69 kV bus3. Install 12 Mvar capacitor bank at Sterling City 69 kV bus4. Add 12 Mvar capacitor bank to the existing capacitor bank at Cedar Hill 69 kV substation
WT-NL-13 (Taylor County)	<ol style="list-style-type: none">1. Upgrade the existing Abilene South-Abilene West Texas Gulf 69 kV line
WT-NL-14 (Due to G-1+N-1)	<ol style="list-style-type: none">1. Expand the existing Vealmoor 138 kV substation to accommodate 345/138 kV facilities2. Install a new 345/138 kV transformer at Vealmoor3. Construct a new 345 kV line from Vealmoor to Longdraw4. Connect SU-W Stanton to SU-Vealmoor (Sharyland Northern Loop Project)

