Wansley CC 7 Transmission Improvement Alternatives

Executive Summary

Background

The purpose of this document is to summarize the current analysis that has been conducted regarding the 575 MW firm transmission service request (TSR) out of the existing Wansley 7 combined-cycle (CC) site in Heard County, GA (OASIS # 143556). The firm 575 MW transmission service request was requested for the period 01/01/2010 – 01/01/2020. The analyses have been performed to determine if providing the requested service would, without new facilities or upgrades, impair or degrade reliability of the existing system or existing service commitments. Any necessary system modifications within the ITS required to offset transaction impact have been identified through the study process.

Study analysis identified that the Wansley – Villa Rica 500 kV line and the Villa Rica 500/230 kV transformer will overload under contingency situations without transmission system improvements to support the Wansley 7 TSR. Near-term solutions to provide transmission service for 2011-2013 are in progress and will be in-service by 6/1/2011 with an estimated cost of $5M. Additionally, a longer-term solution will be needed by 2014 in order to continue to provide firm service for the Wansley 7 TSR through 2020. This document provides a summary of the evaluated 230 kV and 500 kV longer-term alternatives (see Diagrams attached). Table 1 provides a comparison of the longer-term evaluated alternatives.

Analysis of Longer-Term Transmission Improvement Alternatives

<u>Option 1 (Preferred Alternative): Heard County –Dresden 500 kV line.</u>

Construct a Heard - Dresden 500 kV Line (6 miles, $16M), Install a 500/230 kV transformer at Dresden ($36M)

The following additional constraints were identified with the above improvements in service:

- Newnan – Dresden section of the Dresden – Yates 230 kV line overloads for the loss of Yates – Yellow Dirt 230 kV line
- Union City – Yates 230 kV line (white) overloads for the loss of Fairburn – Yates section of the Union City – Yates 230 kV line (black)

To mitigate these limitations the following projects are recommended:

- Install a 2%, 230 kV, 2000 A series reactor at Dresden substation on the Yates 230 kV line ($1M)

The project cost of Option 1 is $53M which results in creating additional transmission capacity of 2016 MVA. Multiple phases of this alternative have customer and ITS approval.

The 2014 improvements completion date is attainable.

Option 2: Wansley – Villa Rica 500 kV Line #2

Construct a 2nd Wansley – Villa Rica 500 kV line (25 miles, $68M)

The following additional constraints were identified with the above improvements in service:

- O'hara- Jonesboro 230 kV Line overloads for the loss of Union City 500/230 kV Transformer
- Union City – Villa Rica 500 kV line overloads for the loss of Wansley – O'hara 500 kV line

The system improvements that alleviate these limitations are:

- Re-conductor O'hara- Jonesboro 230 kV Line with a 1351 ACSS conductor and replace existing jumpers with a least 2000 A capacity (9 miles, $7M)
- Replace existing jumpers on O'Hara- Jonesboro 230 kV Line
- Replace line traps and switches on Union City – Villa Rica 500 kV line

The project cost of Option 2 is $75M which results in creating additional transmission capacity of 4624 MVA.

Implementing this option requires 6 years and does not meet the required in service date for longer-term transmission improvements (2014).

Option 3: Wansley – Union City 500 kV Line

Construct a Wansley – Union City 500 kV Line (40 miles, $108M)

The following additional constraints were identified with the above improvements in service:

1- Union City – East Point 230 kV line (black) overloads for the loss of one of the following facilities: Wansley – Villa Rica 500 kV line, Villa Rica 500/230kV transformer or Union City – East Point 230 kV line (white)
2- Union City – East Point 230 kV line (white) overloads for the loss of one of the following facilities: Wansley – Villa Rica 500 kV line, Villa Rica 500/230kV transformer, Klondike –Norcross 500 kV line, Union City – East Point 230 kV line (black) or Villa Rica – Douglasville 230 kV line
3- Union City – Morrow 230 kV line (black) overloads for the loss of one of the following facilities: O'hara 500/230 kV transformer, Klondike 500/230 kV transformer, O'hara – Wansley 500 kV line, Union City – Morrow 230 kV line (white), Union City – East Point 230 kV line (black) or Morrow – Yates 230 kV line
4- Union City – Morrow 230 kV line (white) overloads for the loss of one of the following facilities: O'hara 500/230 kV transformer, Klondike 500/230 kV transformer , Union City – Morrow 230 kV line (black), Union City – East Point 230 kV line (black) or O'hara – Jonesboro 230 kV line
5- Klondike – Morrow 230 kV line overloads for the loss of Klondike 500/230 kV transformer

To mitigate limitations # 1 and #2, the overloaded lines are to be re-conductored with a bundled 100^0C 1351 ACSR conductor (total of 21 miles, $15M). Limitation #3 and #4 are alleviated by replacing the line traps on the overloaded lines. Klondike- Morrow constraint is addressed by replacing line switches.

The project cost of Option 3 is $123M which results in creating additional transmission capacity of 4525 MVA.

Implementing this option requires 8 years and does not meet the required in service date for longer-term transmission improvements (2014).

Option 4: Wansley – Yellow Dirt 500 kV Line

Install a 500/230kV transformer at Yellow Dirt substation ($36M) and construct a 500 kV line from Wansley to Yellow Dirt (1351 ACSR, 1 mile, $3M)

The following additional constraints were identified with the above improvements in service:

- Union City – Yates 230 kV line (white) overloads for the loss of Wansley – Villa Rica 500 kV line or Union City – Yates 230 kV 230 kV line.
- Yellow Dirt – Bright Star section of Yellow Dirt – Hickory level 230 kV line overloads for the loss of Villa Rica – Wansley 500 kV line or Villa Rica 500/230 kV transformer.

These limitations are mitigated by re-conductoring Union City – Yates 230 kV line (160^{0}C SSAC conductor, 23 miles) and Yellow Dirt –Bright Star section of Yellow Dirt – Hickory level 230 kV line (Bundled 100^{0}C 1351 ACSR, 20 miles). (Total $32M).

The project cost of Option 4 is $71M. Option 4 allows for 636 MVA additional transmission capacity. Implementing this option requires 5 years and does not meet the required in service date for longer-term transmission improvements (2014).

Option 5a & 5b: Heard County – Dresden 230 kV Lines

Install 500/230kV transformer at Heard County substation ($36M) and construct either three 1351 ACSR lines from Heard County to Dresden (Option 5a, three 6-mile lines, $27M) or two bundled 795 ACSR 230 kV lines from Heard County to Dresden (Option 5b, two 6-mile lines, $24M)

The following additional constraints were identified with the above improvements in service:

- Dresden – Yates 230 kV line overloads for the loss of Yates-Yellow Dirt 230 kV line.
- Union City – Yates 230 kV line (white) overloads for the loss of one of the following lines: Wansley – Villa Rica 500 kV line or Union City – Yates 230 kV line (black).

A 2% series reactor on the Dresden – Yates 230 kV line alleviates the identified limitations ($1M).

The project cost of Option 5a is $64M which results in creating additional transmission capacity of 1806 MVA. Option 5b project cost is $61M and results in 1732MVA additional transmission capacity. Implementing this option requires 4 years and does not meet the required in service date for longer-term transmission improvements (2014).

Option 6: Wansley – Union City 230 kV Line

Install a 500/230kV transformer at Wansley substation ($36M) and construct a 230 kV line from Wansley to Union City (bundled 1351 ACSR, 40 miles, $80M)

The following additional constraints were identified with the above improvements in service:

1- Union City – East Point 230 kV line (black) overloads for the loss of one of the following facilities: Wansley – Villa Rica 500 kV line, Klondike – Norcross 500 kV line, Villa Rica 500/230kV transformer, Union City – East Point 230 kV line (White), Villa Rica – East Point 230 kV line or Adamsville – East Point 230 kV line
2- Union City - East Point 230 kV line (White) overloads for the loss of one of the following facilities: Wansley – Villa Rica 500 kV line, Klondike –Norcross 500 kV line, Villa Rica 500/230kV transformer, Union City – East Point 230 kV line (black), Villa Rica – East Point 230 kV line or Villa Rica – Douglasville 230 kV line
3- Union City – Morrow 230 kV line (black) overloads for the loss of one of the following facilities: Klondike 500/230 kV transformer, O'hara 500/230 kV transformer, Union City –Morrow 230 kV line (white), Morrow – Yates 230 kV line, Union City – East Point 230 kV line (black), Union City-East Point 230 kV line (White) or O'hara – Jonesboro 230 kV line
4- Union City – Morrow 230 kV line (white) overloads for the loss of one of the following facilities: O'hara 500/230 kV transformer, Union City – Morrow 230 kV line (black) or Morrow – Yates 230 kV line
5- Klondike – Morrow 230 kV line overloads for the loss of Klondike 500/230 kV transformer
6- East Point 230/115 kV Transformer #1 overloads for the loss of the East Point – Adamsville 230 kV line

To mitigate limitations # 1 through 4, the overloaded lines are to be re-conductored with a bundled 100^0C 1351 ACSR conductor (total of 44 miles, $33M).

Limitation #5 is alleviated by replacing switches on Klondike- Morrow.

Limitation #6 is addressed by replacing East Point 230/115 kV transformer #1 ($4M).

With these upgrades in place a new constraint is identified:

- East Point – Adamsville 230 kV line overloads for the loss of Union City – East Point 230 kV line (White). Re-conductoring the line with a 160^0C 1351 SSAC mitigates this limitation (7 miles, $5M).

The project cost of Option 6 is $158M which results in creating additional transmission capacity of 3459 MVA. Implementing this option requires 7 years and does not meet the required in service date for longer-term transmission improvements (2014).

LIABILITY OF RESULTS

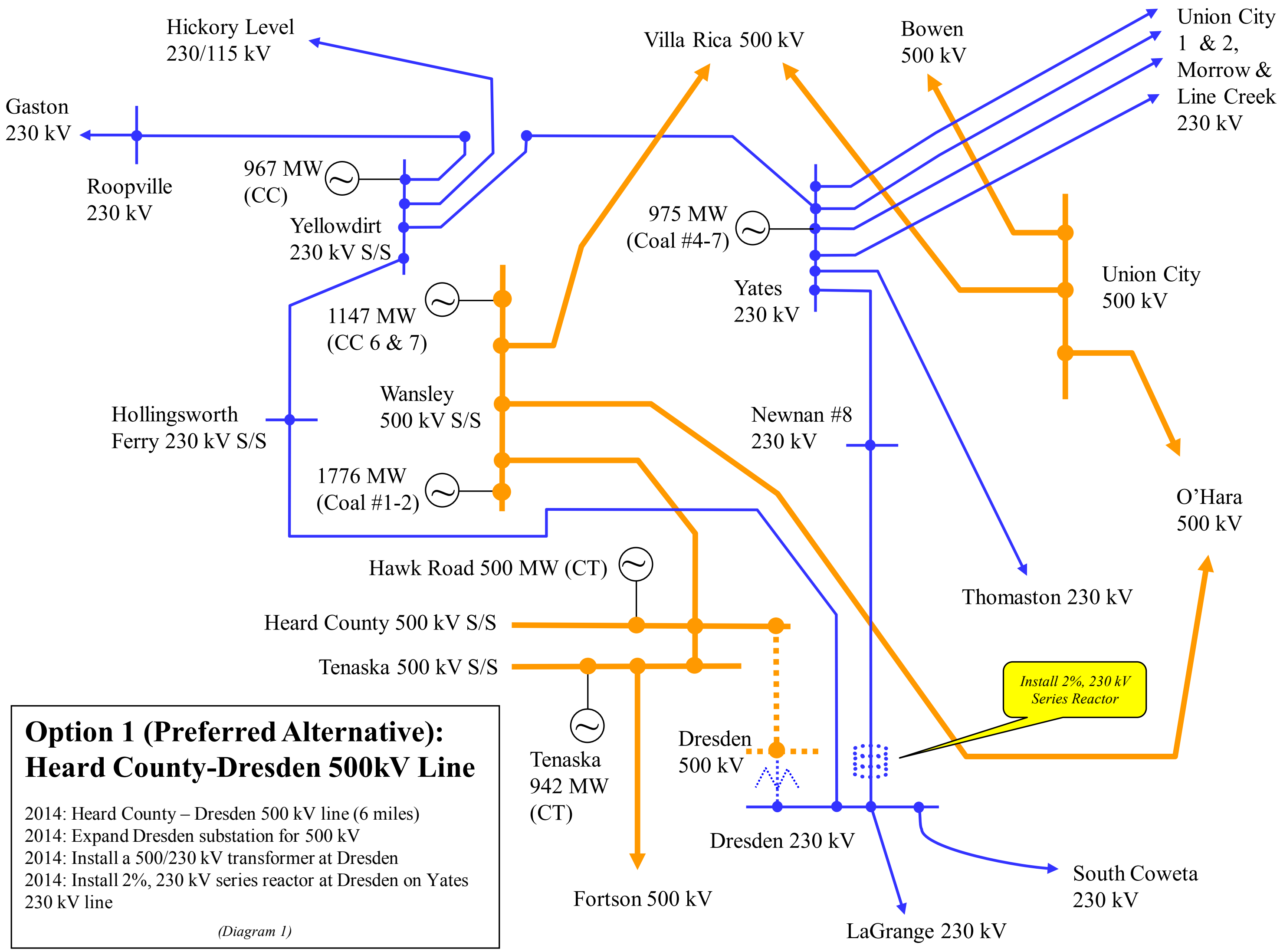
Costs provided in this study are planning grade estimates. Changes in requests for service that precede this request may result in changes in the results of this study. GTC utilized the latest information regarding generation interconnections, TSRs and system modifications available in the performance of this analysis.

Any change to the subject request for interconnection (timing, amount, etc.) may necessitate the need for additional studies. GTC cannot guarantee the study results contained in this report for a change in timing or amount of the proposed service. A change in the study reservations may result in the need for system improvements if the system configuration or reservations order for the surrounding area changes.

Appendices

Table 1: Comparison of Alternative Solutions for Wansley 7 Transmission Service Request

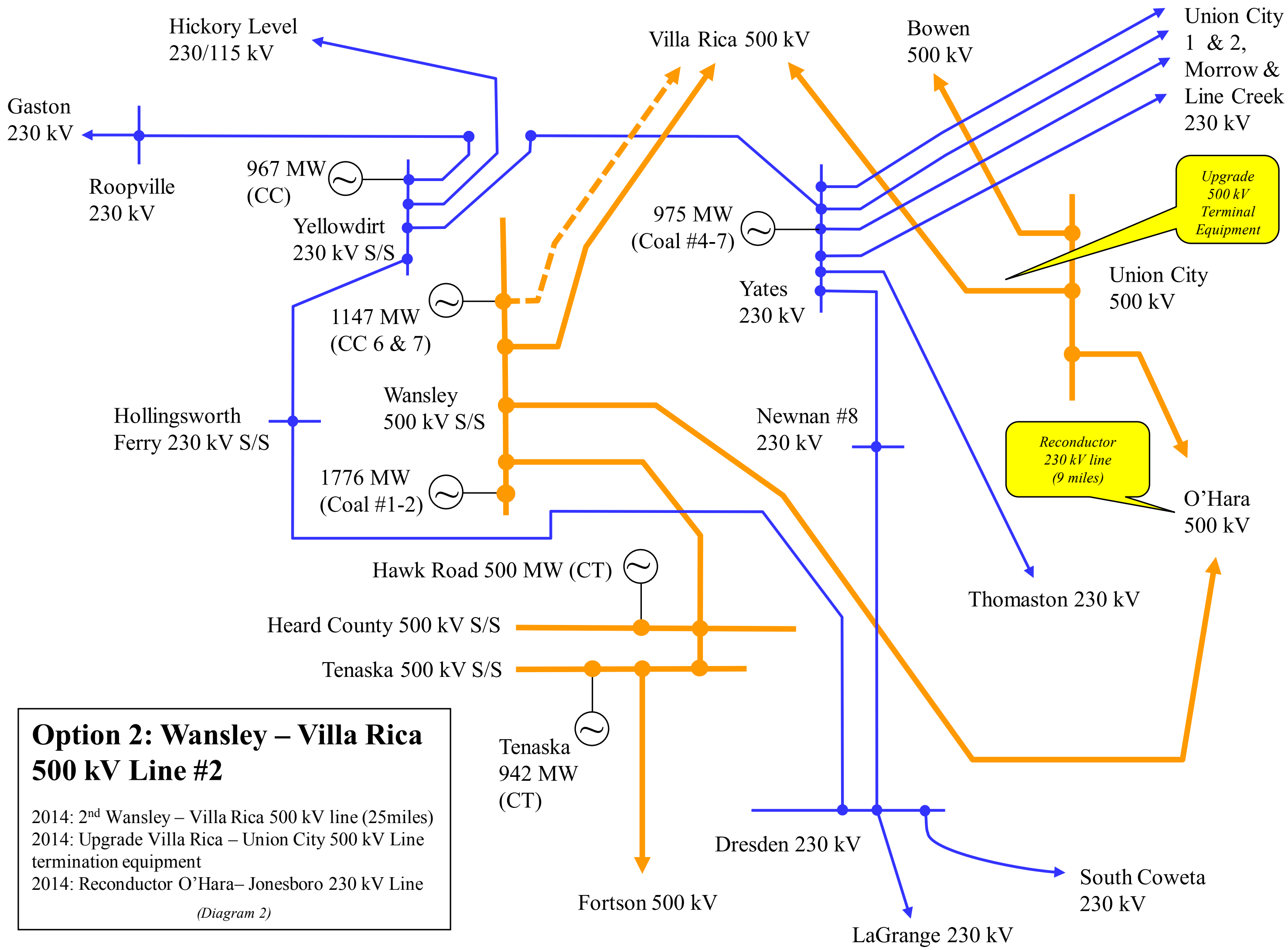
	500 kV Line Mileage (New)	230 kV Line Mileage (New)	230 kV Line Mileage (Rebuilt)	New MVA Transmission Capacity	Project Cost (millions)	Construction Period	Comments
Preferred Solution							
Heard County - Dresden 500 kV Line	6	0	0	2016	$53	4 Years	Dresden 500/230 kV Transformer
Alternatives							
Wansley - Villa Rica 500 kV Line #2	25	0	9	4624	$75	6 Years	No additional 500/230 kV transformation required
Wansley - Union City 500 kV Line	40	0	21	4525	$123	8 Years	No additional 500/230 kV transformation required
Wansley - Yellow Dirt 500 kV Line	1	0	43	636	$71	5 Years	Yellow Dirt 500/230 kV Transformer
Heard County - Dresden 230 kV Lines (Three lines with 1351 ACSR Conductors)	0	18	0	1806	$64	4 Years	Heard County 500/230 kV Transformer
Heard County - Dresden 230 kV Lines (Two lines with 2-795 ACSR Conductors)	0	12	0	1732	$61	4 Years	Heard County 500/230 kV Transformer
Wansley - Union City 230 kV Line (One line with 2-1351 ACSR Conductors)	0	40	51	3459	$158	7 Years	Wansley 500/230 kV Transformer



Option 1 (Preferred Alternative):
Heard County-Dresden 500kV Line

2014: Heard County – Dresden 500 kV line (6 miles)
2014: Expand Dresden substation for 500 kV
2014: Install a 500/230 kV transformer at Dresden
2014: Install 2%, 230 kV series reactor at Dresden on Yates 230 kV line

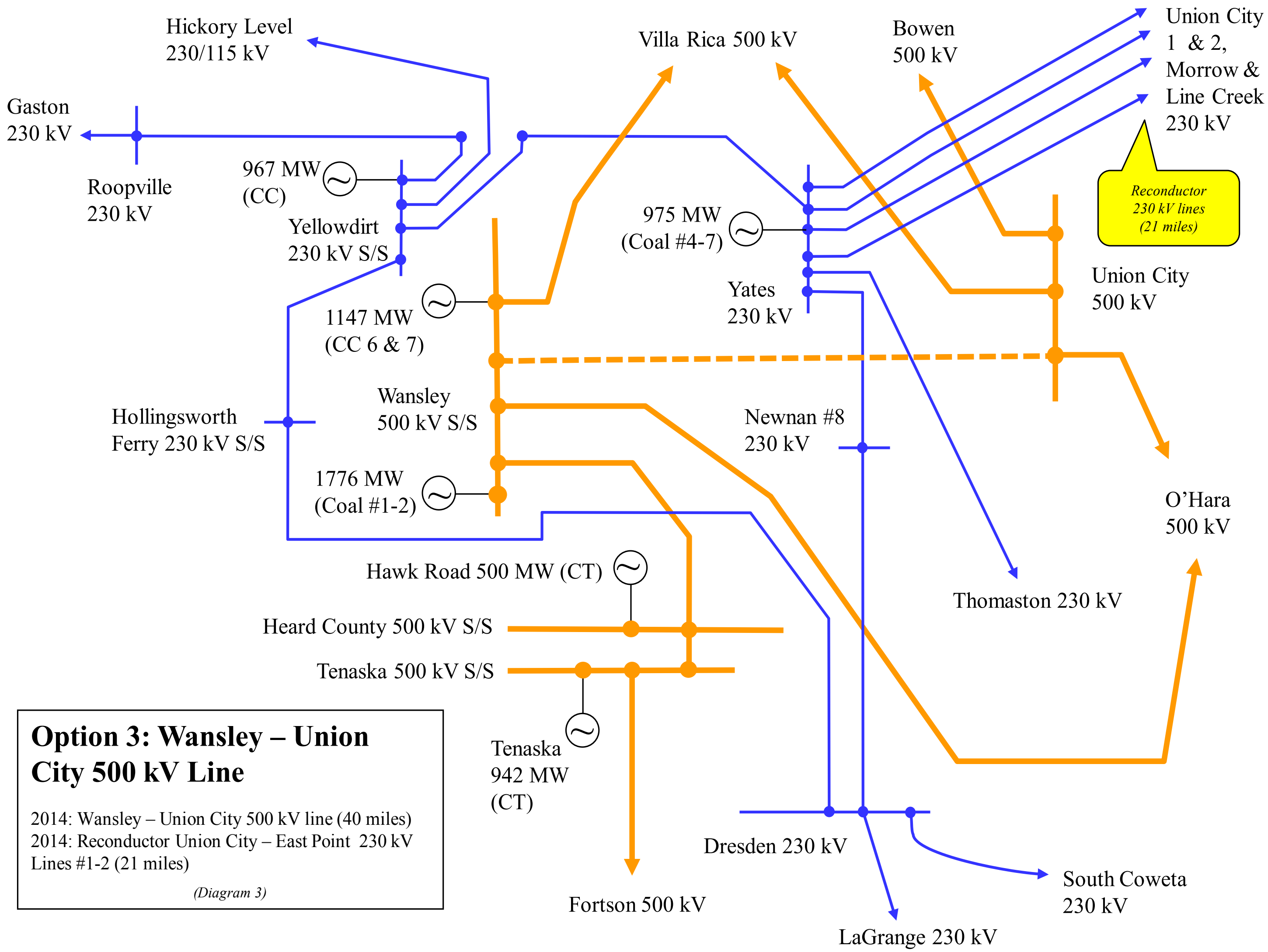
(Diagram 1)



Option 2: Wansley – Villa Rica 500 kV Line #2

2014: 2nd Wansley – Villa Rica 500 kV line (25miles)
2014: Upgrade Villa Rica – Union City 500 kV Line termination equipment
2014: Reconductor O'Hara– Jonesboro 230 kV Line

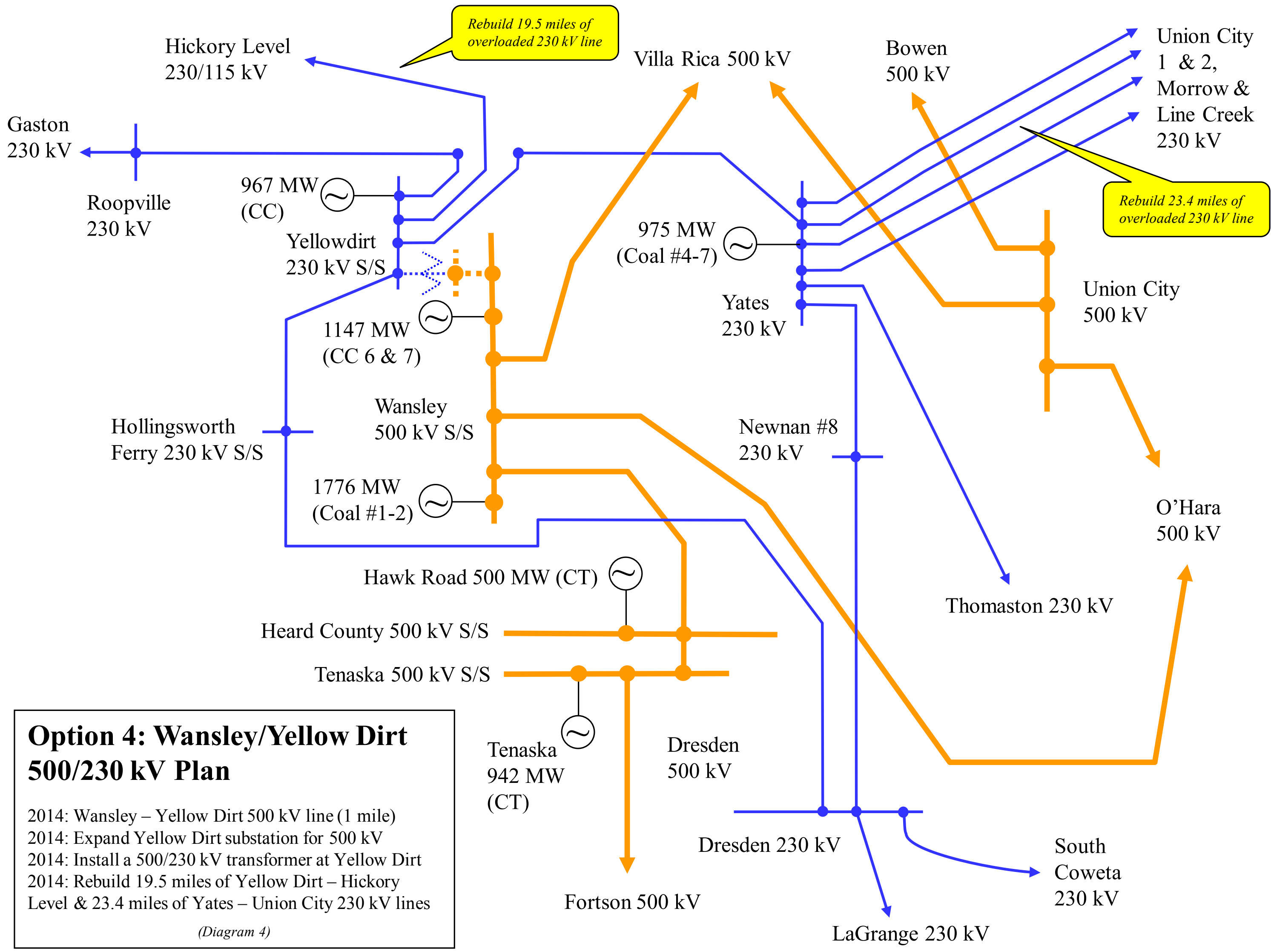
(Diagram 2)



Option 3: Wansley – Union City 500 kV Line

2014: Wansley – Union City 500 kV line (40 miles)
2014: Reconductor Union City – East Point 230 kV Lines #1-2 (21 miles)

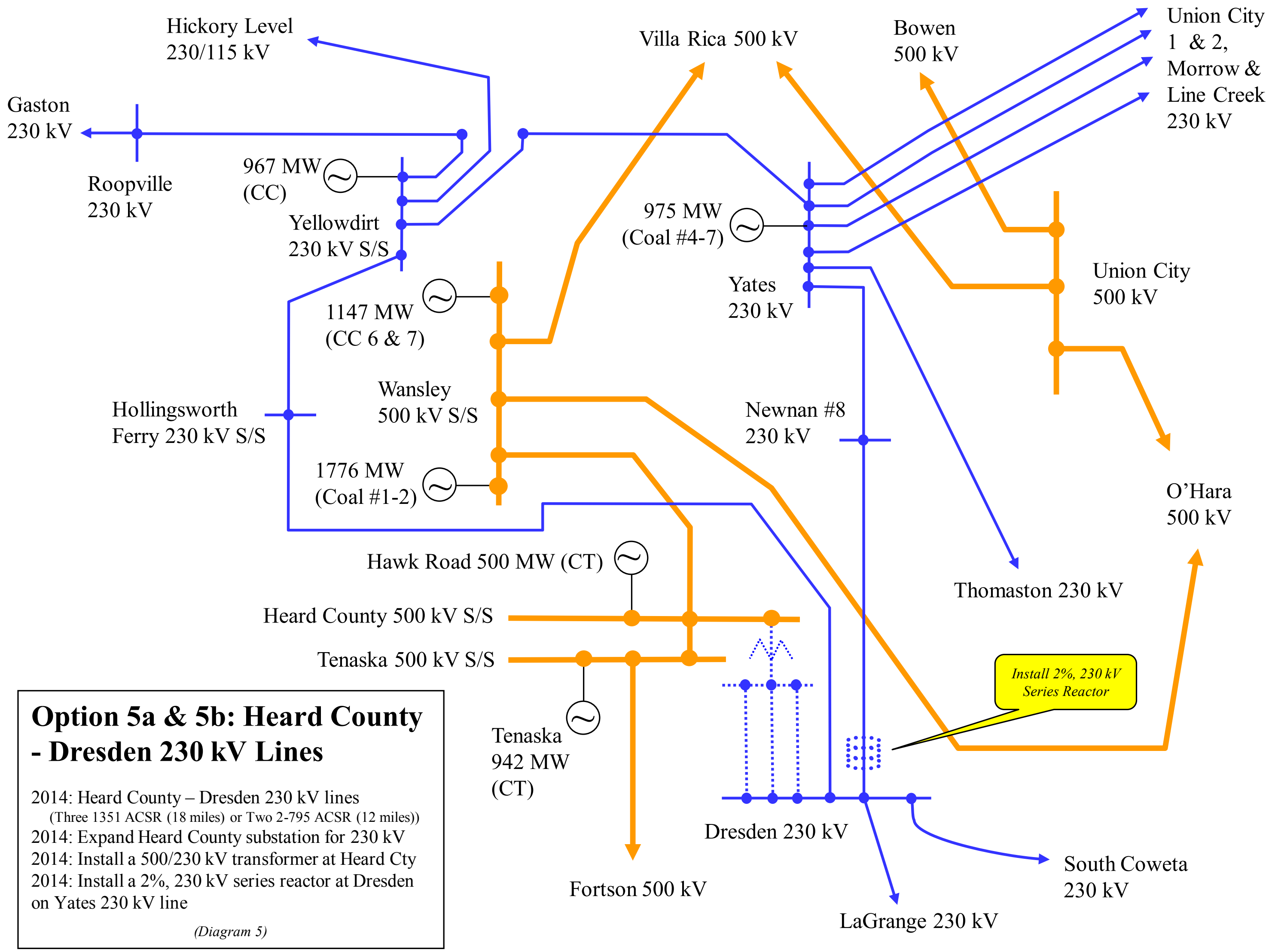
(Diagram 3)

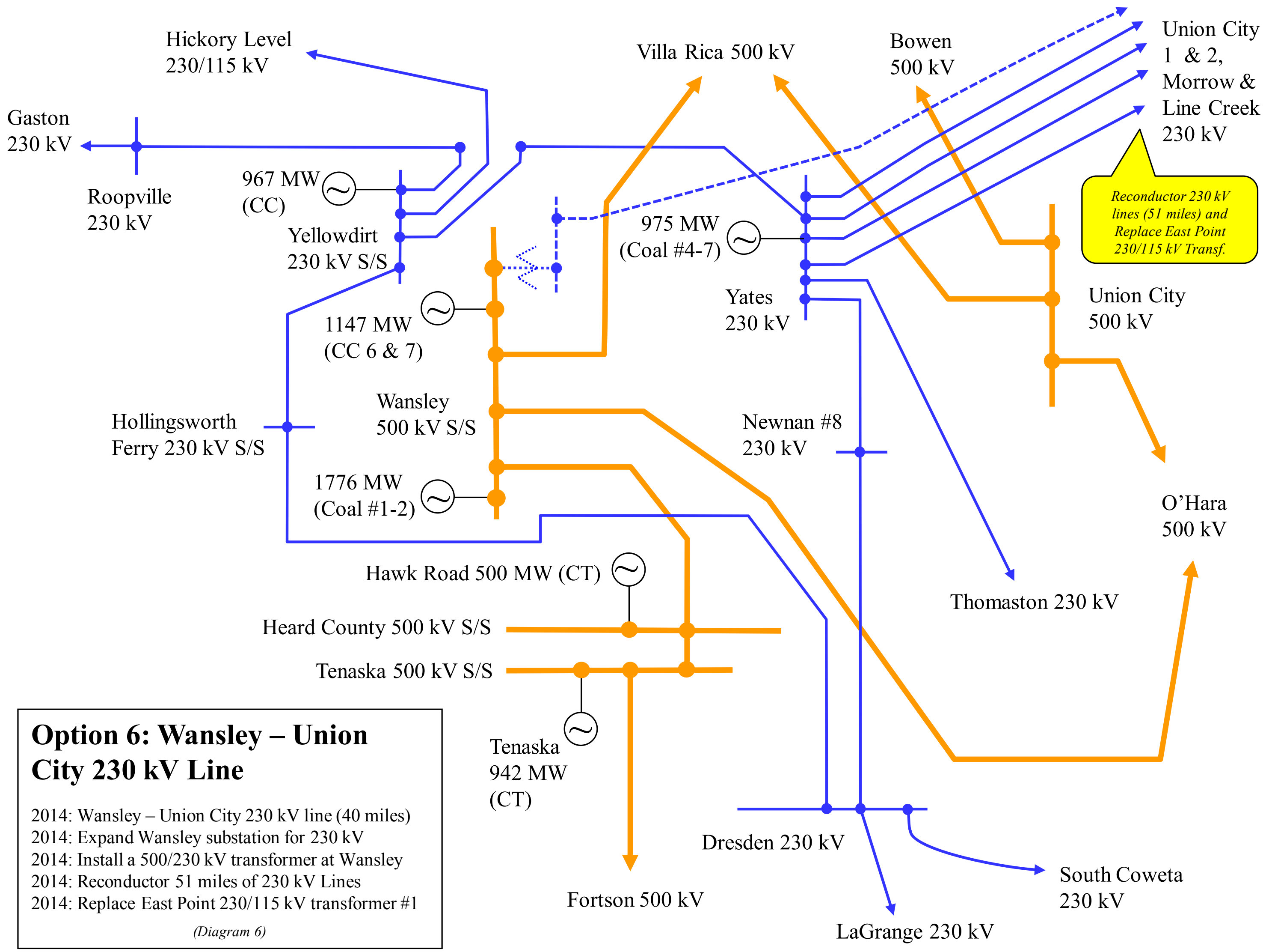


Option 4: Wansley/Yellow Dirt 500/230 kV Plan

2014: Wansley – Yellow Dirt 500 kV line (1 mile)
2014: Expand Yellow Dirt substation for 500 kV
2014: Install a 500/230 kV transformer at Yellow Dirt
2014: Rebuild 19.5 miles of Yellow Dirt – Hickory Level & 23.4 miles of Yates – Union City 230 kV lines

(Diagram 4)


Hickory Level 230/115 kV
Gaston 230 kV
Roopville 230 kV
967 MW (CC)
Yellowdirt 230 kV S/S
Villa Rica 500 kV
Bowen 500 kV
Union City 1 & 2, Morrow & Line Creek 230 kV
975 MW (Coal #4-7)
Yates 230 kV
Union City 500 kV
1147 MW (CC 6 & 7)
Wansley 500 kV S/S
Hollingsworth Ferry 230 kV S/S
Newnan #8 230 kV
1776 MW (Coal #1-2)
O'Hara 500 kV
Hawk Road 500 MW (CT)
Thomaston 230 kV
Heard County 500 kV S/S
Tenaska 500 kV S/S
Install 2%, 230 kV Series Reactor
Tenaska 942 MW (CT)
Dresden 230 kV
Fortson 500 kV
South Coweta 230 kV
LaGrange 230 kV
Option 5a & 5b: Heard County - Dresden 230 kV Lines
2014: Heard County – Dresden 230 kV lines
(Three 1351 ACSR (18 miles) or Two 2-795 ACSR (12 miles))
2014: Expand Heard County substation for 230 kV
2014: Install a 500/230 kV transformer at Heard Cty
2014: Install a 2%, 230 kV series reactor at Dresden on Yates 230 kV line
(Diagram 5)



Option 6: Wansley – Union City 230 kV Line

2014: Wansley – Union City 230 kV line (40 miles)
2014: Expand Wansley substation for 230 kV
2014: Install a 500/230 kV transformer at Wansley
2014: Reconductor 51 miles of 230 kV Lines
2014: Replace East Point 230/115 kV transformer #1

(Diagram 6)

EPRI/GTC Tailored Colaboration
Transmission Line Siting Model

Engineering		Natural Environment		Built Environment		AREAS OF LEAST PREFERENCE
Linear Infrastructure	**48.3%**	**Floodplain**	**6.2%**	**Proximity to Buildings**	**11.5%**	Listed Archaeology Sites
Rebuild Existing Transmission Lines	1	Background	1	Background	1	Listed NRHP Districts and Buildings
Parallel Existing Transmission Lines	1.4	100 Year Floodplain	9	900-1200	1.8	Eligible NRHP Districts
Parallel Roads ROW	3.6	**Streams/Wetlands**	**20.9%**	600-900	2.6	Airports
Parallel Gas Pipelines	4.5	Background	1	300-600	4.2	EPA Superfund Sites
Parallel Railway ROW	5	Streams < 5cfs+ Regulatory Buffer	5.1	0-300	9	Non-Spannable Waterbodies
Background	5.5	Non-forested Non-Coastal Wetlands a+ 30' Buffer	6.1	**Eligible NRHP Historic Structures**	**13.9%**	State and National Parks
Future GDOT Plans	7.5	Rivers/Streams > 5cfs+ Regulatory Buffer	7.4	Background	1	Military Facilities
Parallel Interstates ROW	8.1	Non-forested Coastal Wetlands + 30' Buffer	8.4	0 - 1500	9	City and County Parks
Road ROW	8.4	Trout Streams (50' Buffer)	8.5	**Building Density**	**37.4%**	Mines and Quarries
Scenic Highways ROW	9	Forested Wetlands + 30' Buffer	9	0 - 0.05 Buildings/Acre	1	Day Care Parcels
Slope	**9.1%**	**Public Lands / Easements**	**16.0%**	0.05 - 0.2 Buildings/Acre	3	Cemetery Parcel s
Slope 0-15%	1	Background	1	0.2 - 1 Buildings/Acre	5	School Parcels (K-12)
Slope 15-30%	5.5	WMA - Non-State Owned	4.8	1 - 4 Buildings/Acre	7	Church Parcels
Slope >30%	9	Other Conservation Land	8.3	4 - 25 Buildings/Acre	9	USFS Wilderness Area
Intensive Agriculture	**42.6%**	USFS	8	**Proposed Development**	**6.3%**	Wild/Scenic Rivers
Background	1	WMA - State Owned	9	Background	1	Areas of Ritual Importance
Fruit Orchards	5	**Land Cover**	**20.9%**	Proposed Development	9	Wildlife Refuge
Pecan Orchards	9	Open Land (Pastures, Scrub/Shrub, etc…)	1	**Spannable Lakes and Ponds**	**3.8%**	Buildings
Center Pivot Agriculture	9	Managed Pine Plantations	2.2	Background	1	
		Row Crops and Horticulture	2.2	Spannable Lakes and Ponds	9	
		Developed Land	6.5	**Major Property Lines**	**8.0%**	
		Hardwood/Mixed/Natural Coniferous Forests	9	Edge of field	1	
		Wildlife / Habitats	**36.0%**	Landlots	7.9	
		Background	1	Background	9	
		Potential High Biodiversity Areas	9	**Land Use**	**19.1%**	
				Undeveloped	1	
				Non-Residential	3	
				Residential	9	

Ecology Report

Dresden – Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Prepared by:
Jacobs Engineering Group, Inc.

Prepared for:
Georgia Transmission Corporation

February 2012

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EXECUTIVE SUMMARY

Executive Summary

The proposed Dresden – Heard County 500 kV Transmission Line would originate at the Dresden Substation in Coweta County, Georgia and terminate at the Heard County Substation in Heard County, Georgia. The total project length is approximately 6.2 miles. Jacobs Engineering Group, Inc. was contracted to perform ecological studies within the study corridor. Field studies included identification and delineation of jurisdictional waters and wetlands following the accepted methodology of the United States Department of the Army Corps of Engineers (USACE). In addition, office and field reviews were conducted for animal and plant species listed under the protection of the Endangered Species Act. Furthermore, state-listed species were included in the office and field reviews. This report includes a site description, study methodologies, results of field surveys, and an overview of permit requirements for the proposed transmission line.

Review of existing literature and available databases determined that eight federal- and five state-listed species are known from Coweta and Heard Counties. All counties in which the six mile corridor extends within were included in the office review. In addition, the Georgia Department of Natural Resources – Non-game Conservation Section (GDNR-NCS) was requested to conduct a database search for known protected species within close vicinity of the approximate 6-mile transmission line corridor. The GDNR-NCS database lists federal- and state- protected species and additional species which are tracked by GDNR-NCS and are known to occur in the area. Tracked species are not subject to the regulations of the Endangered Species Act. A response was received on August 10, 2011. GDNR-NCS has no records of any high priority species or habitats within a three-mile radius of the project corridor. Please refer to Appendix A for the attached correspondence with the GDNR-NCS. Please refer to Section 2: Threatened and Endangered Species for more information regarding protected species.

In addition, field studies of jurisdictional features identified the presence of nine jurisdictional wetlands, seventeen jurisdictional streams, and one jurisdictional open water within the surveyed corridor. The jurisdictional wetlands were classified as palustrine emergent or palustrine forested systems. Jurisdictional streams were classified as perennial or intermittent systems. Jurisdictional open water was classified as palustrine open waters. Please refer to Section 3: Jurisdictional Studies of this report for more information regarding jurisdictional areas.

Potential Section 404 permitting cannot be determined until final impacts are identified as a result of access plans to complete construction of the proposed Dresden – Heard County 500 kV Transmission Line. Section 404 permitting will be required if streams and wetlands would be impacted as a result of fill or dredging activities. Jurisdictional waters and wetlands will likely need to be crossed, and some new access points may need to be established; however, existing access road readily available will be utilized for construction and maintenance when possible. The majority of impacts to waters and wetlands will likely be in the form of short culverts and/or at-grade road crossings. Please refer to Section 4: Permit Considerations of this report for a detailed discussion of permitting issues.

SECTION 1

Introduction

SECTION 1
Introduction

The proposed Dresden – Heard County 500 kV Transmission Line would originate at the Dresden Substation in Coweta County, Georgia and terminate at the Heard County Substation in Heard County, Georgia. The total project length is approximately 6.2 miles. Ecological studies within the study corridor were completed. Field studies included identification and delineation of jurisdictional waters and wetlands following the accepted methodology of the United States Department of the Army Corps of Engineers (USACE). In addition, office and field reviews were conducted for animal and plant species listed under the protection of the Endangered Species Act. State-listed species were included in the office and field reviews. This report includes a site description, study methodologies, results of field surveys, and an overview of permit requirements for the proposed transmission line corridor.

Site Location and Description

The proposed transmission line corridor is located in Coweta and Heard Counties, Georgia (Figure 1). The proposed transmission line is situated on the Newnan SW, Georgia United States Geological Survey (USGS) 7.5-minute topographic map (Figures 2a – 2d). The study corridor is located within the Hydrologic Unit Code 03130002 of the Middle Chattahoochee – Lake Harding watershed (Figure 3).

The proposed transmission line would originate at the Dresden Substation in Coweta County, Georgia (33º 20' 51'' N, 84º 54' 24'' W) and terminate at the Heard Substation in Heard County, Georgia (34º 21' 35'' N, 84º 59' 55'' W). From the existing Dresden Substation, the proposed transmission line corridor will extend parallel to the existing Georgia Power O'Hara – Plant Wansley 500 kV Transmission Line right-of-way for approximately two miles in a northwest direction. The alignment will then turn in a west direction and traverses cross-country for approximately three miles before turning in a south direction near the Coweta - Heard County boundaries. From this turn location, the project will traverse south for approximately 0.5 miles to the existing Heard County Substation located along Joe Stephens Road.

Upland Vegetation Communities

Classifying vegetation communities is an important part of field studies. Prior to field investigation, vegetation communities of potential occurrence within the proposed project area were determined by reviewing aerial photography. Based on this interpretation, biologists assigned generic vegetation community types such as ruderal, forested, and agricultural fields. This preliminary assessment was verified and expanded upon field investigation. Brief descriptions of vegetation communities occurring within the project study corridor are listed below. Please refer to Figures 4a – 4d for map illustrations of the vegetative communities identified.

Agricultural - These communities are characterized as open areas used for cultivating crops and/or livestock grazing. Grazing fields are dominated by herbaceous vegetation such as: fescue (*Festuca* *arundinacea*), vasey grass (*Paspalum urvillei*), bahia grass (*Paspalum notatum*), Bermuda grass (*Cynodon dactylon*), and yellow thistle (*Cirsium horridulum*), while other agricultural fields are planted with crops for cultivation. This community provides minimal habitat for wildlife diversity. Please refer to the Appendix B for a representative photograph of this vegetation community.

Bottomland Mixed Hardwoods - These communities are comprised of hardwood deciduous species and are situated in low lying landscapes typically along medium to large streams. Dominant overstory vegetation includes species such as: red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*), green-ash (*Fraxinus pennsylvanica*), sweet-bay magnolia (*Magnolia virginiana*), American beech (*Fagus grandifolia*), oak species (*Quercus* spp.), tulip tree (*Liriodendron tulipifera*), sweet-gum (*Liquidambar styraciflua*), and midstory vegetation such as: brook-side alder (*Alnus serrulata*), possum haw (*Viburnum nudum*), American holly (*Ilex opaca*), blueberry species (*Vacinnium* sp.), and saplings of surrounding canopy specimens. This community offers excellent habitat for wildlife diversity. Please refer to the Appendix B for a representative photograph of this vegetation community.

Early Successional – These communities are human-manipulated areas that currently are not maintained undergo early successional stages of regrowth. Early successional species are the first vegetative communities to dominate areas that have been logged, row cropped, terraced, or otherwise disturbed and abandoned. Vegetation is generally dominated by grasses, forbes, shrubs, and tree saplings. Please refer to the Appendix B for a representative photograph of this vegetation community.

Planted Pine – These communities are silvicultural areas dominated by planted pines for timber production. In these areas, trees are thinned at a pre-determined age for maximum timber harvest. This community is typically dominated by loblolly pine (*Pinus taeda*), longleaf pine (*Pinus palustris*) with an understory of sweet gum, oak species, and black cherry (*Prunus serotina*). In addition, these communities understory is often dominated by greenbrier species (Smilax sp.) and muscadine (*Vitis rotundifolia*). This community provides moderate wildlife habitat. Please refer to Appendix B for a representative photograph.

Ruderal – These communities are characterized by anthropogenic habitats including residential and commercial areas, campgrounds, roads, and/or utility ROWs. This community provides minimal habitat for wildlife diversity, and is found throughout the upland areas of the existing ROW. Please refer to the Appendix B for a representative photograph of this vegetation community.

Secondary Succesional Mixed Hardwoods - These communities are comprised of hardwood deciduous species. Dominant overstory vegetation includes species such as: American beech hickory species (*Carya* spp.), oak species, tulip tree, sweet-gum (*Liquidambar styraciflua*), flowering dogwood (*Cornus florida*), and midstory vegetation such as: American holly (*Ilex opaca*), blueberry species (*Vacinnium* sp.), and saplings of surrounding canopy specimens. This community offers excellent habitat for wildlife diversity. Please refer to the Appendix B for a representative photograph of this vegetation community.

Secondary Successional Mixed Hardwoods - Pine – These communities are primarily comprised of mixed deciduous and evergreen species. Dominant overstory vegetation includes a mixture of species such as: loblolly pine (*Pinus taeda*), American beech, sweet gum, American holly, Eastern redcedar (*Juniperus virginiana*), flowering dogwood, hickory species, tulip tree, and oak species (*Quercus* spp.). The understory is comprised of vegetative species such as: greenbrier species, honeysuckle (*Lonicera japonica*), and muscadine. This community offers good habitat for wildlife diversity. Please refer to Appendix B for a representative photograph of this vegetative community type.

Wetland Vegetation Communities

For the purposes of this report, wetland communities are those that meet the USACE three-parameter definition of a wetland system. The Cowardin Classification System was used to further clarify the wetland system within the study area (Cowardin *et al.*, 1989). The palustrine wetland systems delineated were classified as emergent (PEM), forested (PFO), or a combination of these system types (e.g. PEM/PFO). Please refer to Section 3: Jurisdictional Studies for a more detailed description of the wetland systems identified.

Emergent (EM) - Emergent wetland communities are dominated by herbaceous species. These wetlands are usually characterized by saturated to inundated soil conditions throughout the year. Dominant species typically include soft rush (*Juncus effusus*), sedge species (*Carex* spp.), woolgrass (*Scirpus cyperinus*), giant cane (*Arundinaria gigantea),* tearthumb (*Polygonum sagittatum*), cattail species (*Typha* sp.), seedbox (*Ludwigia decurrens*), velvet panicum (*Dicanthelium scoparium*), smallspike false nettle (*Boehmaria cylindrica*), and bulrush species (*Scirpus* sp.). This community type provides good wildlife habitat. Please refer to Appendix B for a representative photograph of this vegetation community.

Forested (FO) — Forested wetlands systems are those dominated by woody species. These wetlands are usually characterized by seasonally to permanently saturated soil conditions throughout the year. Within the study area, dominant species typically include brook-side alder, red maple, swamp black gum (*Nyssa biflora*), water oak (*Quercus nigra*), sweet-gum, southern spice bush (*Lindera benzoin*), false-nettle (*Boehmeria cylindrica*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), netted-chain fern (*Woodwardia areolata*), and arrow arum. This community type provides good wildlife habitat. Please refer to Appendix B for a representative photograph of this vegetative community type.

SECTION 2
Threatened and Endangered Species

SECTION 2
Threatened and Endangered Species

Overview

Under terms of Section 7 of the Endangered Species Act, federal agencies shall "*ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary to be critical…*" The USACE requires protected species surveys for project sites that involve a Section 404 of the Clean Water Act permit.

Prior to field studies, an office review of available resources was performed to develop a list of potential federal- and state-listed species for Coweta and Heard Counties, Georgia. The tentative list of known protected species was compiled by review of the federal "Redbook" – Region 4, a copy of the United States Fish and Wildlife Service (USFWS) county database http://www.fws.gov/athens/endangered/counties_endangered.html (updated May, 2004), *Protected Animals of Georgia* (GDNR, 1999), *Protected Plants of Georgia* (Patrick *et al.*, 1995), and a review of element occurrence records (including topographical quarter-quad records) on the Georgia Department of Natural Resources Nongame Conservation Section's (GDNR-NCS) website: http://georgiawildlife.dnr.state.ga.us/conservation.aspx.

Review of existing literature and available databases determined that eight federal- and five state-listed species are known from Coweta and Heard Counties, Georgia. In addition, GDNR-NCS was requested to conduct a database search for known protected species within close vicinity of the approximate six mile transmission line corridor. The GDNR-NCS database lists federal- and state-protected species and additional species which are tracked by GDNR-NCS and are known to occur in the area. Tracked species are not subject to the regulations of the Endangered Species Act. A response was received on August 10, 2011. GDNR-NCS has no records of any high priority species or habitats within a three-mile radius of the project corridor. Please refer to the attached correspondence with the GDNR-NCS, which is located in Appendix A.

Field studies were conducted to determine the presence of suitable protected species habitat and the potential occurrence of these species. There were no protected species identified within the proposed transmission line study corridor; however, suitable habitat for one state-listed species (*Schisandra glabra* - bay star-vine) was observed. Please refer to Table 1 for a summary of protected species for Coweta and Heard Counties, Georgia. Natural history information for each species is included in the Species Description section below and was researched using the Natureserve website database (www.natureserve.org/explorer/) and the GDNR's rare species profiles (http://www.georgiawildlife.com/node/2223?cat=6, updated 2009).

Table 1
Summary of Protected Species for Coweta and Heard Counties, Georgia

Common Name	Scientific Name	Federal Status	State Status	Habitat Present (Yes/No)	Preferred Habitat
Faunal species					
Birds					
bald eagle	*Haliaeetus leucocephalus*	D	T	No	nests in large trees near lakes, rivers, and other large bodies of water
Fish					
bluestripe shiner	*Cyprinella callitaenia*	NA	T	No	large, alluvial rivers with open, sand or rock bottomed channels with flowing water and little to no aquatic vegetation
highscale shiner	*Notropis hypsilepis*	NA	T	No	flowing areas of small to large streams over sand or bedrock substrates
Invertebrates					
Gulf moccasinshell mussel	*Medionidus penicillatus*	E	E	No	medium streams to large rivers with slight to moderate current over sand and gravel substrates
oval pigtoe mussel	*Pleurobema pyriforme*	E	E	No	sandy, medium-sized rivers and creeks
purple bankclimber mussel	*Elliptoideus sloatianus*	T	T	No	small to large rivers with moderate current and substrate of sand, fine gravel, or muddy sand
shiny-rayed pocketbook mussel	*Hamiota subangulata*	E	E	No	sandy/ rocky medium-sized rivers and creeks
Floral species					
Plants					
bay star-vine	*Schisandra glabra*	NA	T	Yes	rich bottomland or alluvial floodplain woods on stream terraces and lower slopes
black-spored quillwort	*Isoetes melanospora*	E	E	No	shallow pools on granite outcrops, where water collects after rains; pools are less than 1-foot deep and are rock rimmed
Harper dodder	*Cuscuta harperi*	NA	T	No	parasite usually found on rayless-goldenrod; rarely parasitic on other herbs found on granite or sandstone outcrops
Piedmont barren strawberry	*Waldsteinia lobata*	NA	R	No	rocky, acidic woods along stream terraces with mountain laurel (*Kalmia latifolia*); rarely in dry, upland oak/hickory forests
pool sprite, snorklewort	*Amphianthus pusillus*	T	T	No	shallow pools on granite outcrops, where water collects after rains; pools are less than 1-foot deep and are rock rimmed
white fringeless orchid	*Platanthera integrilabia*	C	T	No	red maple-gum swamps; peaty seeps and streambanks with *Parnassia asarifolia* and *Oxypolis rigidior*

E=endangered, T=threatened, C=candidate, R=rare, D=de-listed species, NA=not applicable

Species Descriptions

Bald eagle (*Haliaeetus leucocephalus*) **–** Bald eagles have a dark brown body with a white head and tail. The legs, eyes, feet, and bill are yellow. This species has been de-listed; however, it is still afforded protection at state and federal levels. The USFWS removed the bald eagle as threatened under the Endangered Species Act on August 8, 2007, and published May 2007, National Bald Eagle Management Guidelines (Eagle Guidelines) to assist the public in understanding protections afforded to and prohibitions related to the bald eagle under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) (Eagle Act), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Lacey Act (16 U.S.C. 3371-3378). The Eagle Act prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Eagle Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

In Georgia, the bald eagle finds habitat along inland waterways and estuarine areas, selecting areas with low human disturbance, suitable forest structure, and abundant prey. The bald eagle typically nests in the largest tree in its chosen territory. Nest sites are usually near water, with large individual trees, and little overall human disturbance. This species prefers nest sites within 0.5 miles of water. The bald eagle usually forages within approximately 1.0 mile of its nest site during breeding season. No specimens or preferred habitat were observed during the field survey; therefore, it is not likely the project will have an effect of this species.

Bluestripe Shiner (*Cyprinella callitaenia*) **–** The bluestripe shiner is identified by a long, rounded head, dusky olive back coloration, silver sides, and blue stripe running laterally along the side of the fish. The bluestripe shiner is endemic to the Apalachicola River drainage. In Georgia, this species occurs in the Chattahoochee and Flint River systems. Furthermore, recent surveys indicate that this species is currently only found in the lower Flint River Basin, the Chattahoochee River below West Point Reservoir, and large tributaries in both systems (GADNR, 1999). This species prefers large, alluvial rivers with open, sand or rock bottomed channels with flowing water and little to no aquatic vegetation. Aquatic surveys were not conducted; however, the proposed project does not encounter any rivers or main stem tributaries characteristic of this habitat. Therefore, it is not likely the project will have an effect on this species.

Highscale shiner (*Notropis hypsilepis*) **–** The highscale shiner is identified by a yellow back with a clear and dusky stripe running down the side, and a separate wedge-shaped spot near the tail. The highscale shiner inhabits pools and runs of tributary streams and small rivers, typically near the confluence of large rivers that have sand and bedrock substrates. The highscale shiner is known to occur in the Flint and Chattahoochee River systems ranging from their headwaters to just below the fall line. In addition, the species has been recorded in the upper Tallulah River of the Savannah River drainage. Aquatic surveys were not conducted; however, the proposed project does not encounter confluences of main stem tributaries of small to large rivers. Therefore, it is not likely the project will have an effect on this species.

Gulf Moccasinshell Mussel (*Medionidus penicillatus*) **–** The gulf moccasinshell mussel is small, reaching only 2.25 inches in length. The shell is yellowish brown to nearly black in color and usually rayed with narrow, interrupted, greenish lines. The gulf moccasinshell mussel is found in streams and rivers where there is moderate current, and lives mainly in sand and gravel. In Georgia, this filter-feeder historically was found in the Chattahoochee and Flint River systems from Atlanta southward. Aquatic sampling was not conducted in the study; however, recent surveys indicate that this species only currently exist in the lower Chattahoochee and Flint River systems (GA DNR, 1999). Therefore, it is not likely the project will have an effect on this species.

Oval Pigtoe Mussel (*Pleurobema pyriforme*) **–** The oval pigtoe mussel is a small mussel reaching only 2.25 inches in length. Its color is variable, ranging from a yellowish brown to dark brown and sometimes almost black. The mussel inhabits medium-sized creeks to small rivers with a slow to moderate current over silt-sand to sand and gravel substrate. In Georgia, this species historically was found in the Chattahoochee, Flint, and Ochlockonee River systems. This species has been documented in only two counties in extreme north Georgia. Coweta and Heard Counties are at the very northern end of its range. Aquatic sampling was not conducted in this study; however, recent surveys indicate that this species only currently exist in the lower Chattahoochee and Flint River systems (GA DNR, 1999). Therefore, it is not likely the project will have an effect on this species

Purple Bankclimber Mussel (*Elliptoideus sloatianus*) **–** The purple bankclimber mussel is a large freshwater mussel can reach a length of greater than eight inches, but usually measures between four and six inches. The purple bankclimber has a characteristic lumpy grey to black heavy outer shell. Habitat for this species is small to large rivers with moderate current in substrate of sand, mud, and gravel. This species is currently known from the Apalachicola, Flint, Chattahoochee, and Ochlockonee River systems with the best populations likely occurring in the Flint River from Decatur County upstream to Upson County. Aquatic surveys were not conducted; however, the proposed project does not encounter small to large rivers. Therefore, it is not likely the project will have an effect on this species.

Shiny-rayed Pocketbook Mussel (*Hamiota subangulata*) **–** The shiny-rayed pocketbook mussel is medium in size reaching lengths of 3.38 inches in length and is golden brown to dark chestnut brown with numerous rays of light to dark emerald green. In Georgia, this species historically was found in the Chattahoochee, Flint, and Ochlockonee River systems. Habitat for this species is medium creeks to main stems of rivers with slow to moderate currents over substrates of sand. Coweta and Heard Counties are at the very northern end of its range. Aquatic sampling was not conducted in this study; however, recent surveys indicate that this species only currently exist in the lower Chattahoochee and Flint River systems (GA DNR, 1999). Therefore, it is not likely the project will have an effect on this species.

Bay star-vine (*Schisandra glabra*) **–** The bay star-vine is a deciduous woody vine with alternate, sparsely-toothed leaves that are sweet smelling when crushed. The flowering period is from May to June with fruiting occurring between July and August. Bay star-vine is typically found twining over understory trees and shrubs in rich, forested bottomlands and adjacent lower slopes.

In addition, the vine occurs on trunks of overstory trees, and can grow in the forest floor litter in patches that are often near stands of mountain laurel (*Kalmia latifolia*). Potential habitat for this species does occur within the project study area; however, no specimens were identified during field studies. Furthermore, due to the linear nature of this project, impacts to this habitat will be limited to clearing of up to a 170-foot ROW. Existing habitat adjacent to the proposed ROW will be left undisturbed. Therefore, due to available surrounding habitat, this project is not likely to affect this species or its overall habitat.

Black-spored quillwort (*Isoetes melanospora*) – Black-spored quillwort is an inconspicuous perennial herb. The leaves arise from a bulbous base, are bunched, linear, slender-tipped and resemble quills. This herb is restricted to shallow flat-bottomed depressions on granite outcrops that collect precipitation. The depressions are less than one foot in depth and are entirely rock rimmed with at least one-half to one inch of soil. Preferred habitat was not encountered during surveys of the proposed transmission line corridor; therefore, it is not likely the project will have an effect on this species.

Harper dodder (*Cuscuta harperi*) – Harper dodder is a parasitic plant that doesn't have any leaves. The plant has stringy yellow to orange stems that twine around a host plant and has loose clusters of four-parted white flowers. Harper dodder can be found on sandstone (Altamaha grit) and less frequently on granite outcrops. It is often closely associated with rayless goldenrod (*Bigelowia nuttallii*), blazing star (*Liatris microcephala*), and pineweed (*Hypericum gentianoides*). Preferred habitat was not encountered during surveys of the proposed transmission line corridor; therefore, it is not likely the project will have an effect on this species.

Piedmont barren strawberry (*Waldsteinia lobata*) – Piedmont barren strawberry is a small perennial herb up to six inches in height and spreads by stolons. The leaves are rounded forming clumps similar to the common strawberry. The Piedmont barren strawberry is found in rocky, acidic woods along streams with mountain laurel (*Kalmia latifolia*). Preferred habitat was not encountered during surveys of the proposed transmission line corridor; therefore, it is not likely the project will have an effect on this species.

Pool Sprite (*Amphianthus pusillus*) – Pool sprite is a small annual herb with both floating and submerged leaves. This herb is restricted to shallow flat-bottomed depressions on granite outcrops, in which water collects after rain. The depressions are less than one foot in depth and entirely rock rimmed with at least 0.5 to 1 inch of soil. Preferred habitat was not encountered during surveys of the proposed transmission line corridor; therefore, it is not likely the project will have an effect on this species.

White-Fringeless Orchid (*Platanthera integrilabia)* – White-fringeless orchid is a perennial herb with two to three stem leaves along a strong central vein and distinctive white flower. White-fringeless orchid is found in seepage sphagnum bogs, springheads, seepy stream banks, red maple-black gum swamps. It often grows with primrose-leaved violet, green woodland orchid, cowbane, and grass-of-Parnassus. Preferred habitat was not encountered during surveys of the proposed transmission line corridor; therefore, it is not likely the project will have an effect on this species.

Conclusion

A response was received on August 10, 2011. GDNR-NCS has no records of any high priority species or habitats within a three-mile radius of the project corridor. Refer to Appendix A for a copy of this correspondence.

Field studies did not identify any protected species within the proposed transmission line corridor; however, preferred habitat for the state-listed species bay star-vine was observed. Habitat for this species consists of rich, forested bottomlands, alluvial floodplains, and adjacent lower slopes. Refer to Figures 4a – 4d for locations of suitable habitat for this species. Due to the linear nature of the proposed project, impacts to suitable habitat for the bay star-vine will be limited to clearing up to a 170-foot wide corridor. Existing habitat adjacent to the proposed corridor will be left undisturbed. Therefore, it is not anticipated that the proposed project would have effect on this species or its overall preferred habitat.

SECTION 3

Jurisdictional Studies

SECTION 3
Jurisdictional Studies

Wetland Methodologies and Parameter Evaluations

Evaluation of a habitat to determine if it meets the criteria defining a jurisdictional wetland is accomplished using one of three methods outlined in the *Army Corps of Engineers Wetlands Delineation Manual (1987 Federal Manual) and Regional supplement of the Federal Manual for the Eastern Mountains and Piedmont Physiographic Regions.* All three methods take into account edaphic (soil), vegetative, and hydrologic parameters to determine if a habitat should be classified as a jurisdictional wetland.

The most common method for performing a jurisdictional assessment is the Routine Determination. This method evaluates each parameter and involves collection of qualitative data. Prior to performing field studies, resources such as USGS topographical maps, aerial photography, and county soil survey information are reviewed to identify potential areas of jurisdictional wetlands and to delineate the extent of the systems. USACE Data Forms are completed for each community type within each wetland system.

A Comprehensive Determination is a methodology that involves collecting quantitative data for complex sites or when intensive documentation of a site is necessary. In certain cases, only one parameter may require Comprehensive Determination, while the assessment of the remaining parameters follows the Routine Determination.

The third method of performing jurisdictional assessments is the Atypical Situation method. This method is recommended in the *1987 Federal Manual* when one of the parameters for identifying jurisdictional wetlands (soils, vegetation, or hydrology) is not present or discernible because of recent human activities or natural events. Part C of this method applies to wetlands that were purposely or incidentally created by human activities but lack one or more of the parameters. Subsection 4 under the Atypical Situation presents examples of anthropogenic-induced hydrology for wetlands and describes these areas as usually lacking indicators of hydric soils. Hydric soils can require long periods of time to develop the normal characteristics indicative of wetland hydrology and subsurface anaerobic conditions.

After deciding which methodology is appropriate, each wetland parameter should be evaluated to make the wetland determination. For this project, the Routine Determination methodology was followed during the identification of jurisdictional area within the study area. Below is a brief discussion of each parameter.

Vegetation

In both the Routine and Comprehensive Determinations, all dominant plants should be identified to species. The vegetation parameter is the strongest, most reliable parameter in undisturbed wetland communities. Following identification, the *National List of Plant Species that Occur in*

Wetlands - Southeast Region (Reed, 1988) should be consulted to determine the wetland indicator status of each species. The indicator status of a plant may fall into one of the categories listed in Table 2.

Table 2
Plant Indicator Status Categories (adopted from the *Federal Manual*)*

Indicator Status	Indicator Symbol	Definition
Obligate Wetland Plants	OBL	Plants that occur almost always (estimated probability > 99%) in wetlands under natural conditions, but also may rarely occur (estimated probability < 1%) in non-wetlands. Examples: *Spartina alterniflora, Taxodium distichum*.
Facultative Wetland Plants	FACW	Plants that usually occur (estimated probability > 67% to 99%) in wetlands, but also occur (estimated probability 1% to 33%) in non-wetlands. Examples: *Fraxinus pennsylvanica, Cornus amomum*.
Facultative Plants	FAC	Plants with a similar probability (estimated probability 33% to 67%) of occurring in both wetlands and non-wetlands. Examples: *Acer rubrum, Smilax rotundifolia*.
Facultative Upland Plants	FACU	Plants that occur sometimes (estimated probability 1% to > 33%) in wetlands but occur more often (estimated probability > 67% to > 99%) in non-wetlands. Examples: *Quercus rubra, Potentilla arguta*.
Obligate Upland Plants	UPL	Plants that rarely occur (estimated probability > 1%) in wetlands, but almost always occur (estimated probability > 99%) in non-wetlands under natural conditions. Examples: *Pinus echinata, Bromus mollis.*
No Indicator	NI	Insufficient information was available to determine an indicator status. Example: *Juncus* spp., *Carex* spp., *Rubus* spp.

* Categories were originally developed and defined by the USFWS National Wetlands Inventory and subsequently modified by the National Plant List Panel. The three facultative categories are subdivided by (+) and (-) modifiers.

Analysis of the vegetation parameter in a Comprehensive Determination involves detailed sampling of various strata to establish plant dominance. In a Routine Determination, dominance may be based on visual observations of each stratum. For the vegetation parameter to be satisfied, a plant community should have greater than 50 percent of the dominant species with a rating of facultative, facultative wetland, or obligate wetland. An alternative to the 50 percent dominance criteria is the facultative-neutral option. This option may be used when a district questions the indicator status of a dominant species. When dominant species with an indicator of facultative occur with facultative upland or facultative wetland dominant plant species, the facultative species may be considered neutral; therefore, the jurisdictional status of the parameter would be based on the greater number of facultative wetland species versus facultative upland species. Should the facultative wetland dominant species equal the facultative upland species, then associate species are considered. Should the number still be equal, then the jurisdictional status is determined by the soil and hydrology parameters. The final step within the vegetation parameter is to identify the type of vegetation community and wetland system following the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al.*, 1989).

Soils

The soil parameter is the least reliable for determining the current status of a community. Review of the soil parameter more reliably reveals historical data, because of the time required for formation of hydric soils is estimated to take from 15 to 50 years by some accounts. Hydric soils that have been drained and fail to support hydrophytic vegetation do not meet the criteria of the soil parameter. However, hydromorphic and redoximorphic characteristics are very consistent and are often used to determine the line between wetland and upland.

Hydric soils are formed during periods of saturation or inundation. These periods create an anaerobic environment within the upper horizons of the soil profile. According to the *1987 Federal Manual*, the following criteria apply to hydric soils:

- All histosols except folists;
- Soils in aquic suborders, aquic subgroups, albolls suborder, salorthids great group, or pell great groups of vertisols that are:
    - Somewhat poorly drained and have a water table less than 6-inches from the surface for a significant period (usually a week or more) during the growing season; or
    - Poorly drained or very poorly drained and have either:
        - A water table at less than 1.0 foot from the surface for a significant period (usually a week or more) during the growing season if permeability is less than 6-inches in any layer within 20-inches; or
        - A water table at less than 1.5 feet from the surface for a significant period (usually a week or more) during the growing season if permeability is less than 6-inches in any layer within 20-inches; or
- Soils that are inundated for a long or very long duration during the growing season; or
- Soils frequently flooded for a long duration or very long duration during the growing season.

Soils may be determined to be hydric by using regional indicators in addition to referencing the *Hydric Soils of the United States.* Several criteria are listed in the 1987 *Federal Manual,* each of which indicates the presence of hydric soils.

Non-Sandy Soils:

- **Organic soils (histosols) -** Organic soils are saturated for long periods of time and commonly are called muck. Soils are determined to be organic if more than 50 percent of the upper 12 inches of soil is composed of organic material or if organic material lies directly over bedrock.

- **Histic epipedons -** Histic epipedons are soils with an 8- to 16-inch layer of soil that is sufficiently saturated to prevent aerobic decomposition of the organic surface. Histic epipedons must be saturated for 30 consecutive days or more for soils containing a minimum of 20 percent organic matter when no clay is present or a minimum of 30 percent organic matter when the clay content is 60 percent or higher.

- **Sulfidic material -** Sulfidic material is determined to be present within the soils when waterlogged, permanently saturated soils emit an odor of rotten eggs. This odor is an indication of the presence of hydrogen sulfide created from a reducing environment.

- **Aquic or peraquic moisture regime -** An aquic moisture regime essentially is free of dissolved oxygen due to strong reducing conditions. The soil is saturated by groundwater, and dissolved oxygen is removed from the soil by soil fauna and root systems. The soil temperature must be above 5 degrees celsius (°C) at some point while the soil is saturated. A peraquic soil regime requires the presence of groundwater always at or near the soil surface.

- **Reducing soil conditions -** During periods of prolonged inundation or saturation, soils will begin to undergo reducing conditions. These conditions result in iron being reduced from the ferric state to the ferrous state. In the field, this can be confirmed by a qualitative test using alpha, alpha dipyridil, a chemical reagent. If the iron in the soil has been reduced, a pink color would occur when the alpha, alpha dipyridil is added to the soil sample.

- **Soil colors -** When anaerobic conditions result in soil reduction, mineral soils often will produce gray or very dark colors. These colors are a direct result of the reduction of iron, manganese, and other elements in the soil. Soils that are saturated for a long duration usually exhibit bluish to greenish-gray colors. This effect is referred to as gleying. The Munsell Color Charts can be used to determine gleyed soils. Mineral soils that are saturated (but not for prolonged periods) will develop a low chroma matrix that may or may not contain mottles. Under these conditions, the mottles often will be “bright” Munsell colors. As a general rule, mineral hydric soils will exhibit one of the following conditions: 1) matrix chroma of 2 or less in mottled soils; or 2) matrix color of 1 or less in unmottled soils.

- **Soil appearing on hydric soils list -** The National Technical Committee for Hydric Soils maintains an updated list of soil types that are known to be hydric or to have hydric inclusions. This list can be referenced to determine if a soil type is hydric. Many National Resources Conservation Service (NRCS) offices also maintain a list of known hydric soils that can be more beneficial on a regional basis.

Sandy Soils:

- **High organic matter content in surface horizon** - Sandy soils that are inundated or saturated for prolonged periods usually develop a layer of organic matter near the surface horizon. This can be attributed to anaerobic conditions that greatly reduce decomposition of the organic matter.

- **Streaking of subsurface horizons by organic matter** - As the water table fluctuates in sandy soils, organic material is carried through the soil profile. The movement of the organics through the soil profile often results in organic streaking in certain portions of the soil profile that are subject to water table fluctuation. Areas of organic streaking can be observed visually with the assistance of a sharpshooter shovel.

- **Organic pans** - As stated above, organic material moves within the soil profile as the water table fluctuates. The organics have a tendency to accumulate in the area that represents the average depth of the water table. The presence of elemental aluminum can result in the soils becoming hardened at the average depth of groundwater. This hardened layer often is referred to as a spodic horizon. Soil pits must be excavated to determine if spodic horizons are present.

In addition to the 1987 *Federal Manual*, several other publications are available that provide guidance in the identification of hydric soils. These publications are available for use at both the regional and national levels. Examples include *Redoximorphic Features for Identifying Aquic Conditions* (Vepraskas, 1994) and *Field Indicators of Hydric Soils in the United States* (USDA, 1995). These resources often provide detailed information on the identification of hydric soils. The USACE district in which the work would be performed should be contacted to ensure that the usage of hydric soil indicators other than those in the 1987 *Federal Manual* is acceptable.

Mapped Soils within the Study Area:

The Web Soil Survey database (NRCS, 2011) for Coweta and Heard Counties was consulted to determine soil series within the project corridor. These soil series were compared to the *National Hydric Soils List by State* (NRCS, 2011) to determine if hydric soils are known to occur within the study area. According to the soil survey database, seven series are crossed by the proposed transmission line corridor. Of these seven series, the *National Hydric Soils List by State* indicates that one series, the Riverview-Chewacla Association, is hydric or contains hydric conditions. Please refer to Figures 5a-5d for map illustrations of the soil series within the project corridor. Please refer to Table 3 for a summary of soil series occurring within the existing transmission line corridor.

Table 3
Summary of the Soil Series Within the Proposed Transmission Line Corridor

Soil Series	Slope Range	Erosion Potential (Low, Med, High)	Soil Descriptions
Appling	0-25%	medium to high moderate to rapid surface runoff	The Appling series consists of well drained, moderately permeable soils that are formed in residuum weathered from felsic igneous and metamorphic rocks of the Piedmont uplands. Appling soils are located on ridges and side slopes in the Piedmont uplands.
Cecil	0-25%	Medium to high, medium to rapid surface runoff	The Cecil series consists of well drained, moderately permeable soils that are formed in residuum weathered from felsic, igneous and high-grade metamorphic rocks of the Piedmont uplands. Cecil soils are located on nearly level to steep Piedmont uplands.
Helena	0-15%	Medium to high, medium to rapid surface runoff	The Helena series consists of well drained, slowly permeable soils that are formed in residuum weathered from a mixture of felsic, intermediate, mafic igneous, or high-grade metamorphic rocks. Helena soils are typically found on broad ridges and toeslopes in the Piedmont.
Madison	2-60%	medium to high, medium to rapid surface runoff	The Madison series consists of well drained, moderately permeable soils that are formed in residuum weathered from felsic or intermediate, high-grade metamorphic or igneous rocks high in mica content. These soils are very deep to bedrock and moderately deep to saprolite, and are typically found on gently sloping to steep uplands in the Piedmont.
Pacolet	2-60%	medium to high, medium to rapid surface runoff	The Pacolet series consists of well drained, moderately permeable soils that are formed in residuum weathered from felsic igneous and metamorphic rocks. Pacolet soils are typically found on gently sloping to steep Piedmont uplands.
Riverview-Chewacla Association*	0-5%	Low, negligible to slow surface runoff	The Riverview series consists of well drained, moderately permeable soils that are formed in loamy alluvium on floodplains. Riverview soils are typically found on high parts of floodplains of rivers and streams draining the Coastal Plain and southern Piedmont. The Chewacla series consists of somewhat poorly drained soils that are formed from alluvium on floodplains. Chewacla soils are typically found on floodplains on Piedmont and Coastal Plain river valleys.
Wedowee	0-60%	medium to high, medium to rapid surface runoff	The Wedowee series consists of well drained, moderately permeable soils that are formed in residuum weathered from felsic igneous and metamorphic rocks. Wedowee soils are typically found on narrow ridges and side slopes of the Piedmont uplands.

* = Listed as a hydric soil

Field soil samples were taken to a minimum depth of 12 inches. The soils were studied for examples of hydromorphic features (i.e., oxidized rhizospheres, redox concentrations, redox depletions, low chroma, concretions, and water saturation). *Munsell Soil Color Charts* (Kollmorgen Instruments Corporation, 1994) were used to determine hue, value, and chroma of both the matrix and the mottle colors of each horizon. Hue indicates the relationship to the primary colors in the spectrum of white light; value indicates the lightness of the color; and chroma represents the strength. A low chroma soil with bright mottles or gleyed soil indicates a hydric soil if the low chroma is a result of a reducing environment rather than natural color or parent materials. A low chroma soil generally has a matrix chroma of 2 or less in mottled soils or a matrix chroma of 1 or less in unmottled soils.

Hydrology

Finally, wetland hydrology is the driving force for the creation of hydric soils and the development of hydrophytic vegetative communities. Observing field indicators can assess hydrology. Research suggests that the most influential factor for plant community development is the duration of soil saturation or inundation, rather than the frequency of the event. In addition, the presence of wetland hydrology is essential during the growing season. The growing season is defined as the period in which soil temperatures are above 5°C (41.5°F) or as the period between the last frost of spring and the first frost of winter. A classification system of wetland hydrologic zones for non-tidal areas, developed by the Department of the Army Waterways Experiment Station, is presented in Table 4 (USACE, *1987).*

Table 4
Hydrologic Zones* - Non-Tidal Areas

Zone	Name	Duration**	Comments
I†	Permanently inundated	100%	Inundation > 6.6 feet mean water depth
II	Semi-permanently to approximately permanently inundated or saturated	> 75% - < 100%	Inundation defined as ≤ 6.6 feet mean water depth
III	Regularly inundated or saturated	> 25% - 75%	
IV	Seasonally inundated or saturated	> 12.5% - 25%	
V	Irregularly inundated or saturated	≤ 5% - 12.5%	Many areas having these hydrologic characteristics are not wetlands
VI	Intermittently or never inundated or saturated	< 5%	Areas with these hydrologic characteristics are not wetlands

* Zones adapted from Clark and Benforado (1981).
** Refers to duration of inundation and/or soil saturation during the growing season.
† This defines an aquatic habitat zone.

Analysis of the hydrology parameter for a Routine Determination involves reviewing a study area for indicators of extended periods of hydrology. Some indicators of wetland hydrology are identified in the 1987 *Federal Manual.* These indicators include recorded data, visual observation of inundation, visual observation of soil saturation, watermarks, drift lines, sediment deposits, drainage patterns within the wetlands, oxidized rhizospheres by live roots within the soil profile, and water-stained leaves. In addition, the presence of wetland hydrology may be inferred from certain morphological, physiological, and reproductive adaptations of plants to an anaerobic environment. Morphological adaptations can only be determined in the field. Examples of morphological adaptations include buttressed tree trunks, pneumatophores, adventitious roots, shallow root systems, inflated vegetative structures, polymorphic leaves, floating leaves and stems, hypertrophied lenticels, and multi-trunks or stooling. The facultative-neutral option also can be used as a secondary indicator of wetland hydrology.

Study Results

Field studies identified the presence of nine jurisdictional wetlands, seventeen jurisdictional streams, and one open water within the proposed transmission line corridor. The jurisdictional wetlands were classified as palustrine emergent, palustrine forested, or a combination of both systems. The jurisdictional wetlands were delineated using fluorescent pink flagging marked - WETLAND BOUNDARY. The jurisdictional waters were classified as riverine lower perennial, intermittent, ephemeral drainages, and palustrine open waters. Intermittent and lower perennial streams were flagged with blue and white striped flagging. Jurisdictional areas were located with a Trimble GeoXH Global Positioning System (GPS). Following is a brief description and table of the characteristics for each type of jurisdictional system encountered. Please refer to Figures 6a - 6h for the locations of jurisdictional features. Representative photographs of jurisdictional features are provided in Appendix C.

Jurisdictional Wetland Characteristics

The study corridor for the proposed Dresden – Heard County 500 kV Transmission Line includes nine jurisdictional wetlands. These wetlands are classified as palustrine, emergent or forested systems. Below are brief descriptions of these wetland systems encountered.

Palustrine Emergent Wetland Systems (PEM)

Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin, 1989). Emergent wetlands typically occur in agricultural fields, ROWs, and may be found in isolated depressions, on seepage slopes, or along narrow streams. One wetland data point was taken within each jurisdictional wetland to determine individual characteristics.

Typical Wetland Characteristics

Dominant vegetation within palustrine emergent systems delineated along the existing line typically includes the following species:

Scientific Name	Common Name	Indicator Status
Ludwigia sp.	seedbox	FACW-OBL
Scirpus cyperinus	woolgrass	OBL
Carex intumescens	bladder sedge	FACW
Dicanthelium scoparium	velvet panicum	FACW
Arundinaria gigantea	giant cane	FACW
Juncus effusus	soft rush	FACW+
Polygonum sagittatum	tear thumb	OBL

Scientific Name	Common Name	Indicator Status
Bidens aristosa	bearded beggerticks	FACW
Typha latifolia	broad-leaf cattail	OBL

Typically, indicators of wetland hydrology included saturated soils within the upper 12 inches, oxidized root channels, water-stained leaves, and drainage patterns in wetlands. Soil samples were taken from a depth of 0 to 12 inches. In most cases, soils at a depth of 0 to 12 inches had a matrix color of 10YR 5/1 or 10YR 4/2; however, some wetland systems exhibited soils with a matrix color of 2.5 YR 5/1 or10YR 4/1. Mottling and iron concentrations typically had a color of 10YR 6/6 or 10YR 4/6. Typically, the soil texture was sandy clay loam, clay loam or sandy loam. Typically, hydric soil indicators included reducing conditions and low chroma; therefore, indicating a depleted matrix per the hydric soil indicators.

Palustrine Forested Wetland System

Forested wetland systems are dominated by deciduous and/or evergreen species. The dominant stratum in a forested wetland system is an upper canopy tree layer. One wetland data point was taken within each jurisdictional wetland to determine individual characteristics. Specific wetland data sheets will be provided upon request.

Typical Wetland Characteristics

Dominant vegetation within palustrine, forested systems delineated along the proposed line include the following species.

Scientific Name	Common Name	Indicator Status
Acer rubrum	red maple	FAC
Alnus serrulata	brook-side alder	FACW+
Salix nigra	black willow	OBL
Liquidambar styraciflua	sweet-gum	FAC+
Nyssa biflora	swamp black gum	OBL
Lindera benzoin	spicebush	OBL
Juncus effusus	soft rush	FACW+
Woodwardia areolata	netted chain fern	OBL
Osmunda regalis	royal fern	OBL
Osmunda cinnamomea	cinnamon fern	FACW+

Typically, indicators of wetland hydrology included saturated soils within the upper 12 inches, watermarks, water-stained leaves, and drainage patterns in wetlands. Soil samples were taken from a depth of 0 to 12 inches. In most cases, soils at a depth of 0 to 12 inches had a matrix color of 10YR 3/2; however, some wetland systems had soils with a matrix color of 10YR 3/1, 10YR 4/1, or 10YR 4/2. Mottling and iron concentrations typically had a matrix color of 10YR 4/6. Typically, hydric soil indicators included reducing conditions and low chroma.

Upland Characteristics

Typical Upland Surroundings

Data for the upland areas surrounding jurisdictional wetland systems were also collected. The typical species found in the upland areas include the following species. Specific upland data sheets can be provided upon request.

Scientific Name	Common Name	Indicator Status
Pinus taeda	loblolly pine	FAC
Cornus florida	flowering dogwood	FACU+
Carya glabra	sweet pignut hickory	FACU
Quercus alba	white oak	FACU
Quercus falcata	southern red oak	FACU-
Liquidambar styraciflua	sweet-gum	FAC
Liriodendron tulipifera	tulip tree	FAC
Fagus grandifolia	American beech	FACU-
Rubus argutus	serrate-leaf blackberry	FACU
Smilax rotundifolia	common greenbrier	FAC
Polystichum acrostichoides	Christmas fern	FAC
Festuca arundinacea	Kentucky fescue	FAC-
Andropogon virginicus	broom-sedge	FAC-

Upland habitats have insufficient indicators of wetland hydrology or hydric soils. Soil samples taken from a depth of 0 to 12 inches had a matrix color of 10YR 4/6. There are some areas in which the upland soils matrix color was 10YR 6/6 or 10YR 4/4. For each of the surrounding upland areas, the data point was determined to be outside of the wetland area, because all three wetland parameters were not met.

Please refer to Table 5 for a summary of the jurisdictional wetlands identified.

Table 5
Summary of Jurisdictional Wetlands

I.D.	Figure Location	USGS Stream Association	Cowardin Class	Rapanos (abutting/adjacent/ isolated)	Existing Condition	Lost Kind	Size (Acres) surveyed
J Wet 1	6a	Tributary to Hilly Mill Creek	PFO1B	abutting	Class 2	Kind A	0.37
J Wet 2	6a	Tributary to Hilly Mill Creek	PFO1B	abutting	Class 3	Kind A	0.83
J Wet 3	6b / 6c	Tributary to Hilly Mill Creek	PEM1E	abutting	Class 5	Kind D	0.27

Table 5
Summary of Jurisdictional Wetlands

I.D.	Figure Location	USGS Stream Association	Cowardin Class	Rapanos (abutting/adjacent/ isolated)	Existing Condition	Lost Kind	Size (Acres) surveyed
J Wet 4	6d	Tributary to Caney Creek	PFO1B	abutting	Class 4	Kind E	0.04
J Wet 5	6d	Tributary to Caney Creek	PFO1B	abutting	Class 3	Kind A	0.08
J Wet 6	6f	Tributary to Caney Creek	PFO1B	abutting	Class 2	Kind A	3.72
J Wet 7	6g	Tributary to Davis Branch	PFO/PEM1E	abutting	Class 3/5	Kind A/E	0.77
J Wet 8	6h	Tributary to Davis Branch	PFO1B	abutting	Class 2	Kind A	0.58
J Wet 9	6h	Tributary to Davis Branch	PFO1B	abutting	Class 2	Kind A	0.61

Jurisdictional Water Characteristics

The study corridor for the proposed Dresden – Heard County 500 kV Transmission Line includes eighteen jurisdictional waters. These waters are classified as riverine lower perennial streams, riverine intermittent streams, and palustrine open water. Typically, the size of stream, flow characteristics, position in the watershed, and substrate determines the classification. Below is a brief description of each system encountered.

Lower Perennial Streams

Streams classified as riverine lower perennial typically contain substrates of cobble-gravel, sand, mud, and/or bedrock. Perennial streams must have flow, channel morphology, and substrate characteristics that indicate year-round flowing conditions. The size of lower perennial streams located within the project corridor varies between three and 12 feet in width at the top of channel (TOC). Pursuant to the Rapanos decision, perennial stream systems are characteristic of Relatively Permanent Waters (RPW), Traditional Navigable Waters (TNW), or both. There are thirteen riverine lower perennial stream systems within the proposed corridor surveyed.

Intermittent Streams

Streams classified as riverine intermittent typically contain substrate of gravel, sand, mud, vegetation, and organic material. The size of intermittent streams located within the project corridor varies between one and five feet in width at the TOC. Intermittent stream flow is periodically driven by groundwater, and will typically have an obvious groundwater initiation point, known as a groundwater discharge area. Often these areas are small pools or wetland areas at the head of the stream. Intermittent streams will flow more consistently from late fall to early spring, because the water table is closer to the surface due in part to reduced evapotranspiration. Pursuant to the Rapanos decision, intermittent stream systems are typically characteristic of seasonal drainages; therefore, are classified as seasonal relatively permanent waters (SRPW). There are four riverine intermittent stream systems within the proposed corridor surveyed.

Open Waters

Palustrine open waters are typically impoundments or depressions that hold water for most of the year. Palustrine open waters typically have a defined bank with little to no vegetation. These open waters are generally less than 20-acres in size and have shallow average depths. In general, these open waters often serve as irrigation ponds for farming or for minimal recreational activity. There is one palustrine open water system within the proposed corridor surveyed. This open water system is classified as relatively permanent water since it serves as an impoundment to existing permanent water.

Please refer to Table 6 for a summary of jurisdictional waters identified within the surveyed corridor.

Table 6
Summary of Jurisdictional Waters

I.D	Figure Location	USGS Stream Association	Cowardin Class	Rapanos	Hydrologic Unit	High Priority Water (Yes/No)	303(d) Water (Yes/No)	Trout Water (Yes/No)	Approx Width (ft)	Approx Depth (ft)
J Wat 1	6a	Tributary to Hilly Mill Creek	R2UB23	RPW	03130002	No	No	No	10-12	1-3
J Wat 2	6a	Tributary to Hilly Mill Creek	R2UB23	RPW	03130002	No	No	No	3-6	2-4
J Wat 3	6a	Tributary to Hilly Mill Creek	R2UB23	RPW	03130002	No	No	No	3-5	2-4
J Wat 4	6a	Tributary to Hilly Mill Creek	R4SB34	SRPW	03130002	No	No	No	2-3	1-2
J Wat 5	6b	Tributary to Hilly Mill Creek	R2UB23	RPW	03130002	No	No	No	3-5	2-3
J Wat 6	6b / 6c	Tributary to Hilly Mill Creek	POW	RPW	03130002	No	No	No	NA	3-6

Table 6
Summary of Jurisdictional Waters

I.D	Figure Location	USGS Stream Association	Cowardin Class	Rapanos	Hydrologic Unit	High Priority Water (Yes/No)	303(d) Water (Yes/No)	Trout Water (Yes/No)	Approx Width (ft)	Approx Depth (ft)
J Wat 7	6b / 6c	Tributary to Hilly Mill Creek	R4SB457	SRPW	03130002	No	No	No	4-6	2-4
J Wat 8	6d	Tributary to Caney Creek	R2UB12	RPW	03130002	No	No	No	5-7	3-4
J Wat 9	6d	Tributary to Caney Creek	R2UB12	RPW	03130002	No	No	No	8-10	4-6
J Wat 10	6d	Tributary to Caney Creek	R4SB45	SRPW	03130002	No	No	No	2-4	1-4
J Wat 11	6d	Tributary to Caney Creek	R2UB12	RPW	03130002	No	No	No	4-6	3-4
J Wat 12	6e	Tributary to Caney Creek	R2UB123	RPW	03130002	No	No	No	10-12	6-7
J Wat 13	6f	Tributary to Caney Creek	R2UB23	RPW	03130002	No	No	No	6-8	3-4
J Wat 14	6f	Tributary to Caney Creek	R4SB45	SRPW	03130002	No	No	No	3-5	2-3
J Wat 15	6f	Caney Creek	R2UB23	RPW	03130002	No	No	No	4-10	2-4
J Wat 16	6g	Tributary to Davis Branch	R2UB23	RPW	03130002	No	No	No	3-8	1-3
J Wat 17	6h	Tributary to Davis Branch	R2UB12	RPW	03130002	No	No	No	8-10	3-4
J Wat 18	6h	Tributary to Davis Branch	R2UB23	RPW	03130002	No	No	No	5-7	3-4

SECTION 4
Permit Considerations

SECTION 4
Permit Considerations

Section 404 Overview

Section 404 of the Clean Water Act provides the Secretary of the Army, acting through the Chief of Engineers, the power to issue Individual Permits and to authorize the use of Nationwide Permits (NWP) for the discharge of dredged or fill materials (i.e. impacts) into the waters of the United States, including special aquatic sites and wetlands (Nation's Waters). District engineers have the authority to issue permits for activities in the Nation's Waters.

For many of the NWPs, a Pre-Construction Notification (PCN) must be submitted to alert the local district office of the USACE of the intent to use a NWP. The PCN must describe the wetland system, provide specifications of the proposed project, identify the prospective permittee, include a mitigation plan, if required, and include a delineation of affected wetlands. The USACE will request a review of the PCN by other resource agencies. Other resource agencies include USFWS, National Marine Fisheries Service, U.S. Environmental Protection Agency, State Historic Preservation Office, and, in the State of Georgia, the Department of Natural Resources. Information regarding Nationwide Permits was obtained from the Federal Register (USACE, 2007).

Anticipated USACE Permit Requirements

The USACE permits minor impacts to jurisdictional areas for utility line activities such as overhead utility lines, substations, access roads, and foundations for towers, poles and anchors under NWP 12 (utility line activities). NWP 12 authorizes the construction, maintenance, or repair of utility lines provided the activity does not result in the loss of greater than 0.5-acre of waters of the U.S. A PCN is required in the following cases:

- Discharges associated with the construction resulting in a temporary or permanent loss of jurisdictional waters of the U.S. (includes all intermittent streams, lower perennial streams, and wetlands), (also includes ephemeral drainages determined jurisdictional).
- Mechanized land clearing in a forested wetland for a utility line ROW.
- A project requiring Section 10 permitting.
- The utility line in waters of the U.S., excluding overhead lines, exceeds 500 linear feet.
- The utility line is placed within a jurisdictional area, and it runs parallel to a stream bed that is within that jurisdictional area.
- Permanent above-grade access/maintenance roads in waters of the U.S.
- Impervious permanent access roads constructed in waters of the U.S. (not to exceed 200 feet).

A PCN for NWPs 12 consists of avoidance and minimization analysis, a compensatory mitigation plan, and an assessment of any potentially significant historic or archaeological sites on or near the property.

NWPs 12 require that the following standards be followed for activities pertaining to utility lines. The construction, expansion, or maintenance of a substation in non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters, is allowed provided that a loss of no more than 0.5 acre occurs. Foundations for towers, poles and anchors must be the minimum size necessary and provide separate footings for each tower leg. Access roads in non-tidal waters, excluding non-tidal wetlands adjacent to tidal waters, must not cause the loss of more than 0.5 acre of non-tidal waters. The cumulative loss of waters of the U.S. for all crossings in one Hydrologic Cataloging Unit cannot exceed 10 acres of wetlands and/or 1,500 linear feet of stream.

Anticipated Project Impacts

As reported in Section 3: Jurisdictional Studies of this report, nine jurisdictional wetlands (determined palustrine, emergent or forested), seventeen jurisdictional streams (determined as riverine, intermittent or perennial), and one open water (determined as palustrine, open water) are located within the proposed corridor surveyed. A PCN will be required if streams and wetlands will be impacted as a result of fill or dredging activities associated with construction of the transmission line. Some existing access roads are readily available and will be utilized where possible, however; streams and/or wetlands may need to be crossed and some new access points may need to be established. The majority of impacts to wetlands and waters will likely be in the form of short culverts and/or at-grade rock ford crossings.

State and Local Regulations of Jurisdictional Waters

Georgia Environmental Protection Division

Per the Erosion and Sedimentation Act of 1975 and its 2003 and 2008 amendments, Chapter 7-17-9 states any land disturbing activities conducted by any electric membership corporation or municipal electric system or any public utility under the regulatory jurisdiction of the Public Service Commission, or any utility under the regulatory jurisdiction of the Federal Energy Regulatory Commission, or any agency or instrumentality of the United States engaged in generation, transmission, or distribution of power would be exempt from rules and regulations set forth in the 1975 Act, except when the electric membership, municipal electric membership, or public utility is considered a secondary permittee for a project located within a larger common plan of development. Requirements for an overhead utility to be exempt include (a) the new utility line right-of-way width does not exceed 200 linear feet, (b) utility lines are routed and constructed so as to minimize the number of stream crossings and disturbances to the buffer, (c) only trees and tree debris are removed from within the buffer resulting in only minor soil erosion, and (d) functional native riparian vegetation is re-established in any bare or disturbed areas within the buffer. Based on the aforementioned information, GTC would qualify for an exemption under Chapter 7-17-9 of the 2003 amendment to the Erosion and Sedimentation Act of 1975.

Stream buffer variances are not anticipated, because there should be no more than minimal land disturbing activities within the 25-foot designated stream buffer, except where it is necessary for access road enhancements. In addition, land disturbing activities will be perpendicular to state water. All vegetation within 25-foot buffers will be hand-cleared. Much of the material will be lopped and left as fallen; any material to be removed will be removed without skidding or dragging. Impacts associated with installation or replacement of culverts at stream crossings are considered minor and are also generally exempt from stream buffer requirements.

Coweta County

No additional buffer regulations will apply.

Heard County

No additional buffer regulations will apply.

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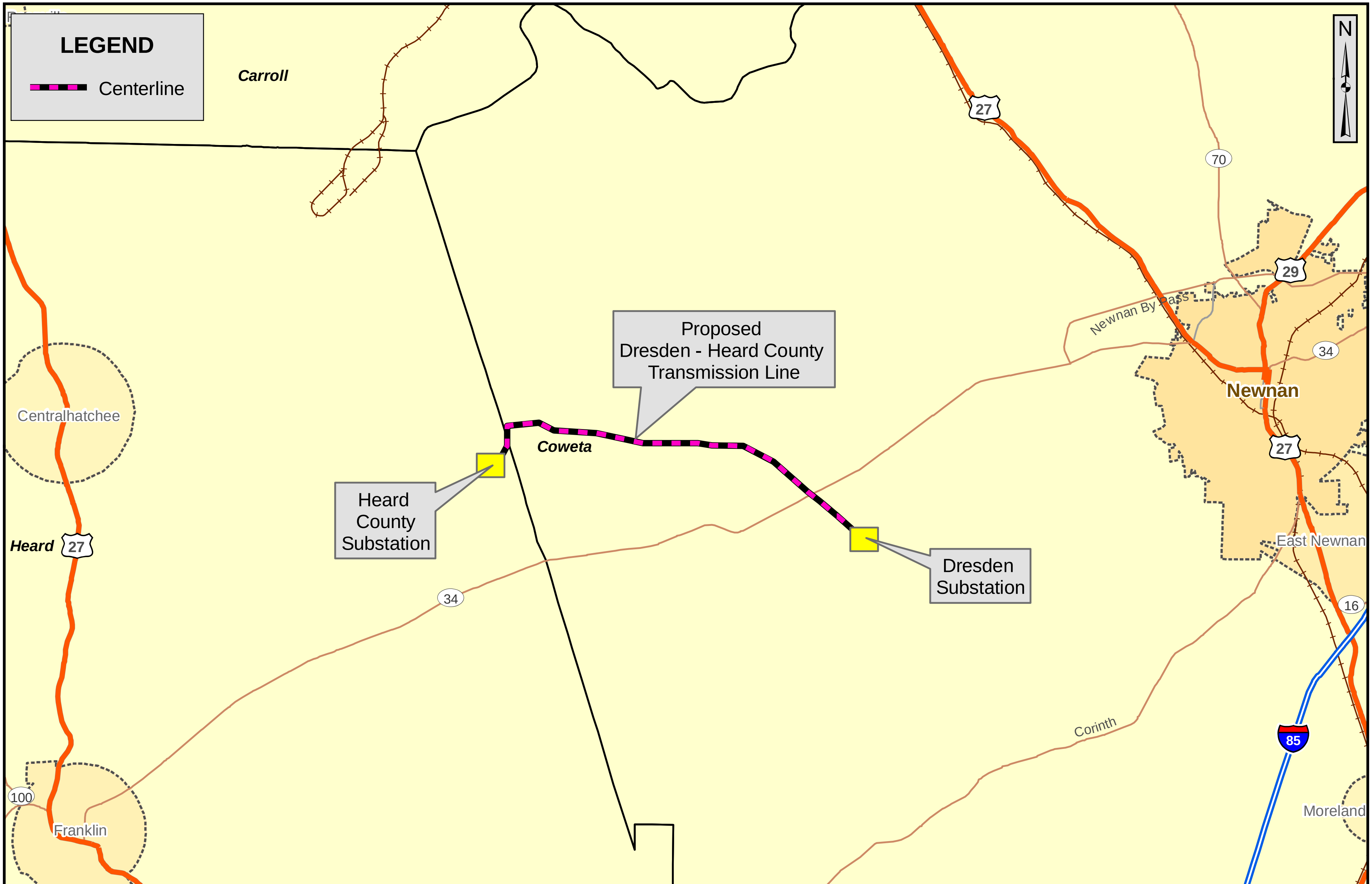
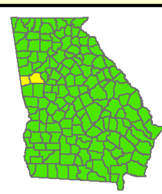
FIGURES



Georgia Transmission

JACOBS

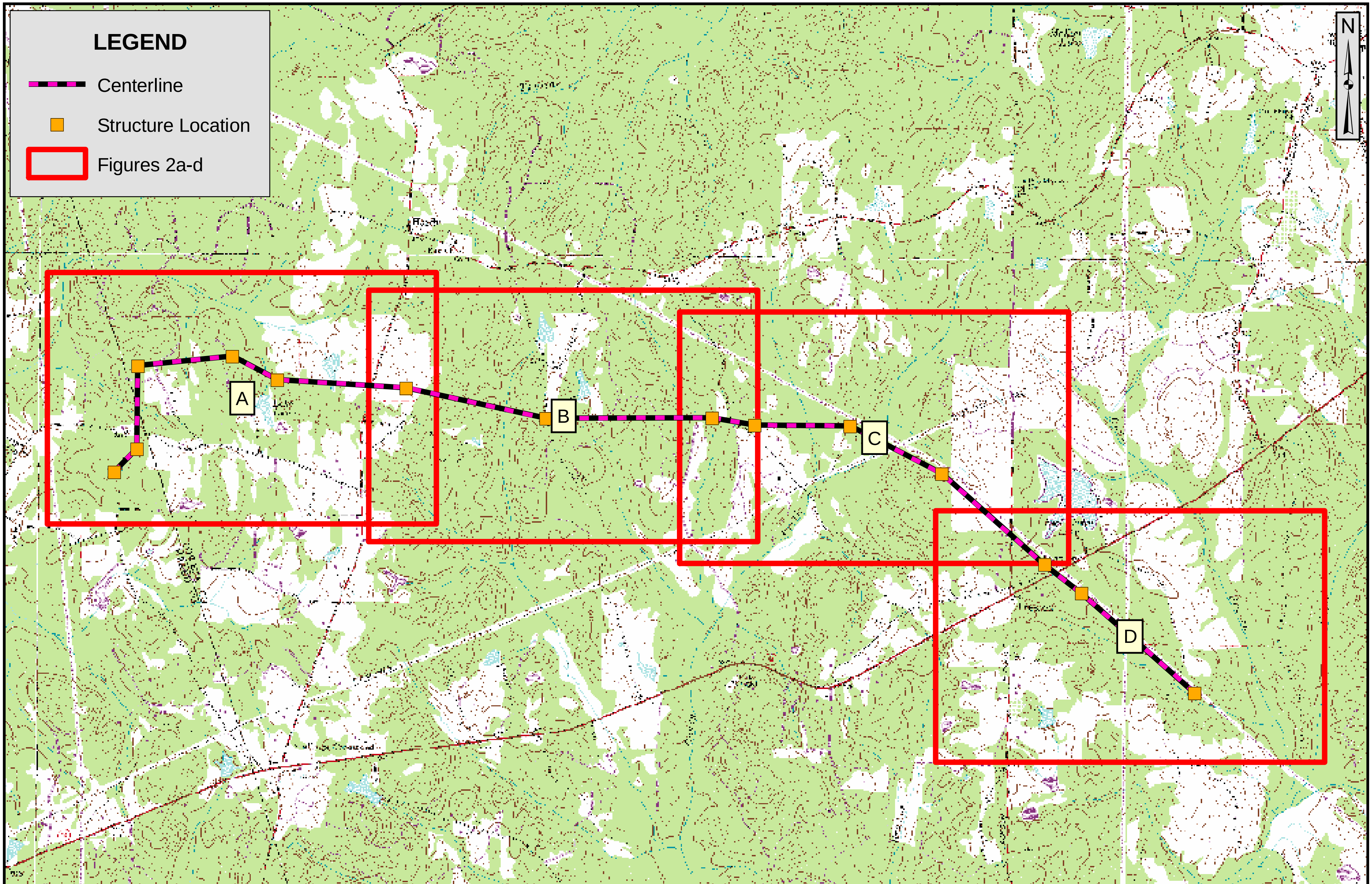


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Project Location Map

Date: September 2011
Scale: 1" = 2 mi
Proj. No.: EGXH2400

Figure 1



Georgia Transmission

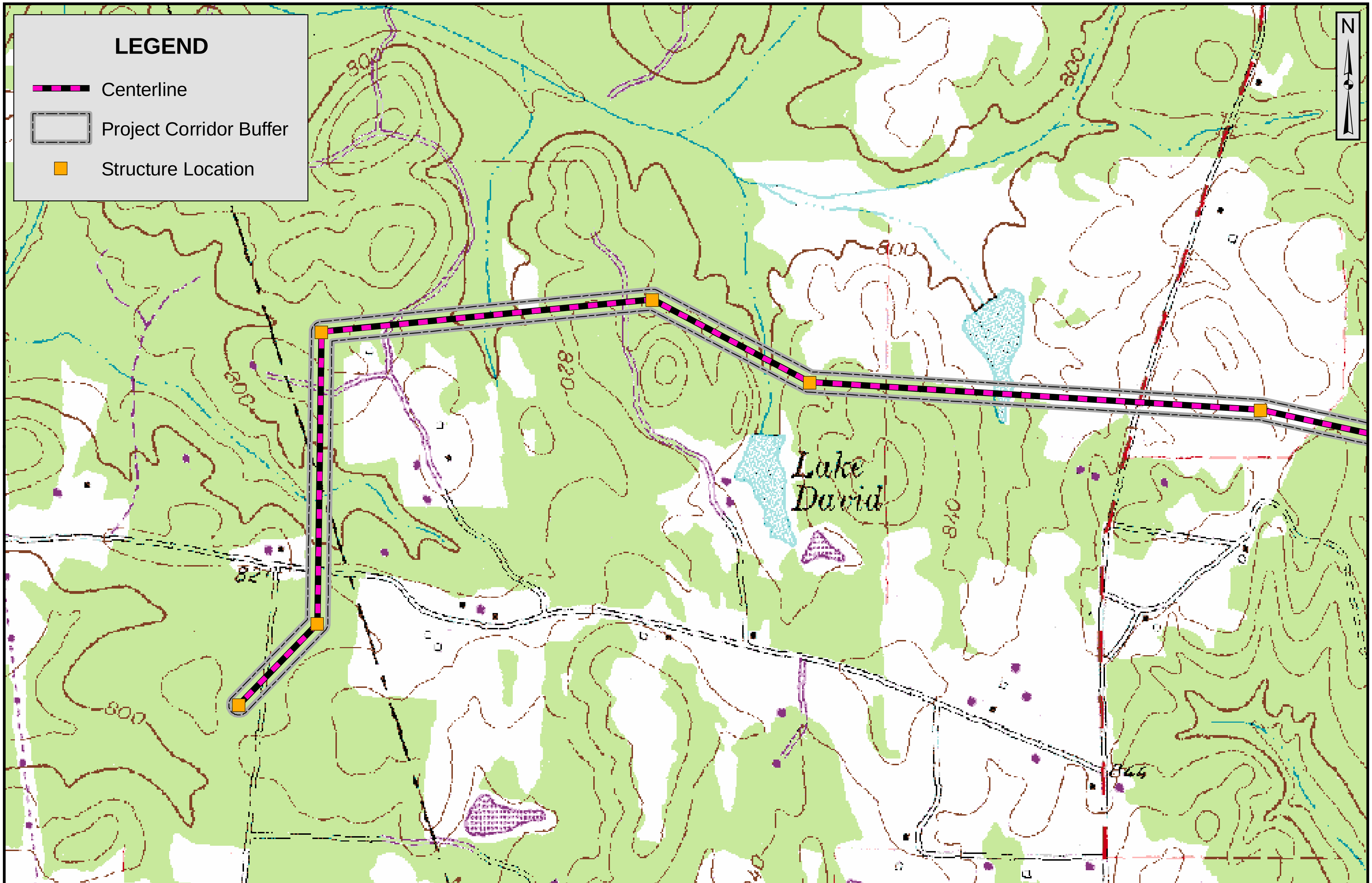
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Topographic Map

Date: September 2011
Scale: 1" = 3,500'
Proj. No.: EGXH2400

Figure 2 Index



Georgia Transmission

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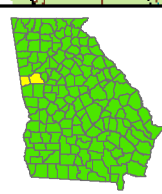
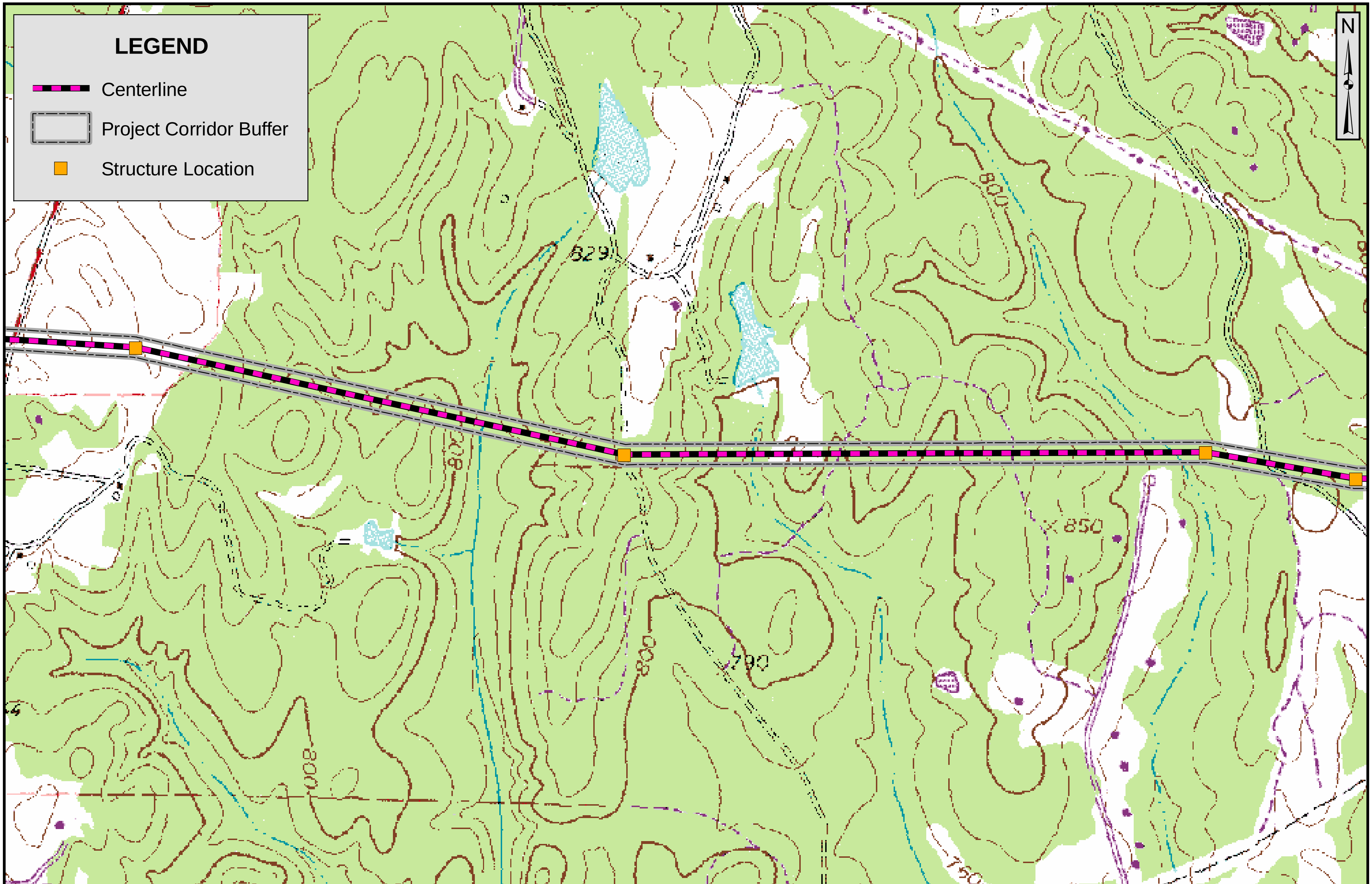


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Topographic Map

Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 2a



Georgia Transmission

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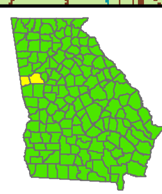
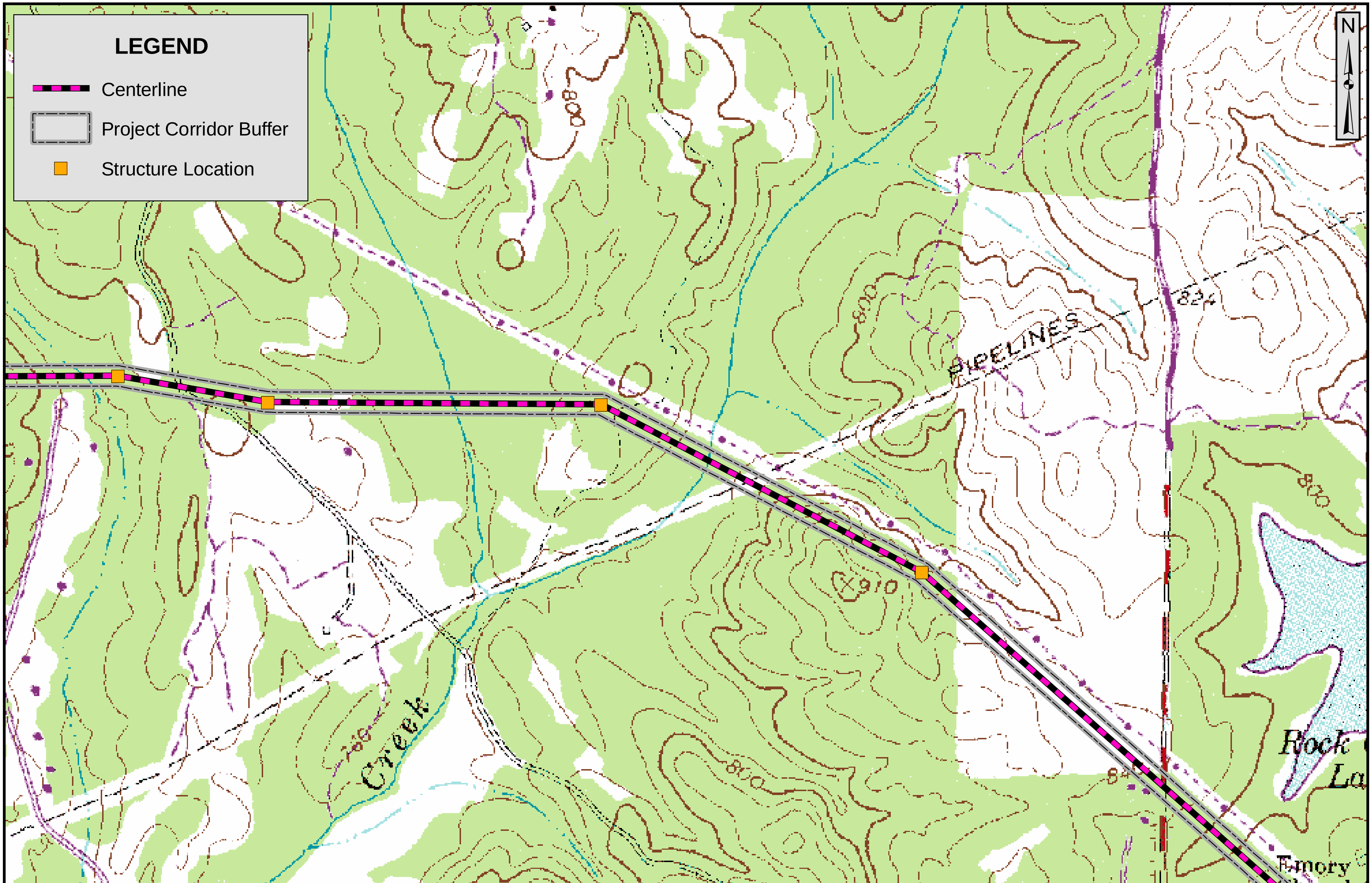


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Topographic Map

Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 2b



GeorgiaTransmission

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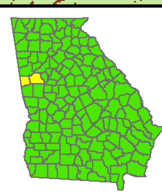
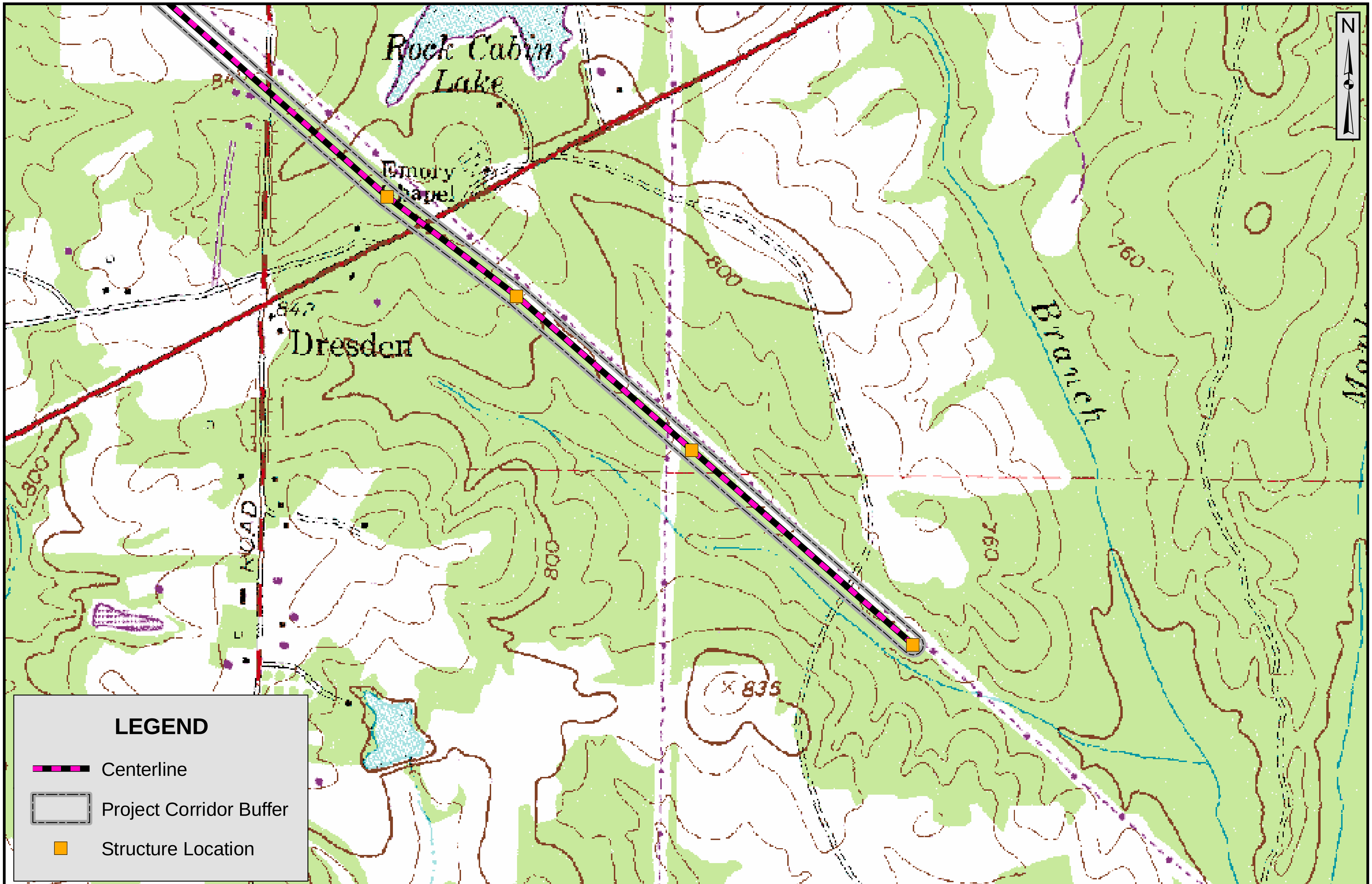


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Topographic Map

Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 2c



LEGEND

- Centerline
- Project Corridor Buffer
- Structure Location

Georgia Transmission

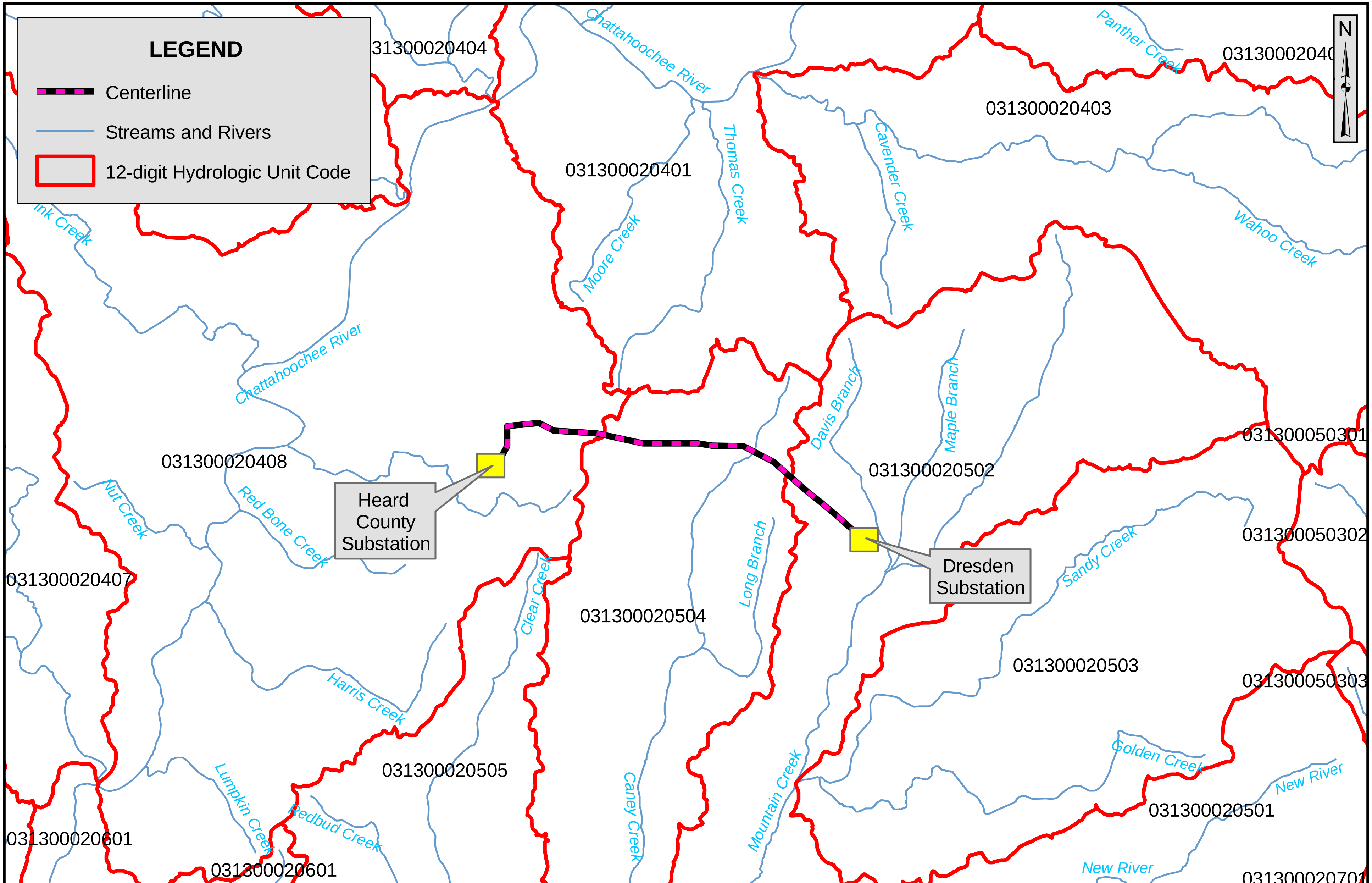
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Topographic Map

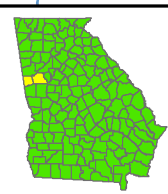
Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 2d



GeorgiaTransmission

JACOBS

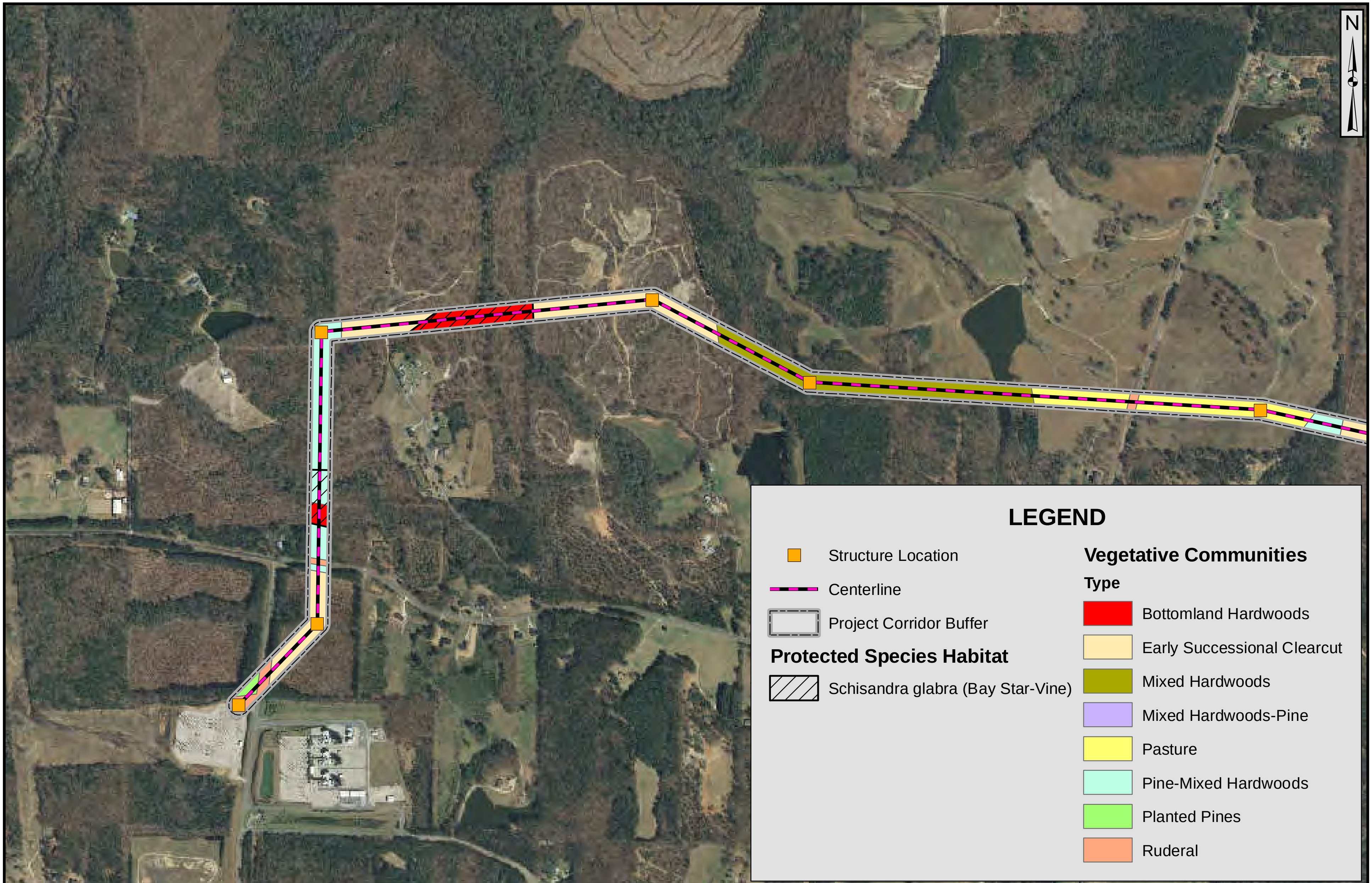


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Hydrologic Unit Code Map

Date: September 2011
Scale: 1" = 2 mi
Proj. No.: EGXH2400

Figure 3



GeorgiaTransmission

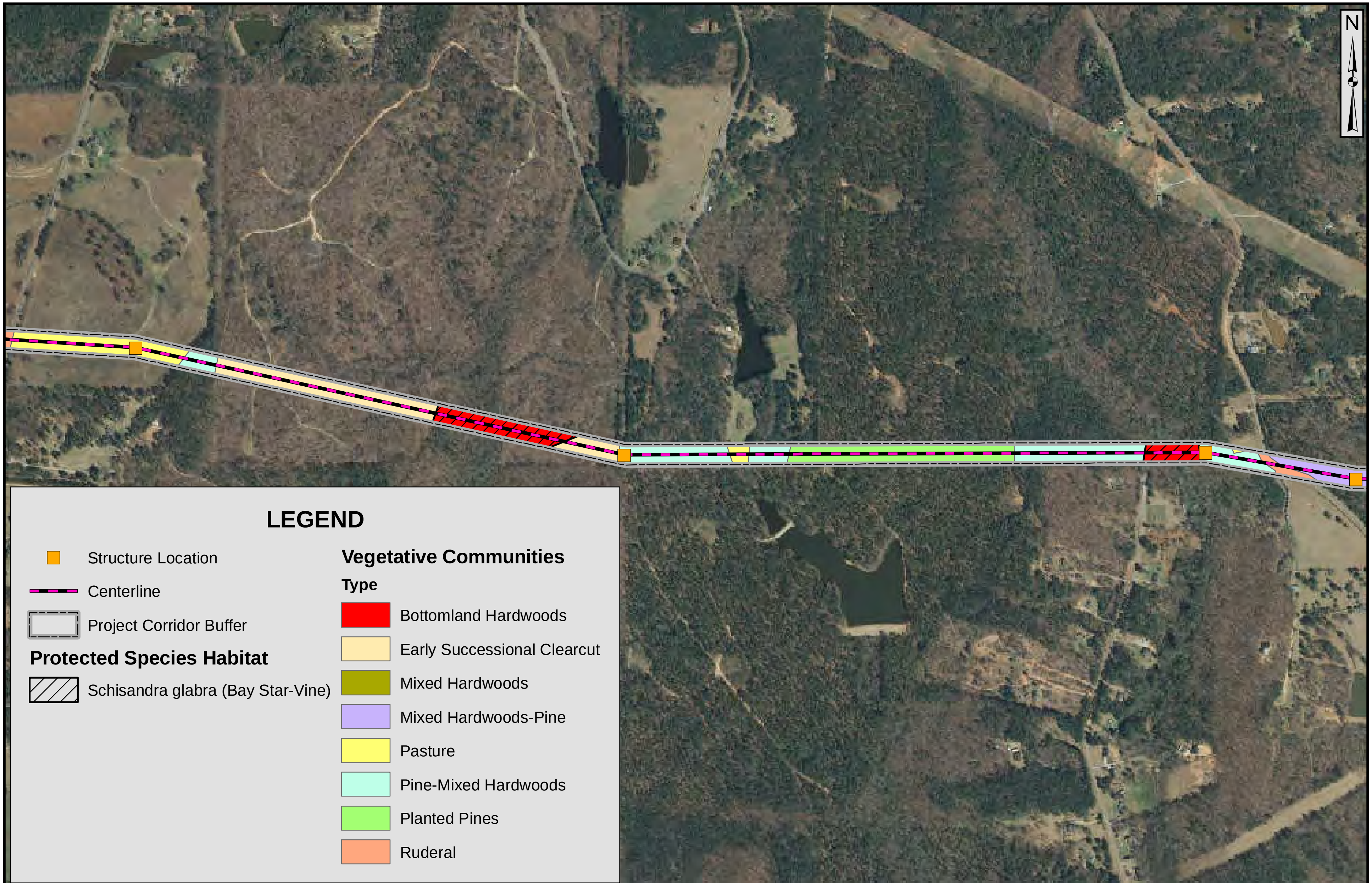
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Vegetative Community Map

Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 4a



LEGEND

- Structure Location
- Centerline
- Project Corridor Buffer

Protected Species Habitat

- Schisandra glabra (Bay Star-Vine)

Vegetative Communities

Type

- Bottomland Hardwoods
- Early Successional Clearcut
- Mixed Hardwoods
- Mixed Hardwoods-Pine
- Pasture
- Pine-Mixed Hardwoods
- Planted Pines
- Ruderal

GeorgiaTransmission

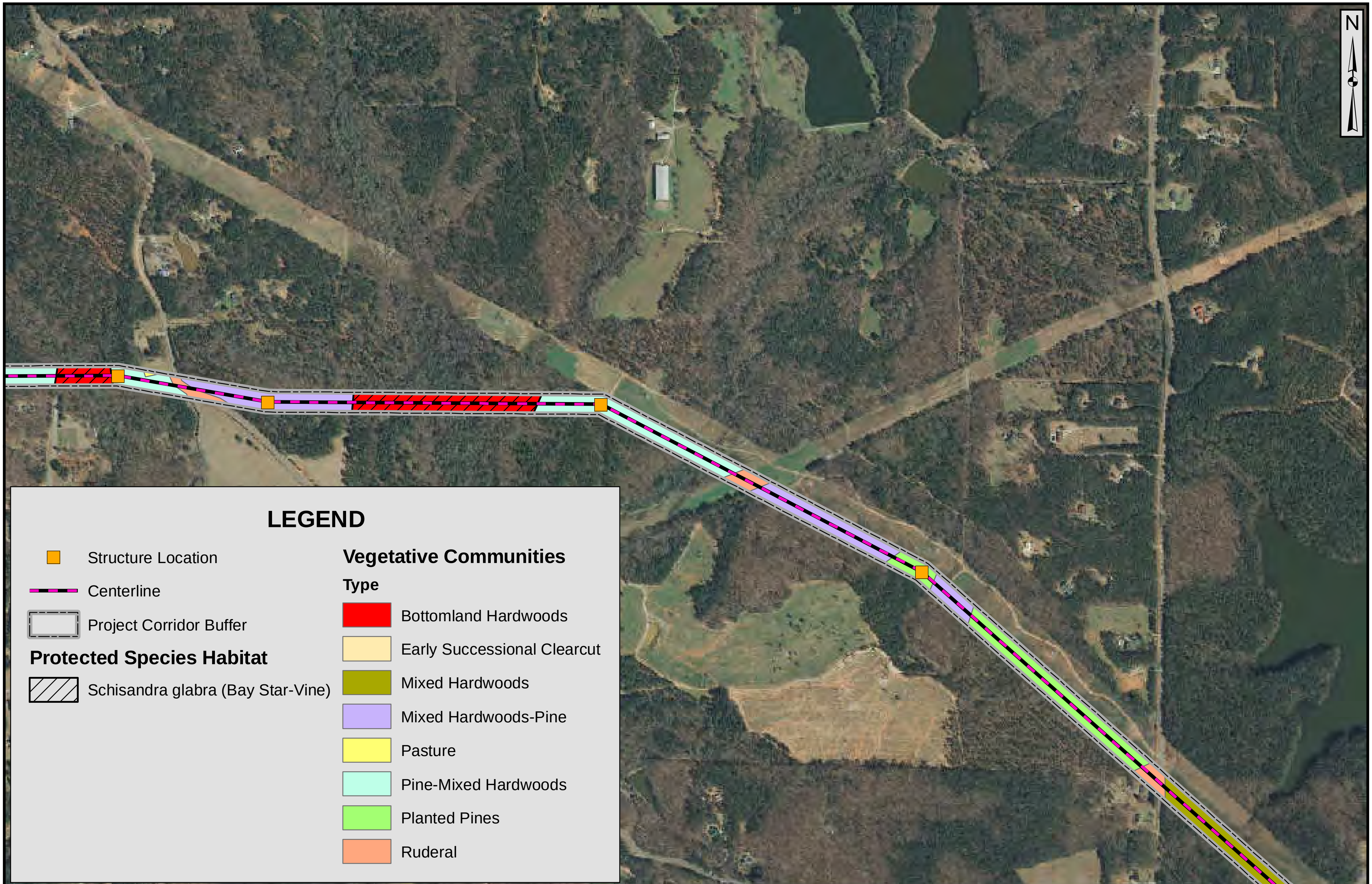
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Vegetative Community Map

Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 4b



LEGEND

- Structure Location
- Centerline
- Project Corridor Buffer

Protected Species Habitat

- Schisandra glabra (Bay Star-Vine)

Vegetative Communities

Type

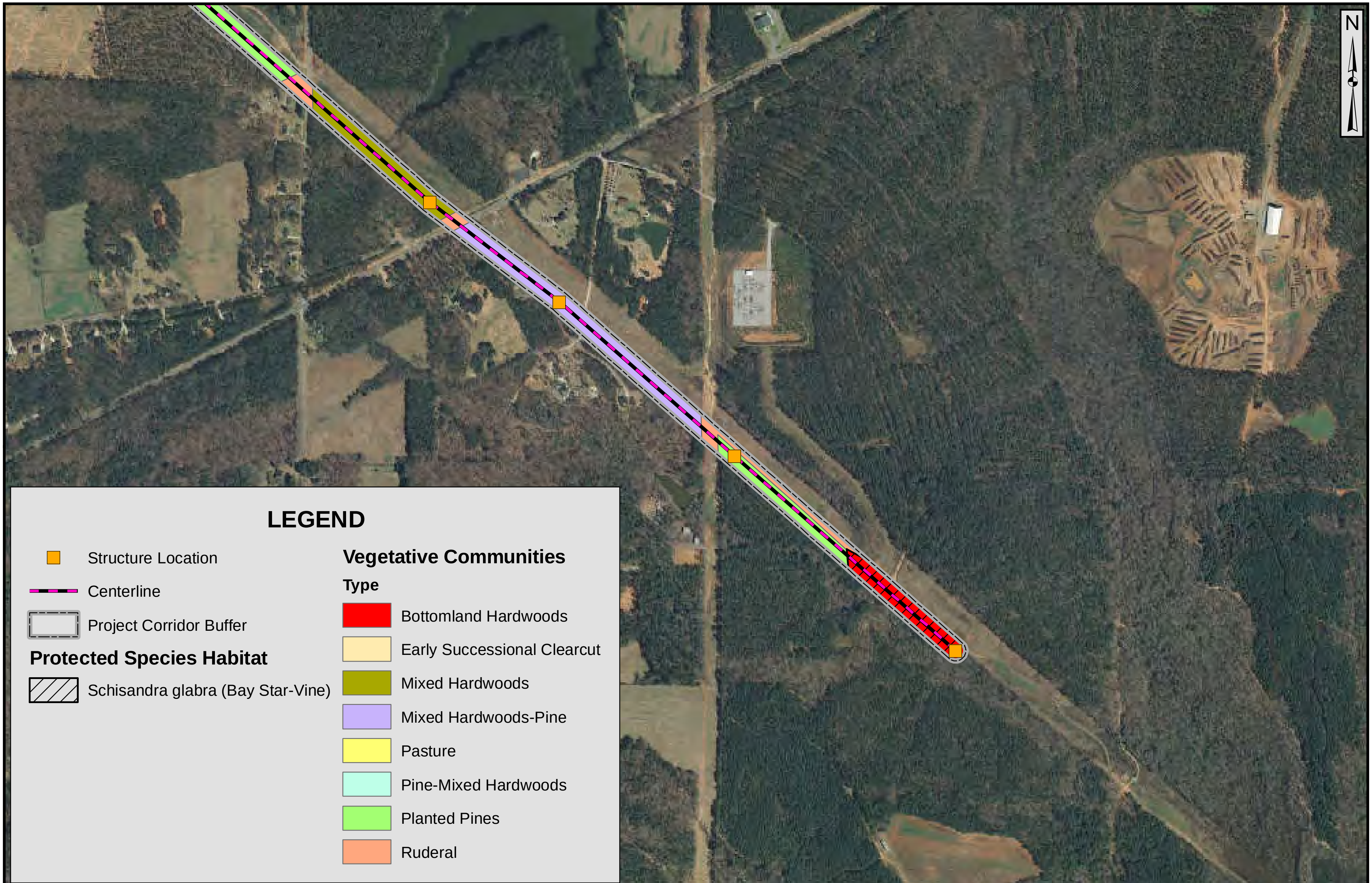
- Bottomland Hardwoods
- Early Successional Clearcut
- Mixed Hardwoods
- Mixed Hardwoods-Pine
- Pasture
- Pine-Mixed Hardwoods
- Planted Pines
- Ruderal

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Vegetative Community Map

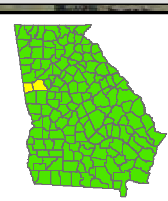
Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 4c



GeorgiaTransmission

JACOBS

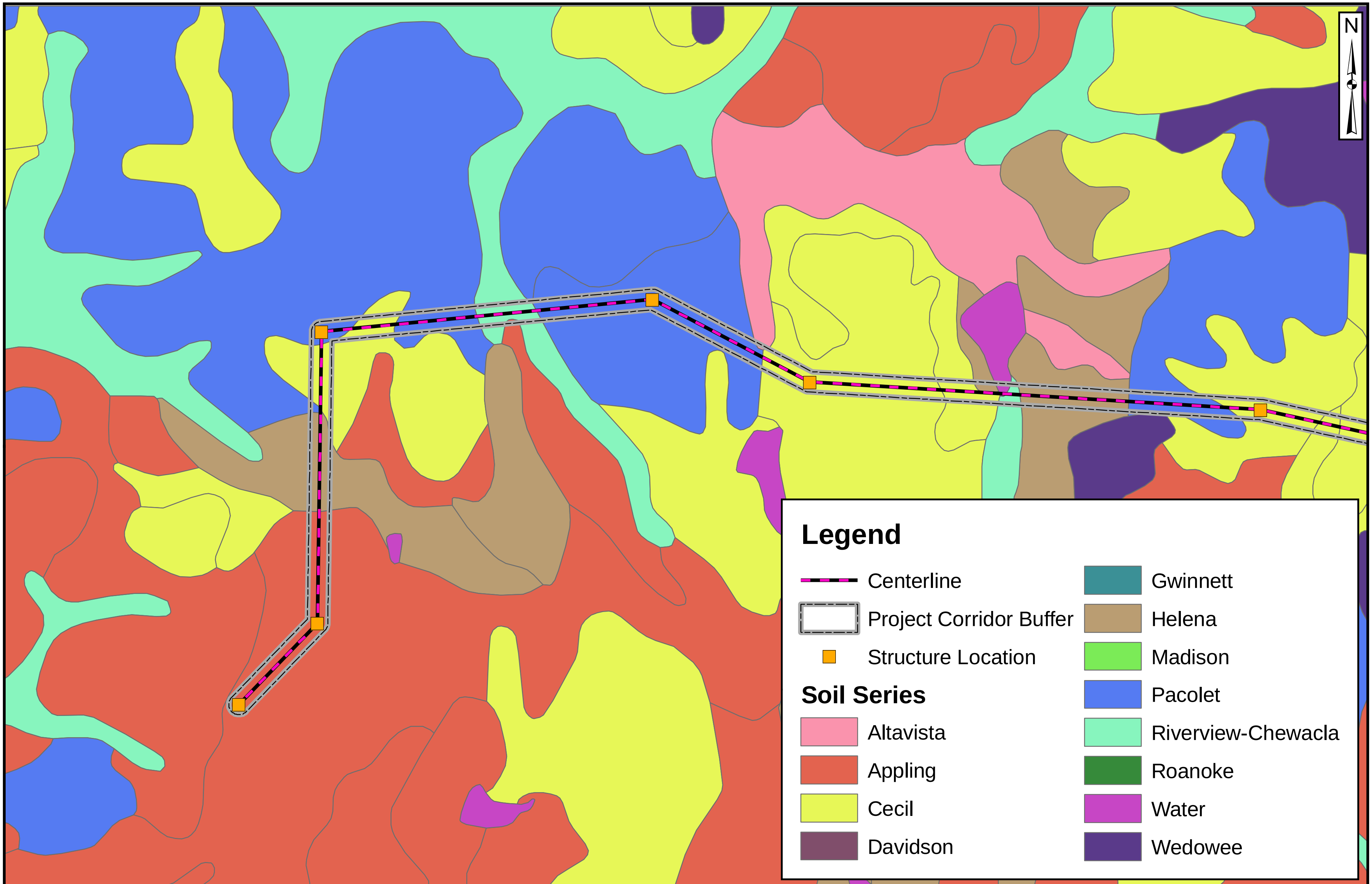


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Vegetative Community Map

Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 4d



GeorgiaTransmission

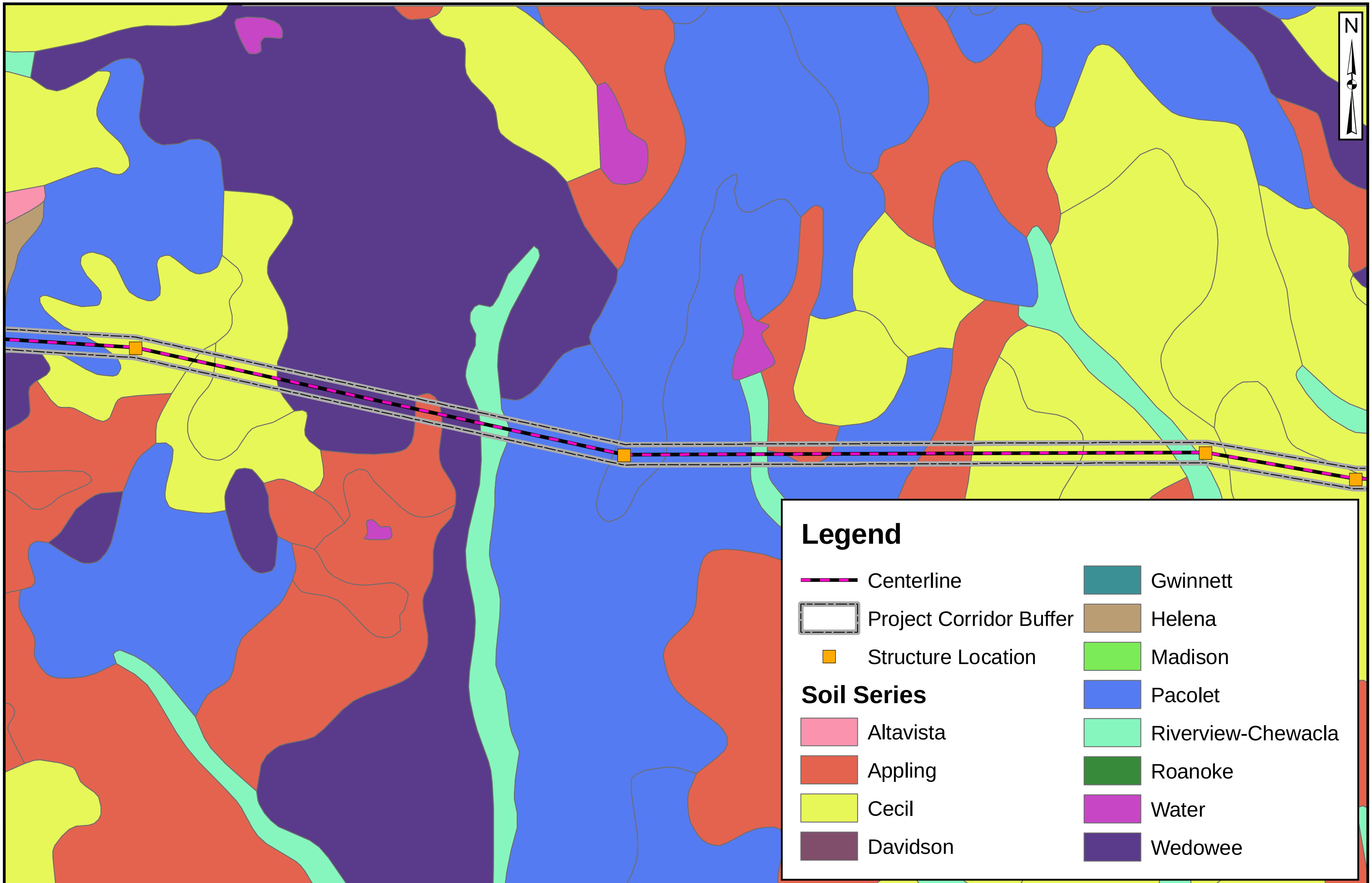
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Soils Map

Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 5a



GeorgiaTransmission

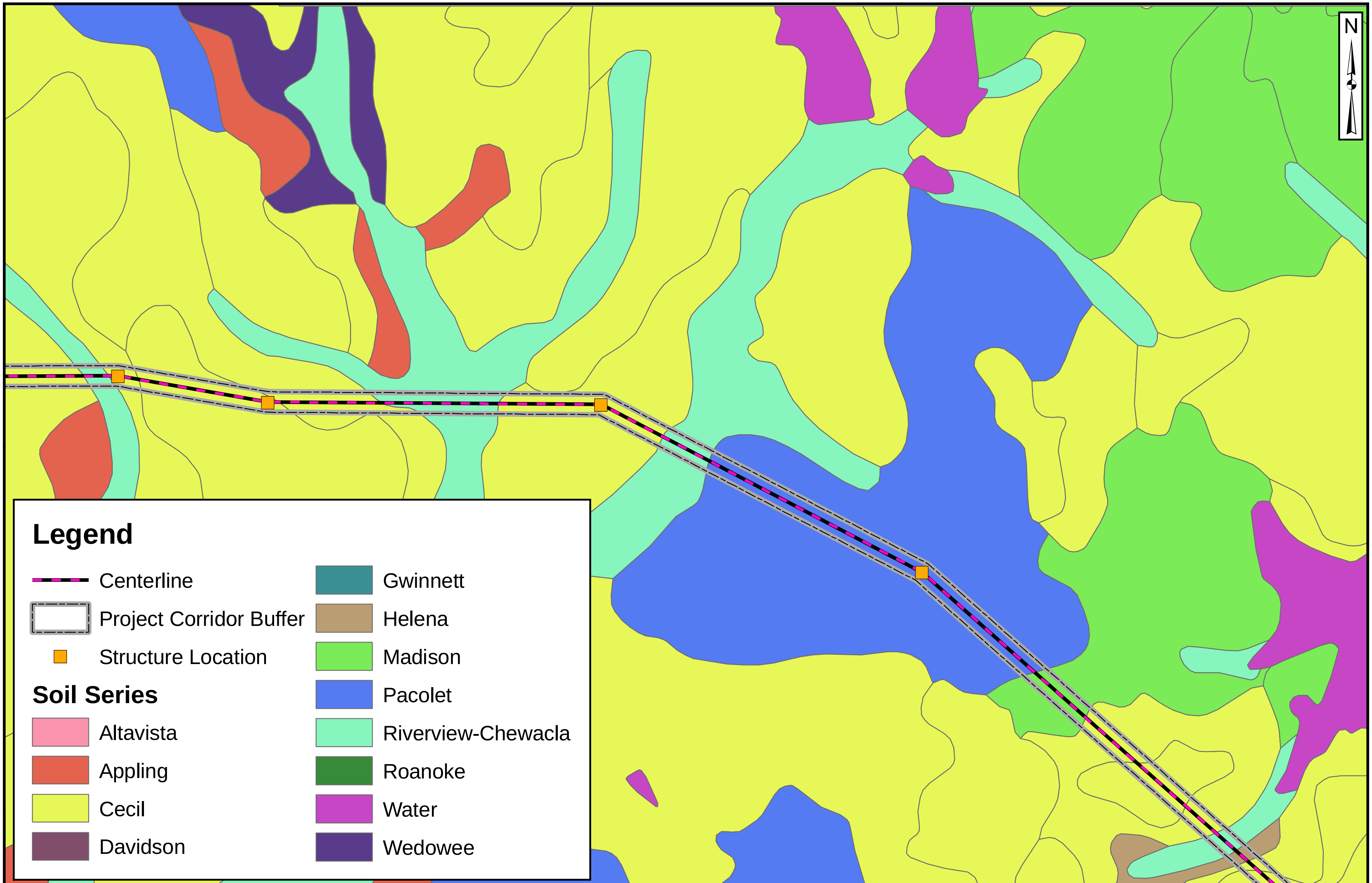
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Soils Map

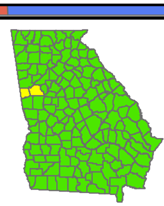
Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 5b



Georgia Transmission

JACOBS



Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

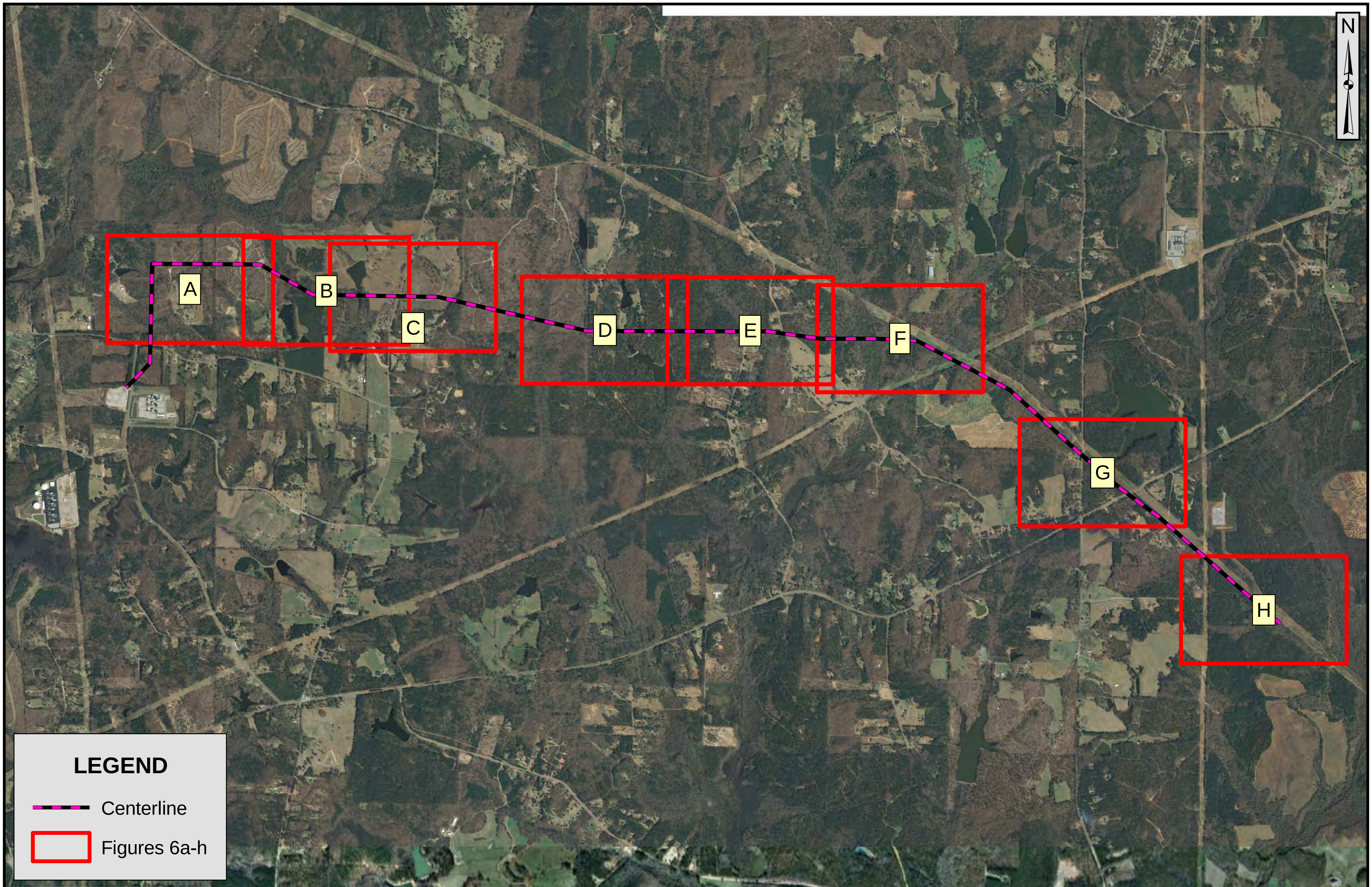
Soils Map

Date: September 2011

Scale: 1" = 1,000'

Proj. No.: EGXH2400

Figure 5c



Georgia Transmission

JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

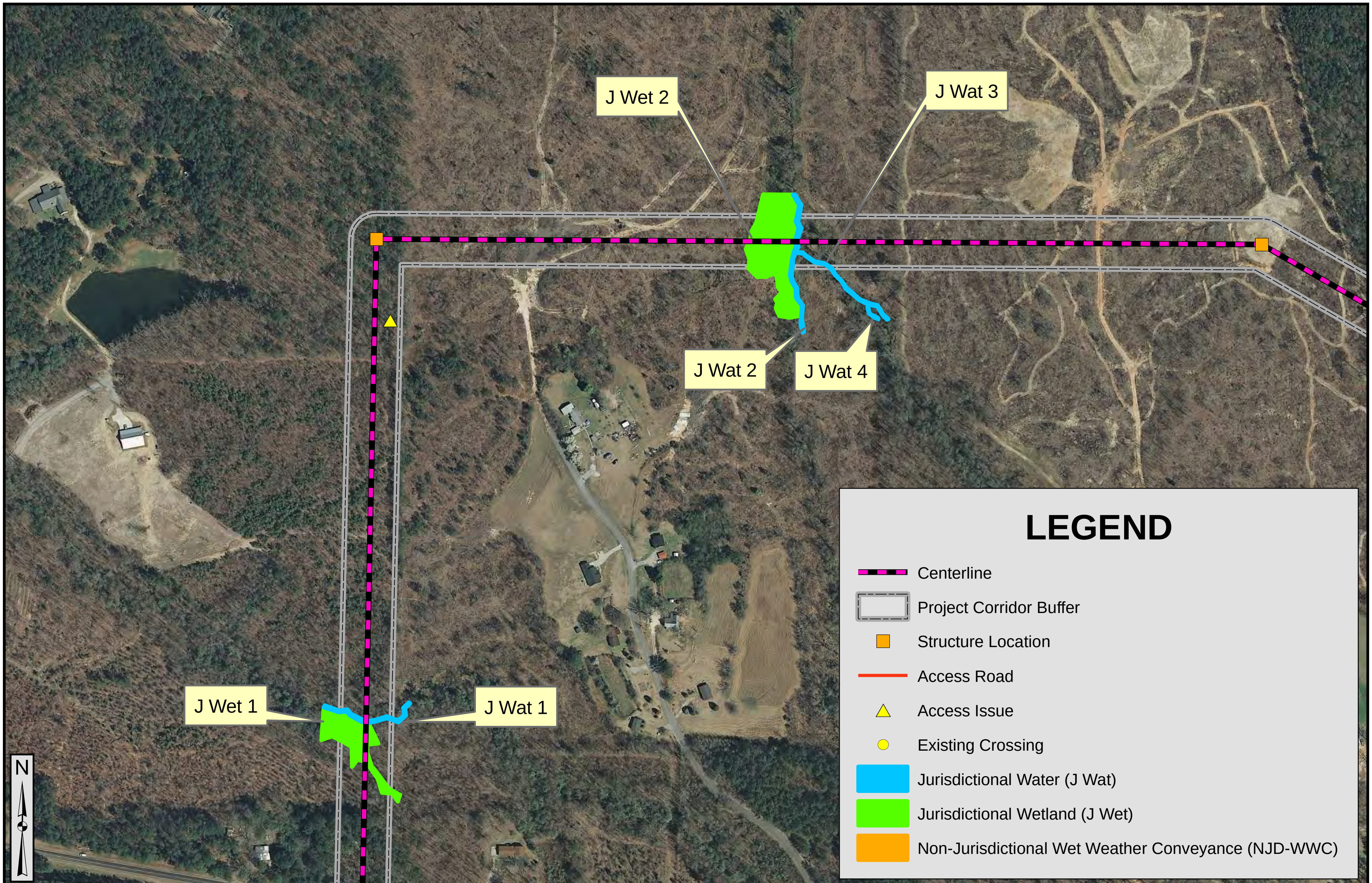
Jurisdictional Features Map

Date: February 2012

Scale: Not to Scale

Proj. No.: EGXH2400

Figure 6 Index



Georgia Transmission

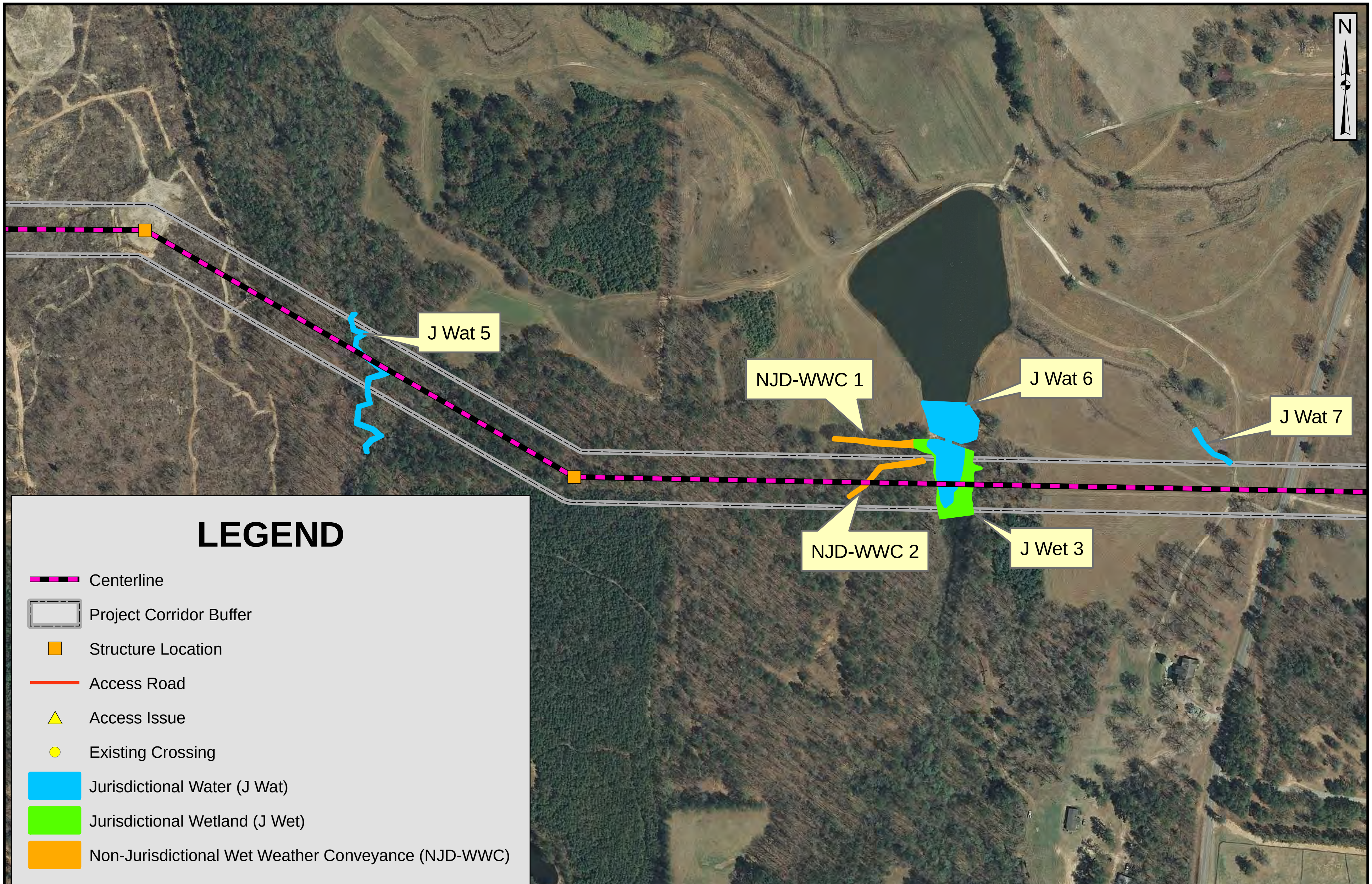
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

Date: February 2012
Scale: 1" = 400'
Proj. No.: EGXH2400

Figure 6a

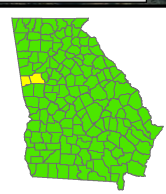


LEGEND

- Centerline
- Project Corridor Buffer
- Structure Location
- Access Road
- Access Issue
- Existing Crossing
- Jurisdictional Water (J Wat)
- Jurisdictional Wetland (J Wet)
- Non-Jurisdictional Wet Weather Conveyance (NJD-WWC)

Georgia Transmission

JACOBS

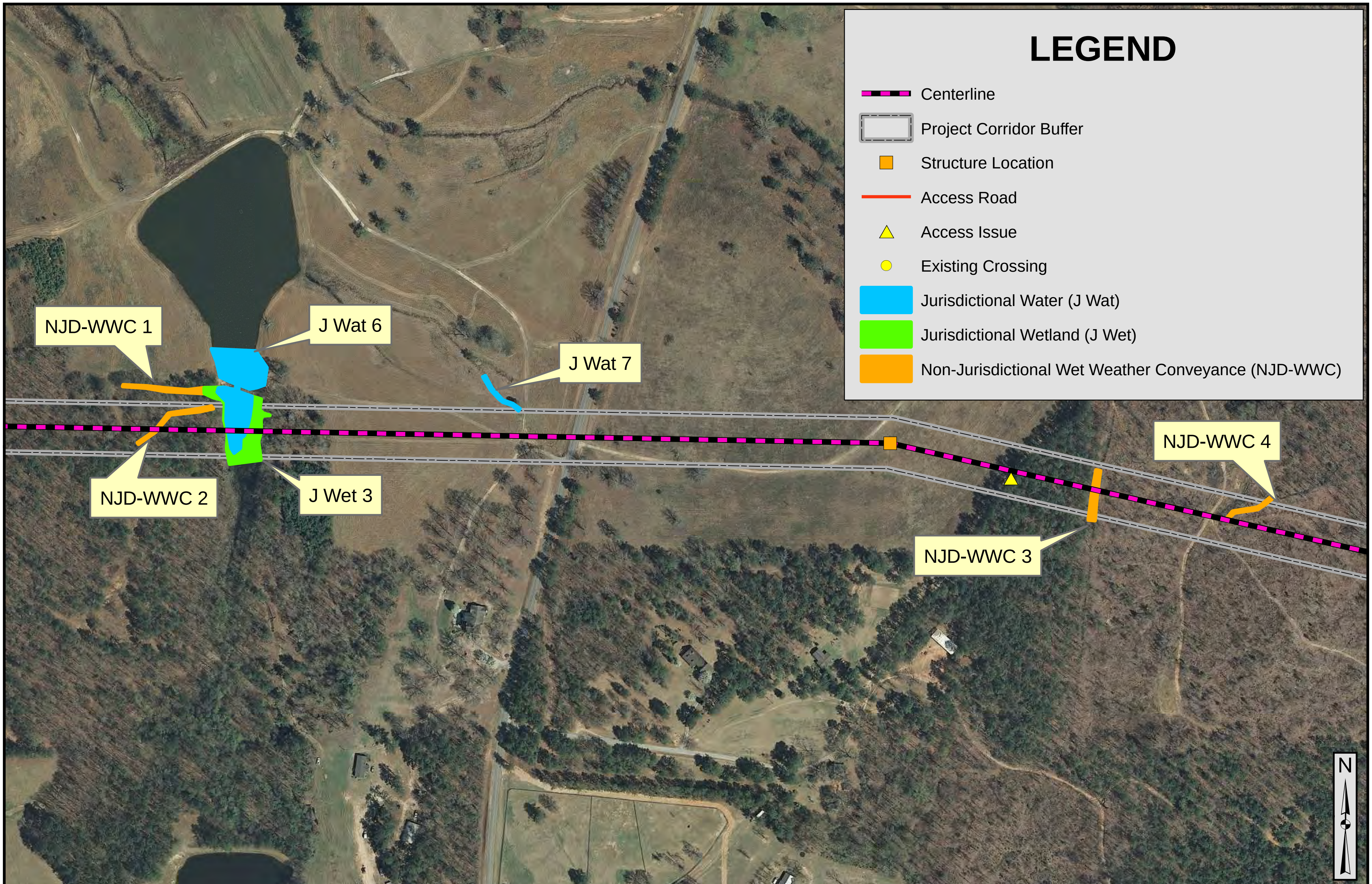


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

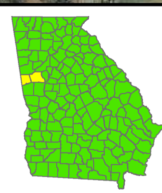
Date:	February 2012
Scale:	1" = 400'
Proj. No.:	EGXH2400

Figure 6b



Georgia Transmission

JACOBS

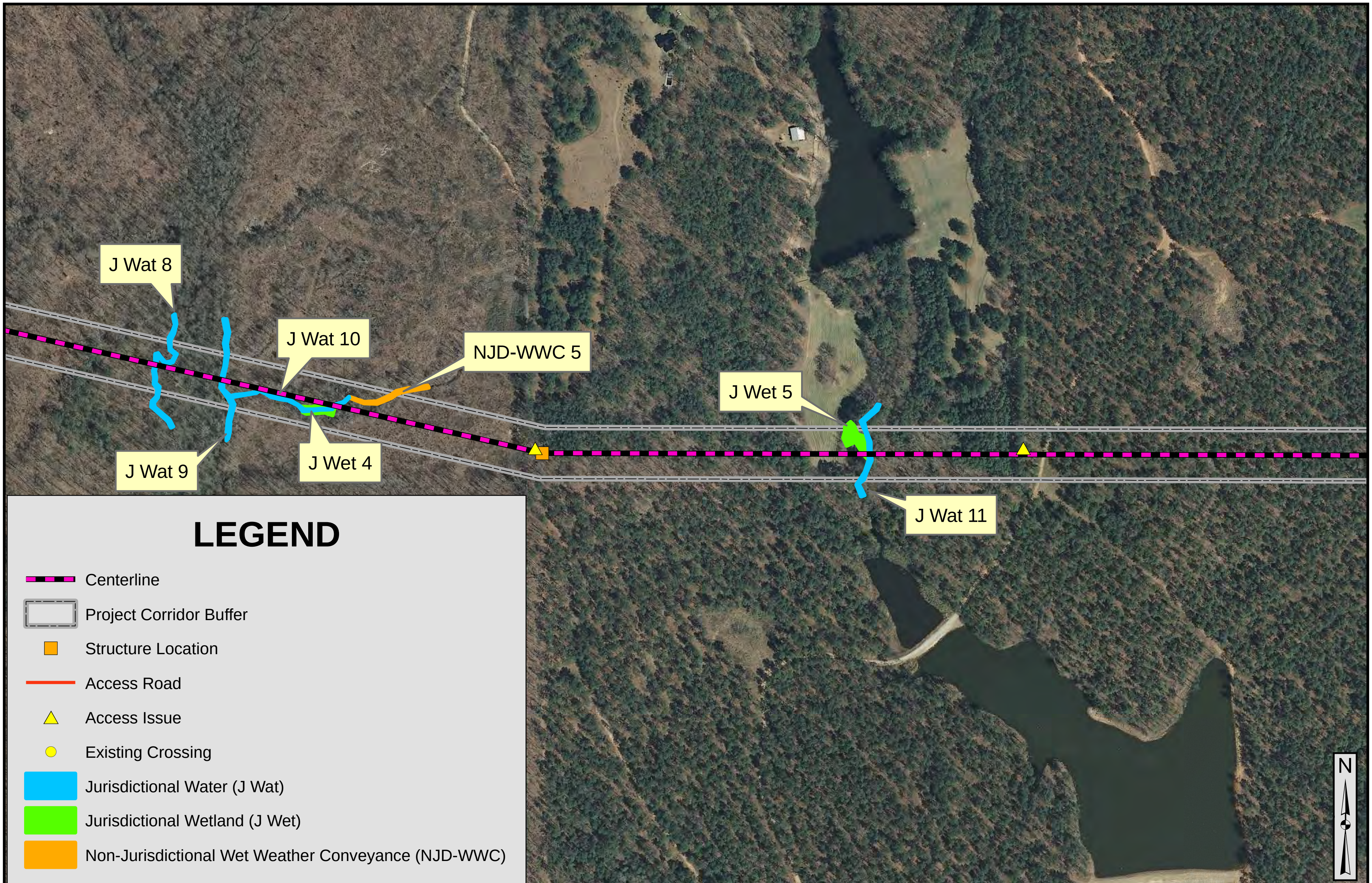


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

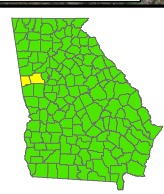
Date:	February 2012
Scale:	1" = 400'
Proj. No.:	EGXH2400

Figure 6c



GeorgiaTransmission

JACOBS

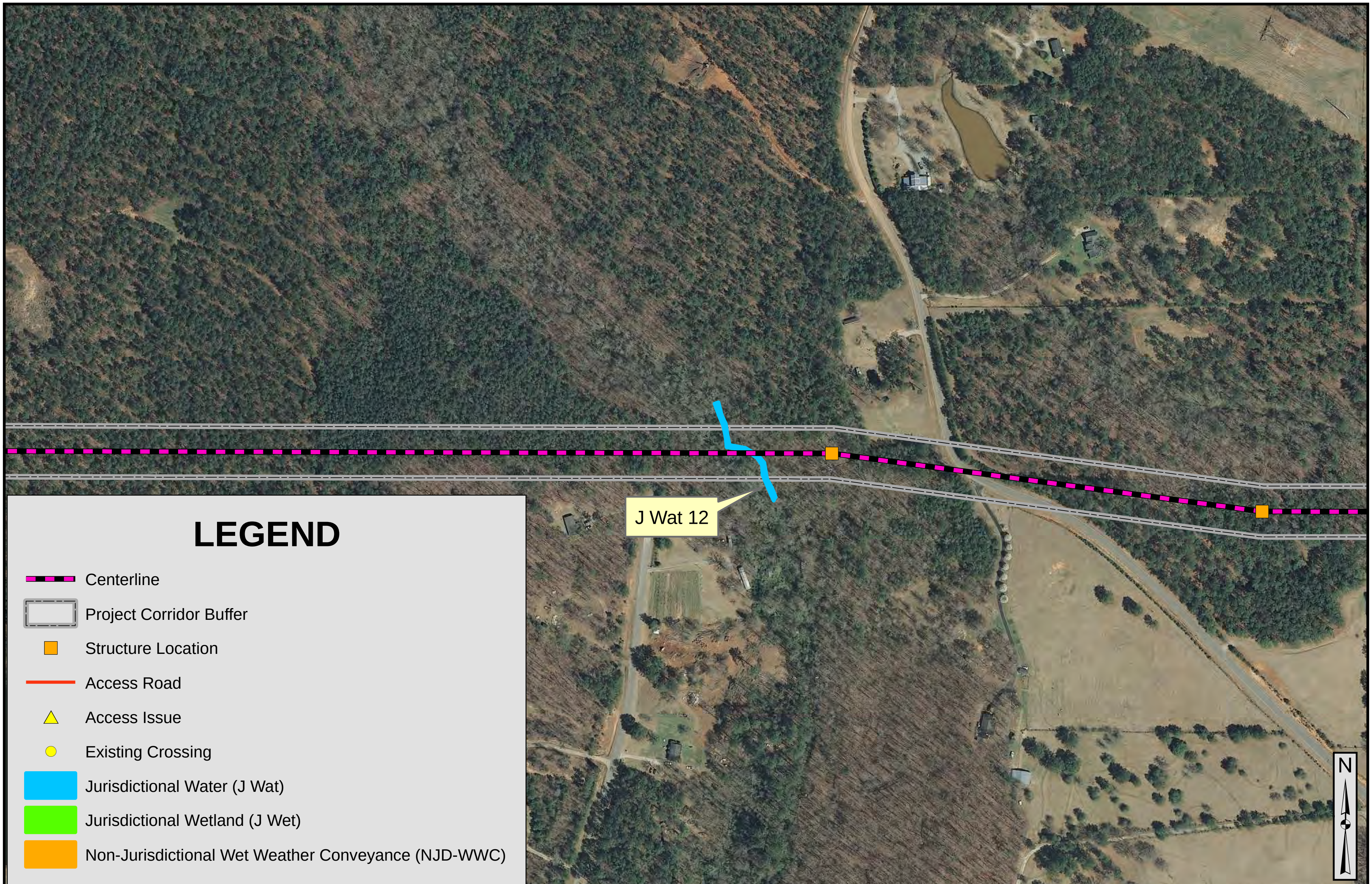


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

Date:	February 2012
Scale:	1" = 400'
Proj. No.:	EGXH2400

Figure 6d



Georgia Transmission

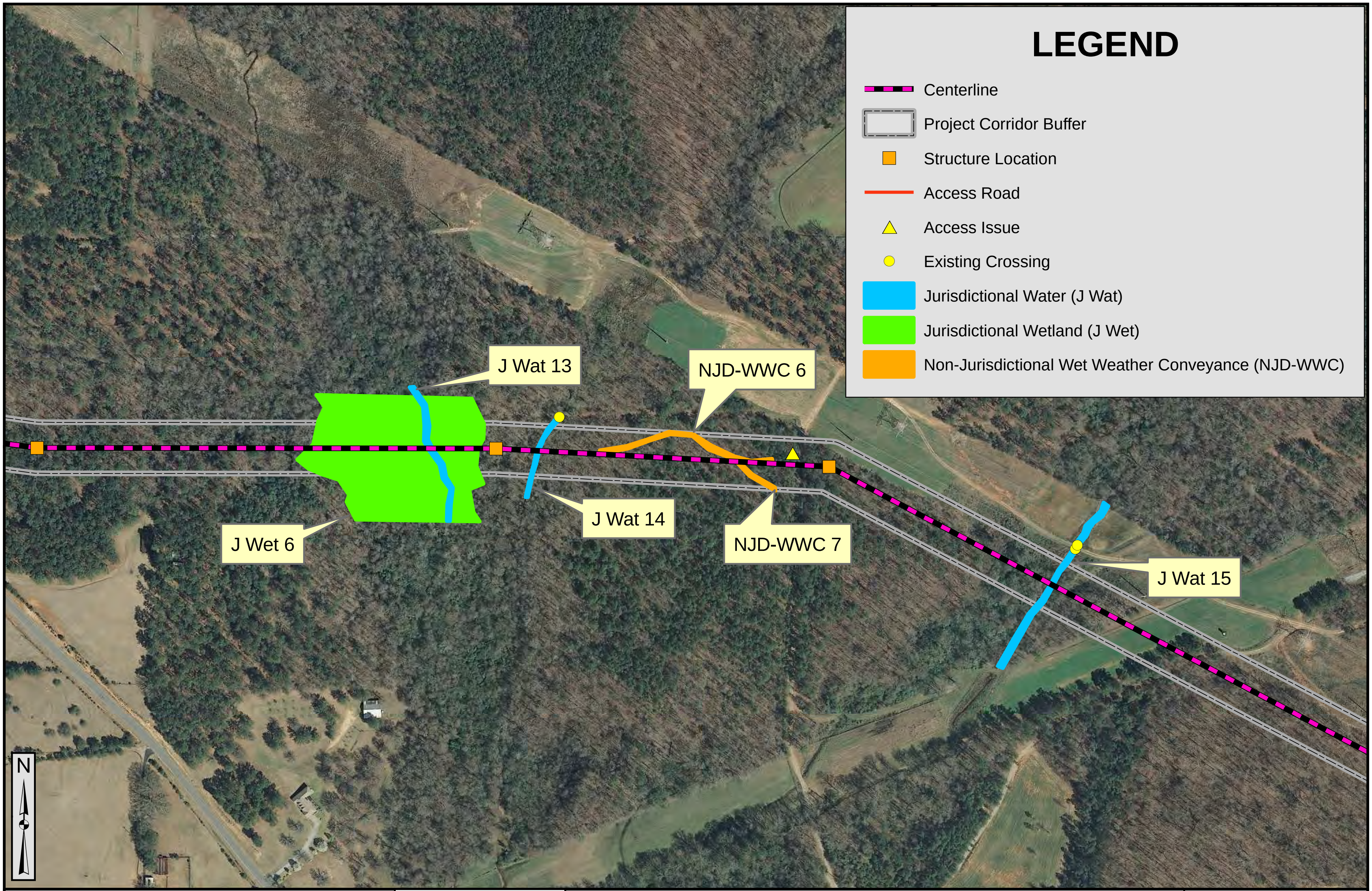
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

Date: February 2012
Scale: 1" = 400'
Proj. No.: EGXH2400

Figure 6e



Georgia Transmission

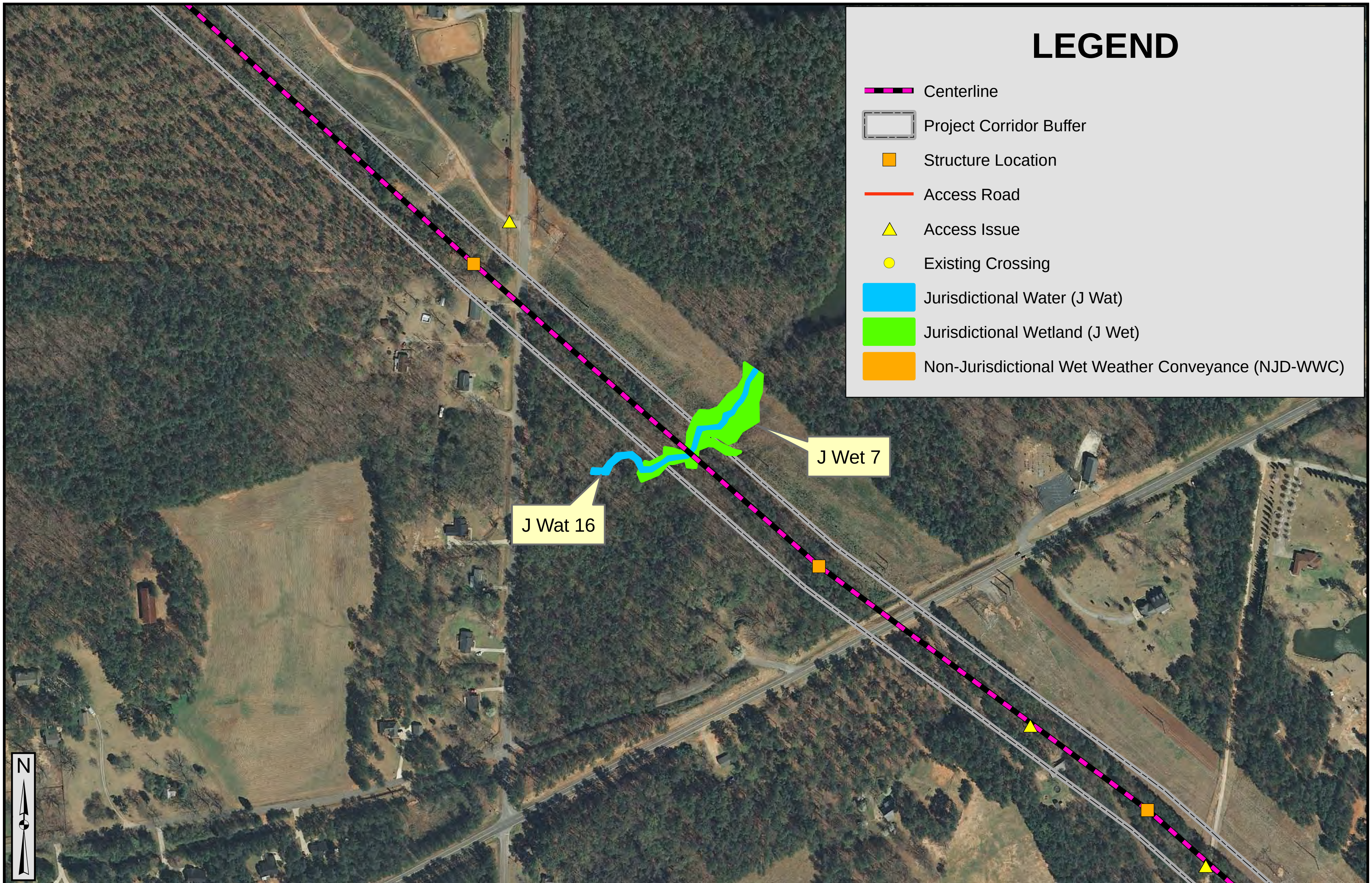
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

Date: February 2012
Scale: 1" = 400'
Proj. No.: EGXH2400

Figure 6f



Georgia Transmission

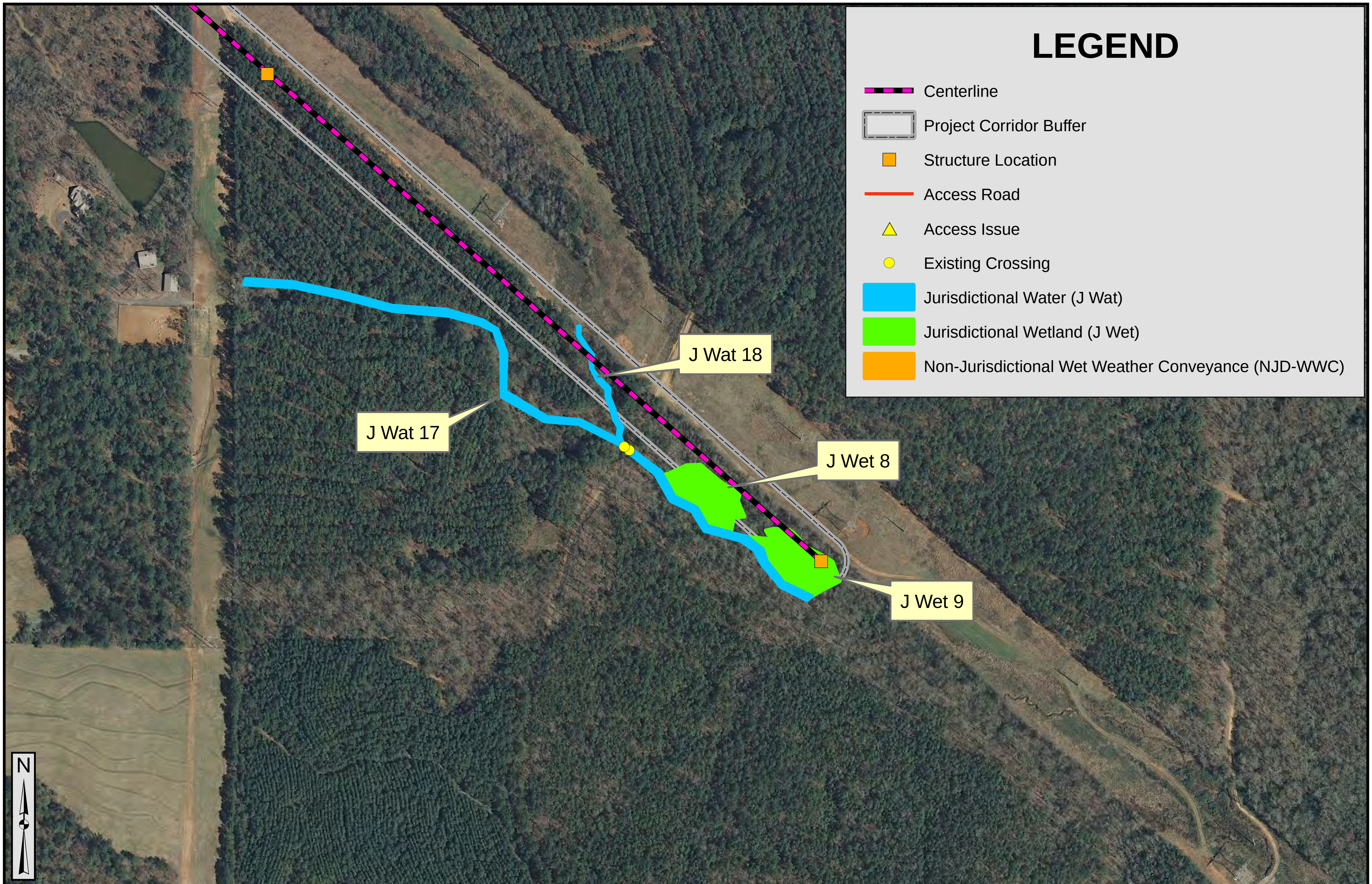
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

Date: February 2012
Scale: 1" = 400'
Proj. No.: EGXH2400

Figure 6g



Georgia Transmission

JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

Date: February 2012
Scale: 1" = 400'
Proj. No.: EGXH2400

Figure 6h

APPENDICES

Appendix A
Agency Coordination

Review of existing literature and available databases determined that eight federal- and five state- listed species are known from Coweta and Heard Counties. In addition, GDNR-NCS was requested to conduct a database search for known protected species within a 3-mile radius of the approximate 6-mile transmission line corridor. The GDNR-NCS database lists federal- and state- protected species and additional species which are tracked by GDNR-NCS and are known to occur in the area. Tracked species are not subject to the regulations of the Endangered Species Act. A response was received on August 10, 2011. GDNR-NCS has no records of any high priority species or habitats within a three-mile radius of the project corridor.

JACOBS

Jacobs Engineering Group, Inc.
6801 Governors Lake Pkwy • Building 200
Norcross, GA 30071 USA
T: 1.770.455.8555 • F: 1.770.455.7391

July 6, 2011

Ms. Katrina Morris
Georgia Department of Natural Resources
Nongame Section
2065 U.S. Hwy. 278 S.E.
Social Circle, GA 30025-4743

Subject: Coordination Request for the proposed Dresden – Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Dear Ms. Morris:

Jordan, Jones and Goulding inc., a Jacobs Engineering Group, Inc. (Jacobs) company has contracted with Georgia Transmission Corporation (GTC) to perform routine ecological investigations, including the identification of jurisdictional wetlands, waters of the U.S., and protected species surveys for the above-referenced project. We are requesting your office to advise us of any documented occurrences of any protected species and bald eagles within the immediate vicinity of the project corridor.

The project corridor is located in Coweta and Heard Counties, Georgia. The project corridor is located within the northeast and northwest quadrants of the Newnan SW, Georgia, United States Geological Survey 7.5-minute topographic map.

The proposed transmission would originate at the existing Dresden Substation located south of Highway 34 and along Quimby Jackson Road (33° 20' 51'' N, 84° 54' 24'' W) and terminate at the existing Heard County Substation located along Joe Stephens Road (34° 21' 35'' N, 84° 59' 55'' W). The total project length is approximately 6 miles.

Jacobs appreciates your timely attention to this matter. If you have any questions or need additional information, please call me at (678) 333-0354.

Sincerely,

JORDAN, JONES & GOULDING INC.
JACOBS ENGINEERING GROUP, INC.

Ben B. Fox
Senior Environmental Scientist

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
WILDLIFE RESOURCES DIVISION

MARK WILLIAMS
COMMISSIONER

DAN FORSTER
DIRECTOR

August 10, 2011

Ben Fox
Ecologist
Jordon, Jones & Goulding
6801 Governors Lake Parkway
Building 200
Norcross, GA 30071

Subject: Known occurrences of natural communities, plants and animals of highest priority conservation status on or near GTC Dresden - Heard County 500 kV Transmission Line, Heard County, Georgia

Dear Mr. Fox:

This is in response to your request of July 6, 2011. There are no Natural Heritage Database records in our database within a three-mile radius of the project site.

Recommendations:

We have no records of high priority species or habitats within the project area. In order to protect aquatic habitats and water quality, we recommend that all machinery be kept out of creeks during construction. Streams should not be culverted/forded to allow equipment access during construction or for future ROW maintenance. Further, we strongly advocate retaining at least a 25-foot vegetative buffer between each stream bank and the closest power pole, and allow this buffer to regenerate to shrub-scrub growth after the line is installed (if the landowner is willing). We realize that some trees may have to be removed, but recommend that shrubs and ground vegetation be left in place. Wider buffers may be needed for projects where land slopes sharply toward the stream being crossed. We also recommend that stringent erosion control practices be used during construction activities and that vegetation is re-established on disturbed areas as quickly as possible. Silt fences and other erosion control devices should be inspected and maintained until soil is stabilized by vegetation. Please use natural vegetation and grading techniques (e.g. vegetated swales, turn-offs, vegetated buffer strips) that will ensure that the project area does not serve as a conduit for storm water or pollutants into the water during or after construction. These measures will help protect water quality in the vicinity of the project as well as in downstream areas.

NONGAME CONSERVATION SECTION
2065 U.S. HIGHWAY 278 S.E. | SOCIAL CIRCLE, GEORGIA 30025-4743
770.918.6411 | FAX 706.557.3033 | WWW.GEORGIAWILDLIFE.COM

NEW - Data Available on the Nongame Conservation Section Website - NEW

NEW Georgia protected plant and animal profiles are available on our website. Originating with the State Wildlife Action Plan, a strategy guiding conservation in Georgia, the accounts cover basics like descriptions and life history, as well as threats, management recommendations and conservation status. Visit http://www.georgiawildlife.com/node/2223?cat=6.

By visiting the Nongame Conservation Section Website you can view the highest priority species and natural community information by Quarter Quad, County and HUC8 Watershed. To access this information, please visit our GA Rare Species and Natural Community Information page at: http://www.georgiawildlife.com/conservation/species-of-concern?cat=conservation

An ESRI shape file of our highest priority species and natural community data by quarter quad and county is also available. It can be downloaded from: http://georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/zip/gnhpds.zip

Disclaimer:

Please keep in mind the limitations of our database. The data collected by the Nongame Conservation Section comes from a variety of sources, including museum and herbarium records, literature, and reports from individuals and organizations, as well as field surveys by our staff biologists. In most cases the information is not the result of a recent on-site survey by our staff. Many areas of Georgia have never been surveyed thoroughly. Therefore, the Nongame Conservation Section can only occasionally provide definitive information on the presence or absence of rare species on a given site. Our files are updated constantly as new information is received. **Thus, information provided by our program represents the existing data in our files at the time of the request and should not be considered a final statement on the species or area under consideration.**

If you know of populations of highest priority species that are not in our database, please fill out the appropriate data collection form and send it to our office. Forms can be obtained through our web site (http://www.georgiawildlife.com/node/1376) or by contacting our office. If I can be of further assistance, please let me know.

Sincerely,

Trina Morris

Katrina Morris
Environmental Review Coordinator

IR 13614

Appendix B
Representative Photographs of Vegetative Communities

Agricultural - Pasture

Early Successional – 5 year old Clear-cut

Mixed Hardwood

Mixed Hardwood - Pine

GeorgiaTransmission	Dresden – Heard County 500 kV Transmission Line Coweta and Heard Counties, Georgia	**Date:** **September 2011** **Scale:** **Not Applicable** **Project No.:** **EGXH2400**
JACOBS	Representative Photographs of Vegetative Communities	**Appendix B**

Planted Pine

Ruderal

Emergent Wetland

Forested Wetland

GeorgiaTransmission	Dresden – Heard County 500 kV Transmission Line Coweta and Heard Counties, Georgia	**Date:** **September 2011** **Scale:** **Not Applicable** **Project No.:** **EGXH2400**
JACOBS	Representative Photographs of Vegetative Communities	**Appendix B**

Appendix C
Representative Photographs of Jurisdictional Features

Intermittent Stream

Perennial Stream

Palustrine Open Water

Non-jurisdictional Wet Weather Conveyance

Georgia Transmission

JACOBS

Dresen – Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Representative Photographs of Jurisdictional Features

Date:	**September 2011**
Scale:	**Not Applicable**
Project No.:	**EGXH2400**

Appendix C

Palustrine Emergent Wetland

Palustrine Forested Wetland

GeorgiaTransmission	Dresden – Heard County 500 kV Transmission Line Coweta and Heard Counties, Georgia	**Date:** **Scale:** **Project No.:**	**September 2011** **Not Applicable** **EGXH2400**
JACOBS	Representative Photographs of Jurisdictional Features	**Appendix C**	

Jacobs Engineering Group Inc.

6801 Governors Lake Parkway
Building 200
Norcross, GA 30071 USA
T 1.770.455.8555 | F 1.770.455.7391

Memorandum

Date: March 30, 2011

To: Monique Humphrey, Georgia Transmission Corporation

From: Kevin A. Mullinax, Jacobs Engineering Group

Subject: Dresden 500 kV Substation Expansion Ecology Survey

Georgia Transmission Corporation identified the need to perform ecological studies for the construction of the Dresden 500 kV Substation alongside the existing Dresden Substation located in Coweta County, Georgia. The total size of the survey area is approximately 73 acres. Field studies included a delineation of Section 404 jurisdictional boundaries in accordance with guidelines promulgated in the U.S. Army Corps of Engineers (USACE) 1987 *Corps of Engineers Wetland Delineation Manual* as well as the *Regional Supplement to the 1987 USACE Wetland Delineation Manual: Eastern Mountains and Piedmont*. In addition, office and field reviews were conducted for federally and state protected species or suitable protected species habitat within the project study area. This memorandum includes results from the field surveys, a protected species assessment, and a potential permitting overview.

Jurisdictional Areas

Field studies identified three jurisdictional wetlands and one jurisdictional stream located within the project study area. Jurisdictional boundaries were field located utilizing a mapping grade Trimble GeoXH Global Positioning System (GPS) and appropriately flagged. Below is a description of these jurisdictional areas. Figure 1 shows the locations of identified jurisdictional features within the project area.

Jurisdictional Wetland 1 (J Wet 1) is classified as a palustrine emergent system with a saturated hydrologic regime (PEM1B). Dominant vegetation within the wetland consists of soft rush (*Juncus effusus*) and elderberry (*Sambucus canadensis*). Soils sampled from a depth of 0-12+ inches had a matrix color of 10YR 5/2 with mottles of 10YR 4/4. The soils consist of a sandy loam texture and meet the depleted matrix hydric soil field indicator. Hydrologic indicators include saturation, oxidized rhizospheres on living roots, and drainage patterns.

Jurisdictional Wetland 2 (J Wet 2) is classified as a palustrine forested/ emergent system with a saturated hydrologic regime (PFO/PEM1B). Dominant vegetation within the wetland consists of soft rush (*Juncus effusus*), primrose (*Ludwigia decurrens*), tulip poplar (*Liriodendron tulipifera*), and sweetgum (*Liquidambar styraciflua*). Soils sampled from a depth of 0-12+ inches had a matrix color of 10YR 5/2 with mottles of 10YR 4/4. The soils consist of a sandy loam texture and meet the depleted matrix hydric soil field indicator. Hydrologic indicators include saturation, water marks, oxidized rhizospheres on living roots and drainage patterns.

Jurisdictional Wetland 3 (J Wet 3) is classified as a palustrine emergent system with a saturated hydrologic regime (PEM1B). Dominant vegetation within the wetland consists of soft rush (*Juncus effusus*) and elderberry (*Sambucus canadensis*). Soils sampled from a depth of 0-2 inches had a matrix color of 10YR 3/1. Soils sampled from a depth on 2-12+ inches had a matrix color of 10YR 5/2 with mottles of 10YR 5/6. The soils consist of a sandy loam texture and meet the depleted matrix hydric soil field indicator. Hydrologic indicators include saturation and oxidized rhizospheres on living roots.

Jurisdictional Water 1 (J Wat 1) is classified as an intermittent/ perennial stream system with a substrate of sand and mud (R4SB45/ R2UB23). Along the intermittent portion, the stream has a top of bank (TOB) width of 3-6 feet with an ordinary high water (OHW) width of 1 foot. J Wat 1 has a TOB width of 3-6 feet with an OHW width of 2-4 feet through the perennial portion. In addition, the stream goes subsurface for approximately 150 feet as it enters the existing O'Hara – Wansley 500 kV Transmission Line right-of-way.

Protected Species

Under terms of Section 7 of the Endangered Species Act (ESA), federal agencies shall "*ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary to be critical…"* The USACE requires protected species surveys for project sites that involve a Section 404 of the Clean Water Act permit. However, it has not been determined at this point if a Section 404 permit will be required for the project. Table 1 provides a list of potential federally and state-listed species in Coweta County, Georgia as reported by the U.S. Fish and Wildlife Service's (USFWS) Region 4 Georgia Ecological Field Office website (http://www.fws.gov/athens/endangered/counties_endangered.html, 2004), and the Georgia Department of Natural Resources – Nongame Conservation Section's website (http://www.georgiawildlife.com/conservation/species-of-concern?cat=6, 2011).

Table 1
Summary of Protected Species for Coweta County, Georgia

Common Name	Scientific Name	Federal Status	State Status	Habitat Present (Yes/No)	Preferred Habitat
Faunal species					
bald eagle	*Haliaeetus leucocephalus*	D	T	No	nests in large trees near lakes, rivers, and other large bodies of water
bluestripe shiner	*Cyprinella callitaenia*	NA	T	No	large, alluvial rivers with open, sand or rock bottomed channels with flowing water and little to no aquatic vegetation
Gulf moccasinshell mussel	*Medionidus penicillatus*	E	E	No	Medium streams to large rivers with slight to moderate current over sand and gravel substrates
highscale shiner	*Notropis hypsilepis*	NA	T	No	flowing areas of small to large streams over sand or bedrock substrates
oval pigtoe mussel	*Pleurobema pyriforme*	E	E	No	sandy, medium-sized rivers and creeks
purple bankclimber mussel	*Elliptoideus sloatianus*	T	T	No	small to large rivers with moderate current and substrate of sand, fine gravel, or muddy sand

Table 1
Summary of Protected Species for Coweta County, Georgia

Common Name	Scientific Name	Federal Status	State Status	Habitat Present (Yes/No)	Preferred Habitat
shiny-rayed pocketbook mussel	*Hamiota subangulata*	E	E	No	sandy/ rocky medium-sized rivers and creeks
Floral species					
bay star-vine	*Schisandra glabra*	NA	T	Yes	rich woods on stream terraces and lower slopes
Piedmont barren strawberry	*Waldsteinia lobata*	NA	R	No	rocky, acidic woods along stream terraces with mountain laurel (*Kalmia latifolia*), rarely in dry, upland oak/hickory forests
white fringeless orchid	*Platanthera integrilabia*	C	T	No	red maple-gum swamps; peaty seeps and streambanks with *Parnassia asarifolia* and *Oxypolis rigidior*

E=endangered, T=threatened, C=candidate, R=rare, D=de-listed species, NA=not applicable

Species Descriptions

Bald eagle - This species has been de-listed; however, it is still afforded protection at state and federal levels. The USFWS removed the bald eagle as threatened under the Endangered Species Act on August 8, 2007, and published in May 2007, the National Bald Eagle Management Guidelines (Eagle Guidelines) to assist the public in understanding protections afforded to and prohibitions related to the bald eagle under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) (Eagle Act), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Lacey Act (16 U.S.C. 3371-3378). The Eagle Act prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Eagle Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

In Georgia, the bald eagle finds habitat along inland waterways and estuarine areas, selecting areas with low human disturbance, suitable forest structure, and abundant prey. The bald eagle typically nests in the largest tree in its chosen territory. Nest sites along rivers are typically close to the shores with large aquatic areas and little forest edge. Nest sites are usually near water, with large individual trees, and little overall human disturbance. This species prefers nest sites within 0.5 miles of water and a clear path to that water. The bald eagle usually forages within approximately 1.0 mile of its nest site during breeding season. No specimens or potential habitat were observed during field studies.

Bay star-vine - Bay star-vine is a woody vine found trailing along the ground or twining among shrubs, trees, or other vines in rich woods, bottomland forests, or wooded slopes. No specimens were observed during field studies; however, habitat does exist for this species within the project area.

Bluestripe shiner – The bluestripe shiner is a small shiner species with an elongate, slender body with a small head and an inferior, oblique mouth and a long, blunt snout. In Georgia, this species had been collected from the Chattahoochee and Flint River systems. This species typically inhabits mainstem reaches of rivers and large streams in riffles and runs with rubble or sand substrate and are most often collected in areas with swift current velocities and little to no aquatic vegetation. While aquatic surveys were not conducted, no habitat for this species was identified within the project area.

Gulf moccasinshell mussel – The gulf moccasinshell mussel is found in streams and rivers where there is moderate current, and lives mainly in sand and gravel. The species is small, reaching only 2.25 inches in length. The shell is yellowish brown to nearly black in color and usually rayed with narrow, interrupted, greenish lines. While aquatic surveys were not conducted, no habitat for this species was identified within the project area.

Highscale shiner – The highscale shiner is a small, fusiform, and somewhat pale species with a blunt snout that extends slightly beyond a small, inferior mouth. This species is endemic to the Chattahoochee and Savannah River drainages. Typically, this species is found close to the Fall Line. The highscale shiner prefers small to medium-sized streams flowing over bedrock and sand substrates. While aquatic surveys were not conducted, no habitat for this species was identified within the project area.

Oval pigtoe mussel – The oval pigtoe mussel is a small mussel reaching only 2.25 inches in length. Its color is variable, ranging from a yellowish brown to dark brown and sometimes almost black. This species has been documented in only two counties in extreme north Georgia counties. The mussel inhabits medium-sized creeks to small rivers with a slow to moderate current and a silty sand to sand and gravel substrate. While aquatic surveys were not conducted, no habitat for this species was identified within the project area.

Piedmont barren strawberry - Piedmont barren strawberry is a small perennial herb up to six inches in height that spreads by stolons. The leaves are rounded forming clumps similar to the common strawberry. The Piedmont barren strawberry is found in rocky, acidic woods along streams with mountain laurel (*Kalmia latifolia*) and in dry upland oak/hickory forests. No habitat or species were identified within the project study area.

Purple bankclimber mussel – The purple bankclimber mussel is a large freshwater mussel can reach a length of greater than eight inches, but usually measures between four and six inches. The Purple bankclimber has a characteristic lumpy grey to black heavy outer shell. Habitat for this species is small to large rivers with moderate current in substrate of sand, mud, and gravel. While aquatic surveys were not conducted, no habitat for this species was identified within the project area.

Shiny-rayed pocketbook mussel – The shiny-rayed pocketbook mussel appears to prefer small creeks and spring-fed rivers. It is medium in size reaching lengths of 3.38 inches in length and is golden brown to dark chestnut brown with numerous rays of light to dark emerald green. It ranges from the Ochlockonee River west to the Choctawhatchee River. Habitat for this species is medium creeks to main stems of rivers with slow to moderate currents over substrates of sand. While aquatic surveys were not conducted, no habitat for this species was identified within the project area.

White fringeless orchid – The white fringeless orchid's range extends from Georgia, Alabama, Tennessee, Kentucky, Mississippi, North Carolina, to South Carolina. It inhabits red maple (*Acer rubrum*)-blackgum (*Nyssa biflora*) swamps; rocky, thinly vegetated slopes; and sandy, mesic stream margins. Monkeyface orchid commonly occurs with white violet (*Viola primulifolia*), grass-of-Parnassus (*Parnassia asarifolia*), green woodland orchid (*Platanthera clavellata*), and cowbane (*Oxypolis rigidior*). No specimens were identified within the project study area. Potential habitat was eliminated from consideration due to the high degree of shading within the understory.

Protected Species Conclusion

Potential habitat exists for the state listed bay star-vine within the project study area. Suitable habitat was thoroughly assessed for the presence of this species. No specimens were identified. Based on the small size of the area of suitable habitat and the lack of specimens, it is unlikely that this species exists within the project area. Therefore, it is not anticipated that protected species or their habitat will be affected by construction activities within the project area.

Potential Permitting Overview

Section 404 of the Clean Water Act provides the Secretary of the Army, acting through the Chief of Engineers, the power to issue Individual Permits and to authorize the use of Nationwide Permits (NWP) for the discharge of dredged or fill materials (i.e. impacts) into the waters of the United States, including special aquatic sites and wetlands (Nation's Waters). District engineers have the authority to issue permits for activities in the Nation's Waters.

For many of the NWPs, a Pre-Construction Notification (PCN) must be submitted to alert the local USACE district office of the intent to use a NWP. The PCN must describe the wetland system, provide specifications of the proposed project, identify the prospective permittee, include a mitigation plan, if required, and include a delineation of affected wetlands. USACE will request a review of the PCN by other resource agencies. Other resource agencies including United States Fish and Wildlife Service, National Marine Fisheries Service (NMFS), U.S. Environmental Protection Agency (EPA), State Historic Preservation Office, and Georgia Department of Natural Resources.

The USACE permits minor impacts to jurisdictional areas for utility line activities such as overhead utility lines, substations, access roads, and foundations for towers, poles and anchors under NWP 12 (utility line activities). NWP 12 allows a maximum impact of 10 acres of cumulative loss of wetlands and/or 1,500 linear feet of stream within one Hydrologic Cataloging Unit. A PCN is required in the following cases:

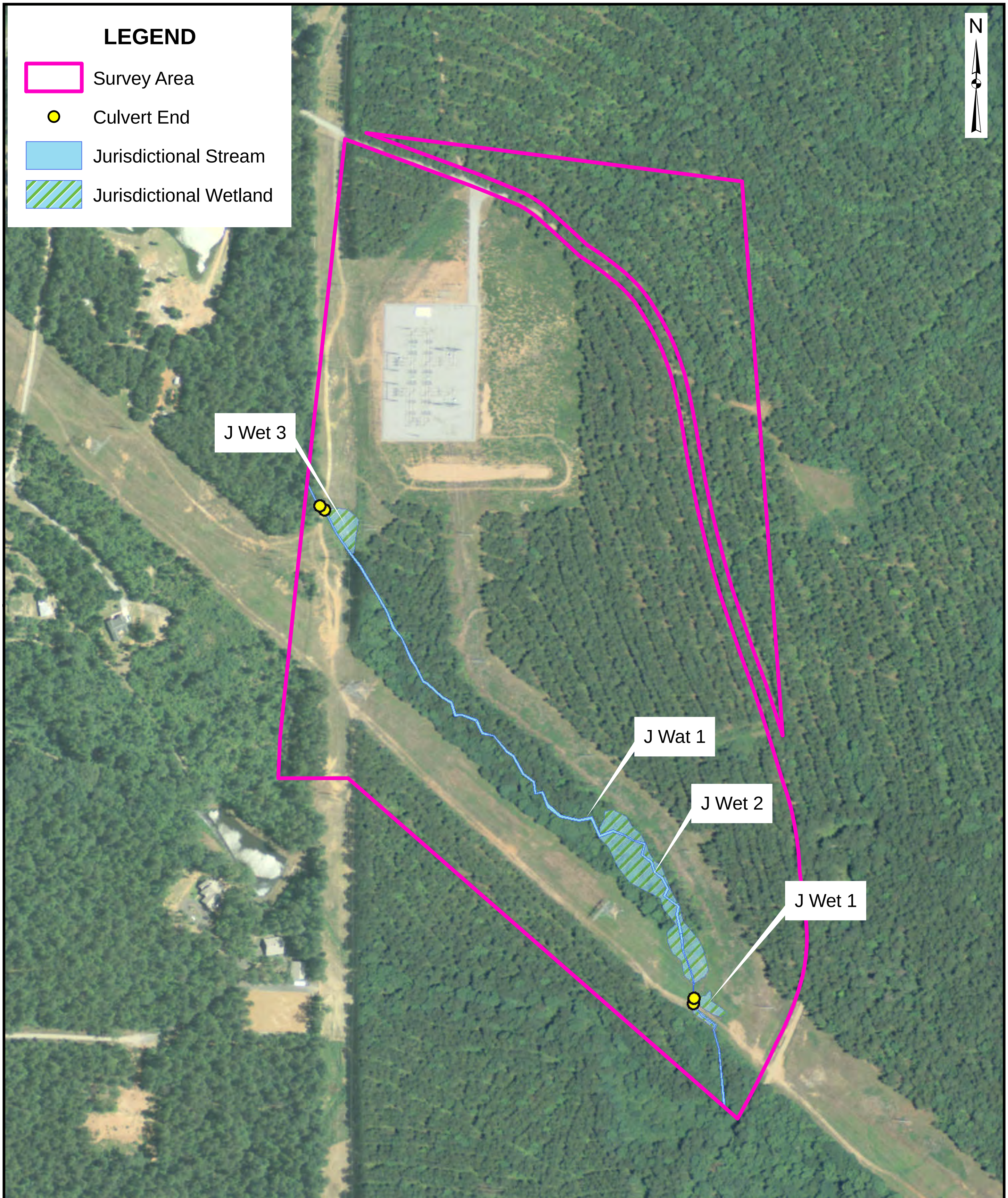
- Discharges associated with the construction or maintenance of utility projects resulting in a temporary or permanent loss of jurisdictional waters of the U.S. (includes jurisdictional ephemeral drainages, intermittent streams, lower perennial streams, and wetlands).
- Mechanized land clearing in a forested wetland for a utility line ROW.
- A project requiring Section 10 permitting.
- The utility line in waters of the U.S., excluding overhead lines, exceeds 500 linear feet.
- The utility line is placed within a jurisdictional area, and it runs parallel to a stream bed that is within that jurisdictional area.
- Permanent above-grade access/maintenance roads in waters of the U.S.
- Impervious permanent access roads constructed in waters of the U.S. (not to exceed 200 feet).

A PCN for NWP 12 consists of avoidance and minimization analysis, a compensatory mitigation plan, and an assessment of any potentially significant historic or archaeological sites on or near the property.

NWP 12 requires that the following standards be followed for activities pertaining to utility lines. Access roads in non-tidal waters, excluding non-tidal wetlands adjacent to tidal waters, must not cause the loss of more than 0.5 acre of non-tidal waters. The cumulative loss of waters of the U.S. for all NWP 12 crossings in one Hydrologic Cataloging Unit cannot exceed 10 acres of wetlands and/or 1,500 linear feet of stream. In addition, Georgia Regional Conditions do not allow substations to be constructed within the banks of a stream. Permanent at-grade access roads cannot impact more than 200 linear feet of wetland at an individual crossing.

Per the Erosion and Sedimentation Act of 1975 and its 2003 and 2008 amendments, Chapter 7-17-9 states any land disturbing activities conducted by any electric membership corporation or municipal electric system or any public utility under the regulatory jurisdiction of the Public Service Commission, or any utility under the regulatory jurisdiction of the Federal Energy Regulatory Commission, or any agency or instrumentality of the United States engaged in generation, transmission, or distribution of power would be exempt from rules and regulations set forth in the 1975 Act, except when the electric membership, municipal electric membership, or public utility is considered a secondary permittee for a project located within a larger common plan of development (GAEPD, 2008).

Requirements for an overhead utility to be exempt include (a) the new utility line right-of-way width does not exceed 200 linear feet, (b) utility lines are routed and constructed so as to minimize the number of stream crossings and disturbances to the buffer, (c) only trees and tree debris are removed from within the buffer resulting in only minor soil erosion, and (d) functional native riparian vegetation is re-established in any bare or disturbed areas within the buffer. Substations are not covered in the exemption and, therefore, are subject to the 25-foot stream buffer.



GeorgiaTransmission

JACOBS

Dresden Substation Expansion
Coweta County, Georgia

Jurisdictional Areas Location Map

Date:	March 2011
Scale:	1" = 400'
Proj. No.:	NA

Figure 1

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

OCT 1 1 2001

Mr. Glendon D. Deal
Acting Director
Engineering and Environmental Staff
Rural Utilities Service
Rural Development
Department of Agriculture
Washington DC 20250

REF: Programmatic Agreement for Transmission Facilities in Georgia

Dear Mr. Deal:

Enclosed is the executed Programmatic Agreement for the referenced program. By carrying out the terms of the Agreement, you will have fulfilled your responsibilities under Section 106 of the National Historic Preservation Act and the Council's regulations.

We appreciate your cooperation in reaching this Agreement. If you have any questions, please call Dr. Tom McCulloch at 202-606-8554.

Sincerely,

Don L. Klima
Director
Office of Planning and Review

Enclosure

GeorgiaTransmission

Georgia Transmission Corporation
2100 East Exchange Place
PO Box 2088
Tucker, GA 30085-2088
phone 770-270-7400
fax 770-270-7872

Via Overnight Mail

July 18, 2001

Mr. Glendon D. Deal
Acting Director of Engineering and Environmental Staff
Rural Utilities Service
South Agriculture Building
1400 Independence Ave., S.W.
Room 2244S
Washington, DC 20250

Dear Mr. Deal:

Subject: Programmatic Agreement with the Georgia SHPO and the Council

Enclosed is the copy of the Programmatic Agreement (PA) among the Rural Utilities Service (RUS), the Georgia State Historic Preservation Officer, and the Advisory Council on Historic Preservation concerning the construction and modification of transmission facilities by Georgia Transmission Corporation's (PA) that has been signed by Mr. Ray Luce, Deputy State Historic Preservation Officer, and by Mr. Jerry Donovan, Vice President, Project Services. Georgia Transmission Corporation is pleased with the agreement and requests the Rural Utilities Service signs the document and forwards it to the Advisory Council on Historic Preservation for final signature.

The agreement eliminates the routine review of transmission projects by the Georgia State Historic Preservation Office, and adverse effects on historic properties will no longer require a memorandum of agreement. Project schedules will be reduced by a minimum of 45 days without an adverse effect, to a maximum of 120 days with an adverse effect. With schedule reductions of 45 to 120 days, more of our projects can qualify for RUS funding.

If you have any questions or need additional information, please call me at (770) 270-7710 or email at johnlasseter@gatrans.com.

Sincerely,

John Lasseter
Environmental & Regulatory Coordinator
Environmental & Land Services Department

JL:clm

Enclosures

cc: Julian Brix, Georgia Transmission
Jerry Donovan, Georgia Transmission
Robert Fox, Georgia Transmission

bcc: Records Center: GC2-6
Legal Files

PROGRAMMATIC AGREEMENT
AMONG
THE RURAL UTILITIES SERVICE,
THE GEORGIA STATE HISTORIC PRESERVATION OFFICER,
AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
CONCERNING
THE CONSTRUCTION AND MODIFICATION OF
TRANSMISSION FACILITIES
BY GEORGIA TRANSMISSION CORPORATION

WHEREAS, the Rural Utilities Service (RUS), U. S. Department of Agriculture provides financial assistance to rural electric cooperatives for the construction, modification, and relocation of transmission facilities; and

WHEREAS, RUS has determined that its actions with regard to the construction of electrical transmission lines; modification of electrical transmission lines and substations; and relocation of electric transmission lines may have an effect on properties included in or eligible for inclusion in the *National Register of Historic Places* (NRHP) and has consulted with the Georgia State Historic Preservation Officer (SHPO); and

WHEREAS, RUS acknowledges that, even with reasonable planning to avoid or minimize adverse effects from electrical facilities, such adverse visual and physical effects on historic properties may be unavoidable, that these effects are similar in nature or repetitive, and that adequate mitigation cannot be achieved on site; and

WHEREAS, Georgia Transmission Corporation (GTC) has been invited to participate in consultation and to concur in this agreement; and

WHEREAS, RUS proposes to comply programmatically with its obligations under Section 106 and 110 of the National Historic Preservation Act [16 U.S.C. §470(f)] as authorized by the regulations of the Advisory Council on Historic Preservation (Council) in 36 CFR §800.14; and

WHEREAS, unless otherwise defined differently in this agreement, all terms used are defined in 36 CFR §800.16;

NOW THEREFORE, RUS, the Council, the Georgia SHPO, and GTC agree that all construction, modification, and relocation of transmission facilities shall be implemented in accordance with the following stipulations which take into account the effect of such activities on historic properties.

STIPULATIONS

RUS shall ensure that the following activities are carried out:

A. DEFINITIONS, APPLICABILITY, AND GENERAL STANDARDS

1. This agreement is intended to apply to the construction of all electric transmission lines and substations, the modification of all electric transmission lines and substations and the relocation of all electric transmission lines not categorically excluded from the Section 106 process by this agreement, hereinafter called "transmission facilities".

2. All terms and phrases within this PA that are followed by an (*) will be defined in Appendix A: Definitions of Terms and Programs. New Products and Procedures to be developed as a result of acceptance of this PA are listed in Appendix B: New Products and Procedures. The new products and procedures will be developed and implemented within one year of the acceptance of this PA.

3. The projects enumerated below are categorically excluded from the requirements of the National Historic Preservation Act and the Section 106 process:

   a. Customer Choice Loads - Construction of transmission facilities on the property of an industrial or commercial facility where the property has been previously disturbed to a degree that a professional archaeologist determines that no intact or eligible archaeological sites exist and that a pedestrian survey would not be practical or necessary, and that a professional architectural historian determines that transmission facilities could not be seen outside the boundaries of the commercial or industrial park or property;

   b. Existing GTC Easements & Fee Properties - Construction and modification of transmission facilities within existing transmission line rights-of-way or substation properties, where no additional disturbance outside the existing rights-of-way, easements, or fee properties will be necessary, and where the effect if any on an historic property would be no greater than already exists, as determined by a professional archaeologist and professional historian;

   c. Properties Previously Surveyed by GTC or Others - Construction and modification of transmission facilities surveyed within the last five years by a qualified archaeologist and architectural historian, where a determination has been made that the area contains no sites listed or eligible for listing in the *National Register of Historic Places* or where identified historic properties will not be affected by the project;

d. <u>Projects Not requiring an Environmental Report by RUS</u> – Any project that requires less reporting than an Environmental Report under RUS Environmental Policies and Procedures 7 CFR Part 1794 will not require a survey for historic properties.

4. Measures carried out under this Agreement will be consistent with the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 Fed. Reg. 44716-44742) (Standards and Guidelines), and the Council's 1980 publication entitled, *Treatment of Archaeological Properties; A Handbook.*

5. Whenever possible and practical, preservation in place shall be the preferred treatment for archaeological sites. Reasonable efforts will be made to avoid an adverse effect on historic properties throughout the planning and design of transmission facilities.*

6. Work carried out under the provisions of this Agreement involving the definition of Area of Potential Effect, identification of historic properties, assessment of effects, and development of mitigation measures shall be undertaken by qualified professionals in architectural history or archaeology, as appropriate, meeting the Secretary of the Interior's *Professional Qualification Standards* (48 Federal Register 44738-9), and having experience with Section 106 projects or training in the Section 106 process. For the purposes of this agreement, GTC and SHPO will determine whether professionals meet these requirements. Professionals having no prior Section 106 work experience in Georgia or with GTC or the SHPO will be required to attend a half-day orientation at the SHPO offices prior to commencing work.

B. SURVEYS AND EVALUATIONS

1. Historic property surveys will be conducted by a professional Archaeologist and Architectural Historian. They will be used on all transmission facilities that are not categorically excluded by this agreement.

2. GTC will conduct literature research and conduct field surveys to identify all known historic properties located within the project study area*. The location of eligible historic properties* will be used to develop and evaluate alternate and preferred sites and routes.

3. Residential subdivisions constructed after WWII will be surveyed as a unit rather than house by house.

4. All transmission facilities not excluded under Section A(2)(a),(b) (c) or (d) of this Agreement will be surveyed, documented, and the survey material* will be distributed to the SHPO, the local Regional Development Center, the local historical society, the University of Georgia, and Georgia State University. Information including locational data about archaeological sites, Traditional Cultural Properties, and other "sensitive" historic properties subject to vandalism, looting, unauthorized salvage, or private property trespass, and information about cultural or religious beliefs may be withheld from public distribution by GTC and the SHPO. SHPO and GTC will agree on the location of such documentation within each university. Additional locations for copies can be requested by the SHPO.

C. EFFECT ASSESSMENT AND PROJECT IMPLEMENTATION

1. If a transmission facility has an effect on a National Historic Landmark, a listed historic property, a traditional cultural property, or an eligible historic district, GTC will initiate consultation with the SHPO. GTC and the SHPO will agree on a plan of resolution. If a plan of resolution is not agreed upon by both parties, GTC will follow the regulations set forth in 36 CFR Part 800.

2. If the project planning and design* guidelines are followed during routing, siting, or modification of a transmission facility, a review by GA-SHPO will not be required and the project can proceed into construction.

3. If it is determined that the project could have an adverse effect on a National Historic Landmark, RUS shall notify the Council in accordance with 36 CFR 800.5 and 800.6.

D. PRESERVATION IN PLACE

1. Where preservation in place is used, GTC will be responsible for the preservation in place of all eligible and listed archaeological sites within GTC's fee properties and easements associated with its transmission lines and substation sites. GTC will use existing and new technology in an effort to maintain a stable vegetative cover over each site. Any erosion caused by natural occurrences or by the operation and maintenance of the facilities will be repaired as soon as possible. GTC will not be responsible for the disturbance of an archaeological site within an easement when the disturbance is caused by a party other than GTC. At the completion of

each project that has an archaeological site preserved in place, GTC will notify the owner of the property to make the owner aware of the eligible site.

2. If preservation in place is used for an eligible archaeological site, the undertaking will not be considered to have an adverse effect on a historic property.

3. During the first year of the term of this Agreement, GTC in consultation with SHPO will develop a long-term management plan for archaeological sites. The management plan will identify standard management policies and practices to include managing archaeological resources, monitoring their condition, and reporting to the SHPO on a regular basis.

E. CURATION

GTC shall ensure that all records and materials resulting from identification and data recovery efforts are curated in accordance with 36 CFR Part 79 at the facilities of GTC's archaeological consultants. Periodically, GTC will collect these materials and transfer them to a permanent curation facility operated by the University of Alabama at Moundville, Alabama, or other approved curation facility.

F. TREATMENT OF HUMAN REMAINS

If any human remains are encountered during the surveys, data recovery, or construction, GTC will halt work in that area and follow the Georgia law governing Abandoned Cemeteries and Burial Grounds. If human remains are found on Federal lands, the requirements of the Native American Graves Protection and Repatriation Act shall apply.

G. RESOURCES DISCOVERED DURING PROJECT IMPLEMENTATION

Should unanticipated historic properties* be discovered during construction, GTC will immediately have a qualified archaeologist or architectural historian review the properties to determine eligibility and effect. If required for compliance, construction activities in the immediate area will be stopped until the requirements of 36 CFR §800.13 have been satisfied.

H. PROMOTION OF HISTORIC PROPERTIES:

1. As part of this Programmatic Agreement, GTC agrees to a statewide strategy for mitigating adverse effects to historic properties from GTC's activities in Georgia. The intent of this strategy is to mitigate the unavoidable and repetitive adverse effects to historic properties from

activities associated with the construction, improvement, and relocation of GTC's facilities. This strategy will be implemented at the initiation of the Programmatic Agreement and will extend through the duration of the Programmatic Agreement.

2. As a mitigation strategy, GTC will fund the collection, storage, and management of data on historic properties (i.e. buildings, structures, districts, sites, and objects that are eligible for the National Register of Historic Places) in Georgia. The research work would include, but not be limited to: field surveys, review and analysis of findings, identification of potential historic districts, and incorporation of legacy data into appropriate inventories. This research will be funded annually or semi-annually by GTC.

3. The research will be undertaken by consultants selected by GTC and approved of by GA SHPO. Consultants shall meet the Secretary of Interiors' Professional Qualifications Standards (36 CFR Part 61). GTC will provide financial support for a Principal Investigator, field assistants, and administrative costs, including materials, supplies, equipment, and travel.

4. Research projects (such as building, structure or district surveys, National Register nominations, etc.) will be undertaken in a manner consistent with the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 Fed. Reg. 44716-44742) (Standards and Guidelines), the Council's 1980 publication entitled, *Treatment of Archaeological Properties; A Handbook*, and The Georgia Historic Resource Survey Manual and/or as directed by the Resource Steering Committee.

5. The research projects will be selected annually by a Resource Steering Committee composed of staff from GA SHPO, GTC, and GTC's consultants. The research will be reviewed annually by the same steering committee.

6. Data will be collected and managed (electronic and/or hard copy) in a format agreed to be the steering committee and approved of by GA SHPO. All data shall be stored or archived at a location agreed to by the Resource Steering committee and approved of by SHPO.

I. ADDITIONAL COMMITMENTS

1. As part of this Agreement, GTC will develop and implement the following products and guidelines with the approval of the SHPO:

a. Preservation and monitoring plan for archaeological sites on GTC's properties and easements.

b. Plan for notification of Native American Nation and Tribes.

c. Private property notification of historic properties (owners only).

d. Landscape plan template for substations.

J. DISPUTE RESOLUTION

1. Should any party to this Agreement object to any actions taken pursuant to the Agreement within 20 days of the action, RUS shall consult with the objecting party in an attempt to resolve the objection. If RUS determines the objection cannot be resolved, it shall forward all documentation relevant to this dispute to the Council. Within 20 days after receipt of all pertinent documentation, the Council shall either:

   a. Provide RUS with recommendations, which RUS will take into account in reaching a final decision regarding the dispute; or

   b. Notify RUS that it will comment within an additional 15 days in compliance with 36 CFR §800.6(b). Any Council comment provided in response to such a request will be taken into account by RUS in accordance with 36 CFR §800.6(c)(2) with reference to the subject of the dispute.

2. Any recommendation or comment provided by the Council will pertain only to the subject of the dispute; RUS's responsibility to carry out all other actions under this agreement will be unaffected.

K. TERM LENGTH OF AGREEMENT

This Agreement will be effective for a term of ten years from the date of its execution by the Advisory Council on Historic Preservation. If RUS determines that the Agreement should be extended, RUS will provide written notice to all parties 90 days prior to the expiration date and invite them to comment.

L. TERMINATION AND AMENDMENT

1. Any party to this Agreement may request that it be amended, whereupon the parties will consult in accordance with 36 CFR Part 800.14 to consider the agreement.

2. Any party to this Agreement may terminate its participation by providing 60 days written notice to the other parties, provided that the parties shall consult during the period prior to termination to seek amendments or other actions that would avoid termination. In the event of a termination, RUS shall comply with 36 CFR Part 800.

3. In the event that the terms of this Agreement are not carried out, RUS shall comply with 36 CFR Part 800.

Execution and implementation of this Programmatic Agreement evidences that RUS has satisfied its Section 106 responsibilities for all individual undertakings of the program.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: John M. Fowler Date: 10/10/01
John M. Fowler
Executive Director

RURAL UTILITIES SERVICE

By: Lawrence R. Wolfe Date: 7-24-01
for Glendon D. Deal
Acting Director, Engineering and Environmental Staff

GEORGIA HISTORIC PRESERVATION DIVISION

By: W. Ray Luce Date: 7/13/01
W. Ray Luce
Deputy State Historic Preservation Officer

Concur:

GEORGIA TRANSMISSION CORPORATION

By: Jerry Donovan Date: 7-18-01
Jerry Donovan
Vice President, Project Services

Appendix A: Definitions of Terms and Programs:

A) Historic Property – Historic properties will include buildings, structures, objects, districts, historical sites, and archaeological sites.

B) Study Area – The geographical area that includes all alternate transmission line routes and alternate substation sites and also includes geographical areas that contain the viewshed of historic properties.

C) Project Planning and Design – The methodology used during the routing and/ or siting phase of project to determine corridors for transmission line routes and study areas for substation site. This methology provides the framework for all the environmental surveys, including but not limited to: Protection or Endangered Species Survey, Wetland Delineation, Cultural Resource Surveys, Phase One Surveys. As part of this methodology, prior to the identification of alternate transmission line routes and alternate substation sites, an architectural historian will identify all historic structures located within the study area and determine their eligibility. The location of eligible historic properties will be used in the evaluation and selection of alternate transmission line routes and alternate substation sites as a constraint. This type of constraint will be avoided in project planning and design. Wherever possible, impacts to eligible historic properties along a transmission line route will be minimized by locating the transmission line away from historic properties or outside the viewshed of historic properties. Impact to eligible historic properties near a substation site will be minimized by leaving an existing vegetation buffer or develop and install a landscape plan* using vegetation native to the surrounding area.

D) Landscape plan – A design for a vegetative buffer, using plant material native to the surrounding area, whose purpose is to minimize the view of an electric substation from an historic property.

E) Survey Material – All historic property survey material will meet a standard acceptable to GTC and SHPO. Unless otherwise stated, survey materials must conform to established Georgia Archaeological Sites File and Georgia Historic Resources Survey Manual standards.

F) Eligibility - All historic properties determined to be possible eligible or potentially eligible will be treated as an eligible resource.

G) Transmission facilities – References to transmission facilities will include electric transmission lines and electric substations.

Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line Coweta and Heard Counties, Georgia

Prepared for:
Georgia Transmission Corporation
2100 East Exchange Place
P.O. Box 2088
Tucker, Georgia 30085 2088

Authored by:

Jerald Ledbetter

Robert Benson
and
Thomas H. Gresham

October 20, 2011

SOUTHEASTERN ARCHEOLOGICAL SERVICES, INC.
P.O. Drawer 8086
Athens, Georgia 30603

Abstract

This report presents the results of an intensive archeological survey conducted by Southeastern Archeological Services, Inc. in central Heard and Coweta Counties Georgia, where the Georgia Transmission Corporation (GTC) wishes to construct a 6.9 mi (11.1 km) 500 kV transmission line. The line will extend from the Heard Substation near the Heard-Coweta County line to the area of the proposed Dresden Substation. The goal of the survey was to locate and evaluate any archeological resources that may be adversely affected by the construction of the transmission line. The survey was undertaken in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. The area of potential effect for the project consisted of a corridor extending 125 ft from the edge of existing cleared corridor (either the O'Hara-Wansley 500 kV line [south of SR 34] or the Dresden-Hollingsworth Ferry 230 kV line) and a 200 ft wide corridor for the new, cross-country segment (the actual cleared corridor will be 150 ft wide). Archival research showed no historic structures with in the project area. One previously recorded site (9CW176) is located near the eastern terminus of the proposed corridor.

The majority of transmission line corridor was surveyed between June 30 and July 7, 2011 with a later follow-up on August 29, 2011. A total of 11 sites (one of which was previously recorded) and two isolated artifact occurrence were recorded. As a result of this survey all of the 11 archaeological sites and the two isolated artifact occurrences are recommended not eligible for listing on the National Register of Historic Places. A list of sites and occurrences follows:

9CW176. Prehistoric lithic scatter (Late Archaic) and minor 19th-20th century artifact scatter.
9CW418. Prehistoric lithic scatter (Archaic).
9CW419. Prehistoric lithic scatter (Middle Archaic).
9CW420. Historic period (19^{th} century) artifact scatter.
9CW421. Sparse prehistoric lithic scatter (Archaic) and historic (19^{th} century) artifact scatter.
9CW422. Prehistoric lithic scatter (Middle Archaic).
9CW423. Prehistoric artifact scatter lithics and sparse Missisppian ceramics.
9CW424. Prehistoric artifact scatter (Late Archaic lithcis) and sparse Woodland ceramics.
9CW425. Prehistoric lithic scatter (Woodland).
9CW426. Prehistoric lithic scatter and sparse Woodland or Mississippian ceramics.
9CW427. Prehistoric lithic scatter (nondiagnostic).
Occurrence 1. Isolated prehistoric flake tool made from Ridge and Valley chert.
Occurrence 2. Two prehistoric period projectile points made from quartz (Archaic/Woodland).

We recommend that because of a lack of integrity, a lack of research potential and no known associations with persons or events important in local history, these eleven sites and two occurrences are not eligible for inclusion in the National Register of Historic Places. We conclude that the project will not adversely affect eligible or potentially eligible archeological resources and the transmission line project should be given clearance to proceed.

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Introduction

This report presents the results of an intensive archeological survey performed by Southeastern Archeological Services, Inc. in central Heard and Coweta Counties (Figure 1). Georgia Transmission Corporation (GTC) wishes to construct a new 6.9 mi (11.1 km) 500 kV transmission line connecting the existing Heard County Substation with a proposed Dresden 500 kV Substation (Figure 2). The goal of the survey was to locate and evaluate any archeological resources that may be adversely affected by the construction of the transmission line. The survey was undertaken in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. This act requires that federal agencies that fund or licence projects, in this case the Rural Utility Services, must take into account the effects of an undertaking on significant cultural resources. A survey to locate sites is one of the first steps in complying with Section 106. The transmission line corridor was surveyed during the period of June 30 to July 7, 2011 and on August 29, 2011 by SAS archeologists Tom Gresham, Rob Benson, and Ron Schoettmer.

The area of potential effect (survey corridor width) was defined by GTC on shape files that were sent to SAS and transcribed onto enlarged USGS maps (the centerline was not marked in the field, but the shape files allowed us to plot it accurately on our enlarged USGS maps). For the portion of the proposed line running adjacent to the existing transmission lines (either the O'Hara-Wansley 500 kV line [south of SR 34] or the Dresden-Hollingsworth Ferry 230 kV line [for the bulk of the line, that portion north of SR 34]) the edge of our survey corridor was about 125 ft from the edge of the existing cleared corridor. The proposed centerline was 120 ft from the existing 500 kV centerline and 100 ft from the existing 230 kV centerline. For the new, cross-country segment, the survey corridor was 100 ft on either side of the proposed centerline, or 200 ft wide centered on the proposed centerline, which again was not marked in the field, but was plotted on enlarged USGS field maps. The actual cleared corridor will be 150 ft wide, centered on the proposed centerline.

The transmission line will begin at the extreme eastern edge of Heard County at the existing Heard County Substation and will follow a route generally to the east that is predominantly undeveloped woodlands and old cultivated fields (Figures 3- 4). The project corridor ends a short distance south of the community of Dresden near the location of the proposed Dresden Substation (see Figure 2). The corridor crosses a number of roads, both paved and dirt (Figures 5-6). Some of the dirt roads are associated with existing transmission line corridors and pipelines (Figure 7) while others are old field or woods roads. The project corridor crosses several headwater streams of the New River which is a tributary of the Chattahoochee River. Along parts of the route, the line follows the edges of existing property lines that were originally laid out as rectangular land lots. Other parts of the corridor will cut across property lots. The western part of the line will extend to the north and east as a series of segments of varying lengths with several sharp turns. The central part of the route extends generally from west to east and the eastern part extends to the southeast in a relatively straight line (see Figures 1 and 2).

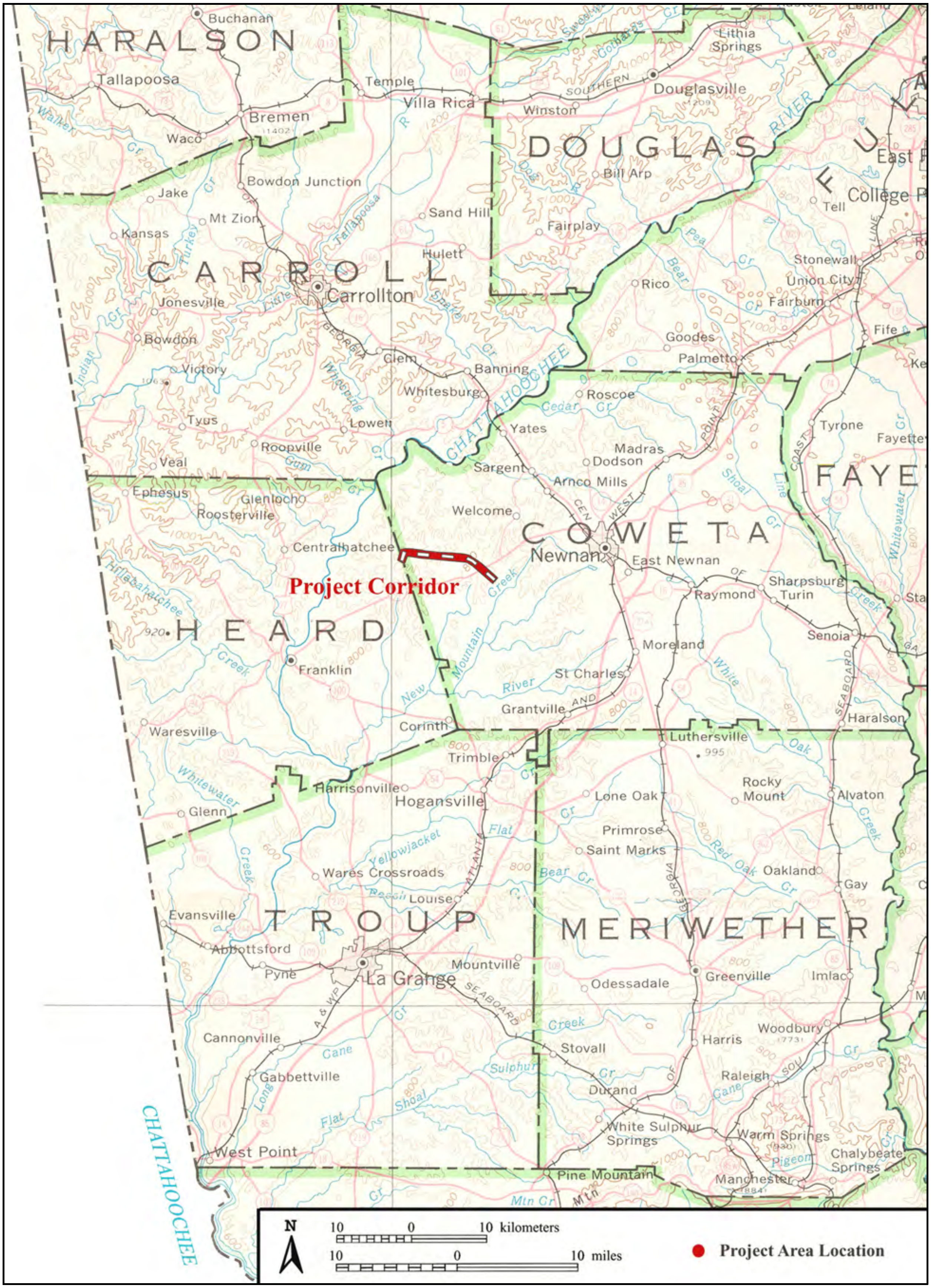
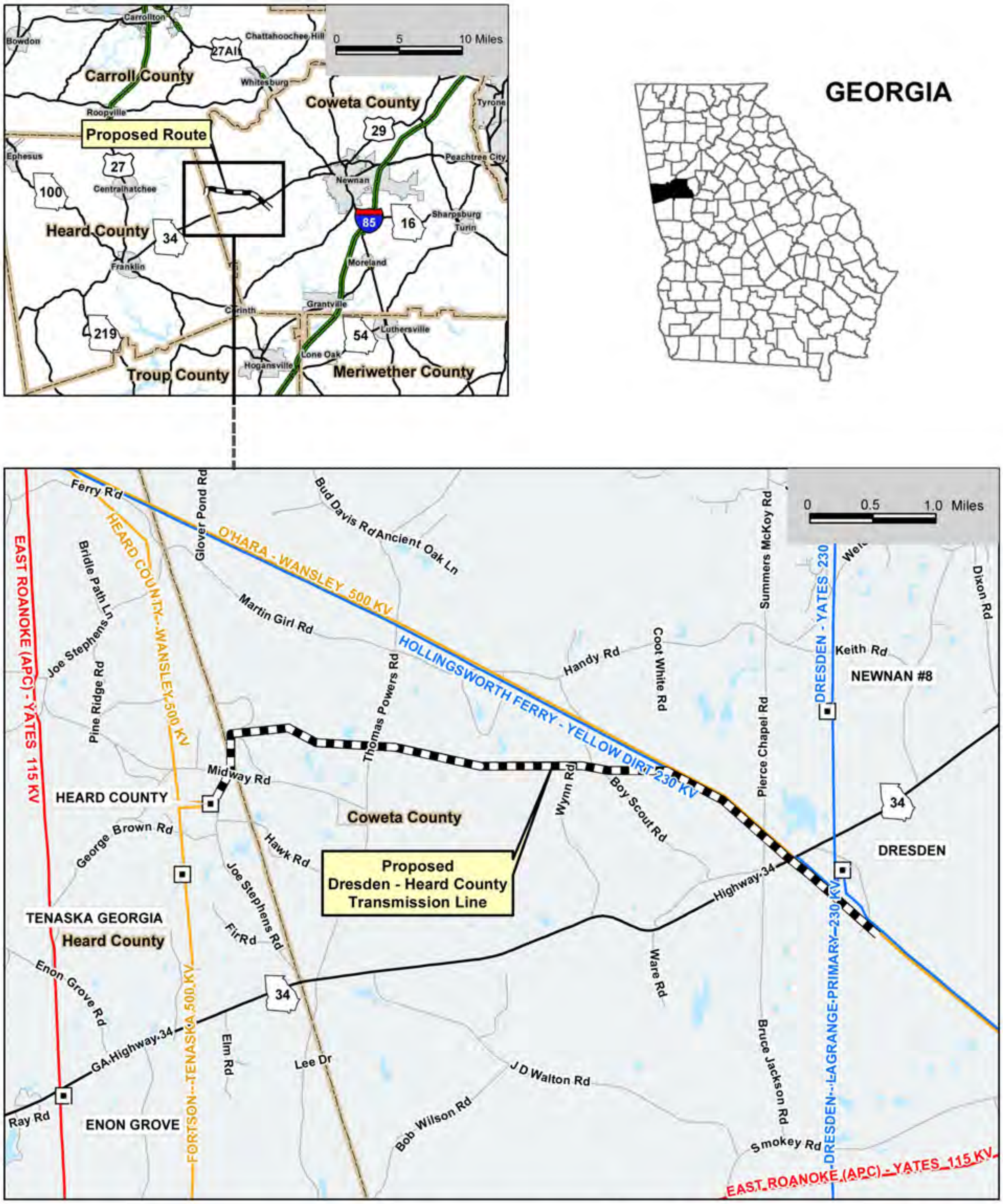


Figure 1. Location of Project Area (source: USGS 1:500,000 Base Map of Georgia)**.**



Dresden - Heard County 500 kV Transmission Line

PROJECT LOCATION MAP

From GTC, take I-285 South to I-85 South toward Columbus/Montgomery. Take I-85 South to GA 34 (Exit # 47) toward Newnan. Turn right onto GA 34/Bullsboro Dr and travel for approximately 1.0 mile to Millard Farmer Industrial Blvd/State Route 34 Bypass. Turn right onto Millard Farmer Industrial Blvd/State Route 34 Bypass and travel approximately 6.0 miles to GA 34 W/Franklin Rd. Turn right onto GA 34 W/Franklin Rd and travel for approximately 4.0 miles to Quimby Jackson Rd. Turn sharp left onto Quimby Jackson Rd and travel approximately 0.3 miles. The Dresden substation is located on the right.

N

GeorgiaTransmission

V:/1Map_Projects/Location_Map

Project No: P79263	Date 06/24/2011
Source: GDT	Plot: C. Gundry

Figure 2. Map of Project Area (provided by Georgia Transmission)**.**

Figure 3. View of wooded (clearcut) area in western part of project area. Location is about 1 km west of Occurrence 1, view to the northwest along ridge slope.

Figure 4. View of wooded ridge slope on old terraced farmland. Location is south of the pipeline in eastern part of project area, view to the south.

Figure 5. Photograph showing pasture on the west side of Thomas Powers Road. Location is in the western part of the project area, view to the east.

Figure 6. Photograph showing surface exposure along a dirt road in a pasture. Located on the east side of Thomas Powers Road in the western portion of the project corridor (view to the west).

Figure 7. Photograph of cleared pipeline corridor and existing transmission line corridor (background). On the eastern side of the Caney Creek floodplain in eastern part of corridor (view to the northwest).

Beginning at the western end, the transmission line extends to the north from the existing Heard County Substation for approximately 0.7 mi, crossing the Coweta-Heard County line. Much of this area contains moderately good surface exposure as the result of clearcutting. This area is primarily uplands but the corridor does cross near the headwaters of a small unnamed stream. The corridor then turns to the east and follows a relatively straight course for approximately 4 mi, where it intersects the existing Dresden-Hollingsworth Ferry transmission line. This long segment extends primarily over upland terrain (see Figures 3, 5 and 6) but it also crosses several small streams that form the headwaters of the New River. These floodplain areas are generally narrow with steep side slopes. The area consists primarily of woodlands but some cultivated areas do exist in the form of pastures. Some of the wooded areas have been logged during the past five years allowing some areas of surface exposure. For the most part, this area was investigated through shovel testing. The remaining or eastern segment of the corridor turns to the southeast for approximately 2 mi and parallels the existing Dresden-Hollingsworth line (see Figure 7). The segment crosses Georgia Highway 34 just to the east of the community of Dresden. The final segment crosses Caney Creek and then follows an upland ridge to a termination point near a branch of Davis Branch. The vegetation of the final segment consisted of woodlands, some of which was pine plantation (see Figure 4). Surface exposure was generally limited in the final segment and extensive shovel testing was required. For the most part, the project area consists of abandoned farm lands that are now covered primarily with pine.

Environmental Setting

The project area is situated in the central portions of eastern Heard County and western Coweta County, which is located in the upper Piedmont region of western Georgia. The western end of the project area is drained by Hilly Mill Creek which flows into the Chattahoochee River approximately 3 miles to the west. The remainder of the corridor is drained by the headwater tributaries of the New River. The New River joins the Chattahoochee River approximately 12 miles to the southwest of the project area.

Physiographically, Hodler and Schretter (1986:16-17) place eastern Heard and western Coweta counties in the Greenville Slope District of the southern Piedmont. This district contains rolling topography with relief ranging from 100 to 200 ft. Geologically, the area is located in the crystalline region, containing the oldest lithological formations in the state (as much a 600 million years). The project area is located in a region composed primarily of biotitic gneiss, and various combinations of granite, gneiss, schist and amphibolite. The Brevard Fault cuts through the northern portions of the two counties (Geologic Map of Georgia, 1976). Crystalline deposits are frequently quartz-bearing and that material were encountered on prehistoric sites throughout the project area. Smaller amounts of Ridge and Valley chert were found on some sites which would have been brought into the area of deposits located in northwestern Georgia.

The soils associated with the project area consists primarily of Cecil-Madison types which are well drained soils with a reddish-clay subsoil. These soils occur on gently sloping to sloping terrains and were extensively cultivated in the past. The streams contain Pacolet-Wedowee and Madison-Pacolet soils which are generally well drained and have a reddish to brownish clayey subsoil (Brooks 1980).

The climate for Heard and Coweta Counties is moderate with typical long warm summers and relatively short cool winters. Rainfall, except during periods of drought, is distributed throughout the growing season with fall months being the driest which is especially favorable for harvesting of crops. The average growing season is 225 days (Long 1919:858).

During the long period of human occupation, environmental changes have occurred. Prior to about 11,000 years ago, a mixed oak and pine forest covered much of the Piedmont. Increased warming and precipitation around 9,000 years ago resulted in the spread of an oak-hickory forest which eventually gave way to an increase in pines around 5,000 years ago. Southern pines eventually became dominant as moisture became more plentiful and an essentially modern environment became established (Delcourt and Delcourt 1979; Sheldon 1983; Wharton 1989). Today, the region supports a Piedmont faunal mix, which includes upland, terrestrial and riverine species (Wharton 1989:219-227). However, many of the native species have diminished greatly in numbers due to changes in landuse practices over the past two centuries. Two centuries of cultivation and the introduction of pine plantations are two factors that have drastically changed the faunal compositions of most habitats in the region.

The Cultural Setting

The following review of culture history represents a broad overview of patterns in the Southeast along with a more specific material culture chronology for northwestern Georgia. Much of the source material for the following summary is taken from the *Georgia Archaeological Research Design Papers* published in the University of Georgia's Laboratory of Archaeology Report series (Hally and Langford 1988; Hally and Rudolph 1986; Joseph et al. 2004; Smith 1992; Stanyard 2003; Wood and Bowen 1995) and culture history overviews prepared for the Georgia Department of Transportation (Espenshade 2008; Ledbetter et al. 2009; Shah and Whitley 2009).

The Paleoindian Period (ca 10,000 - 7800 B.C.)

The first inhabitants of the Georgia Piedmont lived in an environment with much less seasonality than we experience today. Tropical and boreal species of animals and plants coexisted in a climate where temperatures did not fluctuate extremely between summer and winter (Holman 1985). Subsistence was based on hunting and gathering. Large herd animals or megafauna were hunted, such as mastodon and giant bison. Smaller game and fish were also important in the annual subsistence round. Wild plant foods such as fruits, berries, nuts, and wild grains also formed a major part of the diet. Diagnostic artifacts from this period include formalized unifacial scraping and butchering tools and lanceolate projectile points. Clovis, Cumberland and Beaver Lake points identify the early part of this period, while Quad and Dalton points mark the termination of the period (Cambron and Hulse 1975; De Jarnette et al. 1962). These later types are sometimes referred to as Transitional Paleoindian/Early Archaic.

Available data suggest that early Paleoindian sites that may contain Clovis points are relatively rare in the western Georgia Piedmont region and examples have yet to be recorded in Coweta-Heard County (Anderson et al. 1990). The Georgia Paleoindian Point Survey has also yet to record late Paleoindian points in the county (Ledbetter et al. 2008) but this may relate more to a lack of survey coverage than actual lack of occupation. Overall, the scarcity of reported Paleoindian points in the region would appear to reflect a low level of utilization rather than collection bias.

The Early Archaic Period (7800 - 6000 B.C.)

With the extinction of the large herbivores, greater emphasis was placed on hunting smaller animals. These adaptations probably included settlement changes and the introduction of new tool types. Projectile points changed through time, probably reflecting a change in the equipment and techniques needed to hunt the smaller animals, while unifacial tools remained unchanged from the Paleoindian period. Corner notched, side notched, and stemmed points evolved from the lanceolate forms of the earlier period.

Diagnostic types associated with the Early Archaic period in the western Piedmont of Georgia include Big Sandy Side Notched (Lewis and Kneberg 1959), Kirk Corner Notched, Kirk Serrated (Coe 1964), and LeCroy (Kneberg 1956). Based on the numbers of recorded sites found in the region, population increased, but social structure may have changed little from the Paleo-indian period.

Intensively occupied base camps or aggregation sites and numerous small sites characterize settlement in the Southeast during the Early Archaic period (Anderson and Hanson 1988; Chapman 1985; O'Steen 1996). The base camps, located primarily in floodplain settings, appear to be long term, seasonal or multi-seasonal sites, with evidence of varied activity and diverse resource use. The smaller sites, found in both floodplain and upland settings, are believed to be short term seasonal habitation sites or specialized logistical sites (Anderson and Joseph 1988; Cantley and Joseph 1991; Chapman 1985; Ledbetter et al. 2001; O'Steen 1996). Previous research in region suggest that Early Archaic sites distributed throughout the upland areas and along the floodplains of streams of various sizes (Stanyard 2003:102). A review of previous projects conducted near the project corridor suggests Early Archaic sites consisting of isolated projectile points or unifacial tools appear sporadically in the immediate area (Price 2001).

The Middle Archaic Period (6000 - 3000 B.C.)

A warming trend known as the Hypsithermal Interval marks the end of the Early Archaic and the beginning of the Middle Archaic period. To the south, pine forests in the Coastal Plain became established during this period (Carbone 1983:9). Middle Archaic people continued a hunter-gatherer subsistence strategy and the extensive use of local raw materials appears to indicate that foraging groups may have been restricted to smaller territories (Anderson 2001:160; Anderson and Joseph 1988:135). The scarcity of Middle Archaic sites south of the Fall Line and in the Ridge and Valley Province of northwestern Georgia suggests that certain habitats, such as those found in upland areas in the Piedmont, were more conducive to these people. Acheologically, the transition from the Early Archaic to the Middle Archaic is characterized by the appearance of stemmed rather than notched projectile points, and an increased incidence of bone and ground stone tools, including atlatl weights, axes, and grinding implements (Chapman 1985; Coe 1964; Lewis and Lewis 1961). A variety of specialized tools appeared, and the increased number and diversity of ground stone tools is particularly noticeable in many Middle Archaic assemblages.

Diagnostic Middle Archaic projectile points found in northwestern Georgia include Stanley and Morrow Mountain (Coe 1964), Sykes (Lewis and Lewis 1961), White Springs (DeJarnette et al. 1962), and Benton (Kneberg 1956). The first two of these are more common in the Piedmont while the latter three appear more often in the Ridge and Valley. The Middle Archaic in Piedmont Georgia is primarily identified by Morrow Mountain points (Coe 1964) and an abundance of small, predominately quartz, lithic scatters. For many years archaeologists associated these upland lithic scatters with the Old Quartz Culture (Caldwell 1954).

Based on work conducted in the Coweta County area, we now know that these upland sites were occupied over an extended portion of the Archaic period (Johnson 1981). We are also beginning to recognize that many of the upland lithic scatters are not associated with Morrow Mountain points but instead contain small stemmed points (Piedmont Allendale) that date to the transitional Middle Archaic/Late Archaic period (Jones 2006:45, Jordan et al. 2003:77; Whatley 2002:16). Previous surveys near the project corridor have produced evidence of Middle Archaic occupation (Price 2001). For the most part these previously recorded sites consists of single diagnostic projectile points found on quartz lithic scatters.

The Late Archaic Period (3000 - 700 B.C.)

During this period of time, an essentially modern climate and vegetation landscape emerged (Anderson 2001:161). In portions of the Coastal Plain, and to a lesser extent the southern Piedmont, the period is associated with the introduction of ceramic technology. Craft specialization and evidence of a more sedentary lifestyle identify this period. In some regions of the southeast, such as the Savannah River valley near Augusta and the lower Tennessee River valley, extensive exploitation of shellfish and aquatic resources also begins in this period. In areas where fiber-tempered pottery does appear, the Late Archaic period is often divided into a preceramic phase (Savannah River) characterized by large Savannah River points (Coe 1964), and a ceramic phase (Stallings Island), characterized by plain and then decorated fiber-tempered pottery (Claflin 1931:37-42; Fairbanks 1942:230). Throughout much of northern Georgia, the earliest late Archaic points are typed as Elora (Cambron and Hulse 1975:46) and Paris Island Stemmed (Elliott 1985; Whatley 2002). During the Late Archaic period point styles evolved from medium sized points with broad-blade and square stems, to larger points of similar form, to smaller stemmed points of highly variable form.

The widespread adoption of soapstone vessels during the latter portion of the period characterizes much of the Late Archaic period in the region (Elliott 1981). In areas such as Coweta-Heard County, suitable deposits of soapstone were quarried and fashioned into bowls and other objects such as bannerstones (Jordan et al. 2003). One significant soapstone bowl quarry, 9CL18 (Sheldon 1973, Elliott 1986:9), is recorded in nearby Carroll County and others should be present in the region (Ledbetter et al. 2009:21-24).

Although large Late Archaic sites tend to be situated in riverine settings, there is evidence of widespread use of tributary valleys in many areas of the Piedmont and the Ridge and Valley provinces. Occupation of upland areas near floodplains appears to have been seasonal. Some of the specialized sites and smaller habitation sites are located along the interior tributary streams (Jordan 2007:13). Survey projects conducted near the project corridor have produced evidence of Late Archaic in the form of isolated projectile points (Price 2001). At present, the intensity of Late Archaic occupation in the Heard and Coweta County areas is simply not well understood. Previous research suggests that at least some of the projectile points formerly associated with the Middle Archaic (Old Quartz Culture) are probably Late Archaic in age (Johnson 1981:70).

The Late Archaic cultural sequence for the eastern portion of Georgia is relatively well understood but that is not the case for northwest Georgia. Stanyard (2003:58) has suggested that the entire area of northwest Georgia should be placed within an undifferentiated Late Archaic phase because of a general lack of information. Caldwell (1957) proposed the Stamp Creek focus for sites found in northwestern Georgia that produced classic Savannah River Stemmed points and soapstone vessels but few archaeologists presently employ the terminology (Ledbetter 2007). Some archaeologists now distinguish a transitional time between the Late Archaic and the Woodland period as the Terminal Archaic Period (Faulkner and Graham 1966, Ledbetter et al. 2009). A period of transition dating beginning around 1100 B.C. and ending ca. 700 - 600 B.C. represents a regional manifestation of a population who appear to continue Late Archaic traditions when people in other parts of the Southeast were adapting cultural and subsistence strategies of the Woodland period. Terminal Archaic sites may be recognized by distinctive projectile point types of the Terminal Archaic Barbed Cluster (Justice 1987:179), an absence of ceramic vessels, and continued use of soapstone vessels (Ledbetter et al. 2009:7). Based on our review of site files data it is unclear if sites containing possible Terminal Archaic point types and soapstone vessel fragments have been found during previous surveys near the project corridor. However, the there is a great likelihood that sites of this time period were found during the previous surveys.

Woodland Period (ca. 700 B.C. - A.D. 900)

The Woodland period in the Piedmont is marked by extensive use of pottery, increased reliance on agriculture, and greater evidence of permanent occupation sites. Extensive research in the region indicates more extensive use of floodplain areas along rivers and major tributaries with broad floodplain, and increased exploitation of local resources during the Woodland period (Anderson and Mainfort 2002; Espenshade 2008, Garrow 2009; Ledbetter et al. 2009; Wood and Bowen 1995). In northwestern Georgia, Woodland period sites are identified by pottery types decorated with fabric marking, check stamping, simple stamping, and complicated stamping (Espenshade 2008; Garrow 2009; Williams and Thompson 1999; Wood and Bowen 1995).

The Early Woodland period (700 - 200 B.C.) represents a transition from the Archaic period and occupations are most commonly recognized by fabric marked pottery (Dunlap) and medium-sized triangular points. The pottery type Cartersville Check Stamped was added in greater proportions by the end of the period. Based on data from northwestern Georgia, the Early Woodland is best defined by the Kellog phase in the area near Lake Allatoona. In northwest Georgia, storage pits and circular houses are associated with the Early Woodland Kellog phase (Caldwell 1957, 1958; Garrow 2009; Ledbetter 1992; Wood and Bowen 1995). A review of the survey data from around the project corridor suggests little evidence of Early Woodland occupation (Price 2001). A few of these sites contain check stamped pottery but these likely date to the Middle Woodland. Early Woodland occupation as defined by the presence of fabric marked pottery may be ephemeral in the region in areas outside the Chattahoochee River valley.

Ceramic types, such as Cartersville Check Stamped and Simple Stamped, are typically found on sites of the Middle Woodland period (200 B.C. - A.D. 600) in this area. Early varieties of Swift Creek Complicated Stamped pottery occur in the latter part of the Middle Woodland in the area. It is during this time that economic and religious influences from Hopewell cultures of the Mississippi/Ohio River valleys entered Georgia (Caldwell 1958, Espenshade 2008). Middle Woodland sites producing Cartersville pottery are common in much of the region (Ledbetter et al. 2009:239). The most intensively occupied sites are typically situated in floodplain settings and frequently display deep middens and numerous features (Caldwell 1957; Espenshade 2008; Garrow 2009; Wood and Bowen 1995). Sites producing small to moderate numbers of Cartersville and Swift Creek sherds have been found on several sites near the project area (Price 2001).

The Late Woodland period (A.D. 600 - 900) throughout northern Georgia is characterized by the spread from the south of Swift Creek pottery and the later development of Napier. The pottery type Woodstock Complicated Stamped occurs towards the end of the subperiods (Garrow 2009:41). Hopewellian influence seems to fade and is replaced by cultural influences from the southern coastal areas in the Late Woodland period. Small triangular projectile points, as the types Jacks Reef Corner Notched and Pentagonal points appear during the Late Woodland period (Ritchie 1961:28).

In the Eastern Woodlands, the Late Woodland period witnessed the continuation of a generalized Woodland hunting and gathering lifestyle, coupled with an increasing dependence on domesticated plants. Previous archeological investigations in the region have produced a number of Late Woodland sites in the more extensive floodplain areas of the major river valleys but little information exists for outlying areas such as the non-riverine areas of Coweta and Heard Counties. Espenshade (2008) suggests that the traditional time period assigned to the Late Woodland should be adjusted to ca. A.D. 650 to 1150. That revision would place Woodstock entirely with the Late Woodland rather than the Mississippian period. Espenshade and others argue that the Woodstock culture, as presently defined, lacks characteristics that define the Mississippian culture (Espenshade 2008:139). Previous projects conducted near the project corridor have produced limited data for Late Woodland occupation (Price 2001).

The Mississippi Period (A.D. 900 - 1650)

During the Mississippi period large population centers emerged in the major river valleys of northwestern Georgia. A stratified society based on lineage or clan distinctions developed, with village or tribal chief's power depending on the control of agricultural production. Villages were sometimes fortified by palisades to protect the inhabitants from attacks by rival groups. Flat top temple mounds appear as manifestations of the emerging Southeastern Ceremonial Complex (Hudson 1976). Mississippian phases are distinguished by a variation or combination of pottery types identified by type of stamping or incised designs (Hally and Rudolph 1986; Hally and Langford 1988; Williams and Thompson 1999). Small triangular projectile points occur on most sites during the Early and Middle Mississippian but are rare on Late Mississippian sites.

The Woodstock culture is considered part of the Early Mississippi period (A.D. 900 - 1200) by many but it is clearly rooted in the Late Woodland and its temporal placement should not be rigidly confined. Recent work on Woodstock sites in the region indicates stronger ties to the Late Woodland (Espenshade 2008:139; Markin 2007; Stanyard and Baker 1992).

Etowah phase ceramics emerge out of the Woodstock tradition and a truly Mississippian culture became established in portions of northern Georgia around AD. 1000. The Etowah phase has been divided into as many as four sub-phases based on the evolution of stamped designs on pottery (Hally 1975) but King (1997:37) recognizes only two (early and late). Major sites of this time period are found on major waterways with broad floodplains and for that reason are poorly represented in upland areas like the project area that lie outside these major waterways. In north-western Georgia, the Middle Mississippi period (A.D. 1200 - 1350) is associated with Wilbanks phase ceramic types, but sites of this time period are also rare in the local area. The Etowah site probably represents the best studied mound sites associated with the Middle Mississippian Wilbanks phase in the region (King 1997, 2003).

The Late Mississippi period (A.D. 1350 - 1650) is associated with the Lamar culture. Lamar sites may be found dispersed in alluvial settings and in upland settings. These Lamar sites are characterized by complicated stamped and incised pottery and applied “folded” rims. Previous surveys on tracts near the project corridor have identified relatively few Mississippian period sites (D’Angelo 2007:30; Price 2001).

The Protohistoric Period (A.D. 1540 - 1650)

The year 1540 marks the start of the historic period and, following European incursions, the aboriginal population suffered greatly from Old World diseases and warfare. European expeditions made first contact with native populations along the Atlantic and Gulf coasts in the sixteenth and seventeenth centuries. The DeSoto expedition of 1540 traveled through Georgia and visited the site of Itaba which is believed to be Etowah (Smith 1992:21). Slightly later, soldiers from the de Luna expedition visited Coosa which lies well to the north of the project area (Smith 1992:23). There is also some information that one or more individuals associated with the 1566/1568 Pardo expedition visited Coosa (Smith 1992:23).

Little is known about the Indians of the region for the next two centuries. Archeological evidence indicates that the large mound centers were depopulated because of disease and break-down of political authority. During the protohistoric period, substantial population movement occurred and areas that may have once been buffer zones earlier were filled in by farmstead settlements. Large geographic areas such as the Oconee River valley to the east appear to have been intensively occupied during this period by resident populations and people from other areas (Kowalewski and Hatch 1991). Smith (1992:32) suggests abandonment of northwestern Georgia population centers following the mid-sixteenth century Spanish entradas.

There is evidence that these people moved down the Coosa to the area of Weiss Reservoir (Smith 1987). Within that area, shell tempered pottery of the Weiss phase is associated with sites dating to the late sixteenth century (Little 2008:158). Previous surveys conducted near the project area have produced no clear evidence of Protohistoric period sites.

Historic Period (A.D. 1650 to present)

The project area (Coweta and Heard Counties) was originally part of a 1825 treaty signed by the Creek Indians at Indian Springs. The land session resulted in the creation of Carroll, Coweta and Troup Counties. Coweta County was formed in 1826 and Heard was created in 1830 from parts of these three original counties (Davis 1982; Long 1919). Newnan, the county seat of Coweta County became the most important town and served as a hub for the multiple railroad lines (Long 1919:657).

Small subsistence farms and cotton plantations were originally established in the richer floodplain settings along the east side of the Chattahoochee River and some of the major tributary streams. The earlier plantations produced a diversity of crops with a strong reliance upon cotton occurring by the 1850s. The 1850 federal census showed the population of Coweta County consisting of 8,220 whites and 5,415 slaves. By 1860 the number of whites had decreased to 7,449 and the slave population had increased to 7,248. The establishment of the Atlanta and LaGrange Railroad in 1849 and subsequent lines in the 1850s increased the wealth of the region which grew stronger following the Civil War with the establishment of the regions textile mill industry along the falls of the Chattahoochee River.

Civil War activity was limited in the region with most occurring on July 30, 1864 in the Newnan vicinity. On that date, General E. M. McCook led the Union Cavalry from the Chattahoochee through Heard County to destroy the railroad lines. McCook was attacked by Confederate forces in a skirmish known as the Battle of Brown's Mill (Swanson 2004:92). Because Newnan was a railroad hub, several hospitals were established to care for wounded Confederate soldiers during that time (Castel 1992).

After the Civil War, the economy of the south was devastated. The large plantations were gradually replaced by smaller farms owned by both whites and freed blacks. Tenancy became established as a means of agricultural production. For the most part, Heard and Coweta Counties remained rural with an agricultural base well into the twentieth century. The 1920 federal census showed Coweta County with a population of 29,047 of which 75.8 percent was classified as rural (Long 1919:857). The boll weevil reached the area by the time of World War I and cotton production greatly decreased. Like much of the agricultural region of Georgia, the population declined in the 1920s and 1930s as poor farmers moved elsewhere. The population has only recently begun to increase as the result of the regional growth and development.

Methods

Literature Review

Information about previous archeological investigations was gathered from the Georgia Archaeological Site Files at the University of Georgia in Athens. The official topographic maps housed there were examined to locate reported sites in or near the project area. Reports and manuscripts of archeological investigations conducted near the project area were examined to learn about the types of sites, density, and distribution in the area. Pertinent site forms and portions of pertinent reports were copied. The author also examined various early maps and aerial photographs of the project area housed at the University of Georgia's Science Library map room. These sources were used to locate specific structures or farm complexes in the project area and to understand how the region developed.

The 1919 Coweta County soil map and the 1940 county highway map produced by the State Highway Board and several aerial photographs were consulted (there is no early soil map for Heard County). Figure 8 shows the portion of the 1940 highway map that contains the project area. The aerial photographs made between 1938 and the early 1980s were useful for this study because they most clearly show the surface conditions as related to landuse practices that changed over time. Enlarged views of the 1942 aerials were copied to allow identification of standing structures that would be greater than 50 years old today.

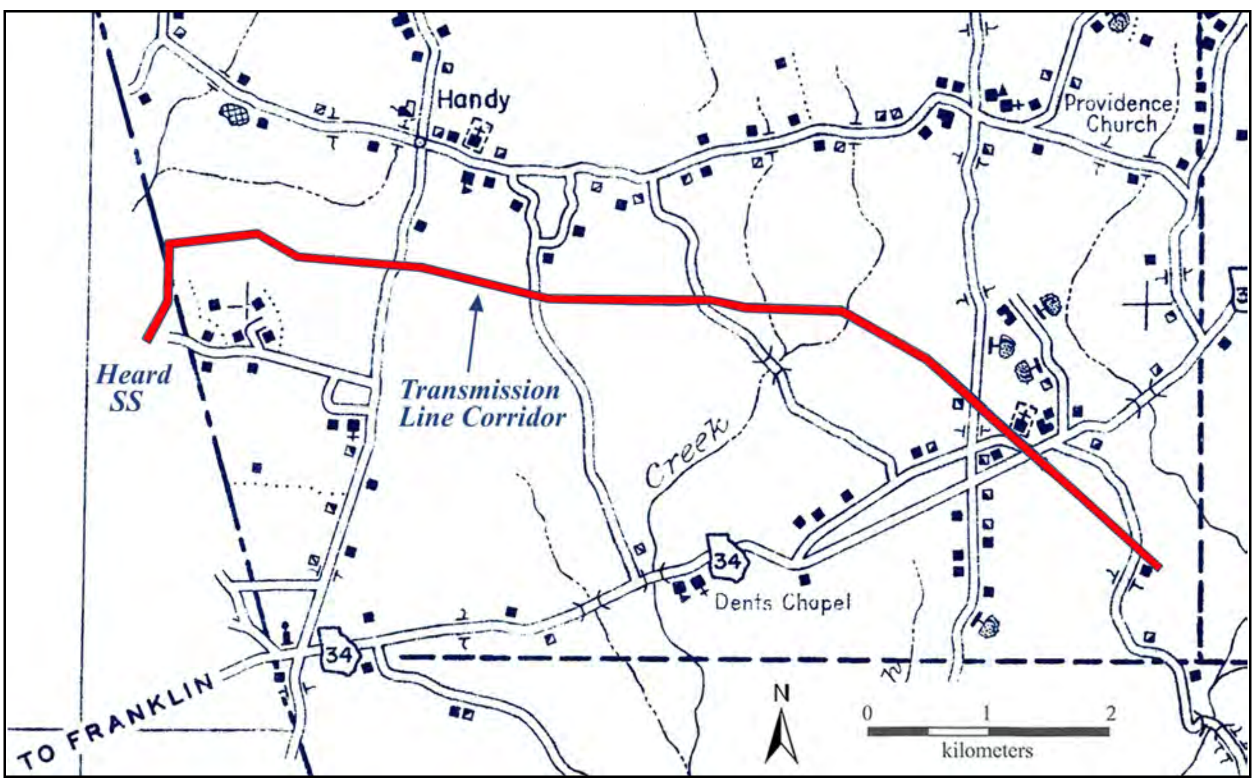


Figure 8. A portion of the 1940 Coweta County highway map showing structures near the project area.

Published regional and county histories (Coleman 1982; Davis 1982; Long 1919; Swanson 2004) were consulted for general background information concerning Coweta and Heard Counties. The lack of specific details in the these sources indicate, that during most of the past two centuries, most of the project corridor has been used primarily for agricultural purposes; predominantly farming and timber. The primary area of rural development near the project area lies at the eastern end in the small community of Dresden.

Field Survey

The survey was conducted during the period of June 30 to July 7, 2011 and on August 29, 2011 by SAS archeologists Tom Gresham, Rob Benson, and Ron Schoettmer. Seventeen person days were expended on fieldwork. The extent and location of the survey corridor had been marked on aerial photographic project maps by Georgia Transmission Corporation, as well as verbally described. A meeting between personnel of GTC and SAS archeologist Tom Gresham prior to the beginning of the field work to discuss various aspects of the survey, including access issues. In addition, during the survey, SAS archeologists were in contact with the GTC land agent who provided assistance with access and property owners.

The survey corridor width (Area of Potential Effect) was defined by GTC on shape files that were sent to SAS and transcribed onto the enlarged USGS maps, which served as our primary field map. Because the centerline was not marked in the field, the shape files allowed us to plot it accurately on our enlarged USGS maps. For the portion of the proposed line running adjacent to the existing transmission lines (either the O'Hara- Wansley 500 kV line [south of SR 34] or the Dresden-Hollingsworth Ferry 230 kV line [for the bulk of the line, that portion north of SR 34]) the edge of our survey corridor was about 125 ft from the edge of the existing cleared corridor. The proposed centerline was 120 ft from the existing 500 kV centerline and 100 ft from the existing 230 kV centerline. For the new, cross-country segment, the survey corridor was 100 ft on either side of the proposed centerline, or 200 ft wide centered on the proposed centerline, which again was not marked in the field, but was plotted on enlarged USGS field maps. The actual cleared corridor will be 150 ft wide, centered on the proposed centerline.

The survey was accomplished by walking the corridor searching for surface exposures that would have artifacts, other visible evidence of sites (chimney stubs, unusual vegetation, features) and landforms that would be conducive to prehistoric and historic occupation and use. Because most of the project area was vegetated and lacked adequate surface exposure, shovel testing was the primary site detection method employed. Shovel tests were generally placed every 30 m except on steep (>15 percent) slopes or in areas of obvious, intensive disturbance. Additional shovel tests were placed on high probability land forms, which generally equated to ridge crests or broad areas of floodplains. A total of 242 non-site shovel tests were placed on mostly upland landforms of the proposed transmission line (Figures 9-10). Areas of good surface exposure are also indicated on Figures 9 and 10.

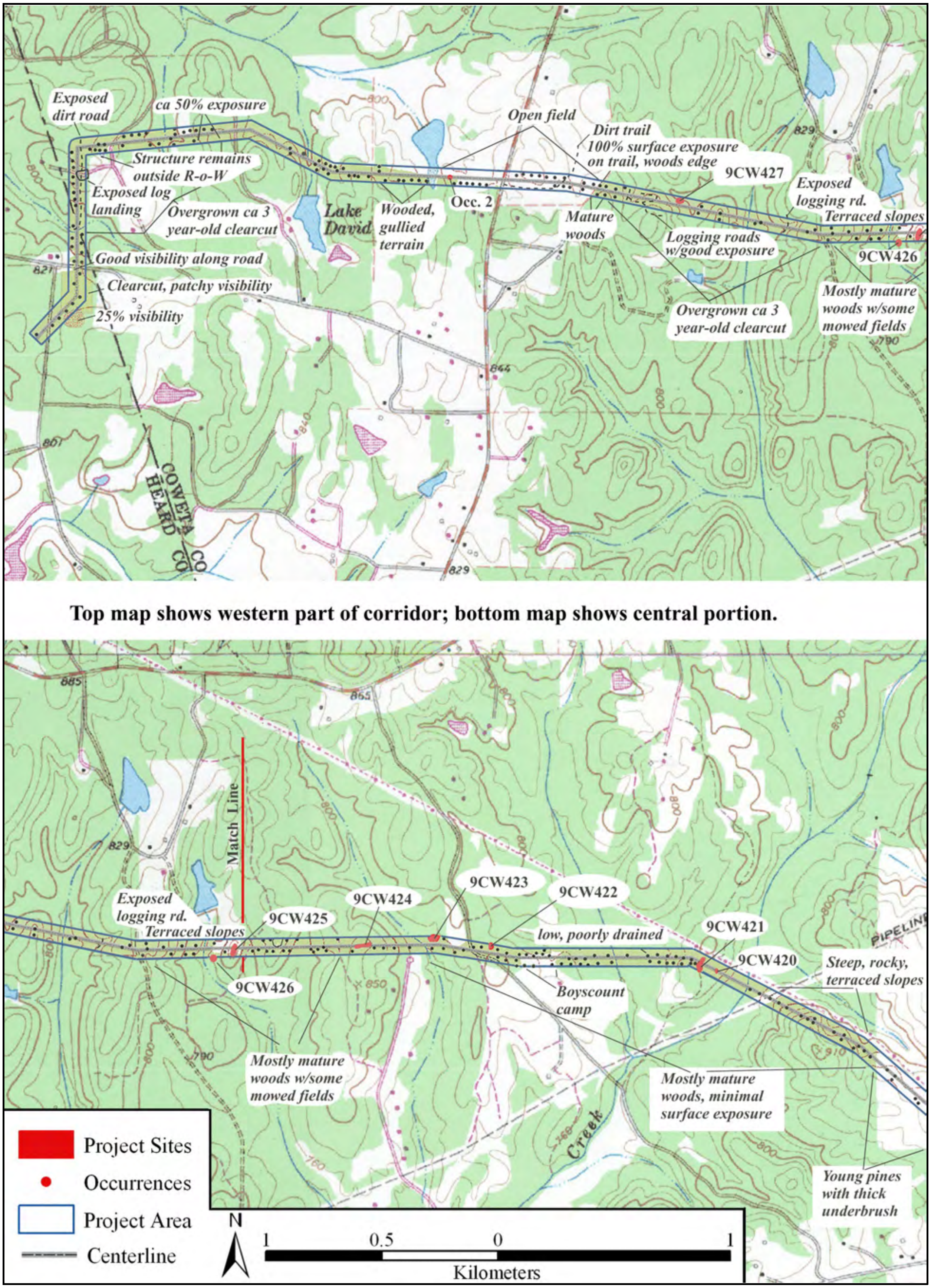


Figure 9. Two maps showing the locations of all shovel tests, identified sites, and surface conditions within the western and central segments of the project corridor (map source USGS Newnan SW quadrangle).

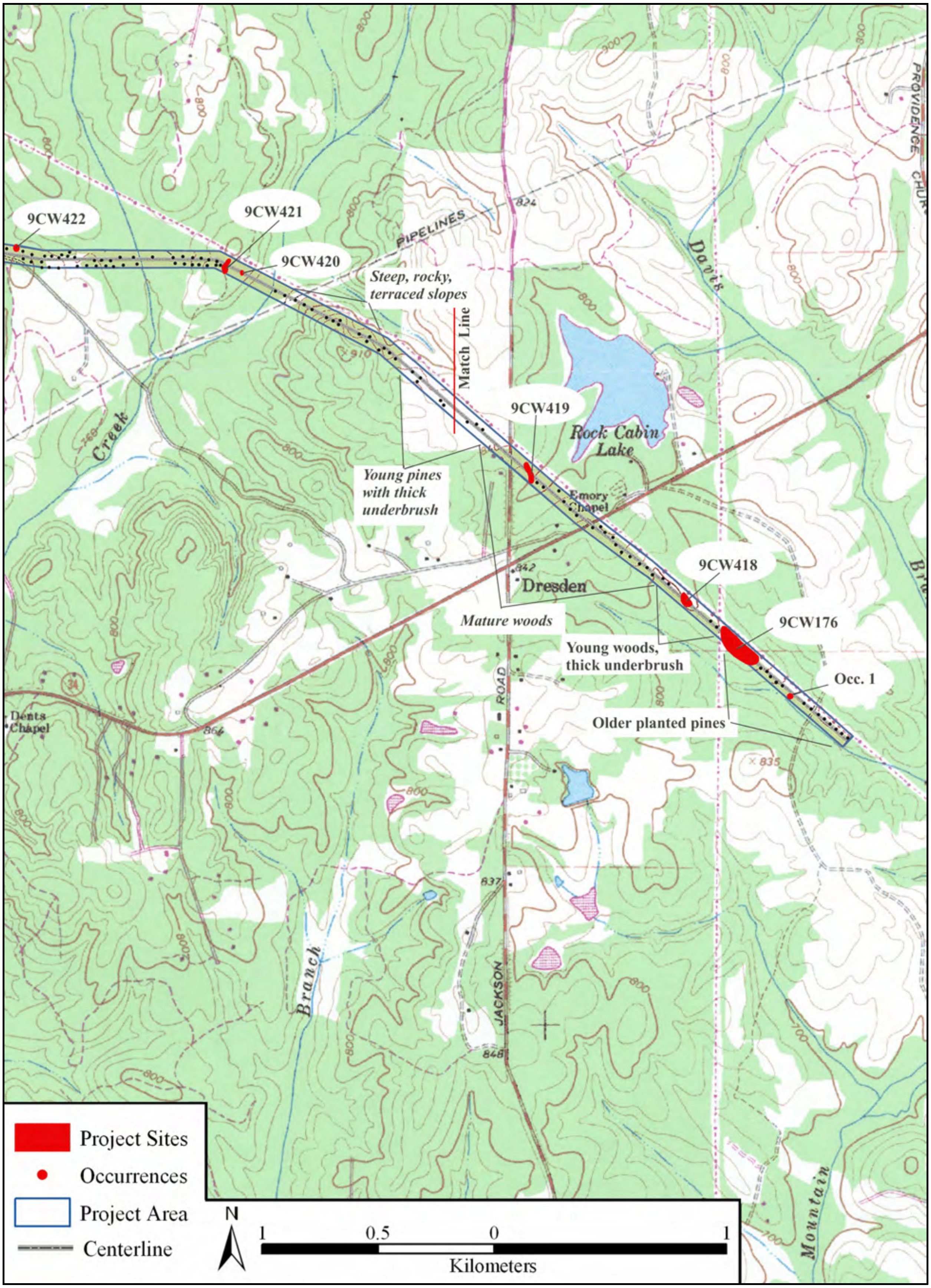


Figure 10. Map showing the locations of all shovel tests, identified sites, and surface conditions within the eastern segment of the project corridor (map source USGS Newnan SW quadrangle).

Subsurface shovel testing consisted of 30-cm diameter excavations dug into culturally sterile subsoil. Soil was screened through quarter inch hardware cloth. Because of the shallowness of the topsoil on most eroded upland landforms, tests were less than 25 cm deep in most areas. Soils in a few areas such as agricultural terraces and in floodplain areas, were deeper, requiring shovel tests of 40 cm to 90 cm in depth.

For this project a site was defined as a location where evidence of past human activity (more than 50 years old) was found in meaningful cultural context. More specifically, a site is defined as a location where three or more artifacts were found on the surface within 30 m of each other, where one or more artifacts was found on the surface and recovered in one or more shovel tests within 30 m of the surface find(s), or where two or more artifacts were found in shovel tests. Sites with historic period features, such as rock piles, cemeteries, moonshine stills, and house sites without artifacts would also be considered as archeological sites. Historic period artifacts determined to be recent trash (less than 50 years old), would not be recorded as a site. Also not considered as sites were historic period landscape features, such as fence lines, terraces, and old road beds. For this project, any recovered artifacts which do not fit these criteria are classified as occurrences.

When a site was detected, additional shovel tests were excavated. This was accomplished with a cruciform pattern of shovel tests to define site boundaries. The shovel tests were generally placed at either 10 m or 20 m intervals. Positive shovel tests were surrounded by additional tests within the project boundaries until sterile shovel tests surrounded it or the property boundary was reached. Generally, we did not excavate shovel tests outside the boundaries of the project area. Sites maps were prepared and relevant information was recorded on individual site forms. Sites were photographed using a digital camera.

Laboratory Methods

The artifacts recovered were transported to our Athens office for processing. Each lot of artifacts was washed using plain water and light brushing, allowed to air dry and then replaced into its original bag. Artifacts analysis was conducted by the senior author of this report. After analysis the artifacts were prepared for permanent curation by bagging and labeling according to the standards and guidelines of the University of Georgia's Laboratory of Archaeology. The artifacts will be temporarily stored at the SAS laboratory in Athens.

The artifacts recovered from the survey consist primarily of prehistoric chipped stone, primarily made from quartz. A small amount of pottery was recovered from the prehistoric sites and moderate amounts of historic period artifacts were recovered that relate to nineteenth to mid-twentieth century house sites. A list of all recovered artifacts is presented with each site description in this report. Artifacts were identified as described as follows:

Aboriginal pottery was sorted by temper type and surface treatment. All pottery recovered during the project was tempered with either fine sand or grit. Surfaces were either undecorated or stamped. *A Guide to Georgia Indian Pottery Types* (Williams and Thompson 1999) was used as a guide to published type descriptions. The few sherds recovered during the survey were small and eroded which precluded the need for detailed analysis. For that reason, the pottery was of limited value for determining components.

Prehistoric Lithic Artifacts

Prehistoric lithic artifacts were identified by raw material and sorted into tool and debris categories. Raw material categories commonly found on Coweta-Heard County sites include Piedmont and Ridge and Valley resources such as quartz, quartzite, Ridge and Valley chert, diabase and soapstone. The collection of chipped stone found during the survey consists of locally available quartz commonly called vein quartz and good quality milky or crystal quartz which may also outcrop near the project corridor. Varieties of quartz were sorted using Jones' (2006) classification system. Characteristics of the six types defined by Jones follows:

1) Crystal which is clear and glass like.
2) Ice which varies from glassy to slightly irregular.
3) Milk Glass which is opaque to translucent and glass-like.
4) Irregular with fracture surfaces having a "bumpy" appearance (common vein quartz).
5) Frosty which has the appearance of sandblasted glass.
6) Grainy/Sugary which is similar to quartzite.

Darkly colored chert was procured from Ridge and Valley outcrops located above the Cartersville Fault area but some may represent material from more distant sources. Coastal Plain chert would have been procured from sources located south of the fall line. All chipped stone artifacts were examined through a low power magnifying glass. All chipped stone with possible retouch or use-wear was then examined under a 15 power stereoscopic microscope.

Lithic artifacts were also sorted by functional criteria relating to reduction or possible tool use. Tool and debris categories used in this report are based on definitions and descriptions presented in the works of Crabtree (1972), Collins (1975), Ensor (1981), Faulkner and McCollough (1973), and Chapman (1973). Debris categories related to the production of formal tools follow the sequence of reduction beginning with a core through the flake types associated with the final production of a bifacial or unifacial tool or the maintenance of that tool. A different sequence is associated with bipolar reduction and the production of small flakes utilized as expedient tools and more formalized microtools. A general list of debris categories used in this report includes cores of several types, core-trimming flakes, primary decortication flakes (listed in text as primary flakes), secondary decortication flakes (listed in text as secondary flakes), tertiary flakes, biface thinning flakes, flake fragments, and shatter.

Chipped stone tools are sorted as preforms (early and late stages), finished bifaces or projectile point knives, unifacial tools, flake tools (a flake that appears to be shaped in part by deliberate retouch), and utilized flakes. Formal definitions of these categories follow (all categories were not identified during this project).

Chipped stone tools: any piece possibly exhibiting retouch and not associated with a core was sorted into the tool category for later reappraisal and typing.

Diagnostic projectile point/knife - whole or fragmentary thin biface that retains enough characteristics to be identified to published type descriptions. Type descriptions used are taken primarily from Baker (1995), Cambron and Hulse (1975), and Whatley (2002).

Projectile point/knife fragment - thin biface fragment too small to be diagnostic.

Biface - bifacially worked piece lacking culturally diagnostic shape; four morphologically based types were recognized.

Preform - bifacially retouched artifact that has few and large flake scars on the margin of the piece. These are generally thicker than bifaces, but not as thick as bifacial cores. They are interpreted to be early stages of biface manufacture and are sometimes referred to as blanks.

Utilized flake - flakes exhibiting marginal retouch that does not significantly alter the shape or edge angle of the flake. Utilized flakes may show end use, side use or multiple edge (composite use).

Other tools - include drill perforator, unifacial scraper, chopper, notched adze, flake adze, graver, wedge, denticulate, spokeshave, awl, backed flake, notched flake.

Debitage: waste material produced during the reduction process or during maintenance of a tool (resharpening). Debitage generally consists of recognizable flake forms and formless debris. A flake is defined by the presence of a striking platform and a bulb of percussion. Debitage lacking these attributes would be placed into the categories of flake fragment or shatter.

Primary flake - a percussion flake with cortex on 95-100 percent of the dorsal surface and few or no flake scars; usually has a prominent bulb of percussion with few or no facets on the striking platform.

Secondary flake - a percussion flake with cortex on 5-95 percent of the dorsal surface.

Tertiary flake - a percussion flake with less than 5 percent cortex on the dorsal surface.

Core trimming flake - contains the remnants of a striking platform on the dorsal surface; must have at least three flake scars and signs of battering on the old platform; cannot have any cortex on the dorsal surface. This type of flake occurs when a resistant or weakened section of the striking platform is removed; it facilitates the removal of additional flakes from the core.

Bifacial thinning flake - generally small, thin flake with no cortex and a multifaceted, acute, and often lipped striking platform. This type of flake is associated with biface production.

Flake fragment - defined by the absence of striking platform and bulb of percussion (often the distal edge of a broken flake of the preceding categories). The presence of cortex was noted which allowed separation of early stage from late stage reduction.

Shatter - broken flakes or angular pieces less than 3 cm in maximum dimension.

Core - a thick artifact with three or more relatively large flake removal scars and evidence of one or more striking platforms. Core types may include: (1) single platform--exhibiting one platform; (2) double platform--exhibiting two platforms, either opposed or at right angles (also called bipolar core); (3) bifacial--with acute angled platform and flakes struck from two different planes; (4) fragment--exhibiting a portion of the platform; (5) amorphous--a blocky, multifaceted piece with two or more platforms, also known as informal, multiplatform, unspecialized, random, and polyhedral cores. Recent experimental research suggests the term anvil core may be appropriate for smaller packages of raw material that require a rigid surface (anvil) for flake removal (Jones 2006:62).

Historic Artifacts

Historic period artifacts were analyzed and described using standard terminology. The ceramics were quantified by ware-groups (refined earthenwares, stonewares, porcelain, etc.) and by temporally sensitive differences in the manufacturing technique and decoration. Bottle glass was described by color, and if possible, by manufacturing technique and functional criteria (soft drink, medicine). Flat glass was identified as such and measured for thickness. Nails were categorized by manufacturing technique (machine-cut versus wire nail) when possible. Miscellaneous artifacts, especially plastic pieces and formed metal objects, were described as thoroughly as possible.

Evaluation Methods

Sites were evaluated using established criteria for inclusion of sites in the National Register of Historic Places, primarily criterion d. No architectural evaluations (criterion c) were made because there were no standing structures on any of our sites (only outbuildings). Criteria a and b, related to important persons and events or trends in history, were applied to the historic period sites. Criterion d specifically addresses archeological sites and states that significant sites “have yielded, or may be likely to yield, information important in prehistory or history." While the range of "important information" is wide and diverse, it can be simply defined to allow site evaluations at a survey and/or testing level. Important information may consist of data that provides new, non-redundant, non-trivial information beyond which can be gathered by survey or archival methods. For historic period sites to provide new and important information, they would have to be unusual (as in age or type) and especially well preserved.

The series of research design papers for the Piedmont of Georgia (Anderson et al. 1990; Hally and Rudolph 1986; Joseph et al. 2004; Smith 1992; Stanyard 2003; Wood and Bowen 1995) was consulted to help define current research themes, gaps in knowledge, and the types of sites and data bases needed to address current research issues. However, these volumes are highly variable in their treatment and specificity. For the purpose of this survey, a site is considered potentially eligible if:

1) it appears relatively undisturbed; and

2) there are sufficient quantities of cultural material present for meaningful analysis or to suggest the presence of intact features, or

3) the types and diversity of artifacts suggest an unusual or rare type of site.

The primary reasons for recommending a site ineligible are:

1) the site has been disturbed to the extent that there is little potential for identifying meaningful artifact distribution patterns or locating features; or

2) the site is relatively undisturbed but so little cultural material is present that there is little potential for conducting further meaningful research.

3) the site is relatively undisturbed and material is not sparse, but the archeologically recoverable data is not considered important, relative to data that can be gathered by other means.

Curation

All artifacts, notes, photographs, analysis forms and other information generated by this survey will be submitted to the University of Georgia's Laboratory of Archaeology in Athens for permanent curation.

Results

Archival Research

An examination of archaeological sites recorded on the Newnan SW quadrangle map at the Georgia Archaeological Site Files showed that one site (9CW176) was previously recorded within the project corridor. This is attributed to the earlier survey of 1,150 acres for a proposed land application site for the city of Newnan (Price 2001).   9CW176 had been described as a highly eroded ridge slope site containing small amounts of prehistoric chipped stone. The site was recommended not eligible as the result of that previous field investigation (Price 2001).

As the result of that survey and a few additional surveys in the area, a number of sites have been recorded within one mile of the current project corridor, although the vast majority are located near the eastern end. Sites recorded near the project corridor are the result of surveys conducted on the previously mentioned 1150 acre Newnan application site (Price 2001), a second land application survey of 1,200 acres for the city of Newnan by D'Angelo (2005) and a natural gas plant and pipeline project (Benyshek 1998). None of these reports are currently available at the site files and the titles are preliminary as listed on the site forms. For this reason, information could only be procured from the site forms.

Previously recorded sites located within one mile of the project corridor were present near the western end (N = 5) and the eastern end of the line (N = 28). There were no previously recorded sites near the central part of the corridor. The sites previously recorded near the west end of the corridor consisted of four prehistoric lithic scatters (one contained a Middle Woodland projectile point) and a single historic period artifact scatter dating to the late nineteenth to early twentieth century. All were recommended ineligible for listing on the National Register (Benyshek 1998).

The large number of sites recorded near the eastern end of the project corridor were primarily prehistoric (N = 19), but included seven historic period sites and two sites with both prehistoric and historic period components (Price 2001, D'Angelo 2005). According to the site forms, six of the prehistoric sites were unidentified lithic scatters. Prehistoric sites with recognized components included Early Archaic (N = 3), Middle Archaic (N = 1), Late Archaic (N = 1), "Archaic" (N = 2), Middle to Late Woodland (N = 4), "Woodland" (N = 5), and three sites with unidentified pottery that might be either Woodland or Mississippian. The historic period sites included two dating to the mid-to-late nineteenth century and seven dating to the late nineteenth to mid-twentieth centuries. Based primarily upon site integrity, Price (2001) recommended 9 of 24 sites eligible for nomination to the National Register and the remainder were recommended ineligible. The recommended eligible sites appear to be examples that required further testing to adequately determine status. The four nearby sites recorded by D'Angelo (2005) were all recommended ineligible for listing on the National Register.

Other projects on the Newnan SW quadrangle include two Department of Transportation bridge replacement surveys (Joseph et al. 1993, 1998) and one transmission line survey (Will 2002). No sites were recorded on the Newnan SW map as the result of those two projects.

An examination of the 1919 soil survey map and the 1940 highway map for Coweta County shows only a few farm houses and community residences located near the corridor. There is no early soil map for Heard County and the oldest highway map available for that county dates to 1950. Figure 11 shows the 1919 Coweta County soil survey map with the approximate location of the project corridor. According to the soil map (which is generally accurate but not precise with the locations of structures), there are six structures located within or very near the corridor. One is located near the county line near the western end of the corridor, one is located just south of the corridor on present-day Thomas Powers Road, one is located in the forks of the road south of Elam Church, one is located just north of the community of Dresden, one is a church located in Dresden, and one is located near the eastern terminus of the corridor. Of these, only the farm structure located south of Elam Church appears to lie within the corridor. Our survey found no evidence of a former structure at this location. No structure is shown at the location on the 1940 highway map (see Figure 8) and it does not appear on aerial photographs.

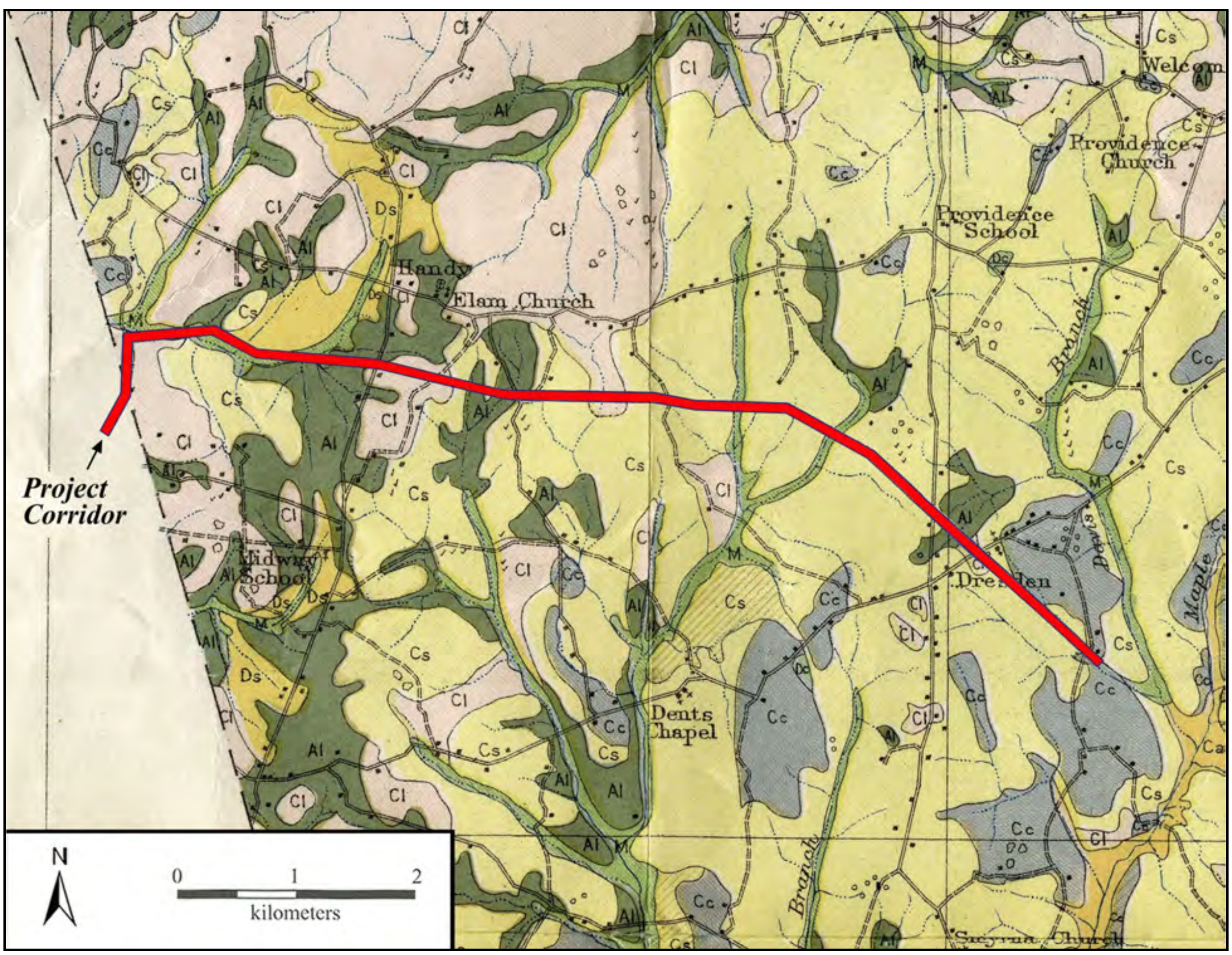


Figure 11. Portion of the 1919 Coweta County soil survey map showing the project corridor and nearby structures.

Aerial photographs show most of the project area under cultivation or in woodlands during the period of the late 1930s until the 1960s when it was allowed to revert to pines. The only area of more urban development lies around the community of Dresden. Based on the presence of agricultural terraces, it is obvious that the area has been cultivated for an extended length of time prior the 1930s. The aerial photographs clearly show the extent to which the area has been modified by agricultural terracing which would have been particularly destructive to any prehistoric (or earlier historic period) cultural deposits that may have been located on the landforms.

A careful examination of the 1942 aerial photographs shows that most of the structures shown on the 1919 soil map still remained but that all visible structures lay outside the corridor. There was no visible indications of a structure located south of Elam Church. One structure is located near the western end of the corridor in Heard County but no evidence was found during our survey. In the Dresden community, the corridor is located to the west of the old Emory Chapel cemetery. Of the three sites recorded during this survey with historic period artifacts, none appear associated with standing structures dating to the early to mid-twentieth century.

Our archival research indicates the survey corridor contains one previously recorded prehistoric archaeological site. Our efforts to compare structures shown on the 1919 soil survey map, the 1940 highway map, and the 1942 aerial photographs indicate that six structures are located near the corridor, but only one of which may have been located within the survey area. Our field survey found no evidence that these structures or associated activity areas extended into the project area.

Field Survey

The archeological survey for the proposed 6.9 mile (11.1 km) long 500 kV transmission line from Dresden to Heard County required 17 person days (so far) to complete. Most of the project area was vegetated, necessitating shovel tests for archeological site discovery. The project required 242 non-site/occurrence shovel tests. An additional 121 shovel tests were excavated on archeological sites and occurrences (cultural resources). We recorded ten newly discovered archeological sites and one previously recorded archeological site (9CW176). Two artifact occurrences were also recorded (Figure 12).

The survey identified ten prehistoric sites that span the Archaic through Mississippian time periods while the historic period sites (N = 3) date primarily to the nineteenth century (2 contained both). All of the prehistoric sites are plowzone scatters and most collections are dominated by locally available quartz. Small amounts of non-local raw lithic raw materials (Ridge and Valley and Coastal Plain chert) were recovered along with very small amounts of prehistoric pottery. With the possible exception of 9CW176, the historic period sites are artifact scatters lacking direct association with confirmed structures. Both of the occurrences are prehistoric lithic artifacts.

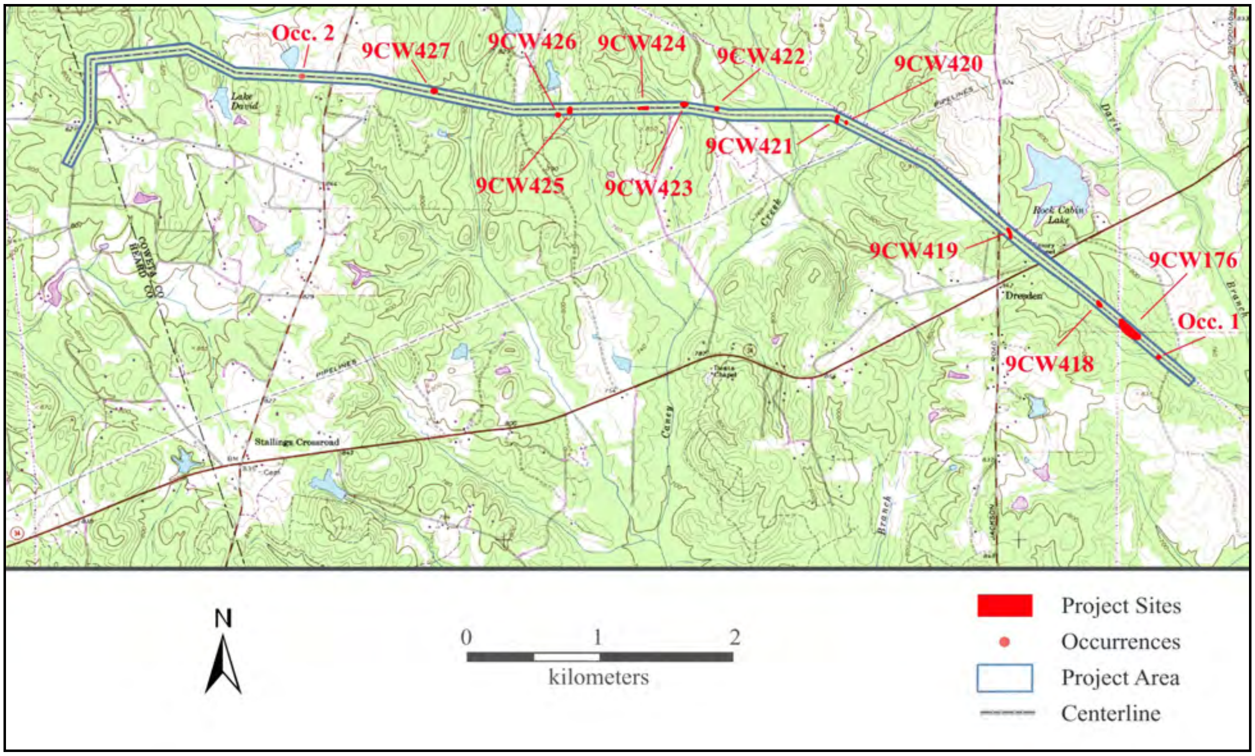


Figure 12. Map showing the locations of sites and occurrences found in the project area.

The Archeological Sites

9CW176 is an extensive, surface and subsurface prehistoric lithic scatter with a Late Archaic component and a nineteenth century component distributed along a moderately broad ridge nose. The ridge nose incorporates two knolls, one on the northwestern end and a smaller one near the southeastern end of the site. The prehistoric component covers the entire site area and the nineteenth century component is confined to the northwestern portion of the site. Surface exposure was provided by access dirt roads that runs along two intersecting transmission lines. Most of the surface prehistoric artifacts and all of the historic period surface artifacts were collected from a well exposed and gullied area at the intersection of the two transmission line corridors. Vegetation in the existing transmission line corridors consisted of mowed grass and weeds with patches of exposure. The remaining area of the site and present project area consisted of older planted pines with moderately thick scrub brush.

9CW176 was originally recorded by Garrow and Associates in 2001 as a surface and subsurface prehistoric lithic scatter (Price 2001). The original estimated site dimensions were 255 m in length and 60 m in width. A 30-m grid of shovel tests was excavated across the site and only one shovel test was positive. Presumably, site dimensions were estimated based upon the extent of the surface scatter and the shape of the landform. No diagnostic prehistoric artifacts were recovered and the historic period component was not discovered on the northwestern portion of the site. 9CW176 was recommended as not eligible for listing on the NRHP because of low artifact density and poor preservation (Price 2001).

9CW176

Location/Environment

Field Number: NA
County: Coweta
USGS Quad: Newnan SW
Easting: 694705
Northing: 3691632
Topography: Ridge nose
Elevation: 234
Site Size (m^2): 12,672
Component 1: Late Archaic
Component 2: 19^{th} Century

Collections/Recommendation

Percent Surface Exposure: 5%
Surface Collected?: Yes
Positive ST: 4
Negative ST: 9
NRHP Eligibility
Recommendation.: Ineligible

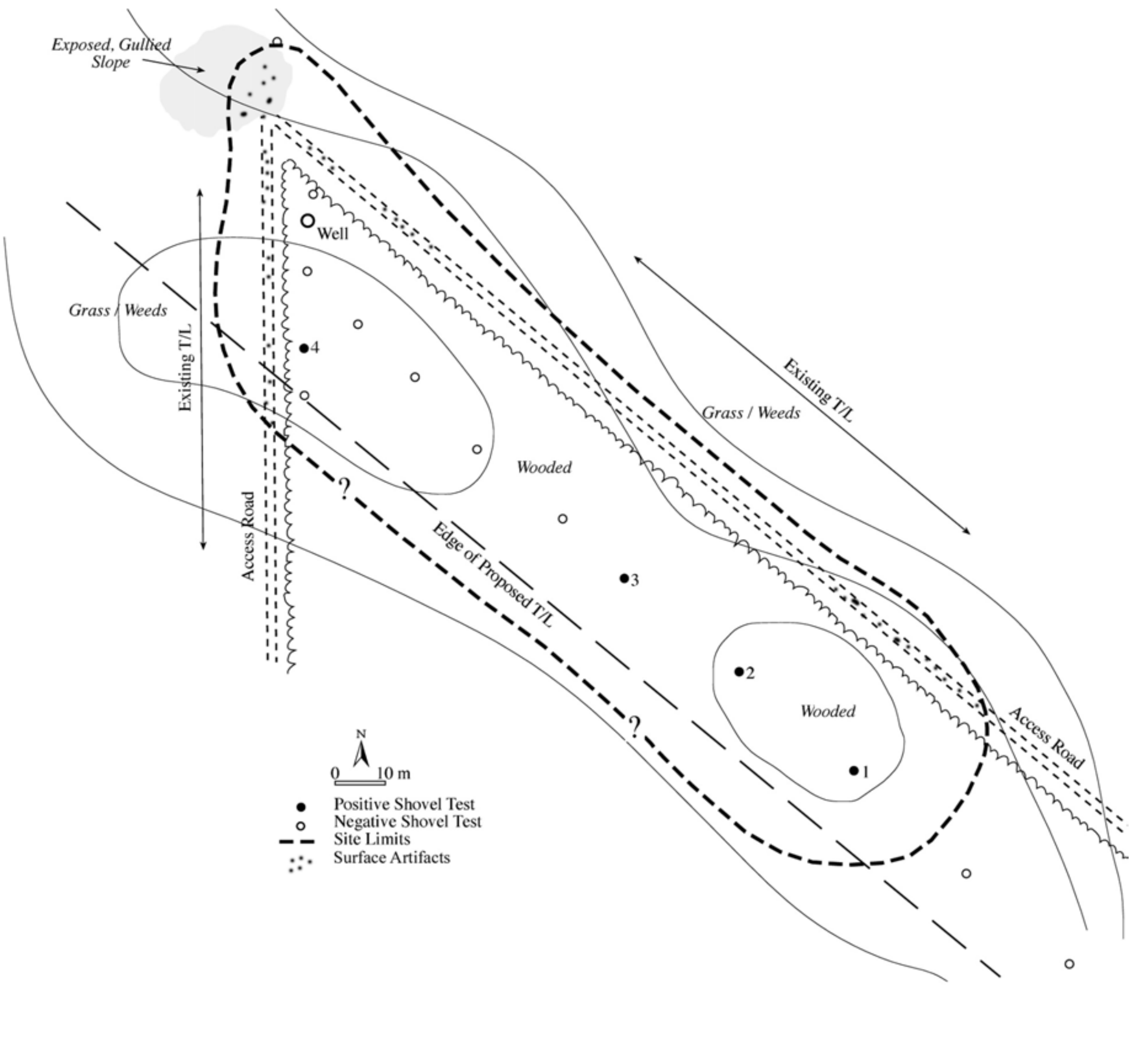


Figure 13. Photograph of 9CW176, view to the southeast.

We excavated 13 shovel tests at 15- and 30-m intervals mostly to confirm the presence of previously recorded subsurface deposits and site dimensions and four were positive. Three of the four positive shovel tests were located on the lower knoll on the southeastern portion of the site. The fourth was located on the upper knoll, on the northwestern portion of the site. Shovel Test 4 produced both prehistoric and historic period artifacts. We estimated site dimensions based upon the distribution of positive and negative shovel tests and the spatial extent of surface artifacts collected from the respective existing transmission line corridors. Our site dimensions are slightly smaller than the originally recorded dimensions, approximately 210 m in length and 55 m in width. Soil stratigraphy consisted of 10-20 cm of rocky brown clay loam overlying reddish brown clay subsoil. Artifacts were recovered at various depths throughout the topsoil (Table 1).

Among the prehistoric lithic artifacts, one diagnostic PP/K was collected from the surface of the access road along the north-south transmission line corridor. The artifact displays similarities to Otarre and Kiokee Creek PP/K types (Whatley 2002:55, 88), indicating a Late Archaic or Terminal Archaic occupation on 9CW176 (Figure 14). Most of the chipped stone consisted of late stage quartz reduction debris. Fragments of three additional bifaces were found but these were not diagnostic. Small amounts of Ridge and Valley and Coastal Plain chert were also found.

Figure 14. Quartz Late Archaic PP/K from surface of 9CW176.

Table 1. Artifact list for 9CW176.

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface		1	quartz (Type 4) Kiokee Creek PP/K
		1	quartzite (white) PP/K distal (well made point)
		2	quartz (Type 4) biface fragments
		2	quartz (Type 4) tertiary flakes
		7	quartz (Type 4) biface thinning flakes
		3	quartz (Type 4) late reduction flake fragments
		1	quartz (Type 4) late reduction angular fragment
		1	blue edged whiteware fragment
		1	sponge blue transfer print whiteware fragment
		1	unidentified blue transfer print whiteware fragment
Shovel Test 1	0-10	1	quartz (Type 4) biface thinning flake
Shovel Test 2	0-12	1	CP chert expedient composite tool
		1	R/V (Knox) chert biface thinning flake
		1	CP chert late reduction flake fragment
		1	quartz (Type 4) tertiary flake
Shovel Test 3	0-15	1	quartz (Type 4) tertiary flake
		1	quartz (Type 4) biface thinning flake
Shovel Test 4	10-20	1	quartz (Type 2) biface thinning flake
		2	plain whiteware fragments
Total		**30**	

Evidence of the historic period occupation is confined to the northwestern portion of the site. A shallow circular depression located in the woods near the intersection of the two transmission line corridors is possibly a well. Visible architecture, such as structure support stones or a chimney rubble pile, are not present. A few middle-late nineteenth century ceramic fragments were collected from the surface and were also recovered from Shovel Test 4. No construction material was recovered. The artifacts suggest an occupation dating between the 1830s to the 1850s.

Neither of the two components on 9CW176 retain good enough preservation integrity to suggest that additional excavation will produce important archeological information beyond the survey level of investigation. The area is extensively eroded and topsoil is thin. Prehistoric lithic artifacts are sparsely distributed across the landform with no concentrations that would suggest a specific occupation or activity area. Remains of a possible mid-nineteenth century house on the northwestern portion of the site are nearly non-existent, consisting only of a well-like depression and a few artifacts. Therefore, because of poor preservation and limited research potential, we concur with the existing eligibility status and recommend 9CW176 ineligible for listing on the National Register of Historic Places.

9CW418 is a surface and subsurface, prehistoric lithic scatter located on the southwestern side of a ridge nose. The ridge nose is broad and descends gradually to the southeast. The main ridge crest is northeast of the site, within the existing transmission line right-of-way. Artifacts were found immediately southeast of a silted-in drainage head that dissects the southwestern slope of the landform. Surface artifacts were collected along the southwestern edge of existing right-of-way. An abandoned and overgrown dirt road runs northeast-southwest through the site. The majority of 9CW418 lies within wooded terrain with only the northeastern edge extending into existing transmission line right-of-way.

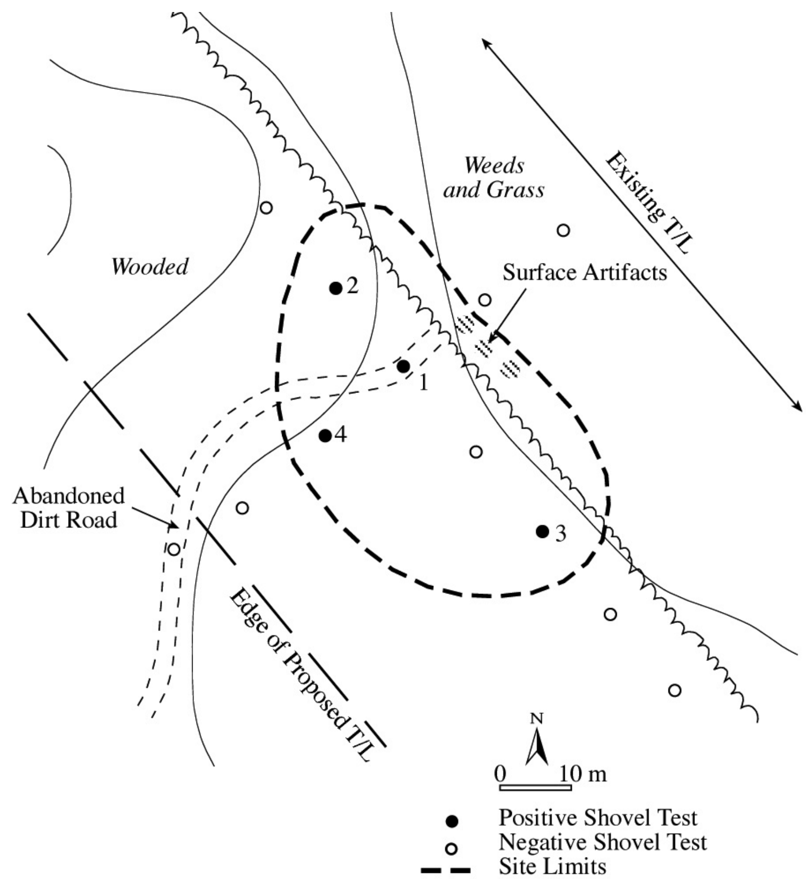
9CW418

Location/Environment

Field Number: RB-3
County: Coweta
USGS Quad: Newnan SW
Easting: 694473
Northing: 3691840
Topography: Ridge nose
Elevation: 243
Site Size (m^2): 1,795
Component: Archaic

Collections/Recommendation

Percent Surface Exposure: 5%
Surface Collected?: Yes
Positive ST: 4
Negative ST: 8
NRHP Eligibility
Recommendation.: Ineligible



We excavated twelve shovel tests at 15-m intervals in a cruciform pattern aligned with the axis of the main ridge and four tested positive. The distribution of positive and negative shovel tests and the extent of the surface scatter determined site limits. Soil stratigraphy consisted of 18-20 cm of light orange/brown sandy loam overlying light red sandy clay subsoil. The top 18 cm of soil in Shovel Test 1 was mottled, indicating subsurface disturbances probably from construction of the now abandoned dirt road. Artifacts were recovered from the top 20 cm of sediment.

Later reduction quartz flaking debris was recovered from all positive shovel tests (Table 2). An early stage quartz preform from Shovel Test 2 indicates a general Archaic period occupation. The sparse distribution of lithic artifacts likely represents the poorly preserved remains of several short-term occupations of limited activity.

Table 2. Artifact list for 9CW418.

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface		1	quartz (Type 4) PP/K distal fragment
		1	quartz (Type 4) biface fragment
		1	quartz (Type 2) biface thinning flake
		1	quartz (Type 2) late reduction angular fragment
Shovel Test 1	0-10	1	quartz (Type 2) late reduction flake fragment
Shovel Test 2	0-10	1	quartz (Type 6) early preform
Shovel Test 3	0-20	1	quartz (Type 2) late reduction flake fragment
		2	quartz (Type 4) late reduction flake fragments
Shovel Test 4	10-20	1	quartz (Type 4) biface thinning flake
Total		**10**	

Preservation integrity has been severely compromised by recent historic period land use activities, adversely affecting potential artifact patterning. Additional excavation is unlikely to produce information beyond the survey level of investigation. Therefore, because of poor preservation and limited research potential we recommend 9CW418 ineligible for listing on the NRHP.

9CW419 is a surface and subsurface, prehistoric lithic scatter with a possible Middle Archaic component. The Archaic component is based on the recovery of a single ovate biface (Figure 15). Artifacts are sparsely distributed along the crest of a moderately broad ridge nose that gradually descends south. A gullied first order drainage bounds the western side of the landform. The northern portion of the site extends onto existing transmission right-of-way. Two artifacts were collected from the surface along the southwestern edge of the existing right-of-way, which was covered with weeds and grass with patchy surface exposure at the time of the survey. The area containing the larger portion of the site to the south within the proposed right-of-way consisted of mature woods.

We excavated ten shovel tests at 15-m intervals in a cruciform pattern aligned with the landform axis and five tested positive. The distribution of positive and negative shovel tests and surface artifacts determined site limits. The southern end of the site was not defined by shovel tests due to limitations of the project area. However, the slope of the landform increases significantly beyond Shovel Test 2 and it is unlikely that the site continues further south. Soil stratigraphy consisted of 15-21 cm of orange brown or reddish brown sandy clay loam overlying red or orange/red clay subsoil. Artifacts were recovered at various depths throughout the topsoil. Table 3 provides a list of artifacts collected during survey.

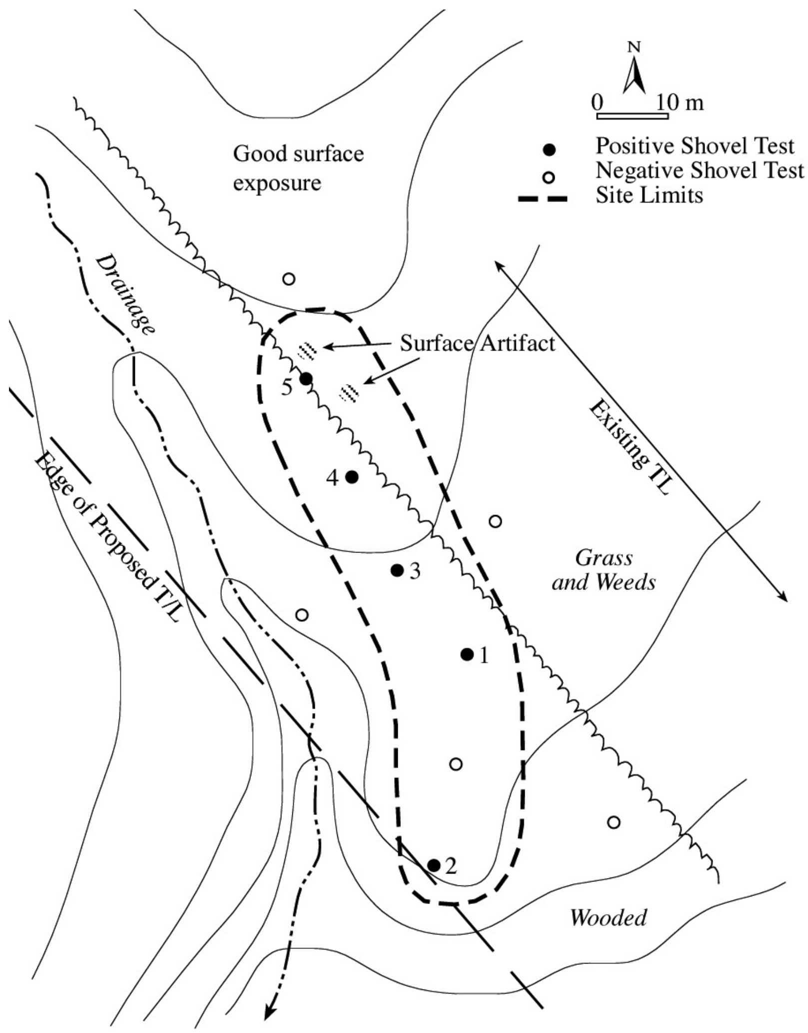
9CW419

<u>Location/Environment</u>

Field Number: RB-1
County: Coweta
USGS Quad: Newnan SW
Easting: 693792
Northing: 3692368
Topography: Ridge nose
Elevation: 246
Site Size (m^2): 2,001
Component: Middle Archaic

<u>Collections/Recommendation</u>

Percent Surface Exposure: 5%
Surface Collected?: Yes
Positive ST: 5
Negative ST: 5
NRHP Eligibility
Recommendation.: Ineligible



All artifacts recovered from 9CW419 were prehistoric lithics. One Coastal Plain chert late reduction flake fragment was recovered among Types 2 and 4 quartz flaking debris and tools. The Archaic component was identified by an ovate (rounded base) biface made from quartz that is similar to a Morrow Mountain PP/K (Coe 1964) collected from the surface (Figure 15). Similar bifaces may represent bifacial knives used during the Early through Late Archaic (Johnson 1981). Generally, the lithic flaking debris represents later stages of tool production and maintenance activities. The scatter likely represents several overlapping occupations of limited duration and activity.

Figure 15. Quartz biface from 9CW419.

Table 3. Artifact list for 9CW419.

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface		1	quartz (Type 4) Morrow Mountain I PP/K
		1	quartz (Type 4) early (emergent) preform
Shovel Test 1	0-15	1	CP chert late reduction flake fragment
		1	quartz (Type 2) tertiary flake
		1	quartz (Type 4) biface thinning flake
		1	quartz (Type 4) retouch flake
Shovel Test 2	0-10	1	quartz (Type 4) biface thinning flake
Shovel Test 3	10-15	1	quartz (Type 4) tertiary
Shovel Test 4	0-15	1	quartz (Type 4) wedge (expedient tool)
		1	quartz (Type 2) late reduction flake fragment
Shovel Test 5	0-5	1	quartz (Type 4) biface thinning flake
Total		**11**	

Additional excavation is unlikely to produce important information beyond the survey level of investigation due to low artifact density and generally poor preservation integrity. Therefore, because of poor preservation and limited research potential we recommend 9CW419 ineligible for listing on the NRHP.

9CW420 is a subsurface, historic period ceramic artifact scatter located on a small ridge nose that descends southeast from a larger ridge to the northwest. Erosional gullies have dissected the landform's southern slope. Site 9CW421, a probable later nineteenth-early twentieth artifact scatter, is located on the larger and more prominent ridge to the northwest. Skirting the northern edge of 9CW420 is the southwestern edge of an existing transmission line right-of-way. The marginal surface exposure within the right-of-way revealed no surface artifacts. No above-ground remains indicative of a former structure, e.g., field stone structure piers, were visible. Vegetation consisted of mature woods at the time of site recording.

We excavated nine shovel tests at 10- and 15-m intervals in a cruciform pattern aligned with the landform axis and two tested positive. Positive tests were contiguous, so site limits exclude all sterile shovel tests. Soil stratigraphy consisted of 10 cm of brown sandy clay loam overlying reddish brown or red clay subsoil. Artifacts were recovered from the top 10 cm of sediment. Each of the two positive tests produced a single stoneware sherd (Table 4). The glaze is different on each of the two sherds, so they each represent individual vessels.

It is unknown whether this small ceramic scatter represents the location of a residential structure or an outbuilding associated with the probably domestic structure on 9CW421, or a small activity area associated with the occupation on 9CW421. The alkaline glazed stoneware most like dates to the early to mid-nineteenth century.

9CW420

Location/Environment

Field Number: RS-1
County: Coweta
USGS Quad: Newnan SW
Easting: 692538
Northing: 3693204
Topography: Ridge nose
Elevation: 237
Site Size (m^2): 252
Component: 19^{th} - 20^{th} Century

Collections/Recommendation

Percent Surface Exposure: 5%
Surface Collected?: No
Positive ST: 2
Negative ST: 7
NRHP Eligibility
Recommendation.: Ineligible

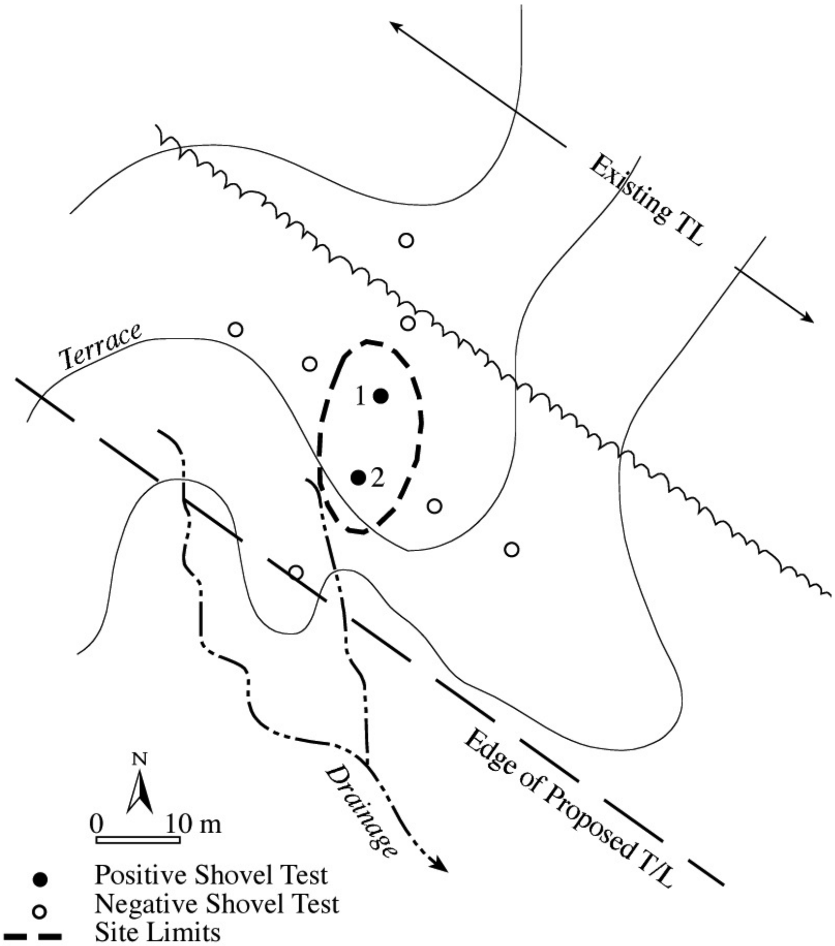


Table 4. Artifact list for 9CW420.

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Shovel Test 1	0-10	1	brown salt glazed stoneware fragment
Shovel Test 2	0-10	1	green alkaline glazed stoneware fragment
Total		**2**	

At present, site 9CW420 can be defined only as a low density historic period ceramic scatter. Given the close proximity to site 9CW421, there is a high probability of association. However, too few artifacts remain for meaningful research and preservation integrity is poor. Additional excavation is unlikely to produce information beyond the survey level of investigation. Therefore, because of poor preservation and limited research potential we recommend 9CW420 ineligible for listing on the National Register of Historic Places.

9CW421 is a surface and subsurface scatter of prehistoric lithic and historic period artifacts sparsely distributed along the crest of a narrow ridge nose. The historic component is defined by a light scatter of ceramics. No above-ground remains are visible, nor are there any depressions suggesting a former well or privy, but a single large field stone located on the western edge of the site may be a structure pier that has been displaced. Low earthen pushpiles along the western side of 9CW421 indicate that the area has been cleared with heavy machinery, making way for planting pines. Presently older planted pines cover the area.

We excavated ten shovel tests mostly at 15-m intervals in a cruciform pattern aligned with the landform axis and two tested positive. The distribution of positive and negative shovel tests and the distribution of surface artifacts along the southwestern edge of existing right-of-way determined site limits. Soil stratigraphy consisted of 20 cm of light brown sandy loam overlying red sandy clay subsoil. Artifacts were found between 10 and 20 cm below surface (Table 5).

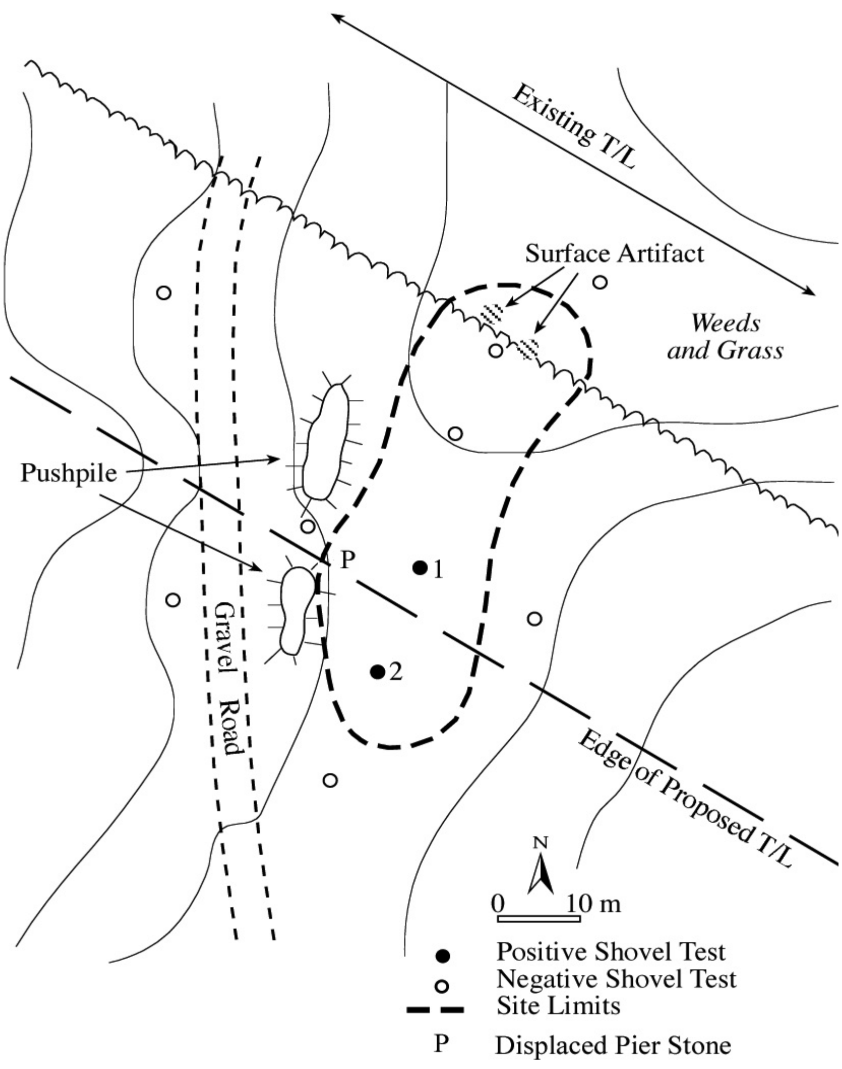
9CW421

Location/Environment

Field Number: RB-2
County: Coweta
USGS Quad: Newnan SW
Easting: 692468
Northing: 3693228
Topography: Ridge nose
Elevation: 240
Site Size (m^2): 1,340
Component 1: Unidentified lithic
Component 2: 19th - 20th Century

Collections/Recommendation

Percent Surface Exposure: 5
Surface Collected?: Yes
Positive ST: 2
Negative ST: 8
NRHP Eligibility
Recommendation.: Ineligible



A single prehistoric lithic artifact was collected from the surface. The artifact is the distal portion of a relatively large biface fragment of probable Late Archaic age. No other prehistoric artifacts were recovered from 9CW421. All historic period artifacts consist of plain whiteware fragments, generally dating the historic period occupation to sometime during the nineteenth or possibly the early twentieth centuries.

Table 5. Artifact list for 9CW421.

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface		1	quartz (Type 4) PP/K fragment (Mid-Late Archaic)
		1	plain whiteware fragment
Shovel Test 1	10-20	1	plain whiteware fragment
Shovel Test 2	10-15	1	plain whiteware fragment
Total		**4**	

Neither the prehistoric or historic period components on 9CW421 retain good enough preservation integrity or high enough artifact density to suggest that additional excavation would produce important archeological information. Recent historic period land use has severely adversely impacted the landform. Therefore, because of poor preservation and limited research potential we recommend 9CW421 ineligible for listing on the NRHP.

9CW422 is a surface and subsurface, prehistoric lithic scatter with a Middle Archaic component located on the northern end of a knoll on a ridge nose. Silted-in, first order drainages bound the eastern and western sides of the landform. A dirt road that runs through the woods along with a fence line is directly south of the site. The road offered a marginal amount of surface exposure, but no artifacts were found on its surface. Vegetation in the site area consisted of widely spaced planted pines and hardwoods with patches of surface exposure within woody undergrowth (Figure 16).

Figure 16. Photograph of 9CW422, view to the north.

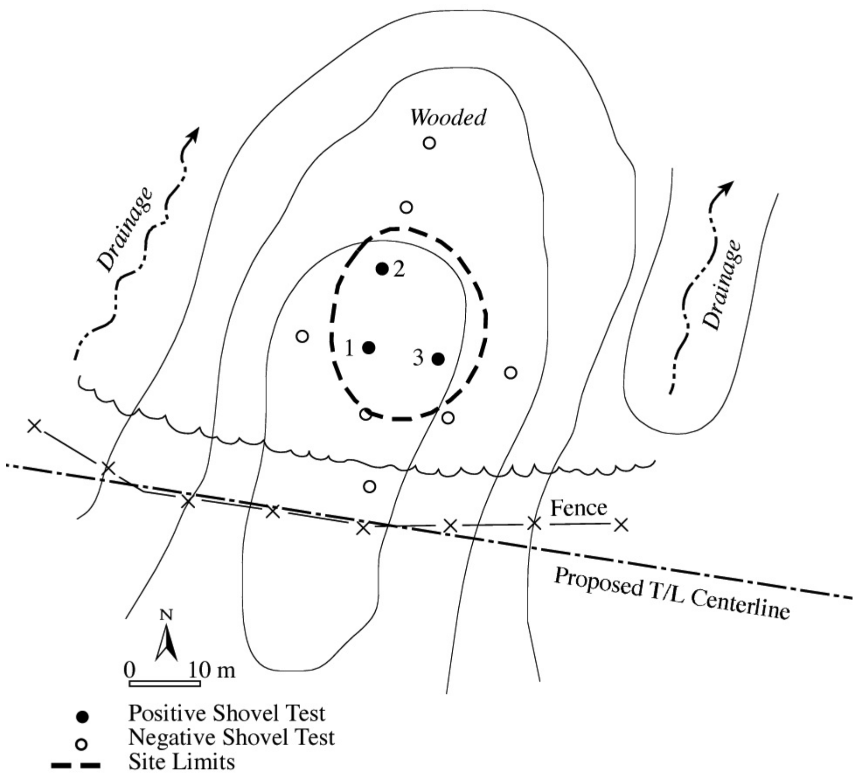
9CW422

Location/Environment

Field Number: RS-2
County: Coweta
USGS Quad: Newnan SW
Easting: 691569
Northing: 3693292
Topography: Knoll on ridge nose
Elevation: 243
Site Size (m^2): 535
Component: Middle Archaic

Collections/Recommendation

Percent Surface Exposure: 5%
Surface Collected?: Yes
Positive ST: 3
Negative ST: 7
NRHP Eligibility
Recommendation.: Ineligible



We excavated ten shovel tests at 10-m intervals in a cruciform pattern oriented with the axis of the landform and three tested positive. The distribution of positive and negative shovel tests determined site limits. Surface artifacts were collected from patches of exposed ground within the boundaries of the site determined by the shovel tests. Soil stratigraphy varied from one area to another. Shovel Tests 1 and 2 had 8-15 cm of brown sandy clay loam overlying red clay subsoil. Shovel Test 3 consisted of 5 cm of light grayish brown sandy loam overlying 17 cm of yellowish orange sandy clay loam. Red clay subsoil followed. Artifacts were recovered at various depths throughout the topsoil.

A total of six lithic artifacts were recovered from 9CW422 (Table 6). One of the six artifacts is a quartz Morrow Mountain PP/K (Coe 1964), which identifies a Middle Archaic occupation (Figure 17). The haft area of the point displays damage typical of Morrow Mountain. The remaining artifacts consist of Type 4 quartz and one piece of Ridge and Valley chert (Knox) late stage reduction flaking debris.

Figure 17. Quartz Morrow Mountain PP/K from 9CW422.

Table 6. Artifact list for 9CW422.

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface		1	quartz (Type 4) Morrow Mountain I PP/K
		2	quartz (Type 4) biface thinning flakes
Shovel Test 1	0-8	1	quartz (Type 4) biface thinning flake
Shovel Test 2	0-15	1	quartz (Type 4) tertiary
Shovel Test 3	0-10	1	Ridge and Valley (Knox) chert tertiary
Total		**6**	

Overall artifact density on 9CW422 is low with no apparent concentrations that might suggest specific activity areas or occupation areas. Additional excavation is unlikely to encounter meaningful intrasite data due to low artifact density. Therefore, because of limited research potential we recommend 9CW422 ineligible for listing on the NRHP.

9CW423 is defined as an extensive prehistoric artifact scatter consisting primarily of chipped stone and small amounts of prehistoric pottery that appears to be Mississippian in age. The site was recorded near the edge of the project area and most appears to lie north of the corridor. The southern edge of the site overlooks the narrow floodplain of a tributary of Caney Creek. The remainder of the site extends up a ridge slope to the northeast.

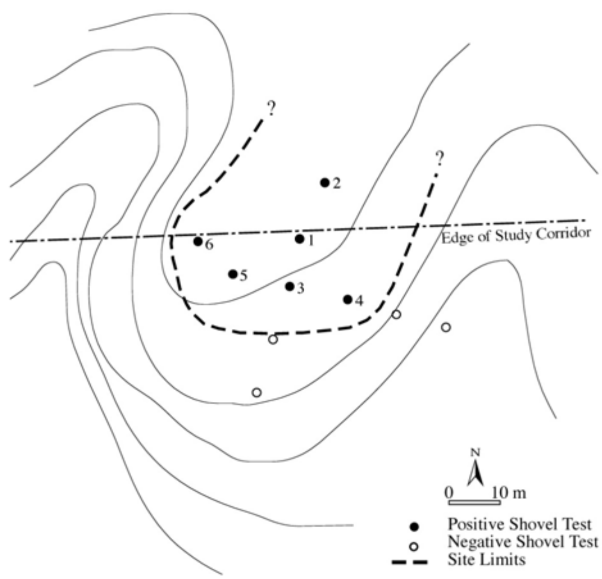
9CW423

Location/Environment

Field Number: RS-5
County: Coweta
USGS Quad: Newnan SW
Easting: 691322
Northing: 3693321
Topography: Ridge Nose
Elevation: 235
Site Size (m^2): > 1500
Component 1: Mississippian

Collections/Recommendation

Percent Surface Exposure: 5%
Surface Collected?: No
Positive ST: 6
Negative ST: 4
NRHP Eligibility
Recommendation.: Ineligible



The site area has been recently timbered, and contains a logging deck but surface exposure was minimal. Ten shovel tests were dug at 10-m intervals in a cruciform pattern basically aligned with the landform axis. Six of the shovel tests were positive. The distribution of positive and negative shovel tests and surface artifacts determined site limits for the portion of the site within the corridor. The northern extent of the site, which lies outside the project area, remains undetermined. However, the landform appears conducive to containing a potentially large site area. Soil stratigraphy consisted of 5-20 cm of brown sandy clay loam plowzone overlying red or reddish-orange clay subsoil. Artifacts were distributed along the crest of the ridge nose with counts ranging from one to six. Table 7 provides a list of collected artifacts.

Table 7. Artifact list for 9CW423.

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Shovel Test 1	0-15	1	quartz (Type 4) biface thinning flake
		1	quartz (Type 4) late stage flake fragment
		1	Ridge & Valley chert tertiary flake
Shovel Test 2	0-5	1	quartz (Type 4) tertiary flake
Shovel Test 3	0-20	1	quartz (Type 4) tertiary flakes
		2	quartz (Type 4) early stage flake fragments
Shovel Test 4	0-15	2	plain grit tempered sherds
		1	quartz (Type 4) biface thinning flake
		1	quartz (Type 4)late stage flake fragment
		2	Ridge & Valley chert late stage flake fragments
Shovel Test 5	0-15	3	quartz (Types 3 & 4) late stage flake fragments
Shovel Test 6	0-18	1	quartz (Type 3) bipolar core or wedge
		1	quartz (Type 4) late stage flake fragment
Total		**18**	

Artifacts recovered from 9CW423 were predominantly prehistoric lithics (N = 16). The majority (N = 13) were made from locally available quartz (Types 3 and 4). Three pieces of Ridge and Valley chert debris were also recovered. Generally, the lithic flaking debris represents later stages of tool production and maintenance activities. One small core or possibly a tool appears to have been subjected to bipolar reduction which indicates use as a wedge or perhaps intentional flake removal as a bipolar core. Similar objects appear on Early Archaic sites but bipolar technology may also be associated with the Mississippian period in western Georgia (Ledbetter 1997:155). The lithic scatter could easily represent multiple overlapping occupations of limited duration and activity.

Two grit tempered sherds were recovered from Shovel Test 4 located near the southeastern corner of the site. The use of heavy grit tempering appears most commonly on Mississippian period sherds in the area.

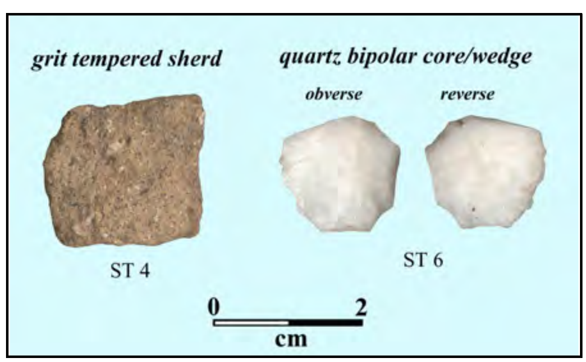


Figure 18. Artifacts found on 9CW423.

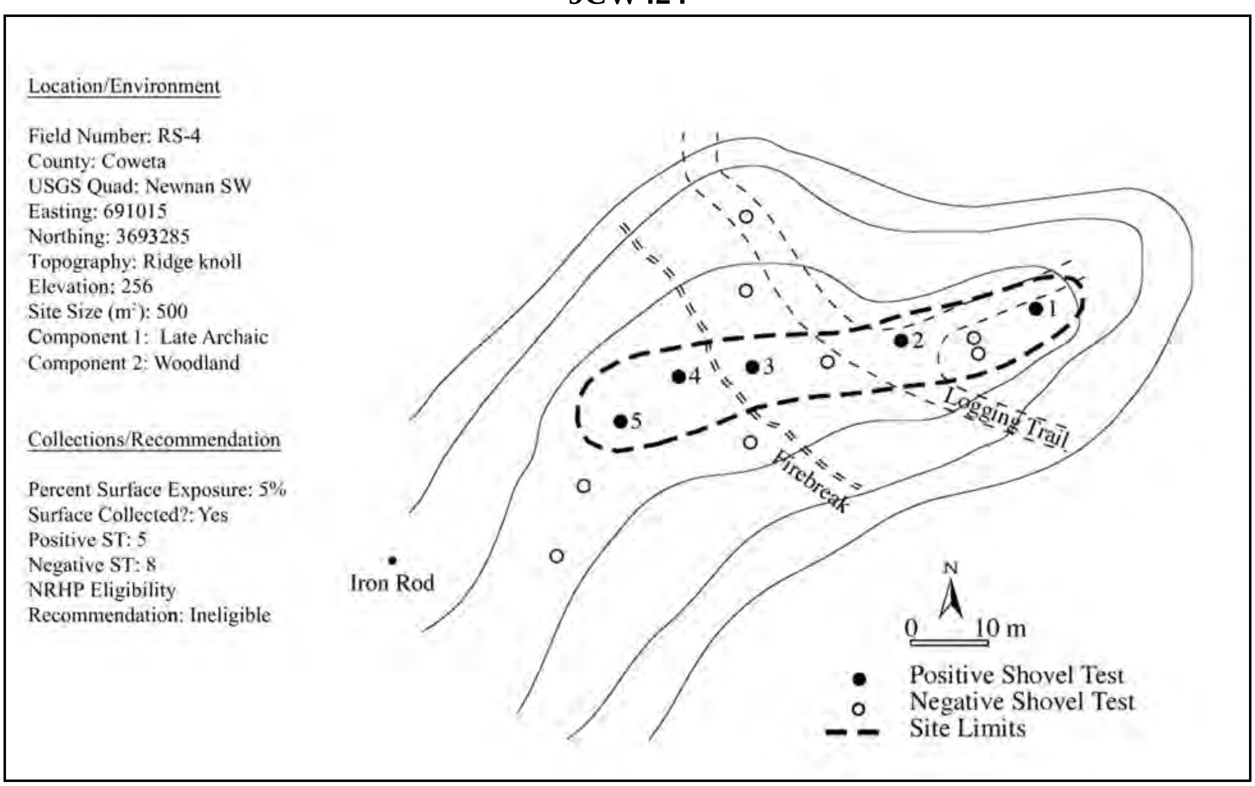
While the sherds are undecorated, a tentative assignment to the Mississippian period is proposed. The absence of pottery in the other shovel tests may be an indication limited activity rather than habitation.

9CW423 displays a low to moderate artifact density but there is no evidence of preserved midden deposits. The site appears to be a plowzone deposit located on a sloping landform that is conducive to artifact displacement. The possibility does exists that a better preserved part of the site area lies outside the project area. Based on the poor preservation and limited research potential we recommend the portion of site 9CW423 located within the project boundaries (the area of potential effect) ineligible for listing on the National Register of Historic Places.

9CW424 is identified as a prehistoric artifact scatter located on an eroded ridge knoll located in the central portion of the transmission line corridor. The site overlooks the narrow floodplains of a two tributaries of Caney Creek. The site area had been logged within the past few years but surface exposure was limited to a logging road and a firebreak. Little cultural material was found on the surface. Most of the artifacts were recovered from shovel tests.

The site area has been recently timbered (selectively cut) within the past few years but little surface exposure was present. Thirteen shovel tests were excavated at 10-m intervals in a cruciform pattern aligned with the axis of the ridge. Five of the shovel tests were positive. The distribution of positive and negative shovel tests and surface artifacts determined site limits for the portion of the site within the corridor.

9CW424



The soil stratigraphy consisted of 6-15 cm of brown clay loam plowzone overlying red or reddish-orange clay subsoil. The plowzone was more rocky in the western portion of the site. Artifacts were distributed along the crest of the ridge nose with counts ranging from one to six. Table 8 provides a list of artifacts collected during survey.

Table 8. Artifact list for 9CW424.

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface		1	quartz (Type 4) tertiary flake
Shovel Test 1	0-12	1	residual surface sand tempered sherd (fresh break in 2 pieces)
Shovel Test 2	0-12	1	quartz (Type 6) late stage preform fragment (Late Archaic)
		2	quartz (Type 4) tertiary flake
		1	quartz (Type 6) primary flake
Shovel Test 3	0-6	1	quartz (Type 4) utilized flake (composite use)
		2	quartz (Type 4) early stage preform fragments
Shovel Test 4	0-8	1	quartz (Type 4) early stage preform fragment
		1	quartz (Type 3) late stage flake fragment
Shovel Test 5	0-15	1	quartz (Type 6) late stage preform fragment (Late Archaic)
		1	quartz (Type 6) late stage flake fragment
Total		**14**	

Artifacts recovered from 9CW424 were predominantly prehistoric chipped stone tools and debris made from locally available Types 4 and 6 quartz (N = 12). The chipped stone was equally divided between tool fragments and debris. Five of the tool fragments were pieces of relatively large bifacial preforms that are most similar to Late Archaic in size. The use of grainy quartz is also typically associated with Late Archaic point production. One small utilized flake made from a better grade of quartz was also recovered. Most of the lithic flaking debris represents later stages of tool production and maintenance activities. One highly eroded sand tempered sherd was recovered from Shovel Test 1 located near the eastern edge of site. The sherd is relatively thin with a poorly consolidated paste. Based on tempering the sherd appears to be Woodland in age.

9CW424 would appear to consist primarily of a Late Archaic lithic scatter with lesser amounts of material associated with a minor component that is probably Woodland. The site displays a low artifact density and the site is highly eroded with no evidence of preserved midden deposits. The cultural material found on the site appears to be restricted to a plowzone deposit that has also been impacted by logging activity. Based on the poor preservation and limited research potential 9CW424 is recommended ineligible for listing on the National Register of Historic Places.

9CW425 is a surface and subsurface, prehistoric lithic scatter with a probable Early to Middle Woodland component located on a knoll of a ridge nose. The knoll and ridge are narrow and oriented north-south with moderately steep side slopes. First order drainages bound the eastern and western sides of the landform. An ATV trail skirts the southern and eastern sides of 9CW425, offering a marginal amount of surface exposure around the perimeter of the knoll. Vegetation consisted of mature woods at the time of site recording. One probable Woodland period projectile point was recovered during the survey (Figure 19).

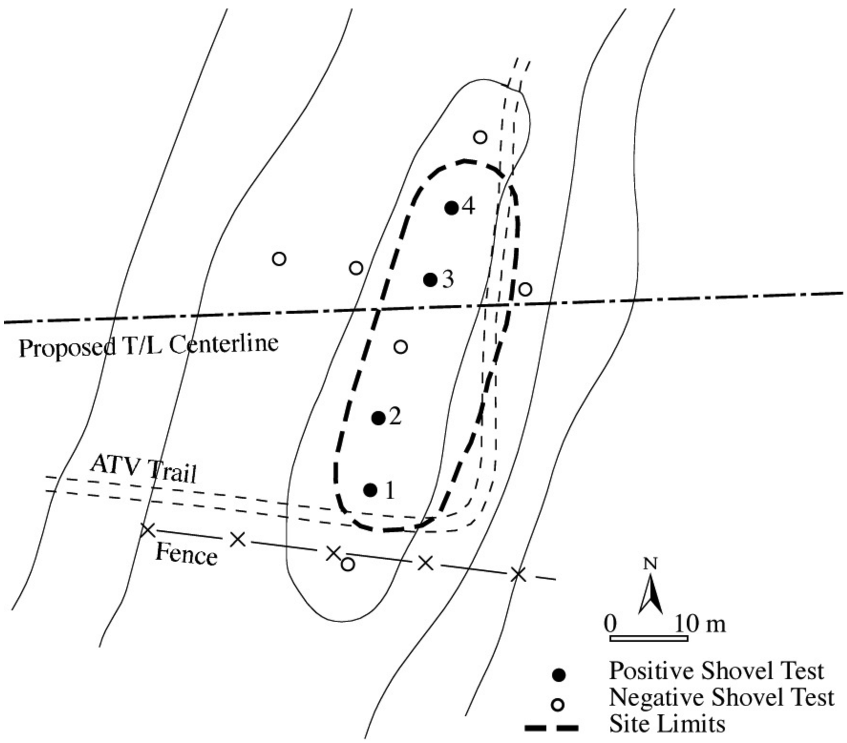
9CW425

<u>Location/Environment</u>

Field Number: RS-3
County: Coweta
USGS Quad: Newnan SW
Easting: 690461
Northing: 3693258
Topography: Knoll on ridge nose
Elevation: 249
Site Size (m^2): 912
Component: Middle Woodland

<u>Collections/Recommendation</u>

Percent Surface Exposure: 5%
Surface Collected?: Yes
Positive ST: 4
Negative ST: 6
NRHP Eligibility
Recommendation.: Ineligible



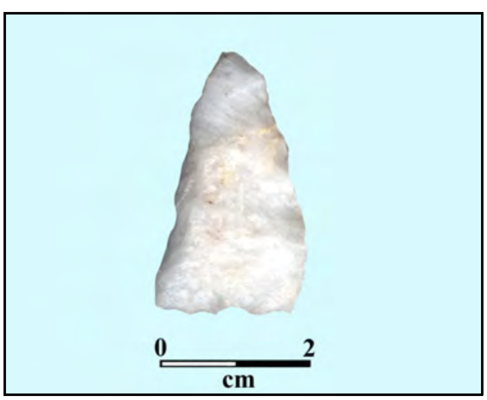


Figure 19. Large triangular quartz point from 9CW425.

We excavated ten shovel tests at 10-m intervals in a cruciform pattern aligned with the landform axis and four tested positive. The distribution of positive and negative shovel tests and the locations of surface artifacts on the ATV trail determined site limits. Soil stratigraphy consisted of 12-15 cm of light gray sandy loam overlying red clay subsoil. Artifacts were recovered at various depths throughout the topsoil (Table 9). No evidence of preserved midden deposits were found on the site during the survey.

Table 9. Artifact list for 9CW425.

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface		1	quartz (Type 4) triangular PP/K (19 mm base)
		4	quartz (Type 4) tertiary
		2	quartz (Type 4) late reduction flake fragments
Shovel Test 1	0-10	1	quartz (Type 2) biface thinning flake
Shovel Test 2	0-12	1	quartz (Type 4) late reduction flake fragment
Shovel Test 3	0-12	2	quartz (Type 4) late reduction flake fragments
Shovel Test 4	10-20	1	quartz (Type 2) biface thinning flake
Total		**12**	

The surface collections and shovel tests produced at total of 12 artifacts made entirely from quartz (1 Type 2 and 11 Type 4). Most was quartz late stage reduction flakes and fragments, but one diagnostic tool was collected from the surface of the ATV trail, a large triangular point with a 19 mm base (see Figure 19). The relatively narrow basal width suggests a Middle Woodland occupation, but the point is thick (9 mm) and somewhat crudely flaked. This may be evidence of an aborted preform rather than a finished point or possibly even the refurbishing of a broken point. In spite of the apparent Woodland period occupation, no prehistoric ceramics were encountered on the site

9CW425 is a relatively small, low density lithic scatter that likely represents a few short-term occupations of limited activity, the remains of which have been compromised by recent historic period land use and subsequent erosion. Additional excavation is unlikely to encounter informative intrasite data. Therefore, because of limited research potential we recommend 9CW425 ineligible for listing on the National Register of Historic Places.

9CW426 is a surface and subsurface, prehistoric artifact scatter located on a narrow and nearly level toe slope. The landform terminates at the confluence of two first order drainages, immediately prior to reaching a second order drainage. An ATV trail circumscribes the edge of the landform, providing marginal surface exposure. A few artifacts were collected from its surface. The area consisted of mature woods at the time of site recording.

We excavated nine shovel tests at 10- and 15-m intervals across the landform and two tested positive. The distribution of positive and negative shovel tests and the location of surface artifacts determined site limits. Soil stratigraphy consisted of 18-30 cm of light grayish brown or light yellowish brown sandy loam overlying orange sandy clay subsoil. Artifacts were recovered from the top 20 cm (Table 10).

A single, non-diagnostic grit-tempered sherd was recovered from Shovel Test 1, among quartz and Coastal Plain chert later reduction flaking debris. Overall artifact density is low but confined to a relatively small area on the landform. The artifact assemblage may represent a single occupation some time during the Woodland or Mississippian periods.

9CW426

Location/Environment

Field Number: RB-5
County: Coweta
USGS Quad: Newnan SW
Easting: 690376
Northing: 3693221
Topography: Toe slope
Elevation: 240
Site Size (m^2): 414
Component: Wood/Miss

Collections/Recommendation

Percent Surface Exposure: 3%
Surface Collected?: Yes
Positive ST: 2
Negative ST: 7
NRHP Eligibility
Recommendation.: Ineligible

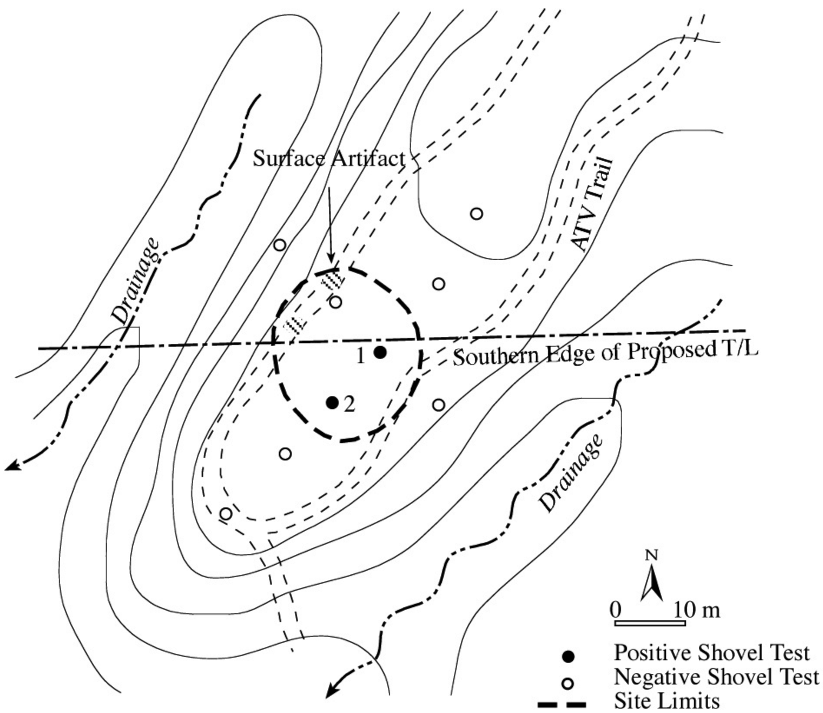


Table 10. Artifact list for 9CW426.

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface		1	quartz (Type 4) tertiary
		1	quartz (Type 4) biface thinning flake
Shovel Test 1	10-20	1	grit tempered residual sherd
Shovel Test 2	0-20	1	CP chert biface thinning flake
		1	quartz (Type 4) tertiary
		2	quartz (Type 4) biface thinning flakes
Total		**7**	

The artifact density 9CW426 is too low to suggest that archeologically detectable artifact patterns relating to specific activities performed on the site would be definable. Additional excavation is unlikely to produce significantly more important information. Therefore, because of limited research potential we recommend 9CW426 ineligible for listing on the National Register of Historic Places.

9CW427 is a subsurface, prehistoric lithic scatter located on an elevated and nearly level toe slope situated above a second order drainage. The drainage is located north of the site, at the base of steep slope, forming a bluff-like situation. Significant terrain disturbances are evident, consisting of a combination of severe erosion and gullying and redeposition across the landform. The area consisted of mature woods immediately around the site and overgrown ca. three-year-old clear cut beyond the site area.

We excavated nine shovel tests at 15-m intervals in a modified cruciform pattern across the landform and three tested positive. The positive tests are contiguous, so site limits exclude all sterile shovel tests. Shovel tests were placed to the south and east of the site at varying distances to allow us to work around terrain disturbances such as the wash out shown on the site map. Soil stratigraphy on the site consisted of 20-40 cm of light grayish brown or light brown sandy loam overlying light orange sandy clay or sandy clay loam subsoil. At least 20 cm of recently deposited soil was evident in Shovel Test 3. Artifacts were recovered at various depths throughout the topsoil and beneath the recently deposited overburden (Table 11).

9CW427

Location/Environment

Field Number: RB-4
County: Coweta
USGS Quad: Newnan SW
Easting: 689437
Northing: 3693388
Topography: Toe slope
Elevation: 243
Site Size (m^2): 433
Component: UD Lithic

Collections/Recommendation

Percent Surface Exposure: 0%
Surface Collected?: No
Positive ST: 3
Negative ST: 6
NRHP Eligibility
Recommendation.: Ineligible

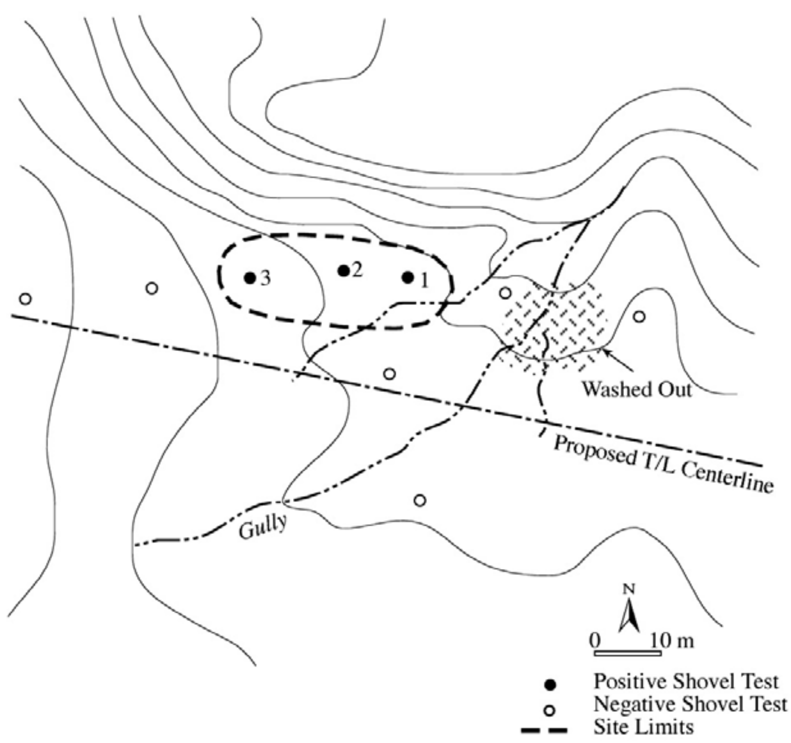


Table 11. Artifact list for 9CW427.

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Shovel Test 1	0-10	1	quartz (Type 4) tertiary
Shovel Test 2	0-20	2	quartz (Type 4) tertiary
		1	quartz (Type 4) late reduction angular fragment
Shovel Test 3	25-35	1	quartz (Type 4) late reduction flake fragment
Total		**5**	

All artifacts that were recovered consist of Type 4 quartz later reduction flakes and fragments. No formal or expedient tools were recovered. The small, low density scatter likely represents one or a few short-term occupations of limited activity. These remains have since been adversely impacted by recent historic period land use and subsequent erosion and redeposition.

Preservation integrity on 9CW427 is too poor to suggest that additional excavation will produce information beyond the survey level of investigation. Therefore, because of poor preservation and limited research potential we recommend 9CW427 ineligible for listing on the National Register of Historic Places.

Occurrences

Three isolated prehistoric lithic artifacts were recovered at two locations, as shown in Figures 9-10 and Figure 12 and as described in Table 12. In some instances artifact occurrences are actual evidence of past human activity but frequently these objects represent displaced material of limited interpretive importance. The two artifact occurrences identified in the project corridor have been disturbed by historic cultivation processes or displaced by artifact collectors. Occurrence 1 was found in an eroded area and most likely represents slope wash. Occurrence 2 was found in a hunting camp and represents artifacts moved from their original locations and tossed on the ground at a new location.

Table 12 List of Artifact Occurrences from the Project Area.

Occurrence Number	Artifact Description	UTMs (Zone 16)	Elevation (meters)	Recovery Method
1	RV chert BTF	0634931E 3691424N	222m	shovel Test 1 (0-10 cm)
2	2 quar tz bifaces	0688445E 3693478N	253 m	surface on firebreak

Brief descriptions of the two artifact occurrences follow. Field maps were prepared for each along with information on field site forms. The maps will not be used in the follow accounts but are available if needed in the paperwork curated with the other material related to the transmission line project.

Occurrence 1 was an isolated chert flake found during systematic shovel testing on a narrow ridge spur in the eastern portion of the transmission line corridor (see Figures 10 and 12 for location). The occurrence is located on an eroded rocky landform that is only slightly elevated above two streams. The artifact was found approximately 10 m from the southern edge of the corridor. A firebreak located less than 10 m from the artifact occurrence contained sufficient surface exposure for artifact discovery but no additional material was found.

The small Ridge and Valley chert biface thinning flake was found in the top 10 cm of a shovel test. The soil was described as a rocky tan/brown clay loam. An additional seven shovel tests were excavated in a cruciform pattern around the positive test but all were sterile. The artifact has likely been displaced an unknown distance from its original point of deposition but the landform may have been the location of limited prehistoric activity. Occurrence 1 is not considered a significant resource and is recommended ineligible for nomination to the National Register of Historic Places.

Occurrence 2 consists of two quartz bifaces found in the western portion of the transmission line survey area (see Figures 9 and 12). The two quartz bifaces were found on the surface of a firebreak and appeared to have been placed there quite recently. One biface is the distal portion of a medium sized projectile point and the second is a complete example of a spike-like biface that probably dates to the Middle Woodland period (Figure 20).

The two bifaces were found in an area that appeared suitable for prehistoric occupation. The plowed firebreak containing the two bifaces extended over level ground from the edge of a pasture at the edge of a wooded lot overlooking wetlands that now feed into a pond. There was good surface exposure in the plowed strip and fair exposure in the sparsely grassed field but no other artifacts were observed. Five shovel tests were excavated around the occurrence but none yield artifacts.

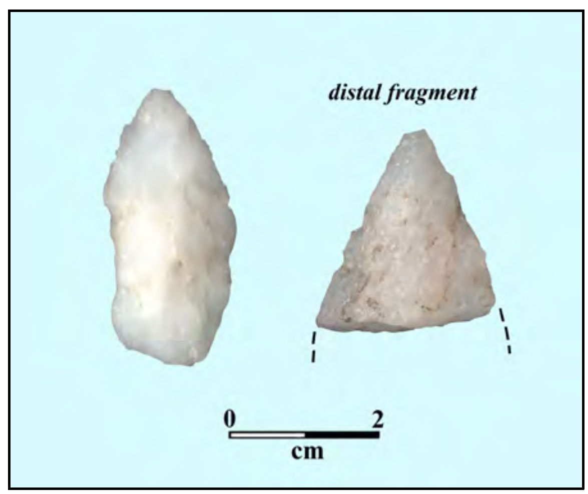


Figure 20. Occurrence 2 bifaces.

A hunting camp is located about 20 m from the location of the artifact occurrence and it is theorized that the two points may have been discarded recently by someone who had collected them in larger field when it was plowed. Because Occurrence 2 rather clearly represents displaced artifacts, it cannot be considered a significant resource. Occurrence 2 is recommended ineligible for nomination to the National Register of Historic Places.

Conclusions and Recommendations

During the summer of 2011, Southeastern Archeological Services, Inc., conducted an intensive archeological survey in central Heard and Coweta Counties where Georgia Transmission Corporation plans to construct a 6.9 mile (11.1 km) long 500 kV transmission line that will connect the existing Heard County Substation with a proposed Dresden 500 kV Substation. Archival research, which focused on the 1919 soil survey map, the 1940 Coweta County highway map, and aerial photographs from the early 1940s, showed one potential structure in the project corridor and perhaps half a dozen in close proximity. None of these were identified as archeological sites as the result of our survey.

Eleven sites and two isolated artifact occurrence were recorded in the transmission line corridor. One of the sites, 9CW176, had been previously recorded (Price 2001). Of the recorded sites, nine contain prehistoric components, and three contain historic period components. Two of the sites contained both prehistoric and historic components. The prehistoric sites consist primarily of small Archaic period lithic scatters and somewhat larger sites that also produced limited evidence of Woodland and Mississippian occupation. Recovered projectile points date to the Middle Archaic, Late Archaic, and Early to Middle Woodland periods. All of the prehistoric sites are plowzone scatters and most collections are dominated by locally available quartz. Small amounts of non-local raw lithic raw materials (Ridge and Valley and Coastal Plain chert) were found on a few of the sites. Recovered pottery appears to date to both the Woodland and Mississippian periods. The few prehistoric sherds recovered during the survey were small and eroded and temporal designation was based entirely on temper (fine sand for Woodland and grit temper for Mississippian).

The historic period sites include three small ceramic scatters that appear to date primarily to the nineteenth century. The historic period sites are sparse artifact scatters lacking association with confirmed structure locations. Unlike most transmission line surveys, no farmsteads dating to the late nineteenth to mid-twentieth century were identified. As noted earlier, a few farm houses were noted on the maps and early aerial photographs near the project corridor but none were found within the survey area. This probably relates to the fact that most of the corridor traverses open farm land and timber land rather than following existing roads. The two occurrences were chipped stone artifacts that probably date to the Archaic and Woodland periods.

We recommend that none of the sites recorded during the survey are eligible for listing on the National Register of Historic Places. All of the sites were determined to represent plowzone artifact scatters with little potential for preserved features. Because of the disturbed condition of these sites, little research potential remains. We conclude that the proposed transmission line will not adversely affect eligible or potentially eligible archeological resources and we recommend that the project be granted clearance to proceed.

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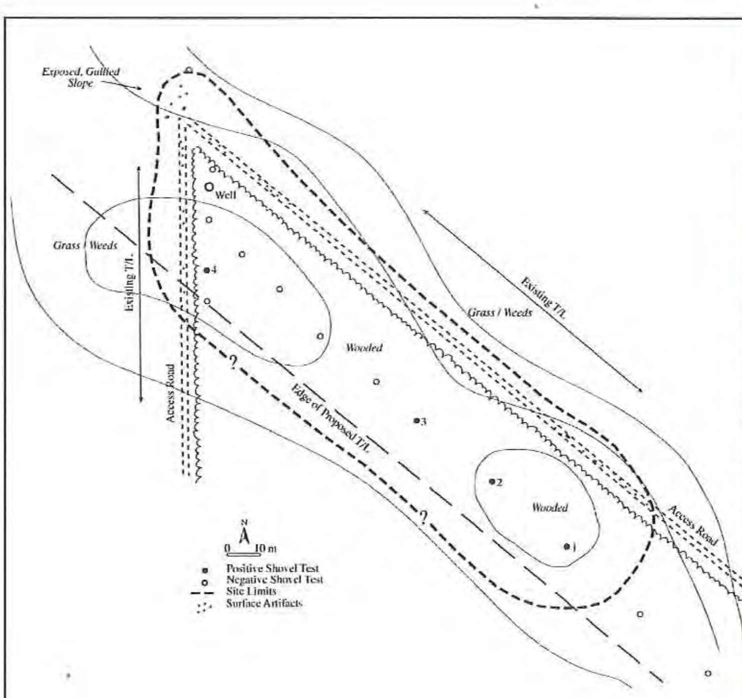
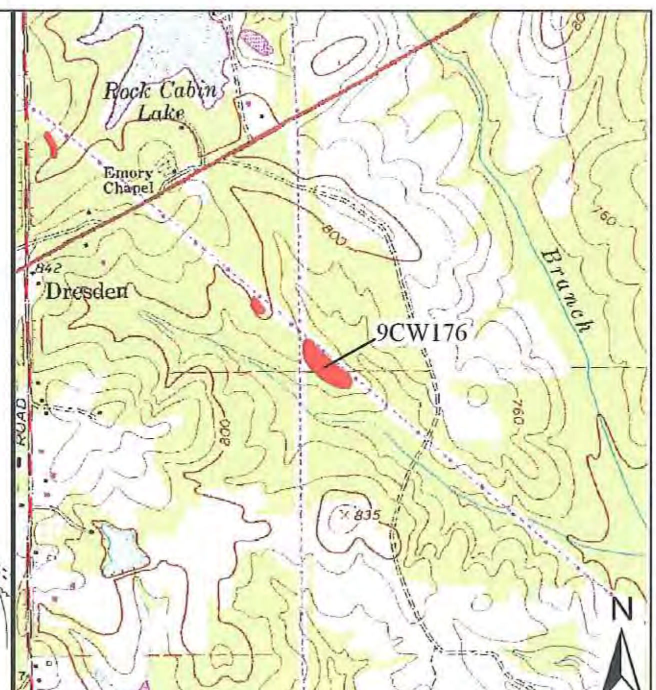
GEORGIA ARCHAEOLOGICAL SITE FORM
1990
Official Site Number: 9CW176

Institutional Site Number: Revisit **Site Name:**
County: Coweta **Map Name:** Newnan SW **USGS OR USNOAA**
UTM Zone: 16 **UTM East:** 694705 **UTM North:** 3691632
Owner: **Address:**
Site Length: 210 m **Width:** 55 m **Elevation:** ± - 234 m
Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown
Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur
Standing Architecture: 1. Present 2. Absent
Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater
Midden: 1. Present 2. Absent 3. Unknown **Features:** 1. Present 2. Absent 3. Unknown
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown
Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Prehistoric lithic scatter; Historic period house

Topography (Ridge, Terrace, etc.): Ridge nose
Current Vegetation (Woods, Pasture, etc.): Wooded
Additional Information: 9CW176, a previously recorded site, consists of a low density scatter of prehistoric lithic artifacts and a middle-late nineteenth century house. Prehistoric artifacts are sporadically scattered along a dirt access road that runs with the southern edge of the existing transmission line. A few subsurface prehistoric artifacts also were recovered. The historic component, which was not previously recorded, is located on the northwestern end of the site. A circular well depression is visible and surface and subsurface ceramic artifacts were recovered.



SKETCH MAP



OFFICIAL MAP (USGS 7.5' quadrangle)

State Site Number: 9CW176 **Institutional Site Number:** Revisit

Public Status: 1. National Historic Landmark 2. National Natural Landmark 3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible 2. Recommended Ineligible 3. Recommended Eligible 4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed 2. Cultivated 3. Eroded 4. Submerged 5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited 9. Graded 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Transmission line construction 3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Rob Benson **Affiliation:** Southeastern Archeological Services, Inc. (SAS) **Date:** 7/5/11
Report Title: Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia

Artifacts Collected:

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface	0	1	quartz 4 Kiokee Creek PP/K
		1	quartz 4 (smokey) PP/K distal fragment
		2	quartz 4 biface fragments
		2	quartz 4 tertiary flakes
		7	quartz 4 biface thinning flakes
		3	quartz 4 late reduction flake fragments
		1	quartz 4 late reduction angular fragment
		1	blue edged whiteware fragment
		1	sponge blue transfer print whiteware fragment
		1	unidentified blue transfer print whiteware fragment
Shovel Test 1	0-10	1	quartz 4 biface thinning flake
Shovel Test 2	0-12	1	CP chert expedient composite tool
		1	R/V (Knox) chert biface thinning flake
		1	CP chert late reduction flake fragment
		1	quartz 4 tertiary flake
Shovel Test 3	0-15	1	quartz 4 tertiary flake
		1	quartz 4 biface thinning flake
Shovel Test 4	10-20	1	quartz 2 biface thinning flake
		2	plain whiteware fragments
Total		**30**	

Location of Collections: Laboratory of Archaeology, University of Georgia, Athens
Location of Field Notes: Laboratory of Archaeology, University of Georgia, Athens ; SAS
Private Collections: None

CULTURAL AFFINITY

Cultural Periods: Late Archaic; Middle-late nineteenth century
Phases: Kiokee Creek; Ante- and Post Bellum

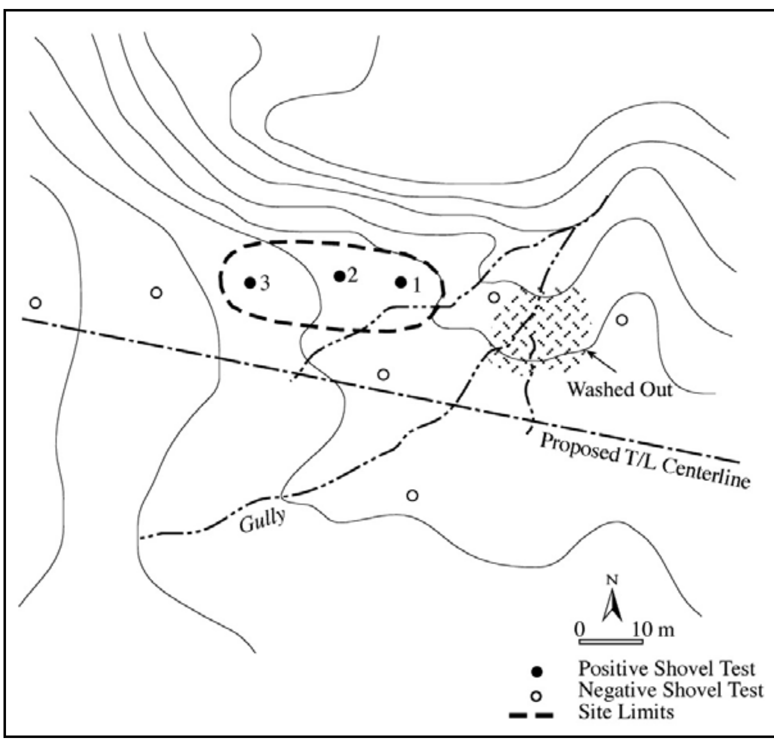
FORM PREPARATION AND REVISION

Date	Name	Institutional Affiliation
7/20/11	Rob Benson	Southeastern Archeological Services, Inc.

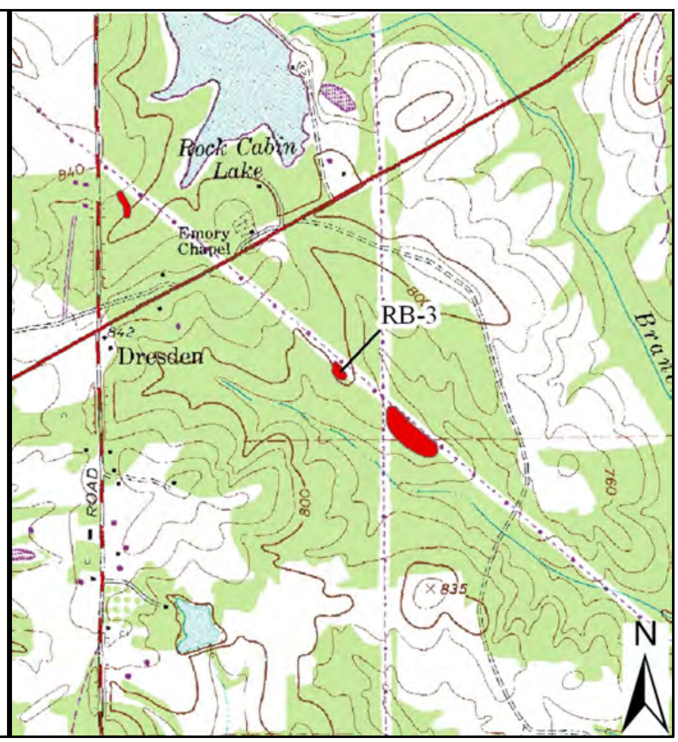
GEORGIA ARCHAEOLOGICAL SITE FORM
1990
Official Site Number: 9CW418

Institutional Site Number: RB-3 **Site Name:**
County: Coweta **Map Name:** Newnan SW **USGS OR USNOAA**
UTM Zone: 16 **UTM East:** 694478 **UTM North:** 3691831
Owner: **Address:**
Site Length: 60 m **Width:** 35 m **Elevation:** ± - 243 m
Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown
Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur
Standing Architecture: 1. Present 2. Absent
Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater
Midden: 1. Present 2. Absent 3. Unknown **Features:** 1. Present 2. Absent 3. Unknown
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown
Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Prehistoric lithic scatter

Topography (Ridge, Terrace, etc.): Ridge nose
Current Vegetation (Woods, Pasture, etc.): Wooded/cleared field
Additional Information: Site consists of a surface and subsurface scatter of prehistoric lithic artifacts located on a ridge nose. The scatter is mostly distributed along the southern edge of an existing transmission line right-of-way. Area is heavily eroded. The distal end of a PP/K and a large early stage preform identifies a general Archaic period.



SKETCH MAP



OFFICIAL MAP (USGS 7.5' quadrangle)

State Site Number: 9CW418 **Institutional Site Number:** RB-3

Public Status: 1. National Historic Landmark 2. National Natural Landmark 3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible 2. Recommended Ineligible 3. Recommended Eligible 4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed 2. Cultivated 3. Eroded 4. Submerged 5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited 9. Graded 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Transmission line construction 3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Rob Benson **Affiliation:** Southeastern Archeological Services, Inc. (SAS) **Date:** 7/5/11
Report Title: *Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia.*

Other Reports:

Artifacts Collected:

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface	0	1	quartz 4 PP/K distal fragment
		1	quartz 4 biface fragment
		1	quartz 2 biface thinning flake
		1	quartz 2 late reduction angular fragment
Shovel Test 1	0-10	1	quartz 2 late reduction flake fragment
Shovel Test 2	0-10	1	quartz 6 early preform
Shovel Test 3	0-20	1	quartz 2 late reduction flake fragment
		2	quartz 4 late reduction flake fragments
Shovel Test 4	10-20	1	quartz 4 biface thinning flake
Total		**10**	

Location of Collections: Laboratory of Archaeology, University of Georgia, Athens

Location of Field Notes: Laboratory of Archaeology, University of Georgia, Athens ; SAS

Private Collections: None
Name: **Address:**

CULTURAL AFFINITY

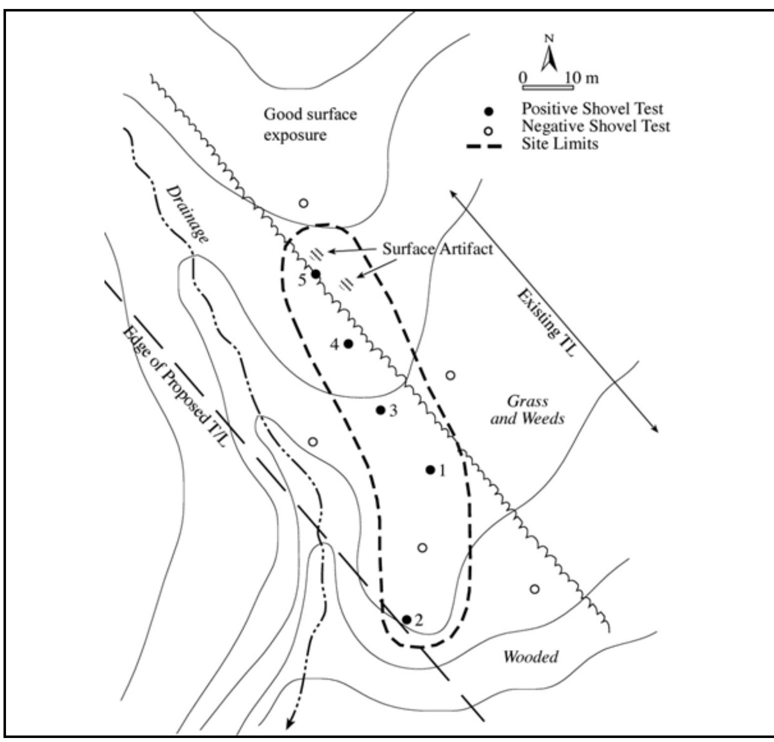
Cultural Periods: Archaic
Phases: Unknown

FORM PREPARATION AND REVISION

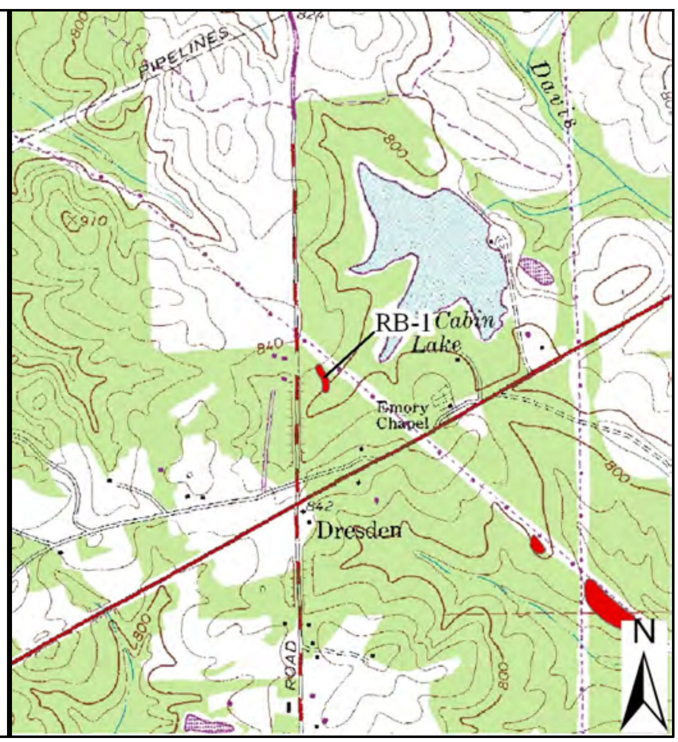
Date	Name	Institutional Affiliation
7/20/11	Rob Benson	Southeastern Archeological Services, Inc.

GEORGIA ARCHAEOLOGICAL SITE FORM
1990
Official Site Number: 9CW419

Institutional Site Number: RB-1 **Site Name:**
County: Coweta **Map Name:** Newnan SW **USGS OR USNOAA**
UTM Zone: 16 **UTM East:** 693792 **UTM North:** 3692368
Owner: **Address:**
Site Length: 85 m **Width:** 20 m **Elevation:** ± - 246 m
Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown
Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur
Standing Architecture: 1. Present 2. Absent
Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater
Midden: 1. Present 2. Absent 3. Unknown **Features:** 1. Present 2. Absent 3. Unknown
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown
Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Prehistoric lithic scatter
Topography (Ridge, Terrace, etc.): Ridge nose
Current Vegetation (Woods, Pasture, etc.): Wooded/Mowed grass and weeds
Additional Information: Site records a low density scatter of prehistoric lithic artifacts. Most artifacts were recovered from shovel tests in wooded terrain, but the northern end of the site extends onto an existing transmission line. Surface artifacts, including a Morrow Mountain I PP/K, were collected from exposed surfaces within the exiting transmission line right-of-way.



SKETCH MAP



OFFICIAL MAP (USGS 7.5' quadrangle)

State Site Number: 9CW419 **Institutional Site Number:** RB-1

Public Status: 1. National Historic Landmark 2. National Natural Landmark 3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible <u>2. Recommended Ineligible</u> 3. Recommended Eligible 4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed <u>2. Cultivated</u> 3. Eroded 4. Submerged 5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited <u>9. Graded</u> 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Transmission line construction 3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Rob Benson **Affiliation:** Southeastern Archeological Services, Inc. (SAS) **Date:** 6/30/11
Report Title: *Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia.*
Other Reports:
Artifacts Collected:

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface	0	1	quartz 4 Morrow Mountain I PP/K
		1	quartz 4 early (emergent) preform
Shovel Test 1	0-15	1	CP chert late reduction flake fragment
		1	quartz 2 tertiary flake
		1	quartz 4 biface thinning flake
		1	quartz 4 retouch flake
Shovel Test 2	0-10	1	quartz 4 biface thinning flake
Shovel Test 3	10-15	1	quartz 4 tertiary
Shovel Test 4	0-15	1	quartz 4 wedge (expedient tool)
		1	quartz 2 late reduction flake fragment
Shovel Test 5	0-5	1	quartz 4 biface thinning flake
Total		**11**	

Location of Collections: Laboratory of Archaeology, University of Georgia, Athens
Location of Field Notes: Laboratory of Archaeology, University of Georgia, Athens ; SAS
Private Collections: None

CULTURAL AFFINITY

Cultural Periods: Middle Archaic
Phases: Morrow Mountain

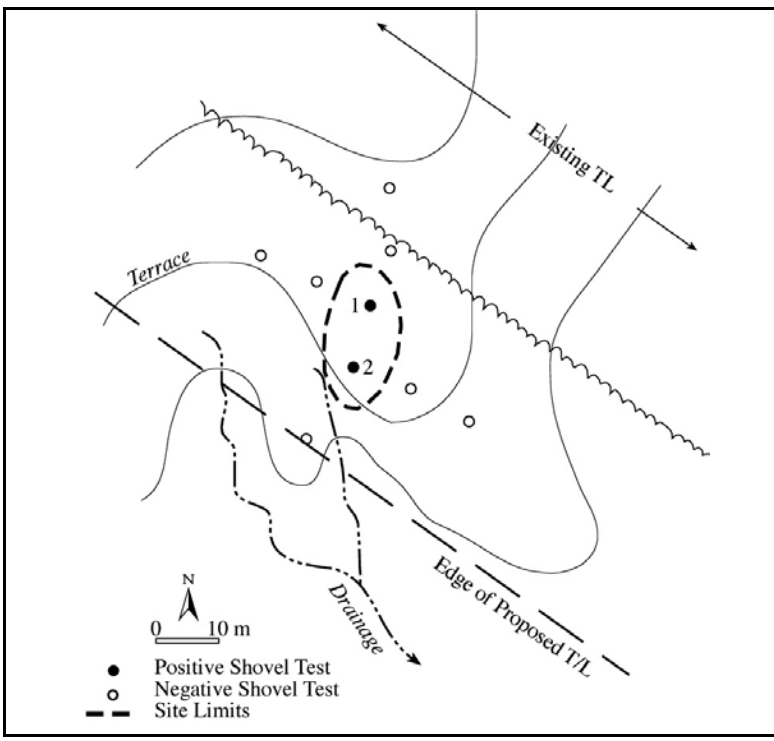
FORM PREPARATION AND REVISION

Date	**Name**	**Institutional Affiliation**
7/20/11	Rob Benson	Southeastern Archeological Services, Inc.

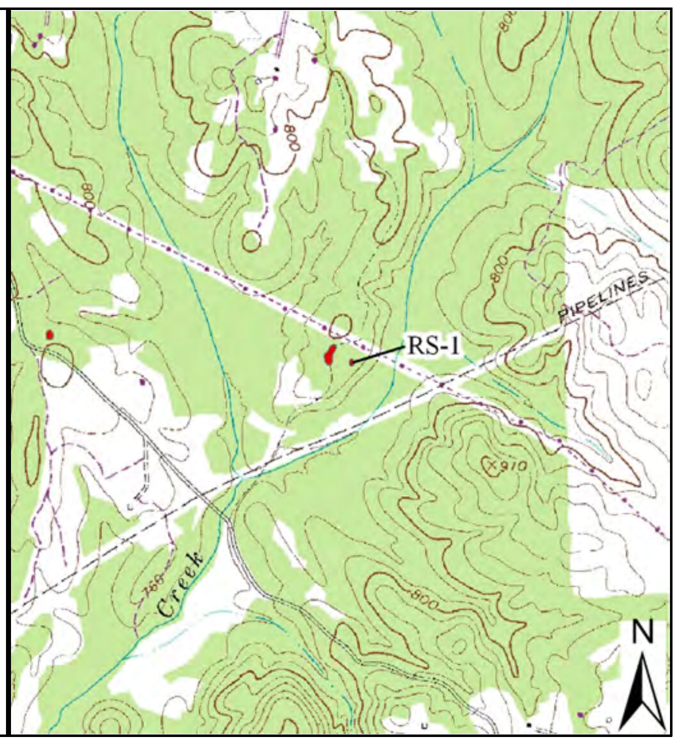
GEORGIA ARCHAEOLOGICAL SITE FORM
1990
Official Site Number: 9CW420

Institutional Site Number: RS-1 **Site Name:**
County: Coweta **Map Name:** Newnan SW **USGS OR USNOAA**
UTM Zone: 16 **UTM East:** 692538 **UTM North:** 3693204
Owner: **Address:**
Site Length: 25 m **Width:** 13 m **Elevation:** ± - 237 m
Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown
Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur
Standing Architecture: 1. Present 2. Absent
Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater
Midden: 1. Present 2. Absent 3. Unknown **Features:** 1. Present 2. Absent 3. Unknown
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown
Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Historic period artifact scatter

Topography (Ridge, Terrace, etc.): Ridge nose
Current Vegetation (Woods, Pasture, etc.): Wooded
Additional Information: Site likely records the location of a former outbuilding associated with a probable house recorded by RB-2 to the west. A continuous artifact scatter could not be established between the two site locations. No above-ground remains were visible. Only subsurface artifacts were recovered.



SKETCH MAP



OFFICIAL MAP (USGS 7.5' quadrangle)

State Site Number: 9CW420 **Institutional Site Number:** RS-1

Public Status: 1. National Historic Landmark 2. National Natural Landmark
3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible 2. Recommended Ineligible
3. Recommended Eligible 4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed 2. Cultivated 3. Eroded
4. Submerged 5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited
9. Graded 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Transmission line construction
3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Rob Benson **Affiliation:** Southeastern Archeological Services, Inc. (SAS) **Date:** 7/1/11
Report Title: Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia.

Other Reports:

Artifacts Collected:

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Shovel Test 1	0-10	1	brown alkaline glazed stoneware fragment
Shovel Test 2	0-10	1	green alkaline glazed stoneware fragment
Total		**2**	

Location of Collections: Laboratory of Archaeology, University of Georgia, Athens

Location of Field Notes: Laboratory of Archaeology, University of Georgia, Athens ; SAS

Private Collections: None
Name: **Address:**

CULTURAL AFFINITY

Cultural Periods: Later nineteenth-early twentieth century
Phases: Unknown

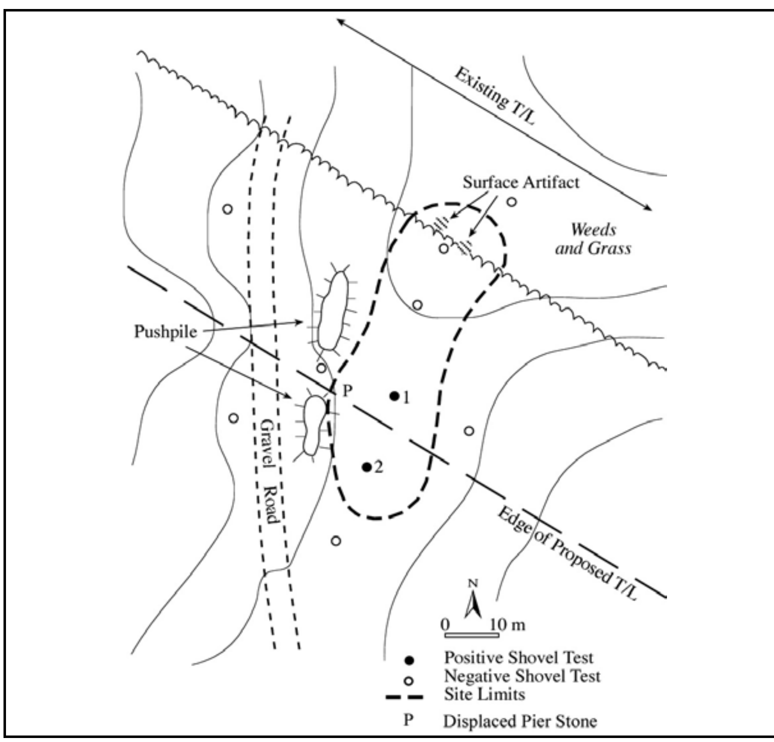
FORM PREPARATION AND REVISION

Date	**Name**	**Institutional Affiliation**
7/20/11	Rob Benson	Southeastern Archeological Services, Inc.

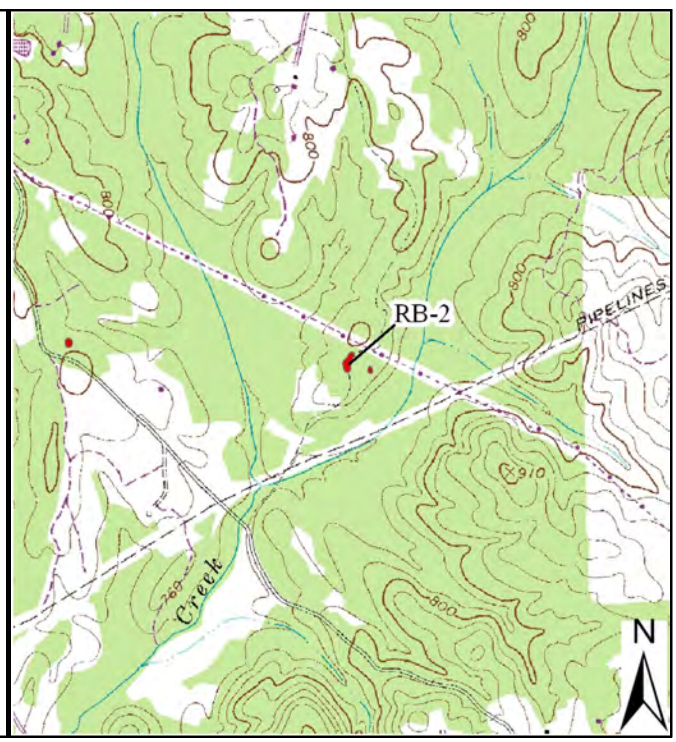
GEORGIA ARCHAEOLOGICAL SITE FORM
1990
Official Site Number: 9CW421

Institutional Site Number: RB-2 **Site Name:**
County: Coweta **Map Name:** Newnan SW **USGS** OR USNOAA
UTM Zone: 16 **UTM East:** 692468 **UTM North:** 3693228
Owner: **Address:**
Site Length: 55 m **Width:** 20 m **Elevation:** + - 240 m
Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown
Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur
Standing Architecture: 1. Present 2. Absent
Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater
Midden: 1. Present 2. Absent 3. Unknown **Features:** 1. Present 2. Absent 3. Unknown
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown
Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Prehistoric lithic isolate; Historic artifact scatter

Topography (Ridge, Terrace, etc.): Ridge nose
Current Vegetation (Woods, Pasture, etc.): Wooded
Additional Information: Site records the remains of a probable later nineteenth-early twentieth century house. No above-ground remains are visible. One large field stone, a probable structure pier, is visible on the western edge of the site. No construction material was present and area appears to have been thoroughly bulldozed several decades ago. Deflated pushpiles are located along the western edge of the site.



SKETCH MAP



OFFICIAL MAP (USGS 7.5' quadrangle)

State Site Number: **9CW421** **Institutional Site Number:** **RB-2**

Public Status: 1. National Historic Landmark 2. National Natural Landmark 3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible <u>2. Recommended Ineligible</u> 3. Recommended Eligible 4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed <u>2. Cultivated</u> <u>3. Eroded</u> 4. Submerged 5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited 9. Graded 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Transmission line construction 3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Rob Benson **Affiliation:** Southeastern Archeological Services, Inc. (SAS) **Date:** 7/1/11
Report Title: *Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia.*

Other Reports:

Artifacts Collected:

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface	0	1	quartz 4 PP/K base (Mid-Late Archaic)
		1	plain whiteware fragment
Shovel Test 1	10-20	1	plain whiteware fragment
Shovel Test 2	10-15	1	plain whiteware fragment
Total		**4**	

Location of Collections: Laboratory of Archaeology, University of Georgia, Athens

Location of Field Notes: Laboratory of Archaeology, University of Georgia, Athens ; SAS

Private Collections: None
Name: **Address:**

CULTURAL AFFINITY

Cultural Periods: Middle-Late Archaic; Late nineteenth-early twentieth century
Phases: Unknown

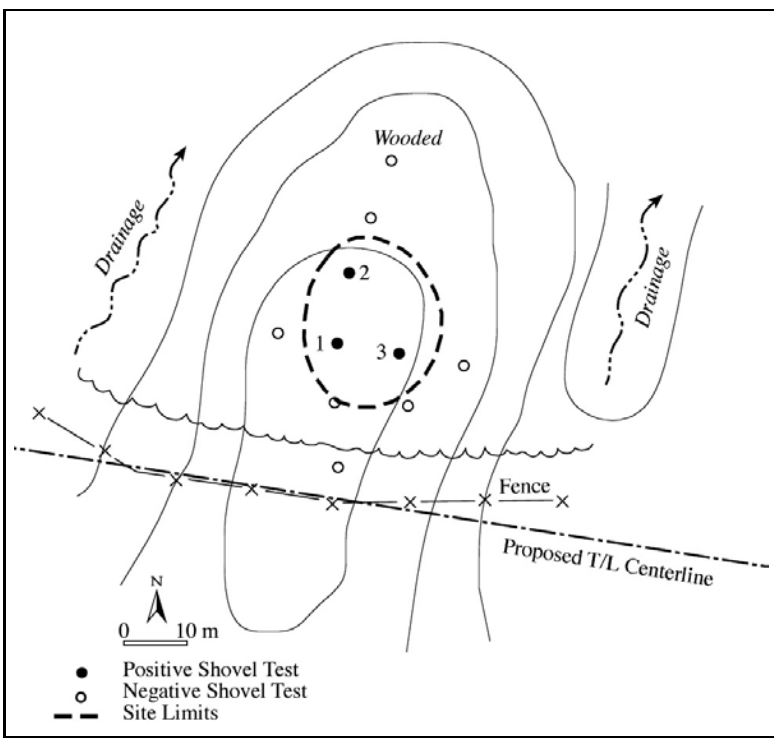
FORM PREPARATION AND REVISION

Date	Name	Institutional Affiliation
7/20/11	Rob Benson	Southeastern Archeological Services, Inc.

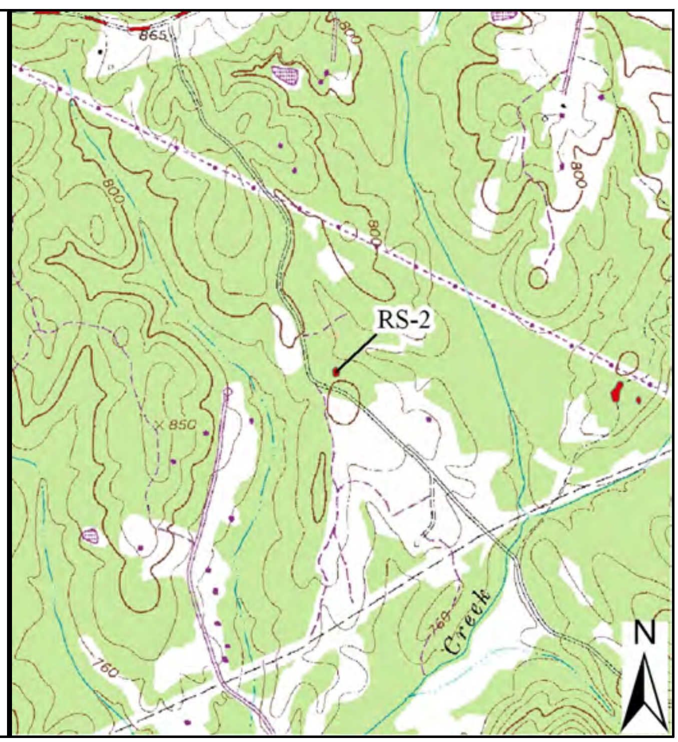
GEORGIA ARCHAEOLOGICAL SITE FORM
1990
Official Site Number: 9CW422

Institutional Site Number: RS-2 **Site Name:**
County: Coweta **Map Name:** Newnan SW **USGS OR USNOAA**
UTM Zone: 16 **UTM East:** 691569 **UTM North:** 3693292
Owner: **Address:**
Site Length: 26 m **Width:** 22 m **Elevation:** ± - 243 m
Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown
Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur
Standing Architecture: 1. Present 2. Absent
Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater
Midden: 1. Present 2. Absent 3. Unknown **Features:** 1. Present 2. Absent 3. Unknown
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown
Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Prehistoric lithic scatter

Topography (Ridge, Terrace, etc.): Knoll on ridge nose
Current Vegetation (Woods, Pasture, etc.): Wooded
Additional Information: Site consists of a small, low density surface and subsurface scatter of prehistoric lithic artifacts. The scatter is located on the northern end of a knoll of a ridge nose. First order drainages bound both sides of the landform. Area is moderately eroded. A Morrow Mountain I PP/K was collected from the surface.



SKETCH MAP



OFFICIAL MAP (USGS 7.5' quadrangle)

State Site Number: **9CW422** **Institutional Site Number:** **RS-2**

Public Status: 1. National Historic Landmark 2. National Natural Landmark
3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible 2. Recommended Ineligible
3. Recommended Eligible 4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed 2. Cultivated 3. Eroded
4. Submerged 5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited
9. Graded 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Transmission line construction
3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Rob Benson **Affiliation:** Southeastern Archeological Services, Inc. (SAS) **Date:** 7/6/11
Report Title: Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia.

Other Reports:

Artifacts Collected:

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface	0	1	quartz 4 Morrow Mountain I PP/K
		2	quartz 4 biface thinning flakes
Shovel Test 1	0-8	1	quartz 4 biface thinning flake
Shovel Test 2	0-15	1	quartz 4 tertiary
Shovel Test 3	0-10	1	R/V (Knox) chert tertiary
Total		**6**	

Location of Collections: Laboratory of Archaeology, University of Georgia, Athens

Location of Field Notes: Laboratory of Archaeology, University of Georgia, Athens ; SAS

Private Collections: None
Name: **Address:**

CULTURAL AFFINITY

Cultural Periods: Middle Archaic
Phases: Morrow Mountain I

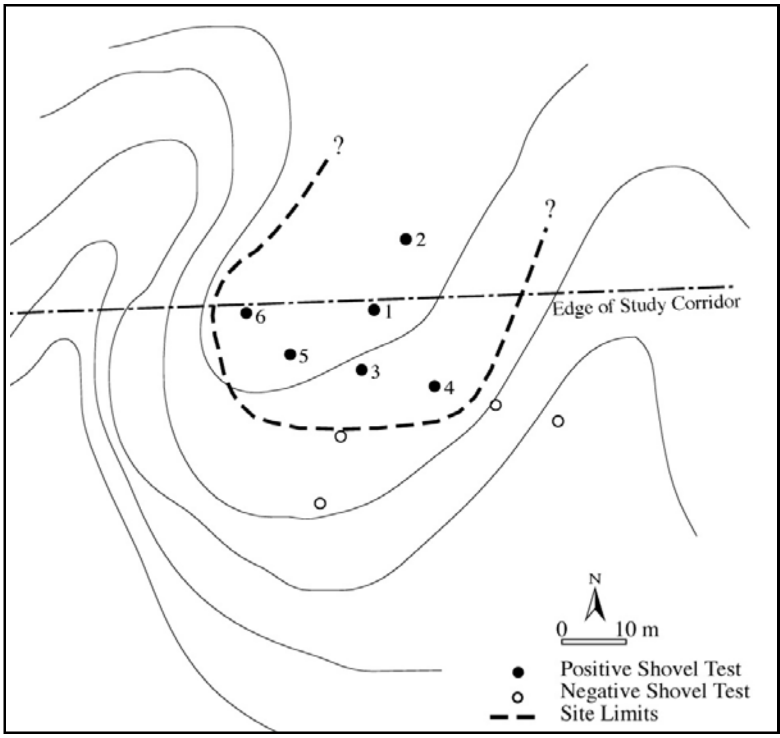
FORM PREPARATION AND REVISION

Date	**Name**	**Institutional Affiliation**
7/20/11	Rob Benson	Southeastern Archeological Services, Inc.

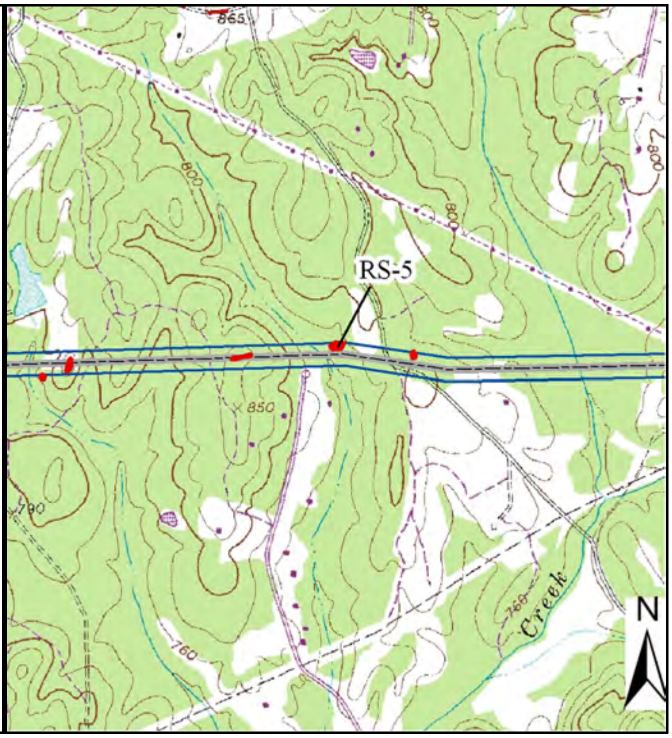
GEORGIA ARCHAEOLOGICAL SITE FORM
1990
Official Site Number: 9RS423

Institutional Site Number: RS-5 **Site Name:**
County: Coweta **Map Name:** Newnan SW **USGS OR USNOAA**
UTM Zone: 16 **UTM East:** 691322 **UTM North:** 3693321
Owner: **Address:**
Site Length: 40+ m **Width:** 50 m **Elevation:** ± - 235 m
Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown
Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur
Standing Architecture: 1. Present 2. Absent
Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater
Midden: 1. Present 2. Absent 3. Unknown **Features:** 1. Present 2. Absent 3. Unknown
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown
Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Prehistoric artifact scatter

Topography (Ridge, Terrace, etc.): Ridge nose
Current Vegetation (Woods, Pasture, etc.): Wooded
Additional Information: Site consists of a lithic and ceramic scatter with most of the site probably north of the corridor. Site area has been recently timbered, and contains a logging deck. Material restricted to 5-20 cm thick plowzone.



SKETCH MAP



OFFICIAL MAP (USGS 7.5' quadrangle)

State Site Number: 9CW423 **Institutional Site Number:** RS-5

Public Status: 1. National Historic Landmark 2. National Natural Landmark 3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible 2. Recommended Ineligible 3. Recommended Eligible 4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed 2. Cultivated 3. Eroded 4. Submerged 5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited 9. Graded 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Transmission line construction 3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Rob Benson **Affiliation:** Southeastern Archeological Services, Inc. (SAS) **Date:** 8/29/11
Report Title: *Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia.*

Other Reports:

Artifacts Collected: 13 quartz flakes, 3 Ridge & Valley chert flakes, 2 sherds

Location of Collections: Laboratory of Archaeology, University of Georgia, Athens

Location of Field Notes: Laboratory of Archaeology, University of Georgia, Athens ; SAS

Private Collections: None
Name: **Address:**

CULTURAL AFFINITY

Cultural Periods: Mississippian
Phases: undefined

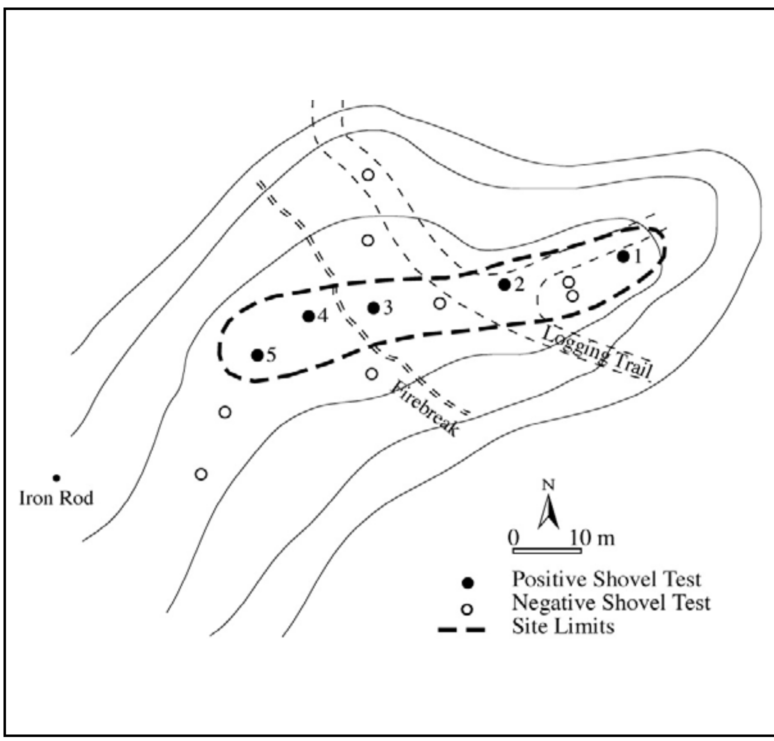
FORM PREPARATION AND REVISION

Date	**Name**	**Institutional Affiliation**
9/26/11	Rob Benson	Southeastern Archeological Services, Inc.

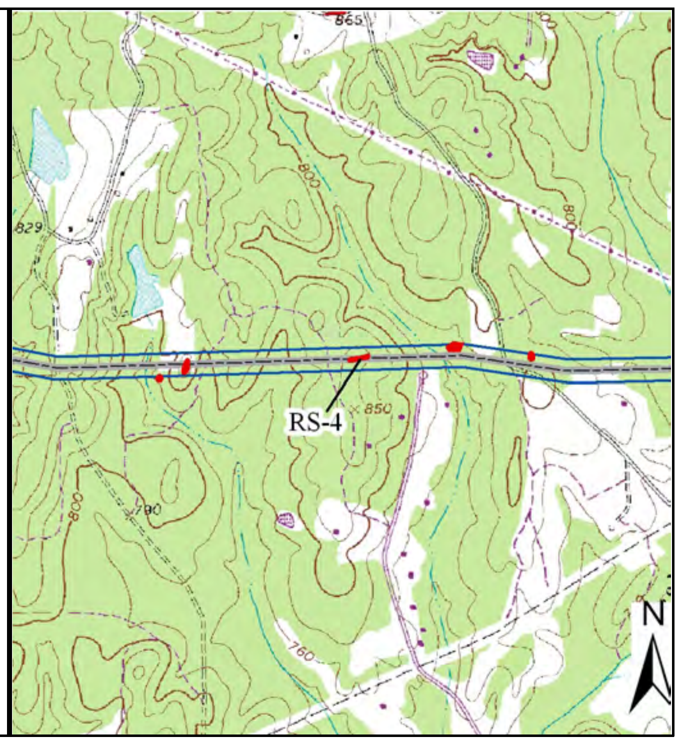
GEORGIA ARCHAEOLOGICAL SITE FORM
1990
Official Site Number: 9CW424

Institutional Site Number: RS-4 **Site Name:**
County: Coweta **Map Name:** Newnan SW **USGS OR USNOAA**
UTM Zone: 16 **UTM East:** 691015 **UTM North:** 3693285
Owner: **Address:**
Site Length: 65 m **Width:** 10 m **Elevation:** ± - 256 m
Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown
Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur
Standing Architecture: 1. Present 2. Absent
Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater
Midden: 1. Present 2. Absent 3. Unknown **Features:** 1. Present 2. Absent 3. Unknown
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown
Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Prehistoric artifact scatter

Topography (Ridge, Terrace, etc.): Knoll on ridge nose
Current Vegetation (Woods, Pasture, etc.): pine plantation,
Additional Information: Site records a low density prehistoric artifact scatter on a selectively cut, very eroded ridge nose.



SKETCH MAP



OFFICIAL MAP (USGS 7.5' quadrangle)

State Site Number: 9CW424 **Institutional Site Number:** RS-4

Public Status: 1. National Historic Landmark 2. National Natural Landmark 3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible 2. Recommended Ineligible 3. Recommended Eligible 4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed 2. Cultivated 3. Eroded 4. Submerged 5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited 9. Graded 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Transmission line construction 3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Rob Benson **Affiliation:** Southeastern Archeological Services, Inc. (SAS) **Date:** 8/29/11
Report Title: *Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia.*

Other Reports:

Artifacts Collected: 5 quartz preform fragments, 1 eroded sand tempered sherd, 6 quartz flakes

Location of Collections: Laboratory of Archaeology, University of Georgia, Athens

Location of Field Notes: Laboratory of Archaeology, University of Georgia, Athens ; SAS

Private Collections: None
Name: **Address:**

CULTURAL AFFINITY

Cultural Periods: Late Archaic, probable Woodland
Phases: undefined

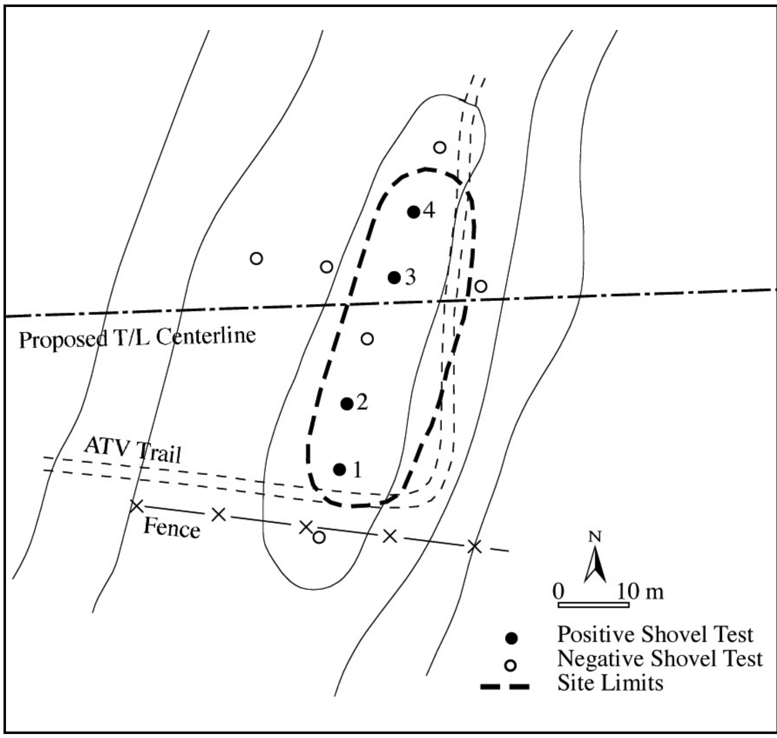
FORM PREPARATION AND REVISION

Date	**Name**	**Institutional Affiliation**
9/26/11	Rob Benson	Southeastern Archeological Services, Inc.

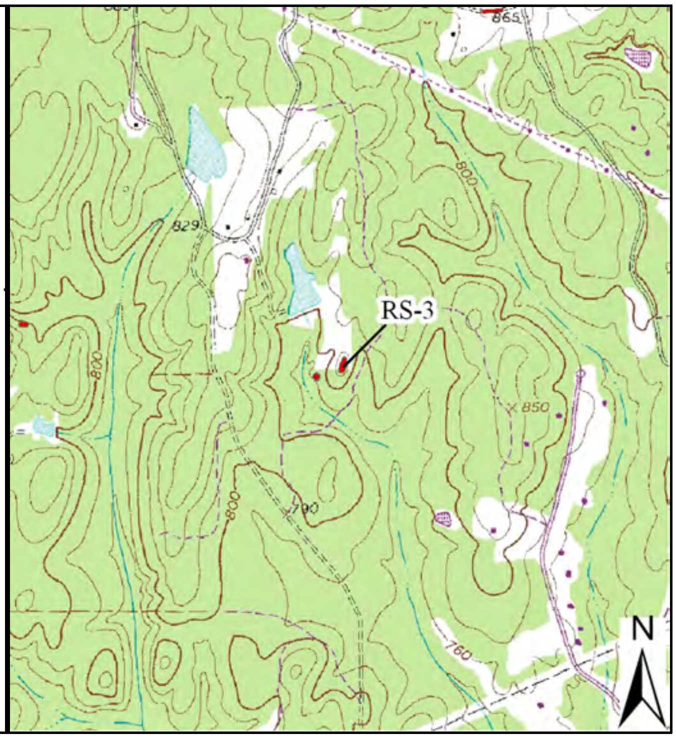
GEORGIA ARCHAEOLOGICAL SITE FORM
1990
Official Site Number: 9CW425

Institutional Site Number: RS-3 **Site Name:**
County: Coweta **Map Name:** Newnan SW **USGS OR USNOAA**
UTM Zone: 16 **UTM East:** 690461 **UTM North:** 3693258
Owner: **Address:**
Site Length: 50 m **Width:** 20 m **Elevation:** ± - 249 m
Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown
Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur
Standing Architecture: 1. Present 2. Absent
Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater
Midden: 1. Present 2. Absent 3. Unknown **Features:** 1. Present 2. Absent 3. Unknown
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown
Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Prehistoric lithic scatter

Topography (Ridge, Terrace, etc.): Knoll on ridge nose
Current Vegetation (Woods, Pasture, etc.): Wooded
Additional Information: Site records a low density prehistoric lithic scatter distributed across a knoll of a narrow ridge nose. Surface artifacts were collected from an ATV trail that runs along the eastern and southern edges of the knoll/site area. A large Yadkin-like triangular PP/K was collected from the trail.



SKETCH MAP



OFFICIAL MAP (USGS 7.5' quadrangle)

State Site Number: 9CW425 **Institutional Site Number:** RS-3

Public Status: 1. National Historic Landmark 2. National Natural Landmark 3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible 2. Recommended Ineligible 3. Recommended Eligible 4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed 2. Cultivated 3. Eroded 4. Submerged 5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited 9. Graded 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Transmission line construction 3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Rob Benson **Affiliation:** Southeastern Archeological Services, Inc. (SAS) **Date:** 7/7/11
Report Title: *Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia.*

Other Reports:

Artifacts Collected:

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface	0	1	quartz 4 triangular PP/K (19 mm base)
		4	quartz 4 tertiary
		2	quartz 4 late reduction flake fragments
Shovel Test 1	0-10	1	quartz 2 biface thinning flake
Shovel Test 2	0-12	1	quartz 4 late reduction flake fragment
Shovel Test 3	0-12	2	quartz 4 late reduction flake fragments
Shovel Test 4	10-20	1	quartz 2 biface thinning flake
Total		**12**	

Location of Collections: Laboratory of Archaeology, University of Georgia, Athens

Location of Field Notes: Laboratory of Archaeology, University of Georgia, Athens ; SAS

Private Collections: None
Name: **Address:**

CULTURAL AFFINITY

Cultural Periods: Early to Middle Woodland
Phases: Yadkin?

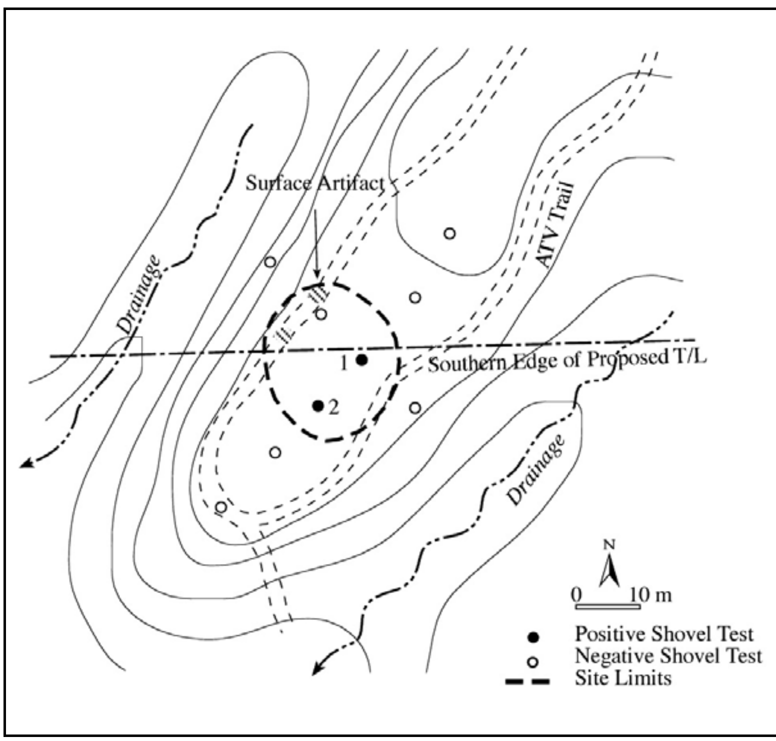
FORM PREPARATION AND REVISION

Date	**Name**	**Institutional Affiliation**
7/20/11	Rob Benson	Southeastern Archeological Services, Inc.

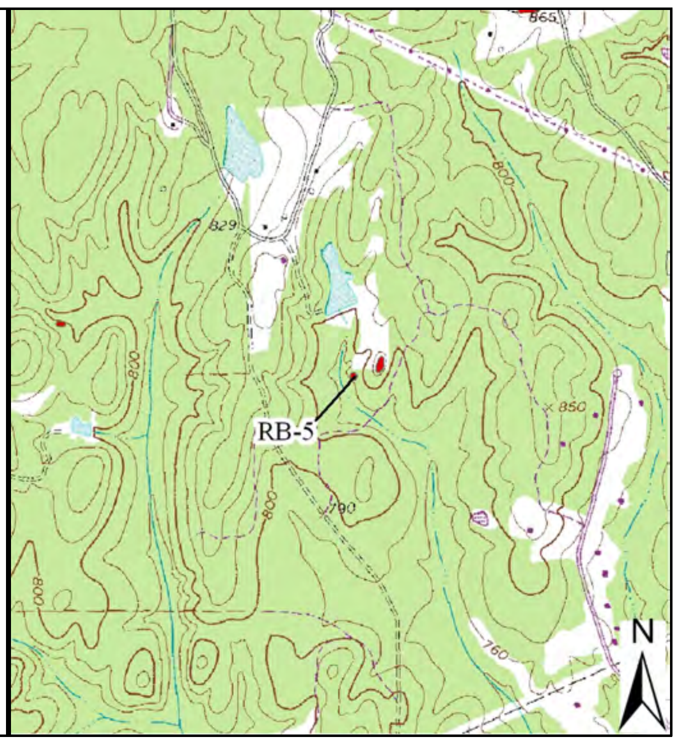
GEORGIA ARCHAEOLOGICAL SITE FORM
1990
Official Site Number: 9CW426

Institutional Site Number: RB-5 **Site Name:**
County: Coweta **Map Name:** Newnan SW **USGS OR USNOAA**
UTM Zone: 16 **UTM East:** 690376 **UTM North:** 3693221
Owner: **Address:**
Site Length: 20 m **Width:** 20 m **Elevation:** + - 240 m
Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown
Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur
Standing Architecture: 1. Present 2. Absent
Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater
Midden: 1. Present 2. Absent 3. Unknown **Features:** 1. Present 2. Absent 3. Unknown
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown
Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Prehistoric lithic and ceramic scatter

Topography (Ridge, Terrace, etc.): Toe slope
Current Vegetation (Woods, Pasture, etc.): Wooded
Additional Information: Site consists of a small, low density prehistoric lithic and ceramic scatter located on a level toe slope. The landform is situated above the confluence of first and second order drainages. Soil preservation is relatively good, but few artifacts were recovered.



SKETCH MAP



OFFICIAL MAP (USGS 7.5' quadrangle)

State Site Number: 9CW426 **Institutional Site Number:** RB-5

Public Status: 1. National Historic Landmark 2. National Natural Landmark 3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible 2. Recommended Ineligible 3. Recommended Eligible 4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed 2. Cultivated 3. Eroded 4. Submerged 5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited 9. Graded 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Transmission line construction 3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Rob Benson **Affiliation:** Southeastern Archeological Services, Inc. (SAS) **Date:** 7/7/11
Report Title: *Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia.*

Other Reports:

Artifacts Collected:

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Surface	0	1	quartz 4 tertiary
		1	quartz 4 biface thinning flake
Shovel Test 1	10-20	1	grit tempered residual sherd
Shovel Test 2	0-20	1	CP chert biface thinning flake
		1	quartz 4 tertiary
		2	quartz 4 biface thinning flakes
Total		**7**	

Location of Collections: Laboratory of Archaeology, University of Georgia, Athens

Location of Field Notes: Laboratory of Archaeology, University of Georgia, Athens ; SAS

Private Collections: None
Name: **Address:**

CULTURAL AFFINITY

Cultural Periods: Unknown Woodland/Mississippian
Phases: Unkown

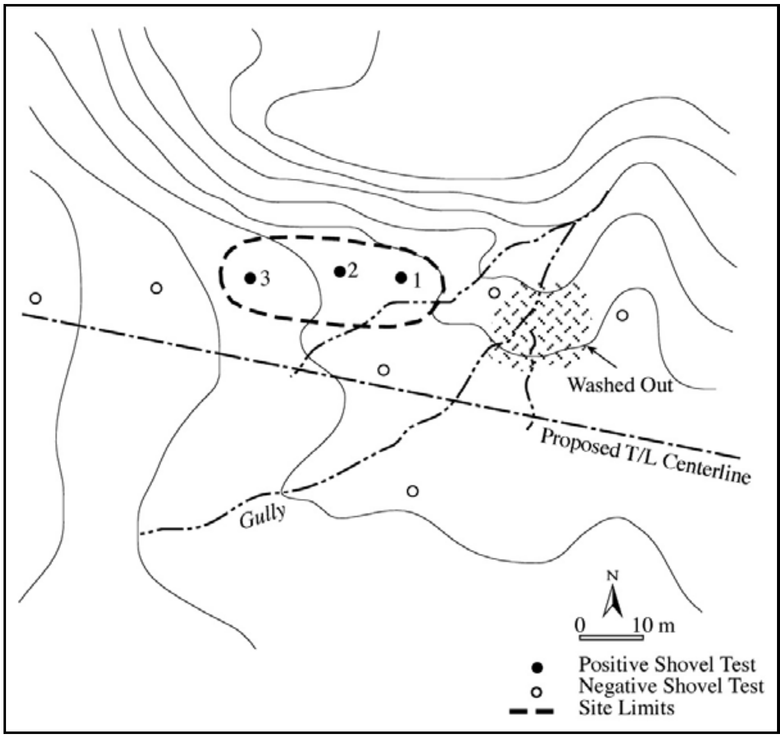
FORM PREPARATION AND REVISION

Date	Name	Institutional Affiliation
7/20/11	Rob Benson	Southeastern Archeological Services, Inc.

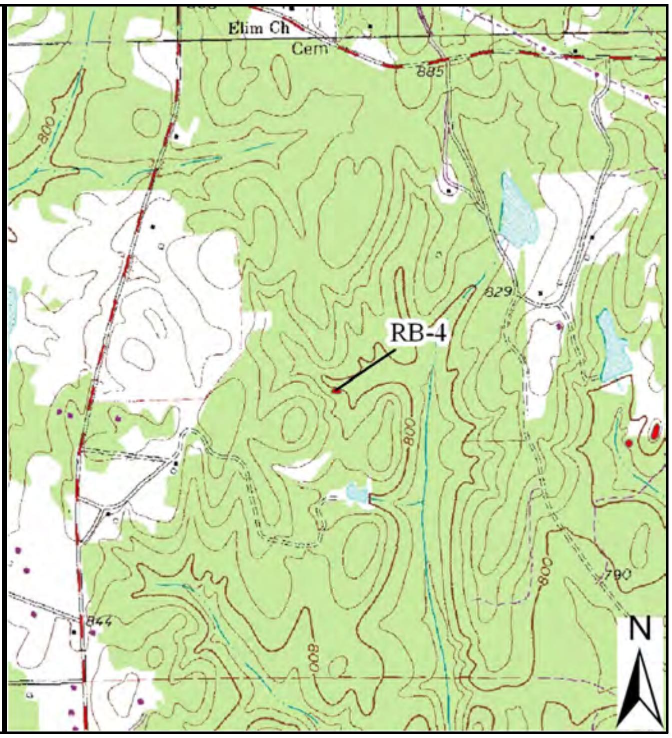
GEORGIA ARCHAEOLOGICAL SITE FORM
1990
Official Site Number: 9CW427

Institutional Site Number: RB-4 **Site Name:**
County: Coweta **Map Name:** Newnan SW **USGS OR USNOAA**
UTM Zone: 16 **UTM East:** 689437 **UTM North:** 3693388
Owner: **Address:**
Site Length: 35 m **Width:** 15 m **Elevation:** ± - 243 m
Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown
Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur
Standing Architecture: 1. Present 2. Absent
Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater
Midden: 1. Present 2. Absent 3. Unknown **Features:** 1. Present 2. Absent 3. Unknown
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown
Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Prehistoric lithic scatter

Topography (Ridge, Terrace, etc.): Toe slope
Current Vegetation (Woods, Pasture, etc.): Wooded
Additional Information: Site consists of a small, low density lithic scatter on a relatively level toe slope. The northern side slope is very steep, forming a bluff above the second order drainage below. At least a portion of the site has been redeposited. Old farming terraces have been breached and much of the area has been scoured by erosional gullies.



SKETCH MAP



OFFICIAL MAP (USGS 7.5' quadrangle)

State Site Number: 9CW427 **Institutional Site Number:** RB-4

Public Status: 1. National Historic Landmark 2. National Natural Landmark 3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible 2. Recommended Ineligible 3. Recommended Eligible 4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed 2. Cultivated 3. Eroded 4. Submerged 5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited 9. Graded 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Transmission line construction 3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Rob Benson **Affiliation:** Southeastern Archeological Services, Inc. (SAS) **Date:** 7/6/11
Report Title: *Archeological Survey of the Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia.*

Other Reports:

Artifacts Collected:

Provenience	Artifact Depth (cmbs)	Artifact Count	Artifact Description
Shovel Test 1	0-10	1	quartz 4 tertiary
Shovel Test 2	0-20	2	quartz 4 tertiary
		1	quartz 4 late reduction angular fragment
Shovel Test 3	25-35	1	quartz 4 late reduction flake fragment
Total		**5**	

Location of Collections: Laboratory of Archaeology, University of Georgia, Athens

Location of Field Notes: Laboratory of Archaeology, University of Georgia, Athens ; SAS

Private Collections: None
Name: **Address:**

CULTURAL AFFINITY

Cultural Periods: Unknown prehistoric lithic
Phases: Unknown

FORM PREPARATION AND REVISION

Date	**Name**	**Institutional Affiliation**
7/20/11	Rob Benson	Southeastern Archeological Services, Inc.

APPENDIX B:

VITA OF PRINCIPAL INVESTIGATOR

JERALD LEDBETTER

Education

B.S., 1971, Biology, Union University, Jackson, Tennessee

Areas of Specialization

Large Scale Excavations
Paleoindian-Archaic Lithic Analysis
Prehistory of the upper Oconee Valley
Artifact Illustration

Professional Experience

1983-present	Senior Archeologist, Southeastern Archeological Services, Inc., Athens, Georgia
1980-1982	Project Archeologist, Memphis State University and several consulting firms
1980	Crew Member, Testing Phase of Kings Bay Project, Camden County, Georgia; University of Florida
1977-1979	Field Director, various projects, University of Georgia, Athens.
1977	Crew Member, Survey of the Valley of Oaxaca, Mexico; Pennsylvania State University
1976-1977	Crew Member, Fort Loudon Project, Monroe County, Tennessee; Tennessee Division of Archeology, Nashville

Professional Affiliations

Society for Georgia Archeology
Georgia Council of Professional Archeologists
Southeastern Archeological Conference

Publications

The Late Archaic to Early Woodland Transition in Northwest Georgia: Evidence for Terminal Archaic (ca. 1100 - 600 B.C.) Period Occupation in the Region. 2009. Georgia Department of Transportation *Occasional Papers in Cultural Resource Management* No. 14. Co-authored with Lisa D. O'Steen and Scott Jones.

A Discussion of Joseph Caldwell's Late Archaic Stamp Creek Focus of Northwest Georgia. 2007. *The Profile*, No. 135:9-14.

Caught Knapping, A Modern Flintknapping Station in Greene County, Georgia. 2006 Early Georgia 34 No. 1 pp . 17-26. Co-authored with Scott Jones.

Archeological Investigation of the Vulcan Site, Bartow County, Georgia. 2001. *Early Georgia* (29).

Isabel Garrard Patterson: Advocate for Georgia Archaeology 1999. In *Grit-Tempered, early Women Archaeologists in the Southeastern United States*, edited by N.M. White, L.P. Sullivan, and R.A. Marrinan.

Paleoindian and Early Archaic Research in Georgia. 1996. In *The Paleoindian and Early Archaic Southeast*, edited by D.G. Anderson and K.E. Sassaman. Co-authored with D.G. Anderson, L.D. O'Steen, and D.T. Elliott.

Middle and Late Archaic Architecture. 1996. In *Archaeology of the Mid-Holocene Southeast* edited by K.E. Sassaman and D.G. Anderson. Co-authored with K.E. Sassaman.

Dear Isabel: Archeological Correspondence A.R. Kelly and Isabel Patterson 1934-1953. 1995. R.J. Ledbetter, editor. Lamar Institute Publication 33.

Paleoindian and early Archaic in the Lower Southeast: A View from Georgia. 1994. *Ocmulgee Archaeology 1936-1986*. Co-authored with David G. Anderson, Lisa D. O'Steen, Daniel T. Elliott, Dennis Blanton, Glen T. Hanson, and Frankie Snow.

The Grayson Site: Late Archaic and Late Woodland Occupations in the Little Sandy Drainage. 1993. Kentucky Heritage Council. Co-authored with Lisa D. O'Steen.

Upland Mississippian Occupation in the Allatoona Area. 1992. *Early Georgia* Vol. 20(2). Co-authored with Adam King.

Late Archaic/Early Woodland Structures from the Mill Branch Sites, Warren County, Georgia. 1992. *Early Georgia*.

Paleoindian Period Archaeology of Georgia, 1990. Co-authored with David Anderson and Lisa O'Steen

A Comment on the Research Value of Upland Lamar "Plowzone" Sites. 1988. *The Profile* 60-61:5-6.

Recent Paleoindian Research in Georgia. 1987. *Current Research in the Pleistocene* 4:47. Co-authored with David G. Anderson, Lisa O'Steen, Daniel T. Elliott, and Dennis Blanton.

Late Mississippian Settlement North of the Oconee Province. *The Profile* 54:9-12. Co-authored with Lisa O'Steen.

Paleoindian Sites of the Inner Piedmont of Georgia: Observations of Settlement in the Oconee Watershed. 1986. *Early Georgia*. Co-authored with Lisa D. O'Steen, Daniel T. Elliott, and William W. Barker.

Chert of Southern Oconee County, Georgia. 1981. *Early Georgia* 9:1-13. Co-authored with Stephen A. Kowalewski and Lisa O'Steen.

Papers Presented

Caught Knapping, A Modern Flintknapping Station in Greene County, Georgia. 2005 Society for Georgia Archaeology, Athens, Georgia. Co-authored with Scott Jones.

Paleoindian Archeology of Georgia. 2000. Southeastern Archaeological Conference, Macon. Co-authored with D.G. Anderson and L.D. O'Steen.

Late Archaic/Early Woodland Structures from the Mill Branch Sites, Warren County, Georgia. 1991 Meeting of Society for Georgia Archeologists, Augusta.

Paleoindian Research in Georgia. 1991. Paleoindian and Early Archaic Research in the Lower Southeast, A South Carolina Perspective. Co-authored with David G. Anderson and Lisa D. O'Steen.

Paleoindian and Early Archaic in the Lower Southeast: A View from Georgia. 1986. Ocmulgee National Monument 50th Anniversary Conference, Macon. Co-authored with David G. Anderson, Dennis Blanton, Daniel T. Elliott, Lisa O'Steen and Glen T. Hanson.

Paleoindian Sites of the Inner Piedmont of Georgia and South Carolina. 1983. Southeastern Archaeological Conference, Columbia, South Carolina. Co-authored with Lisa D. O'Steen and Daniel T. Elliott.

Settlement and Demography: the Wallace Survey. 1978. Southeastern Archaeological Conference, Atlanta. Co-authored with Paul R. Fish and Greg Paulk.

Technical Reports and Manuscripts

Author and coauthor of 85 reports on survey, testing and data recovery projects in Alabama, Florida , Georgia, Kentucky, South Carolina, and Tennessee conducted from 1978-2010.

PHASE I HISTORIC STRUCTURES SURVEY

DRESDEN-HEARD COUNTY 500 KV TRANSMISSION LINE

COWETA AND HEARD COUNTIES, GEORGIA

NEW SOUTH ASSOCIATES

PROVIDING PERSPECTIVES ON THE PAST

Phase I Historic Structures Survey, Proposed Dresden-Heard 500 kV Transmission Line

Coweta and Heard Counties, Georgia

Report submitted to:

Georgia Transmission Corporation • 2100 East Exchange Place • Tucker, GA 30084-5342

Report prepared by:

New South Associates • 6150 East Ponce de Leon Avenue • Stone Mountain, Georgia 30083

Mary Beth Reed

Mary Beth Reed – Principal Investigator

Mary Beth Reed – Historian and Co-Author
Christina Olson – Historian and Co-Author
Mark Swanson – Historian and Co-Author

April 23, 2010 • Draft Report
New South Associates Technical Report 1865

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I. INTRODUCTION

New South Associates conducted a Phase I historic resources survey of the proposed Dresden-Heard 500 kV Transmission Line in Coweta and Heard counties in April 2010. The project area, roughly six miles east-west and three miles north-south, is located in the western extreme of Coweta County, and in an adjoining strip of Heard County, Georgia. This area is located some seven miles west of Newnan, the seat of Coweta County, and less than a mile from the Chattahoochee River to the west (Figure 1). Atlanta is about 30 miles away, to the northeast. The project area is rural, with some residential development along the larger roads. The largest of these roads is State Road 34, located along the southern edge of the project area. Other main roads include: Thomas-Powers, Martin Girl, Handy, Midway, Boy Scout, and Dr. Bruce Jackson. Three crossroads communities form a triangle within the project area: Handy, Dresden, and Stallings Crossroads (also known as Powers Crossroads). To the west of these communities is a large north-south power line, located in Heard County along the western edge of the project area.

The study was performed in order to identify and evaluate resources within the study area for their eligibility to the National Register of Historic Places (NRHP) for project planning. The study began with a search of the Georgia's Natural, Archaeological, and Historic Resource GIS (NAHRGIS) database to identify any NRHP-listed properties or previously identified resources. Research revealed that there are two NRHP-listed properties located within the study area, the William Leonard Crowder Home Place (Resource ID 16175/80800), and the Henderson-Orr House/Powers House/Moss Oak Plantation (Resource ID 16671/81619). The William Leonard Crowder Home Place consists of a gabled wing house, constructed in 1880, and was listed on the NRHP in 1986. The Henderson-Orr House/Powers House/Moss Oak Plantation is an I-house, constructed in 1790 and was listed on the NRHP in 2000. In addition 24 other previously recorded resources were identified. These resources were recorded in a Newnan-Coweta Historical Society Survey conducted in 1992-1993.

Historical research was carried out with an emphasis on historic maps and tax records. Copies of Coweta and Heard County highway maps from various years were acquired from the University of Georgia Libraries Map Library. Other historical maps are courtesy of the Georgia State Archives online Virtual Vault (http://content.sos.state.ga.us/index.php) and the Library of Congress website (http://memory.loc.gov/ammem/index.html). These maps were used to provide context for the survey area. In addition, when possible, county tax data was retrieved for the identified resources to help with building dates, assigning building types, and in the evaluations.

New South Associates' historian Christina Olson conducted a survey of the study area, following the methodology requested in the scope of work. This consisted of identifying resources 50 years of age or older with the exception of Ranch Houses within the study area, verifying the locations of previously surveyed resources, and providing a preliminary assessment on whether the building, site, structure or landscape is eligible, possibly eligible, or non-eligible. Also when NRHP-eligible districts were identified, the historian was required to provide a boundary.

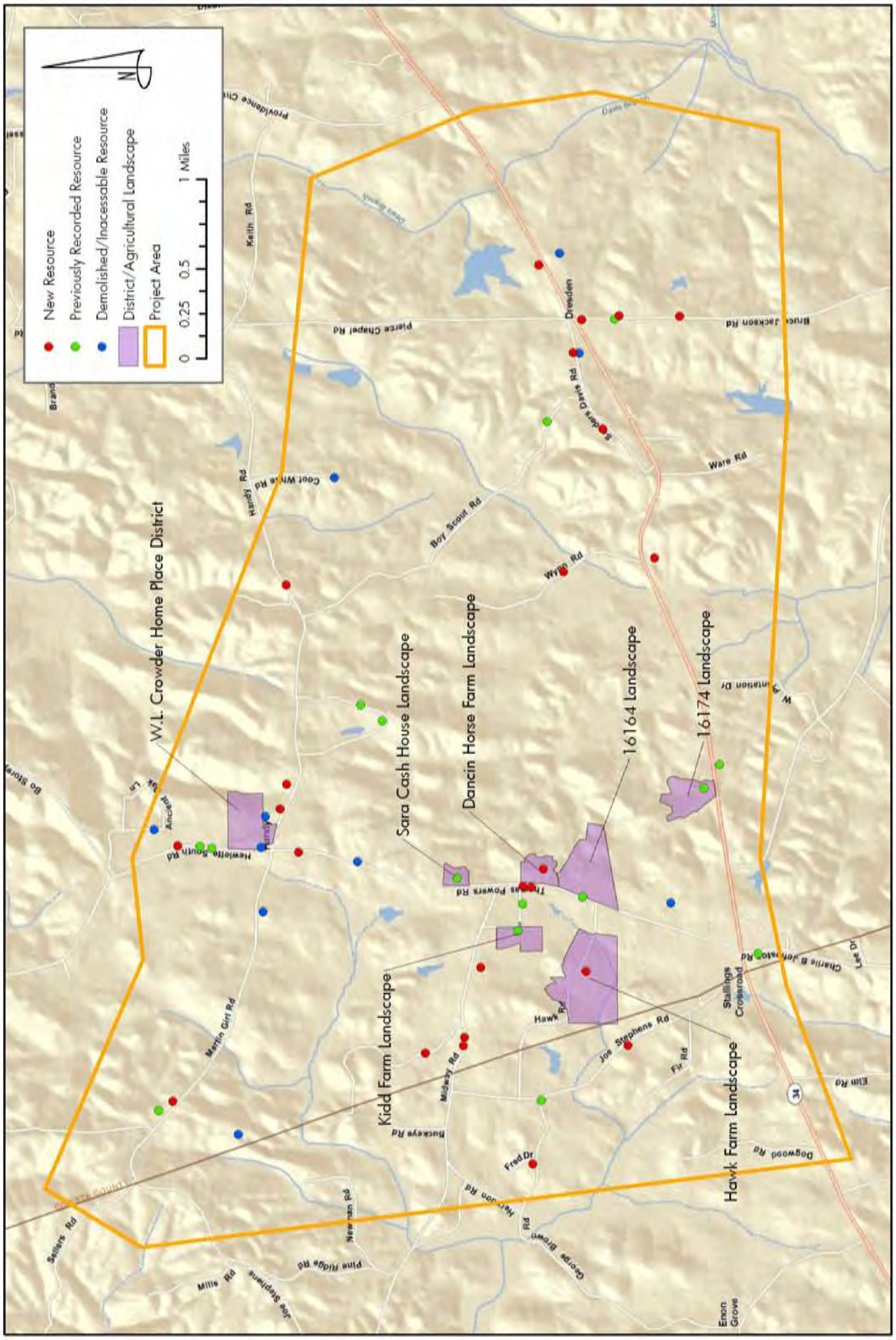


Figure 1. Study Area and Resource Distribution

Where survey forms were available in NAHRGIS, they were printed out and used in the field verification process. Each identified resource was digitally photographed and survey data was collected using a Trimble Geo XP. The collected survey data was used to generate GIS data for initial GTC planning purposes and to generate a data form for each resource for inclusion in this report (see appendix). The GIS deliverable was structured by GTC guidance and was submitted in advance of the report. The survey data is summarized in the results chapter in tabular form; full descriptions and photographs for all resources are found in the appendix that was generated using a Microsoft Access database. The survey identified a total of 48 resources. Their distribution is shown on Figure 1; more detailed maps are located in the appendix. Of the 24 previously recorded resources, 16 were relocated and resurveyed. The remaining 8 previously recorded resources were not relocated due changes in land access or because they are no longer extant.

The identified resources were evaluated for their NRHP eligibility using the following criteria:

> *The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:*
>
> > *a. That are associated with events that have made a significant contribution to the broad patterns of our history; or*
> >
> > *b. That are associated with the lives of persons significant in our past; or*
> >
> > *c. That embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or are associated with the lives of persons significant in our past; or*
> >
> > *d. That have yielded, or may be likely to yield, information important in prehistory or history.*

Also, the evaluation of historic cemeteries was shaped by recent guidance from the Historic Preservation Division that all cemeteries that have not been overwhelmed by non-historic intrusion qualify for listing in the National Register due to their universal significance as sacred places of reverence and devout sentiment, each one of which is a distinct manifestation of the cultures and environments in which it was created, and each of which can be defined as a recognizable type of historic property and has the potential to yield information important in history. Where churches and cemeteries were found in association, the church was evaluated separately.

This report presents the results of the field survey and evaluation. This chapter introduces the survey and provides methods. A context for that area's growth and development is contained in Chapter II. Chapter III contains the results and conclusions. The appendix contains the data forms for each resource and the resource location maps.

II. HISTORIC CONTEXT

The earliest historic settlement in the project area was that of the Creek. The Creeks, the Native American occupants of what is now western Georgia, made the transition from centralized settlements to farmsteads during the first centuries of contact with Europeans. Members of the 1540 de Soto expedition described the Creeks as town dwellers who relied a mixed economy of hunting, gathering, fishing, and agriculture. Diagnostic ceramics of historic Creek occupations include Chattahoochee Brushed and Ocmulgee (or Lamar) Plain with some incidence of Ocmulgee (or Lamar) Incised pottery (Huscher et al. 1972; Gardner and Roberts 1990). Creek sites have also been identified through the records of Indian Agent Benjamin Hawkins (1848), as well as through archaeological investigations (Swanton 1922; Fairbanks 1952). Archival sources identify the Coweta sub-tribe of the Lower Creek Indians as the study area's earliest recorded residents, while the 1818 Melish map of Alabama shows early Creek towns such as Chattahoochee, located near what is now West Point Lake.

Creek culture was modified and eventually overwhelmed by the spread of Anglo-American settlement, beginning in the 1600s and 1700s. By the early 1800s, this conflict came to a head. War between different Creek groups, mainly divided by degrees of acculturation and resistance to American culture, led to the Red Stick War, which broke out during the War of 1812. The war ended badly for the Creeks, and eventually led to the Treaty of Indian Springs in 1825, which ceded Creek land to Georgia, opening the region to Euro-American and African American settlement.

The oldest structure still standing in Coweta County (as of 1988) is located within the project area, and dates to this time period. Started in 1795 by the Orr family, who had permission from the Creek to clear the land, this structure is now part of the Powers plantation house, located at the intersection of Highway 34 and Thomas Powers Road. The Powers family acquired the land through marriage, and their plantation became the nucleus for Powers Crossroads (The Newnan-Coweta Historical Society 1988:7).

The lands obtained from the 1825 treaty were carved into five counties: Carroll, Coweta, Lee, Muscogee, and Troup. Lots measuring 202.5 acres were created and distributed by lottery in 1827. Initial settlement in Coweta County focused on the Chattahoochee (Gardner and Roberts 1990). The county seat of Newnan was established in 1828. Enumeration of the county's population in 1840 recorded 7,263 whites, 3,078 slaves and 23 free African Americans. The Newnan-Coweta Historical Society (1988) states that most houses at this time were log cabins.

Coweta County farms raised cotton, corn, wheat, and sweet potatoes, and contributed 28 percent of the state's total cotton yield in 1839. The 1850 and 1860 agricultural statistics report the continued popularity of these crops. Reports of limited rice production in 1850 suggest experimentation with this crop, but the 1860 records indicate rice never took hold in the county. Plantation agriculture was on the rise between 1850 and 1860: population statistics for 1850 show 8,220 whites and 5,415 slaves. By 1860, however, the white population dropped to 7,449 individuals while the African-American population increased to 7,248.

Local growth increased substantially after the Atlanta and LaGrange Railroad, organized in 1849, was completed (Newnan-Coweta Historical Society 1988:10-12). In the 1850s rail connections were made with Atlanta, Alabama, and beyond, which also made the county a military target. The Newnan vicinity was the site of military action on July 30, 1864 and its "hospitals" were filled with soldiers injured during the battle.

Cotton manufacturing became established during Reconstruction. Coweta and Heard counties prospered during this period as the Chattahoochee Valley became a center of cotton production to meet the needs of the region's newly established textile mills. Local rail connections helped retain some of the wealth produced in the late nineteenth century. Newnan grew beyond its original function as an administrative center to also serve as a focus for local business and trade (The Newnan-Coweta Historical Society 1988:11). In the mid-1870sm William Leonard Crowder constructed his home at Handy, part of the Crowder Home Place (The Newnan-Coweta Historical Society 1988:182).

The local agricultural focus began to shift in the 1880s as produce (peaches, grapes, strawberries, blackberries, and plums) began replacing cotton and corn. In 1896 the state Commissioner of Agriculture described Coweta County as one of the state's pioneer fruit-growing counties (Nesbitt 1896:428). Beside orchard products, the county produced cotton, corn, sugar cane, clover, and grass. Land was valued between $8 and $50 per acre with fruit lands typically valued at between $15 and $25 per acre. Overall, Coweta ranked fourth in the state in terms of volume and value of agricultural products. Newnan also emerged as a manufacturing center with an iron foundry and machine works, an ice factory, cotton oil mills, guano factory, sulfuric acid plant, a cigar factory, a harness and collar factory, cotton factory, cotton compress, electric light plant, waterworks, corn mills, and planing mills. Moreland and Senoia also contained cotton factories (Nesbitt 1896:428-429).

Heard County lagged behind Coweta in fruit production, but it too was overwhelmingly agricultural. Its major crops by the end of the 1800s were cotton, corn, wheat, oats, barley and potatoes (Nesbitt 1896:444).

Adverse weather caused fluctuations in fruit yields between 1890 and 1920 (Gardner and Roberts 1990:35). The boll weevil and soil erosion led to further crises for farmers in Coweta and Heard counties. In reaction, some farmers diversified, raising poultry and peaches, for instance. Some also made efforts to rebuild the soil. However, other farmers, both white and African American, abandoned their farms to look for opportunities in urban areas. Local towns like Newnan reported population increases of 75 percent between 1910 and 1920 (The Newnan-Coweta Historical Society 1988:33). Textile firms and other county industries absorbed this new labor force but many African Americans made a different choice, migrating to northern cities in search of employment.

The Great Depression caused more severe hardships in the 1930s. Public relief programs such as the WPA helped find work for the jobless, and improved the physical environment through road projects and the creation of parks. The Rural Electrification Administration allotted funds to build power lines in the local area (The Newnan-Coweta Historical Society 1988:33). Despite this relief, the 1930s were difficult. A 1940 County Highway map provides a sense of the sparse settlement at that time in the study area. As before, some county farmers changed their economic tactics in response, making a shift to cattle and dairy products (Figure 2). To encourage crop diversification

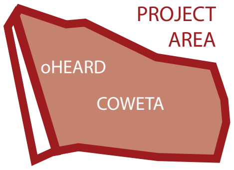
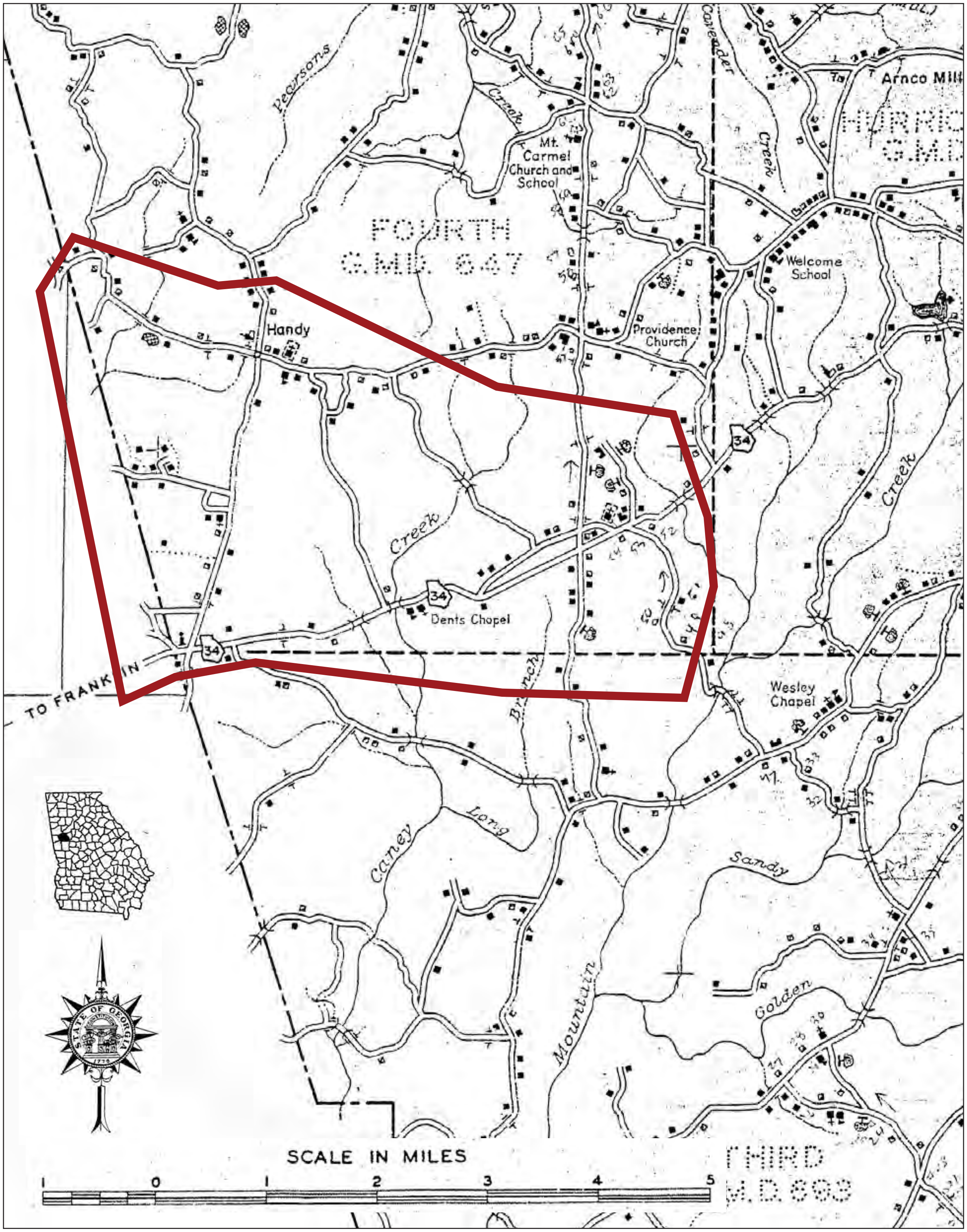


Figure 2.
Detail from 1940 County Highway Map Showing Part of Study Area



in the late 1950s the government paid farmers for not planting cotton. Instead corn and other feed crops were produced as a complement to livestock. Also, during the 1950s peach growing declined and by the mid 1960s was no longer practiced in the county. Agricultural pursuits that emerged during the last part of the twentieth century included timber products, Christmas tree farms, and catfish farming (Gardner and Roberts 1989:37).

The decline of traditional agriculture in recent years has gone hand-in-hand with the expansion of suburbanization associated with Atlanta and Newnan. Much of this has been pushed by the development of Interstate 85, immediately east of Newnan. Even though the project area is still overwhelmingly rural, there has been the steady growth of scattered suburban communities, especially along the major roads. This has been particularly noteworthy along Thomas Powers Road, between Handy and Powers Crossroads.

III. RESULTS

While the overall character of the project area has remained rural, the agricultural aspect of the area has given way somewhat to a more suburban quality; however, several working agricultural landscapes are still present in the area. The majority of properties 50 years of age or more consist of single story central hallway type houses and two-story I-houses or Plantation Plain type residential buildings. Other house types (less than 50 years of age) include late period ranch type houses and large c. 2000 single-family residences. The landscape typically bears the patterns of mid-nineteenth to mid-twentieth century agricultural use in fields, pastures, and fence lines. Road placement appears to follow a combination of commerce as well as agricultural use, creating community intersections such as Stallings Crossroads and Handy.

The distribution of the identified resources is shown in Figure 1. The resources are fairly evenly distributed with exception of the cultural landscapes that are clustered in the southwest quadrant of the study area in Coweta County. However, a NRHP-listed district and Centennial Farm is located to the north of this cluster along Thomas Power Road at Handy.

Of the 26 previously recorded resources within the project area, two are listed on the NRHP, seven are recommended as possibly eligible for listing, and the remainder is recommended as non-eligible (Table 1). Ten of the previously recorded resources identified within the project area were not relocated, either because of discrepancies in GIS information, changes in land access or because they are no longer extant (Table 2). Four of the previously recorded resources that were resurveyed were identified as agricultural landscapes (Table 1). Boundaries for each have been submitted with the GIS data.

Two of the previously recorded resources, the William Leonard Crowder Home Place (Resource ID 16175/80800), and the Henderson-Orr House/Powers House/Moss Oak Plantation (Resource ID 16671/81619), were identified with dual Resource ID numbers and on dual survey forms. Both of these resources are listed on the NRHP. The owners of the William Leonard Crowder Home Place (Resource ID 16175/80800) requested that their property not be resurveyed as it is a well-documented historic district, having received not only a NRHP designation, but also a Centennial Heritage Farm Designation, and inclusion in two separate histories of Coweta County. It is possible that the Handy Grist Mill (Resource ID 16176), one of the resources that was not relocated during the field survey, may be located within the Crowder Home Place Historic District.

In addition, personal communication with the owner of the Brown Grant Farm (Resource ID 16155) indicated that the Martin Girl's House (Resource ID 16166) might be the same resource. The Martin Girl's House (Resource ID 16166) was not relocated during the field survey due to discrepancies in GPS information and changes in land access.

Table 1. Previously Recorded Resources in the Project Area

Resource ID	County	Property Name/Address	Resource Use	Resource Type	Building Type	Construction Date	NRHP Eligibility
16155	Coweta	Brown Grant Farm, 819 Martin Girl Rd	Residential	Building	Plantation Plain	1832	Eligible, A and C
16156	Coweta	Starr House, 176 Hewlett S. Rd	Building	Building	Central Hallway	1900	Possibly Eligible, A and C
16157	Coweta	E side of Hewitt S. Rd next to 231	Residential	Building	Gable-el	1900	Non-Eligible
16161	Coweta	Sara Cash House, 837 Thomas Powers Rd	Agricultural	Landscape	Central Hallway	c.1900	Possibly Eligible, A and C
16162	Coweta	Kidd Farm, 134 Robert Stephens Rd	Agricultural	Landscape	Pyramid Cottage	1912	Possibly Eligible, A and C
16163	Coweta	Midway School, Robert Stephens Rd	Public/Institutional	Building	One Room School	c.1900	Possibly Eligible, A
16164	Coweta	491 Powers Rd	Agricultural	Landscape	Plantation Plain	1867	Possibly Eligible, A and C
16174	Coweta	4335 Hwy 34	Agricultural	Landscape	Gable-ell	1885	Possibly Eligible, A and C
16178	Coweta	192 Hoot Owl Hollow	Residential	Building	Central Hallway	1900	Non-Eligible
16179	Coweta	287 Hoot Owl Hollow	Residential	Building	Bungalow	1930	Non-Eligible
16180	Coweta	145 Boy Scout Rd	Residential	Building	No recognized type	1971	Non-Eligible
16669	Coweta	115 Dr Bruce Jackson	Residential	Building	I-House	1900	Possibly Eligible, A and C
16670	Coweta	4330 Hwy 34	Residential	Building	Bungalow	1938	Non-Eligible
16671; 81619	Coweta	Henderson-Orr House/Powers House/Moss Oak Plantation, Powers Rd, SW Corner of Stallings Crossroads	Residential	Building	I-House	1790	Listed, A and C
36998	Heard	Corner Joe Stephens and George Brown Roads	Residential	Building	New South Cottage	c.1920	Non-Eligible
16175; 80800	Coweta	William Leonard Crowder Home Place, 1615 Handy Road	Residential	Building	Gabled Wing	1880	Listed, A and C

Table 2. Previously Recorded Resources in the Project Area Not Relocated During Survey

Resource ID	County	Property Name/Address	Reason Not Relocated
16158	Coweta	Hewlett S. Rd, approx. ½ mile N of Handy	No longer extant
16160	Coweta	Cash Farm, E side of Thomas Power Rd, ½ mile S of Handy	Change in land access/no longer extant
16165	Coweta	Madras General Store, E side of Thomas Powers Rd, ½ mile N of Stallings Crossing	No longer extant
16166	Coweta	Martin Girl Rd, 1&¼ mile W of Handy	GIS discrepancy/Change in land access
16167	Coweta	Brooks Wortham House, S side of Martin Girl Rd ¾ mile W of Handy	No longer extant
16171	Coweta	Rock House, Rock House Rd N of GA 34	Change in land access
16173	Coweta	Crowder Commissary, Sanders Davis Rd	No longer extant
16176	Coweta	Handy Grist Mill, Handy	Access not granted
16177	Coweta	N side of Handy Rd, ¼ E of Handy	GIS discrepancy
16183	Coweta	End of Johnny Wortham Rd, N of Handy	No longer extant

Within the 24 newly identified resources, there are 19 buildings; 3 resources that contain buildings and sites (Emory Chapel and Cemetery, Resource ID 4; Dent Chapel AME Church and Cemetery, Resource ID 9; Elim Baptist Church and Cemetery, Resource ID 23), and two agricultural landscapes (Hawk Farm, Resource ID 12; Dancin' Horse Farm Resource ID 13). Of these resources, 11 have been recommended as possibly eligible for listing on the NRHP, and 13 have been recommended as not eligible (Table 3).

As noted, historic cemeteries that have not been overwhelmed by non-historic intrusion qualify for listing on the NRHP given recent Historic Preservation Division guidance. Therefore, the cemeteries associated with the Emory Chapel (Resource ID 4), the Dent Chapel AME Church (Resource ID 9) and the Elim Baptist Church (Resource ID 23) are all recommended as possibly eligible for listing on the NRHP; however, the church buildings associated with these resources do not appear to meet the criteria for listing and have been recommended as not eligible.

In conclusion, 48 resources were surveyed. Two are listed resources, one is recommended as eligible, 18 are recommended as possibly eligible, and 19 are recommended as non-eligible. Of the possibly eligible resources, three are historic cemeteries. Figure 3 shows the listed, recommended eligible, and possibly eligible resources.

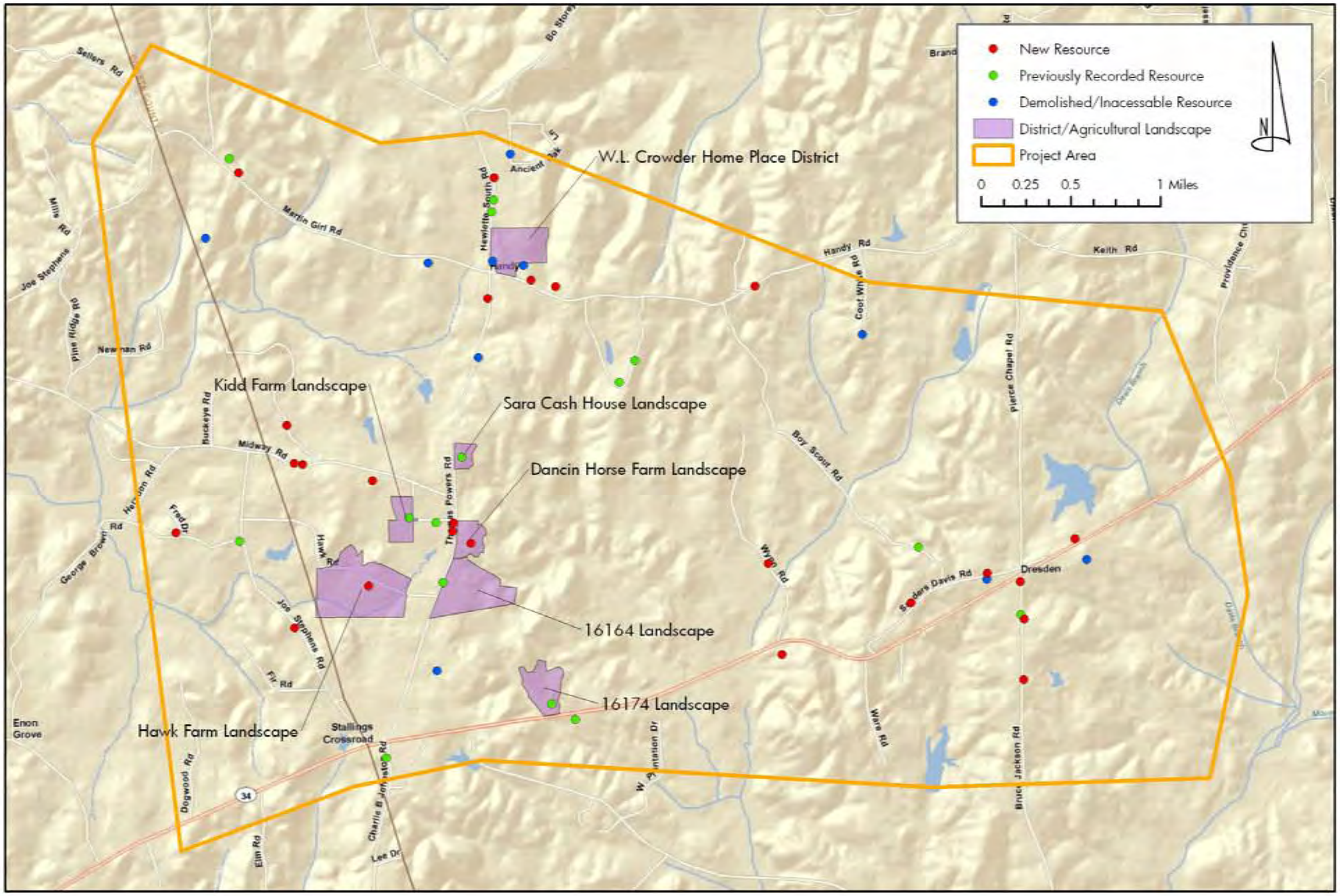


Figure 3. Listed, Recommended and Possibly Eligible Resources

Table 3. Newly Surveyed Resources in the Project Area

Resource ID	County	Property Name/Address	Resource Use	Resource Type	Building Type	Construction Date	NRHP Eligibility
1	Coweta	112 Dr Bruce Jackson Rd	Residential	Building	No recognized type	1940	Possibly Eligible, C
2	Coweta	124 Dr Bruce Jackson Rd	Residential	Building	Bungalow	1938	Possibly Eligible, C
3	Coweta	546 Dr Bruce Jackson Rd	Residential	Building	Side-Gable Cottage	c.1900	Non-Eligible
4	Coweta	Emory Chapel and Cemetery, 2677 Hwy 34	Religious	Building/Site	Front Gable Church	1950	Possibly Eligible (cemetery), A and D
5	Coweta	83 Handy Rd	Residential	Building	Central Hallway	c.1930	Possibly Eligible, C
6	Coweta	229 Sanders Davis Rd	Residential	Building	Gable-el	c.1920	Non-Eligible
7	Coweta	423 Sanders Davis Rd	Residential	Building	Central Hallway	1905	Non-Eligible
8	Coweta	247 Wynn Rd	Residential	Building	Bungalow	1935	Non-Eligible
9	Coweta	Dent Chapel AME Church and Cemetery, Hwy 34	Religious	Building/Site	Front Gable Church	1930	Possibly Eligible (cemetery), A and D
10	Heard	779 Joe Stephens Rd	Residential	Building	American Small House	c.1960	Non-Eligible
11	Heard	1865 George Brown Rd	Residential	Building	No recognized type	c.1940	Non-Eligible
12	Coweta	Hawk Farm, 192 Hawk Rd	Agricultural	Landscape	Central Hallway	1925	Possibly Eligible, A and C
13	Coweta	Dancin' Horse Farm, 617 Thomas Powers Rd	Agricultural	Landscape	Plantation Plain	c.1900	Possibly Eligible, A and C
14	Coweta	646 Thomas Powers Rd	Residential	Building	American Small House	1960	Non-Eligible
15	Coweta	678 Thomas Powers Rd	Residential	Building	Bungalow	1950	Non-Eligible
16	Coweta	248 Midway Rd	Residential	Building	Hall-Parlor	1947	Non-Eligible
17	Coweta	467 Midway Rd	Residential	Building	Central Hallway	1900	Possibly Eligible, C
18	Coweta	491 Midway Rd	Residential	Building	Ranch House	1960	Non-Eligible
19	Coweta	William Calloway House, 145 Will Calloway Rd	Residential	Building	Gabeled Wing	1919	Possibly Eligible, A and C
20	Coweta	1360 Thomas Powers Rd	Residential	Building	Central Hallway	1910	Non-Eligible
21	Coweta	819 Martin Girl Rd, on to Brown Grant Farm	Residential	Building	No recognized type	1900	Non-Eligible

Resource ID	County	Property Name/Address	Resource Use	Resource Type	Building Type	Construction Date	NRHP Eligibility
22	Coweta	North Newnan General Mercantile, 263 Hewlett S. Rd	Commercial	Building	Community Store	c.1900	Possibly Eligible, A and C
23	Coweta	Elim Baptist Church and Cemetery, 1529 Handy Rd	Religious	Building/Site	Front Gable Church	1950	Possibly Eligible (cemetery, A and D
24	Coweta	1347 Handy Rd	Residential	Building	Central Hallway	1910	Non-Eligible

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APPENDIX A. DATA FORMS AND LOCATION MAPS

Resource ID 1 **Address** 112 Dr Bruce Jackson Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1940
House Type	No recognized type
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Synthetic Siding
Foundation	Concrete Block
Porch	Entry
Windows	Double hung sash
Chimney	Not Visible
Alterations	Material Changes

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	C

Resource ID 2 **Address** 124 Dr Bruce Jackson Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1938
House Type	Bungalow
Barn Type	Single Crib
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Synthetic Siding
Foundation	Concrete Block
Porch	Other
Windows	Double hung sash
Chimney	Brick
Alterations	Material Changes

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	C

Resource ID 3 **Address** 546 Dr Bruce Jackson Rd

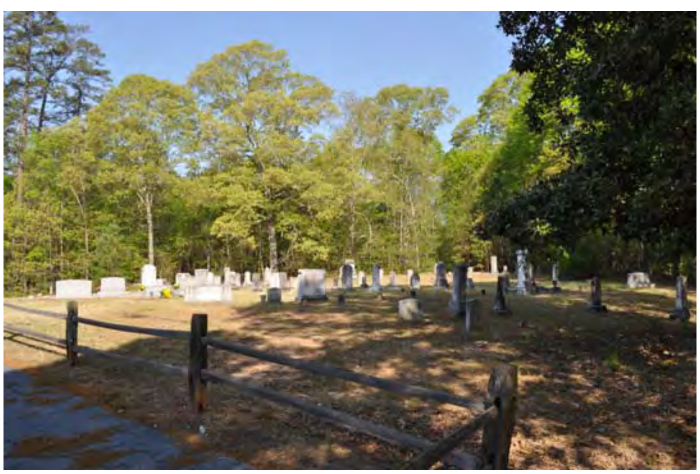
FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	c.1900
House Type	Side-Gable Cottage
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Brick Pier
Porch	Other
Windows	Double hung sash
Chimney	Brick
Alterations	None

Preliminary Assessment	Non-Eligible
Status - Listed	No
Applicable Criteria	

Resource ID 4 **Address** Emory Chapel and Cemetery, 2677 Hwy 34

FIPS ID 77 **County** Coweta



Resource Type	Building
Resource Use	Religious
Date of Construction	1950
House Type	
Barn Type	
Church Type	Front Gable
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Synthetic Siding
Foundation	Not visible
Porch	Partial
Windows	Double hung sash
Chimney	None
Alterations	Material Changes

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A,D

Resource ID 5 **Address** 83 Handy Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	c.1930
House Type	Central Hallway
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Synthetic Siding
Foundation	Concrete Block
Porch	Full
Windows	Double hung sash
Chimney	Brick and Stone
Alterations	Material Changes

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	C

Resource ID 6 **Address** 229 Sanders Davis Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	c.1920
House Type	Gable-el
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Other
Exterior Cladding	Weatherboard
Foundation	Stone
Porch	Other
Windows	Double hung sash
Chimney	Brick
Alterations	Additions

Preliminary Assessment	Non-Eligible
Status - Listed	No
Applicable Criteria	

Resource ID 7 **Address** 423 Sanders Davis Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1905
House Type	Central Hallway
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Synthetic Siding
Foundation	Brick Pier with Fill
Porch	Full
Windows	Double hung sash
Chimney	Brick
Alterations	Additions

Preliminary Assessment Non-Eligible

Status - Listed No

Applicable Criteria

Resource ID 8 **Address** 247 Wynn Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1935
House Type	Bungalow
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Hip
Exterior Cladding	Weatherboard
Foundation	Concrete Block
Porch	Full
Windows	Double hung sash
Chimney	None
Alterations	None

Preliminary Assessment Non-Eligible

Status - Listed No

Applicable Criteria

Resource ID 9 **Address** Dent Chapel AME Church and Cemetery, Hwy 34

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Religious
Date of Construction	1930
House Type	
Barn Type	
Church Type	Front Gable
Commercial Type	
School Type	
Structural System	Masonry
Style	No academic style
Roof	Gable
Exterior Cladding	Brick
Foundation	Slab
Porch	Other
Windows	Double hung sash
Chimney	None
Alterations	None

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A,D

Resource ID 10 **Address** 779 Joe Stphens Rd

FIPS ID 149 **County** Heard

Resource Type	Building
Resource Use	Residential
Date of Construction	c.1960
House Type	American Small House
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Other
Foundation	Not visible
Porch	Entry
Windows	Double hung sash
Chimney	None
Alterations	None

Preliminary Assessment	Non-Eligible
Status - Listed	No
Applicable Criteria	

Resource ID 11 **Address** 1865 George Brown Rd

FIPS ID 149 **County** Heard

Resource Type	Building
Resource Use	Residential
Date of Construction	c.1940
House Type	No recognized type
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Brick Pier
Porch	Entry
Windows	Double hung sash
Chimney	None
Alterations	None

Preliminary Assessment	Non-Eligible
Status - Listed	No
Applicable Criteria	

Resource ID 12 **Address** Hawk Farm, 192 Hawk Rd

FIPS ID 77 **County** Coweta

Resource Type	Landscape
Resource Use	Agricultural
Date of Construction	1925
House Type	Central Hallway
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Asbestos Shingle
Foundation	Block Pier with Fill
Porch	Other
Windows	Double hung sash
Chimney	None
Alterations	Additions

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A,C

Resource ID 13 **Address** Dancin' Horse Farm, 617 Thomas Powers Rd

FIPS ID 77 **County** Coweta

Resource Type	Landscape
Resource Use	Agricultural
Date of Construction	c.1900
House Type	Plantation Plain
Barn Type	Transverse Crib
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Synthetic Siding
Foundation	Brick Pier with Fill
Porch	Full
Windows	Double hung sash
Chimney	Not Visible
Alterations	Material Changes

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A,C

Resource ID 14 **Address** 646 Thomas Powers Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1960
House Type	American Small House
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Asbestos Shingle
Foundation	Concrete Block
Porch	Entry
Windows	Double hung sash
Chimney	None
Alterations	None

Preliminary Assessment	Non-Eligible
Status - Listed	No
Applicable Criteria	

Resource ID 15 **Address** 678 Thomas Powers Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1950
House Type	Bungalow
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Shiplap
Foundation	Concrete Block
Porch	Partial
Windows	Double hung sash
Chimney	None
Alterations	None

Preliminary Assessment Non-Eligible

Status - Listed No

Applicable Criteria

Resource ID 16 **Address** 248 Midway Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1947
House Type	Hall-Parlor
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Synthetic Siding
Foundation	Concrete Block
Porch	Entry
Windows	Double hung sash
Chimney	Not Visible
Alterations	None

Preliminary Assessment Non-Eligible

Status - Listed No

Applicable Criteria

Resource ID 17 **Address** 467 Midway Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1900
House Type	Central Hallway
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Stucco
Foundation	Not visible
Porch	Full
Windows	Double hung sash
Chimney	Brick
Alterations	None

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	C

Resource ID 18 **Address** 491 Midway Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1960
House Type	Ranch House
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Shiplap
Foundation	Concrete Block
Porch	Partial
Windows	Double hung sash
Chimney	None
Alterations	None

Preliminary Assessment	Non-Eligible
Status - Listed	No
Applicable Criteria	

Resource ID 19 **Address** William Calloway House, 145 Will Calloway Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1919
House Type	Gabeled Wing
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Stucco
Foundation	Not visible
Porch	Full
Windows	Double hung sash
Chimney	Brick
Alterations	None

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A,C

Resource ID 20 **Address** 1360 Thomas Powers Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1910
House Type	Central Hallway
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Asbestos Shingle
Foundation	Concrete Block
Porch	Partial
Windows	Double hung sash
Chimney	Brick
Alterations	None

Preliminary Assessment	Non-Eligible
Status - Listed	No
Applicable Criteria	

Resource ID	21	**Address**	819 Martin Girl Rd, on to Brown Grant Farm
FIPS ID	77	**County**	Coweta

Preliminary Assessment	Non-Eligible
Status - Listed	No
Applicable Criteria	

Resource Type	Building
Resource Use	Residential
Date of Construction	1900
House Type	No recognized type
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Brick Pier
Porch	Full
Windows	Double hung sash
Chimney	None
Alterations	Material Changes

Resource ID	22	**Address**	North Newnan General Mercantile, 263 Hewlett S. Rd
FIPS ID	77	**County**	Coweta

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A,C

Resource Type	Building
Resource Use	Commercial
Date of Construction	c.1900
House Type	
Barn Type	
Church Type	
Commercial Type	Community Store
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Stone Pier
Porch	Other
Windows	Windows boarded
Chimney	Brick
Alterations	None

Resource ID	23	**Address**	Elim Baptist Church and Cemetery, 1529 Handy Rd
FIPS ID	77	**County**	Coweta

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A,D

Resource Type	Building
Resource Use	Religious
Date of Construction	1950
House Type	
Barn Type	
Church Type	Front Gable
Commercial Type	
School Type	
Structural System	Masonry
Style	No academic style
Roof	Gable
Exterior Cladding	Brick
Foundation	Brick
Porch	Entry
Windows	Double hung sash
Chimney	Brick
Alterations	None

Resource ID	24	**Address**	1347 Handy Rd
FIPS ID	77	**County**	Coweta

Preliminary Assessment	Non-Eligible
Status - Listed	No
Applicable Criteria	

Resource Type	Building
Resource Use	Residential
Date of Construction	1910
House Type	Central Hallway
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Concrete Block Pier
Porch	Full
Windows	Double hung sash
Chimney	Brick
Alterations	Additions

Resource ID 16155 **Address** Brown Grant Farm, 819 Martin Girl Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1832
House Type	Plantation Plain
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Brick
Porch	Full
Windows	Double hung sash
Chimney	Brick
Alterations	None

Preliminary Assessment	Eligible
Status - Listed	No
Applicable Criteria	A,C

Resource ID 16156 **Address** Starr House, 176 Hewlett S. Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Agricultural
Date of Construction	1900
House Type	Central Hallway
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Not visible
Porch	Full
Windows	Double hung sash
Chimney	Brick
Alterations	Material Changes

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A,C

Resource ID 16157 **Address** E side of Hewitt S. Rd next to 231

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1900
House Type	Gable-el
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Other
Foundation	Not visible
Porch	Partial
Windows	Windows gone
Chimney	Brick
Alterations	None

Preliminary Assessment Non-Eligible

Status - Listed No

Applicable Criteria

Resource ID 16161 **Address** Sara Cash House, 837 Thomas Powers Rd

FIPS ID 77 **County** Coweta

Resource Type	Landscape
Resource Use	Agricultural
Date of Construction	c.1900
House Type	Central Hallway
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Brick Pier with Fill
Porch	Full
Windows	Double hung sash
Chimney	Brick
Alterations	Additions

Preliminary Assessment Possibly Eligible

Status - Listed No

Applicable Criteria A,C

Resource ID 16162 **Address** Kidd Farm, 134 Robert Stephens Rd

FIPS ID 77 **County** Coweta

Resource Type	Landscape
Resource Use	Agricultural
Date of Construction	1912
House Type	Pyramid Cottage
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Hip
Exterior Cladding	Weatherboard
Foundation	Not visible
Porch	Full
Windows	Double hung sash
Chimney	Brick
Alterations	Additions

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A,C

Resource ID 16163 **Address** Midway School, Robert Stephens Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Public/Institutional
Date of Construction	c.1900
House Type	
Barn Type	
Church Type	
Commercial Type	
School Type	One Room
Structural System	Frame
Style	No academic style
Roof	Other
Exterior Cladding	Weatherboard
Foundation	Brick Pier
Porch	Other
Windows	Windows gone
Chimney	Not Visible
Alterations	None

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A

Resource ID 16164 **Address** 491 Powers Rd

FIPS ID 77 **County** Coweta

Preliminary Assessment Possibly Eligible
Status - Listed No
Applicable Criteria A,C

Resource Type	Landscape
Resource Use	Residential
Date of Construction	1867
House Type	Plantation Plain
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Not visible
Porch	Full
Windows	Double hung sash
Chimney	Brick
Alterations	Material Changes

Resource ID 16174 **Address** 4335 Hwy 34

FIPS ID 77 **County** Coweta

Preliminary Assessment Possibly Eligible
Status - Listed No
Applicable Criteria A,C

Resource Type	Landscape
Resource Use	Residential
Date of Construction	1885
House Type	Gable-el
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Other
Exterior Cladding	Weatherboard
Foundation	Brick Pier with Fill
Porch	Partial
Windows	Double hung sash
Chimney	Brick
Alterations	Additions

Resource ID 16178 **Address** 192 Hoot Owl Hollow

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1900
House Type	Central Hallway
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Synthetic Siding
Foundation	Not visible
Porch	Full
Windows	Double hung sash
Chimney	None
Alterations	Material Changes

Preliminary Assessment Non-Eligible

Status - Listed No

Applicable Criteria

Resource ID 16179 **Address** 287 Hoot Owl Hollow

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1930
House Type	Bungalow
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Synthetic Siding
Foundation	Not visible
Porch	Full
Windows	Double hung sash
Chimney	Not Visible
Alterations	Additions

Preliminary Assessment Non-Eligible

Status - Listed No

Applicable Criteria

Resource ID 16180 **Address** 145 Boy Scout Rd

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1971
House Type	No recognized type
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Other
Foundation	Concrete Block
Porch	Other
Windows	Double hung sash
Chimney	None
Alterations	None

Preliminary Assessment Non-Eligible
Status - Listed No
Applicable Criteria

Resource ID 16669 **Address** 115 Dr Bruce Jackson

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1900
House Type	I-House
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	Federal
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Block Pier with Fill
Porch	Entry
Windows	Double hung sash
Chimney	Brick
Alterations	Additions

Preliminary Assessment Possibly Eligible
Status - Listed No
Applicable Criteria A,C

Resource ID 16670 **Address** 4330 Hwy 34

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1938
House Type	Bungalow
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Brick
Porch	Other
Windows	Double hung sash
Chimney	Brick
Alterations	None

Preliminary Assessment Non-Eligible

Status - Listed No

Applicable Criteria

Resource ID 16671; 81619 **Address** Henderson-Orr House/Powers House/Moss Oak Plantation, Powers Rd, SW Corner of Stallings Junction

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1790
House Type	I-House
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	Federal
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Brick
Porch	Two-story
Windows	Double hung sash
Chimney	Brick
Alterations	None

Preliminary Assessment Listed

Status - Listed Yes

Applicable Criteria A,C

Resource ID	36998	**Address**	Corner Joe Stephens and George Brown Roads
FIPS ID	149	**County**	Heard

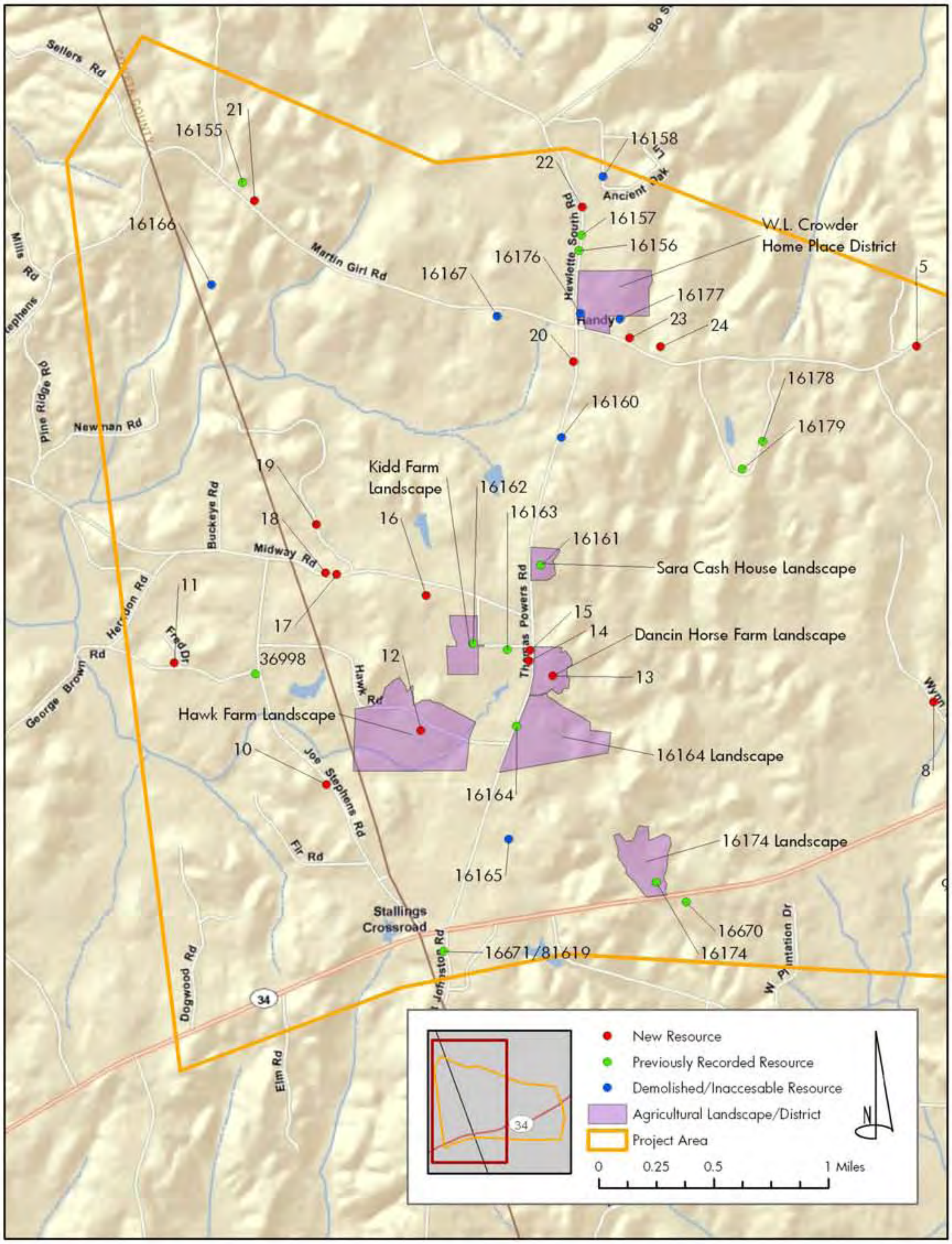
Resource Type	Building
Resource Use	Residential
Date of Construction	c.1920
House Type	New South Cottage
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Multiple Hip
Exterior Cladding	Weatherboard
Foundation	Brick Pier with Fill
Porch	Full
Windows	Double hung sash
Chimney	Not Visible
Alterations	Material Changes

Preliminary Assessment	Non-Eligible
Status - Listed	No
Applicable Criteria	

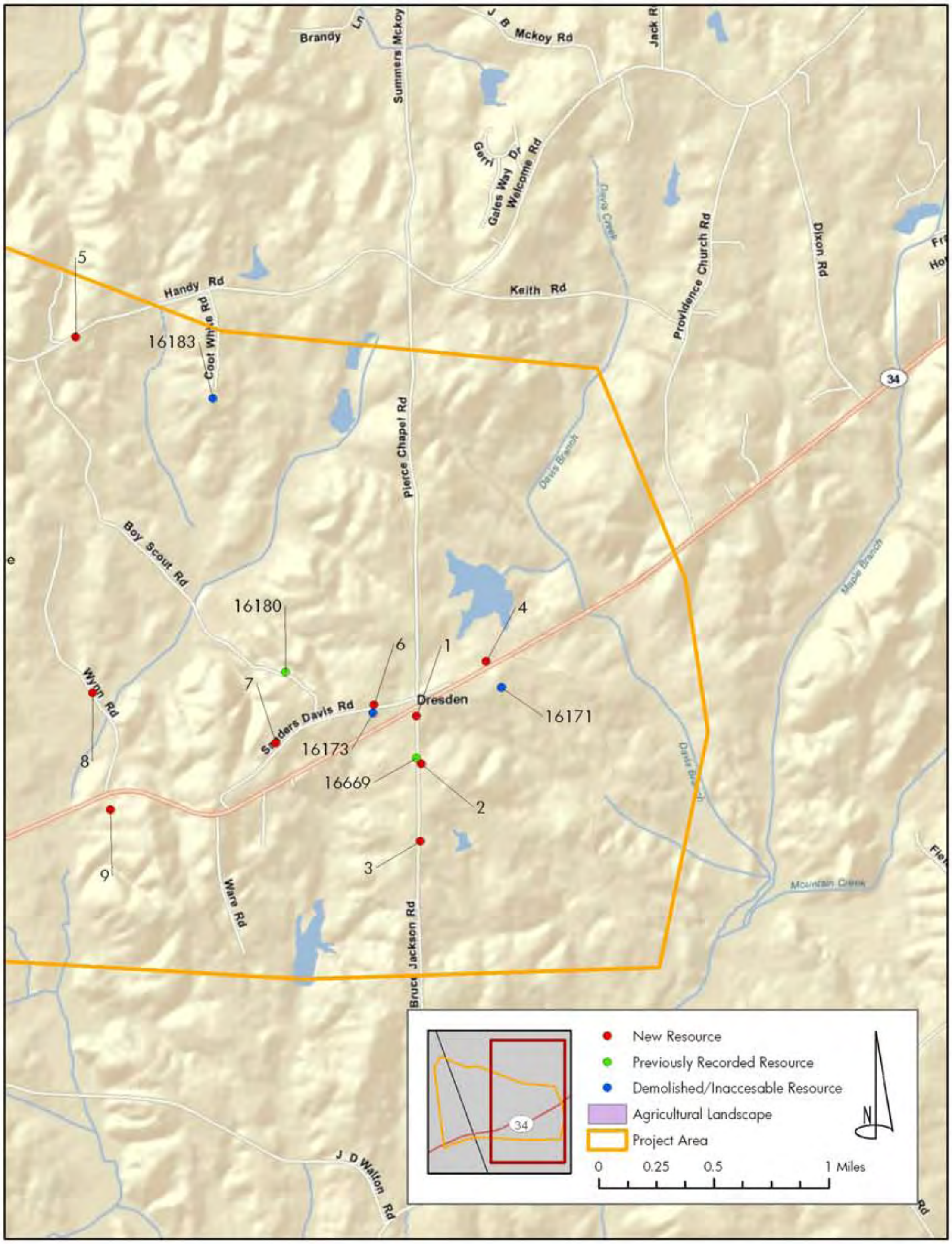
Resource ID	16175; 80800	**Address**	William Leonard Crowder Home Place, 1615 Handy Road
FIPS ID	77	**County**	Coweta

Resource Type	Building
Resource Use	Residential
Date of Construction	1880
House Type	Gabled Wing
Barn Type	unknown
Church Type	N/A
Commercial Type	N/A
School Type	N/A
Structural System	Frame
Style	Folk Victorian
Roof	Cross-gable
Exterior Cladding	Weatherboard
Foundation	Brick
Porch	Partial
Windows	Double hung sash
Chimney	Brick
Alterations	None

Preliminary Assessment	Listed
Status - Listed	Yes
Applicable Criteria	A,C



21
16155
16158
22
16157
16156
16166
W.L. Crowder
Home Place District
16176
16167
16177
23
24
5
20
16178
16160
16179
19
Kidd Farm
Landscape
16162
16163
16
18
16161
Sara Cash House Landscape
11
17
15
14
Dancin Horse Farm Landscape
12
36998
13
Hawk Farm Landscape
10
16164 Landscape
8
16164
16174 Landscape
16165
Stallings
Crossroad
16670
16671/81619
16174
Sellers Rd
Martin Girl Rd
Mills Rd
Pine Ridge Rd
Newnan Rd
Buckeye Rd
Midway Rd
Herndon Rd
Fred Dr
George Brown Rd
Hawk Rd
Joe Stephens Rd
Fir Rd
Dogwood Rd
Elm Rd
Thomas Powers Rd
Hewlette South Rd
Ancient Oak
Handy
Johnston Rd
W. Plantation Dr
34
New Resource
Previously Recorded Resource
Demolished/Inaccesable Resource
Agricultural Landscape/District
Project Area
0
0.25
0.5
1 Miles
N



Brandy Ln
Summers Mckoy
J B Mckoy Rd
Jack Rd
Gerri Dr
Gales Way Dr
Welcome Rd
Davis Creek
Providence Church Rd
Dixon Rd
Handy Rd
Keith Rd
Coot White Rd
Pierce Chapel Rd
Davis Branch
34
Boy Scout Rd
Maple Branch
Wynn Rd
Sanders Davis Rd
Dresden
Ware Rd
Mountain Creek
Bruce Jackson Rd
J D Walton Rd
1
2
3
4
5
6
7
8
9
16183
16180
16173
16669
16171
New Resource
Previously Recorded Resource
Demolished/Inaccesable Resource
Agricultural Landscape
Project Area
0
0.25
0.5
1 Miles
N

Phase II Study, Proposed Dresden-Heard 500 kV Transmission Line

Coweta and Heard Counties, Georgia

New South Associates, Inc.

Phase II Study, Proposed Dresden-Heard 500 kV Transmission Line

Coweta and Heard Counties, Georgia

Report submitted to:

Georgia Transmission Corporation • 2100 East Exchange Place • Tucker, Georgia 30084

Report prepared by:

New South Associates • 6150 East Ponce de Leon Avenue • Stone Mountain, Georgia 30083

Mary Beth Reed

Mary Beth Reed– Principal Investigator

Jackie H. Tyson – Historian and Author

September 17, 2012 • Final Report

New South Associates Technical Report 2092

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INTRODUCTION

In November 2011, New South Associates conducted a Phase II Historic Resources Survey of the proposed Dresden-Heard 500 kV Transmission Line in Coweta and Heard counties. The purpose of the Phase II survey was to identify historic properties located in the proposed transmission line's area of potential effect (APE) and to evaluate its effects on those properties. The initial Phase I survey, which identified historic properties in a larger study area, was conducted in April 2010. The initial study area encompassed roughly six miles east-west, and three miles north-south in the western extreme of Coweta County and in an adjoining strip of Heard County. Based on the results of the Phase I survey, a preferred route for the transmission line was selected. The overall project area is rural, with some residential development along the larger roads. The largest of these roads is State Road (SR) 34, located along the southern edge of the project area. Other main roads include: Thomas-Powers, Martin Girl, Handy, Midway, Boy Scout, and Dr. Bruce Jackson. Three crossroads communities form a triangle within the project area: Handy, Dresden, and Stallings Crossroads (also known as Powers Crossroads). To the west of these communities is a large north-south transmission line, located in Heard County along the western edge of the project area. Two transmission lines, a 230 kV and a 500 kV, are also located on the east side of the initial study area (Figures 1 and 2).

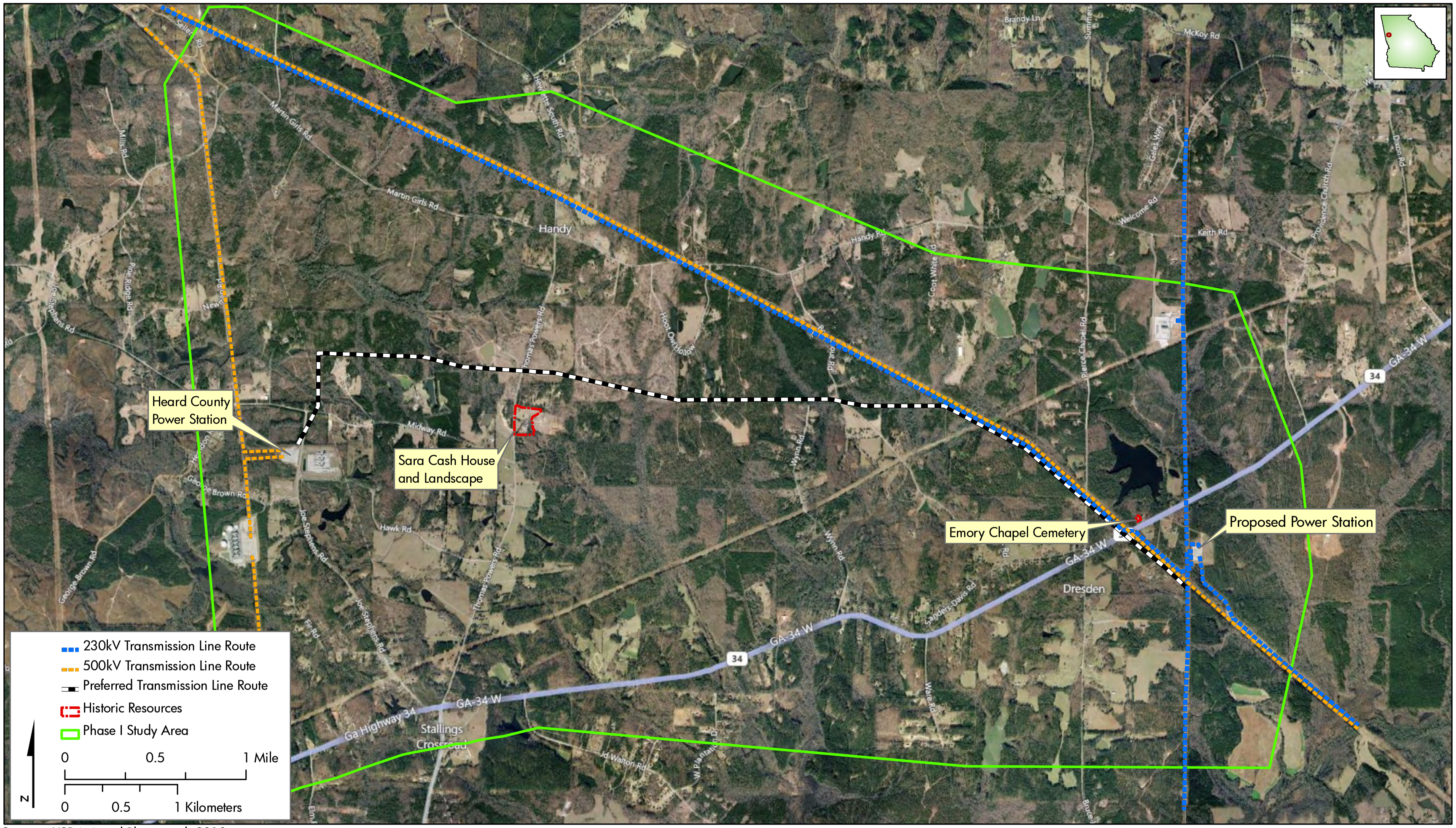
The 2010 report, along with an addendum report, identified 49 resources (Appendix A) (Reed et al. 2010; Sullivan 2010). Two of these, the William Leonard Crowder Home Place (Resource ID 16175/80800), and the Henderson-Orr House/Powers House/Moss Oak Plantation (Resource ID 16671/81619), are listed in the National Register of Historic Places (NRHP). Neither of these structures are located within the proposed transmission line's APE. Of the remaining resources, two were recommended eligible for the NRHP and 18 as possibly eligible. Only two of the eligible or possibly eligible properties were identified during the Phase II fieldwork as located in the proposed project's APE. These are the Emory Chapel Cemetery and the Sarah Cash House and Landscape.

PROJECT DESCRIPTION

The proposed route for the Dresden-Heard 500kV transmission line is approximately six miles in length and runs between the proposed Dresden Substation, located southeast of SR 34 on the east side of the project area, and the Heard County Power Station on the west side of the project area at Hawk Road and Joe Stephens Road (Figure 1). From the Dresden Substation, the proposed line parallels the existing 230 kV and 500 kV transmission lines for approximately 1.7 miles. From a point just northeast of Boy Scout Road, the proposed line diverges from the existing lines and continues west, crossing Boy Scout Road and continuing through a densely wooded area. The proposed line also crosses Thomas Powers Road and runs past a dead end residential road named Will Calloway Road, after which it turns south to terminate at the Heard County Power Station.

FINDINGS AND RECOMMENDATIONS

Because the Phase I report was completed a year ago, background research was conducted to ascertain if any properties have been added to the list of previously identified resources within the proposed transmission line's APE during the last year. Background research was performed through a search of the Georgia's Natural, Archaeological, and Historic Resource GIS (NAHRGIS) database to identify any NRHP-listed properties or previously identified resources. The newest lists



Source: USDA Aerial Photograph 2010

Figure 1.
Project Plan Map

Figure 2.
View of Existing 230 kV and 500 kV Transmission Lines

of NRHP properties and Georgia Centennial Farms were consulted as well. This research confirmed that no newly identified properties are located within the proposed transmission line's APE.

Fieldwork during the Phase II evaluation included driving the proposed transmission line corridor at all points where the proposed route is accessible. As a portion of the proposed line parallels two existing lines, it proved useful to compare site lines and vistas from the existing lines when judging viewshed range for the proposed line. The area is hilly, and is characterized by densely forested areas interspersed with cleared pastureland. The forested areas are made up of southern yellow pine trees and some deciduous trees; the mixture of trees provides visual buffering even in the fall months, which was the time of this Phase II survey. The eligible and listed properties in the previous larger study area for the Phase I study were visited to determine if they were located in the APE. During the overview of the proposed corridor, it was determined that two of the NRHP eligible properties are located in the project's APE: Emory Chapel Cemetery and the Sara Cash House and Landscape.

The Emory Chapel Cemetery (Resource ID 4) is located on the northwest side of SR 34, near its intersection with Pierce Chapel Road. It is a cemetery with burials dating from the late nineteenth century to the present. During the Phase I survey, the recommendation was made that the cemetery is eligible, but the church building itself is not eligible. Within the area of the cemetery, the proposed 500 kV transmission line will run parallel to two existing transmission lines, a 230 kV line and a 500 kV line (Figure 3). The existing lines, located approximately 750 feet southwest of the cemetery, are visible from the historic cemetery when facing southwest (Figure 4a). A thick stand of woods is present on the west side of the cemetery, blocking any views of the transmission lines (Figure 4b). The proposed transmission line will be located on the far southwest-west side of the existing transmission lines, further away from the cemetery. It is highly unlikely the proposed transmission line will be visible from the cemetery due to this distance. Because of the presence of the two transmission lines and the wooded buffer, it appears the proposed 500 kV transmission line will have no adverse effect on the NRHP-eligible Emory Chapel Cemetery.

The Sara Cash House and Landscape (Resource ID 16161) is located south of the proposed line where it crosses Thomas Powers Road. This property includes a Central Hallway house that dates to circa 1900 and its surrounding agricultural fields, which are currently used for grazing horses. The proposed corridor is located approximately 1,000 feet north of the end of the property's associated pastureland and 1,500 feet north from the main house, which faces west towards Thomas Powers Road (Figure 5). The proposed line will be located on the other side of an approximately 700 foot wide stand of trees just beyond the horse pasture (Figure 6a-c). Due to the distance between the proposed transmission line and the Sara Cash House and Landscape, the thick stand of trees between the pasture and the proposed line, and the slightly sloping topography just north of the property, it appears the proposed transmission line will not be visible from the property. It is possible the tops of the transmission towers may be visible above the tree stand north of the property, but the effects would be very minimal. Therefore, it appears the proposed project will have no adverse effect on the NRHP-eligible Sara Cash House and Landscape.

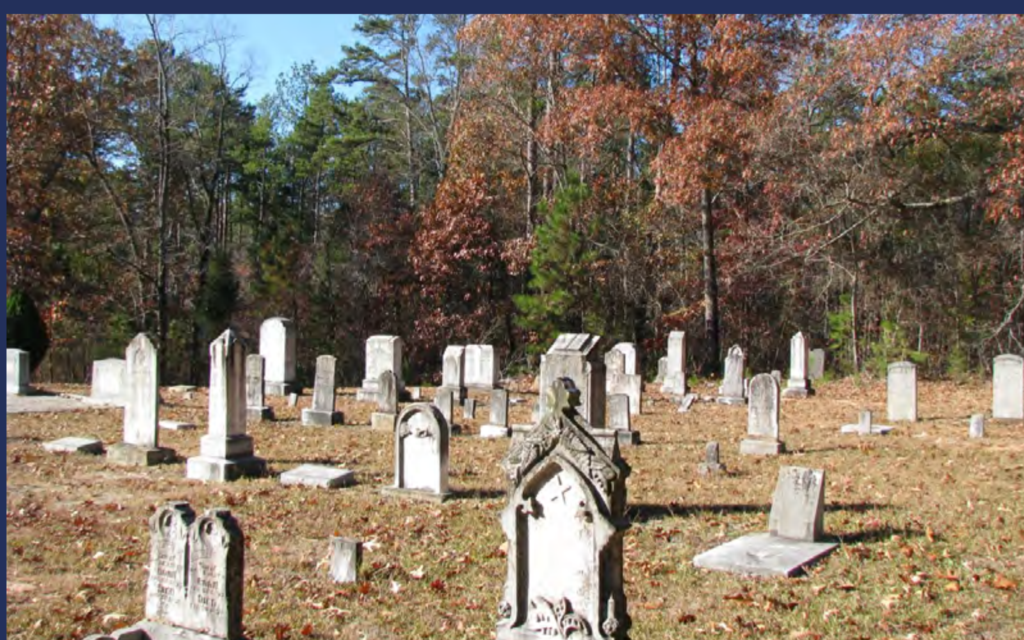
In conclusion, based on the results of the Phase II Historic Resource Survey, two resources considered eligible for listing in the National Register and located in the APE will not be adversely affected by the proposed transmission line.

Figure 3.
Photo Key and Locational Map, Emory Chapel Cemetery

Source: Bing Maps Aerial Photograph

Figure 4.
Views from Emory Chapel Cemetery to Existing Transmission Lines

A. View Southwest from Cemetery



B. View West from Cemetery

Figure 5.
Photo Key and Locational Map, Sarah Cash House and Landscape

Source: USDA Aerial Photograph 2010

Figure 6.
Views from Sara Cash House and Landscape to Proposed Line

A.
View North

B.
View Northeast

C.
View South from Proposed Transmission Line to Property

REFERENCES CITED

Reed, Mary Beth; Christina Olson; and Mark Swanson

2010 Phase I Historic Structures Survey Dresden-Heard County 500KV Transmission Line, Coweta and Heard Counties, Georgia. Prepared for Georgia Transmission Corporation by New South Associates. Inc.

Sullivan, Patrick

2010 Phase I Historic Resources Survey Addendum, Proposed Dresden-Heard County 500 kV Transmission Line, Coweta and Heard Counties, Georgia. Prepared for Georgia Transmission Corporation by New South Associates. Inc.

APPENDIX A: DATA FORMS AND LOCATION MAPS

Resource ID 4 **Address** Emory Chapel and Cemetery, 2677 Hwy 34

FIPS ID 77 **County** Coweta

Resource Type	Building
Resource Use	Religious
Date of Construction	1950
House Type	
Barn Type	
Church Type	Front Gable
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Synthetic Siding
Foundation	Not visible
Porch	Partial
Windows	Double hung sash
Chimney	None
Alterations	Material Changes

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A,D

Resource ID 16161 **Address** Sara Cash House, 837 Thomas Powers Rd

FIPS ID 77 **County** Coweta

Resource Type	Landscape
Resource Use	Agricultural
Date of Construction	c.1900
House Type	Central Hallway
Barn Type	
Church Type	
Commercial Type	
School Type	
Structural System	Frame
Style	No academic style
Roof	Gable
Exterior Cladding	Weatherboard
Foundation	Brick Pier with Fill
Porch	Full
Windows	Double hung sash
Chimney	Brick
Alterations	Additions

Preliminary Assessment	Possibly Eligible
Status - Listed	No
Applicable Criteria	A,C

Results of the Environmental Justice Survey
Dresden – Heard County 500 kV Transmission Line

An Environmental Justice (EJ) Survey was conducted for the proposed Dresden – Heard County 500 kV Transmission Line study area in Coweta and Heard Counties, Georgia. The survey was conducted in accordance with GTC's *Environmental Justice Guidelines* and *Methodology for Analyzing Potential Environmental Justice Areas of Concern*. The GTC EJ documents, based upon methodology developed by EPA Region IV, explain the fundamental details of this analysis. The EPA methodology is based on Census 1990. At that time, Georgia's minority population was approximately 30.0%, and the low-income population was approximately 14.7%. The minority and low-income population percentages in Georgia have changed during the decades leading up to Census 2010. The 2010 Census (SF 1) shows that Georgia's minority population has now increased to 44.1%, and the low-income population has increased to 15%. For the 2010 Census, low-income data will be released through the American Community Survey (ACS), which updates every year and is now current through the end of 2009 at the Census tract level.[1] EPA Region IV did not develop new thresholds for the 2000 Census numbers and has not yet done so for 2010. At this time, GTC is continuing to use the 1990 EPA thresholds for environmental justice evaluations. Both the minority and low-income analyses will be more inclusive than would be required if the EPA thresholds were adjusted to account for the changes in population. The results of the survey, using 2010 Census data for the minority analysis and 2009 ACS data for the low-income analysis, are detailed below.

Race: Minority populations were analyzed at the Census 2010 block level. The minority population was defined by grouping together all non-white races, Hispanics, and those whose race is described as the combination of two or more races. A block is considered to be a potential EJ area if the minority population percentage of the block is greater than the percentage specified as the EPA minority threshold (35.72% of the total population).

The proposed transmission line intersects a total of 18 Census blocks (Figure 1), 15 in Coweta County and 3 in Heard County. Each entire block was evaluated for EJ purposes, even though the proposed transmission line affects only a small portion of each Census block. A total of 11 study area blocks have minority population percentages below the EPA threshold and 4 blocks have no population; these are not considered to be potential EJ areas. Three (3) blocks have minority population percentages above the EPA threshold and are considered to be potential EJ areas. All of the high minority blocks are in Coweta County.

Income: Low-income populations were analyzed with ACS data at the Census tract level. The low-income population was defined as those individuals living below the United States poverty levels for 2009. A Census tract is considered to be a potential EJ area if the low-income population percentage of the tract is greater than the percentage specified as the EPA low-income threshold (17.58% of the total population).

The proposed transmission line intersects a total of two (2) Census tracts (Figure 2), one in each of the project area counties. Each entire tract was evaluated for EJ purposes, even though the proposed transmission line affects only a small portion of each tract. The Heard County tract is

[1] The ACS is current through 2010 for larger area geographies, but these larger areas are not appropriate for this analysis.

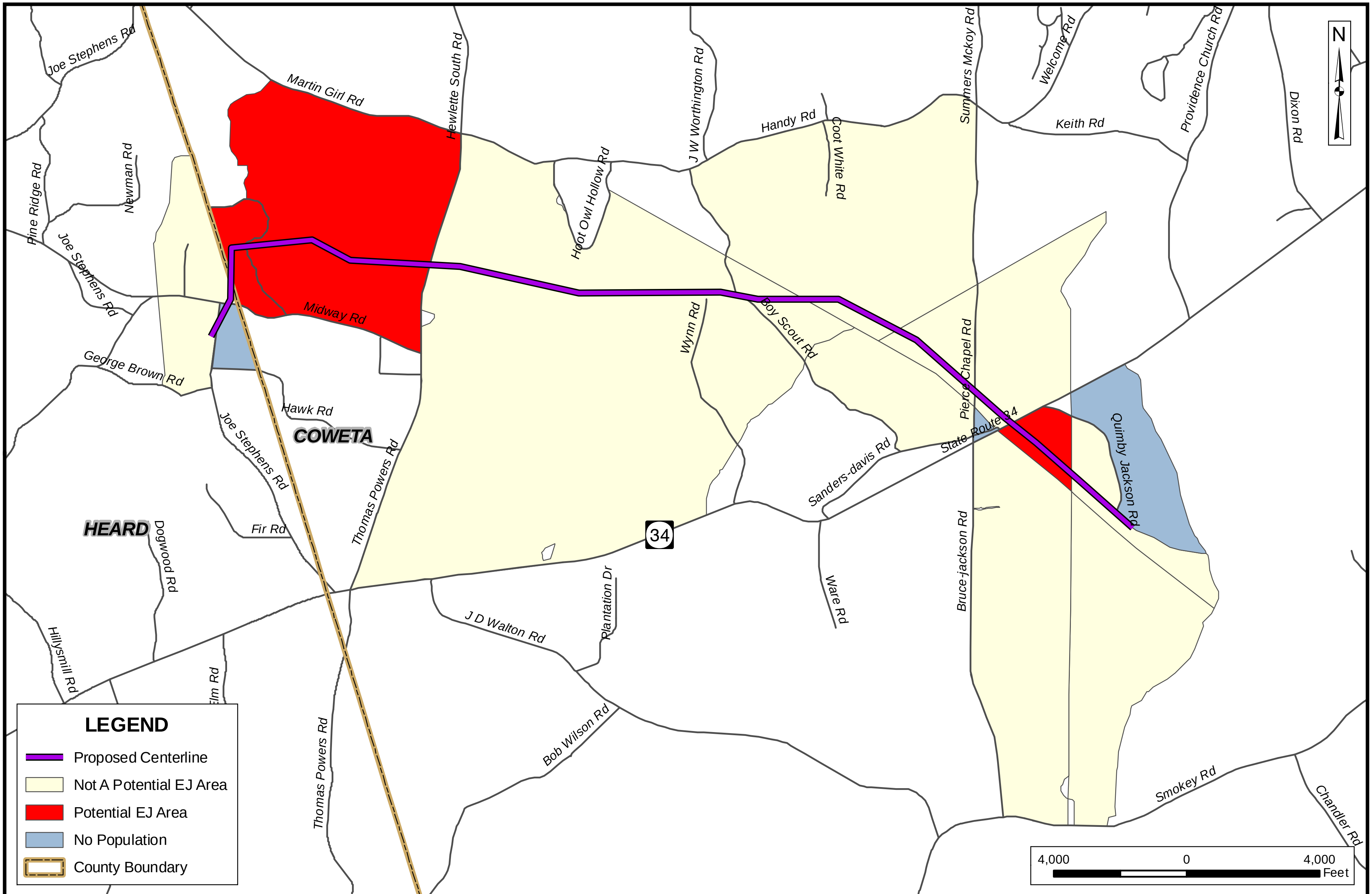
above the EPA threshold and is considered to be potential EJ area; the Coweta County tract is below the EPA threshold and is not considered to be a potential EJ area.

Conclusion: The methodology utilized for this study is consistent with guidelines developed by EPA Region IV. The EPA guidelines are described fully in the GTC documents noted above. A review of the proposed Dresden – Heard County 500 kV Transmission Line project area found potential environmental justice areas for both minority populations and low-income populations.

The proposed transmission line would originate at the Dresden Substation in Coweta County, Georgia and terminate at the Heard Substation in Heard County, Georgia. From the existing Dresden Substation, the proposed transmission line corridor will extend parallel to the existing Georgia Power O'Hara – Plant Wansley 500 kV Transmission Line right-of-way for approximately two miles in a northwest direction. The alignment will then turn in a west direction and traverse cross-country for approximately three miles, crossing Boy Scout Road, Thomas Powers Road, and Will Calloway Road before turning south near the Coweta/ Heard County line. From this location, the project will traverse south for approximately 0.5 miles to the existing Heard County Substation located along Joe Stephens Road.

The project area is primarily comprised of lower density rural development and forested areas. A review of aerial photography (2010 NAIP) indicates that the homes within this area are widely-scattered. One high minority block is located along the existing transmission line right-of-way, in the area of State Route 34 and Quimby Jackson Road. This block contains several structures which appear to be residential in nature, and one of these structures is situated less than 50 feet from the proposed line. The two other high minority blocks are located between Thomas Powers Road and the Heard County line. Several homes are located on the west side of Thomas Powers Road, near the crossing of the proposed line. Two residential structures are located within 200 feet of the proposed line in this high minority block. In regard to low-income populations, there are no residential structures in close proximity to the proposed line within the single low-income Census tract in the project area.

In conclusion, some project area blocks and tracts are identified by the most current Census data as potential areas of EJ impact for minority and low-income populations. It is possible that additional smaller areas of minority and low-income populations are present in the study area but masked by the larger Census geography. This may particularly apply to low-income populations, because the tracts are large in terms of population, cover large land areas, and extend well beyond the proposed transmission line area. For example, several homes are located along the proposed line in Coweta County, and some of them could belong to low-income families even though the Census tract data does not indicate so. GTC should conduct field surveys and provide public notification as soon as possible in order to avoid potential EJ impacts from the proposed transmission line route.



Georgia Transmission

JACOBS

Dresden-Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Environmental Justice Analysis
Minority Populations

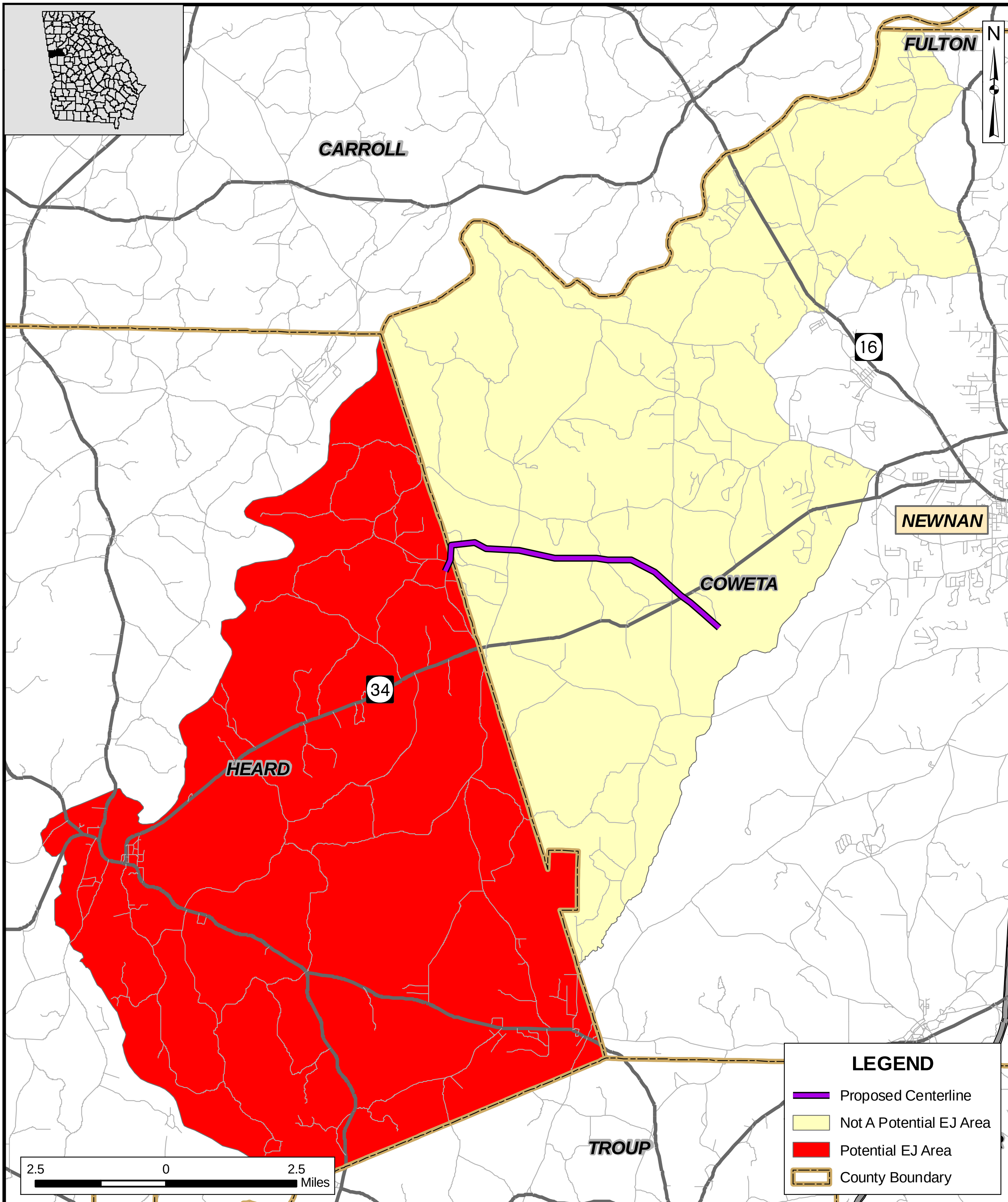
Date: Nov. 2011

Scale: 1" = 4,000'

Proj. No.:

Figure 1

COWETA AND HEARD COUNTIES



Georgia Transmission

JACOBS

Dresden-Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Environmental Justice Analysis
Low Income Populations

Date:	Nov. 2011
Scale:	1" = 2.5 mi
Proj. No.:	

Figure 2

Cumulative Effects Report

Dresden – Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Prepared by:
Jacobs Engineering Group, Inc.

Prepared for:
Georgia Transmission Corporation

February 2012

Introduction

This report addresses the potential cumulative effects associated with the construction and operation of the Dresden-Heard County 500 kV transmission line in Coweta and Heard Counties, Georgia. The Council on Environmental Quality's (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) define cumulative effects as:

> *the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions* (40 CFR § 1508.7).

The cumulative effects of an action may be undetectable when viewed individually in the context of direct or indirect impacts, but nevertheless when added to other actions can eventually lead to measurable environmental or social change. This report analyzes the cumulative effects of the combined construction and operation of the project in regard to other local and regional development and infrastructure projects as compared to baseline conditions.

To determine the potential for cumulative impacts, a literature review of relevant planning documents, including the 2006-2026 Coweta County Comprehensive Plan; Coweta County Greenway Master Plan, and Coweta Joint Comprehensive Transportation Plan, 2006-2026 Heard County Comprehensive Plan, and the 2005-2035 Georgia Statewide Transportation Plan Update have been examined. Additionally, telephone interviews were conducted with the planning department staff in Coweta County and Heard County (see **Appendix A,** Conversation Records). Other data for analysis included historic aerial photographs, county future land use planning maps, jurisdictional features maps, floodplain maps, historic resources, and environmental justice population maps.

Project Description

The proposed transmission line would originate at the Dresden Substation in Coweta County, Georgia and terminate at the Heard Substation in Heard County, Georgia. From the existing Dresden Substation, the proposed transmission line corridor will extend parallel to the existing Georgia Power O'Hara – Plant Wansley 500 kV Transmission Line right-of-way for approximately two miles in a northwest direction. The alignment will then turn in a west direction and traverse cross-country for approximately three miles, crossing Boy Scout Road, Thomas Powers Road, and Will Calloway Road before turning south near the Coweta/Heard County line. From this location, the project will traverse south for approximately 0.5 mile to the existing Heard County Substation located along Joe Stephens Road. The total project length is approximately 6.2 miles (see **Appendix B**, **Figure** 1, Project Location Map and **Figures 2** and **2a-2d**, Topographic Map).

Analysis of Cumulative Impacts

This report analyzes whether the Dresden-Heard County 500 kV Transmission Line Project, when combined with other proposed projects in the area, would result in either short-term and/or long-term cumulative environmental impacts. Short-term cumulative impacts are those related primarily to project construction. Long-term cumulative impacts are those related primarily to permanent features or operation of the project. In the project area, short-term cumulative construction impacts could include increased traffic, air emissions, and noise. Short-term construction-related impacts are not typically considered significant. Long-term cumulative impacts could include those related to visual and biological resources.

A. Short-Term Cumulative Impacts

The Dresden-Heard County 500 kV Transmission Line Project is currently scheduled for construction in Fall 2013. If scheduled for the same construction time frame, additional proposed development and/or roadway improvement in close proximity to the project could result in short-term cumulative impacts to traffic, noise, and air quality. Overlapping time schedules would place a concentrated construction effort in the area, which would require greater coordination between agencies to minimize impacts. The following plans have been identified as currently proposed future actions in the project area. See **Appendix B, Figures 1 and 2** for maps of these locations.

Description of Currently Proposed Future Actions

Discussions with Ms. Kathy Knowles, President of the Heard County Chamber of Commerce and Ms. Julie Pope, Director of the Development Authority in Heard County indicated that very little development is planned for the eastern section of the county in the vicinity of the proposed transmission line because there is no land to market near the Coweta County line. However, development is planned within the Franklin Industrial Park, located in the City of Franklin, approximately eight miles west of the project corridor. Plasti Paint, a manufacturing facility, is currently under construction and a water tower to service the park is planned in the near future (see **Appendix A**, **Conversation Records)**. These two developments are discussed in detail below.

- **Plasti Paint** is an industrial facility located in Franklin, Heard County, approximately eight miles east of the proposed transmission line. The facility is currently under construction and anticipated to be in operation by Summer 2012. The facility would be 50,000 square feet with the potential to expand by 20,000 square feet. The facility would manufacture powder coat paint for automotive parts, 80 percent of which would service Franklin Automotives. It is anticipated to have 50 employees with the potential to increase to ten more employees. Franklin Automotives, also located in the City of Franklin, is currently the largest employer in Heard County with approximately 435 employees.

  However, Plasti Paint construction is currently ongoing and would not conflict with transmission line construction; therefore, no cumulative impacts are anticipated as a result of the proposed Dresden-Heard County 500 kV Transmission Line Project.

- **Water Tower** is planned for construction in the near future to service the existing fire station and other facilities located in the Franklin Industrial Park.

Construction of the water tower is planned in the near future and therefore, would not likely conflict with project construction. Therefore, no cumulative impacts are anticipated as a result of the proposed Dresden-Heard County 500 kV Transmission Line Project.

Discussions with Ms. Ashlee of the Coweta County Planning and Zoning Department indicate that no development is planned for the western section of the county in the general vicinity of the proposed transmission line. However, additional phases of construction are planned in the Chattahoochee Bend State Park (see **Appendix A**, **Conversation Records**).

- **Chattahoochee Bend State Park** is located to the north of the proposed transmission line in the northwest corner of Coweta County. Phase I has been operational since July 2011. The park is one of Georgia's largest covering approximately 2,910 acres, according to the Georgia Department of Natural Resources (GDNR), providing visitors with what has been called a spectacular tract of protected wilderness area. Although most of the park has been left in its natural state, the new park offers amenities that include 25 RV campsites, 12 tent walk-in campsites, 10 tent pop-up campsites, 16 riverside platform campsites, four screened Adirondack campsites, two picnic shelters, and a visitors center. Other amenities include a boat ramp that provides easy access to the river, a playground and more than six miles of wooded trails for hiking and nature photography. Potential Phase 2 amenities could be established sometime in the future. That time frame is not set and will depend on state funding.

  Phase 1 construction is complete, and Phase 2 construction is in long range and is not likely to conflict with project construction; therefore, no cumulative impacts are anticipated as a result of the proposed Dresden-Heard County 500 kV Transmission Line Project.

Conclusion

Because construction schedules for the preceding projects are not anticipated to overlap with the Dresden-Heard County 500 kV Transmission Line Project, short-term cumulative impacts in regards to construction related-traffic, noise, and air quality impacts are not anticipated.

B. Long-Term Cumulative Impacts

Long-term cumulative impacts analysis considers future conditions (2013-2014) when the project would be fully operational. The analysis also takes into account known transportation, infrastructure and development plans, public policies, and general community growth. For the purpose of this analysis, past actions are those related to the resources before the Dresden-Heard County 500 kV Transmission Line Project siting. Present actions are those related to the resources at the time of the environmental analysis, and future actions are considered to be those that are reasonably foreseeable through the year 2014.

The impact of the Dresden-Heard County 500 kV transmission line project is combined with other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. These combined impacts are defined as "cumulative" in 40 CFR 1508.7 and include individually minor but collectively significant actions taking place over a period of time. It is possible that an impact that may be small by itself could result in a moderate or large impact when considered in combination with the impacts of other actions on the affected resource. Likewise, if a resource is regionally declining or imperiled, even a small individual impact could be important if it contributes to or accelerates the overall resource decline. The long-term cumulative impacts analysis for the Dresden-Heard County 500 kV Transmission Line Project include the following resources: land use, socioeconomics, air quality, water quality, wetlands, streams, wildlife habitat, threatened and endangered species, hazardous waste and materials, noise, cultural resources, aesthetics, and transportation/traffic.

B1. Land Use

Future Land Use Maps for the two counties covered by the proposed project show an overall sense of preservation for the residential and agricultural character of the area (see **Appendix B, Figure 3a,** Heard County Future Land Use Map and **Figure 3b,** Coweta County Future Land Use Map). In addition, historic aerial photography was reviewed from 1938, 1978 and 2010 to determine historic land use patterns; and therefore make cumulative impact determinations. The aerials show that the project area and general vicinity were initially forested lands which over time changed to rural conservation and low density residential development.

Heard County

According to Heard County's Current Character Area Maps, the character area in the vicinity of the Dresden-Heard County 500 kV Transmission Line is identified as Agricultural/Rural Residential Areas. The preservation of the overall rural character and the preservation of the family farming heritage are high priorities for the citizens of Heard County. These areas also include vast environmentally sensitive areas and natural and scenic resources. This character area encourages land conservation, farming, commercial agricultural and forestry uses, and very low density large lot residential development. Very limited public services and facilities are available in these areas, thus limiting available opportunity for other types of development.

Prime agricultural and forestlands are located throughout Heard County with larger tracts in the northern half of the county and southwestern section near the Chattahoochee River and the Wildlife Management Area. There has been a growth trend of larger tract residential development along major and minor arterials within these areas recently as timber companies and families have begun to divest their holdings. At the same time, many of these forested areas have been purchased by organizations such as the Georgia Nature Conservancy and the Trust for Public Land, as well as private interests, who are seeking to protect these sensitive areas from development.

As previously noted, discussions with the Heard County Chamber of Commerce and the Development Authority in Heard County indicated that very little development is planned for the eastern section of the county in the vicinity of the proposed transmission line because there is no land to market near the Coweta County line. However, Franklin Industrial Park is located in the City of Franklin, approximately eight miles west of the project corridor. The park currently houses a fire station and the West Georgia Technical College. Plasti Paint, a manufacturing facility, is currently under construction in the park and a water tower to service the fire station and other facilities in the park is planned in the near future.

Coweta County

Coweta County's Future Land Use Map (2006) shows at least half of the land uses (in the western and southern half of the county) are proposed to remain as Rural Conservation including the portion of the project area located in the county. Coweta County adopted the Coweta County Greenspace Acquisition and Protection Plan, thus making it a part of the Comprehensive Land Use Plan. This plan was developed in accordance with the State of Georgia Governor's Greenspace Program. It targets wetlands, floodplains, upland habitat, and areas of vulnerable groundwater recharge for greenspace acquisition and permanent preservation. The Greenspace Acquisition and Protection Plan provides a basis for preserving environmentally sensitive areas through ordinances that require conservation easements.

Coweta County has a substantial amount of prime agricultural land. In 1980, there were 58,500 acres of prime agricultural land in Coweta County, 20.5% of the county's land area. The County is losing its prime agricultural land to residential development at an alarming rate. Between 1980 and 2005, roughly 10,900 acres, or 19%, of the prime agricultural land was developed, mostly into residential subdivisions. The largest remaining, contiguous concentration of prime agricultural land is located around the towns of Turin and Sharpsburg, where 22,400 of the original 25,100 acres remain. This is among the largest concentrations in all of metropolitan Atlanta.

As previously mentioned, the 3,000-acre Chattahoochee Bend State Park recently opened in the northwest section of the county to the north of the proposed transmission line. The park is an extension of a multi-year effort to create a continuous 200-mile greenway along the Chattahoochee River from Helen to Columbus.

Coweta County's population is growing at a rapid rate. Between 1990 and 2004, the County grew at an average annual rate of 6.7%. Between 2000 and 2004, the average annual rate was 4.2% - the 10th fastest growing county in Georgia in absolute population and the 15th fastest growth rate. Since 1980, Coweta County has grown at a much faster rate than the state as a whole. This presents a myriad of issues for Coweta County's services, environment, infrastructure, and quality of life.

Due to transmission lines being constructed on current electrical utility easements and Georgia Department of Transportation rights-of-way, when possible, only small areas of rural conservation lands would be permanently removed from use by pole placement in the context of the region. However, due to the fact that the Dresden-Heard County 500 kV Transmission Line Project will aid and contribute to future planned land use changes in the area; reasonably foreseeable cumulative impacts to land use are anticipated.

B2. Socioeconomics

In regard to socioeconomics, cumulative impacts are generally only a concern if the Dresden-Heard County Transmission Line Project would overextend public services and accommodations in the project area. Construction and operation of the project would benefit the region by ensuring the supply of sufficient electrical power to the area. While intense growth is not planned for the immediate project area, increased capacity and reliability of affordable cost electricity will facilitate economic expansion in designated regional character areas. Discussions with county planning officials indicated that beneficial cumulative impacts would likely include increases in business revenues realized due to construction activities and potential increases in the property tax revenues received by the two counties from existing power plants in the area and as new development occurs in the area. Therefore, reasonably foreseeable cumulative impacts to socioeconomic resources are anticipated to be beneficial for the community.

B3. Air Quality

Heard and Coweta Counties are classified by the Georgia. Environmental Protection Division (EPD) as nonattainment areas for ground-level ozone, particulate matter pollution, or both. Nonattainment status means that air pollution levels are likely to exceed federal and state limits on many days throughout the year.

Metropolitan Atlanta's air quality is among the worst in the United States. Coweta County and part of Heard County are part of a 21-county air quality non-attainment areas. The counties are in violation of the Clean Air Act standards for ground-level ozone and particulate matter. This non-attainment status directly affects a county's ability to expand its system of regionally significant roadways since automobile emissions are directly linked to these high levels of air pollution. Due to federal regulations, a nonattainment designation directly impacts the county's road improvement program and its ability to add additional travel capacity to regionally significant roads such as through street widening. The county's recent development trends will likely exacerbate air quality in Coweta County.

However, no long-term air emissions are associated with the operation of the Dresden-Heard County 500 kV Transmission Line Project. Therefore, reasonably foreseeable cumulative impacts to air quality are not anticipated to result from the Dresden-Heard County 500 kV Transmission Line Project construction or implementation.

B4. Water Quality

The study corridor for the proposed Dresden – Heard County 500 kV Transmission Line includes eighteen jurisdictional waters. These waters are classified as riverine lower perennial streams, riverine intermittent streams, and palustrine open waters. Hilly Mill Creek and its tributaries in the project area are listed as impaired streams on the 2010 State 303(d) list for nonpoint source pollution. Hilly Mill Creek will be crossed by the proposed project.

The proposed transmission line is located on the western portion of the county. The stormwater runoff and steams flowing in the western portion of Coweta County drain into the Chattahoochee

River. The stormwater management system in Coweta County consists of conveyance, storage, and treatment facilities, as well as the existing procedures for proper design, permitting, construction, enforcement and management of new facilities to control the quantity and quality of nonpoint discharges into streams and other water bodies. The management of these facilities is subject to the Clean Water Act and a long list of related federal and state regulations.

Under the requirements of the National Pollution Discharge Elimination System (NPDES), all development sites that disturb greater than one acre are required to receive a permit before they can begin land disturbance. Larger development sites (those with more than 5 disturbed acres) must prepare an approved erosion sedimentation and pollution control plan with Best Management Practices to control soil erosion and sedimentation at the site, and maintain onsite water quality monitoring during construction. Also under this NPDES Phase II permit, Coweta County is required to inventory their stormwater management facilities and discharges, and create a monitoring database that maintains and evaluates samples of water quality for the discharges.

The potential cumulative impacts to water quality associated with the proposed Dresden-Heard County 500 kV Transmission Line Project are anticipated to be minor due to a number of factors. Land use, zoning, tax structure, and environmental practices are incorporated into the development process through regulation, thereby giving special consideration to water quality and associated development. For example, both Heard and Coweta Counties have a population size and density that requires a National Pollutant Discharge Elimination System (NPDES) permit regulating stormwater management. NPDES requirements require additional regulatory and outreach activities to protect water quality and address environmental issues. Therefore, it is anticipated that project implementation would have only minor reasonably foreseeable cumulative effects to the water quality in the area.

B5. Wetlands

According to Ecology Field Survey Report for the Dresden-Heard County 500 kV Transmission Line Project, field studies identified the presence of nine jurisdictional wetlands within the proposed transmission line corridor (see **Appendix B**, **Figures 4** and **4a – 4h**, Jurisdictional Features Map). The wetlands are classified as palustrine emergent, palustrine scrub-shrub, or palustrine forested (or a combination of these three wetland types). The extent of cumulative impacts on wetland habitat associated with the project would depend on the location, nature, and scale of future development projects in the general area. However, a goal of the Section 404 regulatory program is to contribute to the national goal of no overall net loss of the nation's remaining wetlands base through mitigation for loss of wetlands exceeding one acre.

Adverse cumulative impacts are unlikely to result from project implementation because land use plans show areas identified for future development do not contain jurisdictional wetlands. Project construction would be consistent with zoning requirements and federal, state, and local regulations, which would minimize or remove impacts to identified wetland systems. Although, Heard and Coweta Counties currently follow state and federal regulations to avoid, minimize and mitigate adverse impacts to jurisdictional waters of the U.S., there have been incremental adverse impacts to wetlands in these counties over time. However, project implementation is anticipated to have very little reasonably foreseeable cumulative impacts to wetlands.

B5. Streams

According to the Ecology Field Survey Report for the Dresden-Heard County 500 kV Transmission Line Project, field studies identified seventeen jurisdictional streams, and one open water within the proposed transmission line corridor (see **Appendix B**, **Figures 4** and **4a – 4h**, Jurisdictional Features Map). Jurisdictional streams were classified as perennial and/or intermittent systems. Ephemeral channels are jurisdictional drainages showing signs of wet weather conditions flow and present a significant nexus to other jurisdictional features. Non-jurisdictional wet weather conveyances are drainages that do not exhibit a significant nexus to other jurisdictional features.

Past and present actions potentially affecting streams for the Dresden-Heard County 500 kV Transmission Line Project include ongoing weed management, fertilization, crop production, grazing, road use and maintenance, and waterway modifications for stock watering. These activities can result in surface water flow alterations, water diversions, and stream bank modification and destabilization. Weed control and fertilization can introduce pesticides, nutrients, and total suspended solids (TSS) into water supplies. Irrigation and waterway modifications for stock can result in increased TSS and fecal coliform bacteria. Some grazing practices result in sedimentation to surface water due to soil destabilization from reduced vegetation. Maintenance and use of roads at river and stream crossings can destabilize banks and increase sedimentation to surface water. These effects are commonly seen in agricultural areas.

In more developed suburban, commercial and industrial areas, past and present actions potentially affecting streams include increased impervious surfaces, stormwater runoff and subsequently nonpoint source pollution. Increased impervious surfaces are a concern because, with their construction, a chain of events is initiated that modifies urban water resources. Impervious surfaces seal the soil surface eliminating rainwater infiltration and natural groundwater recharge. Stormwater runs directly across the impervious surfaces, raising flood peaks causing stream channel erosion; sediment loads increase and can degrade aquatic habitats. Nonpoint source pollution such as oil and heavy metals from automobiles are carried into streams by stormwater runoff without treatment.

Approximately seventeen jurisdictional streams are found within the Dresden-Heard County 500 kV Transmission Line Project. The Hilly Mill Creek has been impacted by one or more of the activities described above and is listed on the EPD 303(d) list of impaired waters for not meeting their designated use of fishing due to fecal coliform bacteria.

Construction activities, when combined with the potential adverse impacts from the Dresden-Heard County 500 kV Transmission Line Project and the effects of other present and past actions in the analysis area, could cumulatively increase sediment and other pollutant loads in nearby streams. Additionally, although minor, it could potentially affect the quantity and quality of available water resources, cumulatively increasing the possibility of impairment of one or more beneficial uses. However, because most actions would be separated in time or space and because a number of stormwater best management practices (BMPs) will be used both during and after construction, these adverse cumulative impacts are likely to be minimal.

Prior to federal regulations for environmental protection, such as the Clean Water Act of 1972, there have been incremental adverse impacts to streams in these counties. Today, Heard and Coweta Counties follow state and federal regulations to avoid, minimize and mitigate adverse impacts to jurisdictional water of the U.S. Stormwater runoff would not be generated by project implementation. Additionally, there would be no requirements for water use or wastewater discharge for future operations. As such, no potential cumulative adverse impacts to streams have been identified.

Per the Erosion and Sedimentation Act of 1975 and its 2003 and 2008 amendments, Chapter 7-17-9 states any land disturbing activities conducted by any electric membership corporation or municipal electric system or any public utility under the regulatory jurisdiction of the Public Service Commission, or any utility under the regulatory jurisdiction of the Federal Energy Regulatory Commission, or any agency or instrumentality of the United States engaged in generation, transmission, or distribution of power would be exempt from rules and regulations set forth in the 1975 Act, except when the electric membership, municipal electric membership, or public utility is considered a secondary permittee for a project located within a larger common plan of development. Requirements for an overhead utility to be exempt include (a) the new utility line right-of-way width does not exceed 200 linear feet; (b) utility lines are routed and constructed so as to minimize the number of stream crossings and disturbances to the buffer; (c) only trees and tree debris are removed from within the buffer resulting in only minor soil erosion; and (d) functional native riparian vegetation is re-established in any bare or disturbed areas within the buffer. Based on the aforementioned information, GTC would qualify for an exemption under Chapter 7-17-9 of the 2003 amendment to the Erosion and Sedimentation Act of 1975.

Stream buffer variances are not anticipated because there should be no more than minimal land disturbing activities within the 25-foot designated stream buffer, except where it is necessary for access road enhancements. In addition, land disturbing activities will be perpendicular to state waters. All vegetation within 25-foot buffers will be hand-cleared. Much of the material will be lopped and left as fallen; any material to be removed will be removed without skidding or dragging. Impacts associated with installation or replacement of culverts at stream crossings are considered minor and are also generally exempt from stream buffer requirements.

B5. Floodplains

A survey of the project corridor for floodplains has identified a transverse crossing of the 100-year and 500-year floodplain associated with Hilly Mill Creek (see **Figure 5**, Flood Map). The project would be designed in such a way that it would have no significant encroachment on this floodplain. Both Heard and Coweta Counties participate in the Regular Program of the National Flood Insurance Program, and the proposed transmission line overall will produce no rise in flood elevations for Hilly Mill Creek. However, since development is not anticipated to occur rapidly in the area, the proposed project is not likely to precipitate reasonably foreseeable cumulative effects to floodplains.

B6. Wildlife Habitat

Past, present, and reasonably foreseeable future actions were reviewed for potential cumulative impacts on wildlife habitat. The Ecology Field Survey Report for the Dresden-Heard County 500 kV Transmission Line Project identified seven types of upland vegetation communities, four of which provide moderate to excellent wildlife habitat, including bottomland mixed hardwoods, planted pine, secondary successional mixed hardwoods and secondary successional mixed hardwood-pine. Agricultural and ruderal communities provide minimal habitat for wildlife diversity.

Past activities have affected wildlife within the Dresden-Heard County 500 kV Transmission Line Project through loss of native habitat due to agricultural and rural development. These activities have resulted in displacement of individual animals due primarily to habitat loss; however, many wildlife species have adapted to habitat changes, and thus, have not been negatively affected at the population level.

Reasonably foreseeable future actions that develop new or expanded permanent facilities could result in some permanent change in existing wildlife habitat. Habitat may be reduced, altered, or fragmented, which could affect the diversity and abundance of area wildlife. The amount of habitat in general that would be permanently disturbed would, in general, be limited to the area of the Dresden-Heard County 500 kV Transmission Line Project. Birds, however, might avoid the area surrounding the transmission lines.

The cumulative impact of habitat loss, as previously described, could affect some wildlife, but it would not likely reduce the viability of wildlife populations within the region, as structures would reduce habitat by a relatively small amount and would not likely consume critical habitats for wildlife species. Since there is no loss of sensitive habitat, animals should be able to adapt to changing habitat conditions. Therefore, the Dresden-Heard County 500 kV Transmission Line Project's implementation would have no reasonably foreseeable cumulative effects to the wildlife habitat in the project area.

B7. Threatened and Endangered Species

According to the 2011 Ecology Field Survey Report for the Dresden-Heard County 500 kV Transmission Line Project, field studies were conducted to determine the presence of suitable protected species habitat and the potential occurrence of these species. There were no protected species identified within the proposed transmission line study corridor; however, suitable habitat for one state-listed species (*Schisandra glabra* - bay star-vine) was observed. See **Table 1** for a summary of federal and state listed species.

Table 1
Summary of Protected Species for Coweta and Heard Counties, Georgia

Common Name	Scientific Name	Federal Status	State Status	Habitat Present (Yes/No)	Preferred Habitat
Faunal species					
Birds					
bald eagle	*Haliaeetus leucocephalus*	D	T	No	nests in large trees near lakes, rivers, and other large bodies of water
Fish					
bluestripe shiner	*Cyprinella callitaenia*	NA	T	No	large, alluvial rivers with open, sand or rock bottomed channels with flowing water and little to no aquatic vegetation
highscale shiner	*Notropis hypsilepis*	NA	T	No	flowing areas of small to large streams over sand or bedrock substrates
Invertebrates					
Gulf moccasinshell mussel	*Medionidus penicillatus*	E	E	No	medium streams to large rivers with slight to moderate current over sand and gravel substrates
oval pigtoe mussel	*Pleurobema pyriforme*	E	E	No	sandy, medium-sized rivers and creeks
purple bankclimber mussel	*Elliptoideus sloatianus*	T	T	No	small to large rivers with moderate current and substrate of sand, fine gravel, or muddy sand
shiny-rayed pocketbook mussel	*Hamiota subangulata*	E	E	No	sandy/ rocky medium-sized rivers and creeks
Floral species					
Plants					
bay star-vine	*Schisandra glabra*	NA	T	Yes	rich bottomland or alluvial floodplain woods on stream terraces and lower slopes
black-spored quillwort	*Isoetes melanospora*	E	E	No	shallow pools on granite outcrops, where water collects after rains; pools are less than 1-foot deep and are rock rimmed

Table 1
Summary of Protected Species for Coweta and Heard Counties, Georgia

Common Name	Scientific Name	Federal Status	State Status	Habitat Present (Yes/No)	Preferred Habitat
Harper dodder	*Cuscuta harperi*	NA	T	No	parasite usually found on rayless-goldenrod; rarely parasitic on other herbs found on granite or sandstone outcrops
Piedmont barren strawberry	*Waldsteinia lobata*	NA	R	No	rocky, acidic woods along stream terraces with mountain laurel (*Kalmia latifolia*); rarely in dry, upland oak/hickory forests
pool sprite, snorklewort	*Amphianthus pusillus*	T	T	No	shallow pools on granite outcrops, where water collects after rains; pools are less than 1-foot deep and are rock rimmed
white fringeless orchid	*Platanthera integrilabia*	C	T	No	red maple-gum swamps; peaty seeps and streambanks with *Parnassia asarifolia* and *Oxypolis rigidior*

E=endangered, T=threatened, C=candidate, R=rare, D=de-listed species, NA=not applicable

No physical crossings (i.e. culverts or fords) are anticipated for Hilly Mill Creek. Field studies did not identify any protected species within the proposed transmission line corridor; however, preferred habitat for the state-listed species bay star-vine was observed. Habitat for this species consists of rich, forested bottomlands, alluvial floodplains, and adjacent lower slopes. Due to the linear nature of the proposed project, impacts to suitable habitat for the bay star-vine will be limited to clearing up to a 170-foot wide corridor. Existing habitat adjacent to the proposed corridor will be left undisturbed. Therefore, it is not anticipated that the proposed project would have an effect on this species or its overall preferred habitat.

Additionally, current regulations, such as Section 7 of the Endangered Species Act and Section 404 of the Clean Water Act, provide a system to protect and prevent degradation of water and natural resources. These protection mechanisms work to improve habitat for threatened and endangered species. Therefore, project implementation would have no reasonably foreseeable cumulative effects to the threatened and endangered species in the project area.

B8. Hazardous Waste and Materials

The Hazardous Site Inventory (HSI) is a list of sites in Georgia where there has been a known or suspected release of a regulated substance above a reportable quantity and which have yet to show they meet state clean-up standards found in the Rules for Hazardous Site Response. It is compiled and published by the Georgia EPD at least once each year. According to the July 2011 edition of the HSI, no hazardous sites are located within the Dresden-Heard County 500 kV Transmission

Line Project.

Construction and operations associated with reasonably foreseeable future actions would require the use of some hazardous materials, although the variety and amounts of hazardous materials present during operation would be minimal. Types of hazardous materials that may be used include fuels (e.g., gasoline diesel fuel), lubricants, cleaning solvents, paints, and pesticides. These same types of materials would also continue to be used in agriculture, weed management, maintenance of road and rail facilities, and other ongoing activities in the area. Wastes would be managed as required by state and federal law and there would be a low probability of cumulative impacts as a result. Therefore, reasonably foreseeable cumulative impacts in regard to hazardous waste are not anticipated to result from operation of the Dresden-Heard County 500 kV Transmission Line Project.

B9. Noise

As Heard and Coweta Counties have transitioned from rural agricultural into a more rural low density area and suburban area in the case of Coweta County, background noise levels have likely increased. This increase can be attributed to a number of factors including greater population, increased vehicular traffic and property development.

Temporary noise impacts may occur during project construction, but these would not be of a cumulative type. These temporary impacts would generally occur during normal working hours. Upon final construction and operation of the project, cumulative impacts associated with audible noise would be additive but are expected to be less than double the existing level of noise caused by operation of the current electrical infrastructure. The increased noise level at the edge of the right-of-way may be audible during wet-weather conditions, although the line noise would likely be masked by naturally occurring sounds at locations beyond the right-of-way and would not be significant. Therefore, reasonably foreseeable cumulative impacts in regard to noise are not anticipated for the Dresden-Heard County 500 kV Transmission Line Project.

B10. Cultural Resources

Cumulative impacts to cultural resources, including historic resources and archaeological features, could result over time from repeated incremental damage caused by new right-of way, motorized vehicles and easement maintenance. According to the Natural, Archaeological, and Historic Resource website (https://www.itos.uga.edu/nahrgis/) there are a number of historic resources in Heard and Coweta County. Historic resources include buildings, structures, historic sites, landscapes, and districts included in the Historic Preservation Division's Historic Resources Survey or listed in the National Register of Historic Places.

Heard County's cultural resources are documented through formal surveys and other local initiatives. The county's most significant properties are protected locally as historic overlay districts: Davis-Ridley Historic Rural District, Bell Homeplace/Salem Church, Bethel/Bethel Heard, Flat Rock Campground, Old Tennessee Rd., and Bethel Primitive Church.

The historic towns of Newnan, Senoia, Grantville, Sharpsburg, Haralson, Moreland, and Turin, as well as the unincorporated landscape of Coweta County combined, have a large collection of historic homes, districts, and sites that represents a rich history. The agricultural and historic landscapes reflect the character of the county (see **Figure 6**, Historic Resources Map).

Archaeology reports were prepared for the Dresden-Heard County 500 kV Transmission Line Project, and no resources were identified in or near the project corridor.

The project would not require a substantial level of new access, thereby reducing cumulative impacts to cultural resources. Additionally, the two counties follow history and archaeology survey guidelines in consultation with Department of Natural Resources Historic Preservation staff and concurred by the State Historic Preservation Office. Therefore, reasonably foreseeable cumulative impacts to cultural resources are expected to be minor.

B11. Aesthetics

Cumulative visual impacts would increase with effects to views from highways, residences, and agricultural lands. The transmission lines built in a currently natural setting usually would cause the most noticeable incremental change because of the contrast of form, line, color and texture to the surroundings. Each successive change, when added in an existing corridor, would be less noticeable than the first. However, the new combination of all the changes (e.g., form, line, color, and texture) is more evident. Addition or removal of current electrical transmission and distribution lines as part of the Dresden-Heard County 500 kV Transmission Line Project will have minimal cumulative visual impact and will likely be beneficial by improving the look of aging transmission lines currently in use. In order to lessen any potential impact, mitigation to reduce visual impacts would include maintaining a 30 feet or larger vegetative buffer between the homes and the transmission line, and the reclamation of areas disturbed by construction-related activities. Therefore, the effect of the Dresden-Heard County 500 kV Transmission Line Project would contribute a small increment of aesthetic impact which would not be considered significant.

B12. Transportation/Traffic

Cumulative impacts to traffic and transportation are not anticipated to be permanent, but rather temporary, occurring during construction. The Dresden-Heard County 500 kV Transmission Line Project would not affect traffic circulation and would generate only a small number of vehicle trips. Traffic effects associated with the project area in combination with the local and regional transportation and economic development projects are not expected to be at a noticeable level to impact future baseline conditions. In summary, the proposed project would not be expected to result in cumulative adverse impacts on transportation or traffic.

B13. Environmental Justice

An Environmental Justice (EJ) Survey was conducted for the proposed Dresden – Heard County 500 kV Transmission Line study area in Coweta and Heard Counties, Georgia. The survey was conducted in accordance with GTC's *Environmental Justice Guidelines* and *Methodology for Analyzing Potential Environmental Justice Areas of Concern*. The GTC EJ documents, based upon methodology developed by EPA Region IV, explain the fundamental details of this analysis. The EPA methodology is based on Census 1990. At that time, Georgia's minority population was approximately 30.0%, and the low-income population was approximately 14.7%. The minority and low-income population percentages in Georgia have changed during the decades leading up to Census 2010. The 2010 Census (SF 1) shows that Georgia's minority population has now increased to 44.1%, and the low-income population has increased to 15%. For the 2010 Census, low-income data will be released through the American Community Survey (ACS), which updates every year and is now current through the end of 2009 at the Census tract level1 EPA Region IV did not develop new thresholds for the 2000 Census numbers and has not yet done so for 2010. At this time, GTC is continuing to use the 1990 EPA thresholds for environmental justice evaluations. Both the minority and low-income analyses will be more inclusive than would be required if the EPA thresholds were adjusted to account for the changes in population.

A review of the proposed Dresden – Heard County 500 kV Transmission Line project area found potential environmental justice areas for both minority populations and low-income populations.

The project area is primarily comprised of lower density rural development and forested areas. A review of aerial photography (2010 NAIP) indicates that the homes within this area are widely-scattered. One high minority block is located along the existing transmission line right-of-way, in the area of State Route 34 and Quimby Jackson Road. This block contains several structures which appear to be residential in nature, and one of these structures is situated less than 50 feet from the proposed line. The two other high minority blocks are located between Thomas Powers Road and the Heard County line. Several homes are located on the west side of Thomas Powers Road, near the crossing of the proposed line. Two residential structures are located within 200 feet of the proposed line in this high minority block. In regard to low-income populations, there are no residential structures in close proximity to the proposed line within the single low-income Census Tract in the project area (see **Appendix B**, **Figure 7a,** Environmental Justice Analysis for Minority Populations and **Figure 7b,** Environmental Justice Analysis for Low Income Populations).

In conclusion, some project area blocks and tracts are identified by the most current Census data as potential areas of EJ impact for minority and low-income populations. It is possible that additional smaller areas of minority and low-income populations are present in the study area but masked by the larger Census geography. This may particularly apply to low-income populations because the tracts are large in terms of population, cover large land areas, and extend well beyond the proposed transmission line area. For example, several homes are located along the proposed line in Coweta County, and some of them could belong to low-income families even though the Census tract data does not indicate so. GTC should conduct field surveys and provide public notification as soon as possible in order to avoid potential EJ impacts from the proposed transmission line route. It is likely that reasonably foreseeable cumulative effects to EJ populations may occur as a result of the project.

Summary

This impact analysis addresses the potential cumulative effects associated with the construction and operation of the Dresden-Heard County 500 kV Transmission Line Project in Heard and Coweta Counties, Georgia. From the above resources analyzed for cumulative impacts, over half were not anticipated to result in reasonably foreseeable cumulative impacts from the construction or operation of the project. Six resources were anticipated to sustain minor impacts from the construction or operation of the Dresden-Heard County 500 kV Transmission Line Project: land use, water quality, wetlands, hazardous materials, cultural resources, EJ and aesthetics. Finally, the project is anticipated to have a beneficial cumulative impact to socioeconomic resources in the reasonably foreseeable future.

Appendix A

Conversation Records

Conversation Record

JACOBS

Employee:	Marie Njie	**Project No.:**	510000
Talked With:	Robert Tolleson Director	**Date/Time:**	February 8, 2012
Firm:	Coweta County Planning and Zoning Department	**Telephone No.:**	770-254-2635
Address:	Coweta County Planning and Zoning Department 22 East Broad Newnan, GA 30263		[] Placed Call [x] Returned Call [ ] Conference Call [ ] Met with Party

Subject:

Dresden-Heard County 500 kV Transmission Line

Conversation:

Ms. Ashley returned my calling stating that Mr. Tolleson asked her to give me a call back regarding my voicemail about planned development in the western section of the county. Ms. Ashley indicated that there is no development planned in the west section of the county, however the 3,000-acre Chattahoochee Bend State Park recently completed Phase I construction in the northwest corner of the county, to the north of the proposed project. Phase 1 construction is operational and Phase 2 construction is in long range.

Copy:

Signature: *Marie Njie*

Conversation Record

JACOBS

Employee:	Marie Njie	**Project No.:**	510000
Talked With:	Julie Pope Director	**Date/Time:**	February 8, 2012
Firm:	Heard County Development Authority	**Telephone No.:**	706-675-0554
Address:	Heard County Development Authority 121 South Court Square Franklin, GA 30217-8014		[x] Placed Call [] Returned Call [ ] Conference Call [ ] Met with Party

Subject:

Dresden-Heard County 500 kV Transmission Line

Conversation:

Ms. Julie Pope stated that there is no land to market near the Coweta county line in the area of the proposed transmission line. However, Plasti Paint is planned within the Franklin Industrial Park located approximately 8 miles west of the proposed transmission line. Plasti Paint is an industrial facility located in Franklin, Heard County, approximately eight miles east of the proposed transmission line. The facility is currently under construction and anticipated to be in operation by Summer 2012. The facility would be 50,000 square feet with the potential to expand by 20,000 square feet. The facility would manufacture powder coat paint for automotive parts, 80 percent of which would service Franklin Automotives. It is anticipated to have 50 employees with the potential to increase to ten more employees. Franklin Automotives, also located in the City of Franklin is currently the largest employer in Heard County with approximately 435 employees. The industrial park currently houses a fire station and the West Georgia Technical College and a water tower is planned to service the fire station in the near future.

Copy:

Signature: *Marie Njie*

JACOBS

Conversation Record

Employee:	Marie Njie	**Project No.:**	510000
Talked With:	Kathy Knowles President	**Date/Time:**	February 8, 2012
Firm:	Chamber of Commerce	**Telephone No.:**	706-675-0560
Address:	Heard County Chamber of Commerce 121 South Court Square Franklin, GA 30217-8014		[ ] Placed Call [x] Returned Call [ ] Conference Call [ ] Met with Party

Subject:

Dresden-Heard County 500 kV Transmission Line

Conversation:

Ms. Kathy Knowles stated that very little development is planned for the eastern section of the county in the vicinity of the proposed transmission line. However, the Franklin Industrial Park is located in the City of Franklin, approximately eight miles west of the project corridor. Ms. Knowles referred me to Ms. Julie Pope, Director of the Development Authority for more information. Ms. Knowles also emailed me a copy of the county Comprehensive Land Use Plans and Future Land Use Map.

Copy:

Signature: *Marie Njie*

JACOBS

Conversation Record

Employee:	Marie Njie	**Project No.:**	510000
Talked With:	Darrold Wiggins Director	**Date/Time:**	February 8, 2012
Firm:	Heard County Public Utilities	**Telephone No.:**	706-594-0374
Address:	Heard County Public Utilities 121 South Court Square Franklin, GA 30217-8014		[x] Placed Call [] Returned Call [ ] Conference Call [ ] Met with Party

Subject:

Dresden-Heard County 500 kV Transmission Line

Conversation:

Mr. Darrold Wiggins was referred to me by the Commissioner of Roads (Ms. June Jackson). When asked, Mr. Wiggins stated that there are no planned transportation improvements in the general vicinity of the proposed transmission line.

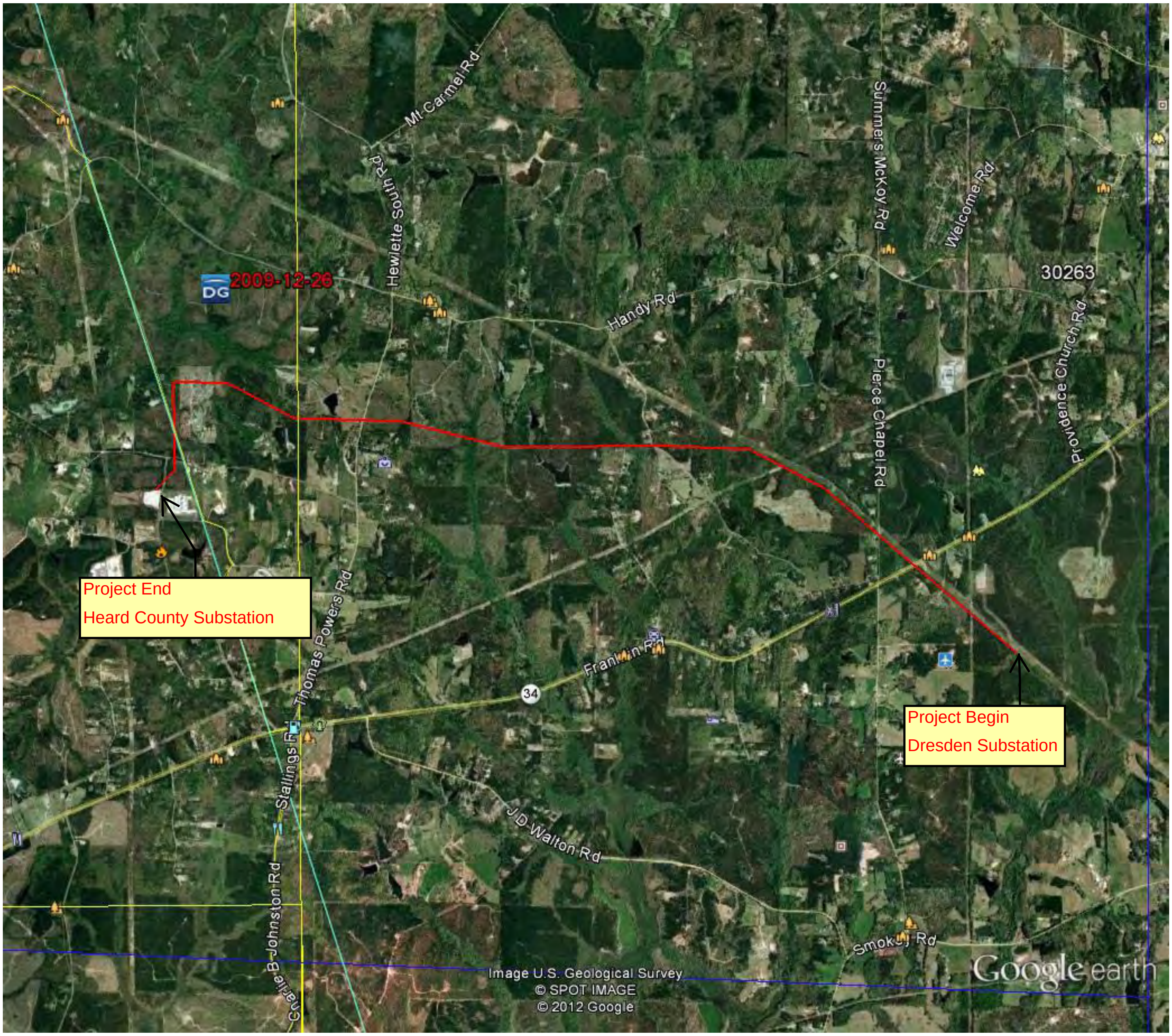
Copy:

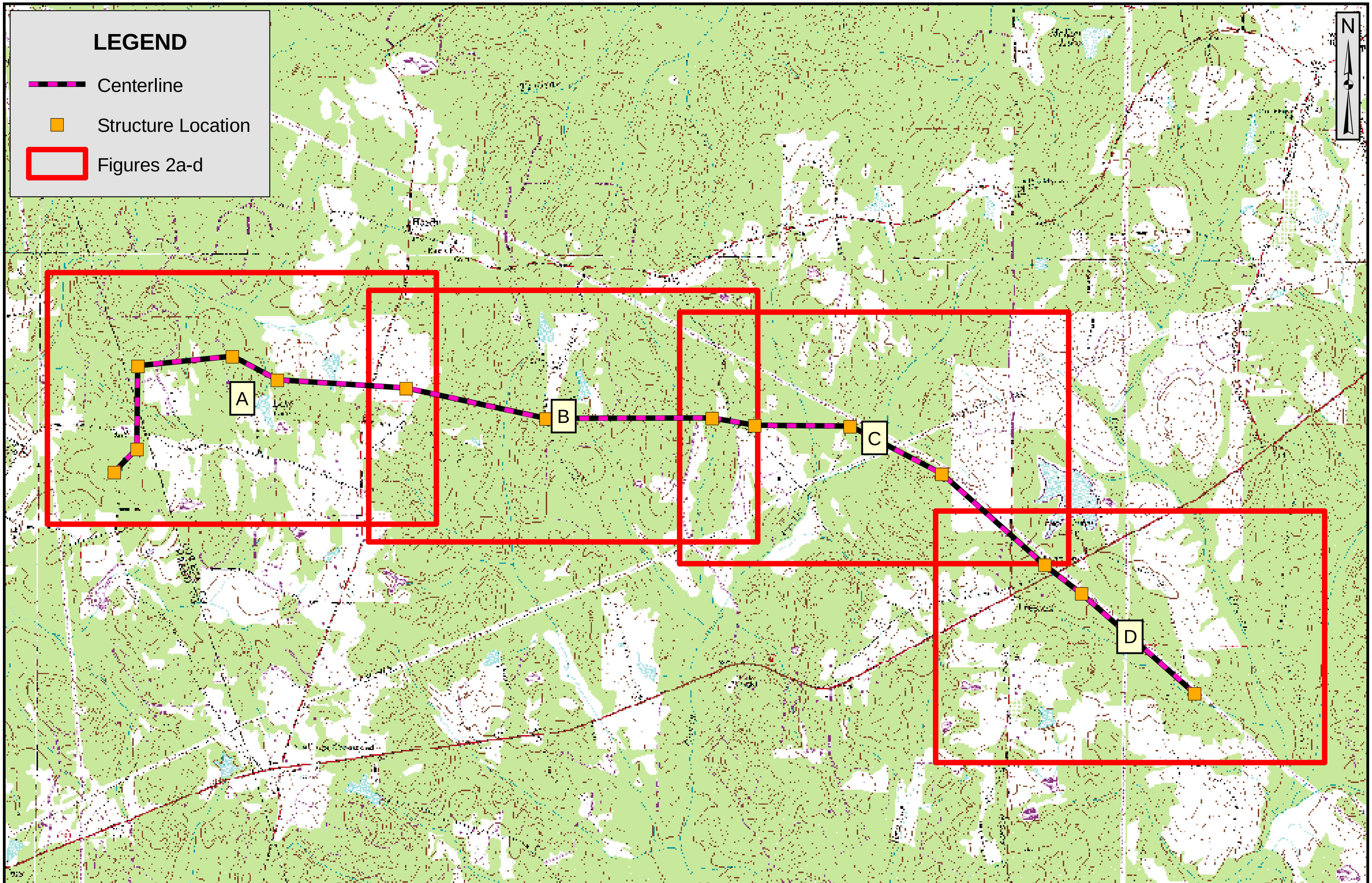
Signature: *Marie Njie*

Appendix B

Figures

Figure 1. Project Location Map





Georgia Transmission

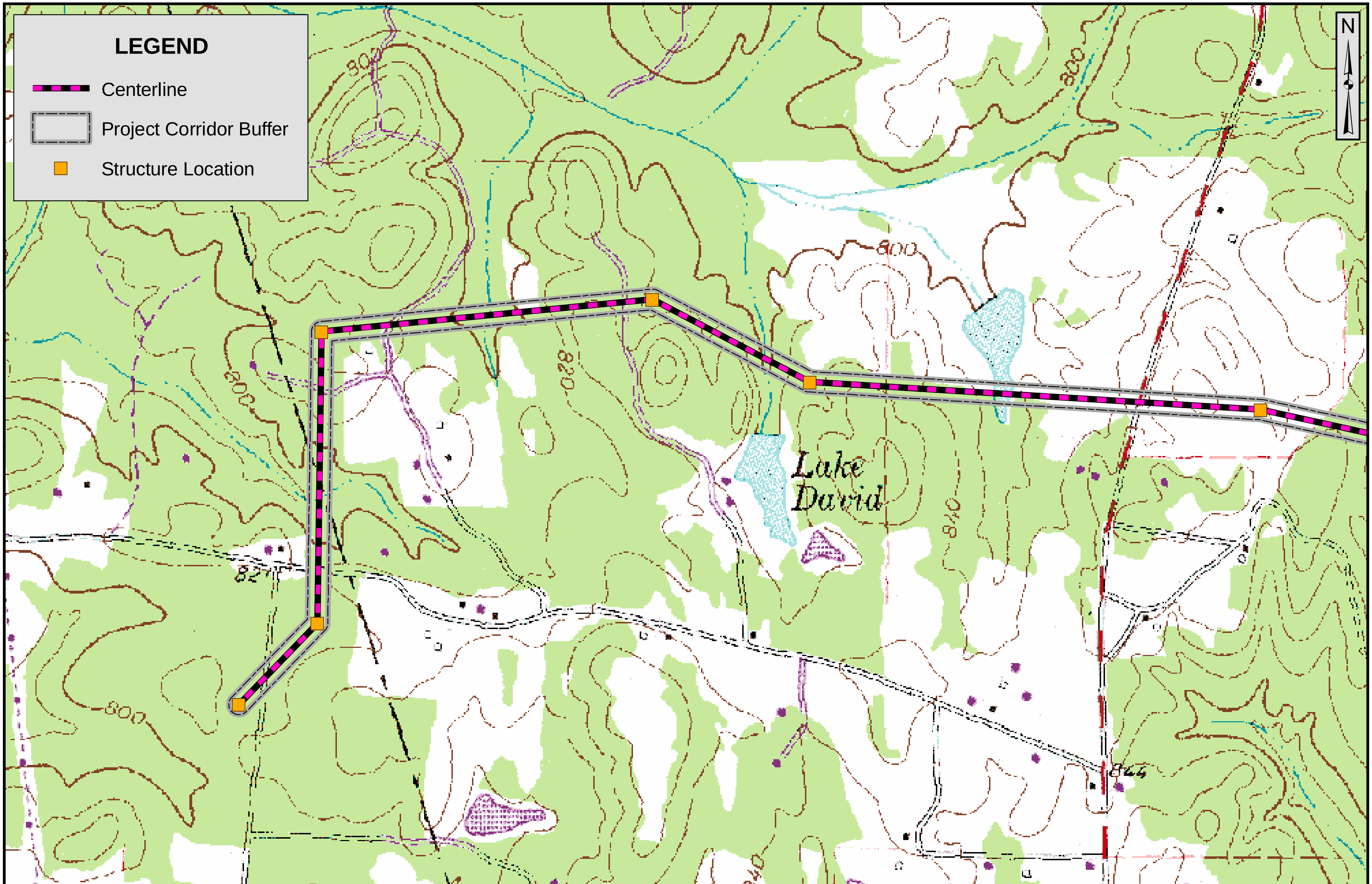
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Topographic Map

Date: September 2011
Scale: 1" = 3,500'
Proj. No.: EGXH2400

Figure 2 Index



Georgia Transmission

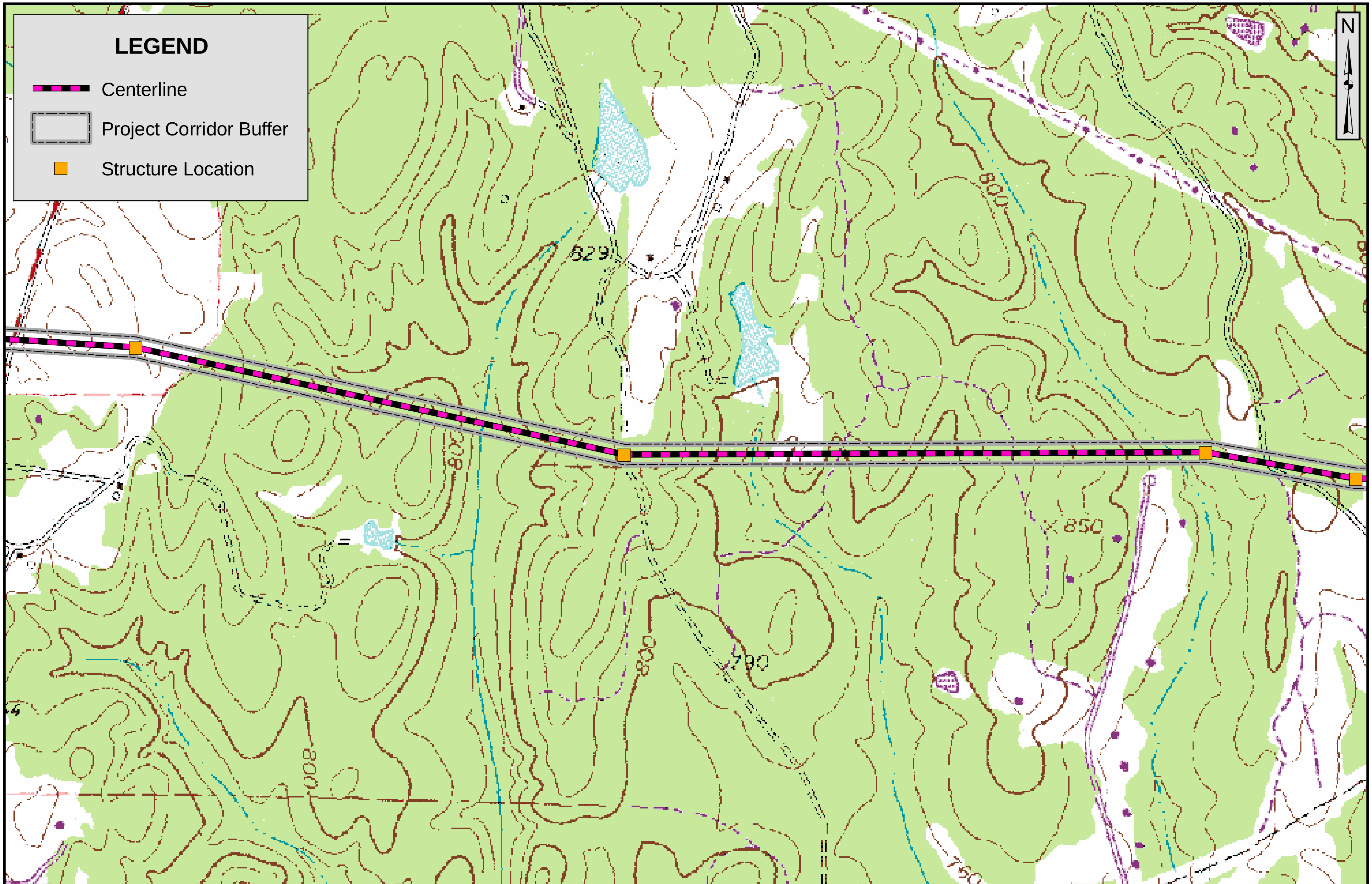
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Topographic Map

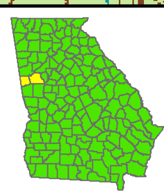
Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 2a



Georgia Transmission

JACOBS

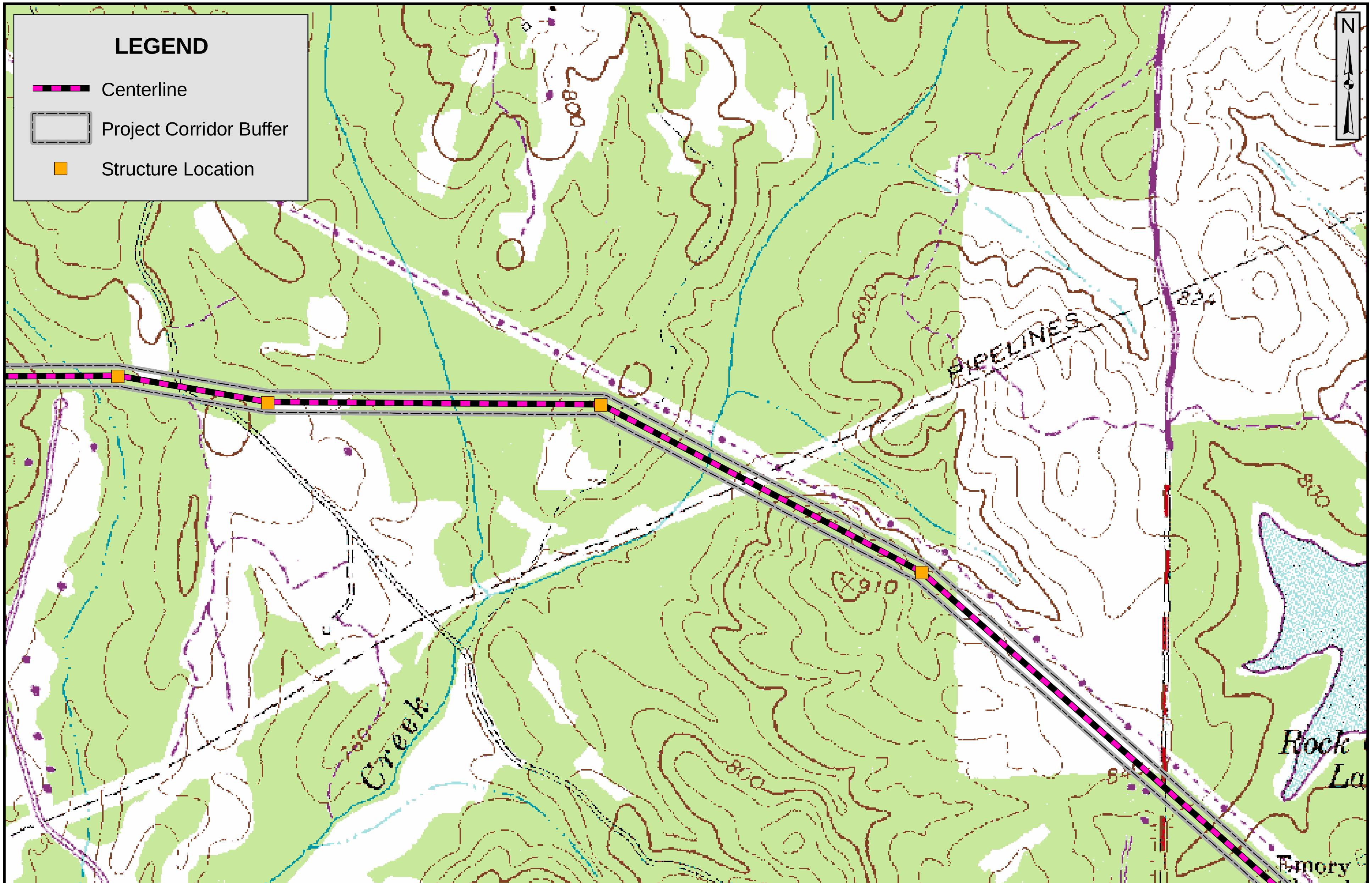


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Topographic Map

Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 2b



Georgia Transmission

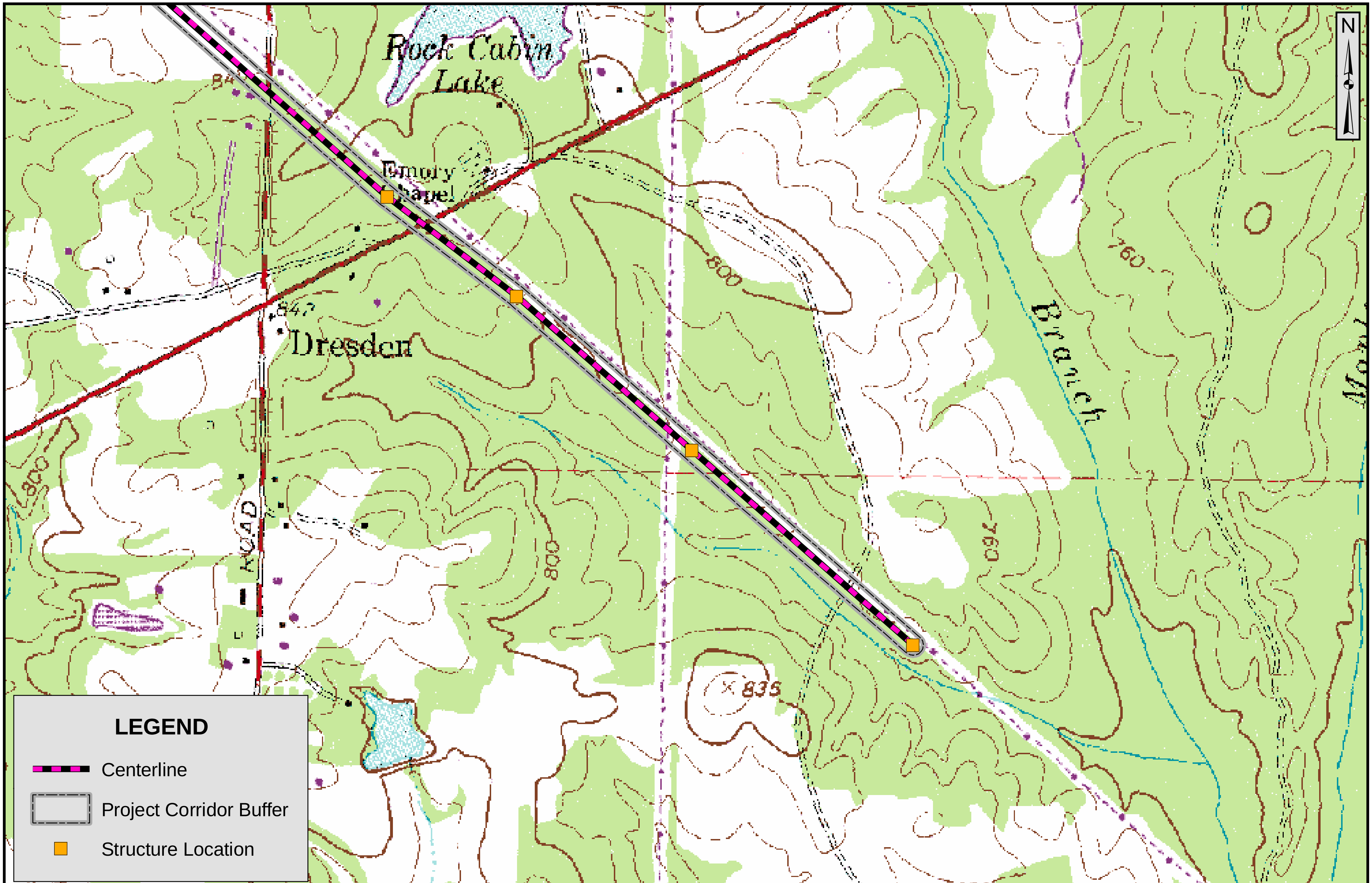
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Topographic Map

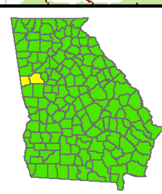
Date: September 2011
Scale: 1" = 1,000'
Proj. No.: EGXH2400

Figure 2c



Georgia Transmission

JACOBS



Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

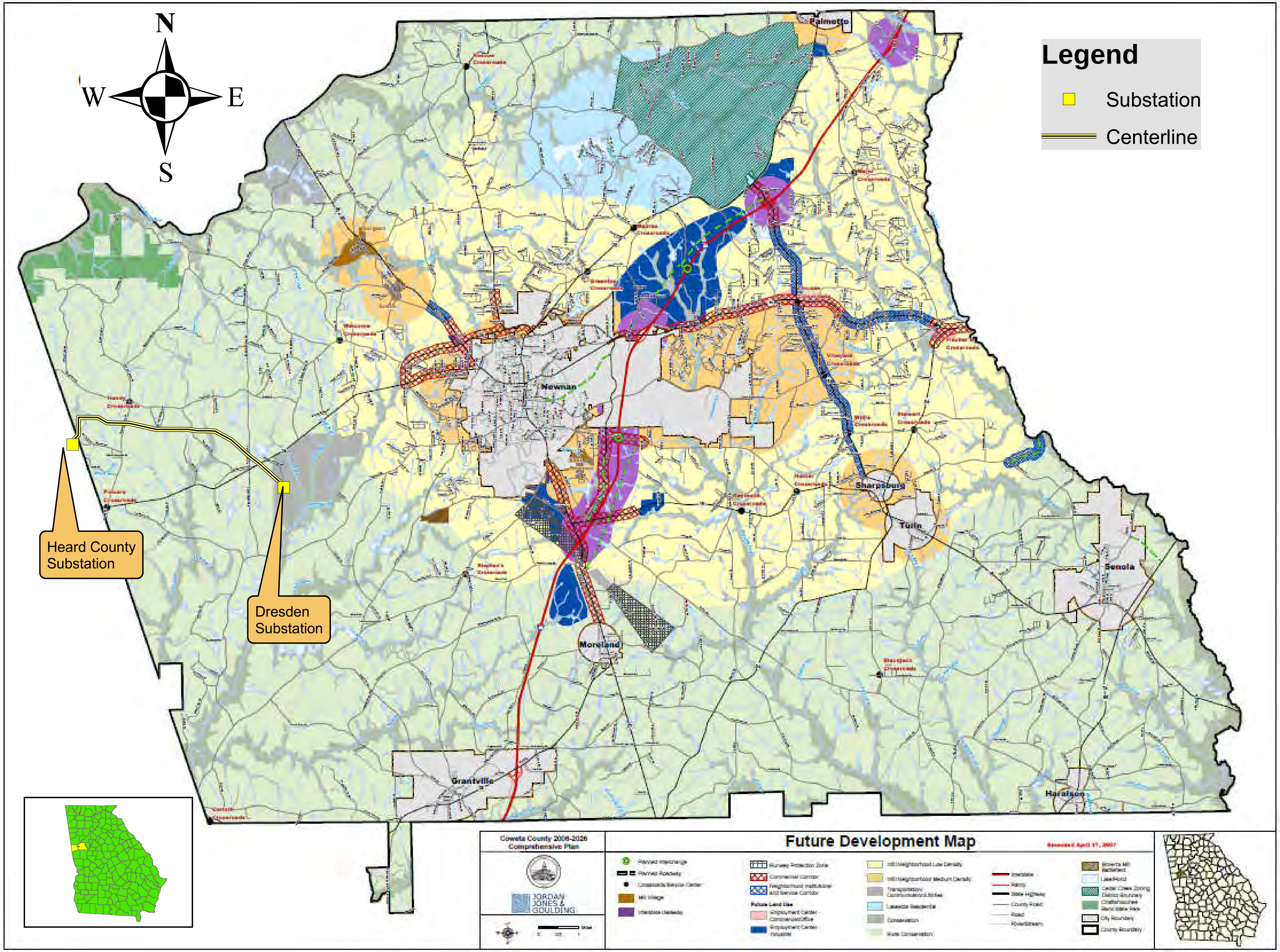
Topographic Map

Date: September 2011

Scale: 1" = 1,000'

Proj. No.: EGXH2400

Figure 2d

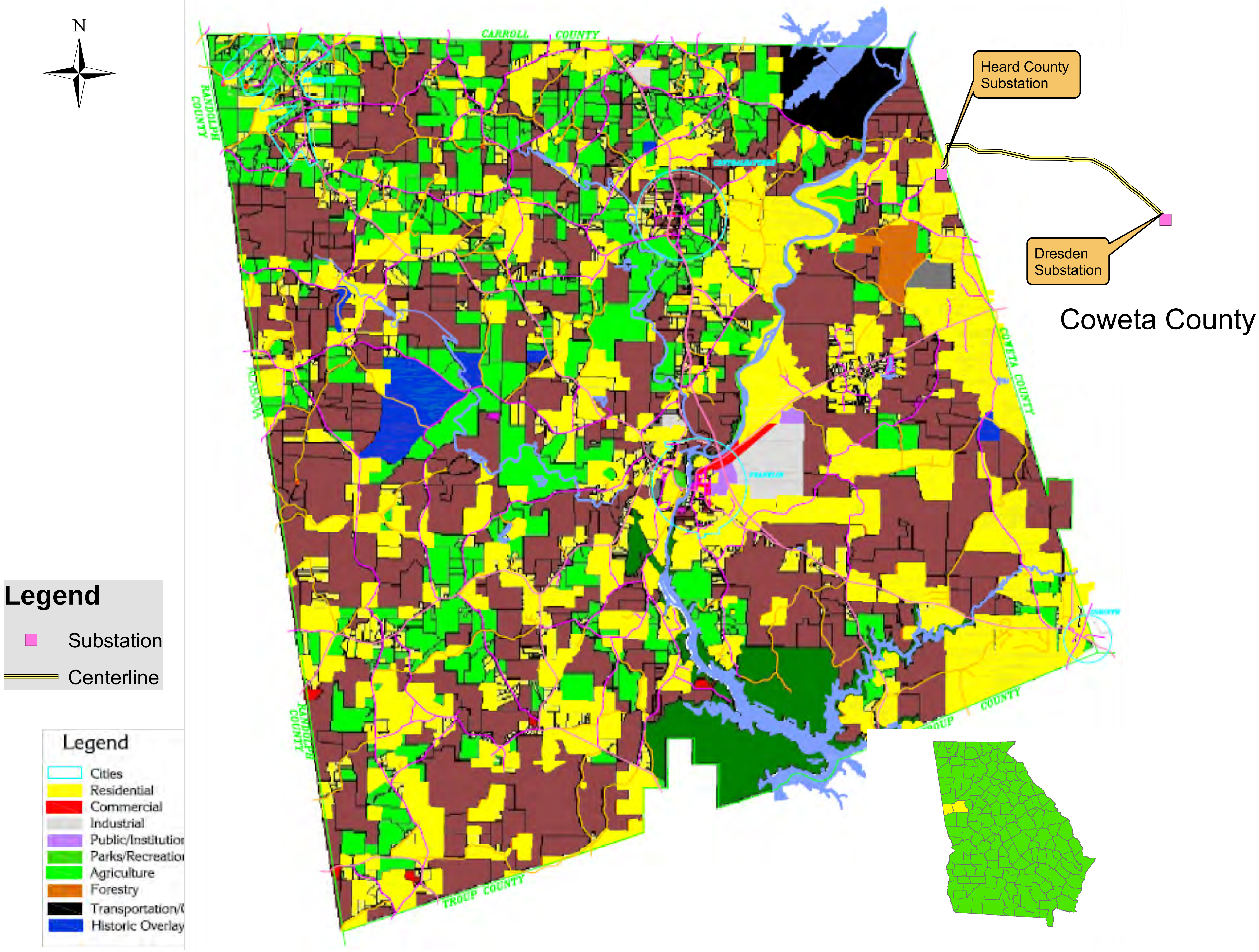


Georgia Transmission JACOBS

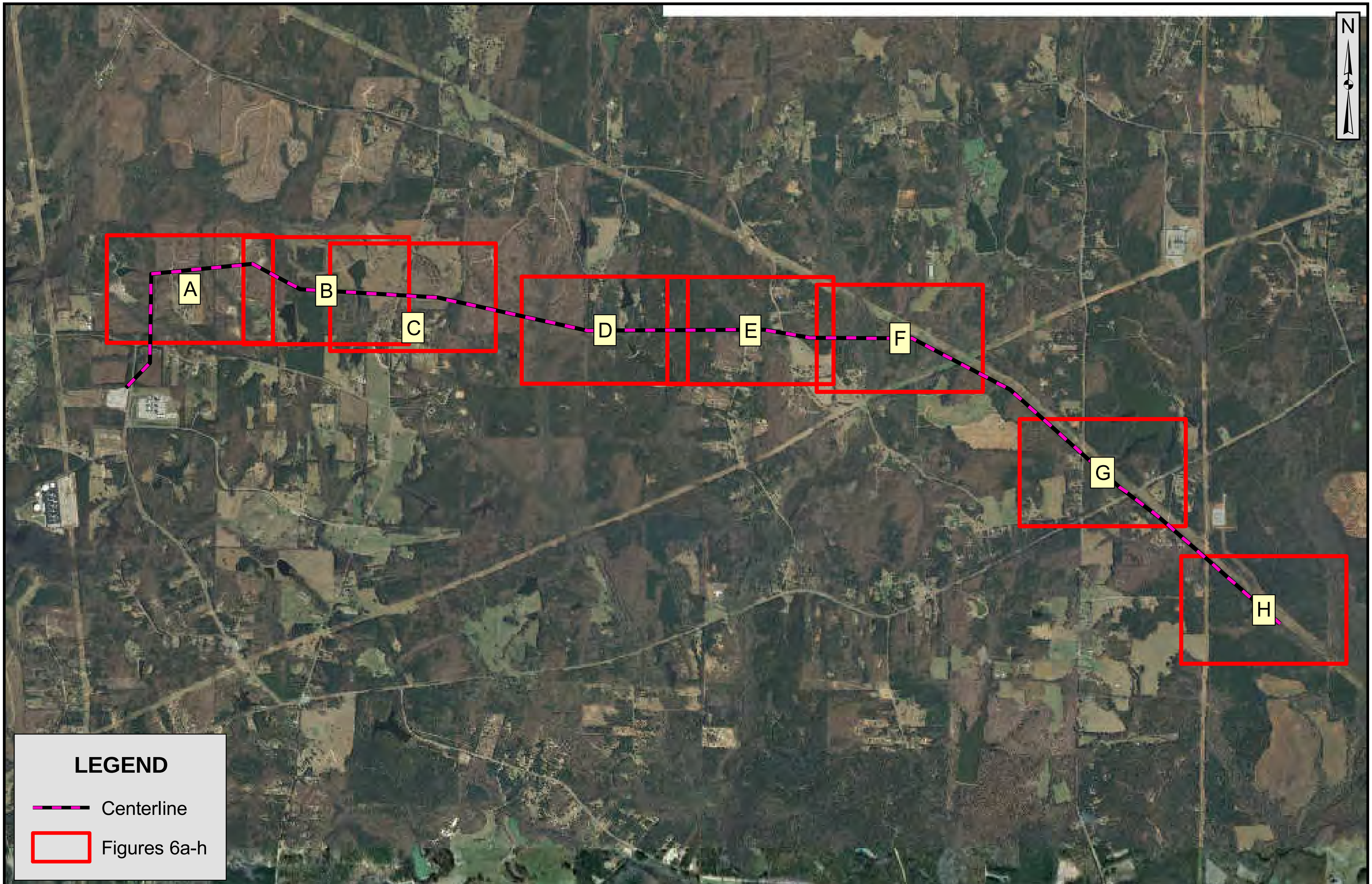
Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia
Proposed Future Land Use Map Coweta County

Date: February 2012
Scale: Not To Scale
Proj. No.: EGXH2400

Figure 3a



Dresden - Heard County 500 kV Transmission Line Coweta and Heard Counties, Georgia Future Land Use Map Heard County	Date: February 2012 Scale: Not To Scale Proj. No.: EGXH2400	Figure 3b

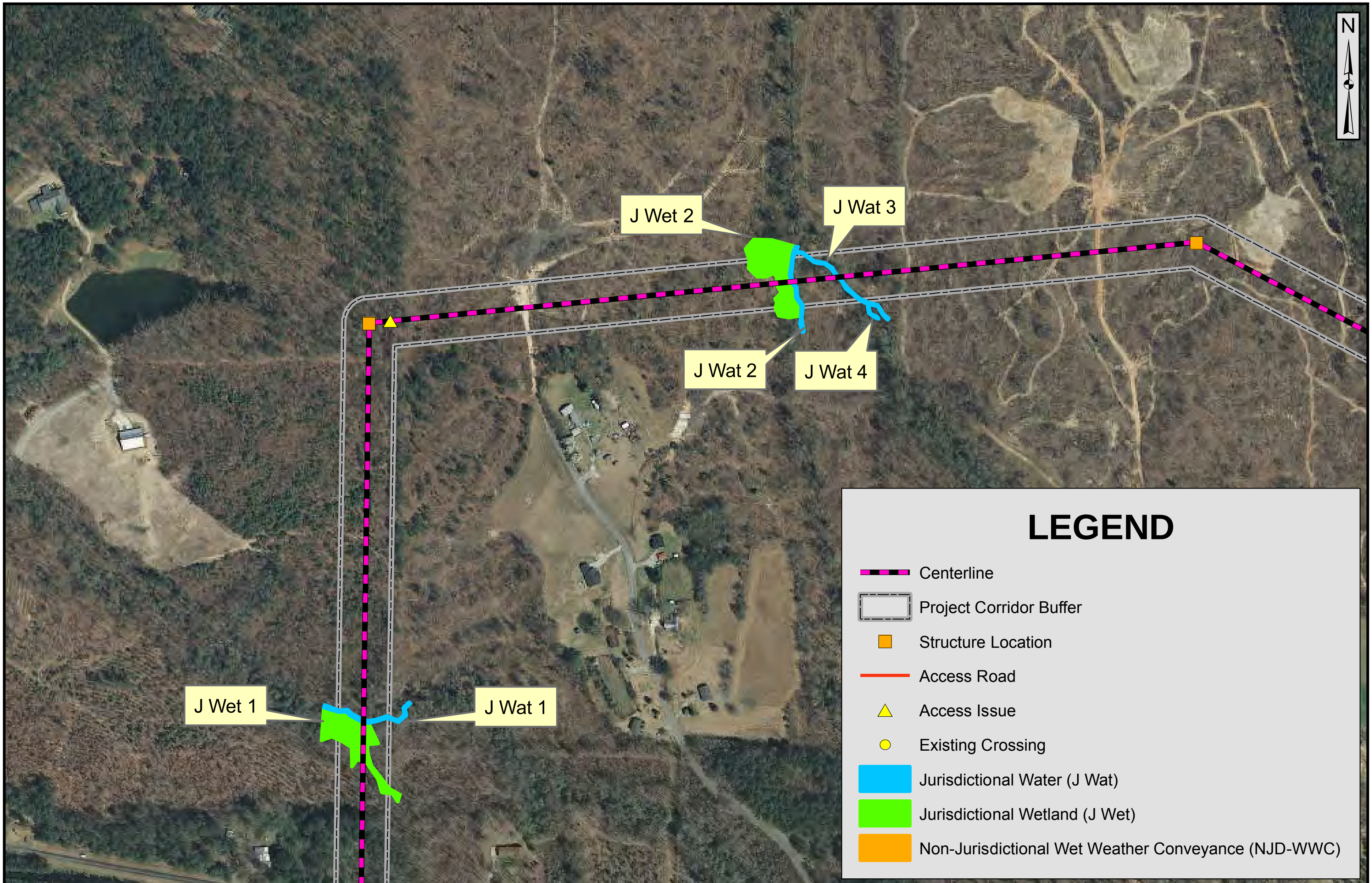


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

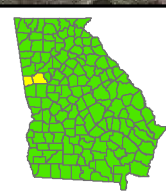
Date: September 2011
Scale: Not to Scale
Proj. No.: EGXH2400

Figure 4 Index



Georgia Transmission

JACOBS

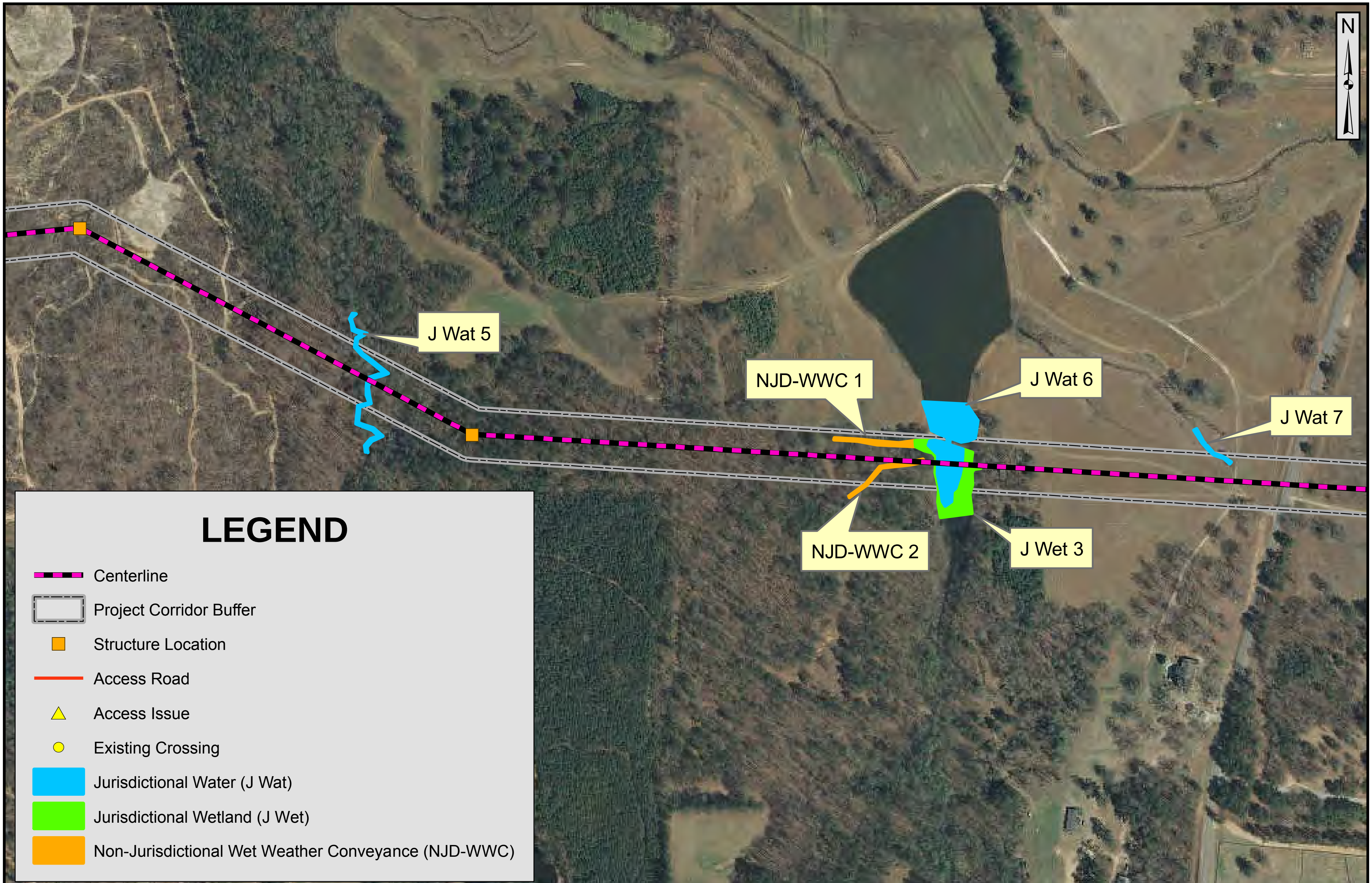


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

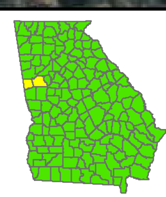
Date: September 2011
Scale: 1" = 400'
Proj. No.: EGXH2400

Figure 4a



GeorgiaTransmission

JACOBS



Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

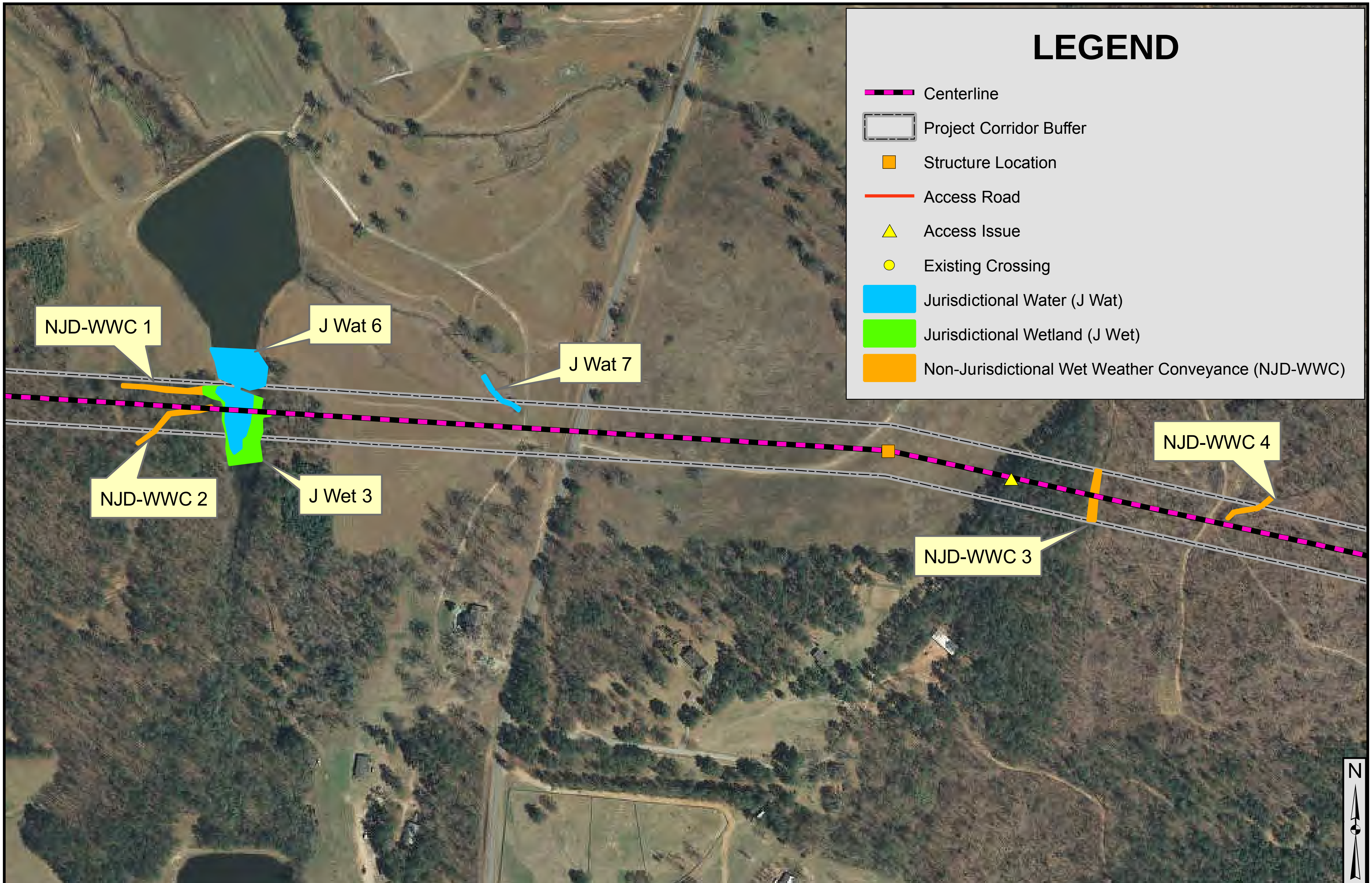
Jurisdictional Features Map

Date: September 2011

Scale: 1" = 400'

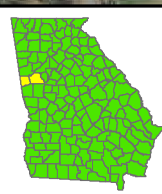
Proj. No.: EGXH2400

Figure 4b



Georgia Transmission

JACOBS



Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

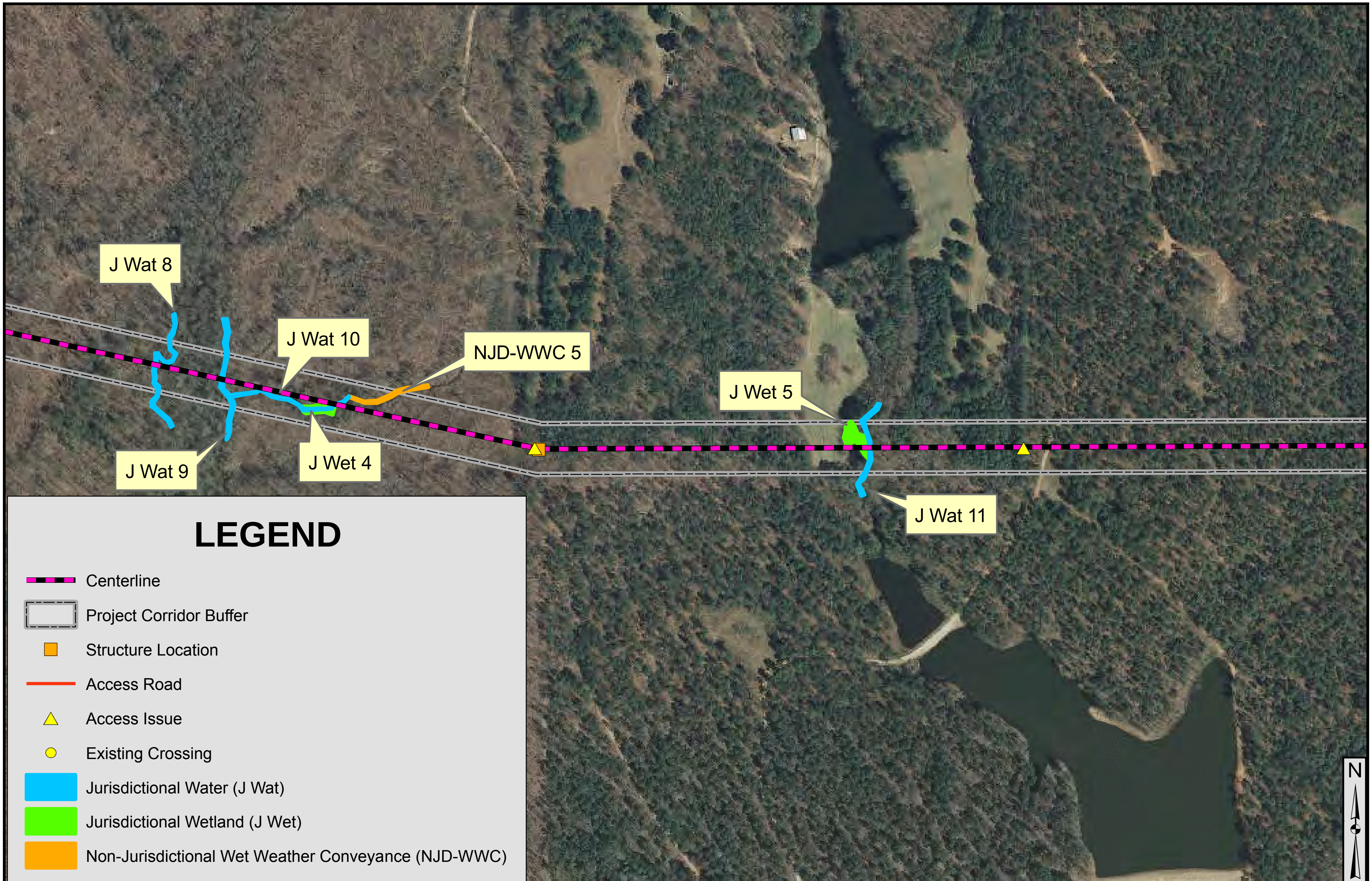
Jurisdictional Features Map

Date: September 2011

Scale: 1" = 400'

Proj. No.: EGXH2400

Figure 4c



LEGEND

- Centerline
- Project Corridor Buffer
- Structure Location
- Access Road
- Access Issue
- Existing Crossing
- Jurisdictional Water (J Wat)
- Jurisdictional Wetland (J Wet)
- Non-Jurisdictional Wet Weather Conveyance (NJD-WWC)

Georgia Transmission

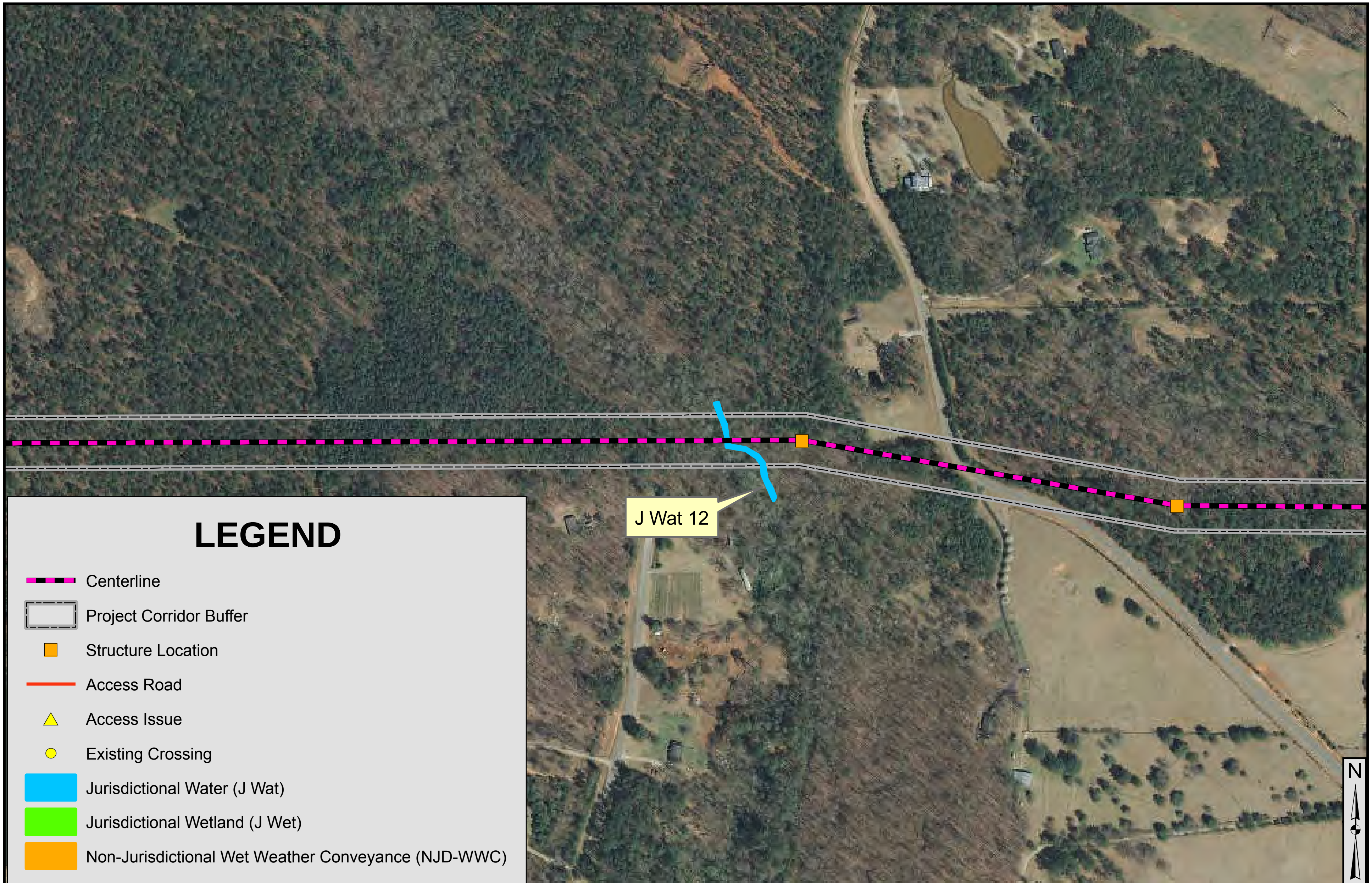
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

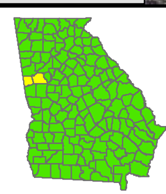
Date: September 2011
Scale: 1" = 400'
Proj. No.: EGXH2400

Figure 4d



Georgia Transmission

JACOBS

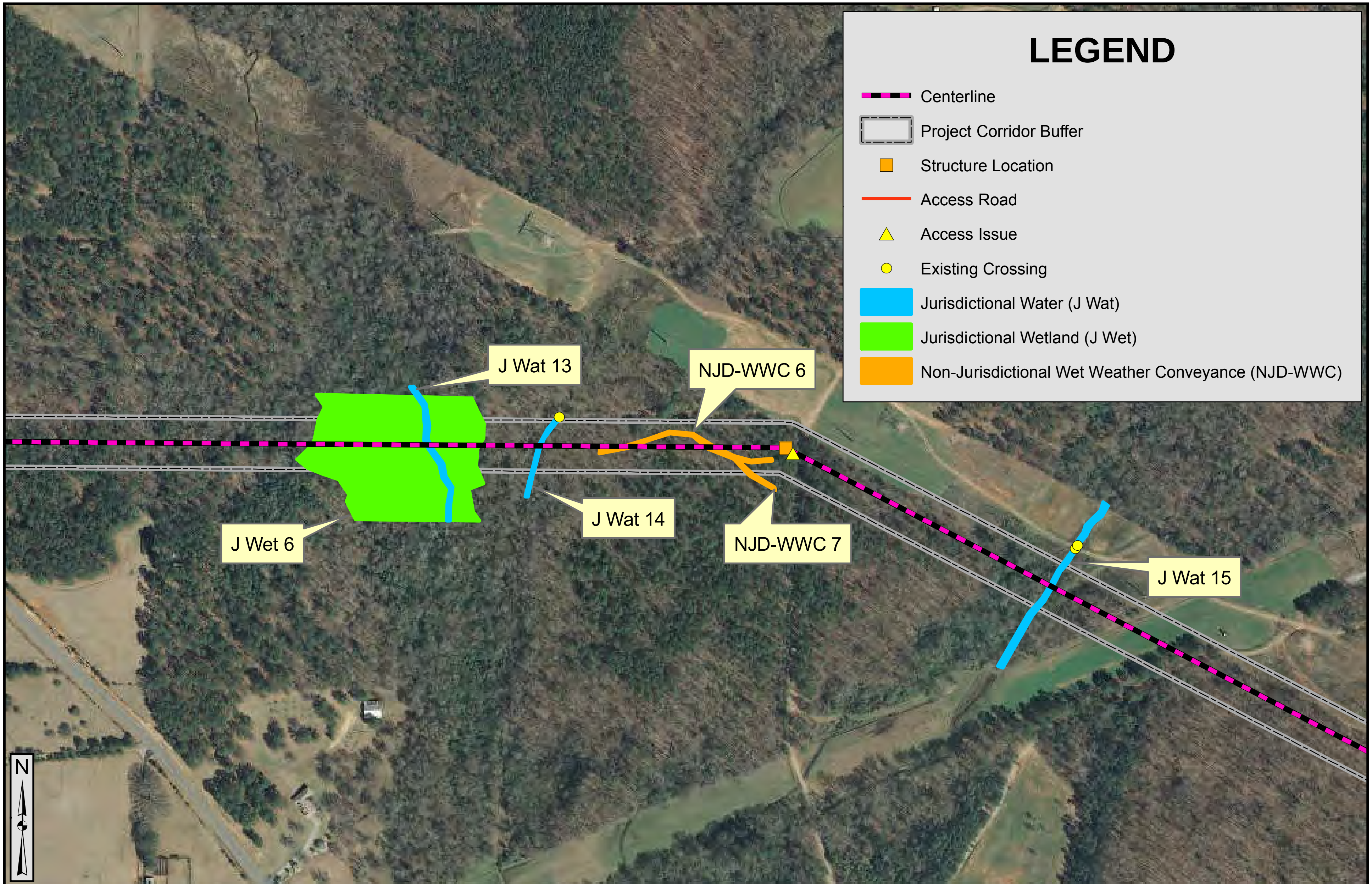


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

Date:	September 2011
Scale:	1" = 400'
Proj. No.:	EGXH2400

Figure 4e



GeorgiaTransmission

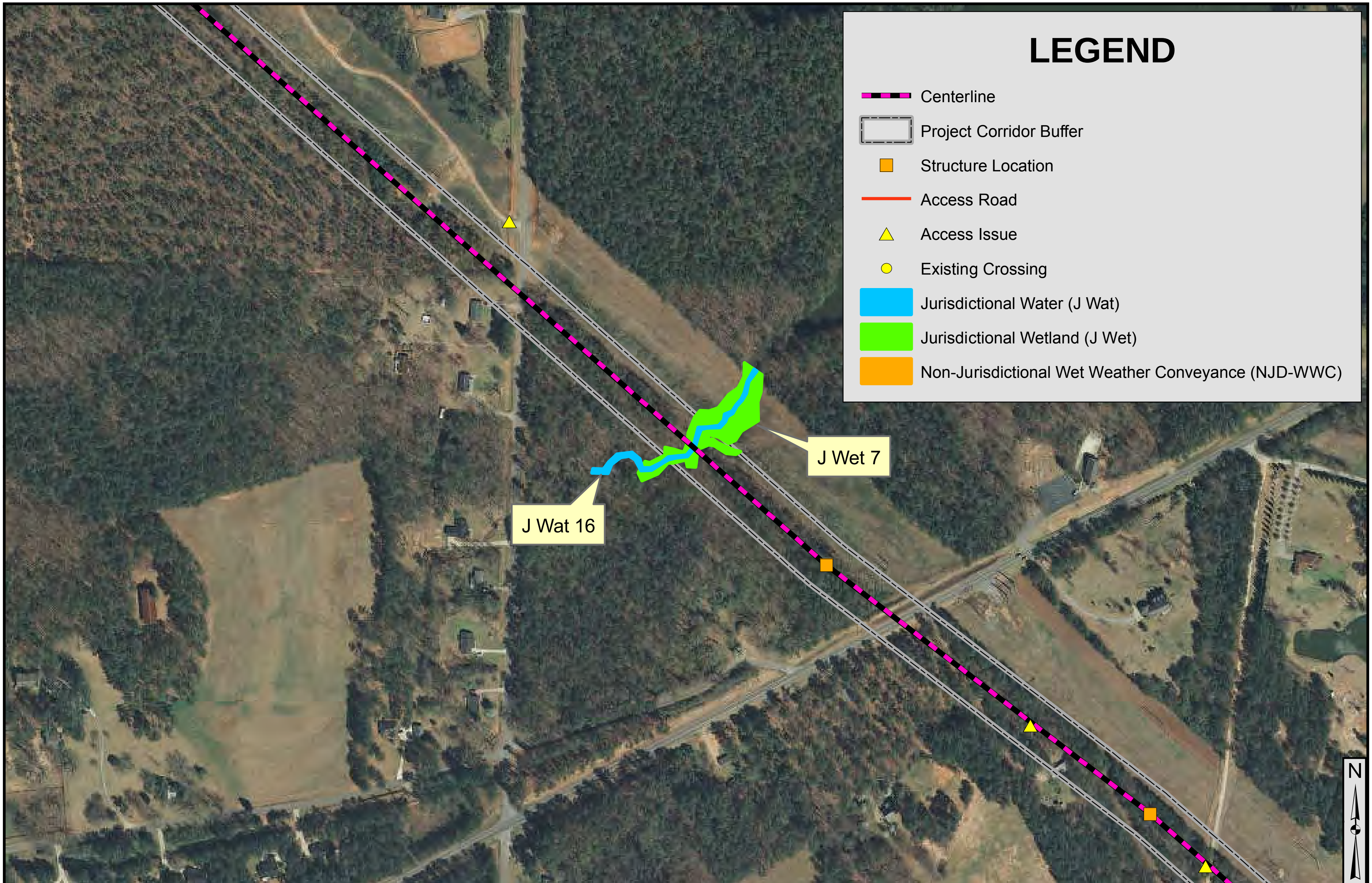
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

Date: September 2011
Scale: 1" = 400'
Proj. No.: EGXH2400

Figure 4f



Georgia Transmission

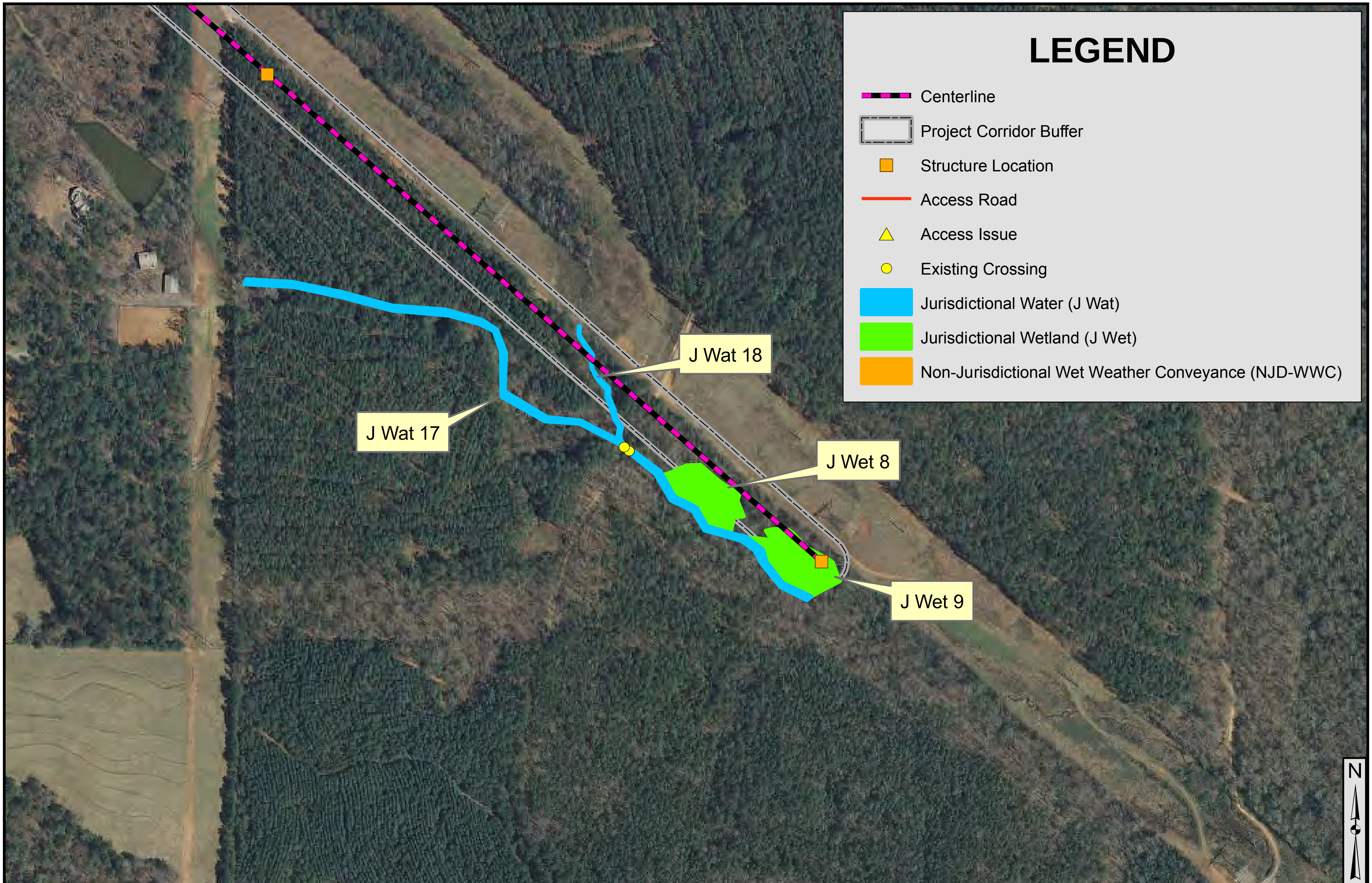
JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

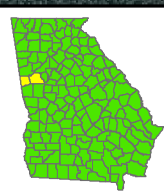
Date: September 2011
Scale: 1" = 400'
Proj. No.: EGXH2400

Figure 4g



Georgia Transmission

JACOBS

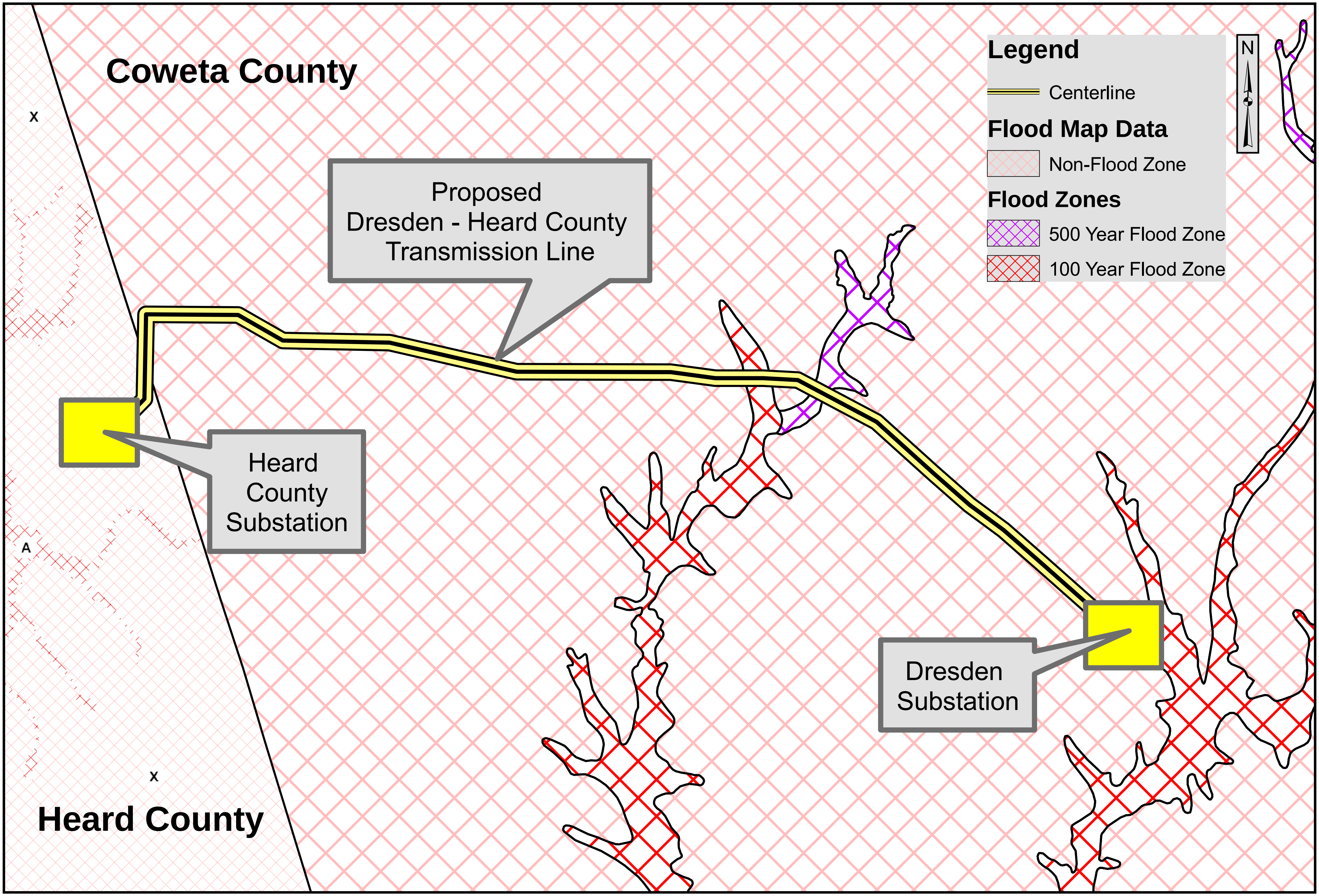


Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Jurisdictional Features Map

Date:	September 2011
Scale:	1" = 400'
Proj. No.:	EGXH2400

Figure 4h



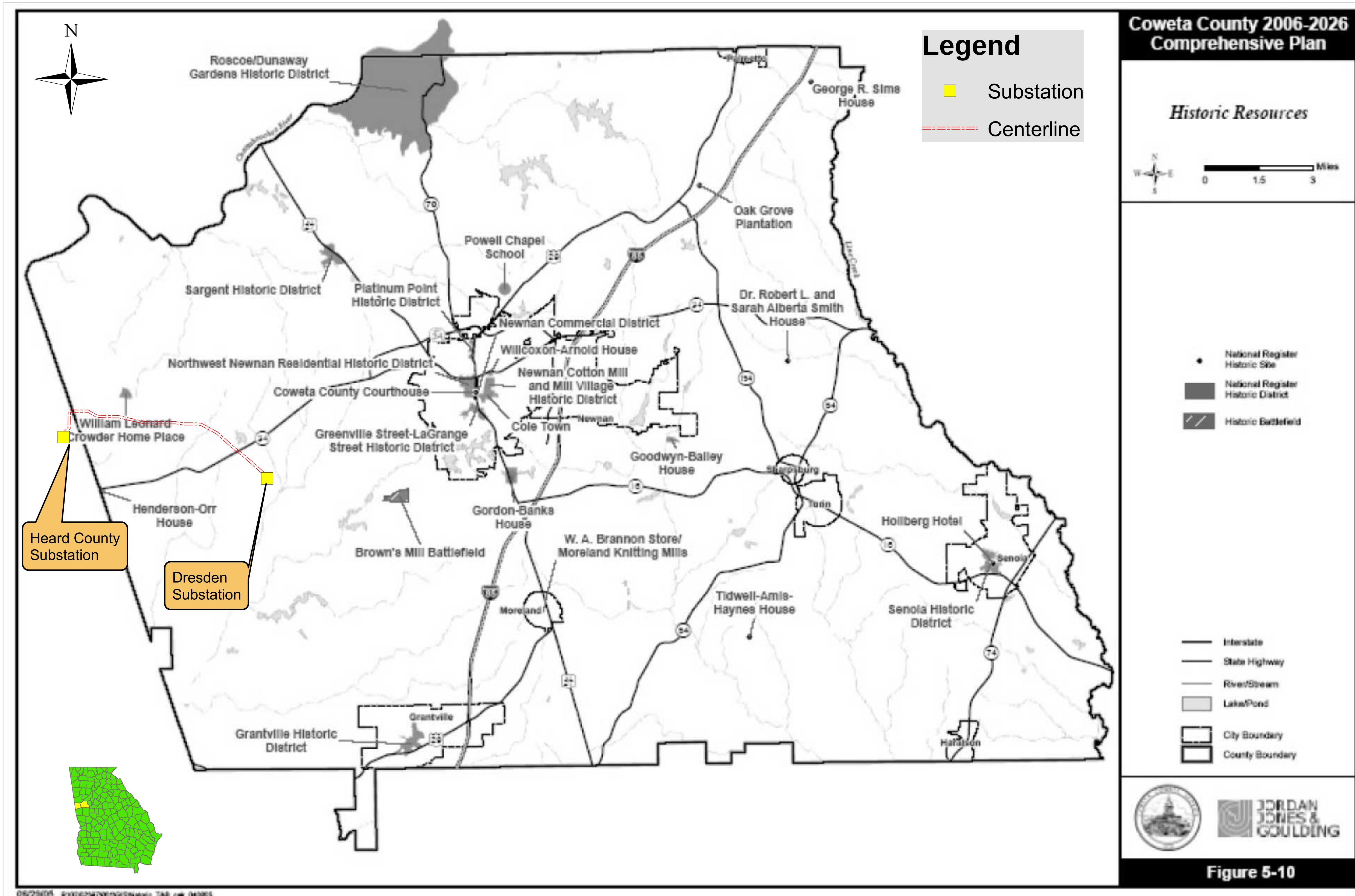
GeorgiaTransmission JACOBS

Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia
Flood Map

Date: February 2012
Scale: Not To Scale
Proj. No.: EGXH2400

Figure 5

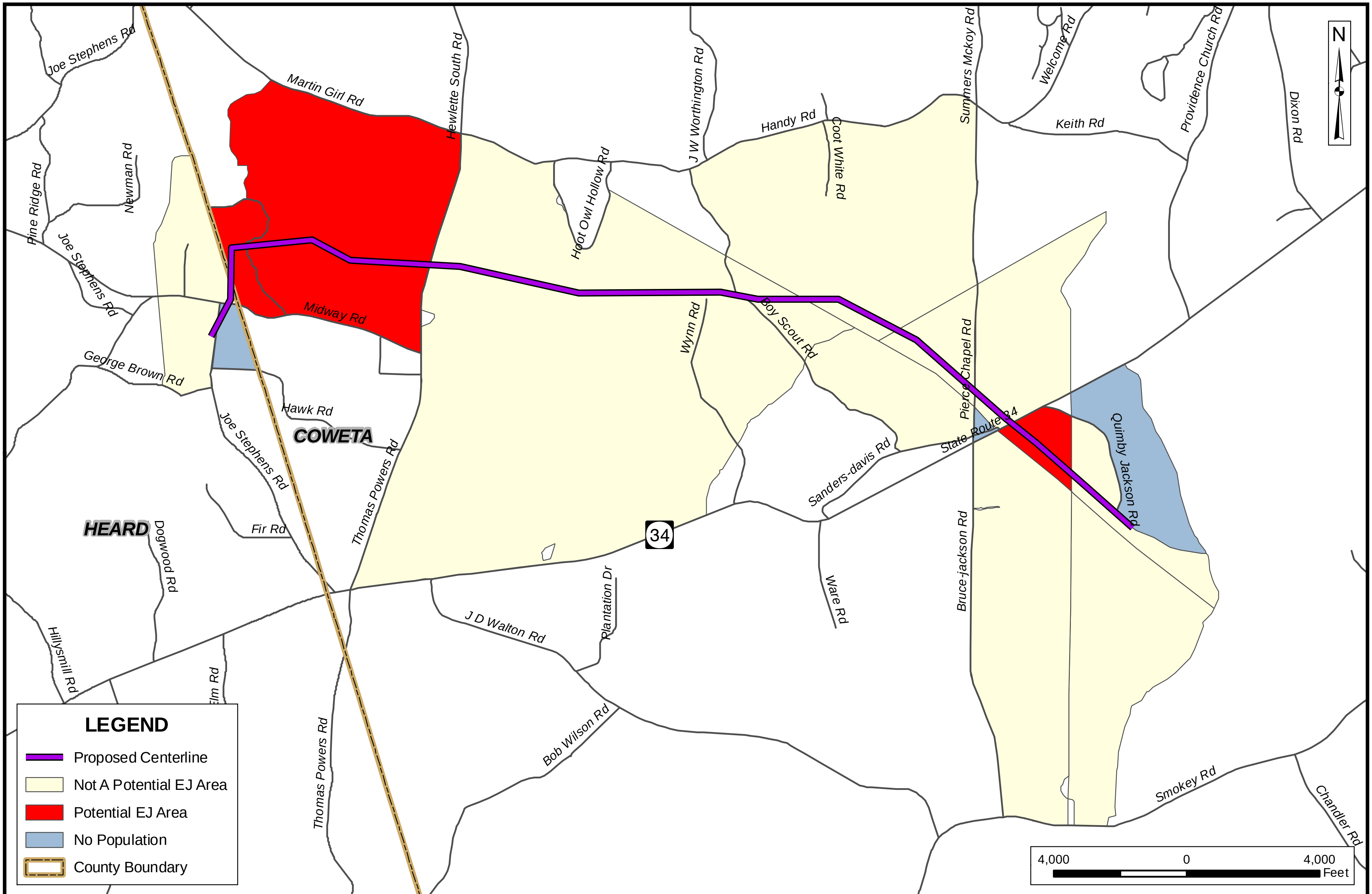
Heard County Flood Data was not available in the DFIRM database. Therefore the spatial projection of Heard County Flood Data does not evenly match the spatial projection of Coweta County Flood Data.



Dresden - Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia
Historic Resources Map Coweta County

Date: February 2012
Scale: Not To Scale
Proj. No.: EGXH2400

Figure 6



Georgia Transmission

JACOBS

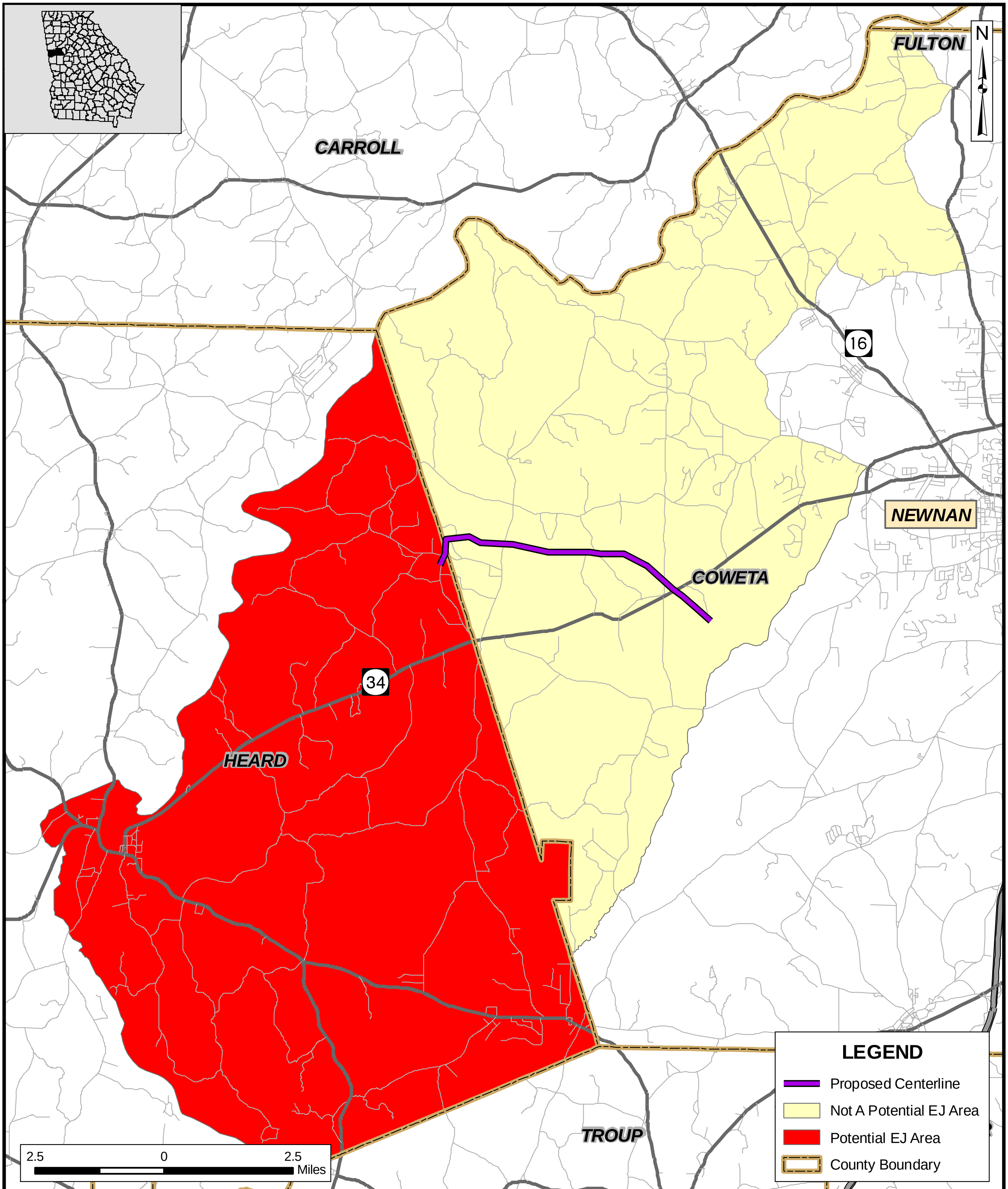
Dresden-Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Environmental Justice Analysis
Minority Populations

Date:	Nov. 2011
Scale:	1" = 4,000'
Proj. No.:	

Figure 7a

COWETA AND HEARD COUNTIES



Georgia Transmission

JACOBS

Dresden-Heard County 500 kV Transmission Line
Coweta and Heard Counties, Georgia

Environmental Justice Analysis
Low Income Populations

Date:	Nov. 2011
Scale:	1" = 2.5 mi
Proj. No.:	

Figure 7b

Jacobs Engineering Group Inc.

6801 Governors Lake Parkway
Building 200
Norcross, GA 30071 USA
T 1.770.455.8555 | F 1.770.455.7391

Date 2011

CERTIFIED MAIL

Address

Dear

Subject: Notice of Intent to Construct the Dresden – Heard County 500 kV Transmission Line
Tax Parcel #:

A recent study revealed that electric circuits serving North West Georgia will reach capacity by 2014. Georgia Transmission Corporation, the transmission service provider for Georgia's Electric Membership Corporations, plans to construct the new Dresden – Heard County 500 kV Transmission Line to ensure that homes and businesses in this area will continue to have reliable electric service.

The result of this search revealed that the transmission line right-of-way, as planned, could cross your property. In order for you to have an opportunity to learn more about this project and express your views, public open house meetings have been scheduled. The open house meetings will be on Tuesday, May 24, 2011 at The Church of God of the Union Assembly, 3821 Highway 34 West, Newnan, Georgia, 30263. We invite you to drop in whenever it is convenient between the hours of 2:00 – 4:00 p.m. or 6:00 – 8:00 p.m.

A copy of the Notice of Intent that was published in the Coweta County Times Herald during the week of April 11, 2011 announcing the meeting is enclosed for your information and is incorporated herein by reference. Also enclosed is a map depicting the general route of the planned transmission line. Please give me a call at 800 241-5374, ext. 7741 or 770 270-7741 if you have any questions.

Sincerely,

Jeannine Haynes
Sr. Public Relations Representative

JH:hd

Enclosures: Notice of Intent, location map

Notice of Intent to Construct the Dresden – Heard County 500 kV Transmission line

Pursuant to O.C.G.A. § 22-3-160 you are hereby notified of certain rights afforded by law concerning a proposed 500 kV electric transmission line to be constructed in Coweta County and Heard County. Georgia Transmission Corporation (GTC), along with other members of Georgia's Integrated Transmission System, continuously monitor and assess the performance and capability of Georgia's electric system. A recent evaluation revealed that the electric system serving North West Georgia will exceed its operating capacity under high load conditions by the summer of 2014. In order to address these issues, GTC plans to construct the Dresden – Heard County 500 kV Transmission Line in the area of the preferred route set forth below.

GTC will conduct public open house meetings concerning this project in Coweta County. The open house meetings will be held from 2:00 – 4:00 p.m. and 6:00 to 8:00 p.m. on Tuesday, May 24, 2011 at The Church of God of the Union Assembly, 3821 Highway 34 West, Newnan, GA 30263.

The purpose of the open house meetings is to provide public notice of GTC's intent to acquire easements for and to construct the Dresden – Heard County 500 kV Transmission Line for which the right of eminent domain may be exercised. GTC representatives will be on hand to provide information and take questions and comments about the project.

The general route of the 5.75 mile transmission line will run in a northerly direction from the Heard County Power Substation to the vicinity of the Coweta County line, then in an easterly direction to the Dresden – Yellow Dirt 230 kV T/L and the O'Hara – Wansley 500 kV T/L. From this point the new transmission line will parallel the existing transmission lines to the Dresden Substation.

The transmission line is located in Heard County, Districts 3 and 4, Land Lots 148 and 205 and in Coweta County, Districts 3 and 4, Land Lots 66, 67, 69, 70, 71, 86, 101, 102, 103, 104, 105, 124, 137, 147, 148 and 169 .

The transmission line will require easements 150 – 180 feet wide. In addition to the transmission line easement, GTC will also require rights to cut and remove dead, diseased and weak or leaning trees located within 10 to 30 foot "danger tree" easements located adjacent to the transmission line right-of-way. GTC may also seek to acquire 30 foot wide non-exclusive rights of access off the transmission line right-of-way to construct and maintain the transmission line.

This preferred route was selected after consideration of existing land uses in the geographic area where the line is to be located, existing corridors, existing environmental conditions in the area, engineering practices relating to the construction and operation of the line, and costs relating to the construction, operation, and maintenance of the line.

The proposed construction approach for this transmission line is overhead construction using delta configured steel lattice towers. This approach was chosen because it meets the engineering, construction, operational, environmental, schedule, cost, electrical, and reliability requirements of the project. Alternative construction approaches considered but rejected were:

(1) Option 1: No Build/Take No Action
- This option was rejected because by the summer of 2014 contingency loading on area transmission facilities is projected to reach a level that can not be addressed through switching operations or limited capital improvement.
- This option would lead to curtailment of the generation output at Wansley CC 7 facility.

(2) Option 2: Wansley – Villa Rica 500 kV Line #2.
- Construct a 2nd Wansley – Villa Rica 500 kV line (25 miles)
- Re-conductor O'Hara- Jonesboro 230 kV Line (9 miles)
- Upgrade O'Hara- Jonesboro 230 kV Line termination equipment
- Upgrade Union City – Villa Rica 500 kV line termination equipment

Implementing this option requires 6 years and does not meet the required in-service date for longer-term transmission improvements (2014).

(3) Option 3: Wansley – Union City 500 kV Line.
- Construct a Wansley – Union City 500 kV line (40 miles)
- Re-conductor Union City – East Point 230 kV lines #1-2
- Upgrade Union City – Morrow 230 kV lines #1-2 termination equipment
- Upgrade Klondike- Morrow 230 kV line termination equipment

Implementing this option requires 8 years and does not meet the required in-service date for longer-term transmission improvements (2014).

(4) Option 4: Wansley – Yellow Dirt 500 kV Line.
- Install a 500/230kV transformer at Yellow Dirt substation
- Construct a 500 kV line from Wansley to Yellow Dirt (1 mile)
- Re-conductor Union City – Yates 230 kV line (23 miles)
- Re-conductor Yellow Dirt –Bright Star 230 kV line (20 miles).

Implementing this option requires 5 years and does not meet the required in-service date for longer-term transmission improvements (2014).

(5) Option 5a & 5b: Heard County – Dresden 230 kV Lines.
- Install a 500/230kV transformer at Heard County substation
- Install a 2% series reactor on the Dresden – Yates 230 kV line
- Option 5a: Construct <u>three</u> Heard County to Dresden 230 kV lines using 1351 ACSR conductor (three 6-mile lines) **or**
- Option 5b: Construct <u>two</u> Heard County to Dresden 230 kV lines using bundled 795 ACSR 230 kV lines from (two 6-mile lines)

Implementing option 5a or 5b requires a significant increase in the acquisition of Right-of-Ways (over the preferred option) and does not meet the required in-service date for longer-term transmission improvements (2014).

(6) Option 6: Wansley – Union City 230 kV Line.

- Install a 500/230kV transformer at Wansley substation
- Construct a 230 kV line from Wansley to Union City (40 miles)
- Reconductor the following lines
  - Union City – East Point 230 kV line (black)
  - Union City - East Point 230 kV line (White)
  - Union City – Morrow 230 kV line (black)
  - Union City – Morrow 230 kV line (white)
  - East Point – Adamsville 230 kV line (7 miles)
- Upgrade Klondike – Morrow 230 kV line termination equipment
- Replace East Point 230/115 kV transformer

Implementing this option requires 7 years and does not meet the required in-service date for longer-term transmission improvements (2014).

(7) Underground construction of the transmission line using buried cable in conduit encased in concrete: This approach was rejected because of greater environmental impact due to more soil disturbance than overhead construction, decreased reliability due to excessive restoration time and the lifetime cost of underground construction being significantly greater than the lifetime cost of overhead construction.

Representatives of Georgia Transmission Corporation will contact property owners that are directly affected by the construction of this transmission line. Clearing for the transmission line is scheduled to begin in the fourth quarter of 2012. It is scheduled to be ready for service by the second quarter of 2014.

Georgia Transmission Corporation is available to answer any questions that you may have about the new Transmission Line. Please call the Jeannine Haynes at 770-270-7741 or 800 241-5374, ext. 7741 for further information.

Date 2011

CERTIFIED MAIL

Address

Dear

Subject: Notice of Intent to Construct the Dresden – Heard County 500 kV Transmission Line
Tax Parcel #:

A recent study revealed that electric circuits serving North West Georgia will reach capacity by 2014. Georgia Transmission Corporation, the transmission service provider for Georgia's Electric Membership Corporations, plans to construct the new Dresden – Heard County 500 kV Transmission Line to ensure that homes and businesses in this area will continue to have reliable electric service.

The result of this search revealed that the transmission line right-of-way, as planned, could cross your property. In order for you to have an opportunity to learn more about this project and express your views, a public open house meeting has been scheduled. The open house meeting will be on Tuesday, May 17, 2011 at Three Rivers Regional Commission, 13273 GA Hwy 34 East, Franklin, GA 30217. We invite you to drop in whenever it is convenient between the hours of 6:00 – 8:00 p.m.

A copy of the Notice of Intent that was published in the Heard County News and Banner during the week of April 11, 2011 announcing the meeting is enclosed for your information and is incorporated herein by reference. Also enclosed is a map depicting the general route of the planned transmission line. Please give me a call at 800 241-5374, ext. 7741 or 770 270-7741 if you have any questions.

Sincerely,

Jeannine Haynes
Sr. Public Relations Representative

JH:hd

Enclosures: Notice of Intent, location map

<u>Notice of Intent to Construct the Dresden – Heard County 500 kV Transmission line</u>

Pursuant to O.C.G.A. § 22-3-160 you are hereby notified of certain rights afforded by law concerning a proposed 500 kV electric transmission line to be constructed in Coweta County and Heard County. Georgia Transmission Corporation (GTC), along with other members of Georgia's Integrated Transmission System, continuously monitor and assess the performance and capability of Georgia's electric system. A recent evaluation revealed that the electric system serving North West Georgia will exceed its operating capacity under high load conditions by the summer of 2014. In order to address these issues, GTC plans to construct the Dresden – Heard County 500 kV Transmission Line in the area of the preferred route set forth below.

GTC will conduct a public open house meeting concerning this project in Heard County. The open house meeting will be held from 6:00 to 8:00 p.m. on Tuesday, May 17, 2011 at Three Rivers Regional Commission, 13273 GA Hwy East, Franklin, Georgia 30217.

The purpose of the open house meeting is to provide public notice of GTC's intent to acquire easements for and to construct the Dresden – Heard County 500 kV Transmission Line for which the right of eminent domain may be exercised. GTC representatives will be on hand to provide information and take questions and comments about the project.

The general route of the 5.75 mile transmission line will run in a northerly direction from the Heard County Power Substation to the vicinity of the Coweta County line, then in an easterly direction to the Hollingsworth Ferry – Yellow Dirt 230 kV T/L and the O'Hara – Wansley 500 kV T/L. From this point the new transmission line will parallel the existing transmission lines to the Dresden Substation.

The transmission line is located in Heard County, [[GMD 1167, 1168 and 1169]] and [[ ]] in Coweta County.

The transmission line will require easements 150 – 180 feet wide. In addition to the transmission line easement, GTC will also require rights to cut and remove dead, diseased and weak or leaning trees located within 10 to 30 foot "danger tree" easements located adjacent to the transmission line right-of-way. GTC may also seek to acquire 30 foot wide non-exclusive rights of access off the transmission line right-of-way to construct and maintain the transmission line.

This preferred route was selected after consideration of existing land uses in the geographic area where the line is to be located, existing corridors, existing environmental conditions in the area, engineering practices relating to the construction and operation of the line, and costs relating to the construction, operation, and maintenance of the line.

The proposed construction approach for this transmission line is overhead construction using delta configured steel lattice towers. This approach was chosen because it meets the engineering, construction, operational, environmental, schedule, cost, electrical, and reliability requirements of the project. Alternative construction approaches considered but rejected were:

(1) Option 1: No Build/Take No Action

- This option was rejected because by the summer of 2014 contingency loading on area transmission facilities is projected to reach a level that can not be addressed through switching operations or limited capital improvement.
- This option would lead to curtailment of the generation output at Wansley CC 7 facility.

(2) Option 2: Wansley – Villa Rica 500 kV Line #2.

- Construct a 2nd Wansley – Villa Rica 500 kV line (25 miles)
- Re-conductor O'Hara- Jonesboro 230 kV Line (9 miles)
- Upgrade O'Hara- Jonesboro 230 kV Line termination equipment
- Upgrade Union City – Villa Rica 500 kV line termination equipment

Implementing this option requires 6 years and does not meet the required in-service date for longer-term transmission improvements (2014).

(3) Option 3: Wansley – Union City 500 kV Line.

- Construct a Wansley – Union City 500 kV line (40 miles)
- Re-conductor Union City – East Point 230 kV lines #1-2
- Upgrade Union City – Morrow 230 kV lines #1-2 termination equipment
- Upgrade Klondike- Morrow 230 kV line termination equipment

Implementing this option requires 8 years and does not meet the required in-service date for longer-term transmission improvements (2014).

(4) Option 4: Wansley – Yellow Dirt 500 kV Line.

- Install a 500/230kV transformer at Yellow Dirt substation
- Construct a 500 kV line from Wansley to Yellow Dirt (1 mile)
- Re-conductor Union City – Yates 230 kV line (23 miles)
- Re-conductor Yellow Dirt –Bright Star 230 kV line (20 miles).

Implementing this option requires 5 years and does not meet the required in-service date for longer-term transmission improvements (2014).

(5) Option 5a & 5b: Heard County – Dresden 230 kV Lines.

- Install a 500/230kV transformer at Heard County substation
- Install a 2% series reactor on the Dresden – Yates 230 kV line
- Option 5a: Construct <u>three</u> Heard County to Dresden 230 kV lines using 1351 ACSR conductor (three 6-mile lines) **or**
- Option 5b: Construct <u>two</u> Heard County to Dresden 230 kV lines using bundled 795 ACSR 230 kV lines from (two 6-mile lines)

Implementing option 5a or 5b requires a significant increase in the acquisition of Right-of-Ways (over the preferred option) and does not meet the required in-service date for longer-term transmission improvements (2014).

(6) Option 6: Wansley – Union City 230 kV Line.
- Install a 500/230kV transformer at Wansley substation
- Construct a 230 kV line from Wansley to Union City (40 miles)
- Reconductor the following lines
    - Union City – East Point 230 kV line (black)
    - Union City - East Point 230 kV line (White)
    - Union City – Morrow 230 kV line (black)
    - Union City – Morrow 230 kV line (white)
    - East Point – Adamsville 230 kV line (7 miles)
- Upgrade Klondike – Morrow 230 kV line termination equipment
- Replace East Point 230/115 kV transformer

Implementing this option requires 7 years and does not meet the required in-service date for longer-term transmission improvements (2014).

(7) Underground construction of the transmission line using buried cable in conduit encased in concrete: This approach was rejected because of greater environmental impact due to more soil disturbance than overhead construction, decreased reliability due to excessive restoration time and the lifetime cost of underground construction being significantly greater than the lifetime cost of overhead construction.

Representatives of Georgia Transmission Corporation will contact property owners that are directly affected by the construction of this transmission line. Clearing for the transmission line is scheduled to begin in the fourth quarter of 2012. It is scheduled to be ready for service by the second quarter of 2014.

Georgia Transmission Corporation is available to answer any questions that you may have about the new Transmission Line. Please call the Jeannine Haynes at 770-270-7741 or 800 241-5374, ext. 7741 for further information.

In The Matter Of:

Dresden-Heard County 500 kV Transmission Line
Public Information Meeting - 6:00 P.M.

Three Rivers Regional Commission
May 17, 2011

American Court Reporting Company, Inc.
52 Executive Park South
Suite 5201
Atlanta, Georgia 30329-2217
(404) 892-1331 - (800) 445-2842

Original File 62942.TXT

Min-U-Script® with Word Index

DRESDEN-HEARD COUNTY 500 kV TRANSMISSION LINE

PUBLIC INFORMATION MEETING

MAY 17TH, 2001

6:00 P.M.

P R O C E E D I N G S

The time is 6:00 p.m., May 17th, 2011. Georgia Transmission Coroporation's public information meeting for the Dresden-Heard County 500 kV Transmission Line has begun.

The Meeting is being held at Three Rivers Regional Commission, 13273 Georgia Highway 34 East, Franklin, Heard County, Georgia.

Georgia Transmission Corporation has arranged for seven tables where property owners may ask questions of subject matter experts. A sign-in sheet is being used at the door. In addition to asking questions and make oral comments, individuals may submit questions or statements in writing on forms provided, or they may request the court reporter present to take down questions and comments. Information brochures on the Dresden-Heard County 500 kV Transmission Line project are available for the public.

Subject matter experts are:

Herb Payne - Project Manager; Quan Fan - Transmission Line Design; Christy Johnson - Environmental Compliance; Tony Chaapel - Land and Legal Rights Coordinator; Donald Enderle - PhotoScience Map Coordination; Mike Shelley - Maintenance; Rob Wiley - Area Planning; Jeannine Haynes - External Affairs.

ORAL COMMENTS:

MR. JOE NEWNAN: I'm mad at the power line. Rather it go somewhere else. But not possible. I want to be treated like a decent human being. I do not want to pay or be stepped on for getting power to somebody else. That's it in a nut shell when you put it right there because people they get run over by power lines like this. Just run over them and not treated right. They promise to surprise me and I told them, yeah, I'll be surprised negatively I'm sure. If it's positive that's great, but I don't expect it. I think I said enough over there. Well, I'll be at the next meeting. I know all these guys got to do their jobs, but this whole thing looks like a poor planning thing to me. That's good enough.

CLOSING STATEMENT:

The time is 8:00 p.m. and the public information meeting for the Dresden-Heard County 500 kV Transmission Line has concluded. Approximately two individuals from the area visited after the meeting opened at 6:00 p.m.

C E R T I F I C A T E

STATE OF GEORGIA
COUNTY OF HEARD

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This the 17th day of May, 2011.

YORANDA N. SAID, CCR # 2758

DRESDEN-HEARD COUNTY 500 kV TRANSMISSION LINE

PUBLIC INFORMATION MEETING

MAY 17TH, 2001

6:00 P.M.

American Court Reporting Company, Inc.

52 Executive Park South, Suite 5201
Atlanta, Georgia 30329

404-892-1331 800-445-2842

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DRESDEN-HEARD COUNTY 500 kV TRANSMISSION LINE

PUBLIC INFORMATION MEETING

The Church of God of the Union Assembly

3821 GA Hwy 34 West

Newnan, Georgia 30263

May 24th, 2011

2:00 P.M.

American Court Reporting Company, Inc.

52 Executive Park South, Suite 5201
Atlanta, Georgia 30329

404-892-1331

800-445-2842

ORAL COMMENTS:

MR. W. DAVID STEPHENS: Basically what I was wanting them to do is evaluate an alternate route from the one that they have proposed. It would be Route 28 to 21 to 44 to 16. And the primary reason for that is to get it on the back of my property so that when I do build down there the line won't be right at my front door or back door. It'll be toward the back. We also discussed this with Mr. Bill Calloway who was here earlier. Was it Jessie Calloway or Bill Calloway? Jessie Calloway. And he was in agreement with that also. He's my neighbor.

THE COURT REPORTER: Okay. Anything else?

MR. W. DAVID STEPHENS: That's done.

THE COURT REPORTER: Okay. Thank you.

CLOSING STATEMENT:

The time is 4:00 p.m. and the public information meeting for the Dresden-Heard County 500 kV Transmission Line has concluded. Approximately 15 individuals from the area visited after the meeting opened at 2:00 p.m.

OPENING STATEMENT:

The time is 2:00 p.m., May 24th, 2011. Georgia Transmission Coroporation's public information meeting for the Dresden-Heard County 500 kV Transmission Line has begun.

The Meeting is being held at The Church of God of the Union Assembly, 3821 Highway 34 West, Newnan, Coweta County, Georgia.

Georgia Transmission Corporation has arranged for seven tables where property owners may ask questions of subject matter experts. A sign-in sheet is being used at the door. In addition to asking questions and making oral comments, individuals may submit questions or statements in writing on forms provided, or they may request the court reporter present to take down questions and comments. Information brochures on the Dresden-Heard County 500 kV Transmission Line project are available for the public.

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C E R T I F I C A T E

STATE OF GEORGIA
COUNTY OF COWETA

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Yoranda N. Said

YORANDA N. SAID, CCR # 2758

CERTIFIED COURT REPORTER STATE OF GEORGIA 1776 2758

In The Matter Of:

Dresden-Heard County 500 kV Transmission Line

Public Information Meeting - 2:00 P.M.

The Church of God of the Union Assembly

May 24, 2011

American Court Reporting Company, Inc.

52 Executive Park South

Suite 5201

Atlanta, Georgia 30329-2217

(404) 892-1331 - (800) 445-2842

Original File 62943-1.TXT

Min-U-Script® with Word Index

DRESDEN-HEARD COUNTY 500 kV TRANSMISSION LINE

PUBLIC INFORMATION MEETING

The Church of God of the Union Assembly

3821 GA Hwy 34 West

Newnan, Georgia 30263

May 24th, 2011

2:00 P.M.

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DRESDEN-HEARD COUNTY 500 kV TRANSMISSION LINE

PUBLIC INFORMATION MEETING

The Church of God of the Union Assembly

3821 GA Hwy 34 West

Newnan, Georgia 30263

May 24th, 2011

6:00 P.M.

American Court Reporting Company, Inc.

52 Executive Park South, Suite 5201
Atlanta, Georgia 30329

404-892-1331 800-445-2842

P R O C E E D I N G S

The time is 6:00 p.m., May 24th, 2011. Georgia Transmission Coroporation's public information meeting for the Dresden-Heard County 500 kV Transmission Line has begun.

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ORAL COMMENTS:

MR. MITCH HEADLEY: I'm Mitch Headley with Coweta Recreation, Inc. I would like to see the alignment moved to where it splits. Instead of being on my property Coweta Recreation I wanted it to be split the property line between Coweta Recreation and Sweet Bay Farms. Also in that we use the property for camping and trees are important, we would like to see an access road go across the creek all weather with a culvert or other type of crossing suitable as well as gravel on the road so we can access the back of the property during all weather, most weather. That's it.

MR. T.M. RUBINO: All right. I've already got wrecked on the back of my property. There's lattice power lines there. They expanded I guess one of the other power companies I can't remember who it was. I been there 29 years, 28 and a half. They expanded with the concrete poles so they're within a 100 feet of my back door from my porch. And now they're going to run these lattice towers -- I have lattice and concrete behind me now they're going to run lattice towers to the left of me about a thousand feet from the front corner of my property -- yeah, about a thousand feet to the left or east side of me on the front side of my property.

So basically I'm going to be triangulated in the middle of a substation is what I feel like which anyone that even remotely was interested in purchasing my place is going to drive under power lines from either side and that's the first thing they're going to see before they pull to my mailbox. So I think it's extremely disgruntling that I poured my heart and soul in this place and it's just it looks like a substation. You know what I mean? So I'm disgusted with it. I know everybody's got to have power including myself, but enough is enough. Then when they drop the trees -- then they drop these trees on the right-a-ways with their pretty much probably I don't know how many of them a legal immigrants because I went out there and talk to them, they drop them right into my yard heading toward the house. All these trees that they have this paragraph that I have highlighted about.

COURT REPORTER: Any other comments?

MR. T. M. RUBINO: No.

MR. DAVID PAYTON: I'll try to keep it clean. I've been on this land all my life. My sons live on it. My grand kids live on it. My son has built one house close to the power line now which would be maybe 400 feet from the line. My other son is in the process of building a house which would be without measuring it somewhere around 200 feet from the power line. I don't think it is fun [sic], medically sound to have a power line under there. This property has been in the family for 100 years and we thought we didn't have any problems with whether our kids could play, ride motorcycles, hunt, fish, and that. This is going to affect it tremendously if in the future that my sons wanted to sell this, the house from where they are which I know they won't. This power line is greatly going to affect the price and the ability to sell their homes.

I don't like it. We have power lines above us right now. This power line will be behind us. I'll be in the triangle of it. The power line that's there now we are constantly, constantly having motorcycles, four wheelers, pickup trucks, and whatnot up and down that power line. I don't want that close to my kids and grand kids. My kids and grand kids use this area right where they are putting the power line. It's cleared out. It's where they play ball. It's where they ride bikes. That's where they live. That's all they've known. And it's not a money deal to me. My father didn't sell it. I'm not going to sell it and I don't want to lose it this way. I really don't think it is good for the health of my kids and my grand kids and I know I ain't going to be around long enough for it to affect me probably, but I'm totally oppose to it. Thank you.

MR. RALPH CONTRERAS: I'm not happy with it at all. It's going to devalue my land. It's going to ruin my way of life, you know. Also across the street from me is a Boy Scout camp. They're going to go right over that. Like what happens to the boys. That's the only thing that they do there. They have their rallies and everything else and -- you know, it just becomes terrible that they come and take whatever they want whenever they want it. I'm just totally against that. I'm not happy with it at all. Not happy at all. I'm saying what everybody else is saying the same thing, you know, my kids, grand kids. My wife has a brain tumor. Is this going to make it worse? I don't know. You know being so close to a power line because they do emit a lot of radiation and everything else you know. So I'm worried about that. I'm not happy.

MR. RAYMOND PAYTON: We got and adjoining one another close to 100 acres. It's been in the family for I don't know 75 or more years. My daddy cleared it himself. He about killed himself made him die early. He cleared it for us, for him, and for us the kids. Under no way do I want this power line. I mean it's just quiet. It's peaceful. It's for us, our kids, and grand kids. They want to build houses behind our house which will be right on the power line. And I don't think it would be safe because whatever comes down from the electromagnetic field or whatever comes down from the power line is going to get to them.

I heard a lot of folks say they wouldn't put a power line within so many feet -- I forget how many feet of a house because it be dangerous to the kids, small kids. I have concern for the kids, concern for the welfare of when we get -- most of us are old and ready to retire and don't have any retirement -- well, I don't have any retirement whatsoever and I was going to depend on raising trees on the rest of my land where they going to come across trees are apart of it to make me some income for a few years and I just can't say anything but power line coming through there is going to be an awful lot of pain, shooting deer rifles around my grand kids.

They're going to be riding four wheelers riding up and down it. We already see them with power lines around. They fly on it. They go crazy on it. They drink, throw beer bottles, beer cans, they shoot. And just no way do I see this power line should come across residential personal property and you live on it. I could see if you owned a thousand acre track and you lived somewhere else and you ran across it, but where residential people live, no, I can't see it, you know. That's enough.

CLOSING STATEMENT:

The time is 8:00 p.m. and the public information meeting for the Dresden-Heard County 500 kV Transmission Line has concluded. Approximately 18 individuals from the area visited after the meeting opened at 6:00 p.m.

C E R T I F I C A T E

STATE OF GEORGIA
COUNTY OF COWETA

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YORANDA N. SAID, CCR # 2758

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Dresden-Heard County 500 kV Transmission Line

Public Information Meeting - 6:00 P.M.

The Church of God of the Union Assembly

May 24, 2011

American Court Reporting Company, Inc.

52 Executive Park South

Suite 5201

Atlanta, Georgia 30329-2217

(404) 892-1331 - (800) 445-2842

Original File 62943-2.TXT

Min-U-Script®

DRESDEN-HEARD COUNTY 500 kV TRANSMISSION LINE

PUBLIC INFORMATION MEETING

The Church of God of the Union Assembly

3821 GA Hwy 34 West

Newnan, Georgia 30263

May 24th, 2011

6:00 P.M.

PROCEEDINGS

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MR. RALPH CONTRERAS: I'm not happy with it at all. It's going to devalue my land. It's going to ruin my way of life, you know. Also across the street from me is a Boy Scout camp. They're going to go right over that. Like what happens to the boys. That's the only thing that they do there. They have their rallies and everything else and -- you know, it just becomes terrible that they come and take whatever they want whenever they want it. I'm just totally against that. I'm not happy with it at all. Not happy at all. I'm saying what everybody else is saying the same thing, you know, my kids, grand kids. My wife has a brain tumor. Is this going to make it worse? I don't know. You know being so close to a power line because they do emit a lot of radiation and everything else you know. So I'm worried about that. I'm not happy.

MR. RAYMOND PAYTON: We got and adjoining one another close to 100 acres. It's been in the family for I don't know 75 or more years. My daddy cleared it himself. He about killed himself made him die early. He cleared it for us, for him, and for us the kids. Under no way do I want this power line. I mean it's just quiet. It's peaceful. It's for us, our kids, and grand kids. They want to build houses behind our house which will be right on the power line. And I don't think it would be safe because whatever comes down from the electromagnetic field or whatever comes down from the power line is going to get to them.

I heard a lot of folks say they wouldn't put a power line within so many feet -- I forget how many feet of a house because it be dangerous to the kids, small kids. I have concern for the kids, concern for the welfare of when we get -- most of us are old and ready to retire and don't have any retirement -- well, I don't have any retirement whatsoever and I was going to depend on raising trees on the rest of my land where they going to come across trees are apart of it to make me some income for a few years and I just can't say anything but power line coming through there is going to be an awful lot of pain, shooting deer rifles around my grand kids.

They're going to be riding four wheelers riding up and down it. We already see them with power lines around. They fly on it. They go crazy on it. They drink, throw beer bottles, beer cans, they shoot. And just no way do I see this power line should come across residential personal property and you live on it. I could see if you owned a thousand acre track and you lived somewhere else and you ran across it, but where residential people live, no, I can't see it, you know. That's enough.

CLOSING STATEMENT:

The time is 8:00 p.m. and the public information meeting for the Dresden-Heard County 500 kV Transmission Line has concluded. Approximately 18 individuals from the area visited after the meeting opened at 6:00 p.m.

C E R T I F I C A T E

STATE OF GEORGIA
COUNTY OF COWETA

I hereby certify that the foregoing transcript was taken down, as stated in the caption, and the proceedings were reduced to typewriting under my direction and control.

I further certify that the transcript is a true and correct record of the evidence given at the said proceedings.

I further certify that I am neither a relative or employee or attorney or counsel to any of the parties, nor financially or otherwise interested in this matter.

This the 24th day of May, 2011.

YORANDA N. SAID, CCR # 2758

GeorgiaTransmission

Georgia Transmission Corporation
2100 East Exchange Place
Tucker, GA 30084-5336
phone 770-270-7400
fax 770-270-7872

Memorandum

DATE: July 28, 2010

TO: See Attached List

FROM: Renée King

SUBJECT: Project Release

Northwest Region

79263 Dresden – Heard County (ITS) 500 kV T/L Construction

RK

Attachments

County: COWETA , HEARD

Printed on: 07/08/2010

Georgia Transmission Corporation
PROJECT RELEASE

Planning Contact : ZAKIA EL OMARI

Region: Northwest

Required Cut-In Date: 05/01/2014

Project Manager : HERBERT (HERB) PAYNE JR.

GTC Projects:

P79263 Dresden-Heard County(I.T.S.) 500kV Transmission Line

Approved by Bob [signature] Date 7-8-10

Approved by [signature] Date 7-14-10

Approved by [signature] Date 7/22/2010

Approved by [signature] Date 7/23/10

Zakia EL OMARI 7-8-2010

[signature] 7-27-10

[signature] 7-8-2010

Scopes:

P79263 Construct a new 6.29-mile 500-kV line using 3-1113 ACSR conductor.

Justification: The Wansley CC #7 transmission service request will require significant transmission upgrades within the ITS including the following major additions:

* Construct a (~6.3-mile) 500 kV line from the Heard County 500 kV Switching Station to the Dresden 230 kV Switching Station.

* Install four single phase 500/230 kV, 448-MVA autobanks at Dresden.

* 500 kV Expansions will be required at both Heard County and Dresden.

* Install two 230 kV, 2% series reactors in parallel on the low-side of the Villa Rica 500/230 kV autobanks in 2011. In 2014, one series reactor will be relocated to Dresden and installed on the Dresden - Yates 230 kV line and the other will be assigned elsewhere.

Additional justification attached.

	Total Budget	Retirement	Reimbursement	Net Cost	DSF	NET ITS INV
P79263	$16,896,942			$16,896,942		$16,896,942
Totals:	$16,896,942			$16,896,942		$16,896,942

TRANSMISSION LINE PROJECT INFORMATION

Project Name: Dresden-Heard County | Const Voltage: 500 | Oper Voltage: 500 | Description: New Transmission Line

Facility Owner: GEORGIA TRANSMISSION CORPORATION

Operational Name:

Area Project: Wansley CC 7 Improvements

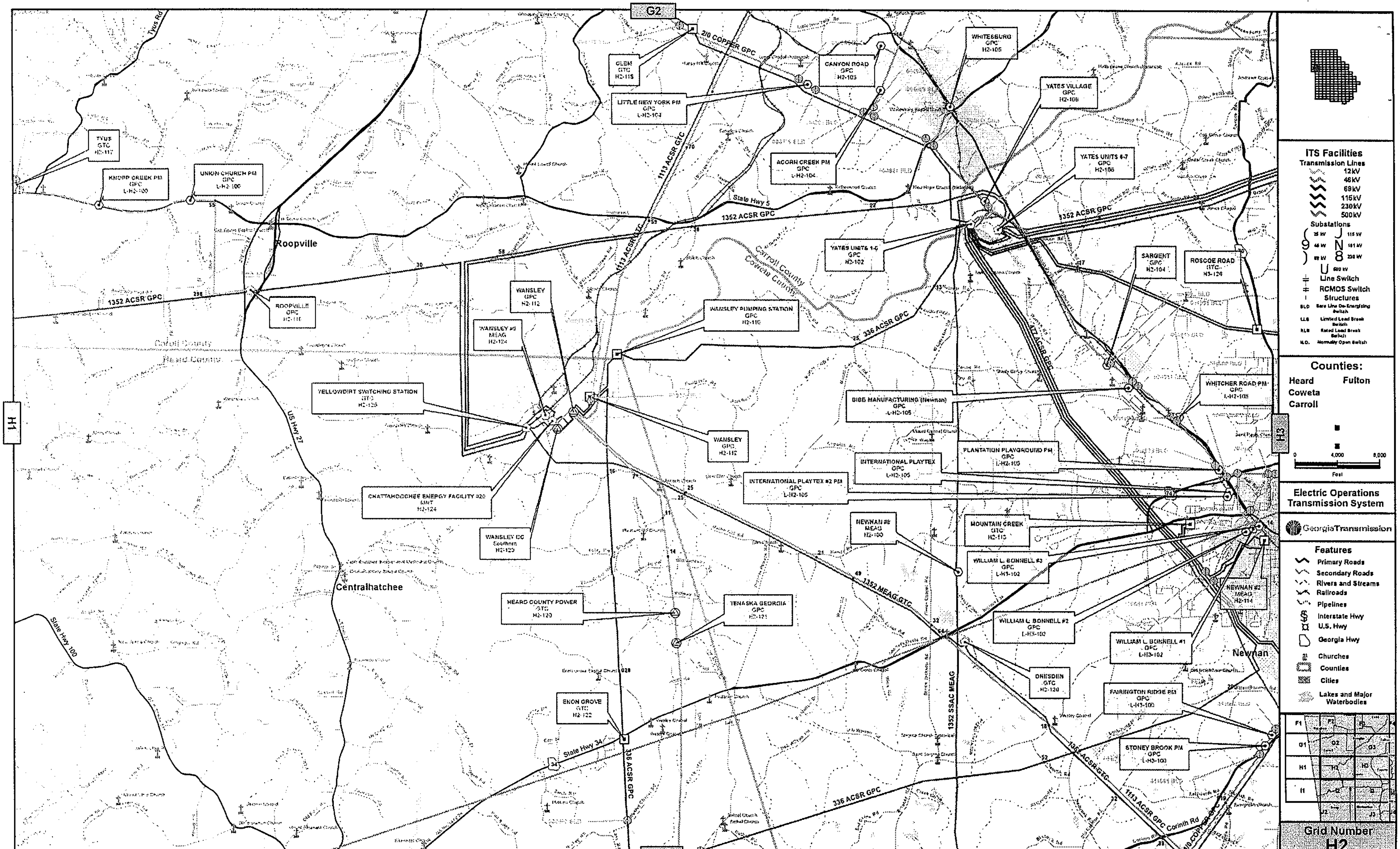
Total Miles After: 6.30 | Line Switch: No | Will Tap To: -

Conductor: 1113 | Underbuild: No

ITS Crit Proj: Yes | Req'd ITS: 06/01/2014

JSTP Submittal: ITS Parity Only - Not Fixed Cost | JSTP Cost: N/A

PCD Required: | PCD Date:



ITS Facilities
Transmission Lines
12kV
46kV
69kV
115kV
230kV
500kV
Substations
Line Switch
RCMDS Switch
Structures
Counties:
Heard
Coweta
Carroll
Fulton
Electric Operations Transmission System
GeorgiaTransmission
Features
Primary Roads
Secondary Roads
Rivers and Streams
Railroads
Pipelines
Interstate Hwy
U.S. Hwy
Georgia Hwy
Churches
Counties
Cities
Lakes and Major Waterbodies
Grid Number H2
G2
H1
H3
I2
TYUS GTC H2-117
KNOPP CREEK PM GPC L-H2-100
UNION CHURCH PM GPC L-H2-100
GLEN GTC H2-115
LITTLE NEW YORK PM GPC L-H2-104
CANYON ROAD GPC H2-103
WHITESBURG GPC H2-105
YATES VILLAGE GPC H2-106
ACORN CREEK PM GPC L-H2-104
YATES UNITS 4-7 GPC H2-106
YATES UNITS 1-6 GPC H2-102
SARGIENT GPC H2-104
ROSCOE ROAD GTC H3-129
ROOPVILLE GPC H2-111
WANSLEY GPC H2-112
WANSLEY #2 MEAG H2-124
WANSLEY PUMPING STATION GPC H2-110
YELLOWDIRT SWITCHING STATION GTC H2-125
WANSLEY GPC H2-112
CHATTAHOOCHEE ENERGY FACILITY 320 MNT H2-124
WANSLEY CC Southern H2-120
BIBB MANUFACTURING (Newnan) GPC L-H2-105
WHITCHER ROAD PM GPC L-H2-105
PLANTATION PLAYGROUND PM GPC L-H2-105
INTERNATIONAL PLAYTEX GPC L-H2-105
INTERNATIONAL PLAYTEX #2 PM GPC L-H2-105
NEWNAN #8 MEAG H2-100
MOUNTAIN CREEK GTC H2-113
WILLIAM L. BONNELL #3 GPC L-H3-102
NEWNAN #2 MEAG H2-114
WILLIAM L. BONNELL #2 GPC L-H3-102
WILLIAM L. BONNELL #1 GPC L-H3-102
HEARD COUNTY POWER GTC H2-120
TENASKA GEORGIA GPC H2-121
DRESDEN GTC H2-130
EKON GROVE GTC H2-122
FAIRINGTON RIDGE PM GPC L-H3-105
STONEY BROOK PM GPC L-H3-100
2/0 COPPER GPC
1113 ACSR GTC
1352 ACSR GPC
State Hwy 5
477 ACSR GPC
336 ACSR GPC
1352 MEAG GTC
1352 SSAC MEAG
1113 ACSR GPC
State Hwy 34
State Hwy 100
US Hwy 27
Corinth Rd
Tyus Rd
Carroll County
Coweta County
Heard County
Roopville
Centralhatchee
Newnan

Transmission Improvements Plan for 575 MW Network Service Request Wansley CC 7 Generation Facility (OASIS # 143556)

Georgia Transmission Corporation

July 1, 2010

Wansley CC7 Transmission Improvements Plan

PROBLEM STATEMENT

A System Impact Study (SIS) was conducted by the Georgia Transmission Corporation to determine the impact to the Integrated Transmission System (ITS) of granting 575 MW of firm transmission service out of the existing Wansley CC 7 combined-cycle (CC) site in Heard County, GA (OASIS # 143556). The firm 575 MW transmission service request (TSR) was requested for the period 01/01/2010 – 01/01/2020.

Beginning in 2010, the Villa Rica 500/230 kV Transformer can exceed its thermal capacity for the loss of the Villa Rica – Union City 500 kV Line. Also, the Villa Rica – Wansley 500 kV Line can loads to 100 % of its thermal capacity for the loss of O'Hara – Wansley 500 kV Line. Beginning in 2014, O'Hara – Wansley 500 kV Line may reach 99 % of its thermal capacity for the loss of Villa Rica – Wansley 500 kV Line. The Wansley CC 7 generation is a contributing factor to these loadings.

As no improvements can be implemented in 2010 to address the above limitations, firm service would be limited to 344 MW in 2010. Several major transmission improvements will be required beginning in 2011 to grant full service for the Wansley CC7 generation facility through the requested period. This request was confirmed on May 12, 2010 pending completion of required transmission improvements.

STUDY RESULTS

Villa Rica Related Improvements (2011)

To address the near-term issues, the Wansley CC7 System Impact Study report (3/18/2010) proposed the addition of two 2%, 2000 A, 230 kV series reactors in parallel (equivalent 1%, 4000 A) on the low-side of the existing Villa Rica 500/230 kV transformer (see Diagram 1). While this improvement will alleviate the potential overloads of the Villa Rica 500/230 kV transformer and the Wansley – Villa Rica 500 kV line, it will also create new overloads of the Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) and the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black). The overall plan includes upgrades of these lines.

Note that Wansley CC7 System Impact Study report identified the above limitations and required transmission improvements as 2012 issues. However, subsequent to the finalization of the report, Georgia Power announced that planned modifications to the existing McDonough generation facility (retirements and additions) will be delayed by one year (from 2011 to 2012). Accordingly, additional analysis indicates that a one year delay in the McDonough generation modifications would result in a one year advancement of the limitations and required transmission improvements (as identified in the Wansley CC7 System Impact Study report) from 2012 to 2011.

Dresden 500/230 kV Improvements (2014)

To address the longer-term issues, the Wansley CC7 System Impact Study report proposed expansion of the existing Dresden 230 kV switching station (see Diagram 3) for 500 kV to accommodate installation of a new 1344 MVA, 500/230 kV transformer and termination of a new 500 kV line from the Heard County area (see Diagram 2). Note that the Wansley CC7 System Impact Study report recommended a Dresden to Tenaska 500 kV line. However, termination of the Dresden 500 kV line at the Heard County 500 kV Switching Station would result in a cost savings of about $5,000,000. With the completion of the Dresden 500/230 kV project in 2014, the 230 kV series reactors will no longer be needed at Villa Rica.

While the Dresden 500/230 kV project will negate the need for the two proposed Villa Rica 230 kV series reactors beginning in 2014, it also creates a potential overload of the Dresden – Yates 230 kV line beginning in 2014. Therefore, one of the Villa Rica 230 kV series reactors can be moved to Dresden on the Yates 230 kV line in 2014 to address this new overload. Moving one of the 230 kV series reactors to Dresden (on the Yates 230 kV line) also mitigates potential overloads of the Yates – Union City 230 kV line (23 miles) in 2014. The other Villa Rica series reactor could be moved to the system pool as a spare.

Dresden 500 kV Termination Issues

Preliminary routing analysis of the proposed Heard County – Dresden 500 kV line identified that this new line would have to cross the existing Wansley – O'Hara 500 kV and the Dresden – Hollingsworth Ferry 230 kV lines at the same point (see Plan A of Diagram 4). This crossing would create an unacceptable operational issue because a single contingency could result in the simultaneous outage of all three lines. Therefore, alternative methods for routing and terminating the Heard County 500 kV line at Dresden have been evaluated.

Plans B1 (Diagram 5) and B2 (Diagram 6) permit the crossing of the existing Wansley – O'Hara 500 kV line and the proposed Heard County – Dresden 500 kV line to occur via bus work within the Dresden 500 kV switchyard. These proposals greatly reduce the risk of simultaneous outages of the 500 kV lines. Plans B1 and B2 differ only by the potential routes for the last mile of the proposed Heard County – Dresden 500 kV line. Also, these proposals avoid a new crossing of the Dresden – Hollingsworth Ferry 230 kV line.

The preferred alternative, Plan C (Diagram 7), would completely avoid a crossing of the existing Wansley – O'Hara 500 kV line and the proposed Heard County – Dresden 500 kV line by breaking and rerouting the existing Wansley – O'Hara 500 kV line. A section of the existing Wansley – O'Hara 500 kV line would then be utilized to terminate the proposed

Heard County 500 kV line at Dresden. A conceptual future build-out of Plan C is shown in Diagram 8.

Plans B1, B2 and C are comparable in electrical performance and costs. While Plan C is currently the preferred method for terminating the proposed Heard County 500 kV line at Dresden, the final decision will be driven by the outcome of the final routing analysis.

RECOMMENDATION

The following is a summary of the near-term and longer-term improvements **(~$60 M)** that will be required to support the Wansley #7 TSR:

2010: Operating Procedure *(reduce Wansley CC 7 generation as necessary)*

2011: Install two 2%, 2000 A, 230 kV series reactors in parallel on the Villa Rica 500/230 kV transformer (equivalent 1%, 4000 A; see Diagram 1)

2011: Reconductor Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) with 1351 ACSS conductor

2011: Reconductor the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black) with at least 636 ASCR conductor

2012: *(No improvements)*

2013: *(No improvements)*

2014: Construct Heard County – Dresden 500 kV line (~8 miles) with a reconfiguration of the existing Wansley – O'Hara 500 kV line to avoid crossing of the 500 kV lines (see Plan C of Diagram 8)

2014: Build out empty bay and terminate 500 kV line at Heard County 500 kV substation

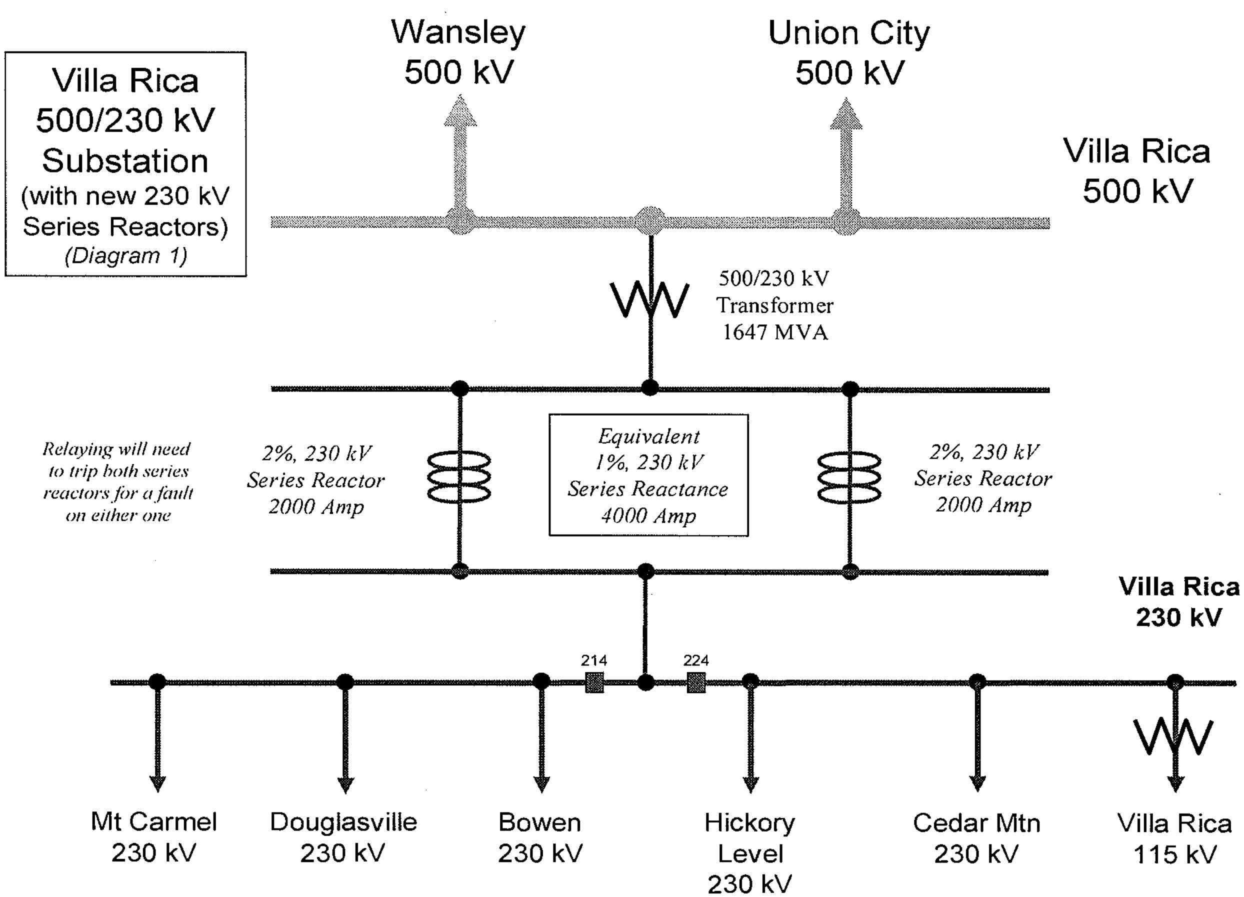
2014: Expand Dresden substation for 500 kV and terminate 500 kV line (see Diagram 8)

2014: Install a 500/230 kV transformer at Dresden

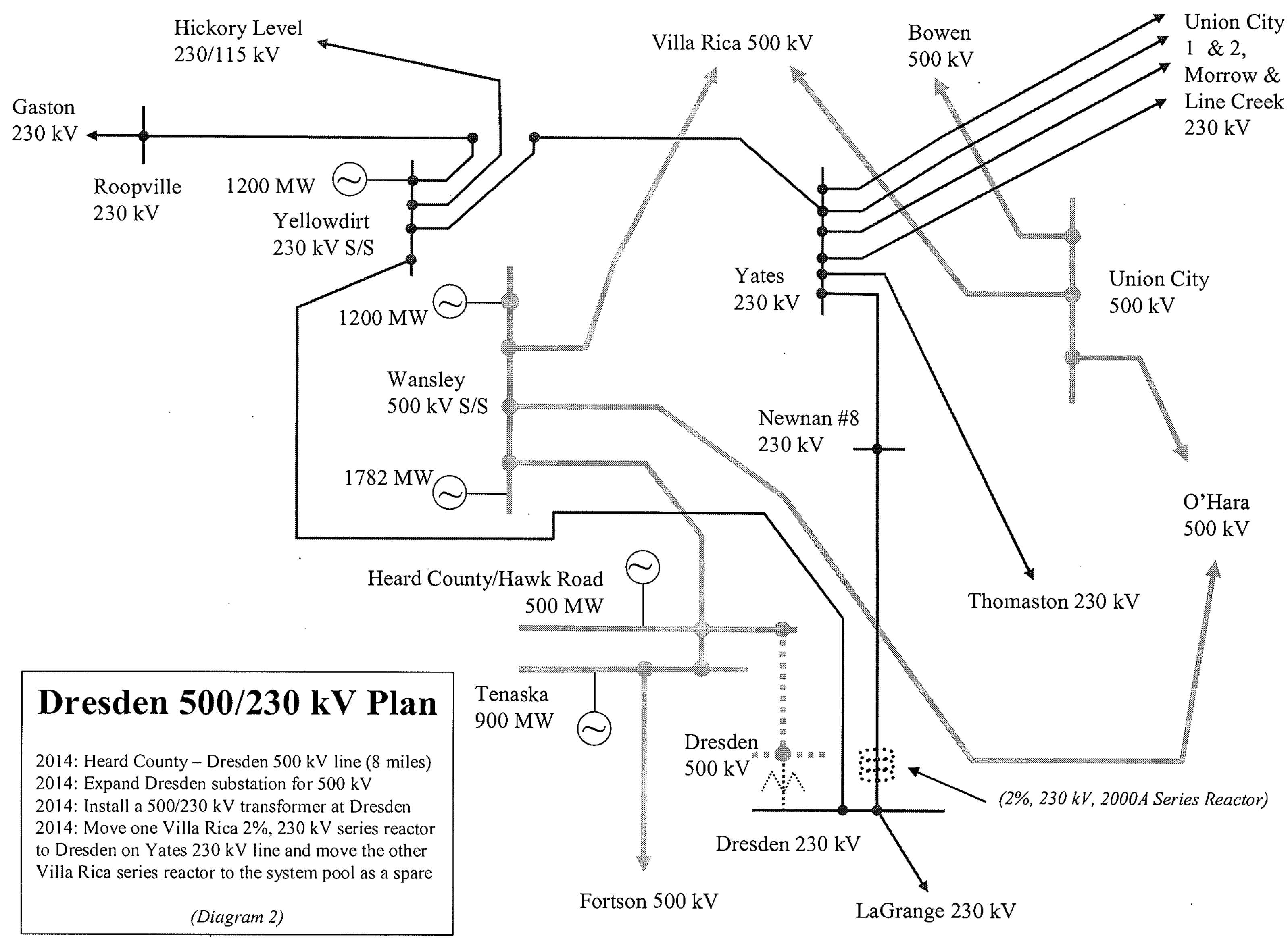
2014: Move one Villa Rica 230 kV series reactor to Dresden on Yates 230 kV line

2014: Move second Villa Rica 230 kV series reactor to system pool

Wansley CC7 Transmission Improvements Plan



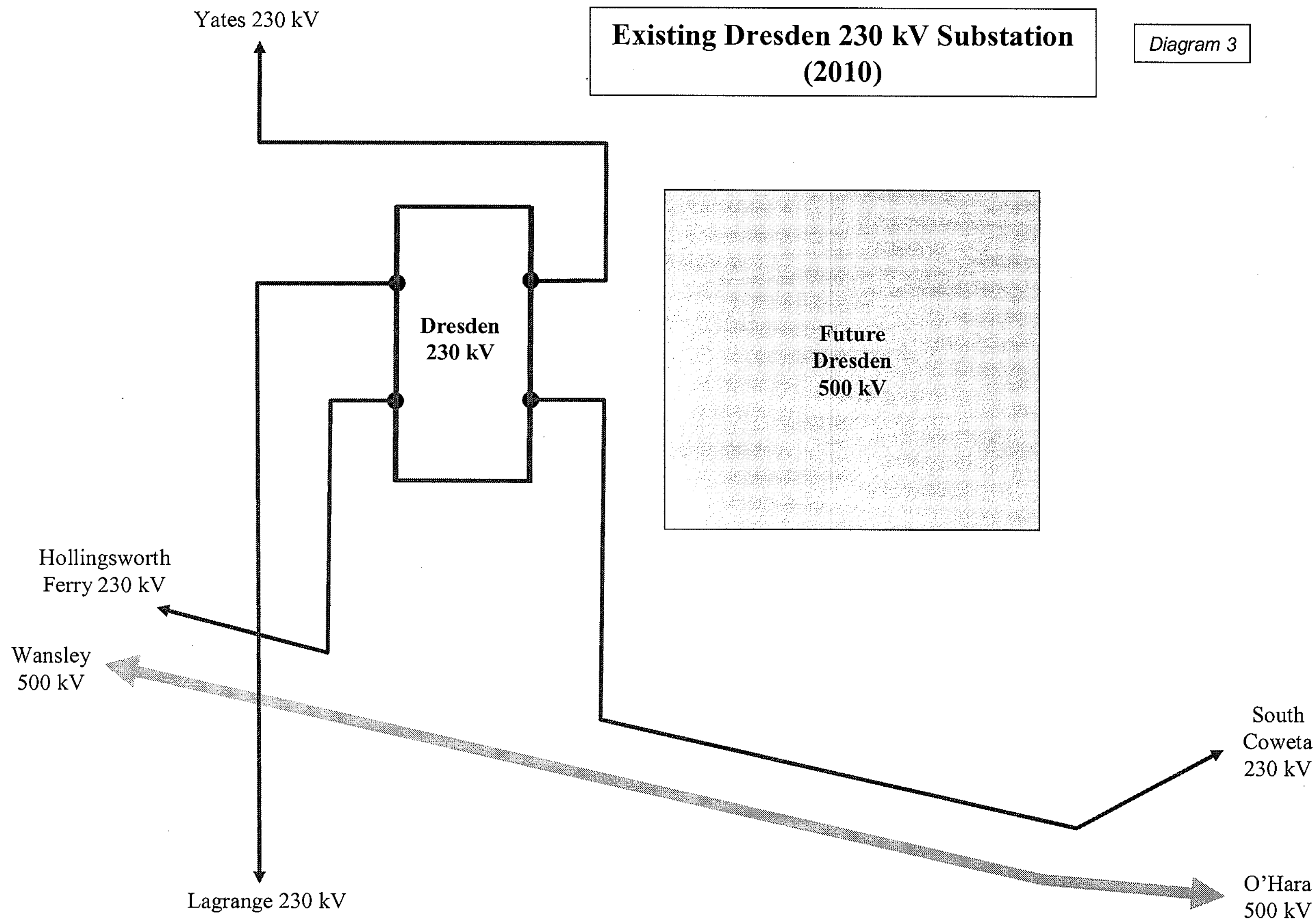
Wansley CC7 Transmission Improvements Plan



Dresden 500/230 kV Plan

2014: Heard County – Dresden 500 kV line (8 miles)
2014: Expand Dresden substation for 500 kV
2014: Install a 500/230 kV transformer at Dresden
2014: Move one Villa Rica 2%, 230 kV series reactor to Dresden on Yates 230 kV line and move the other Villa Rica series reactor to the system pool as a spare

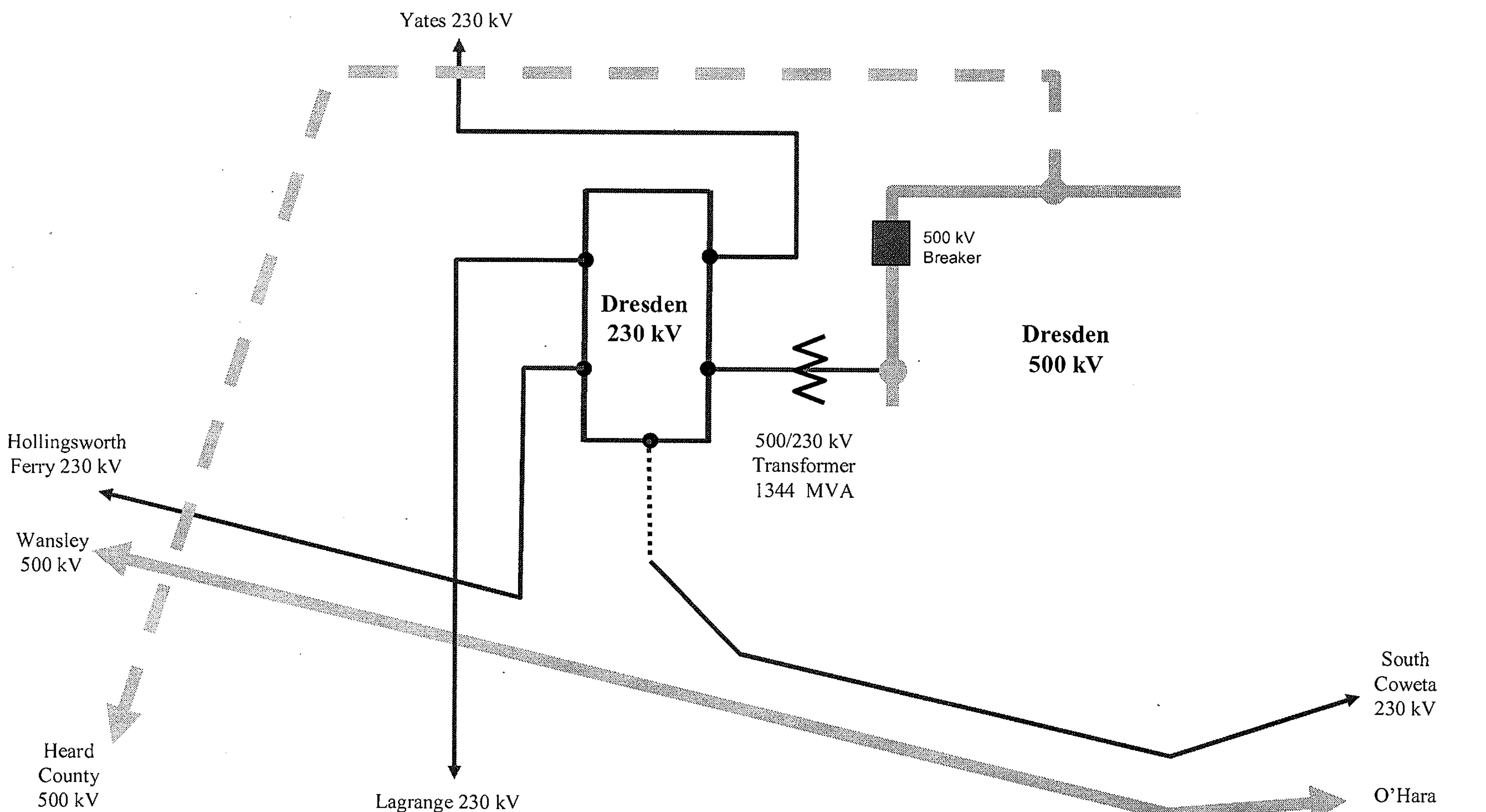
(Diagram 2)


Yates 230 kV
Existing Dresden 230 kV Substation (2010)
Diagram 3
Dresden 230 kV
Future Dresden 500 kV
Hollingsworth Ferry 230 kV
Wansley 500 kV
South Coweta 230 kV
O'Hara 500 kV
Lagrange 230 kV

Wansley CC7 Transmission Improvements Plan

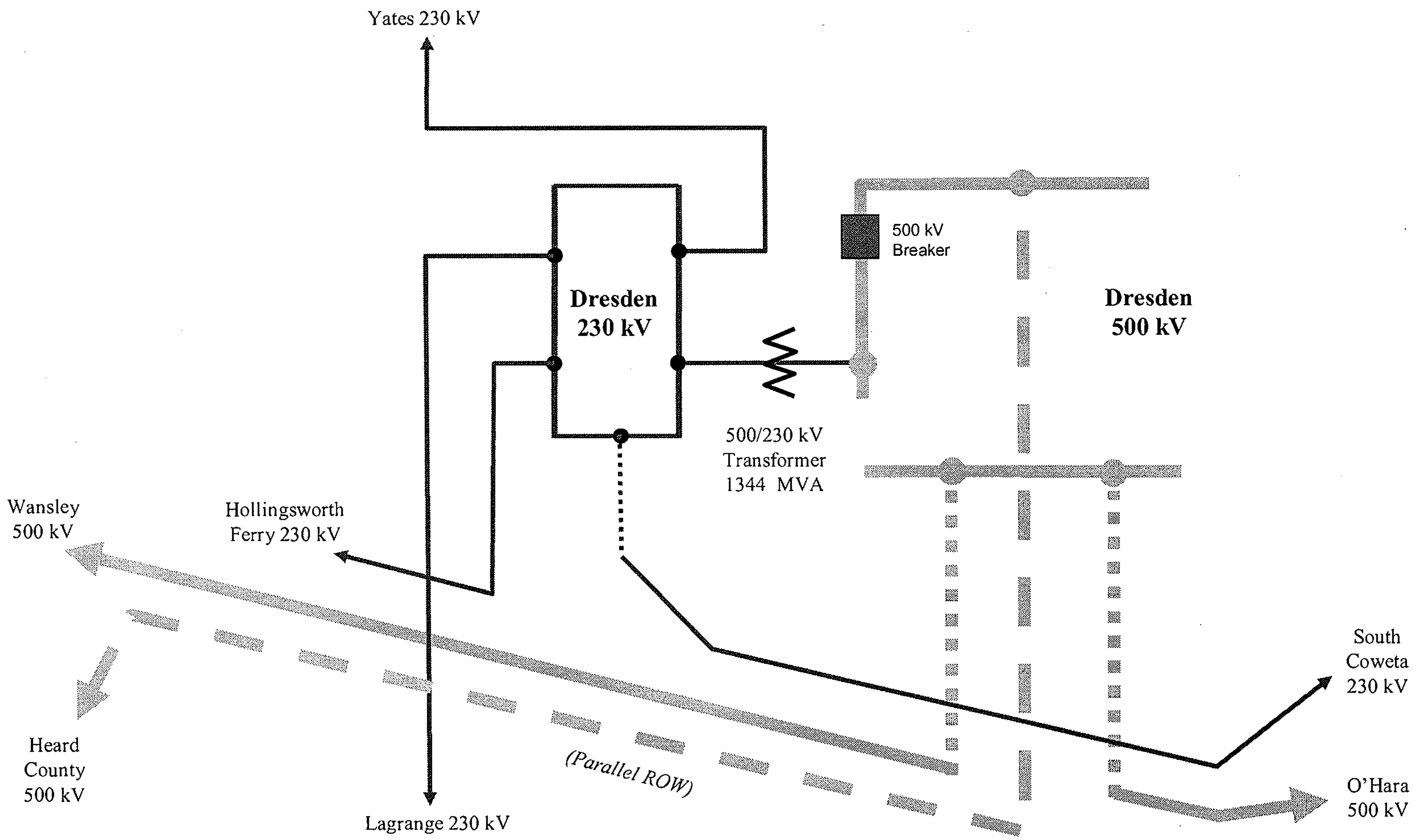
Diagram 4

Plan A
Dresden 500/230 kV Substation with
New Dresden - Heard County 500 kV Line Crossing
Existing Wansley – O'Hara 500 kV Line



Plan B1
Dresden 500/230 kV Substation with Wansley – O'Hara 500 kV Line Looped through Dresden (w/o interconnection) to Facilitate 500 kV Line Crossing Via the Dresden 500 kV Buswork (Parallel 500 kV ROW)

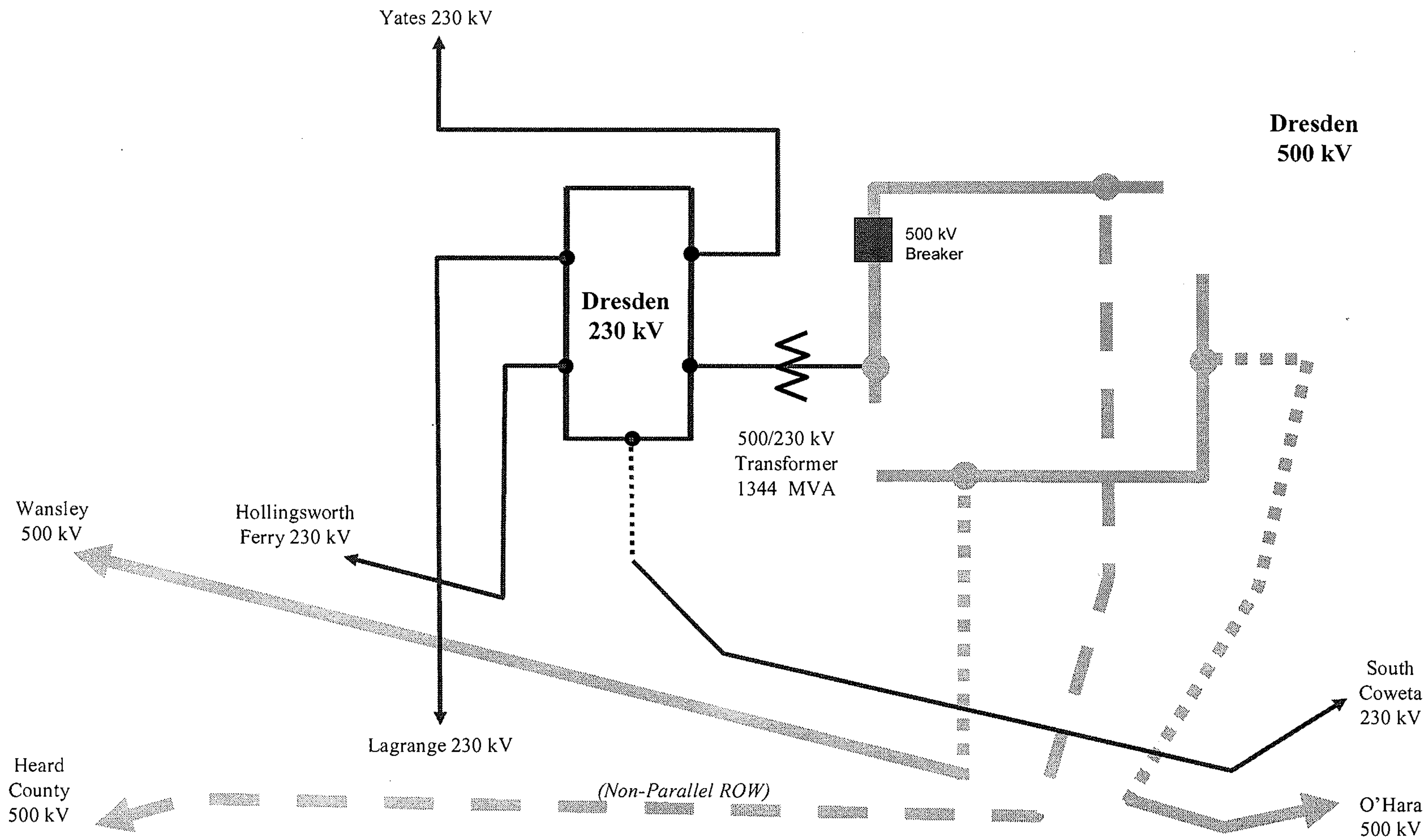
Diagram 5



Plan B2

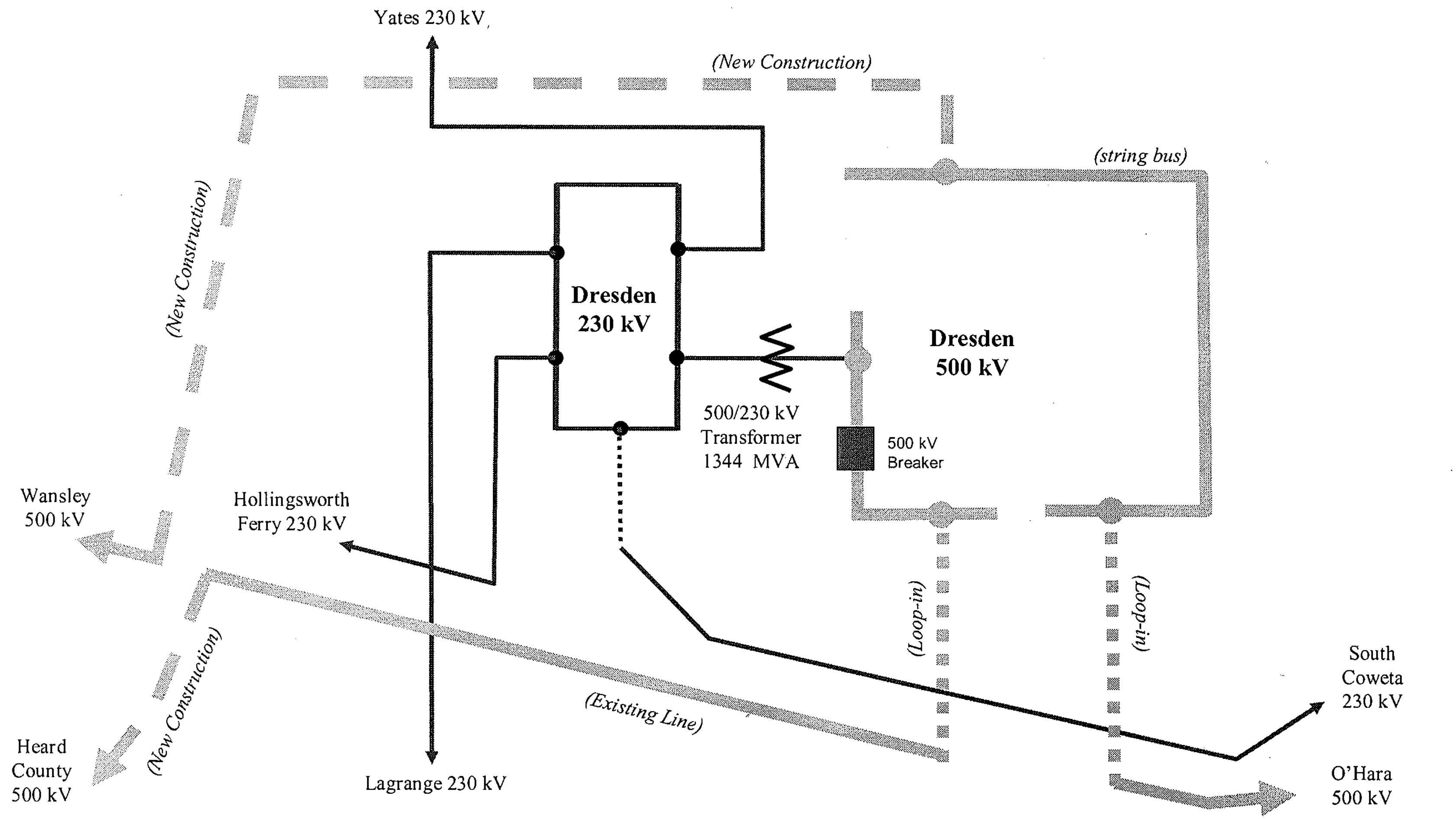
Dresden 500/230 kV Substation with Wansley – O'Hara 500 kV Line Looped through Dresden (w/o interconnection) to Facilitate 500 kV Line Crossing Via the Dresden 500 kV Buswork (Non-Parallel 500 kV ROW)

Diagram 6



Plan C (Preferred Alternative)
Dresden 500/230 kV Substation with existing Wansley – O'Hara 500 kV Line Reconfigured to Avoid Crossing with new Dresden - Heard County 500 kV Line

Diagram 7



Georgia Transmission Corporation

Primavera Project Manager

Project Estimate Summary

Project:	**P79263**	**Dresden-Heard County - NTL**	Customer:	**ITS**
Desc:	**TL_NTL**		Project Manager:	**PAYNE JR.**

Scope: Construct a new 6.29-mile 500-kV line using 3-1113 ACSR conductor.

	Budgeted Cost
Project Total Charges	$16,896,942.00
Direct Charges	$14,893,352.00
50 - Construction Contract Labor	$4,269,091.00
50 - Construction Contract	$3,105,858.00
50 - Site Work Contract	$1,030,233.00
50 - Environmental Field Compliance	$133,000.00
50 - Transport Transformer	$0.00
20 - GPC Mobile	$0.00
64 - Owner Furnished Material	$2,762,708.00
60 - Land	$2,110,420.00
Labor (40 & 54)	$530,198.51
40 - Associate Salary	$518,888.30
54 - Contract Labor	$11,310.21
56 - Professional Services	$729,667.00
56 - Multiple Discipline	$35,000.00
56 - S/S Design	$30,000.00
56 - T/L Design	$0.00
56 - Environmental Services	$117,000.00
56 - Land Services	$89,000.00
56 - Photo Science	$451,667.00
56 - External Affairs	$7,000.00
58 - Legal	$129,200.00
Other	$145,000.00
Miscellaneous (Expenses, permits, etc)	$145,000.00
Project Contingency	$2,680,981.49
Management Reserve	$1,536,086.00
Indirect Charges	$2,003,590.00
Indirects (overheads)	$2,003,590.00
	$16,896,942.00

County: COWETA

Printed on: 10/04/2011

Georgia Transmission Corporation
PROJECT RELEASE

Planning Contact : ZAKIA EL OMARI
Project Manager : DAVID AKIN

Region: Northwest

Required Cut-In Date: 06/01/2014

GTC Projects:

P85727 Dresden(I.T.S.) 500kV/230kV Substation
P86008 Dresden(I.T.S.) 230kV/ Substation

Approved by Bob C **Date** 10-13-2011

Approved by ________ **Date** ________

Approved by ________ **Date** ________

Approved by ________ **Date** ________

RD Wiley 10/12/2011

Zakia EL OMARI 10/12/2011

Scopes:

P85727 Install four 672 MVA, 500/230 kV autobanks w/DGA monitors & terminate Dresden-Heard County 500 kV TL on a breaker. Route Wansley-O'Hara 500 kV TL thru S/S w/o interconnection. Add 2000A, 2%, 230 kV series reactor on Yates 230kV TL

P86008 Expand 230 kV S/S, replace four 230 kV circuit breakers (with 3000 A, 63 kA) and add 230 kV bus work to accommodate the installation of 500/230 kV transformer (reference Project P85727).

Justification: The Wansley CC #7 transmission service request will require significant transmission upgrades within the ITS including the following major additions:

* Construct a (~5.75-mile) 500 kV line from the Heard County 500 kV Switching Station to the Dresden 230 kV Switching Station.

* Install four single phase 500/230 kV, 672-MVA autobanks (4000 A high-side equipment & 5000 A low-side equipment) with DGA monitors at Dresden.

* Expand Dresden substation to accommodate Heard County 500 kV line termination (4000 A termination equipment) and addition of 500/230 kV transformer at Dresden. Route Wansley - O'Hara 500 kV line thru Dresden 500 kV switchyard via bus work w/o interconnection to Dresden 500 kV bus.

* Install two 230 kV, 2% series reactors in parallel on the low-side of the Villa Rica 500/230 kV autobanks in 2011. In 2014, one series reactor will be relocated to Dresden and installed on the Dresden - Yates 230 kV line and the other will be assigned elsewhere.

* Modify the Dresden - South Coweta 230 kV line as necessary to accommodate 500 kV line crossing(s).

* Replace four existing overstressed 230 kV circuit breakers at Dresden with 3000 A, 63 kA circuit breakers

The projects were approved by the TPWG on the 8/11/2011 for a 6/1/2014 need date.

	Total Budget	Retirement	Reimbursement	Net Cost	DSF	NET ITS INV
P85727	$45,593,393			$45,593,393		$45,593,393
P86008	$2,511,726	$397,600		$2,114,126		$2,511,726
Totals:	$48,105,119	$397,600		$47,707,519		$48,105,119

SUBSTATION PROJECT INFORMATION

Project Name: Dresden Met Pt #: Description: General Substation Modification

Facility Owner: GEORGIA TRANSMISSION CORPORATION

Area Project: Wansley CC 7 Improvements

Op H S KV:	500kV	ITS Crit Proj:	Yes	Capacity Added:	2,016.00		
Op L S KV:	230kV	Split Bus:	No	Capacity Removed:	0.00	Pro Type:	NA
Land Req'd:	Yes	EMC Low Side:	No	Control House:	No	RTU:	No
Mobile Req'd:	No	Req'd ITS:	06/01/2014	PCD Required:	No	PCD Date:	
Bypass Metering:	No	JSTP Submittal:	ITS Parity Only - Not Fixed Cost	JSTP Cost Type:	N/A		

Transformer ID	Action	Location	Amount

ITS Member Feeder Information

# of Feeders:	0	Regulator Size:	0
Overhd/Undergrd:	NA	Oper. Voltage:	NA

SUBSTATION PROJECT INFORMATION

Project Name: Dresden　Met Pt #:　Description: General Substation Modification

Facility Owner:

Area Project: Wansley CC 7 Improvements

Op H S KV:	NA	ITS Crit Proj:	Yes	Capacity Added:	0.00		
Op L S KV:	NA	Split Bus:	No	Capacity Removed:	0.00	Pro Type:	NA
Land Req'd:	No	EMC Low Side:	No	Control House:	No	RTU:	Unknown
Mobile Req'd:	No	Req'd ITS:	06/01/2014	PCD Required:	No	PCD Date:	
Bypass Metering:	No	JSTP Submittal:	ITS Parity Only - Not Fixed Cost	JSTP Cost Type:	N/A		

Transformer ID	Action	Location	Amount

ITS Member Feeder Information

# of Feeders:	0	Regulator Size:	0
Overhd/Undergrd:	NA	Oper. Voltage:	NA

Workflow Info For Item 'rec986627'

All Active Workflows --> 85727_86008_Dresden_SS --> Workflow Info

Title: 85727_86008_Dresden_SS
Revision: **1**
Type: Doc
Author: kingr
Workflow Name: 85727_86008_Dresden_SS
Workflow Steps:
1. contribution (*AutoContribute/Edit Revision*)
2. planning_supp_start (*Review*)
3. tse_planner (*Review*)
4. group_lead (*Review*)
5. manager (*Review*)
6. project_control_specialist (*Review*)
7. project_manager_s (*Review*)
8. project_manager_tp (*Review*)
9. vp_ps (*Review*)
10. planning_supp_review (*Review*)
11. vp_s (*Review*)
12. **planning_supp_final (*Review/New Revision*)**
13. notify_records_dept (*Review*)

Current Step: planning_supp_final
Approved By:
Required Approvals: All
Remaining Reviewers: kingr

Workflow Content Action History

Workflow Name	Step	Action	Action Date	Users
85727_86008_Dresden_SS	contribution	Check In	10/13/11 1:54 PM	kingr
85727_86008_Dresden_SS	contribution	Approve	10/13/11 1:54 PM	kingr
85727_86008_Dresden_SS	planning_supp_start	Work Notification	10/13/11 1:54 PM	kingr
85727_86008_Dresden_SS	planning_supp_start	Approve	10/13/11 1:54 PM	kingr
85727_86008_Dresden_SS	tse_planner	Work Notification	10/13/11 1:54 PM	elomari
85727_86008_Dresden_SS	tse_planner	Approve	10/13/11 3:06 PM	elomari
85727_86008_Dresden_SS	group_lead	Work Notification	10/13/11 3:06 PM	wiley
85727_86008_Dresden_SS	group_lead	Approve	10/14/11 8:12 AM	wiley
85727_86008_Dresden_SS	manager	Work Notification	10/14/11 8:12 AM	caseyr
85727_86008_Dresden_SS	manager	Approve	10/14/11 9:33 AM	caseyr
85727_86008_Dresden_SS	project_control_specialist	Work Notification	10/14/11 9:33 AM	kingr starnes
85727_86008_Dresden_SS	project_control_specialist	Approve	10/17/11 7:25 AM	starnes
85727_86008_Dresden_SS	project_manager_s	Work Notification	10/17/11 7:25 AM	akin
85727_86008_Dresden_SS	project_manager_s	Approve	10/18/11 5:46 AM	akin
85727_86008_Dresden_SS	project_manager_tp	Work Notification	10/18/11 5:46 AM	battle
85727_86008_Dresden_SS	project_manager_tp	Approve	10/18/11 3:31 PM	battle
85727_86008_Dresden_SS	vp_ps	Work Notification	10/18/11 3:31 PM	raese
85727_86008_Dresden_SS	vp_ps	Approve	10/18/11 3:41 PM	raese
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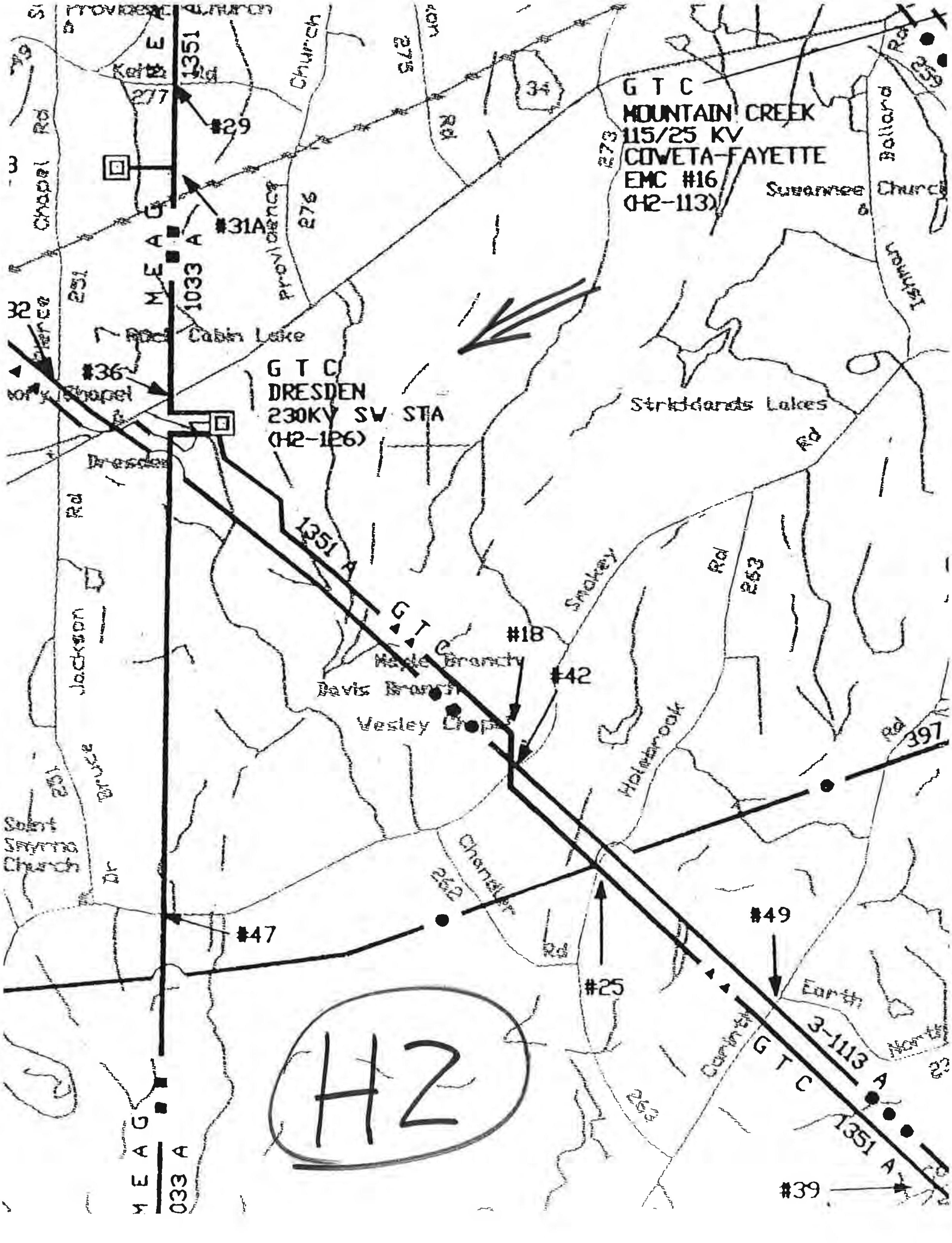
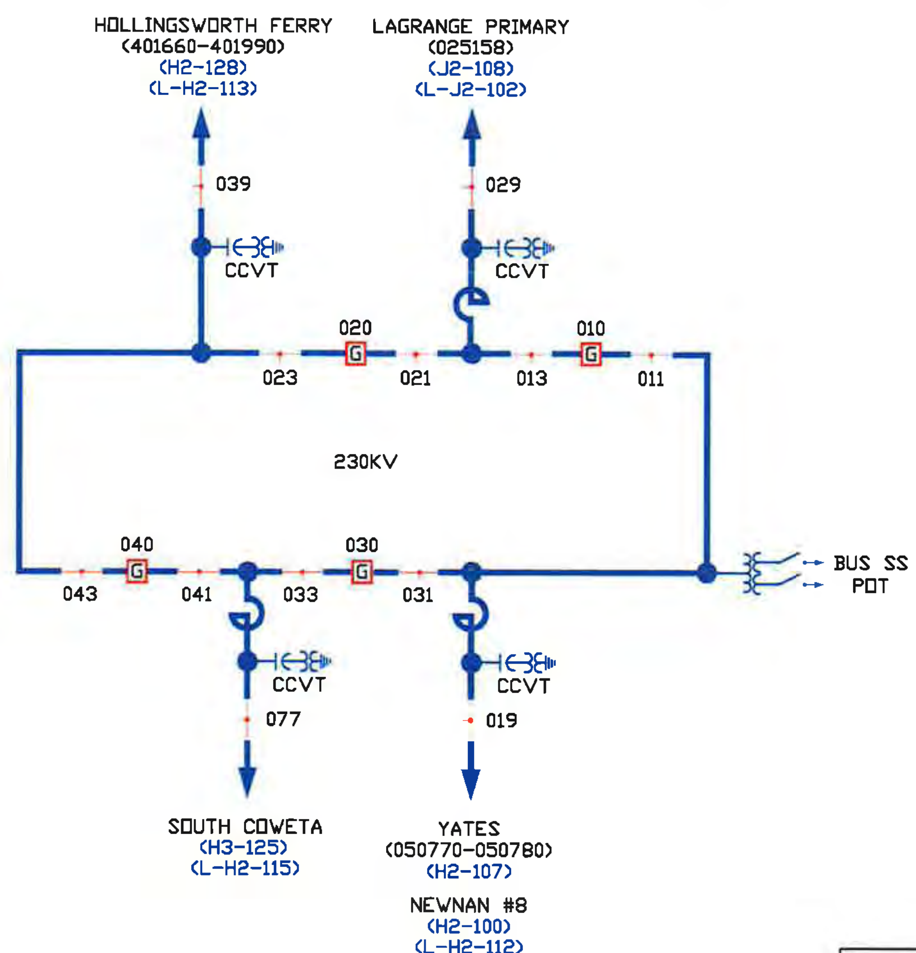
85727_86008_Dresden_SS	planning_supp_review	Approve	10/19/11 7:32 AM	kingr
85727_86008_Dresden_SS	vp_s	Work Notification	10/19/11 7:32 AM	donovan schussle
85727_86008_Dresden_SS	vp_s	Approve	10/20/11 9:23 AM	donovan
85727_86008_Dresden_SS	vp_s	Mail Notification	10/20/11 10:02 AM	donovan

85727_86008_Dresden_SS	vp_s	Approve	11/3/11 7:21 AM	schussle
85727_86008_Dresden_SS	planning_supp_final	Work Notification	11/3/11 7:21 AM	kingr



G T C
MOUNTAIN CREEK
115/25 KV
COWETA-FAYETTE
EMC #16
(H2-113)
G T C
DRESDEN
230KV SW STA
(H2-126)
M E A G
1033 A
1351
#29
#31A
#36
#18
#42
#25
#47
#49
#39
1351 A
3-1113
G T C
Cabin Lake
Providence
Church
Jackson
Bruce
Dr
Smokey
Holbrook
Chandler
Earth
Stricklands Lakes
Ballard
Ishman
Suwannee Church
Davis Branch
Wesley Chapel
Saint Smyrna Church
Corinth
Keith Rd
Chapel Rd
231
277
276
273
275
263
262
397
34
H2



SHEET NO. H2-126

SW. NO. PREFIX 988

GEORGIA INTEGRATED TRANSMISSION SYSTEM
SUBSTATION DIAGRAM

DRESDEN GTC)

Drawn: 03-07-03	Revised: 10-23-08 BAL

SHEET NO. H2-126

Transmission Improvements Plan for 575 MW Network Service Request Wansley CC 7 Generation Facility (OASIS # 143556)

Georgia Transmission Corporation

July 11, 2011

Wansley CC7 Transmission Improvements Plan

PROBLEM STATEMENT

A System Impact Study (SIS) was conducted by the Georgia Transmission Corporation to determine the impact to the Integrated Transmission System (ITS) of granting 575 MW of firm transmission service out of the existing Wansley CC 7 combined-cycle (CC) site in Heard County, GA (OASIS # 143556). The firm 575 MW transmission service request (TSR) was requested for the period 01/01/2010 – 01/01/2020.

Beginning in 2010, the Villa Rica 500/230 kV Transformer can exceed its thermal capacity for the loss of the Villa Rica – Union City 500 kV Line. Also, the Villa Rica – Wansley 500 kV line loads to 100 % of its thermal capacity for the loss of O'Hara – Wansley 500 kV line. Additionally, the Union City - Flat Shoals section of the Union City – East Point 230 kV line (Black) and the Morrow - Murray Lake Junction – Fort Gillem sections of the Grady – Morrow 115 kV line (Black) can exceed their respective thermal capacities under contingency situations. Beginning in 2014, O'Hara – Wansley 500 kV Line may reach 99 % of its thermal capacity for the loss of Villa Rica – Wansley 500 kV Line. The Wansley CC 7 generation is a contributing factor to these loadings.

As no improvements can be implemented in 2010 to address the above limitations, firm service would be limited to 344 MW in 2010. Several major transmission improvements will be required beginning in 2011 to grant full service for the Wansley CC7 generation facility through the requested period. This request was confirmed on May 12, 2010 pending completion of required transmission improvements.

STUDY RESULTS

Villa Rica Related Improvements (2011)

To address the near-term issues, the Wansley CC7 System Impact Study report (3/18/2010) proposed the addition of two 2%, 2000 A, 230 kV series reactors in parallel (equivalent 1%, 4000 A) on the low-side of the existing Villa Rica 500/230 kV transformer (see Diagram 1). While this improvement will alleviate the potential overloads of the Villa Rica 500/230 kV transformer and the Wansley – Villa Rica 500 kV line, it will further increase overloads of the Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) and the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black). The overall plan includes upgrades of these two lines.

Note that Wansley CC7 System Impact Study report identified the above limitations and required transmission improvements as 2012 issues. However, subsequent to the finalization of the report, Georgia Power announced that planned modifications to the existing McDonough generation facility (retirements and additions) would be delayed by one year (from 2011 to 2012). Accordingly, additional analysis indicated that a one year

delay in the McDonough generation modifications would result in a one year advancement of the limitations and required transmission improvements (as identified in the Wansley CC7 System Impact Study report) from 2012 to 2011.

Dresden 500/230 kV Improvements (2014)

To address the longer-term issues, the Wansley CC7 System Impact Study report proposed expansion of the existing Dresden 230 kV switching station (see Diagram 3) for 500 kV to accommodate installation of a new 500/230 kV transformer and termination of a new 500 kV line from the Heard County area (see Diagram 2). Additional upgrades at the existing Dresden 230 kV substation will include potential modification of the existing South Coweta 230 kV line to accommodate new 500 kV crossings and upgrades of the existing Dresden 230 kV circuit breakers. Short-circuit analysis indicates that the existing 230 kV circuit breakers at Dresden will need to be replaced with 3000 A, 63 kA circuit breakers.

While completion of the Dresden 500/230 kV project in 2014 will negate future need for the two proposed Villa Rica 230 kV series reactors, it also creates a potential overload of the Dresden – Yates 230 kV line beginning in 2014. Therefore, one of the Villa Rica 230 kV series reactors can be moved to Dresden on the Yates 230 kV line in 2014 to address this new overload and mitigate potential overloads of the Yates – Union City 230 kV line (23 miles) in 2014. The other Villa Rica series reactor could be reused for a future project or as a system spare.

Dresden – Heard County 500 kV Line (2014)

Note that the Wansley CC7 System Impact Study report recommended a Dresden to Tenaska 500 kV line. However, termination of the Dresden 500 kV line at the Heard County 500 kV Switching Station will result in a cost savings of about $5,000,000 by utilizing an existing open bay at Heard County (see Diagram 10).

Dresden 500 kV Termination Issues (2014)

Preliminary routing analysis of the proposed Dresden - Heard County 500 kV line identified that this new line would have to cross the existing Wansley – O'Hara 500 kV and the Dresden – Hollingsworth Ferry 230 kV lines at the same point (see Plan A of Diagram 4). This crossing would create an unacceptable operational issue because a single contingency could result in the simultaneous outage of all three lines. Therefore, alternative methods for routing and terminating the Heard County 500 kV line at Dresden have been evaluated.

Plan B1 (Diagram 5) and Plan B2 (Diagram 7) permit a "crossing" of the existing Wansley – O'Hara 500 kV line and the proposed Dresden - Heard County 500 kV line to occur via bus work within the Dresden 500 kV switchyard. Plan C (Diagram 9), would also avoid a crossing of the existing Wansley – O'Hara 500 kV line and the proposed Dresden - Heard County 500 kV line by breaking and rerouting the existing Wansley – O'Hara 500 kV line (increases new 500 kV line length by 1 mile). A section of the existing Wansley – O'Hara 500 kV line could then be utilized to terminate the proposed Heard County 500 kV line at Dresden.

Note that for Plans B1, B2 and C, initially the new Dresden - Heard County 500 kV line and the existing Wansley – O'Hara 500 kV line would not interconnect at the Dresden site (a by-pass would be created via 500 kV bus work). The new Dresden 500 kV switching station will be designed to accommodate a future interconnection of the Wansley – O'Hara 500 kV line at the Dresden 500 kV bus.

Plans B1, B2 and C are comparable in electrical performance. However, Plan C has more costs and impacts to land owners due to its longer 500 kV line mileage. Plan B2 is also not desirable alternative since a recent site evaluation has identified an environmental issue that will significantly hinder use of the "south" end of the existing Dresden property for the proposed 500 kV switchyard. Therefore, Plan B1 is the preferred method for terminating the proposed Heard County 500 kV line at Dresden. Plan B1 requires less 500 kV line mileage, has the best utilization of the existing Dresden property and has flexibility for future expansion of the Dresden substation. A conceptual future build-out of Plan B1 is shown in Diagram 6.

Heard County and Hawk Road 500 kV Improvements (2014)

As previously stated, the Wansley CC7 System Impact Study report recommended a Dresden to Tenaska 500 kV line. While termination of the Dresden 500 kV line at the Heard County 500 kV Switching Station results in a cost savings of about $5,000,000, there are minor modifications required at the Heard County and Hawk Road 500 kV sites.

The preferred route for the new Dresden – Heard County 500 kV line requires the line to be terminated at the existing (occupied) bay in northeast corner of the Heard County 500 kV Switching Station. Presently the 500 kV line from the Hawk Road 500 kV collector bus is terminated at that position. Therefore, the empty 500 kV bay at Heard County will be built-out and the 500 kV line to the Hawk Road 500 kV collector bus will be re-terminated there. This will also require the existing 500 kV line termination equipment on the Hawk Road 500 kV collector bus to be transferred to an existing empty bay at Hawk Road in order to re-terminate the "collector bus" line to Heard County (see Diagram 11).

Wansley CC7 Transmission Improvements Plan

RECOMMENDATION

The following is a summary of the near-term and longer-term improvements **(~$60 M)** that will be required to support the Wansley #7 TSR:

2010: Operating Procedure *(reduce Wansley CC 7 generation as necessary)*

2011: Install two 2%, 2000 A, 230 kV series reactors in parallel on the Villa Rica 500/230 kV transformer (equivalent 1%, 4000 A; see Diagram 1)

2011: Reconductor Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) with 1351 ACSS conductor

2011: Reconductor the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black) with at least 636 ASCR conductor

2012: *(No improvements)*

2013: Expand Dresden 230 kV bus to accommodate new 500/230 kV transformer and replace existing four 230 kV circuit breakers with 3000 A, 63 kV circuit breakers

2014: Construct Dresden - Heard County 500 kV line (~6 miles)

2014: Create a by-pass for the existing Wansley – O'Hara 500 kV line through the Dresden site (via bus work) to avoid crossing of the 500 kV lines (see Plan B1 of Diagram 5)

2014: Build out empty bay at Heard County 500 kV substation and re-terminate 500 kV "collector bus" line from Hawk Road 500 kV substation (see Diagram 11)

2014: Terminate the new Dresden 500 kV line at the existing (occupied) bay in northeast corner of the Heard County 500 kV Switching Station (see Diagram 11)

2014: Build-out an existing empty bay at Hawk Road in order to re-terminate the "collector bus" line to Heard County (see Diagram 11)

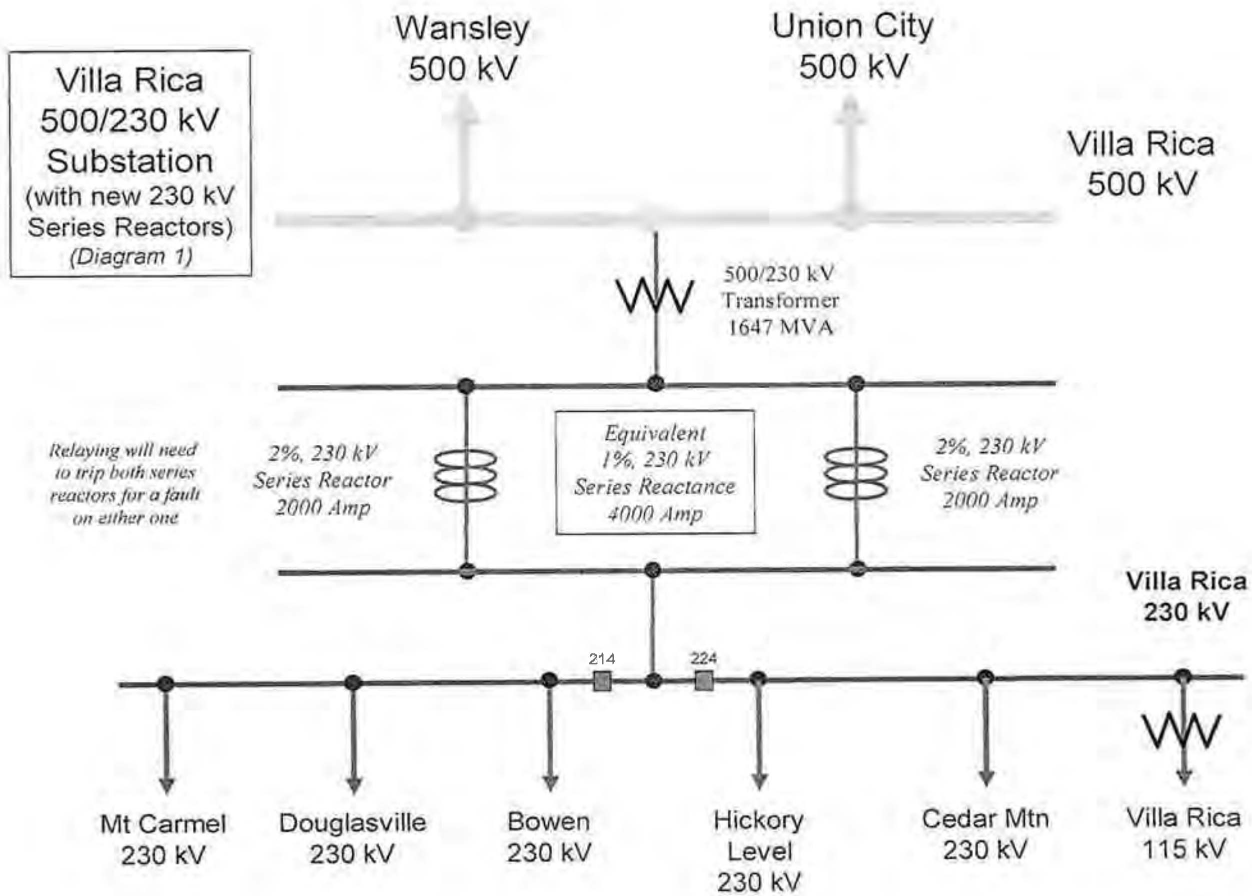
2014: Expand Dresden substation for 500 kV and terminate the Heard County 500 kV line

2014: Install a 2016 MVA, 500/230 kV transformer with 5000 A low-side equipment, an on-site spare phase and DGA monitors

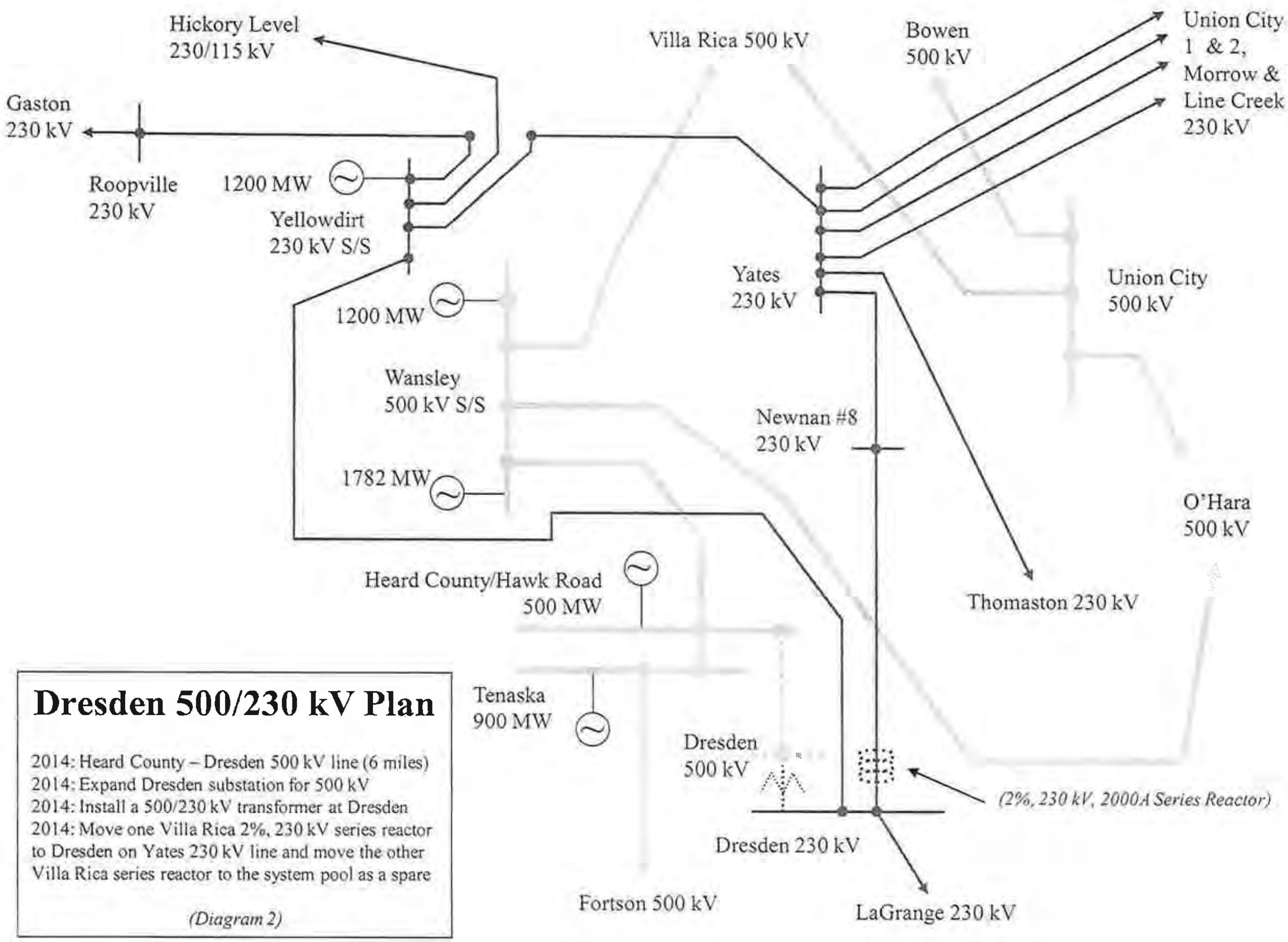
2014: Move one Villa Rica 230 kV series reactor to Dresden on Yates 230 kV line

2014: Remove and reuse second Villa Rica 230 kV series reactor for a future project or as a system spare

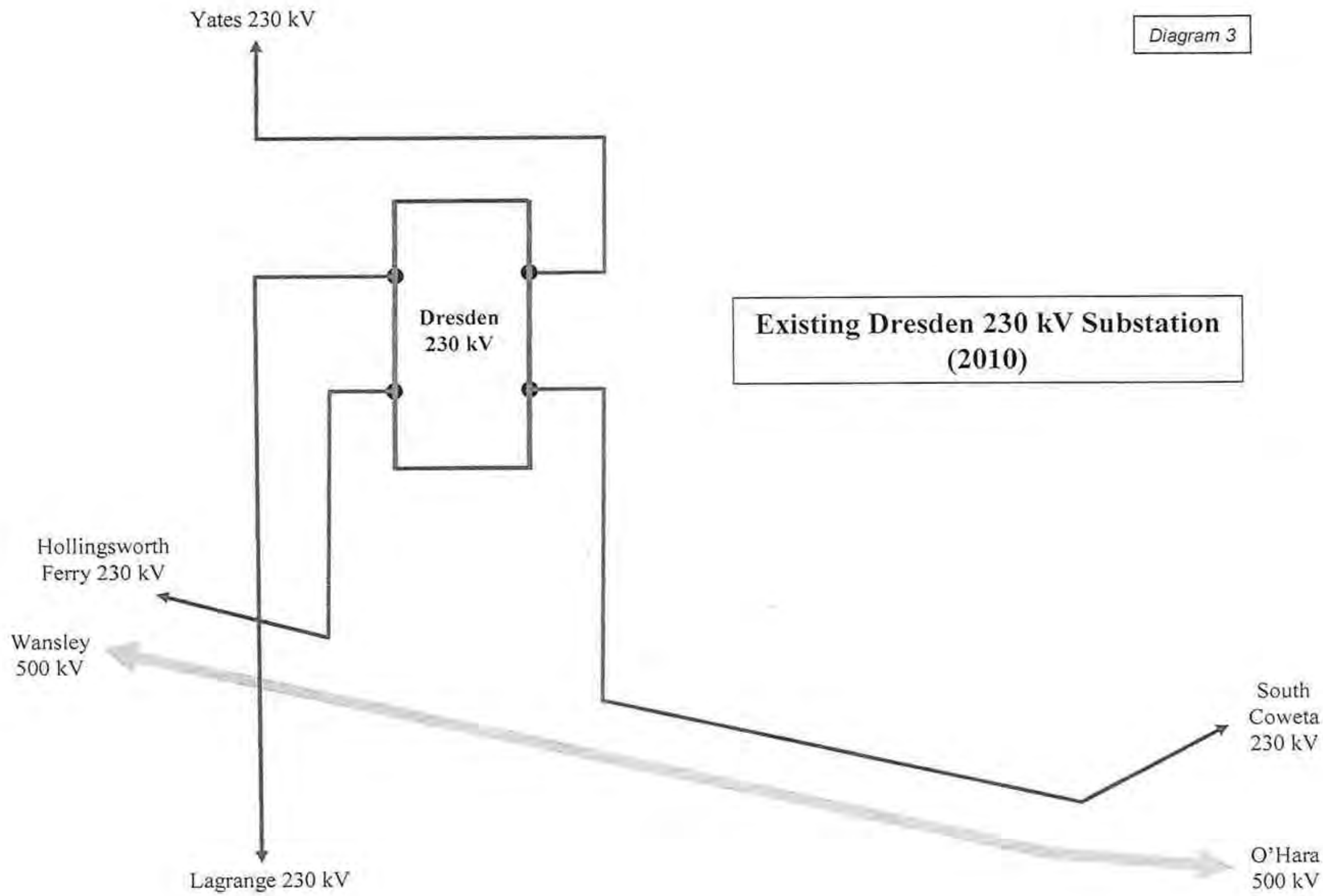
Wansley CC7 Transmission Improvements Plan



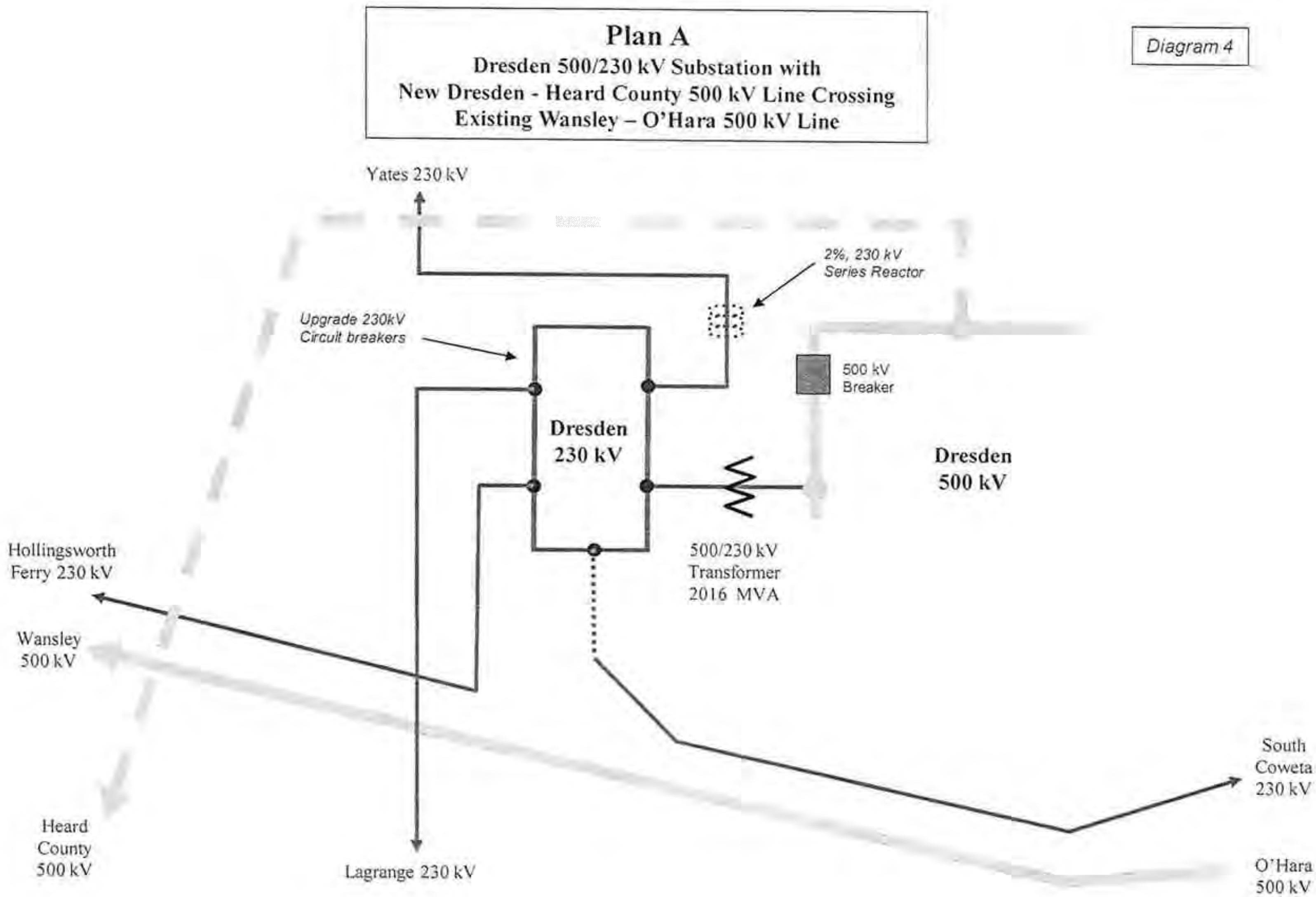
Wansley CC7 Transmission Improvements Plan



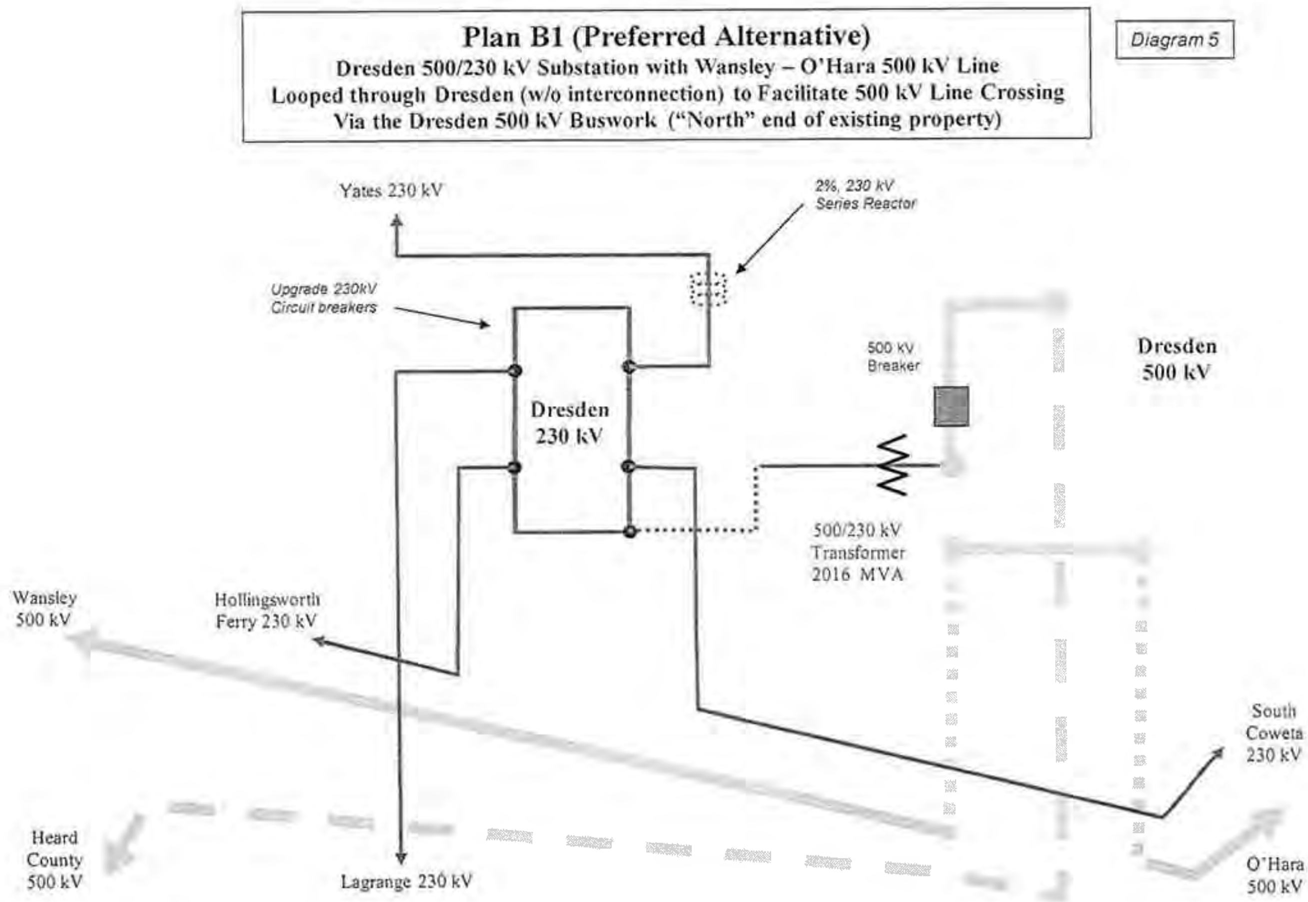
Wansley CC7 Transmission Improvements Plan

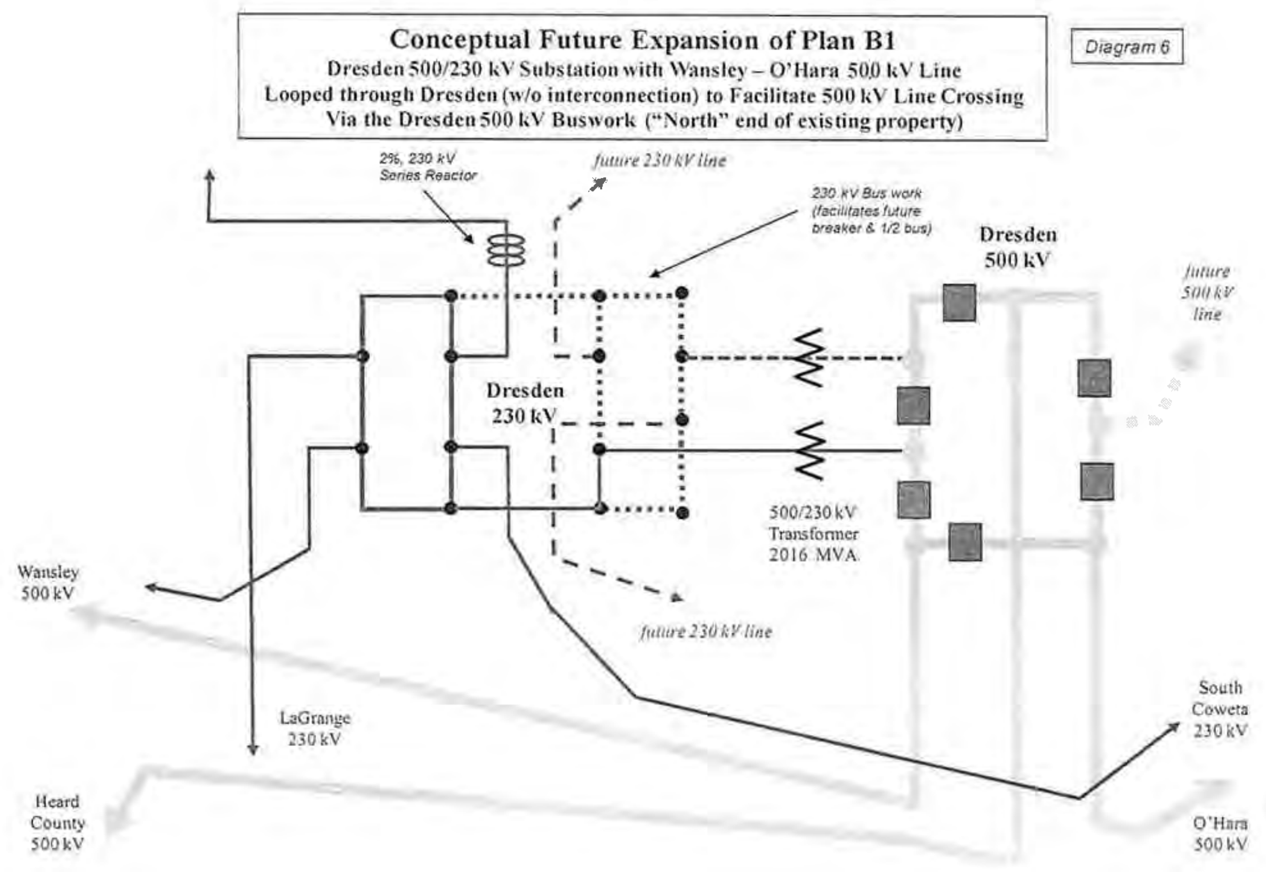


Wansley CC7 Transmission Improvements Plan

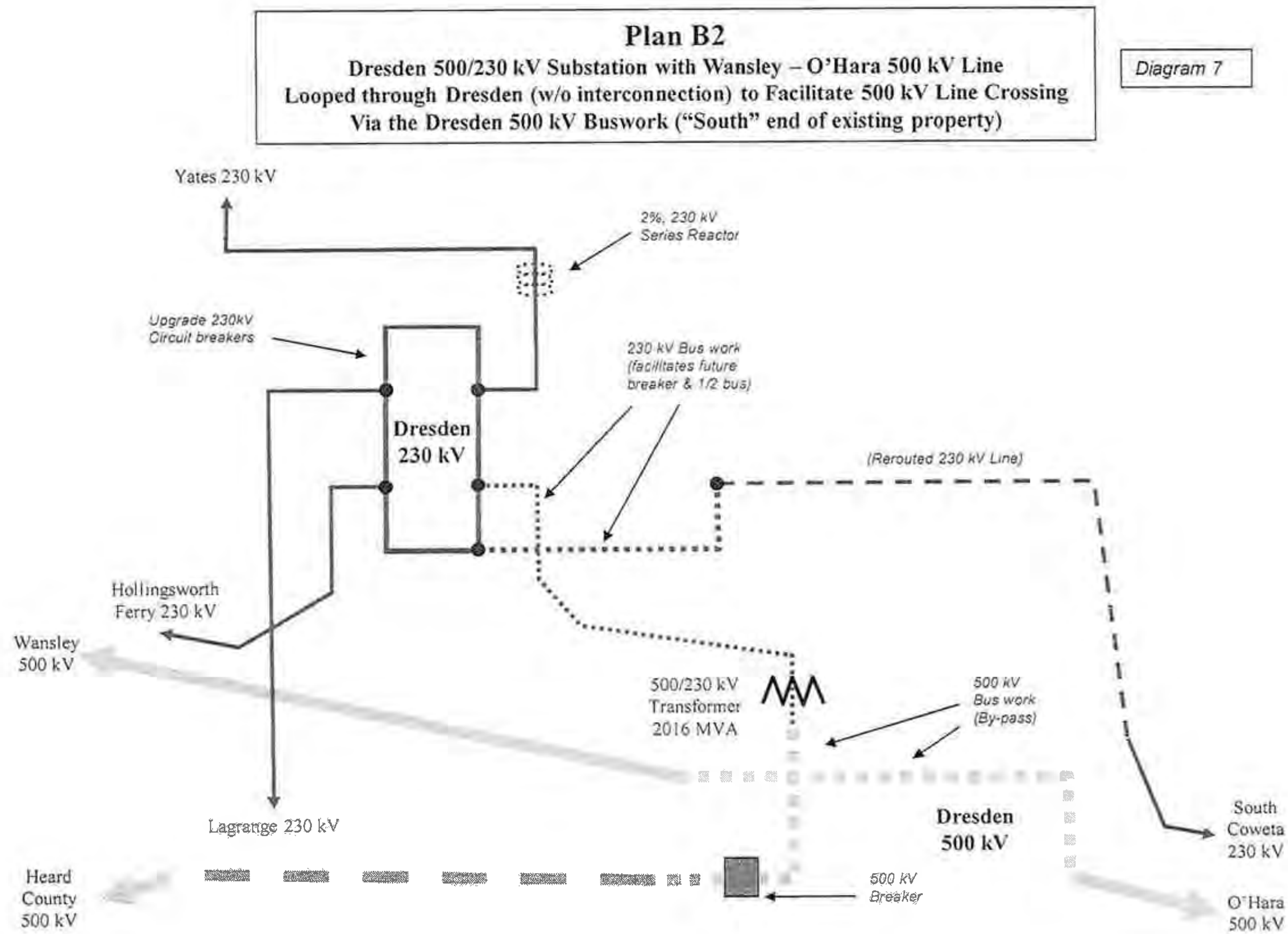


Wansley CC7 Transmission Improvements Plan

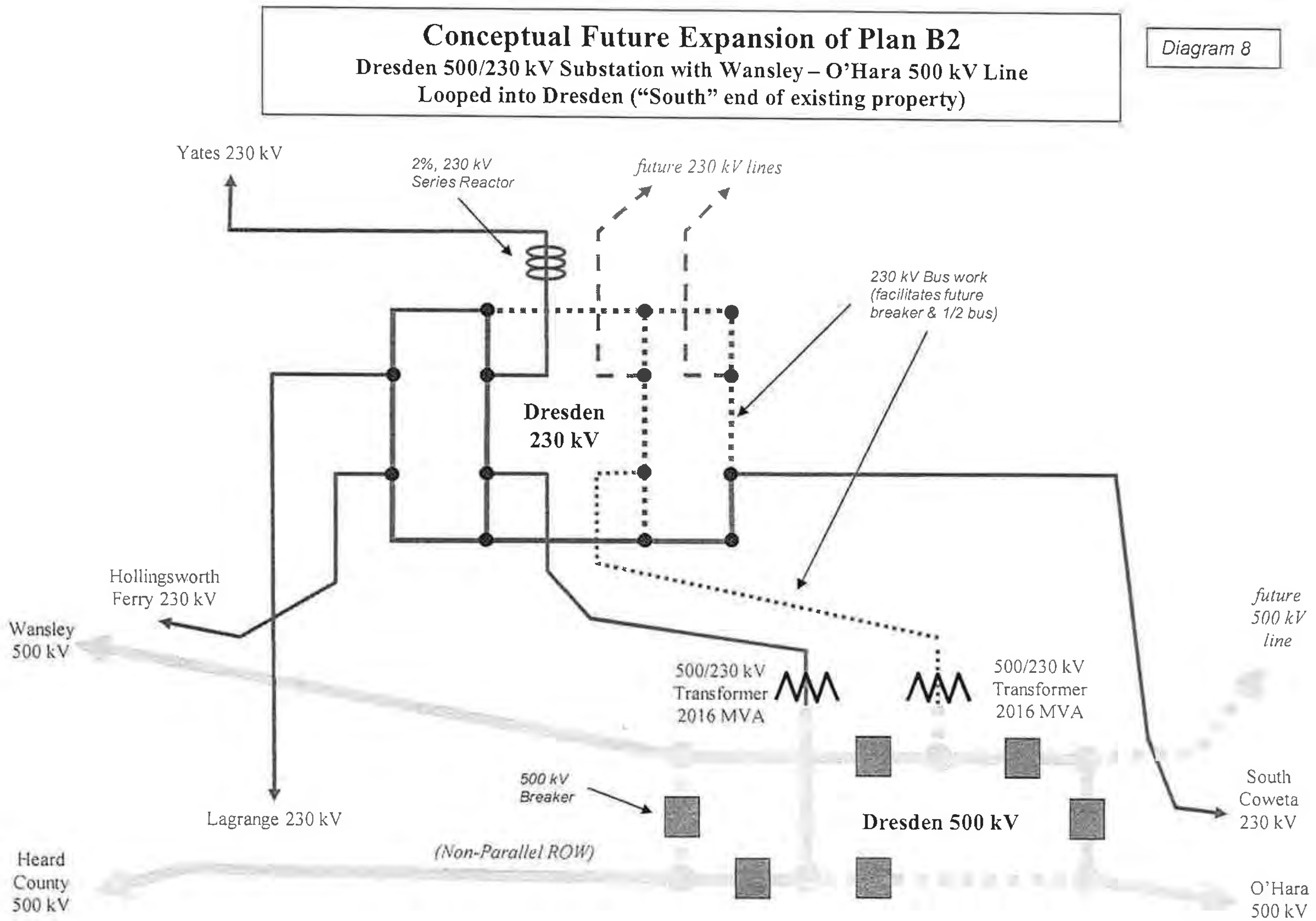



Conceptual Future Expansion of Plan B1
Dresden 500/230 kV Substation with Wansley – O'Hara 500 kV Line
Looped through Dresden (w/o interconnection) to Facilitate 500 kV Line Crossing
Via the Dresden 500 kV Buswork ("North" end of existing property)
Diagram 6
2%, 230 kV
Series Reactor
future 230 kV line
230 kV Bus work
(facilitates future
breaker & 1/2 bus)
Dresden
500 kV
future
500 kV
line
Dresden
230 kV
500/230 kV
Transformer
2016 MVA
Wansley
500 kV
future 230 kV line
LaGrange
230 kV
South
Coweta
230 kV
Heard
County
500 kV
O'Hara
500 kV

Wansley CC7 Transmission Improvements Plan



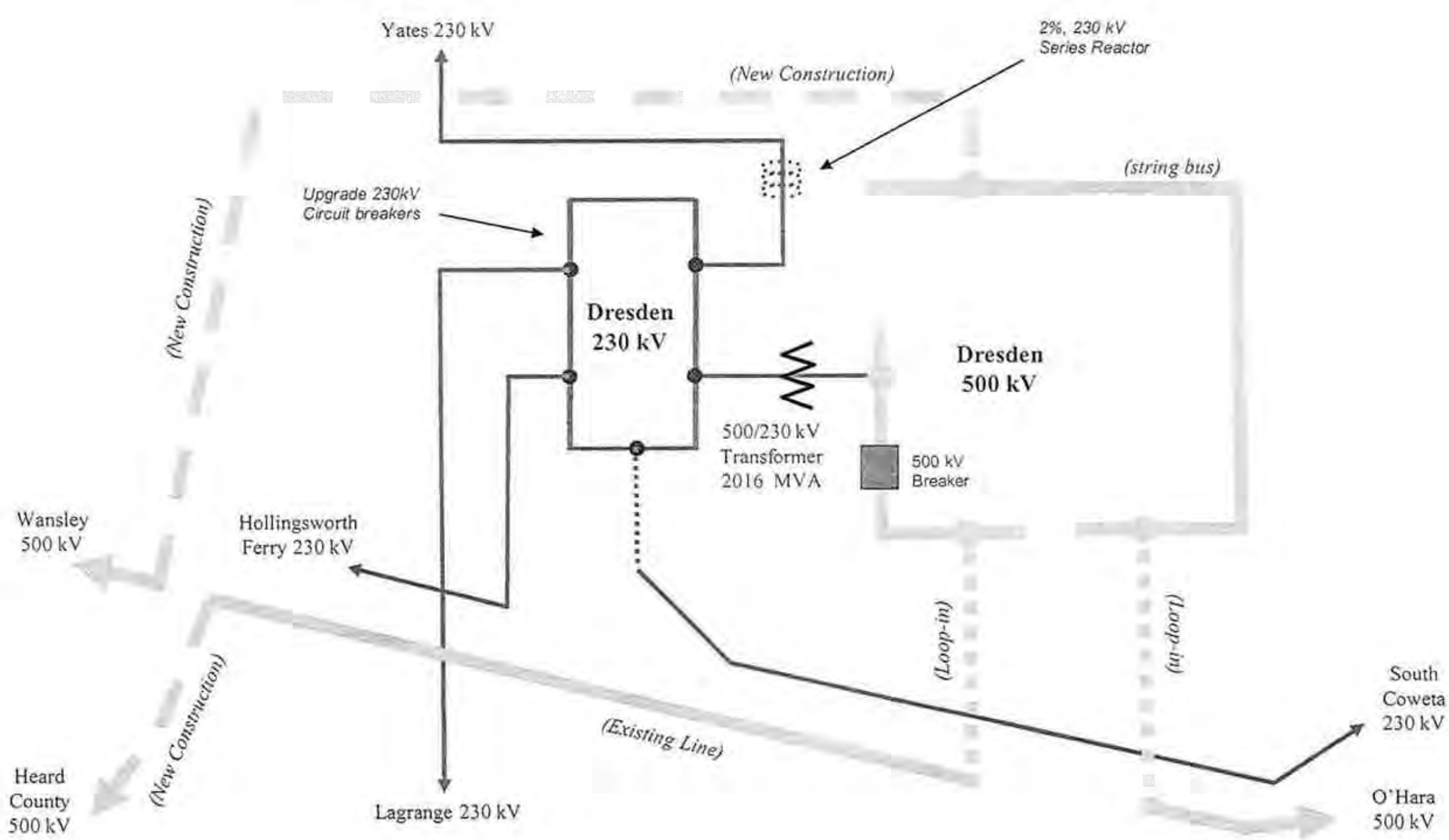
Wansley CC7 Transmission Improvements Plan



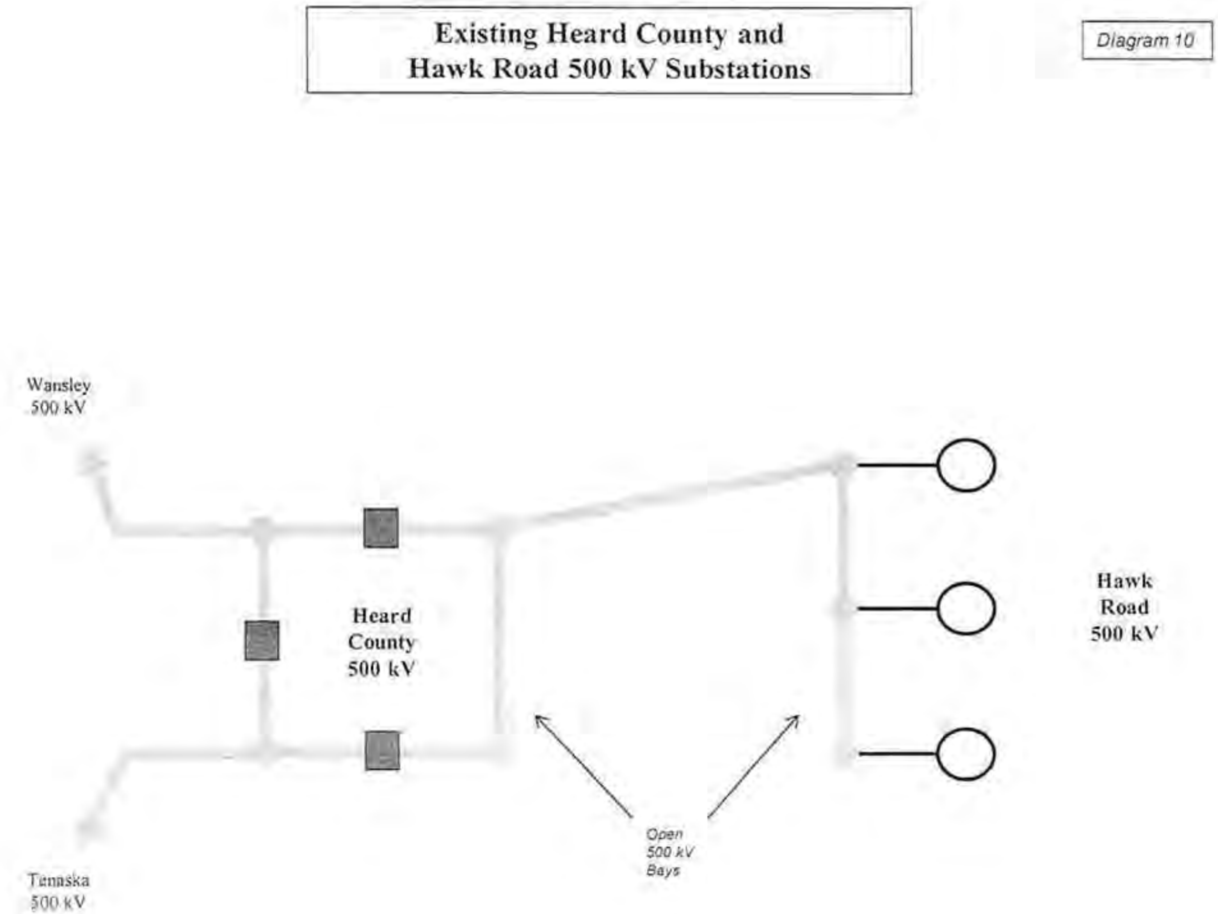
Wansley CC7 Transmission Improvements Plan

Plan C
Dresden 500/230 kV Substation with existing Wansley – O'Hara 500 kV Line Reconfigured to Avoid Crossing with new Dresden - Heard County 500 kV Line

Diagram 9



Wansley CC7 Transmission Improvements Plan

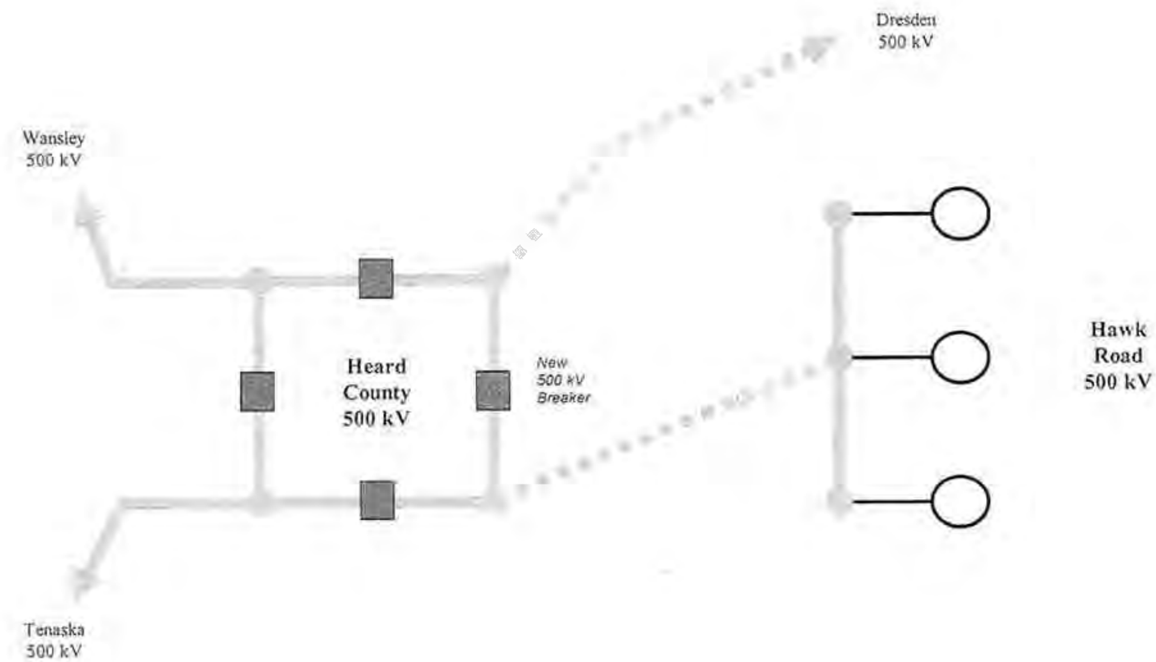


Wansley CC7 Transmission Improvements Plan

2014 Heard County and Hawk Road 500 kV Substations

Diagram 11

Dresden – Heard County 500 kV Line terminated at existing "northeast" bay
Hawk Road 500 kV connection re-terminated at previously empty bay



Interconnection Study (2011)
Wansley 7 CC 500kV
Fault Analysis
Decemeber 20, 2010
Kirk Kondos

Wansley #7 CC 500kV Configuration (Existing Model in CAPE):

a. 2 – 239 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.064857 pu.
b. 1 – 251 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.065032 pu.
c. 3 GSU, 250/275/300 MVA, 500/23kV, 6.0% impedance (estimated) @ 250 MVA

Study Description :

1. This study is based on the 2011 Washington CT TSR Queue.
   (i) Dynergy Head – 500 MW (all on)
   (ii) Franklin – 1780 MW (all on)
   (iii) Hancock – off
   (iv) Harris (APC) – 1222 MW (note because this is APC not modeled in CAPE)
   (v) Hillabee Energy Center – 700 MW (all on)
   (vi) Lindsayhill (Tenaska #1) – 546 MW – (Tenaska #1 ST off)
   (vii) Longleaf – off.
   (viii) Jack McDonough – 583 MW (unit 1 & 2) on.
   (ix) Jack McDonough Units 4, 5 &6 off
   (x) Sewell Creek – 508 MW (all on)
   (xi) SMARR CC – off.
   (xii) Talbot County – 653 MW (all on)
   (xiii) Tenaska GA – 942 MW (all on)
   (xiv) Tiger Creek – 604 MW (all on)
   (xv) Vogle Unit 3 and 4 (off)
   (xvi) Wansley CC (#6 units 1A, 1B & 1) – 572 MW
   (xvii) Wansley CC (#7 units 7A, 7B & 7) – 575 MW, this study.
   (xviii) Wansley MEAG (#9 units 9A, 9B & 9) – 497 MW
   (xix) Wansley Units 1 & 2 – 1780 MW
   (xx) Wansley OPC (Chattahoochee Energy) – 464 MW
   (xxi) Warthen – 600 MW (1 – 8 all on)
   (xxii) Washington CT – off
   (xxiii) West GA – Gen 2 off

2. This study is modeled in CAPE with the its2010_2011Que with the following system modifications:
   (i) Installation of two 2%, 2000A, 230kV series reactors in parallel (1% total) on the low side of the Villa Rica 500/230kV transformer.
3. A benchmark fault study was run in order to determine the fault currents ratings at the new Wansley CC (#7 units 7A, 7B & 7) station. Two cases were run: without generation and with generation at Wansley CC (#7 units 7A, 7B & 7).
4. Next, a breaker-by-breaker duty analysis was done to identify any overstressed breakers at Wansley CC (#7 units 7A, 7B & 7) and Villa Rica 500/230kV installation. Two cases were run:
   (i) 2011 basecase with all generation in service and no generation at Wansley CC (#7 units 7A, 7B & 7).
   (ii) 2011 basecase with all generation in service, including generation at Wansley CC (#7 units 7A, 7B & 7).

Study Results :

1. **Total fault currents at buses (Amps):**

Station	Fault	Base (w/o Gen.)	Ultimate (w/ Gen.)
Wansley CC 500kV	3-phase fault	35217	37934
	Phase-ground fault	38343	40442

Breaker Duty margins without generation at Wansley CC #7 – 2011 conditions:

		3 phase		Phase to ground	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	36028	38	39801	32.2
182010	63	36028	38	39801	32.2
182020	63	36028	38	39801	32.2
182030	63	36028	38	39801	32.2
182040	63	36028	38	39801	32.2
182070	63	36028	38	39801	32.2
182080	63	36028	38	39801	32.2
182090	63	36028	38	39801	32.2
182100	63	33316	42.9	35212	40.8
182110	63	36028	38	39801	32.2
182116	63	35217	39.9	38342	36.7
182226	63	35217	39.9	38342	36.7
182331	63	35217	39.9	38342	36.7
182776	63	35217	39.9	38342	36.7
182886	63	35217	39.9	38342	36.7
182996	63	35217	39.9	38342	36.7
PCB @ Villa Rica 500kV					
159030	63	21384	65.3	15920	74.7
159040	63	16343	72.8	12618	77.0
159050	63	21384	65.3	15920	74.7
PCB @ Villa Rica 230kV Bus 1					
159214	63	36653	41.4	29627	50.2
159238	63	34878	41.0	29144	48.1
159258	63	31482	50.0	26857	54.7
159268	63	34774	41.0	29240	48.0

PCB @ Villa Rica 230kV Bus 2					
159224	63	36653	41.4	29627	50.2
159228	63	33833	42.9	28519	49.2
159248	63	31971	45.4	26956	51.5

Breaker Duty margins with generation at Wansley CC #7 500kV:

		3 phase		Phase to ground	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	38728	33.2	41952	29.6
182010	63	38728	33.2	41952	29.6
182020	63	38728	33.2	41952	29.6
182030	63	38728	33.2	41952	29.6
182040	63	38728	33.2	41952	29.6
182070	63	38728	33.2	41952	29.6
182080	63	38728	33.2	41952	29.6
182090	63	38728	33.2	41952	29.6
182100	63	33316	42.9	35212	40.8
182110	63	38728	33.2	41952	29.6
182116	63	38934	35.0	40442	33.2
182226	63	38934	35.0	40442	33.2
182331	63	38934	35.0	40442	33.2
182776	63	38934	35.0	40442	33.2
182886	63	38934	35.0	40442	33.2
182996	63	38934	35.0	40442	33.2
PCB @ Villa Rica 500kV					
159030	63	21918	64.5	16114	74.4
159040	63	16792	72.1	12793	76.7
159050	63	21918	64.5	16114	74.4
PCB @ Villa Rica 230kV Bus 1					
159214	63	36765	41.2	29675	50.1
159238	63	34983	40.9	29192	47.9
159258	63	31584	49.9	26907	54.5
159268	63	34876	41.1	29288	47.9
159224	63	36765	41.2	29675	50.1
159228	63	33937	42.7	28568	49.1

159248	63	32078	45.2	27007	51.4

Conclusions:

1. **Generation from Simple Cycle units:** Circuit breakers with 50kA minimum interrupting capability are required at the new Wansley CC #7 500kV installation.

2. **Overstressed breakers:** There are no overstressed circuit breakers that need to be upgraded due to the new generation.

Note:
Small changes in short circuit data, modeling assumptions and study methods could increase or decrease fault duties and thus the margins of these currents with respect to circuit breaker fault duty interrupting ratings. Hence should any of the circuit parameters change, please advise P&C because this may warrant further analysis.

Interconnection Study (2014)
Wansley 7 CC 500kV
Fault Analysis
July 7, 2011
Kirk Kondos

Wansley #7 CC 500kV Configuration (Existing Model in CAPE):

a. 2 – 239 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.064857 pu.
b. 1 – 251 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.065032 pu.
c. 3 GSU, 250/275/300 MVA, 500/23kV, 6.0% impedance (estimated) @ 250 MVA

Study Description :

1. This study is based on the 2014 Washington CT TSR Queue.
   (i) Dynergy Head – 500 MW (all on)
   (ii) Franklin – 1780 MW (all on)
   (iii) Hancock – off
   (iv) Harris (APC) – 1222 MW (note because this is APC not modeled in CAPE)
   (v) Hillabee Energy Center – 700 MW (all on)
   (vi) Lindsayhill (Tenaska #1) – 546 MW – (Tenaska #1 ST off)
   (vii) Longleaf – 600 MW.
   (viii) Jack McDonough – 583 MW (unit 1 & 2) off
   (ix) Jack McDonough Units 4, 5 &6 on
   (x) Sewell Creek – 508 MW (all on)
   (xi) SMARR CC – off.
   (xii) Talbot County – 653 MW (all on)
   (xiii) Tenaska GA – 942 MW (all on)
   (xiv) Tiger Creek – 604 MW (all on)
   (xv) Vogle Unit 3 and 4 (off)
   (xvi) Wansley CC (#6 units 1A, 1B & 1) – 572 MW
   (xvii) Wansley CC (#7 units 7A, 7B & 7) – 575 MW, this study.
   (xviii) Wansley MEAG (#9 units 9A, 9B & 9) – 497 MW
   (xix) Wansley Units 1 & 2 – 1780 MW
   (xx) Wansley OPC (Chattahoochee Energy) – 464 MW
   (xxi) Warthen – 600 MW (1 – 8 all on)
   (xxii) Washington CT – 660 MW
   (xxiii) West GA – Gen 2 off

2. This study is modeled in CAPE with the its2010_2014 Que with the following 2014 system improvements:
   (i) New 500kV Dresden to Heard County line, triple conductor 1113 ACSR.
   (ii) Installation of one 2%, 2000A, 230kV series reactor at Dresden on the Yates Line.
   (iii) Install at Dresden 500/230kV, 2016MVA transformer.
3. A benchmark fault study was run in order to determine the fault currents ratings at the new Wansley CC (#7 units 7A, 7B & 7) station. Two cases were run: without generation and with generation at Wansley CC (#7 units 7A, 7B & 7).
4. Next, a breaker-by-breaker duty analysis was done to identify any overstressed breakers at Wansley CC (#7 units 7A, 7B & 7) and other stations that were identified by Transmission Planing. Two cases were run:
   (i) 2014 basecase with all generation in service and no generation at Wansley CC (#7 units 7A, 7B & 7).
   (ii) 2014 basecase with all generation in service, including generation at Wansley CC (#7 units 7A, 7B & 7).

Study Results :

1. Total fault currents at buses (Amps):

Station	Fault	Base (w/o Gen.)	Ultimate (w/ Gen.)
Wansley CC 500kV	3-phase fault	39521	42237
	Phase-ground fault	42091	44103

Breaker Duty margins without generation at Wansley CC #7 and with 2014 System Improvements:

		3 phase		Phase to ground	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	40563	30.7	43905	26.8
182010	63	40563	30.7	43905	26.8
182020	63	40563	30.7	43905	26.8
182030	63	40563	30.7	43905	26.8
182040	63	40563	30.7	43905	26.8
182070	63	40563	30.7	43905	26.8
182080	63	40563	30.7	43905	26.8
182090	63	40563	30.7	43905	26.8
182100	63	37854	35.4	39131	34.7
182110	63	40563	30.7	43905	26.8
182116	63	39521	33.1	42091	31.0
182226	63	39521	33.1	42091	31.0
182331	63	39521	33.1	42091	31.0
182776	63	39521	33.1	42091	31.0
182886	63	39521	30.5	42091	30.6
182996	63	39521	33.1	42091	31.0
PCB @ Dresden 500kV					
New to Heard	63	24384	58.5	20295	67.8
PCB @ Dresden 230kV					
New to 500kV T	63	33886	39.4	33604	46.7
988010	40	41859	-16.2	40187	-5
988020	40	44658	-22.9	42646	-6.6
988030	40	43200	-19.4	41331	-3.3
988040	50	43957	-4.1	41331	17.3
PCB @ Heard County 500kV					
New to Dresden	63	35561	41.4	36115	42.7
914240	63	33433	43.3	35115	42.8
914250	63	29346	49.9	30120	51.4
914260	63	35561	41.4	36115	42.7
PCB @ Tenaska Ga 500kV					
454110	63	32597	45.0	31837	48.8
454220	63	32744	44.8	34523	44.2
454330	63	32744	42.7	34523	44.1
PCB @ Yates					

230kV					
050750	43	44575	-6.4	44855	-5.3
050760	63	43328	29.3	43808	29.7
050770	63	44575	27.4	44855	28.1
050780	43	40863	1.8	42113	1.1
050790	43	44575	-14.5	44855	-9.1
050850	43	44575	-6.4	44855	-5.3
050870	43	44575	-6.4	44855	-5.3
050880	43	44575	-6.4	44855	-5.3
050890	43	43328	-3.7	43808	-2.9
050950	63	44575	27.4	44855	28.1
050960	43	44575	-6.4	44855	-5.3
PCB @ Lagrange 230kV					
025100	40	8970	77.6	8015	79.3
025158	40	6636	83.4	6630	83.4
025168	37.5	8571	77.1	8177	78.2
PCB @ South Coweta 230kV					
903818	40	6280	84.3	4476	88.5
PCB @ Villa Rica 500kV					
159030	63	22083	64.9	16207	74.3
159040	63	19112	68.5	14244	74.2
159050	63	22083	64.4	16207	74.3
PCB @ Villa Rica 230kV Bus 1					
159214	63	43985	27.6	37309	33.7
159238	63	41937	27.3	36538	31.8
159258	63	38600	33.5	34404	36.2
159268	63	41923	27.4	36699	31.6
PCB @ Villa Rica 230kV Bus 2					
159224	63	43985	27.6	37309	33.7
159228	63	40891	29.1	35899	33.1
159248	63	39415	31.1	34777	34.8
PCB @ Hollingsworth Ferry 230kV					
401660	63	40488	30.6	36266	42.4
401770	63	40488	30.6	36266	42.4
401880	63	40488	30.6	36266	42.4
401990	63	40488	30.6	36266	42.4
PCB @ Yellow Dirt 230kV					
987710	50	41820	16.4	38945	21.7
987720	50	36037	24.2	32212	34.8
987730	50	37083	16.9	35644	27.8
987740	50	39976	11.2	37699	24.0
987750	50	35600	21.4	31025	37.6
987760	50	37083	16.9	35644	27.8

Breaker Duty margins with 575MW generation at Wansley CC #7 with and System Improvements:

		3 phase		Phase to ground	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	43266	25.9	45973	23.4
182010	63	43266	25.9	45973	23.4
182020	63	43266	25.9	45973	23.4
182030	63	43266	25.9	45973	23.4
182040	63	43266	25.9	45973	23.4
182070	63	43266	25.9	45973	23.4
182080	63	43266	25.9	45973	23.4
182090	63	43266	25.9	45973	23.4
182100	63	37854	35.1	39131	34.7
182110	63	43266	25.9	45973	23.4
182116	63	42237	28.2	44103	27.7
182226	63	42237	28.2	44103	27.7
182331	63	42237	28.2	44103	27.7
182776	63	42237	28.2	44103	27.7
182886	63	42237	28.2	44103	27.7
182996	63	42237	28.2	44103	27.7
PCB @ Dresden 500kV					
New to Heard	63	25318	56.9	20717	67.1
PCB @ Dresden 230kV					
New to 500kV T	63	34320	38.7	33887	46.2
988010	40	42316	-17.5	40466	-1.2
988020	40	45129	-24.3	42932	-7.3
988030	40	43662	-20.7	41612	-4.0
988040	50	43662	12.7	41612	16.8
PCB @ Heard County 500kV					
New to Dresden	63	37360	38.3	37331	40.7
914240	63	35214	40.3	36398	40.8
914250	63	31145	46.8	31360	49.5
914260	63	37360	38.3	37331	40.7
PCB @ Tenaska Ga 500kV					
454110	63	34243	42.3	32927	47.2
454220	63	34388	42.0	35720	42.4
454330	63	34388	39.8	35720	42.4
PCB @ Yates 230kV					
050750	43	44690	-6.6	44933	-5.5
050760	63	44690	27.2	44933	28.0
050770	63	44690	27.2	44933	28.0
050780	43	40927	1.6	42180	1.0
050790	43	44690	-14.7	44933	-9.3
050850	43	44690	-6.6	44933	-5.5
050870	43	44690	-6.6	44933	-5.5
050880	43	44690	-6.6	44933	-5.5

050890	43	43435	-3.9	43881	-3.1
050950	63	43435	29.1	43881	29.6
050960	43	44690	-6.6	44933	-5.5
PCB @ Lagrange 230kV					
025100	40	8982	77.5	8021	79.3
025158	40	6637	83.4	6631	83.4
025168	40	8592	77.1	8183	78.2
PCB @ South Coweta 230kV					
903818	40	6290	84.3	4481	88.5
PCB @ Villa Rica 500kV					
159030	63	22550	64.2	16372	74.0
159040	63	19513	67.9	14391	73.9
159050	63	22550	63.7	16372	74.0
PCB @ Villa Rica 230kV Bus 1					
159214	63	44200	27.2	37413	33.5
159238	63	42144	26.9	36643	31.6
159258	63	38805	33.1	34512	35.9
159268	63	42126	27.0	36803	31.4
PCB @ Villa Rica 230kV Bus 2					
159224	63	44200	27.2	37413	33.5
159228	63	41098	28.7	36005	32.8
159248	63	39608	30.7	34877	34.5
PCB @ Hollingsworth Ferry 230kV					
401660	63	40637	30.4	36346	42.3
401770	63	40637	30.4	36346	42.3
401880	63	40637	30.4	36346	42.3
401990	63	40637	30.4	36346	42.3
PCB @ Yellow Dirt 230kV					
987710	50	41967	16.7	39030	21.6
987720	50	36184	23.9	32279	34.7
987730	50	37201	16.7	35717	27.7
987740	50	40122	11.0	37787	23.8
987750	50	35748	23.6	31106	37.5
987760	50	37201	16.7	35717	27.7

Conclusions:

1. The new circuit breakers with 63kA minimum interrupting capability are adequate for the new Dresden to Heard 500kV Line at Dresden and Heard.

2. The following are overstressed circuit breakers that need to be upgraded:

   a) **Dresden 230kV (need minimum of 63kA):**
      a. **988010**
      b. **988020**
      c. **988030**
      d. **988040**

   b) **Yates 230kV (need minimum of 63kA):**
      a. **050750**
      b. **050780**
      c. **050790**
      d. **050850**
      e. **050870**
      f. **050880**
      g. **050890**
      h. **050960**

Note:
Small changes in short circuit data, modeling assumptions and study methods could increase or decrease fault duties and thus the margins of these currents with respect to circuit breaker fault duty interrupting ratings. Hence should any of the circuit parameters change, please advise P&C because this may warrant further analysis.

Dresden 500/230kV Substation Estimate Assumptions

6-29-11

The following is a list of assumptions on which the estimate for the subject substation is based.

SCOPE: The scope of this project consists of constructing a new 500/230kV substation connecting the 230kV to the existing Dresden 230kV ring bus. Install 230kV reactors on the Yates 230kV line.

Assumptions:

1. Estimate is based on PDSL 1058-PD6A, PD6B with the latest revision of June 1, 2011 and drawing 1058-LP2F. This estimate includes all materials up to and including the 500/230kV autobanks. (The 230 components are included in the Dresden P86008 estimate.)
2. Estimate assumes four (4) new single phase 500/230kV 403/537/672MVA autotransformers will be installed and costs $3,960,000 per phase.
3. Estimate includes all site development work for the new 500kV yard and the 230kV expansion. Assumptions for the site development design:
    - Design will be to match the existing 230kV station. Assumes no rock or high water table.
    - Design will be a balanced site.
    - No perimeter fence and no retaining wall.
    - Pad elevation is estimated to be at 804.
    - 3:1 Fill slopes and 3:1 cut slopes.
    - 2 driveways
    - Internal drainage system and detention pond.
    - Includes NPDES activity.
4. Estimate assumes the control wiring will be performed under a separate contract.
5. Estimate assumes the transmission line hardware will be provided with the TL project.
6. Estimate assumes a ground grid mesh of 50' x 50' and the ground rods driven to a depth of 10'.
7. There will be a fence expansion of the existing Dresden switching station to include the 230kVconnection to the existing ring bus in a manner that sets the 230kV bus up for a future breaker and a half scheme and will also include the 500kV yard and associated equipment.
8. Estimate assumes an additional control house that will be located in the 500kV yard.
9. Estimate assumes one 500kV breaker with an estimated price of $629,000.
10. Estimate includes (3) 230kV reactors with an estimated price of $123,490 each.
11. Estimate assumes that MEAG will be responsible for the line modification required in order to install reactors on the Yates 230kV line.
12. Estimate includes two (2) 125V DC, 200 amp-hour battery systems.
13. Estimate includes bus work that routes the O'Hara to Wansley 500kV line through the station to prevent the Dresden - Heard County 500kV line from crossing the O'Hara - Wansley 500kV line.

Dresden 500/230kV Substation Estimate Assumptions

6-29-11

14. Estimate does not include any dollars associated with the new Heard County line termination, the O'Hara and Wansley line terminations, or any work required to lower the South Coweta line.
15. GPC has accepted TIN #110-10BP to perform the line work necessary to break the O'Hara - Wansley 500kV line and loop it through the bus at Dresden. This work includes removing the line segment between the two new loop structures. GTC will acquire the necessary land for the new Wansley line loop, as it involves the same landowner we are negotiating with. (GTC will follow up with the new dead end locations to ensure they will still perform this work.)
16. Estimate assumes NO generation re-dispatch expense.
17. Estimate includes dollars to transport the 230kV reactors from GPC's Villa Rica substation.
18. Estimate includes 6.5% contingency on the construction contractor labor and material contracts (EC50 only.)
19. Estimate includes 3% per year escalation for two years on the construction labor and material contracts.
20. Estimate is based on a normal lead-time schedule.
21. Overheads are based on 2011 methodology – 23% adder to direct costs.

Dresden 230kV Switching Station Expansion Estimate Assumptions

6-29-11

The following is a list of assumptions on which the estimate for the subject substation is based.

SCOPE: Modify the existing Dresden switching station by adding an element to the ring bus that contains bus work to the 500/230kV 672 MVA single phase autotransformers and the 500kV bus work and associated equipment.

Assumptions:

1. Estimate is based on PDSL 1058-PD6A, PD6B with the latest revision of June 1, 2011 and drawing 1058-LP2F. This estimate includes all materials up to and including the 230kV tertiary bus. (The 500 components are included in the Dresden P85727 estimate.)
2. Estimate includes one new 230kV breaker and one new 5000 amp 230kV switch.
3. The bus from the transformer to the connection to the ring bus will be rated for 5000amps.
4. Estimate includes replacing five 230kV breakers with 3000amp breakers.
5. Estimate includes all environmental activity associated with both Dresden projects.
6. Estimate includes for a separate contractor to remove and relocate the four (4) existing 230kV breakers.
7. Estimate assumes the control wiring will be performed under a separate contract.
8. Estimate includes 10.5% contingency on the construction contractor labor and material contracts. (EC50 only.)
9. Estimate includes 3% per year escalation for one year on the construction labor and material contracts.
10. Estimate is based on a normal lead-time schedule.
11. Overheads are based on 2011 methodology – 23% adder to direct costs.

Georgia Transmission Corporation
Primavera Project Manager
Project Estimate Summary

Project: **P85727** **Dresden - MSS** Customer: **ITS**
Desc: **TS_MSS** Project Manager: **AKIN**

Scope: Install four 672 MVA, 500/230 kV autobanks w/DGA monitors & terminate Dresden-Heard County 500 kV TL on a breaker. Route Wansley-O'Hara 500 kV TL thru S/S w/o interconnection. Add 2000A, 2%, 230 kV series reactor on Yates 230kV TL

	Budgeted Cost
Project Total Charges	$45,593,392.84
Direct Charges	$36,177,622.84
50 - Construction Contract Labor	$7,692,581.00
50 - Construction Contract	$6,135,496.00
50 - Site Work Contract	$1,507,085.00
50 - Environmental Field Compliance	$40,000.00
50 - Transport Transformer	$10,000.00
20 - GPC Mobile	$0.00
50 - Contract Wireman	$0.00
64 - Owner Furnished Material	$22,371,381.00
60 - Land	$288,438.00
Labor (40 & 54)	$398,647.84
40 - Associate Salary	$394,925.44
54 - Contract Labor	$3,722.40
56 - Professional Services	$545,450.00
56 - Multiple Discipline	$22,850.00
56 - S/S Design	$70,000.00
56 - Environmental Services	$0.00
56 - Land Services	$3,000.00
56 - Photo Science	$149,600.00
56 - S/S Maintenance	$300,000.00
58 - Legal	$5,500.00
Other	$13,000.00
Miscellaneous (Expenses, permits, etc)	$8,000.00
Project Contingency & Escalation	$2,312,625.00
Management Reserve	$2,550,000.00
Indirect Charges	$9,415,770.00
Indirects (overheads)	$9,415,770.00
	$45,593,392.84

Georgia Transmission Corporation
Primavera Project Manager
Project Estimate Summary

Project: **P86008** **Dresden - MSS** Customer: **ITS**
Desc: **TS_MSS** Project Manager: **AKIN**

Scope: Expand 230 kV S/S, replace four 230 kV circuit breakers (with 3000 A, 63 kA) and add 230 kV bus work to accommodate the installation of 500/230 kV transformer (reference Project P85727).

	Budgeted Cost
Project Total Charges	$2,511,726.00
Direct Charges	$2,006,036.00
50 - Construction Contract Labor	$429,468.00
50 - Construction Contract	$364,468.00
50 - Site Work Contract	$0.00
50 - Environmental Field Compliance	$25,000.00
20 - GPC Mobile	$0.00
50 - Removal Cost	$40,000.00
50 - Contract Wireman	$0.00
64 - Owner Furnished Material	$951,942.00
Labor (40 & 54)	$142,936.00
40 - Associate Salary	$142,000.00
54 - Contract Labor	$936.00
56 - Professional Services	$190,690.00
56 - Multiple Discipline	$0.00
56 - Construction Services	$0.00
56 - S/S Design	$0.00
56 - Environmental Services	$53,640.00
56 - Photo Science	$17,050.00
56 - S/S Maintenance	$120,000.00
Other	$6,500.00
Miscellaneous (Expenses, permits, etc)	$4,000.00
Project Contingency & Escalation	$84,500.00
Management Reserve	$200,000.00
Indirect Charges	$505,690.00
Indirects (overheads)	$505,690.00
	$2,511,726.00
Credit from removal of used equipment	$397,600
Net Change to Facility Investment	$2,114,126

County: COWETA

Printed on: 10/11/2011

Georgia Transmission Corporation
PROJECT RELEASE

Planning Contact : ZAKIA EL OMARI
Region: Northeast
Required Cut-In Date: 06/01/2014
Project Manager : HERBERT (HERB) PAYNE JR.

GTC Projects:
P86009 Dresden-South Coweta(I.T.S.) 230kV Transmission Line

Approved by Bob [signature] **Date** 10-13-2011

Approved by ______ **Date** ______

Approved by ______ **Date** ______

Approved by ______ **Date** ______

RDWiley 10/12/2011

ZAKIA EL OMARI 10/12/2011

Scopes:
P86009 Modify Dresden - South Coweta 230 kV line as necessary to accomodate 500 kV line crossing(s).

Justification: The Wansley CC #7 transmission service request will require significant transmission upgrades within the ITS including the following major additions:

* Construct a (~5.75-mile) 500 kV line from the Heard County 500 kV Switching Station to the Dresden 230 kV Switching Station.

* Install four single phase 500/230 kV, 672-MVA autobanks with DGA monitors at Dresden.

* Expand Dresden substation to accommodate Heard County 500 kV line termination and addition of 500/230 kV transformer at Dresden. Route Wansley - O'Hara 500 kV line thru Dresden 500 kV switchyard via bus work w/o interconnection to Dresden 500 kV bus.

* Install two 230 kV, 2% series reactors in parallel on the low-side of the Villa Rica 500/230 kV autobanks in 2011. In 2014, one series reactor will be relocated to Dresden and installed on the Dresden - Yates 230 kV line and the other will be assigned elsewhere.

* Modify the Dresden - South Coweta 230 kV line as necessary to accommodate 500 kV line crossing(s).

This project was approved by the TPWG on the 8/11/2011 for a 6/1/2014 need date.

	Total Budget	Retirement	Reimbursement	Net Cost	DSF	NET ITS INV
P86009	$249,654			$249,654		$249,654
Totals:	$249,654			$249,654		$249,654

TRANSMISSION LINE PROJECT INFORMATION

Project Name: Dresden-South Coweta | Const Voltage: 230 | Oper Voltage: 230 | Description: Modify T/L

Facility Owner: GEORGIA TRANSMISSION CORPORATION
Operational Name:

Area Project:	Wansley CC 7 Improvements				
Total Miles After:	25.00	Line Switch:	No	Will Tap To:	-
Conductor:	NA	Underbuild:	Unknown		
ITS Crit Proj:	Yes	Req'd ITS:	05/01/2014		
JSTP Submittal:	ITS Parity Only - Not Fixed Cost			JSTP Cost:	N/A
PCD Required:	No			PCD Date:	

Workflow Info For Item 'rec986623'

All Active Workflows --> 86009_Dresden-South_Coweta_TL --> Workflow Info

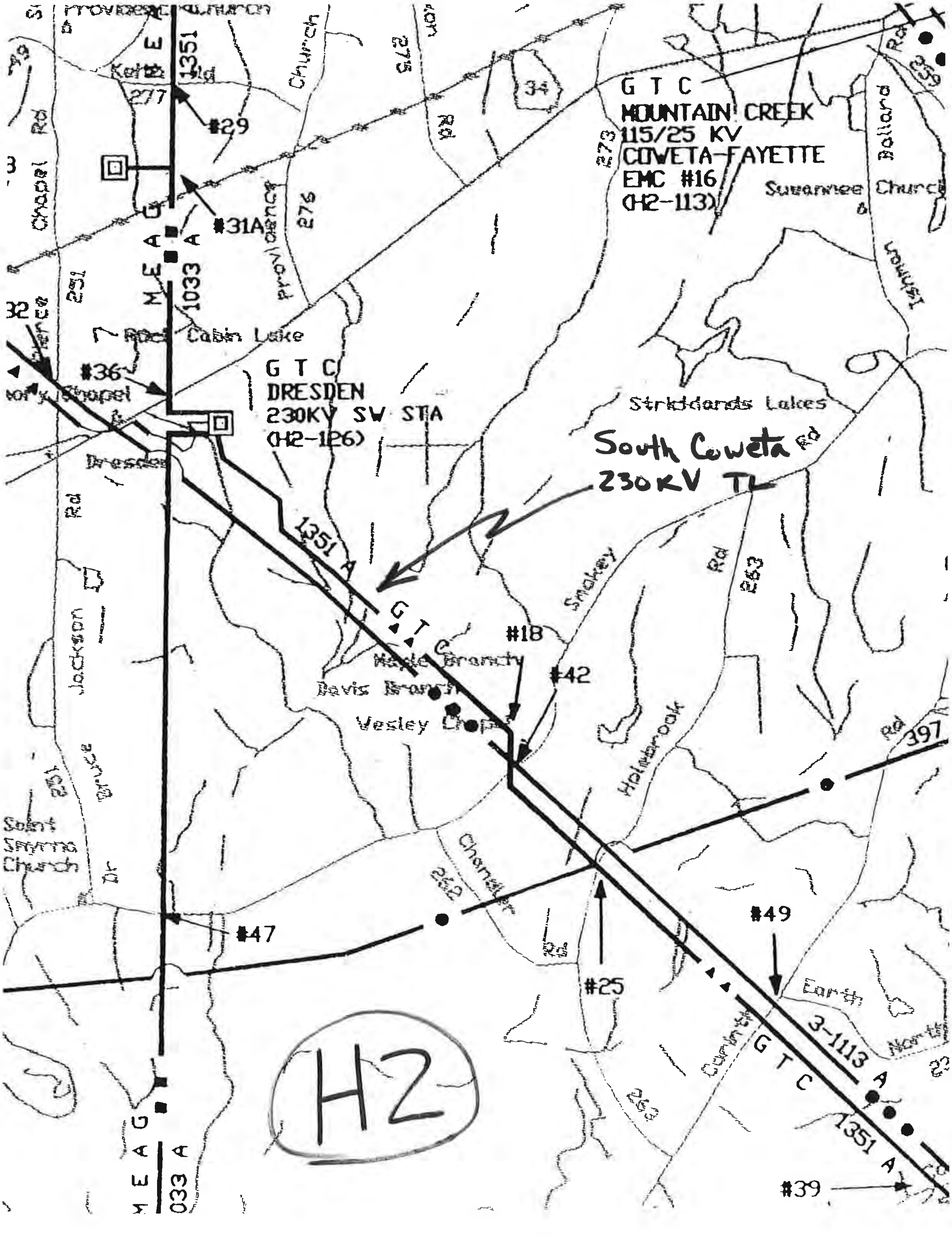
Title: 86009_Dresden-South_Coweta_TL
Revision: 1
Type: Doc
Author: kingr
Workflow Name: 86009_Dresden-South_Coweta_TL
Workflow Steps:

1. contribution (*AutoContribute/Edit Revision*)
2. planning_supp_start (*Review*)
3. tse_planner (*Review*)
4. group_lead (*Review*)
5. manager (*Review*)
6. project_control_specialist (*Review*)
7. project_manager_s (*Review*)
8. project_manager_tp (*Review*)
9. vp_ps (*Review*)
10. **planning_supp_final (*Review/New Revision*)**
11. notify_records_dept (*Review*)

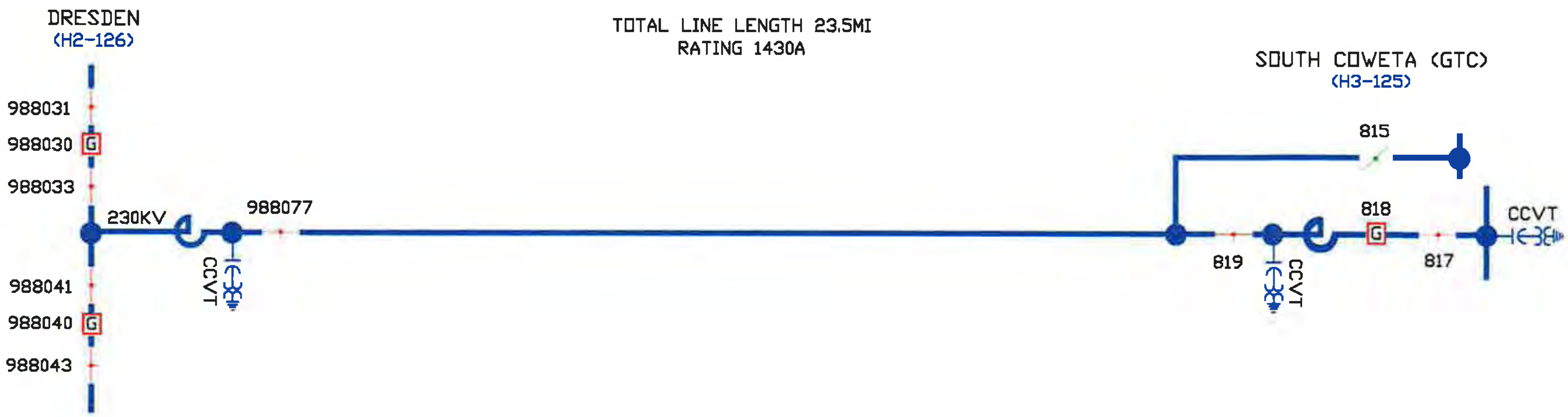
Current Step: planning_supp_final
Approved By:
Required Approvals: All
Remaining Reviewers: kingr

Workflow Content Action History

Workflow Name	Step	Action	Action Date	Users
86009_Dresden-South_Co	contribution	Check In	10/13/11 1:52 PM	kingr
86009_Dresden-South_Co	contribution	Approve	10/13/11 1:52 PM	kingr
86009_Dresden-South_Co	planning_supp_start	Work Notification	10/13/11 1:52 PM	kingr
86009_Dresden-South_Co	planning_supp_start	Approve	10/13/11 1:54 PM	kingr
86009_Dresden-South_Co	tse_planner	Work Notification	10/13/11 1:54 PM	elomari
86009_Dresden-South_Co	tse_planner	Approve	10/13/11 3:07 PM	elomari
86009_Dresden-South_Co	group_lead	Work Notification	10/13/11 3:07 PM	wiley
86009_Dresden-South_Co	group_lead	Approve	10/14/11 8:12 AM	wiley
86009_Dresden-South_Co	manager	Work Notification	10/14/11 8:12 AM	caseyr
86009_Dresden-South_Co	manager	Approve	10/14/11 9:34 AM	caseyr
86009_Dresden-South_Co	project_control_specialist	Work Notification	10/14/11 9:34 AM	kingr prcntr1
86009_Dresden-South_Co	project_control_specialist	Approve	10/14/11 9:36 AM	prcntr1
86009_Dresden-South_Co	project_manager_s	Work Notification	10/14/11 9:36 AM	payne
86009_Dresden-South_Co	project_manager_s	Approve	10/14/11 10:13 AM	payne
86009_Dresden-South_Co	project_manager_tp	Work Notification	10/14/11 10:13 AM	battle
86009_Dresden-South_Co	project_manager_tp	Approve	10/24/11 2:48 PM	battle
86009_Dresden-South_Co	vp_ps	Work Notification	10/24/11 2:48 PM	raese
86009_Dresden-South_Co	vp_ps	Approve	10/24/11 4:00 PM	raese
86009_Dresden-South_Co	planning_supp_final	Work Notification	10/24/11 4:00 PM	kingr



G T C
MOUNTAIN CREEK
115/25 KV
COWETA-FAYETTE
EMC #16
(H2-113)
G T C
DRESDEN
230KV SW STA
(H2-126)
South Coweta
230KV TL
#29
#31A
#36
#18
#42
#47
#25
#49
#39
1351
1033
1351 A
3-1113 A
G T C
MEAG
Rock Cabin Lake
Strickland Lakes
Suwannee Church
Saint Smyrna Church
Wesley Chapel
Davis Branch
Jackson Rd
Holbrook
Smokey Rd
Chandler
Providence
Church
Ballard
H2



GEORGIA INTEGRATED TRANSMISSION SYSTEM LINE DIAGRAM	
DRESDEN-SOUTH COWETA 230KV	
Drawn: 05-11-06	Revised: 01-31-07 BAL

SHEET NO. L-H2-115

Transmission Improvements Plan for 575 MW Network Service Request Wansley CC 7 Generation Facility (OASIS # 143556)

Georgia Transmission Corporation

July 11, 2011

Wansley CC7 Transmission Improvements Plan

PROBLEM STATEMENT

A System Impact Study (SIS) was conducted by the Georgia Transmission Corporation to determine the impact to the Integrated Transmission System (ITS) of granting 575 MW of firm transmission service out of the existing Wansley CC 7 combined-cycle (CC) site in Heard County, GA (OASIS # 143556). The firm 575 MW transmission service request (TSR) was requested for the period 01/01/2010 – 01/01/2020.

Beginning in 2010, the Villa Rica 500/230 kV Transformer can exceed its thermal capacity for the loss of the Villa Rica – Union City 500 kV Line. Also, the Villa Rica – Wansley 500 kV line loads to 100 % of its thermal capacity for the loss of O'Hara – Wansley 500 kV line. Additionally, the Union City - Flat Shoals section of the Union City – East Point 230 kV line (Black) and the Morrow - Murray Lake Junction – Fort Gillem sections of the Grady – Morrow 115 kV line (Black) can exceed their respective thermal capacities under contingency situations. Beginning in 2014, O'Hara – Wansley 500 kV Line may reach 99 % of its thermal capacity for the loss of Villa Rica – Wansley 500 kV Line. The Wansley CC 7 generation is a contributing factor to these loadings.

As no improvements can be implemented in 2010 to address the above limitations, firm service would be limited to 344 MW in 2010. Several major transmission improvements will be required beginning in 2011 to grant full service for the Wansley CC7 generation facility through the requested period. This request was confirmed on May 12, 2010 pending completion of required transmission improvements.

STUDY RESULTS

Villa Rica Related Improvements (2011)

To address the near-term issues, the Wansley CC7 System Impact Study report (3/18/2010) proposed the addition of two 2%, 2000 A, 230 kV series reactors in parallel (equivalent 1%, 4000 A) on the low-side of the existing Villa Rica 500/230 kV transformer (see Diagram 1). While this improvement will alleviate the potential overloads of the Villa Rica 500/230 kV transformer and the Wansley – Villa Rica 500 kV line, it will further increase overloads of the Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) and the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black). The overall plan includes upgrades of these two lines.

Note that Wansley CC7 System Impact Study report identified the above limitations and required transmission improvements as 2012 issues. However, subsequent to the finalization of the report, Georgia Power announced that planned modifications to the existing McDonough generation facility (retirements and additions) would be delayed by one year (from 2011 to 2012). Accordingly, additional analysis indicated that a one year

delay in the McDonough generation modifications would result in a one year advancement of the limitations and required transmission improvements (as identified in the Wansley CC7 System Impact Study report) from 2012 to 2011.

Dresden 500/230 kV Improvements (2014)

To address the longer-term issues, the Wansley CC7 System Impact Study report proposed expansion of the existing Dresden 230 kV switching station (see Diagram 3) for 500 kV to accommodate installation of a new 500/230 kV transformer and termination of a new 500 kV line from the Heard County area (see Diagram 2). Additional upgrades at the existing Dresden 230 kV substation will include potential modification of the existing South Coweta 230 kV line to accommodate new 500 kV crossings and upgrades of the existing Dresden 230 kV circuit breakers. Short-circuit analysis indicates that the existing 230 kV circuit breakers at Dresden will need to be replaced with 3000 A, 63 kA circuit breakers.

While completion of the Dresden 500/230 kV project in 2014 will negate future need for the two proposed Villa Rica 230 kV series reactors, it also creates a potential overload of the Dresden – Yates 230 kV line beginning in 2014. Therefore, one of the Villa Rica 230 kV series reactors can be moved to Dresden on the Yates 230 kV line in 2014 to address this new overload and mitigate potential overloads of the Yates – Union City 230 kV line (23 miles) in 2014. The other Villa Rica series reactor could be reused for a future project or as a system spare.

Dresden – Heard County 500 kV Line (2014)

Note that the Wansley CC7 System Impact Study report recommended a Dresden to Tenaska 500 kV line. However, termination of the Dresden 500 kV line at the Heard County 500 kV Switching Station will result in a cost savings of about $5,000,000 by utilizing an existing open bay at Heard County (see Diagram 10).

Dresden 500 kV Termination Issues (2014)

Preliminary routing analysis of the proposed Dresden - Heard County 500 kV line identified that this new line would have to cross the existing Wansley – O'Hara 500 kV and the Dresden – Hollingsworth Ferry 230 kV lines at the same point (see Plan A of Diagram 4). This crossing would create an unacceptable operational issue because a single contingency could result in the simultaneous outage of all three lines. Therefore, alternative methods for routing and terminating the Heard County 500 kV line at Dresden have been evaluated.

Plan B1 (Diagram 5) and Plan B2 (Diagram 7) permit a "crossing" of the existing Wansley – O'Hara 500 kV line and the proposed Dresden - Heard County 500 kV line to occur via bus work within the Dresden 500 kV switchyard. Plan C (Diagram 9), would also avoid a crossing of the existing Wansley – O'Hara 500 kV line and the proposed Dresden - Heard County 500 kV line by breaking and rerouting the existing Wansley – O'Hara 500 kV line (increases new 500 kV line length by 1 mile). A section of the existing Wansley – O'Hara 500 kV line could then be utilized to terminate the proposed Heard County 500 kV line at Dresden.

Note that for Plans B1, B2 and C, initially the new Dresden - Heard County 500 kV line and the existing Wansley – O'Hara 500 kV line would not interconnect at the Dresden site (a by-pass would be created via 500 kV bus work). The new Dresden 500 kV switching station will be designed to accommodate a future interconnection of the Wansley – O'Hara 500 kV line at the Dresden 500 kV bus.

Plans B1, B2 and C are comparable in electrical performance. However, Plan C has more costs and impacts to land owners due to its longer 500 kV line mileage. Plan B2 is also not desirable alternative since a recent site evaluation has identified an environmental issue that will significantly hinder use of the "south" end of the existing Dresden property for the proposed 500 kV switchyard. Therefore, Plan B1 is the preferred method for terminating the proposed Heard County 500 kV line at Dresden. Plan B1 requires less 500 kV line mileage, has the best utilization of the existing Dresden property and has flexibility for future expansion of the Dresden substation. A conceptual future build-out of Plan B1 is shown in Diagram 6.

Heard County and Hawk Road 500 kV Improvements (2014)

As previously stated, the Wansley CC7 System Impact Study report recommended a Dresden to Tenaska 500 kV line. While termination of the Dresden 500 kV line at the Heard County 500 kV Switching Station results in a cost savings of about $5,000,000, there are minor modifications required at the Heard County and Hawk Road 500 kV sites.

The preferred route for the new Dresden – Heard County 500 kV line requires the line to be terminated at the existing (occupied) bay in northeast corner of the Heard County 500 kV Switching Station. Presently the 500 kV line from the Hawk Road 500 kV collector bus is terminated at that position. Therefore, the empty 500 kV bay at Heard County will be built-out and the 500 kV line to the Hawk Road 500 kV collector bus will be re-terminated there. This will also require the existing 500 kV line termination equipment on the Hawk Road 500 kV collector bus to be transferred to an existing empty bay at Hawk Road in order to re-terminate the "collector bus" line to Heard County (see Diagram 11).

Wansley CC7 Transmission Improvements Plan

RECOMMENDATION

The following is a summary of the near-term and longer-term improvements **(~$60 M)** that will be required to support the Wansley #7 TSR:

2010: Operating Procedure *(reduce Wansley CC 7 generation as necessary)*

2011: Install two 2%, 2000 A, 230 kV series reactors in parallel on the Villa Rica 500/230 kV transformer (equivalent 1%, 4000 A; see Diagram 1)

2011: Reconductor Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) with 1351 ACSS conductor

2011: Reconductor the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black) with at least 636 ASCR conductor

2012: *(No improvements)*

2013: Expand Dresden 230 kV bus to accommodate new 500/230 kV transformer and replace existing four 230 kV circuit breakers with 3000 A, 63 kV circuit breakers

2014: Construct Dresden - Heard County 500 kV line (~6 miles)

2014: Create a by-pass for the existing Wansley – O'Hara 500 kV line through the Dresden site (via bus work) to avoid crossing of the 500 kV lines (see Plan B1 of Diagram 5)

2014: Build out empty bay at Heard County 500 kV substation and re-terminate 500 kV "collector bus" line from Hawk Road 500 kV substation (see Diagram 11)

2014: Terminate the new Dresden 500 kV line at the existing (occupied) bay in northeast corner of the Heard County 500 kV Switching Station (see Diagram 11)

2014: Build-out an existing empty bay at Hawk Road in order to re-terminate the "collector bus" line to Heard County (see Diagram 11)

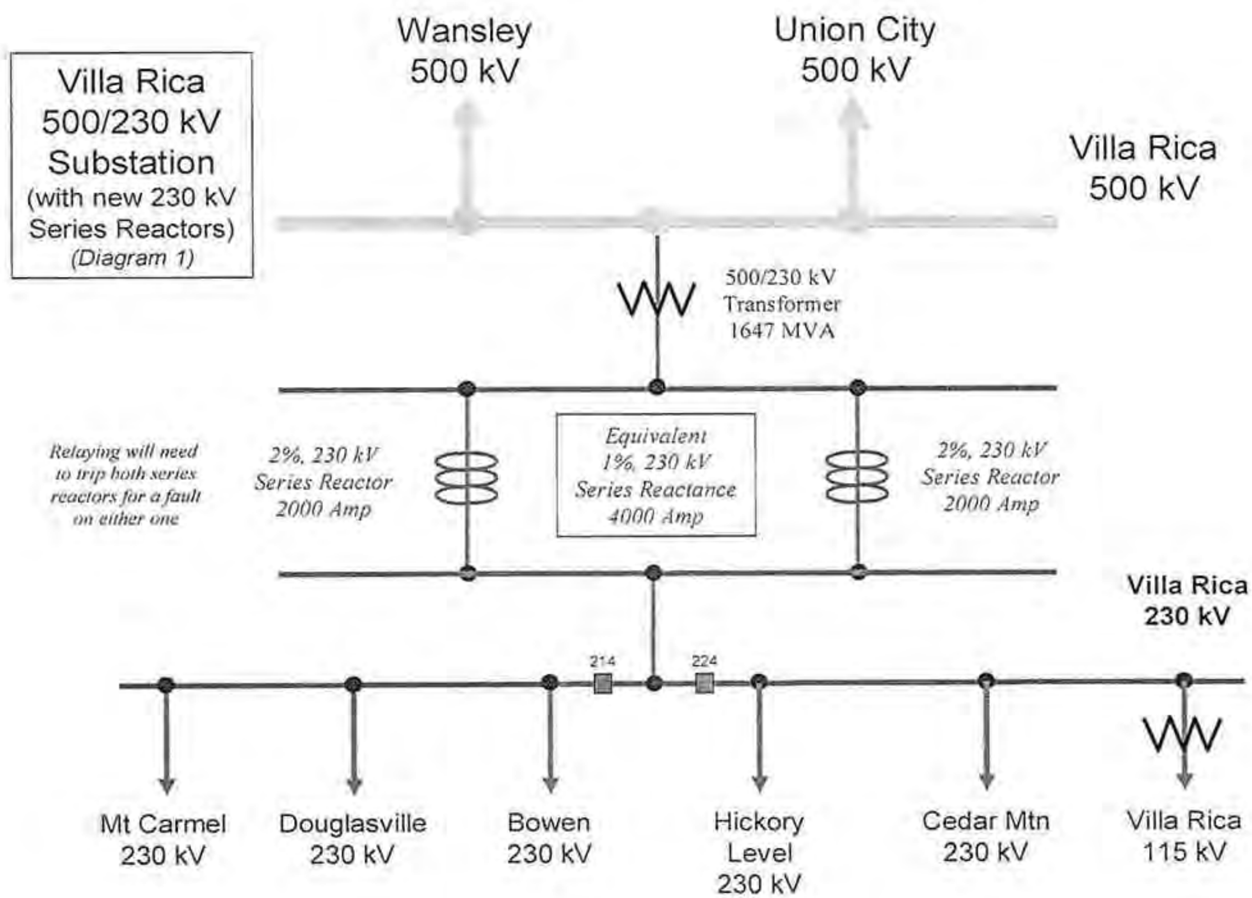
2014: Expand Dresden substation for 500 kV and terminate the Heard County 500 kV line

2014: Install a 2016 MVA, 500/230 kV transformer with 5000 A low-side equipment, an on-site spare phase and DGA monitors

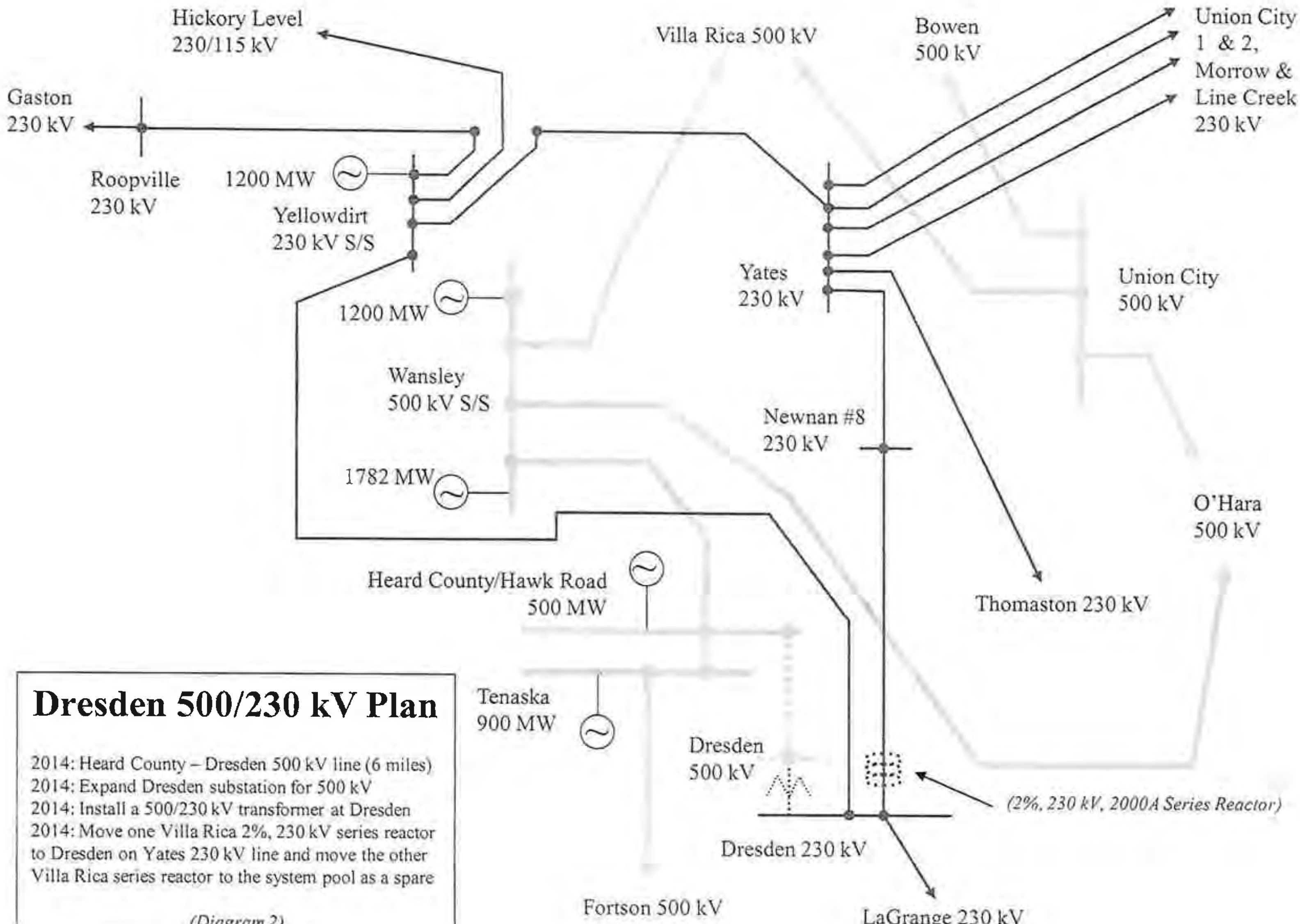
2014: Move one Villa Rica 230 kV series reactor to Dresden on Yates 230 kV line

2014: Remove and reuse second Villa Rica 230 kV series reactor for a future project or as a system spare

Wansley CC7 Transmission Improvements Plan



Wansley CC7 Transmission Improvements Plan

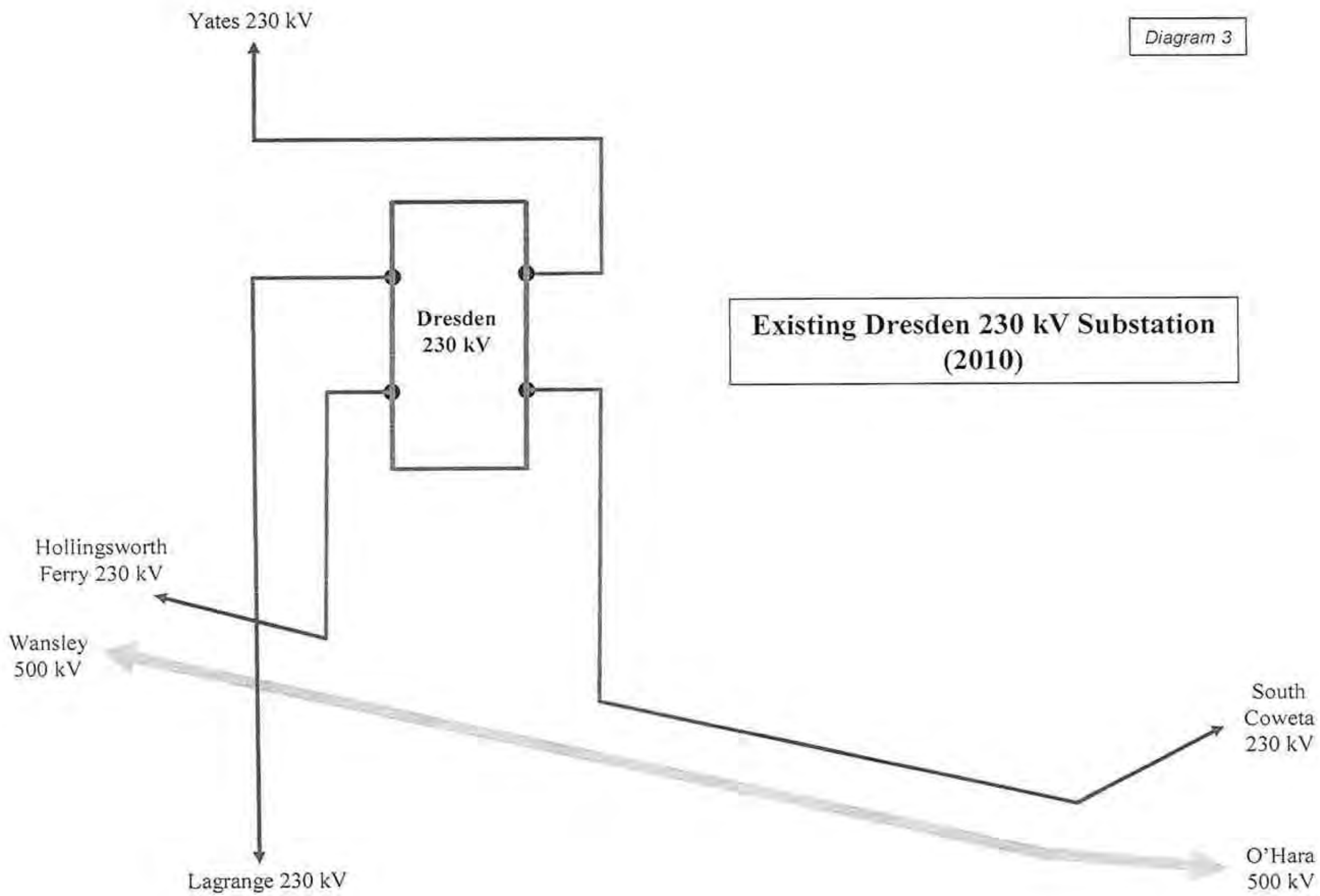


Dresden 500/230 kV Plan

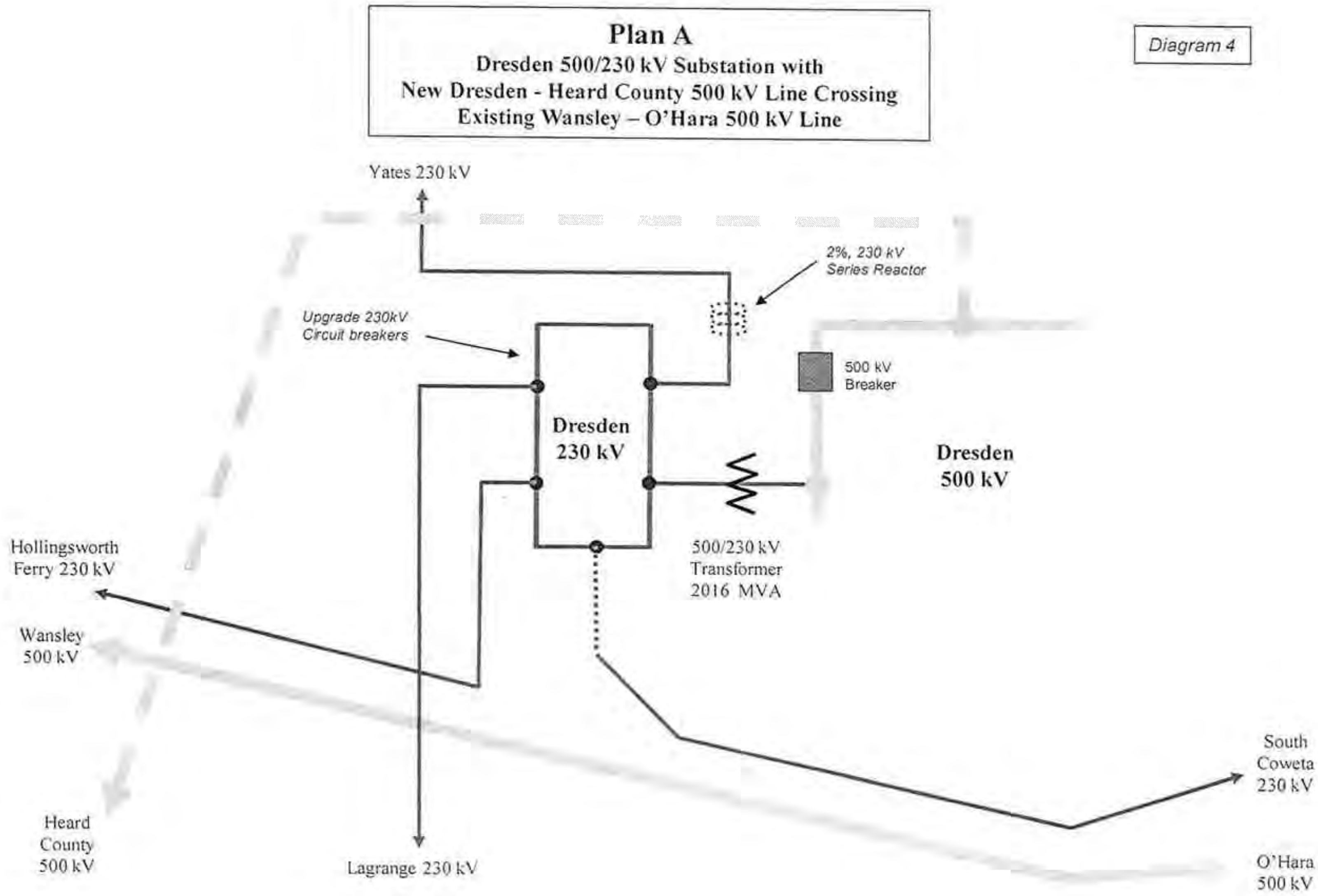
2014: Heard County – Dresden 500 kV line (6 miles)
2014: Expand Dresden substation for 500 kV
2014: Install a 500/230 kV transformer at Dresden
2014: Move one Villa Rica 2%, 230 kV series reactor to Dresden on Yates 230 kV line and move the other Villa Rica series reactor to the system pool as a spare

(Diagram 2)

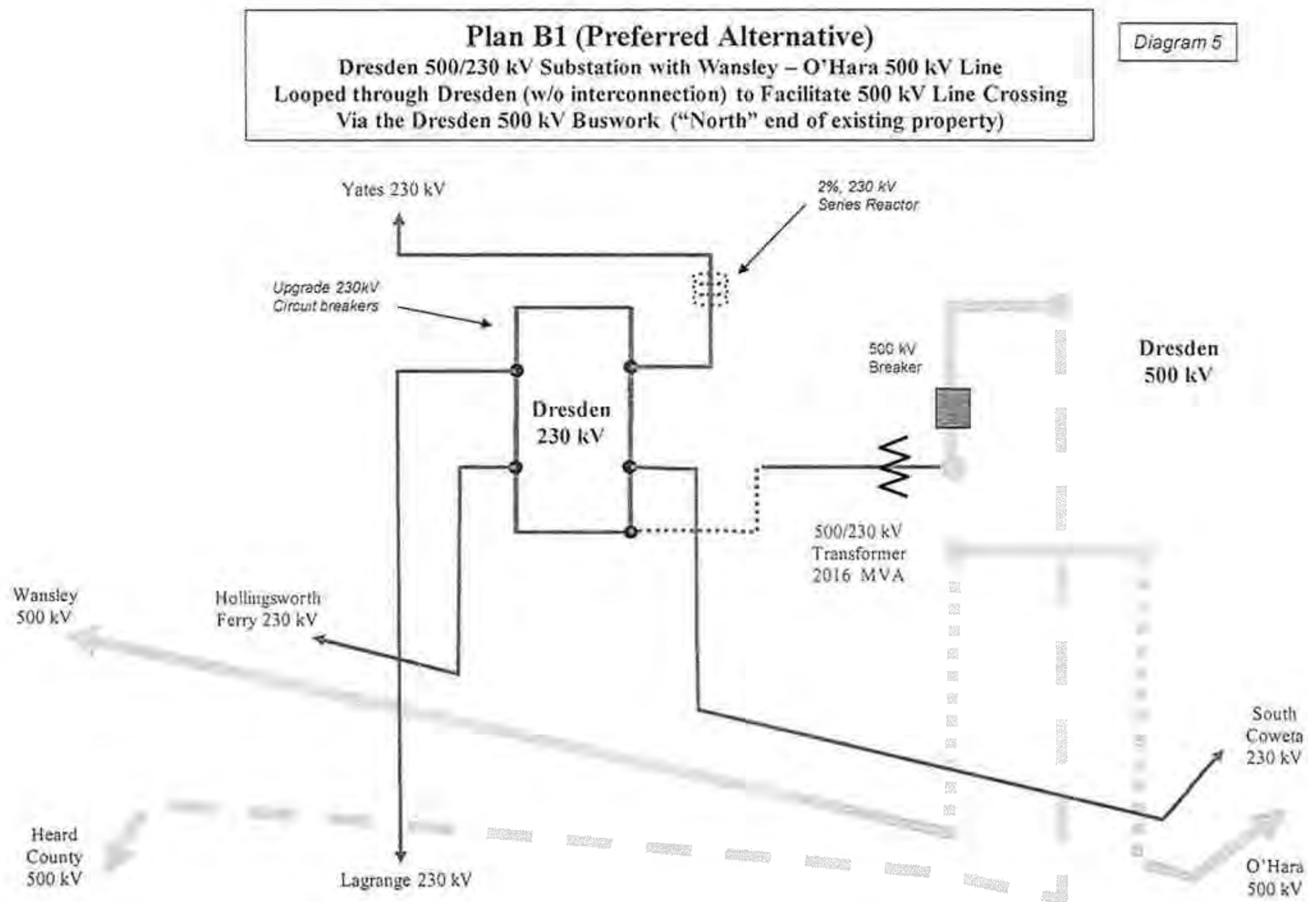
Wansley CC7 Transmission Improvements Plan



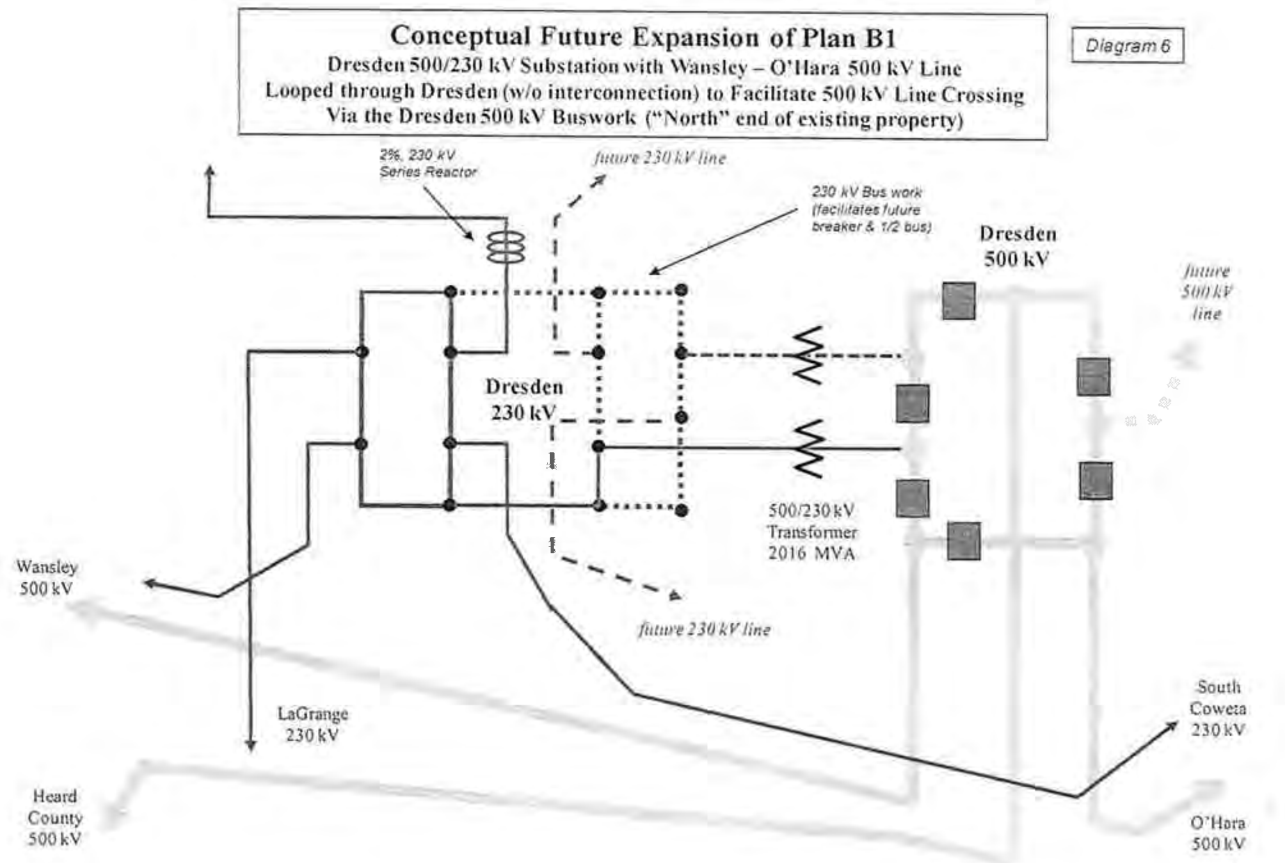
Wansley CC7 Transmission Improvements Plan



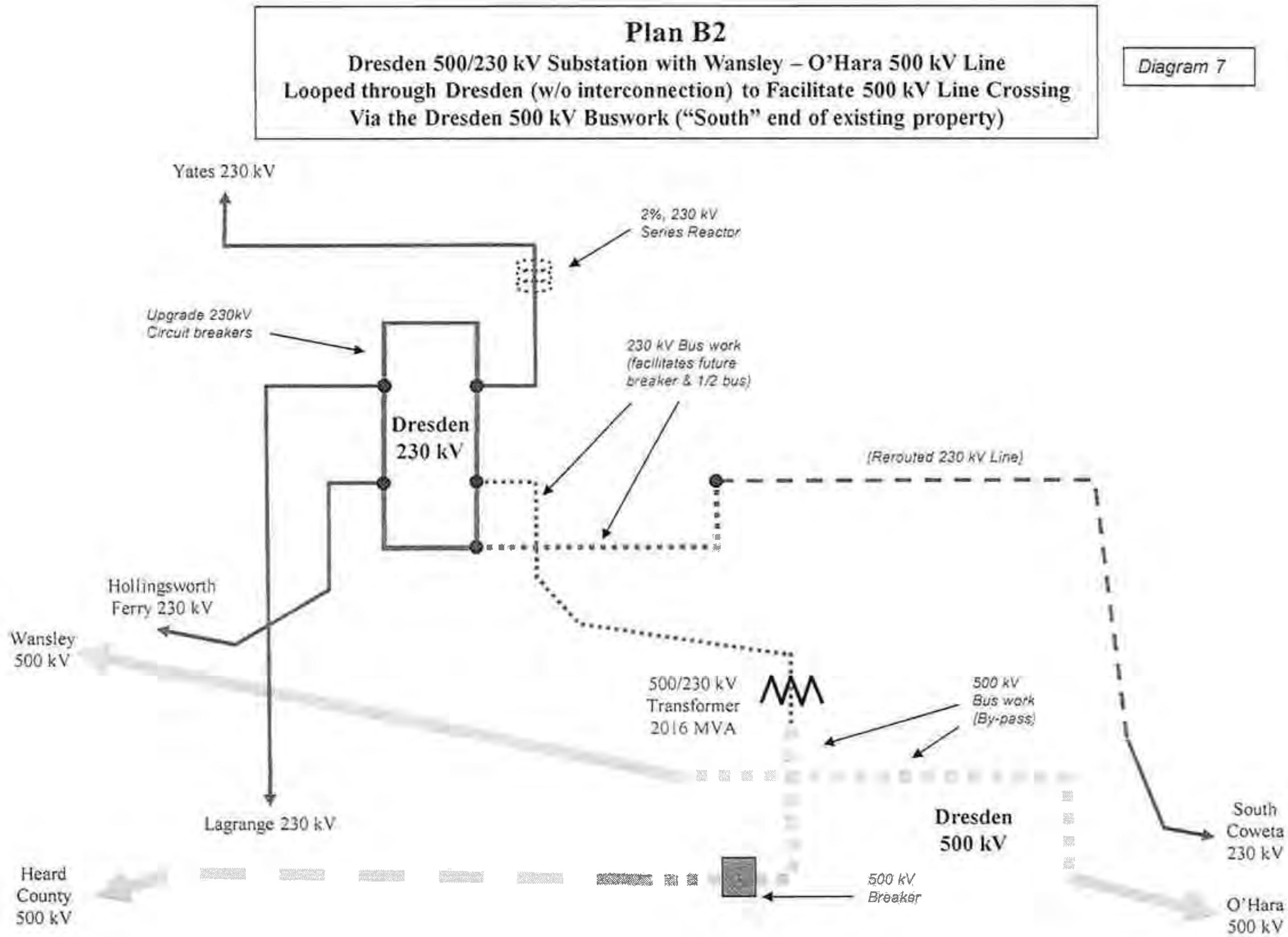
Wansley CC7 Transmission Improvements Plan



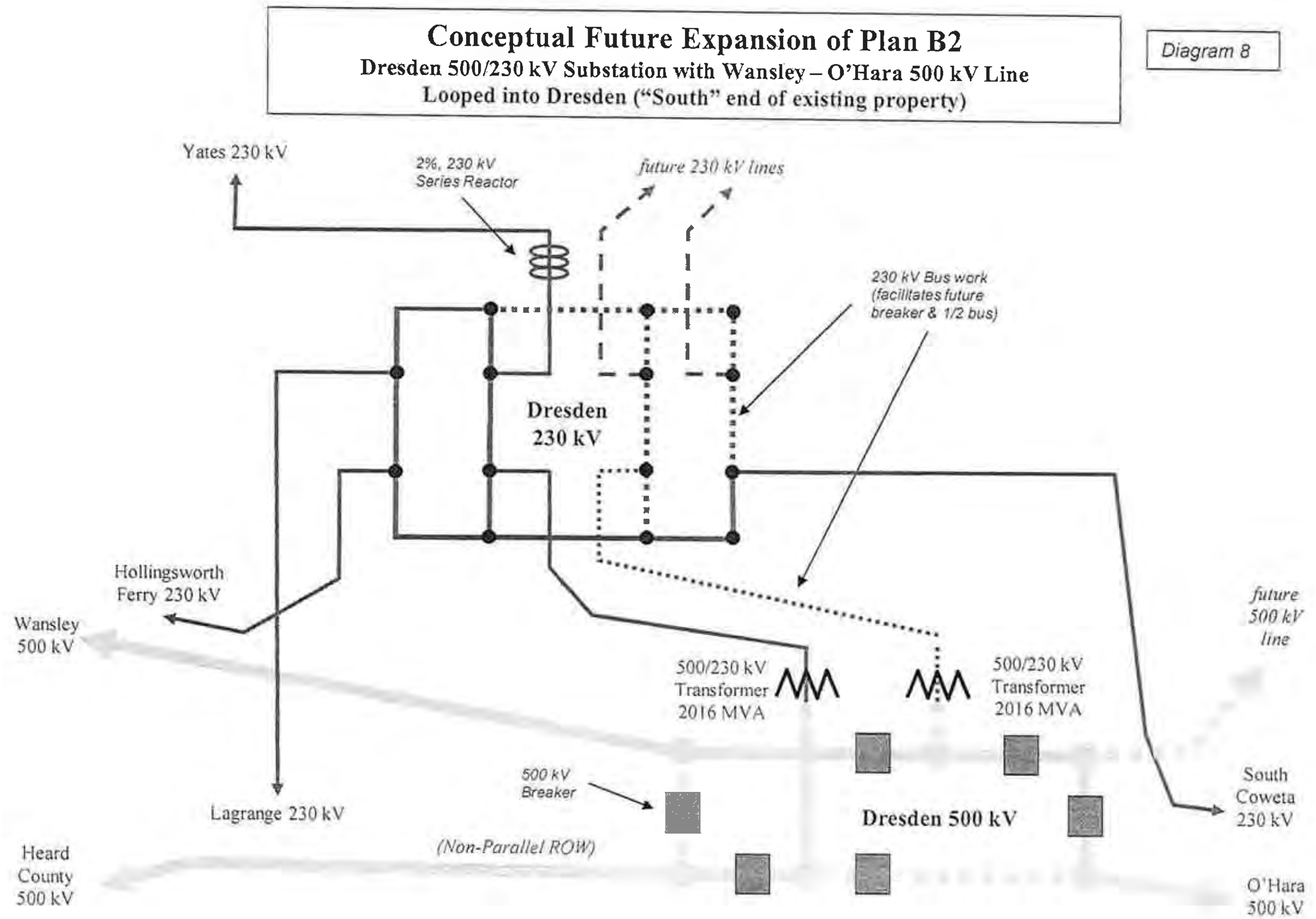
Wansley CC7 Transmission Improvements Plan



Wansley CC7 Transmission Improvements Plan



Wansley CC7 Transmission Improvements Plan

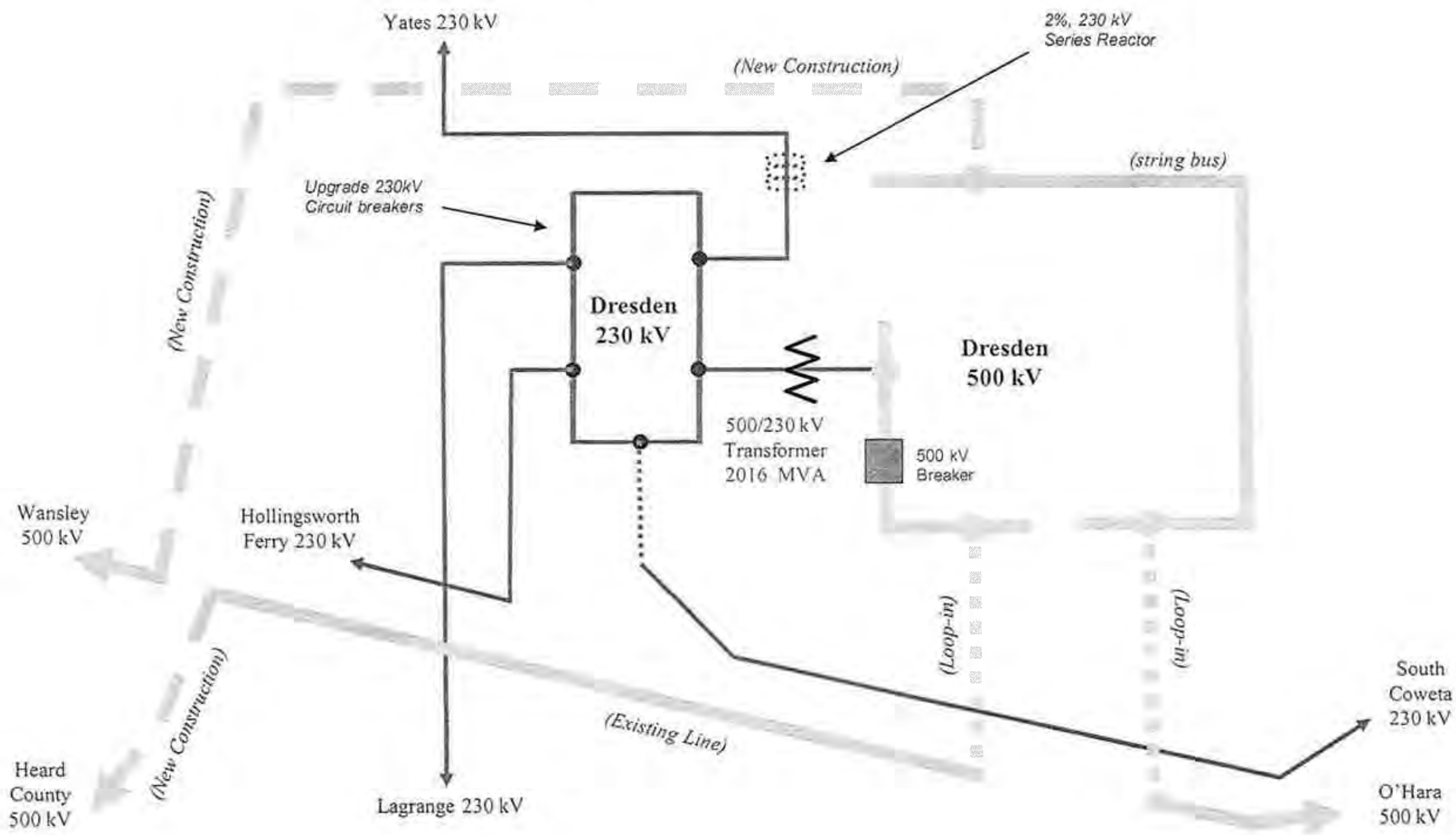


Wansley CC7 Transmission Improvements Plan

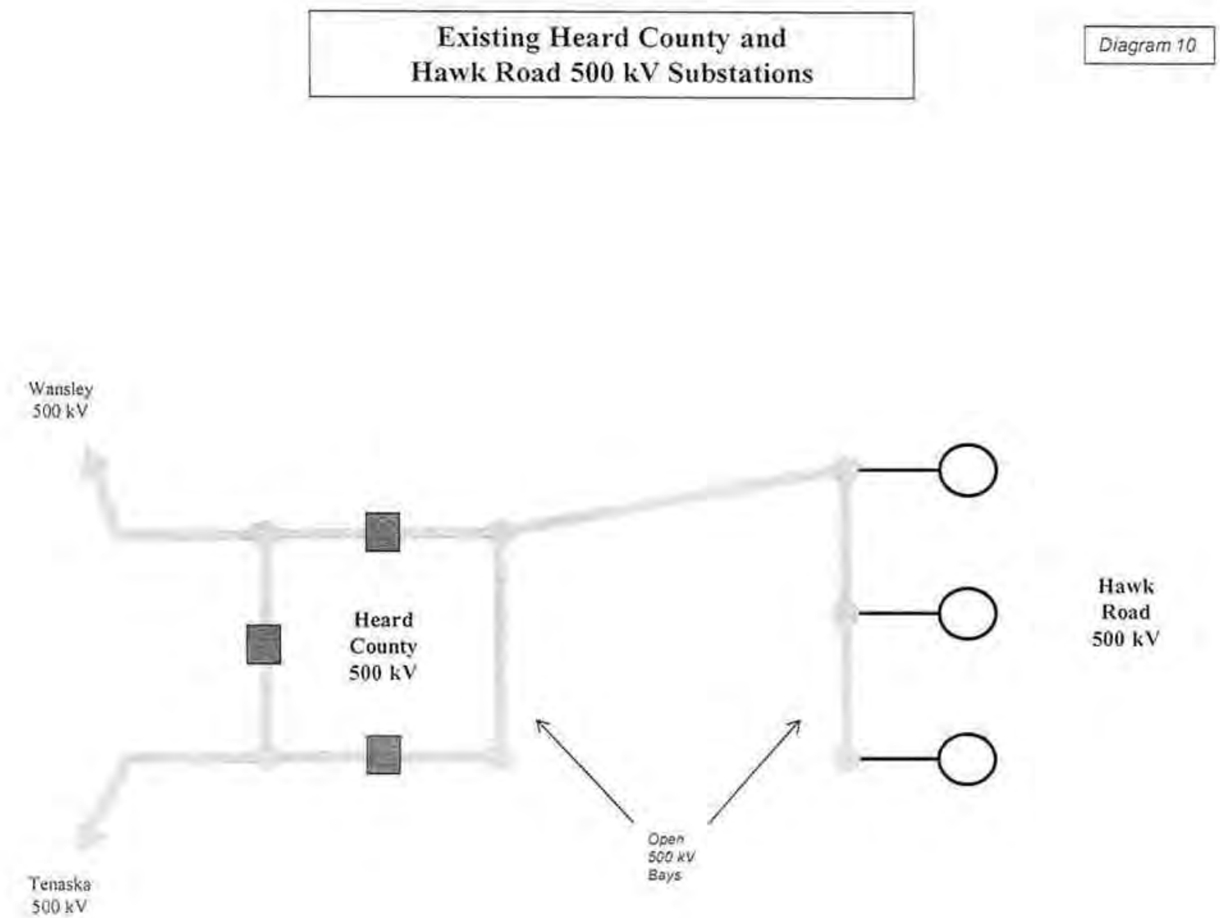
Plan C

Dresden 500/230 kV Substation with existing Wansley – O'Hara 500 kV Line Reconfigured to Avoid Crossing with new Dresden - Heard County 500 kV Line

Diagram 9



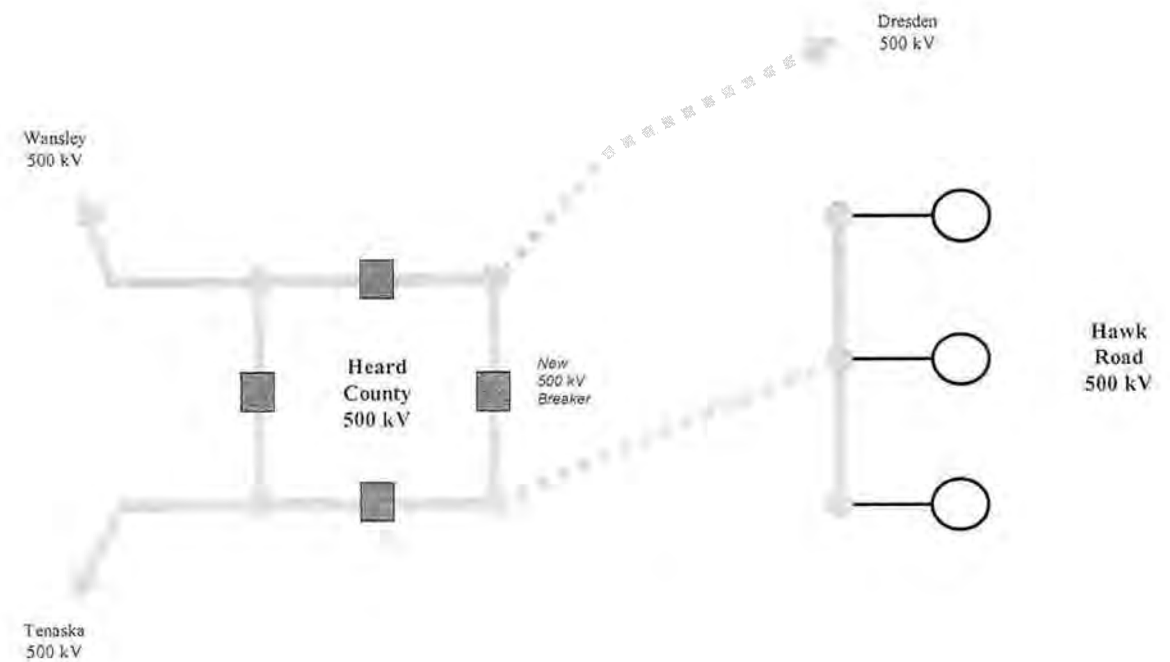
Wansley CC7 Transmission Improvements Plan



2014 Heard County and Hawk Road 500 kV Substations

Dresden – Heard County 500 kV Line terminated at existing "northeast" bay
Hawk Road 500 kV connection re-terminated at previously empty bay

Diagram 11



Interconnection Study (2011)
Wansley 7 CC 500kV
Fault Analysis
Decemeber 20, 2010
Kirk Kondos

Wansley #7 CC 500kV Configuration (Existing Model in CAPE):

a. 2 – 239 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.064857 pu.
b. 1 – 251 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.065032 pu.
c. 3 GSU, 250/275/300 MVA, 500/23kV, 6.0% impedance (estimated) @ 250 MVA

Study Description :

1. This study is based on the 2011 Washington CT TSR Queue.
   (i) Dynergy Head – 500 MW (all on)
   (ii) Franklin – 1780 MW (all on)
   (iii) Hancock – off
   (iv) Harris (APC) – 1222 MW (note because this is APC not modeled in CAPE)
   (v) Hillabee Energy Center – 700 MW (all on)
   (vi) Lindsayhill (Tenaska #1) – 546 MW – (Tenaska #1 ST off)
   (vii) Longleaf – off.
   (viii) Jack McDonough – 583 MW (unit 1 & 2) on.
   (ix) Jack McDonough Units 4, 5 &6 off
   (x) Sewell Creek – 508 MW (all on)
   (xi) SMARR CC – off.
   (xii) Talbot County – 653 MW (all on)
   (xiii) Tenaska GA – 942 MW (all on)
   (xiv) Tiger Creek – 604 MW (all on)
   (xv) Vogle Unit 3 and 4 (off)
   (xvi) Wansley CC (#6 units 1A, 1B & 1) – 572 MW
   (xvii) Wansley CC (#7 units 7A, 7B & 7) – 575 MW, this study.
   (xviii) Wansley MEAG (#9 units 9A, 9B & 9) – 497 MW
   (xix) Wansley Units 1 & 2 – 1780 MW
   (xx) Wansley OPC (Chattahoochee Energy) – 464 MW
   (xxi) Warthen – 600 MW (1 – 8 all on)
   (xxii) Washington CT – off
   (xxiii) West GA – Gen 2 off

2. This study is modeled in CAPE with the its2010_2011Que with the following system modifications:
   (i) Installation of two 2%, 2000A, 230kV series reactors in parallel (1% total) on the low side of the Villa Rica 500/230kV transformer.
3. A benchmark fault study was run in order to determine the fault currents ratings at the new Wansley CC (#7 units 7A, 7B & 7) station. Two cases were run: without generation and with generation at Wansley CC (#7 units 7A, 7B & 7).
4. Next, a breaker-by-breaker duty analysis was done to identify any overstressed breakers at Wansley CC (#7 units 7A, 7B & 7) and Villa Rica 500/230kV installation. Two cases were run:
   (i) 2011 basecase with all generation in service and no generation at Wansley CC (#7 units 7A, 7B & 7).
   (ii) 2011 basecase with all generation in service, including generation at Wansley CC (#7 units 7A, 7B & 7).

Study Results :

1. **Total fault currents at buses (Amps):**

Station	Fault	Base (w/o Gen.)	Ultimate (w/ Gen.)
Wansley CC 500kV	3-phase fault	35217	37934
	Phase-ground fault	38343	40442

Breaker Duty margins without generation at Wansley CC #7 – 2011 conditions:

		3 phase		Phase to ground	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	36028	38	39801	32.2
182010	63	36028	38	39801	32.2
182020	63	36028	38	39801	32.2
182030	63	36028	38	39801	32.2
182040	63	36028	38	39801	32.2
182070	63	36028	38	39801	32.2
182080	63	36028	38	39801	32.2
182090	63	36028	38	39801	32.2
182100	63	33316	42.9	35212	40.8
182110	63	36028	38	39801	32.2
182116	63	35217	39.9	38342	36.7
182226	63	35217	39.9	38342	36.7
182331	63	35217	39.9	38342	36.7
182776	63	35217	39.9	38342	36.7
182886	63	35217	39.9	38342	36.7
182996	63	35217	39.9	38342	36.7
PCB @ Villa Rica 500kV					
159030	63	21384	65.3	15920	74.7
159040	63	16343	72.8	12618	77.0
159050	63	21384	65.3	15920	74.7
PCB @ Villa Rica 230kV Bus 1					
159214	63	36653	41.4	29627	50.2
159238	63	34878	41.0	29144	48.1
159258	63	31482	50.0	26857	54.7
159268	63	34774	41.0	29240	48.0

PCB @ Villa Rica 230kV Bus 2					
159224	63	36653	41.4	29627	50.2
159228	63	33833	42.9	28519	49.2
159248	63	31971	45.4	26956	51.5

Breaker Duty margins with generation at Wansley CC #7 500kV:

		3 phase		**Phase to ground**	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	38728	33.2	41952	29.6
182010	63	38728	33.2	41952	29.6
182020	63	38728	33.2	41952	29.6
182030	63	38728	33.2	41952	29.6
182040	63	38728	33.2	41952	29.6
182070	63	38728	33.2	41952	29.6
182080	63	38728	33.2	41952	29.6
182090	63	38728	33.2	41952	29.6
182100	63	33316	42.9	35212	40.8
182110	63	38728	33.2	41952	29.6
182116	63	38934	35.0	40442	33.2
182226	63	38934	35.0	40442	33.2
182331	63	38934	35.0	40442	33.2
182776	63	38934	35.0	40442	33.2
182886	63	38934	35.0	40442	33.2
182996	63	38934	35.0	40442	33.2
PCB @ Villa Rica 500kV					
159030	63	21918	64.5	16114	74.4
159040	63	16792	72.1	12793	76.7
159050	63	21918	64.5	16114	74.4
PCB @ Villa Rica 230kV Bus 1					
159214	63	36765	41.2	29675	50.1
159238	63	34983	40.9	29192	47.9
159258	63	31584	49.9	26907	54.5
159268	63	34876	41.1	29288	47.9
159224	63	36765	41.2	29675	50.1
159228	63	33937	42.7	28568	49.1

159248	63	32078	45.2	27007	51.4

Conclusions:

1. **Generation from Simple Cycle units:** Circuit breakers with 50kA minimum interrupting capability are required at the new Wansley CC #7 500kV installation.

2. **Overstressed breakers:** There are no overstressed circuit breakers that need to be upgraded due to the new generation.

Note:
Small changes in short circuit data, modeling assumptions and study methods could increase or decrease fault duties and thus the margins of these currents with respect to circuit breaker fault duty interrupting ratings. Hence should any of the circuit parameters change, please advise P&C because this may warrant further analysis.

Interconnection Study (2014)
Wansley 7 CC 500kV
Fault Analysis
July 7, 2011
Kirk Kondos

Wansley #7 CC 500kV Configuration (Existing Model in CAPE):

a. 2 – 239 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.064857 pu.
b. 1 – 251 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.065032 pu.
c. 3 GSU, 250/275/300 MVA, 500/23kV, 6.0% impedance (estimated) @ 250 MVA

Study Description :

1. This study is based on the 2014 Washington CT TSR Queue.
   (i) Dynergy Head – 500 MW (all on)
   (ii) Franklin – 1780 MW (all on)
   (iii) Hancock – off
   (iv) Harris (APC) – 1222 MW (note because this is APC not modeled in CAPE)
   (v) Hillabee Energy Center – 700 MW (all on)
   (vi) Lindsayhill (Tenaska #1) – 546 MW – (Tenaska #1 ST off)
   (vii) Longleaf – 600 MW.
   (viii) Jack McDonough – 583 MW (unit 1 & 2) off
   (ix) Jack McDonough Units 4, 5 &6 on
   (x) Sewell Creek – 508 MW (all on)
   (xi) SMARR CC – off.
   (xii) Talbot County – 653 MW (all on)
   (xiii) Tenaska GA – 942 MW (all on)
   (xiv) Tiger Creek – 604 MW (all on)
   (xv) Vogle Unit 3 and 4 (off)
   (xvi) Wansley CC (#6 units 1A, 1B & 1) – 572 MW
   (xvii) Wansley CC (#7 units 7A, 7B & 7) – 575 MW, this study.
   (xviii) Wansley MEAG (#9 units 9A, 9B & 9) – 497 MW
   (xix) Wansley Units 1 & 2 – 1780 MW
   (xx) Wansley OPC (Chattahoochee Energy) – 464 MW
   (xxi) Warthen – 600 MW (1 – 8 all on)
   (xxii) Washington CT – 660 MW
   (xxiii) West GA – Gen 2 off

2. This study is modeled in CAPE with the its2010_2014 Que with the following 2014 system improvements:
   (i) New 500kV Dresden to Heard County line, triple conductor 1113 ACSR.
   (ii) Installation of one 2%, 2000A, 230kV series reactor at Dresden on the Yates Line.
   (iii) Install at Dresden 500/230kV, 2016MVA transformer.
3. A benchmark fault study was run in order to determine the fault currents ratings at the new Wansley CC (#7 units 7A, 7B & 7) station. Two cases were run: without generation and with generation at Wansley CC (#7 units 7A, 7B & 7).
4. Next, a breaker-by-breaker duty analysis was done to identify any overstressed breakers at Wansley CC (#7 units 7A, 7B & 7) and other stations that were identified by Transmission Planing. Two cases were run:
   (i) 2014 basecase with all generation in service and no generation at Wansley CC (#7 units 7A, 7B & 7).
   (ii) 2014 basecase with all generation in service, including generation at Wansley CC (#7 units 7A, 7B & 7).

Study Results :

1. **Total fault currents at buses (Amps):**

Station	Fault	Base (w/o Gen.)	Ultimate (w/ Gen.)
Wansley CC 500kV	3-phase fault	39521	42237
	Phase-ground fault	42091	44103

Breaker Duty margins without generation at Wansley CC #7 and with 2014 System Improvements:

		3 phase		Phase to ground	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	40563	30.7	43905	26.8
182010	63	40563	30.7	43905	26.8
182020	63	40563	30.7	43905	26.8
182030	63	40563	30.7	43905	26.8
182040	63	40563	30.7	43905	26.8
182070	63	40563	30.7	43905	26.8
182080	63	40563	30.7	43905	26.8
182090	63	40563	30.7	43905	26.8
182100	63	37854	35.4	39131	34.7
182110	63	40563	30.7	43905	26.8
182116	63	39521	33.1	42091	31.0
182226	63	39521	33.1	42091	31.0
182331	63	39521	33.1	42091	31.0
182776	63	39521	33.1	42091	31.0
182886	63	39521	30.5	42091	30.6
182996	63	39521	33.1	42091	31.0
PCB @ Dresden 500kV					
New to Heard	63	24384	58.5	20295	67.8
PCB @ Dresden 230kV					
New to 500kV T	63	33886	39.4	33604	46.7
988010	40	41859	-16.2	40187	-5
988020	40	44658	-22.9	42646	-6.6
988030	40	43200	-19.4	41331	-3.3
988040	50	43957	-4.1	41331	17.3
PCB @ Heard County 500kV					
New to Dresden	63	35561	41.4	36115	42.7
914240	63	33433	43.3	35115	42.8
914250	63	29346	49.9	30120	51.4
914260	63	35561	41.4	36115	42.7
PCB @ Tenaska Ga 500kV					
454110	63	32597	45.0	31837	48.8
454220	63	32744	44.8	34523	44.2
454330	63	32744	42.7	34523	44.1
PCB @ Yates					

230kV					
050750	43	44575	-6.4	44855	-5.3
050760	63	43328	29.3	43808	29.7
050770	63	44575	27.4	44855	28.1
050780	43	40863	1.8	42113	1.1
050790	43	44575	-14.5	44855	-9.1
050850	43	44575	-6.4	44855	-5.3
050870	43	44575	-6.4	44855	-5.3
050880	43	44575	-6.4	44855	-5.3
050890	43	43328	-3.7	43808	-2.9
050950	63	44575	27.4	44855	28.1
050960	43	44575	-6.4	44855	-5.3
PCB @ Lagrange 230kV					
025100	40	8970	77.6	8015	79.3
025158	40	6636	83.4	6630	83.4
025168	37.5	8571	77.1	8177	78.2
PCB @ South Coweta 230kV					
903818	40	6280	84.3	4476	88.5
PCB @ Villa Rica 500kV					
159030	63	22083	64.9	16207	74.3
159040	63	19112	68.5	14244	74.2
159050	63	22083	64.4	16207	74.3
PCB @ Villa Rica 230kV Bus 1					
159214	63	43985	27.6	37309	33.7
159238	63	41937	27.3	36538	31.8
159258	63	38600	33.5	34404	36.2
159268	63	41923	27.4	36699	31.6
PCB @ Villa Rica 230kV Bus 2					
159224	63	43985	27.6	37309	33.7
159228	63	40891	29.1	35899	33.1
159248	63	39415	31.1	34777	34.8
PCB @ Hollingsworth Ferry 230kV					
401660	63	40488	30.6	36266	42.4
401770	63	40488	30.6	36266	42.4
401880	63	40488	30.6	36266	42.4
401990	63	40488	30.6	36266	42.4
PCB @ Yellow Dirt 230kV					
987710	50	41820	16.4	38945	21.7
987720	50	36037	24.2	32212	34.8
987730	50	37083	16.9	35644	27.8
987740	50	39976	11.2	37699	24.0
987750	50	35600	21.4	31025	37.6
987760	50	37083	16.9	35644	27.8

Breaker Duty margins with 575MW generation at Wansley CC #7 with and System Improvements:

		3 phase		Phase to ground	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	43266	25.9	45973	23.4
182010	63	43266	25.9	45973	23.4
182020	63	43266	25.9	45973	23.4
182030	63	43266	25.9	45973	23.4
182040	63	43266	25.9	45973	23.4
182070	63	43266	25.9	45973	23.4
182080	63	43266	25.9	45973	23.4
182090	63	43266	25.9	45973	23.4
182100	63	37854	35.1	39131	34.7
182110	63	43266	25.9	45973	23.4
182116	63	42237	28.2	44103	27.7
182226	63	42237	28.2	44103	27.7
182331	63	42237	28.2	44103	27.7
182776	63	42237	28.2	44103	27.7
182886	63	42237	28.2	44103	27.7
182996	63	42237	28.2	44103	27.7
PCB @ Dresden 500kV					
New to Heard	63	25318	56.9	20717	67.1
PCB @ Dresden 230kV					
New to 500kV T	63	34320	38.7	33887	46.2
988010	40	42316	-17.5	40466	-1.2
988020	40	45129	-24.3	42932	-7.3
988030	40	43662	-20.7	41612	-4.0
988040	50	43662	12.7	41612	16.8
PCB @ Heard County 500kV					
New to Dresden	63	37360	38.3	37331	40.7
914240	63	35214	40.3	36398	40.8
914250	63	31145	46.8	31360	49.5
914260	63	37360	38.3	37331	40.7
PCB @ Tenaska Ga 500kV					
454110	63	34243	42.3	32927	47.2
454220	63	34388	42.0	35720	42.4
454330	63	34388	39.8	35720	42.4
PCB @ Yates 230kV					
050750	43	44690	-6.6	44933	-5.5
050760	63	44690	27.2	44933	28.0
050770	63	44690	27.2	44933	28.0
050780	43	40927	1.6	42180	1.0
050790	43	44690	-14.7	44933	-9.3
050850	43	44690	-6.6	44933	-5.5
050870	43	44690	-6.6	44933	-5.5
050880	43	44690	-6.6	44933	-5.5

050890	43	43435	-3.9	43881	-3.1
050950	63	43435	29.1	43881	29.6
050960	43	44690	-6.6	44933	-5.5
PCB @ Lagrange 230kV					
025100	40	8982	77.5	8021	79.3
025158	40	6637	83.4	6631	83.4
025168	40	8592	77.1	8183	78.2
PCB @ South Coweta 230kV					
903818	40	6290	84.3	4481	88.5
PCB @ Villa Rica 500kV					
159030	63	22550	64.2	16372	74.0
159040	63	19513	67.9	14391	73.9
159050	63	22550	63.7	16372	74.0
PCB @ Villa Rica 230kV Bus 1					
159214	63	44200	27.2	37413	33.5
159238	63	42144	26.9	36643	31.6
159258	63	38805	33.1	34512	35.9
159268	63	42126	27.0	36803	31.4
PCB @ Villa Rica 230kV Bus 2					
159224	63	44200	27.2	37413	33.5
159228	63	41098	28.7	36005	32.8
159248	63	39608	30.7	34877	34.5
PCB @ Hollingsworth Ferry 230kV					
401660	63	40637	30.4	36346	42.3
401770	63	40637	30.4	36346	42.3
401880	63	40637	30.4	36346	42.3
401990	63	40637	30.4	36346	42.3
PCB @ Yellow Dirt 230kV					
987710	50	41967	16.7	39030	21.6
987720	50	36184	23.9	32279	34.7
987730	50	37201	16.7	35717	27.7
987740	50	40122	11.0	37787	23.8
987750	50	35748	23.6	31106	37.5
987760	50	37201	16.7	35717	27.7

Conclusions:

1. The new circuit breakers with 63kA minimum interrupting capability are adequate for the new Dresden to Heard 500kV Line at Dresden and Heard.

2. The following are overstressed circuit breakers that need to be upgraded:

    a) **Dresden 230kV (need minimum of 63kA):**
        a. **988010**
        b. **988020**
        c. **988030**
        d. **988040**

    b) **Yates 230kV (need minimum of 63kA):**
        a. **050750**
        b. **050780**
        c. **050790**
        d. **050850**
        e. **050870**
        f. **050880**
        g. **050890**
        h. **050960**

Note:
Small changes in short circuit data, modeling assumptions and study methods could increase or decrease fault duties and thus the margins of these currents with respect to circuit breaker fault duty interrupting ratings. Hence should any of the circuit parameters change, please advise P&C because this may warrant further analysis.

Georgia Transmission Corporation
Primavera Project Manager
Project Estimate Summary

Project:	**P86009**	**Dresden-South Coweta - MTL**	Customer:	**ITS**
Desc:	**TL_MTL**		Project Manager:	**PAYNE JR.**

Scope: Modify Dresden - South Coweta 230 kV line to accomodate the installation of the new Dresden-Heard Co 500kV NTL near Dresden SS.

	Budgeted Cost
Project Total Charges	$249,654.00
Direct Charges	$202,970.35
50 - Construction Contract Labor	$95,500.00
50 - Construction Contract	$90,000.00
50 - Site Work Contract	$5,000.00
50 - Environmental Field Compliance	$500.00
50 - Transport Transformer	$0.00
20 - GPC Mobile	$0.00
64 - Owner Furnished Material	$60,000.00
Labor (40 & 54)	$29,970.35
40 - Associate Salary	$26,890.35
54 - Contract Labor	$3,080.00
56 - Professional Services	$17,000.00
56 - Multiple Discipline	$0.00
56 - S/S Design	$3,000.00
56 - T/L Design	$0.00
56 - Environmental Services	$0.00
56 - Photo Science	$14,000.00
Other	$500.00
Miscellaneous (Expenses, permits, etc)	$500.00
Project Contingency	$0.00
Management Reserve	$0.00
Indirect Charges	$46,683.65
Indirects (overheads)	$46,683.65
	$249,654.00

County: HEARD

Printed on: 10/14/2011

Georgia Transmission Corporation
PROJECT RELEASE

Planning Contact : ZAKIA EL OMARI
Project Manager : DAVID AKIN

Region: Northwest

Required Cut-In Date: 06/01/2014

GTC Projects:

P85728 Heard County Power(I.T.S.) 500kV/ Substation

Approved by Bob Cory **Date** 10-14-2011

Approved by ________________ **Date** __________

Approved by ________________ **Date** __________

Approved by ________________ **Date** __________

Zakia EL OMARI 10/14/2011

Scopes:

P85728 Add a 500 kV breaker and terminate Heard - Dresden 500 kV line in the bay previously used for the Hawk Road 500kV line. Modify the connection of Heard County - Hawk Road extention bus.

Justification: The Wansley CC #7 transmission service request will require significant transmission upgrades within the ITS including the following major additions:

* Construct a (~5.75-mile) 500 kV line from the Heard County 500 kV Switching Station to the Dresden 230 kV Switching Station.

* Expand Heard County 500 kV switching station to accommodate termination of new Dresden 500 kV line and re-termination of existing Hawk Road 500 kV line

This project was approved by the TPWG on the 8/11/2011 for a 6/1/2014 need date

	Total Budget	Retirement	Reimbursement	Net Cost	DSF	NET ITS INV
P85728	$4,368,590			$4,368,590		$4,368,590
Totals:	$4,368,590			$4,368,590		$4,368,590

SUBSTATION PROJECT INFORMATION

Project Name: Heard County Power
Met Pt #:
Description: General Substation Modification
Facility Owner: GEORGIA TRANSMISSION CORPORATION

Area Project: Wansley CC 7 Improvements

Op H S KV:	500kV	ITS Crit Proj:	Yes	Capacity Added:	0.00		
Op L S KV:	NA	Split Bus:	No	Capacity Removed:	0.00	Pro Type:	NA
Land Req'd:	Unknown	EMC Low Side:	No	Control House:	No	RTU:	No
Mobile Req'd:	No	Req'd ITS:	05/01/2014	PCD Required:	No	PCD Date:	
Bypass Metering:	No	JSTP Submittal:	ITS Parity Only - Not Fixed Cost	JSTP Cost Type:	N/A		

Transformer ID	Action	Location	Amount

ITS Member Feeder Information

# of Feeders:	0	Regulator Size:	0
Overhd/Undergrd:	NA	Oper. Voltage:	NA

Workflow Info For Item 'rec987342'

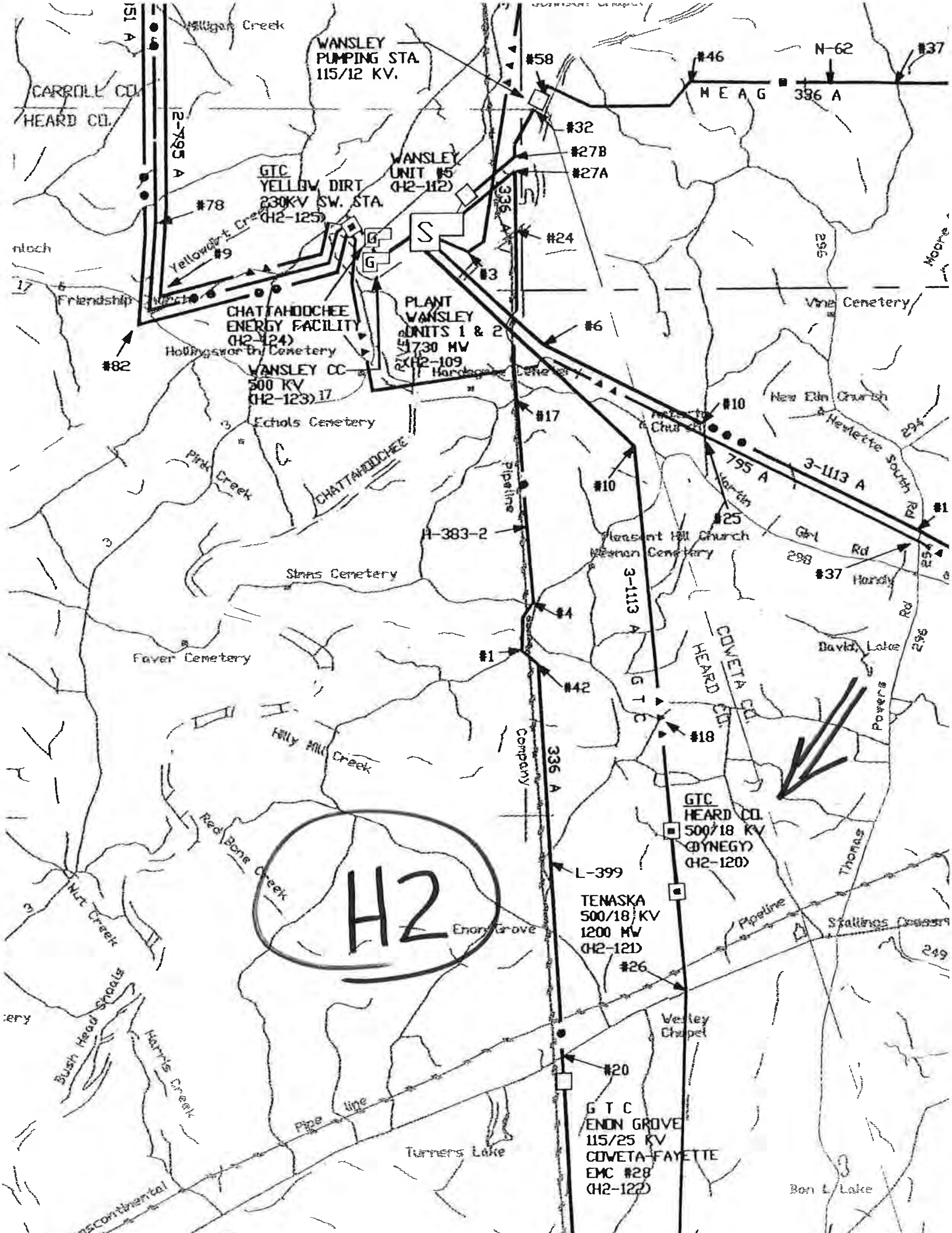
All Active Workflows --> 85728_Heard_County_Power_SS --> Workflow Info

Title: 85728_Heard_County_Power_SS
Revision: 1
Type: Doc
Author: kingr
Workflow Name: 85728_Heard_County_Power_SS
Workflow Steps:
1. contribution (*AutoContribute/Edit Revision*)
2. planning_supp_start (*Review*)
3. tse_planner (*Review*)
4. group_lead (*Review*)
5. manager (*Review*)
6. project_control_specialist (*Review*)
7. project_manager_s (*Review*)
8. project_manager_tp (*Review*)
9. vp_ps (*Review*)
10. vp_s (*Review*)
11. **planning_supp_final (*Review/New Revision*)**
12. notify_records_dept (*Review*)

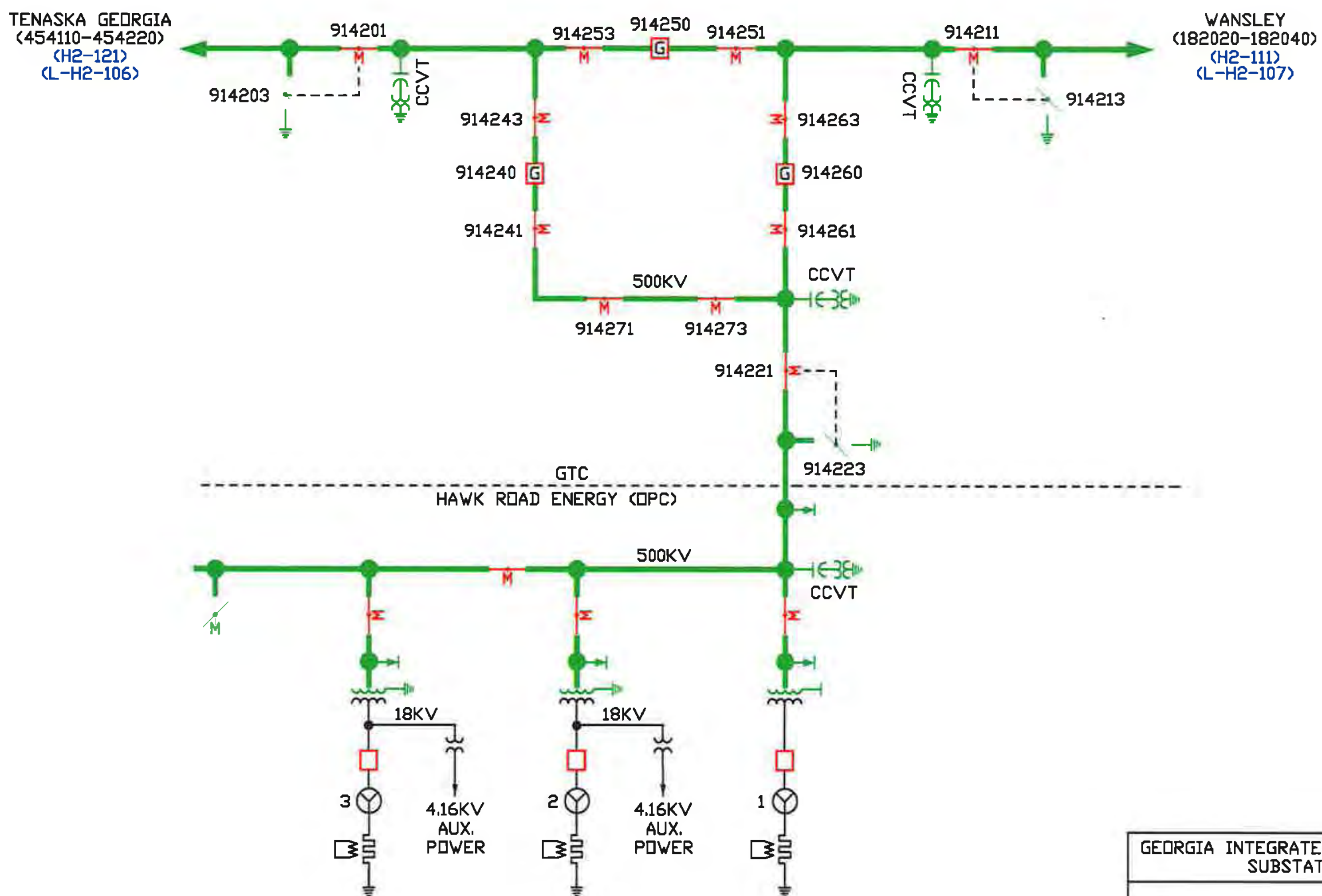
Current Step: planning_supp_final
Approved By:
Required Approvals: All
Remaining Reviewers: kingr

Workflow Content Action History

Workflow Name	Step	Action	Action Date	Users
85728_Heard_County_Pow	contribution	Check In	10/18/11 3:08 PM	kingr
85728_Heard_County_Pow	contribution	Approve	10/18/11 3:08 PM	kingr
85728_Heard_County_Pow	planning_supp_start	Work Notification	10/18/11 3:08 PM	kingr
85728_Heard_County_Pow	planning_supp_start	Approve	10/18/11 3:12 PM	kingr
85728_Heard_County_Pow	tse_planner	Work Notification	10/18/11 3:12 PM	elomari
85728_Heard_County_Pow	tse_planner	Approve	10/18/11 3:30 PM	elomari
85728_Heard_County_Pow	group_lead	Work Notification	10/18/11 3:30 PM	wiley
85728_Heard_County_Pow	group_lead	Approve	11/3/11 5:39 PM	wiley
85728_Heard_County_Pow	manager	Work Notification	11/3/11 5:39 PM	caseyr
85728_Heard_County_Pow	manager	Approve	11/7/11 9:48 AM	caseyr
85728_Heard_County_Pow	project_control_specialist	Work Notification	11/7/11 9:48 AM	kingr starnes
85728_Heard_County_Pow	project_control_specialist	Approve	11/7/11 11:18 AM	starnes
85728_Heard_County_Pow	project_manager_s	Work Notification	11/7/11 11:18 AM	akin
85728_Heard_County_Pow	project_manager_s	Approve	11/8/11 5:26 AM	akin
85728_Heard_County_Pow	project_manager_tp	Work Notification	11/8/11 5:26 AM	battle
85728_Heard_County_Pow	project_manager_tp	Approve	11/18/11 3:14 PM	battle
85728_Heard_County_Pow	vp_ps	Work Notification	11/18/11 3:14 PM	raese
85728_Heard_County_Pow	vp_ps	Approve	11/21/11 7:20 AM	raese
85728_Heard_County_Pow	vp_s	Work Notification	11/21/11 7:20 AM	donovan schussle
85728_Heard_County_Pow	vp_s	Approve	11/21/11 7:54 AM	donovan
85728_Heard_County_Pow	vp_s	Mail Notification	11/21/11 8:00 AM	donovan
85728_Heard_County_Pow	vp_s	Approve	11/21/11 10:38 AM	schussle
85728_Heard_County_Pow	planning_supp_final	Work Notification	11/21/11 10:38 AM	kingr
85728_Heard_County_Pow	planning_supp_final	Check Out	11/28/11 2:27 PM	kingr



WANSLEY
PUMPING STA.
115/12 KV.
#58
#46
N-62
#37
M E A G
336 A
CARROLL CO.
HEARD CO.
2-795 A
151 A
Milligan Creek
#32
#27B
#27A
WANSLEY
UNIT #5
(H2-112)
GTC
YELLOW DIRT
230KV SW. STA.
(H2-125)
#78
#9
#24
#3
336 A
#82
Friendship Church
CHATTAHOOCHEE
ENERGY FACILITY
(H2-124)
PLANT
WANSLEY
UNITS 1 & 2
1730 MW
(H2-109)
#6
Hollingsworth Cemetery
WANSLEY CC
500 KV
(H2-123)
Echols Cemetery
#17
#10
New Elm Church
Hewlette South
795 A
3-1113 A
#10
#25
CHATTAHOOCHEE
Pink Creek
Vine Cemetery
H-383-2
Pleasant Hill Church
#37
Sims Cemetery
3-1113 A
#4
#1
#42
Faver Cemetery
COWETA CO.
HEARD CO.
G T C
#18
David Lake
Powers
Holly Hill Creek
Company
336 A
Red Bone Creek
GTC
HEARD CO.
500/18 KV
(DYNEGY)
(H2-120)
H2
L-399
TENASKA
500/18 KV
1200 MW
(H2-121)
Enon Grove
Stallings Crossing
Pipeline
Thomas
#26
Wesley
Chapel
#20
G T C
ENON GROVE
115/25 KV
COWETA-FAYETTE
EMC #28
(H2-122)
Turners Lake
Pipe line
Bush Head Shoals
Harris Creek
Nut Creek
Transcontinental
Bon L Lake



GEORGIA INTEGRATED TRANSMISSION SYSTEM
SUBSTATION DIAGRAM

HEARD COUNTY (GTC)

Drawn: 01-17-01 | Revised: 07-02-09 BAL

SHEET NO. H2-120

Transmission Improvements Plan for 575 MW Network Service Request Wansley CC 7 Generation Facility (OASIS # 143556)

Georgia Transmission Corporation

July 11, 2011

Wansley CC7 Transmission Improvements Plan

PROBLEM STATEMENT

A System Impact Study (SIS) was conducted by the Georgia Transmission Corporation to determine the impact to the Integrated Transmission System (ITS) of granting 575 MW of firm transmission service out of the existing Wansley CC 7 combined-cycle (CC) site in Heard County, GA (OASIS # 143556). The firm 575 MW transmission service request (TSR) was requested for the period 01/01/2010 – 01/01/2020.

Beginning in 2010, the Villa Rica 500/230 kV Transformer can exceed its thermal capacity for the loss of the Villa Rica – Union City 500 kV Line. Also, the Villa Rica – Wansley 500 kV line loads to 100 % of its thermal capacity for the loss of O'Hara – Wansley 500 kV line. Additionally, the Union City - Flat Shoals section of the Union City – East Point 230 kV line (Black) and the Morrow - Murray Lake Junction – Fort Gillem sections of the Grady – Morrow 115 kV line (Black) can exceed their respective thermal capacities under contingency situations. Beginning in 2014, O'Hara – Wansley 500 kV Line may reach 99 % of its thermal capacity for the loss of Villa Rica – Wansley 500 kV Line. The Wansley CC 7 generation is a contributing factor to these loadings.

As no improvements can be implemented in 2010 to address the above limitations, firm service would be limited to 344 MW in 2010. Several major transmission improvements will be required beginning in 2011 to grant full service for the Wansley CC7 generation facility through the requested period. This request was confirmed on May 12, 2010 pending completion of required transmission improvements.

STUDY RESULTS

Villa Rica Related Improvements (2011)

To address the near-term issues, the Wansley CC7 System Impact Study report (3/18/2010) proposed the addition of two 2%, 2000 A, 230 kV series reactors in parallel (equivalent 1%, 4000 A) on the low-side of the existing Villa Rica 500/230 kV transformer (see Diagram 1). While this improvement will alleviate the potential overloads of the Villa Rica 500/230 kV transformer and the Wansley – Villa Rica 500 kV line, it will further increase overloads of the Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) and the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black). The overall plan includes upgrades of these two lines.

Note that Wansley CC7 System Impact Study report identified the above limitations and required transmission improvements as 2012 issues. However, subsequent to the finalization of the report, Georgia Power announced that planned modifications to the existing McDonough generation facility (retirements and additions) would be delayed by one year (from 2011 to 2012). Accordingly, additional analysis indicated that a one year

delay in the McDonough generation modifications would result in a one year advancement of the limitations and required transmission improvements (as identified in the Wansley CC7 System Impact Study report) from 2012 to 2011.

Dresden 500/230 kV Improvements (2014)

To address the longer-term issues, the Wansley CC7 System Impact Study report proposed expansion of the existing Dresden 230 kV switching station (see Diagram 3) for 500 kV to accommodate installation of a new 500/230 kV transformer and termination of a new 500 kV line from the Heard County area (see Diagram 2). Additional upgrades at the existing Dresden 230 kV substation will include potential modification of the existing South Coweta 230 kV line to accommodate new 500 kV crossings and upgrades of the existing Dresden 230 kV circuit breakers. Short-circuit analysis indicates that the existing 230 kV circuit breakers at Dresden will need to be replaced with 3000 A, 63 kA circuit breakers.

While completion of the Dresden 500/230 kV project in 2014 will negate future need for the two proposed Villa Rica 230 kV series reactors, it also creates a potential overload of the Dresden – Yates 230 kV line beginning in 2014. Therefore, one of the Villa Rica 230 kV series reactors can be moved to Dresden on the Yates 230 kV line in 2014 to address this new overload and mitigate potential overloads of the Yates – Union City 230 kV line (23 miles) in 2014. The other Villa Rica series reactor could be reused for a future project or as a system spare.

Dresden – Heard County 500 kV Line (2014)

Note that the Wansley CC7 System Impact Study report recommended a Dresden to Tenaska 500 kV line. However, termination of the Dresden 500 kV line at the Heard County 500 kV Switching Station will result in a cost savings of about $5,000,000 by utilizing an existing open bay at Heard County (see Diagram 10).

Dresden 500 kV Termination Issues (2014)

Preliminary routing analysis of the proposed Dresden - Heard County 500 kV line identified that this new line would have to cross the existing Wansley – O'Hara 500 kV and the Dresden – Hollingsworth Ferry 230 kV lines at the same point (see Plan A of Diagram 4). This crossing would create an unacceptable operational issue because a single contingency could result in the simultaneous outage of all three lines. Therefore, alternative methods for routing and terminating the Heard County 500 kV line at Dresden have been evaluated.

Plan B1 (Diagram 5) and Plan B2 (Diagram 7) permit a "crossing" of the existing Wansley – O'Hara 500 kV line and the proposed Dresden - Heard County 500 kV line to occur via bus work within the Dresden 500 kV switchyard. Plan C (Diagram 9), would also avoid a crossing of the existing Wansley – O'Hara 500 kV line and the proposed Dresden - Heard County 500 kV line by breaking and rerouting the existing Wansley – O'Hara 500 kV line (increases new 500 kV line length by 1 mile). A section of the existing Wansley – O'Hara 500 kV line could then be utilized to terminate the proposed Heard County 500 kV line at Dresden.

Note that for Plans B1, B2 and C, initially the new Dresden - Heard County 500 kV line and the existing Wansley – O'Hara 500 kV line would not interconnect at the Dresden site (a by-pass would be created via 500 kV bus work). The new Dresden 500 kV switching station will be designed to accommodate a future interconnection of the Wansley – O'Hara 500 kV line at the Dresden 500 kV bus.

Plans B1, B2 and C are comparable in electrical performance. However, Plan C has more costs and impacts to land owners due to its longer 500 kV line mileage. Plan B2 is also not desirable alternative since a recent site evaluation has identified an environmental issue that will significantly hinder use of the "south" end of the existing Dresden property for the proposed 500 kV switchyard. Therefore, Plan B1 is the preferred method for terminating the proposed Heard County 500 kV line at Dresden. Plan B1 requires less 500 kV line mileage, has the best utilization of the existing Dresden property and has flexibility for future expansion of the Dresden substation. A conceptual future build-out of Plan B1 is shown in Diagram 6.

Heard County and Hawk Road 500 kV Improvements (2014)

As previously stated, the Wansley CC7 System Impact Study report recommended a Dresden to Tenaska 500 kV line. While termination of the Dresden 500 kV line at the Heard County 500 kV Switching Station results in a cost savings of about $5,000,000, there are minor modifications required at the Heard County and Hawk Road 500 kV sites.

The preferred route for the new Dresden – Heard County 500 kV line requires the line to be terminated at the existing (occupied) bay in northeast corner of the Heard County 500 kV Switching Station. Presently the 500 kV line from the Hawk Road 500 kV collector bus is terminated at that position. Therefore, the empty 500 kV bay at Heard County will be built-out and the 500 kV line to the Hawk Road 500 kV collector bus will be re-terminated there. This will also require the existing 500 kV line termination equipment on the Hawk Road 500 kV collector bus to be transferred to an existing empty bay at Hawk Road in order to re-terminate the "collector bus" line to Heard County (see Diagram 11).

Wansley CC7 Transmission Improvements Plan

RECOMMENDATION

The following is a summary of the near-term and longer-term improvements **(~$60 M)** that will be required to support the Wansley #7 TSR:

2010: Operating Procedure *(reduce Wansley CC 7 generation as necessary)*

2011: Install two 2%, 2000 A, 230 kV series reactors in parallel on the Villa Rica 500/230 kV transformer (equivalent 1%, 4000 A; see Diagram 1)

2011: Reconductor Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) with 1351 ACSS conductor

2011: Reconductor the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black) with at least 636 ASCR conductor

2012: *(No improvements)*

2013: Expand Dresden 230 kV bus to accommodate new 500/230 kV transformer and replace existing four 230 kV circuit breakers with 3000 A, 63 kV circuit breakers

2014: Construct Dresden - Heard County 500 kV line (~6 miles)

2014: Create a by-pass for the existing Wansley – O'Hara 500 kV line through the Dresden site (via bus work) to avoid crossing of the 500 kV lines (see Plan B1 of Diagram 5)

2014: Build out empty bay at Heard County 500 kV substation and re-terminate 500 kV "collector bus" line from Hawk Road 500 kV substation (see Diagram 11)

2014: Terminate the new Dresden 500 kV line at the existing (occupied) bay in northeast corner of the Heard County 500 kV Switching Station (see Diagram 11)

2014: Build-out an existing empty bay at Hawk Road in order to re-terminate the "collector bus" line to Heard County (see Diagram 11)

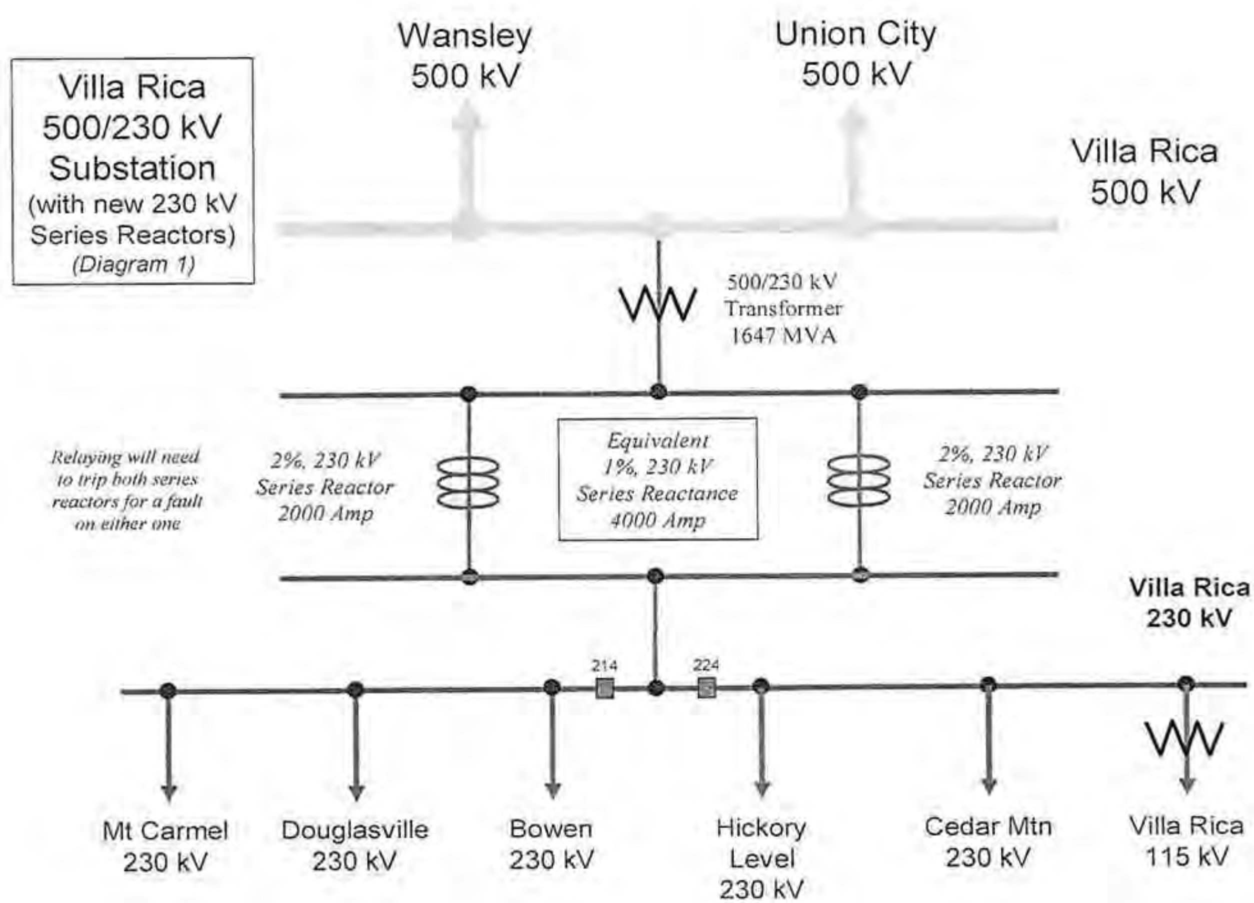
2014: Expand Dresden substation for 500 kV and terminate the Heard County 500 kV line

2014: Install a 2016 MVA, 500/230 kV transformer with 5000 A low-side equipment, an on-site spare phase and DGA monitors

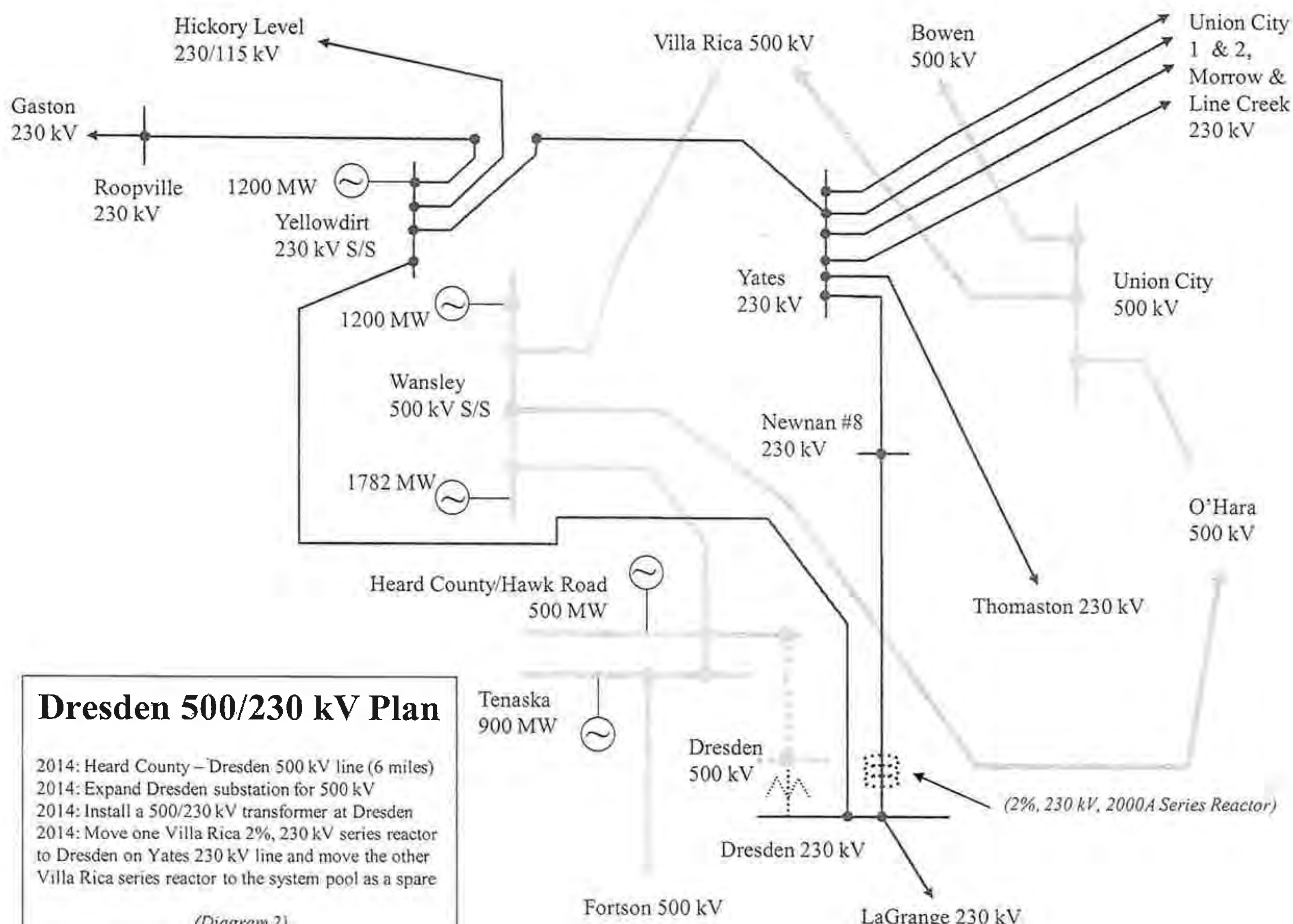
2014: Move one Villa Rica 230 kV series reactor to Dresden on Yates 230 kV line

2014: Remove and reuse second Villa Rica 230 kV series reactor for a future project or as a system spare

Wansley CC7 Transmission Improvements Plan



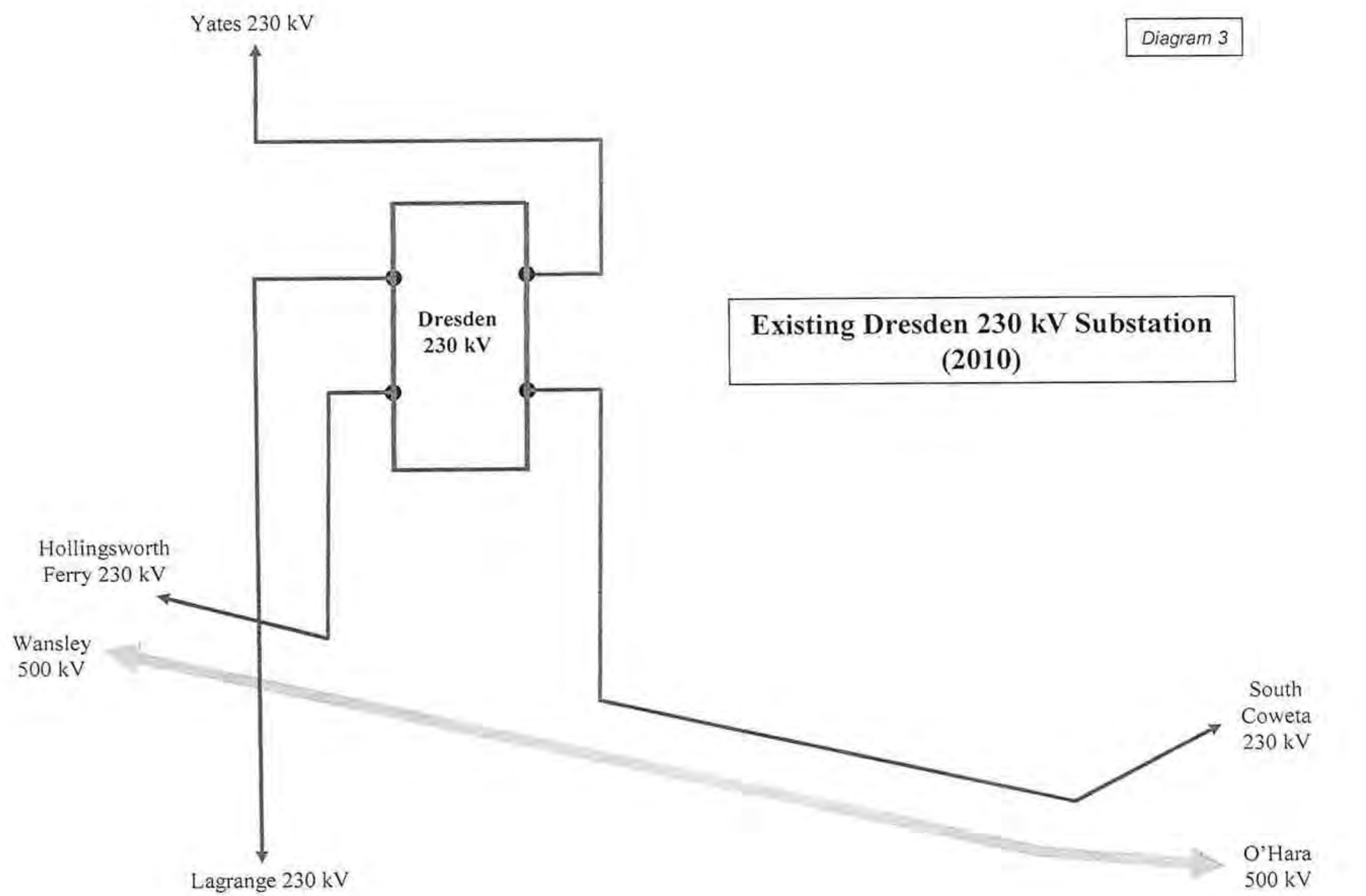
Wansley CC7 Transmission Improvements Plan



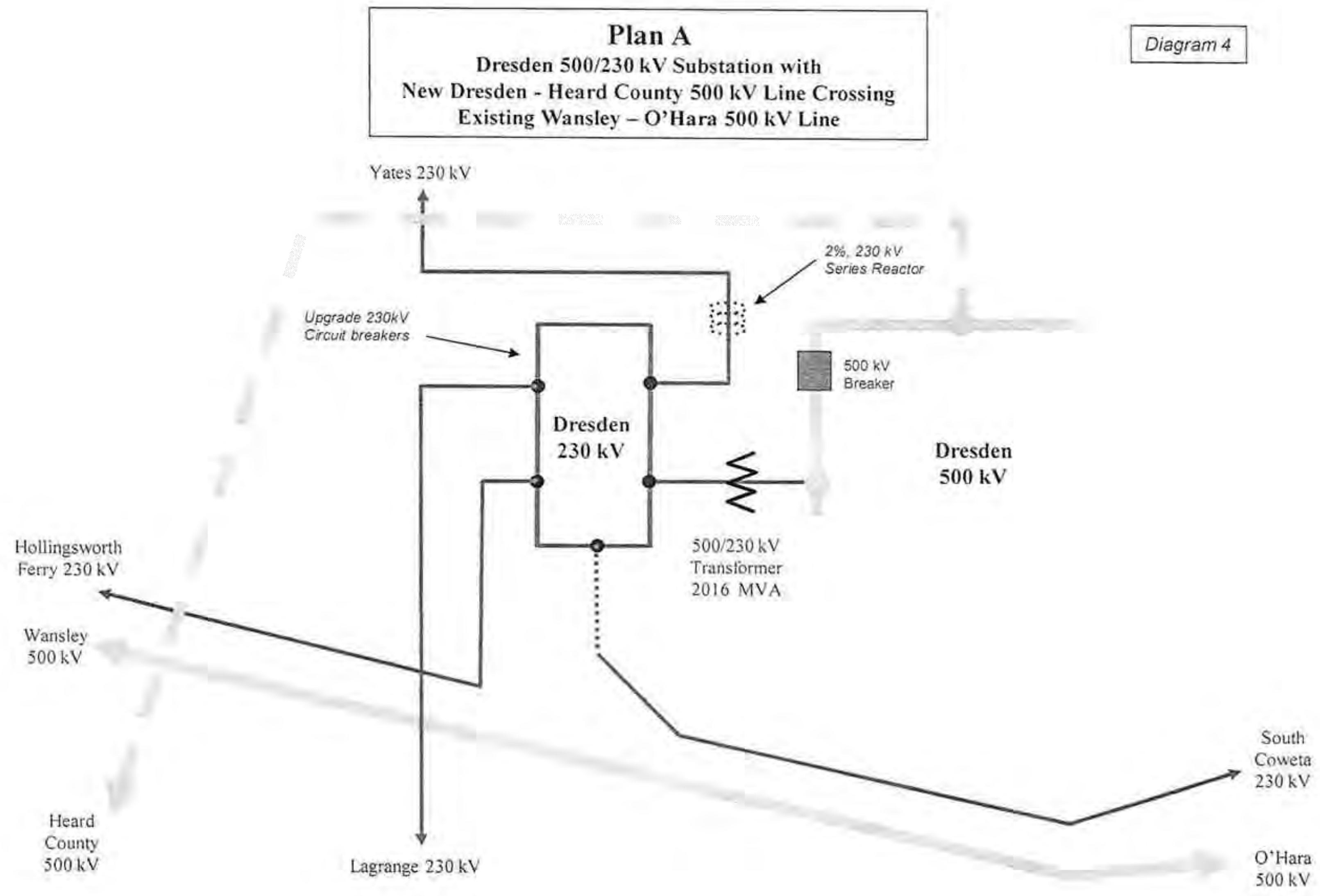
Dresden 500/230 kV Plan

2014: Heard County – Dresden 500 kV line (6 miles)
2014: Expand Dresden substation for 500 kV
2014: Install a 500/230 kV transformer at Dresden
2014: Move one Villa Rica 2%, 230 kV series reactor to Dresden on Yates 230 kV line and move the other Villa Rica series reactor to the system pool as a spare

(Diagram 2)


Yates 230 kV
Diagram 3
Dresden
230 kV
Existing Dresden 230 kV Substation
(2010)
Hollingsworth
Ferry 230 kV
Wansley
500 kV
South
Coweta
230 kV
O'Hara
500 kV
Lagrange 230 kV

Wansley CC7 Transmission Improvements Plan



Wansley CC7 Transmission Improvements Plan

Plan B1 (Preferred Alternative)
Dresden 500/230 kV Substation with Wansley – O'Hara 500 kV Line Looped through Dresden (w/o interconnection) to Facilitate 500 kV Line Crossing Via the Dresden 500 kV Buswork ("North" end of existing property)

Diagram 5

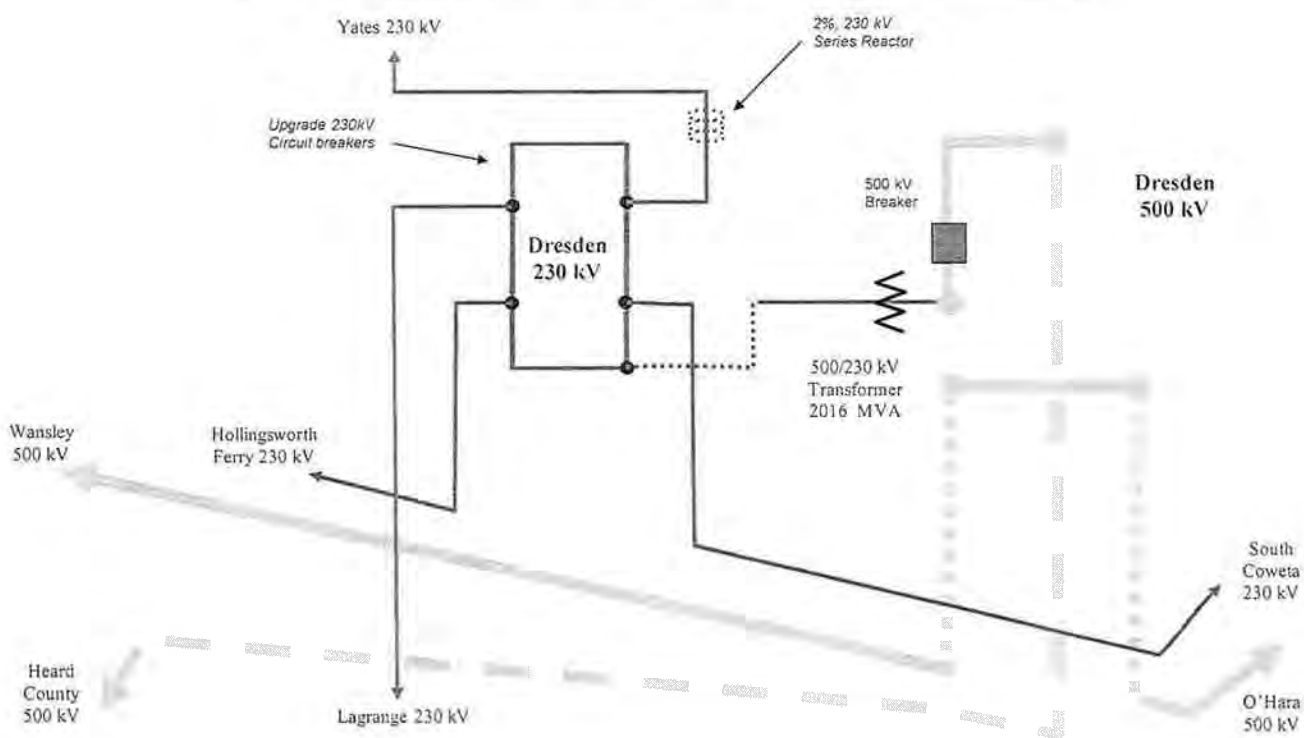
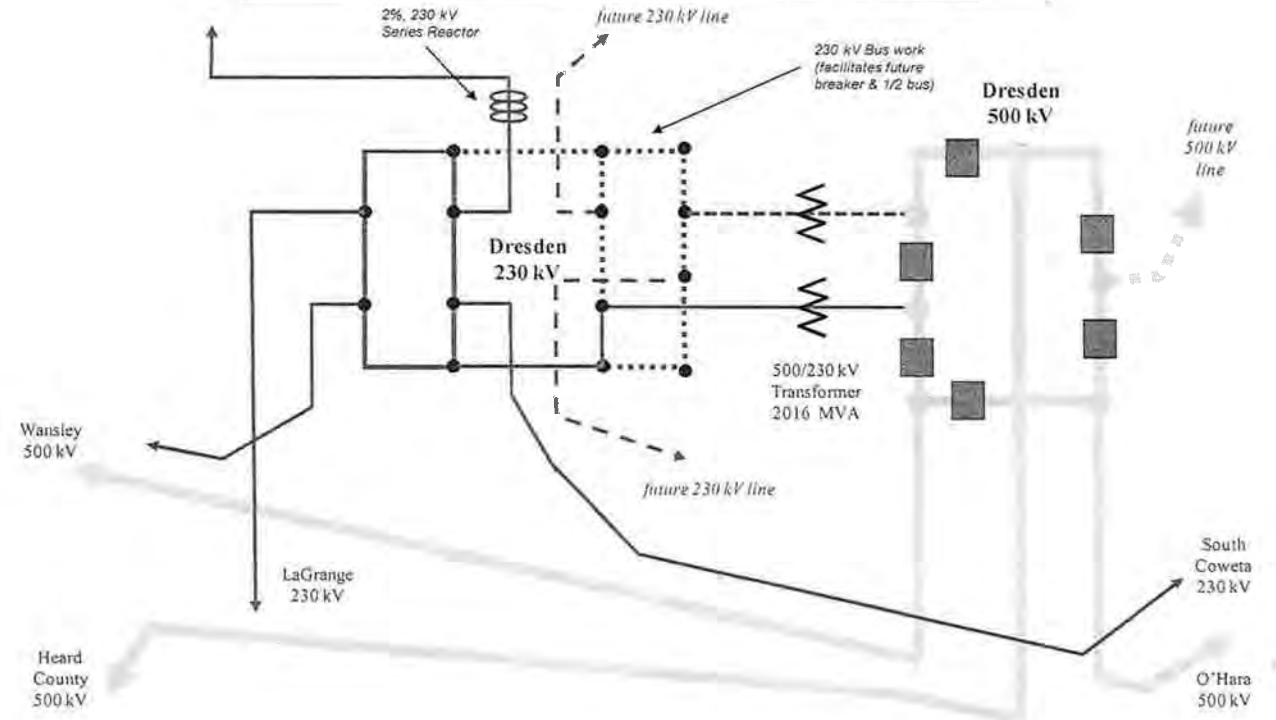


Diagram 6

Conceptual Future Expansion of Plan B1

Dresden 500/230 kV Substation with Wansley – O'Hara 500 kV Line Looped through Dresden (w/o interconnection) to Facilitate 500 kV Line Crossing Via the Dresden 500 kV Buswork ("North" end of existing property)

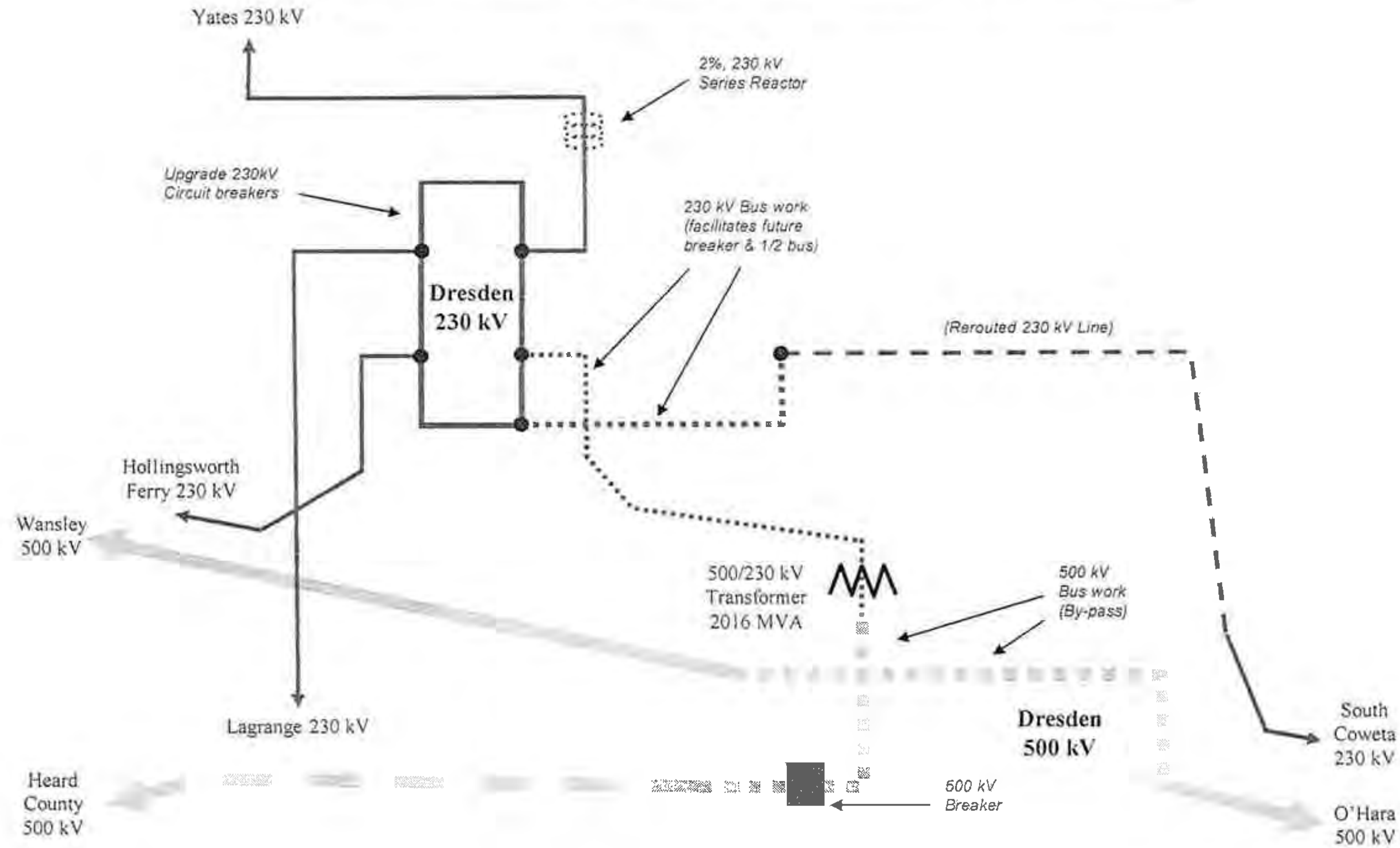


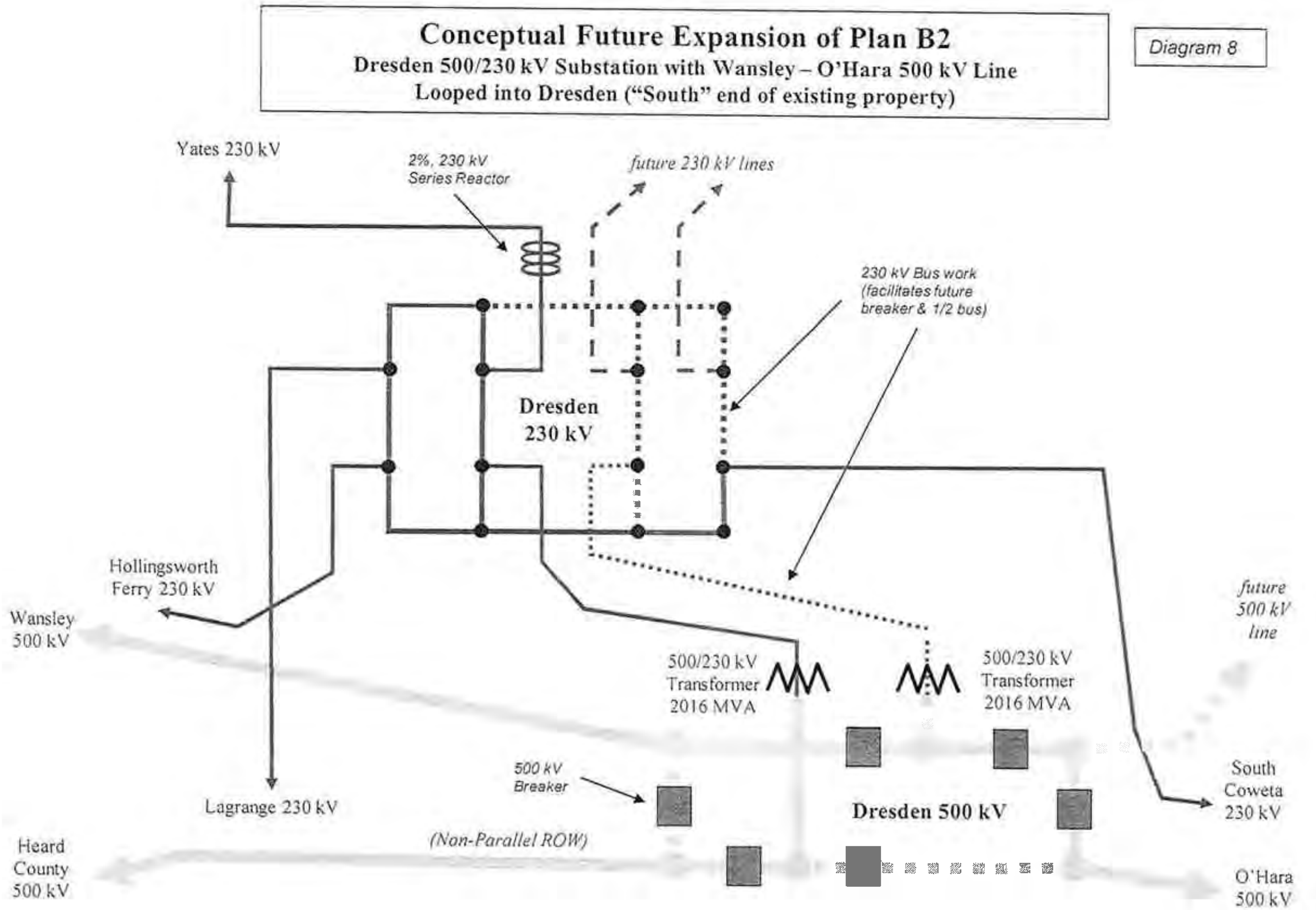
Wansley CC7 Transmission Improvements Plan

Plan B2

Dresden 500/230 kV Substation with Wansley – O'Hara 500 kV Line Looped through Dresden (w/o interconnection) to Facilitate 500 kV Line Crossing Via the Dresden 500 kV Buswork ("South" end of existing property)

Diagram 7

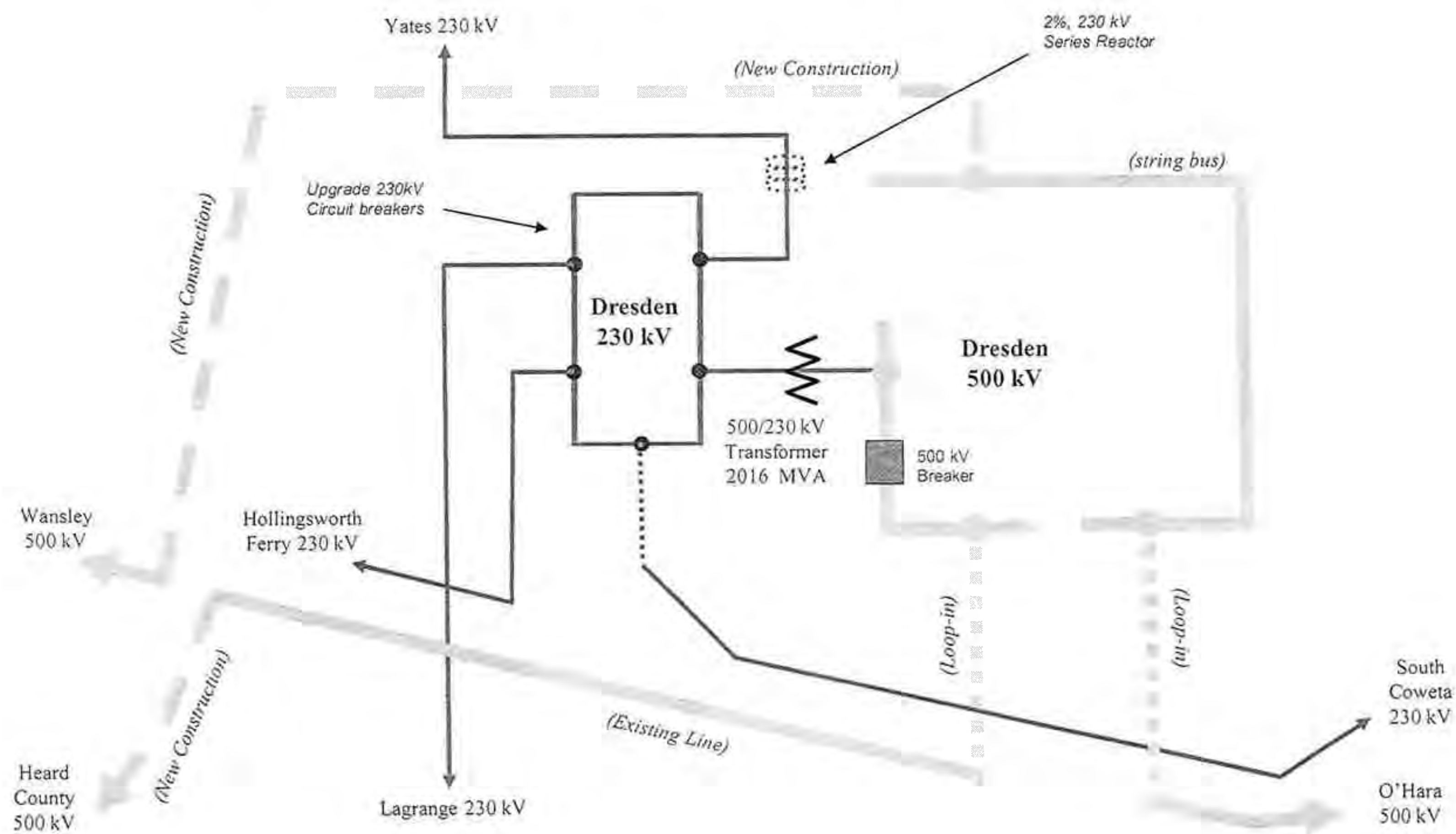



Conceptual Future Expansion of Plan B2
Dresden 500/230 kV Substation with Wansley – O'Hara 500 kV Line
Looped into Dresden ("South" end of existing property)
Diagram 8
Yates 230 kV
2%, 230 kV
Series Reactor
future 230 kV lines
230 kV Bus work
(facilitates future
breaker & 1/2 bus)
Dresden
230 kV
Hollingsworth
Ferry 230 kV
Wansley
500 kV
500/230 kV
Transformer
2016 MVA
500/230 kV
Transformer
2016 MVA
future
500 kV
line
500 kV
Breaker
Lagrange 230 kV
Dresden 500 kV
South
Coweta
230 kV
(Non-Parallel ROW)
Heard
County
500 kV
O'Hara
500 kV

Plan C

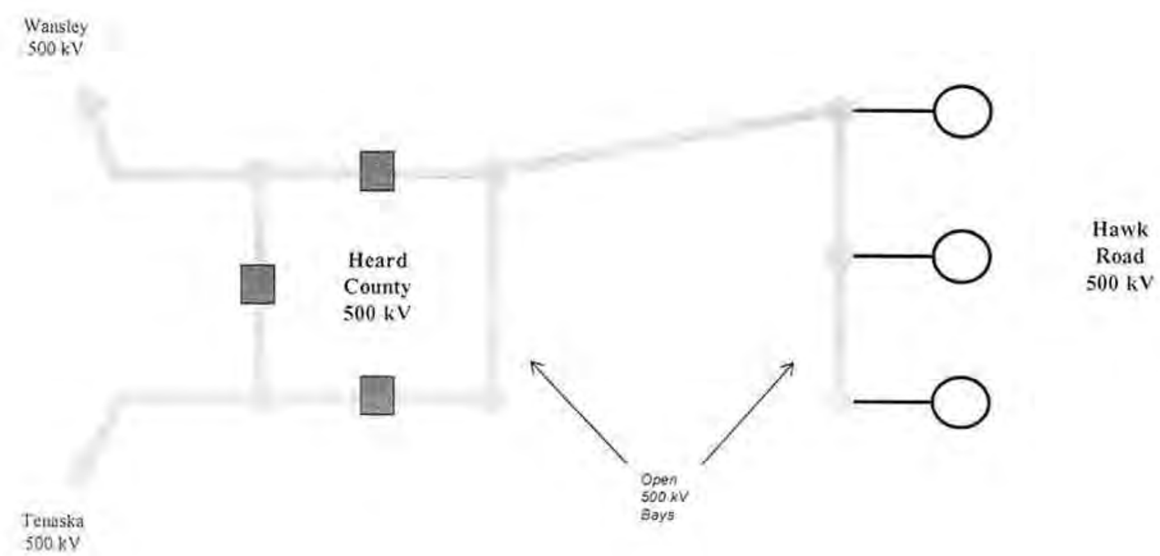
Dresden 500/230 kV Substation with existing Wansley – O'Hara 500 kV Line Reconfigured to Avoid Crossing with new Dresden - Heard County 500 kV Line

Diagram 9



Existing Heard County and Hawk Road 500 kV Substations

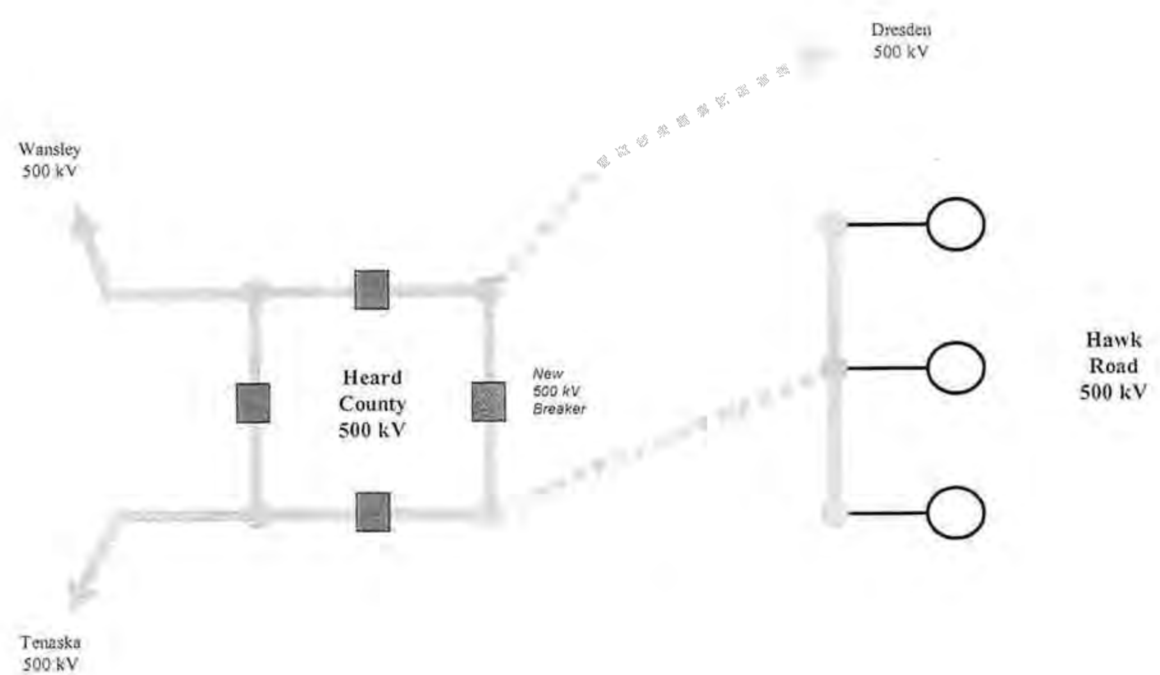
Diagram 10



2014 Heard County and Hawk Road 500 kV Substations

Dresden – Heard County 500 kV Line terminated at existing "northeast" bay
Hawk Road 500 kV connection re-terminated at previously empty bay

Diagram 11



Interconnection Study (2011)
Wansley 7 CC 500kV
Fault Analysis
Decemeber 20, 2010
Kirk Kondos

Wansley #7 CC 500kV Configuration (Existing Model in CAPE):

a. 2 – 239 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.064857 pu.
b. 1 – 251 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.065032 pu.
c. 3 GSU, 250/275/300 MVA, 500/23kV, 6.0% impedance (estimated) @ 250 MVA

Study Description :

1. This study is based on the 2011 Washington CT TSR Queue.
   (i) Dynergy Head – 500 MW (all on)
   (ii) Franklin – 1780 MW (all on)
   (iii) Hancock – off
   (iv) Harris (APC) – 1222 MW (note because this is APC not modeled in CAPE)
   (v) Hillabee Energy Center – 700 MW (all on)
   (vi) Lindsayhill (Tenaska #1) – 546 MW – (Tenaska #1 ST off)
   (vii) Longleaf – off.
   (viii) Jack McDonough – 583 MW (unit 1 & 2) on.
   (ix) Jack McDonough Units 4, 5 &6 off
   (x) Sewell Creek – 508 MW (all on)
   (xi) SMARR CC – off.
   (xii) Talbot County – 653 MW (all on)
   (xiii) Tenaska GA – 942 MW (all on)
   (xiv) Tiger Creek – 604 MW (all on)
   (xv) Vogle Unit 3 and 4 (off)
   (xvi) Wansley CC (#6 units 1A, 1B & 1) – 572 MW
   (xvii) Wansley CC (#7 units 7A, 7B & 7) – 575 MW, this study.
   (xviii) Wansley MEAG (#9 units 9A, 9B & 9) – 497 MW
   (xix) Wansley Units 1 & 2 – 1780 MW
   (xx) Wansley OPC (Chattahoochee Energy) – 464 MW
   (xxi) Warthen – 600 MW (1 – 8 all on)
   (xxii) Washington CT – off
   (xxiii) West GA – Gen 2 off

2. This study is modeled in CAPE with the its2010_2011Que with the following system modifications:
   (i) Installation of two 2%, 2000A, 230kV series reactors in parallel (1% total) on the low side of the Villa Rica 500/230kV transformer.
3. A benchmark fault study was run in order to determine the fault currents ratings at the new Wansley CC (#7 units 7A, 7B & 7) station. Two cases were run: without generation and with generation at Wansley CC (#7 units 7A, 7B & 7).
4. Next, a breaker-by-breaker duty analysis was done to identify any overstressed breakers at Wansley CC (#7 units 7A, 7B & 7) and Villa Rica 500/230kV installation. Two cases were run:
   (i) 2011 basecase with all generation in service and no generation at Wansley CC (#7 units 7A, 7B & 7).
   (ii) 2011 basecase with all generation in service, including generation at Wansley CC (#7 units 7A, 7B & 7).

Study Results :

1. **Total fault currents at buses (Amps):**

Station	Fault	Base (w/o Gen.)	Ultimate (w/ Gen.)
Wansley CC 500kV	3-phase fault	35217	37934
	Phase-ground fault	38343	40442

Breaker Duty margins without generation at Wansley CC #7 – 2011 conditions:

		3 phase		Phase to ground	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	36028	38	39801	32.2
182010	63	36028	38	39801	32.2
182020	63	36028	38	39801	32.2
182030	63	36028	38	39801	32.2
182040	63	36028	38	39801	32.2
182070	63	36028	38	39801	32.2
182080	63	36028	38	39801	32.2
182090	63	36028	38	39801	32.2
182100	63	33316	42.9	35212	40.8
182110	63	36028	38	39801	32.2
182116	63	35217	39.9	38342	36.7
182226	63	35217	39.9	38342	36.7
182331	63	35217	39.9	38342	36.7
182776	63	35217	39.9	38342	36.7
182886	63	35217	39.9	38342	36.7
182996	63	35217	39.9	38342	36.7
PCB @ Villa Rica 500kV					
159030	63	21384	65.3	15920	74.7
159040	63	16343	72.8	12618	77.0
159050	63	21384	65.3	15920	74.7
PCB @ Villa Rica 230kV Bus 1					
159214	63	36653	41.4	29627	50.2
159238	63	34878	41.0	29144	48.1
159258	63	31482	50.0	26857	54.7
159268	63	34774	41.0	29240	48.0

PCB @ Villa Rica 230kV Bus 2					
159224	63	36653	41.4	29627	50.2
159228	63	33833	42.9	28519	49.2
159248	63	31971	45.4	26956	51.5

Breaker Duty margins with generation at Wansley CC #7 500kV:

		3 phase		**Phase to ground**	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	38728	33.2	41952	29.6
182010	63	38728	33.2	41952	29.6
182020	63	38728	33.2	41952	29.6
182030	63	38728	33.2	41952	29.6
182040	63	38728	33.2	41952	29.6
182070	63	38728	33.2	41952	29.6
182080	63	38728	33.2	41952	29.6
182090	63	38728	33.2	41952	29.6
182100	63	33316	42.9	35212	40.8
182110	63	38728	33.2	41952	29.6
182116	63	38934	35.0	40442	33.2
182226	63	38934	35.0	40442	33.2
182331	63	38934	35.0	40442	33.2
182776	63	38934	35.0	40442	33.2
182886	63	38934	35.0	40442	33.2
182996	63	38934	35.0	40442	33.2
PCB @ Villa Rica 500kV					
159030	63	21918	64.5	16114	74.4
159040	63	16792	72.1	12793	76.7
159050	63	21918	64.5	16114	74.4
PCB @ Villa Rica 230kV Bus 1					
159214	63	36765	41.2	29675	50.1
159238	63	34983	40.9	29192	47.9
159258	63	31584	49.9	26907	54.5
159268	63	34876	41.1	29288	47.9
159224	63	36765	41.2	29675	50.1
159228	63	33937	42.7	28568	49.1

159248	63	32078	45.2	27007	51.4

Conclusions:

1. **Generation from Simple Cycle units:** Circuit breakers with 50kA minimum interrupting capability are required at the new Wansley CC #7 500kV installation.

2. **Overstressed breakers:** There are no overstressed circuit breakers that need to be upgraded due to the new generation.

Note:
Small changes in short circuit data, modeling assumptions and study methods could increase or decrease fault duties and thus the margins of these currents with respect to circuit breaker fault duty interrupting ratings. Hence should any of the circuit parameters change, please advise P&C because this may warrant further analysis.

Interconnection Study (2014)
Wansley 7 CC 500kV
Fault Analysis
July 7, 2011
Kirk Kondos

Wansley #7 CC 500kV Configuration (Existing Model in CAPE):

a. 2 – 239 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.064857 pu.
b. 1 – 251 MVA units, 3600 rpm, 60Hz, 18.0kV, pf = 0.90, Xd" = 0.065032 pu.
c. 3 GSU, 250/275/300 MVA, 500/23kV, 6.0% impedance (estimated) @ 250 MVA

Study Description :

1. This study is based on the 2014 Washington CT TSR Queue.
   (i) Dynergy Head – 500 MW (all on)
   (ii) Franklin – 1780 MW (all on)
   (iii) Hancock – off
   (iv) Harris (APC) – 1222 MW (note because this is APC not modeled in CAPE)
   (v) Hillabee Energy Center – 700 MW (all on)
   (vi) Lindsayhill (Tenaska #1) – 546 MW – (Tenaska #1 ST off)
   (vii) Longleaf – 600 MW.
   (viii) Jack McDonough – 583 MW (unit 1 & 2) off
   (ix) Jack McDonough Units 4, 5 &6 on
   (x) Sewell Creek – 508 MW (all on)
   (xi) SMARR CC – off.
   (xii) Talbot County – 653 MW (all on)
   (xiii) Tenaska GA – 942 MW (all on)
   (xiv) Tiger Creek – 604 MW (all on)
   (xv) Vogle Unit 3 and 4 (off)
   (xvi) Wansley CC (#6 units 1A, 1B & 1) – 572 MW
   (xvii) Wansley CC (#7 units 7A, 7B & 7) – 575 MW, this study.
   (xviii) Wansley MEAG (#9 units 9A, 9B & 9) – 497 MW
   (xix) Wansley Units 1 & 2 – 1780 MW
   (xx) Wansley OPC (Chattahoochee Energy) – 464 MW
   (xxi) Warthen – 600 MW (1 – 8 all on)
   (xxii) Washington CT – 660 MW
   (xxiii) West GA – Gen 2 off

2. This study is modeled in CAPE with the its2010_2014 Que with the following 2014 system improvements:
   (i) New 500kV Dresden to Heard County line, triple conductor 1113 ACSR.
   (ii) Installation of one 2%, 2000A, 230kV series reactor at Dresden on the Yates Line.
   (iii) Install at Dresden 500/230kV, 2016MVA transformer.
3. A benchmark fault study was run in order to determine the fault currents ratings at the new Wansley CC (#7 units 7A, 7B & 7) station. Two cases were run: without generation and with generation at Wansley CC (#7 units 7A, 7B & 7).
4. Next, a breaker-by-breaker duty analysis was done to identify any overstressed breakers at Wansley CC (#7 units 7A, 7B & 7) and other stations that were identified by Transmission Planing. Two cases were run:
   (i) 2014 basecase with all generation in service and no generation at Wansley CC (#7 units 7A, 7B & 7).
   (ii) 2014 basecase with all generation in service, including generation at Wansley CC (#7 units 7A, 7B & 7).

Study Results :

1. **Total fault currents at buses (Amps):**

Station	Fault	Base (w/o Gen.)	Ultimate (w/ Gen.)
Wansley CC 500kV	3-phase fault	39521	42237
	Phase-ground fault	42091	44103

Breaker Duty margins without generation at Wansley CC #7 and with 2014 System Improvements:

		3 phase		Phase to ground	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	40563	30.7	43905	26.8
182010	63	40563	30.7	43905	26.8
182020	63	40563	30.7	43905	26.8
182030	63	40563	30.7	43905	26.8
182040	63	40563	30.7	43905	26.8
182070	63	40563	30.7	43905	26.8
182080	63	40563	30.7	43905	26.8
182090	63	40563	30.7	43905	26.8
182100	63	37854	35.4	39131	34.7
182110	63	40563	30.7	43905	26.8
182116	63	39521	33.1	42091	31.0
182226	63	39521	33.1	42091	31.0
182331	63	39521	33.1	42091	31.0
182776	63	39521	33.1	42091	31.0
182886	63	39521	30.5	42091	30.6
182996	63	39521	33.1	42091	31.0
PCB @ Dresden 500kV					
New to Heard	63	24384	58.5	20295	67.8
PCB @ Dresden 230kV					
New to 500kV T	63	33886	39.4	33604	46.7
988010	40	41859	-16.2	40187	-5
988020	40	44658	-22.9	42646	-6.6
988030	40	43200	-19.4	41331	-3.3
988040	50	43957	-4.1	41331	17.3
PCB @ Heard County 500kV					
New to Dresden	63	35561	41.4	36115	42.7
914240	63	33433	43.3	35115	42.8
914250	63	29346	49.9	30120	51.4
914260	63	35561	41.4	36115	42.7
PCB @ Tenaska Ga 500kV					
454110	63	32597	45.0	31837	48.8
454220	63	32744	44.8	34523	44.2
454330	63	32744	42.7	34523	44.1
PCB @ Yates					

230kV					
050750	43	44575	-6.4	44855	-5.3
050760	63	43328	29.3	43808	29.7
050770	63	44575	27.4	44855	28.1
050780	43	40863	1.8	42113	1.1
050790	43	44575	-14.5	44855	-9.1
050850	43	44575	-6.4	44855	-5.3
050870	43	44575	-6.4	44855	-5.3
050880	43	44575	-6.4	44855	-5.3
050890	43	43328	-3.7	43808	-2.9
050950	63	44575	27.4	44855	28.1
050960	43	44575	-6.4	44855	-5.3
PCB @ Lagrange 230kV					
025100	40	8970	77.6	8015	79.3
025158	40	6636	83.4	6630	83.4
025168	37.5	8571	77.1	8177	78.2
PCB @ South Coweta 230kV					
903818	40	6280	84.3	4476	88.5
PCB @ Villa Rica 500kV					
159030	63	22083	64.9	16207	74.3
159040	63	19112	68.5	14244	74.2
159050	63	22083	64.4	16207	74.3
PCB @ Villa Rica 230kV Bus 1					
159214	63	43985	27.6	37309	33.7
159238	63	41937	27.3	36538	31.8
159258	63	38600	33.5	34404	36.2
159268	63	41923	27.4	36699	31.6
PCB @ Villa Rica 230kV Bus 2					
159224	63	43985	27.6	37309	33.7
159228	63	40891	29.1	35899	33.1
159248	63	39415	31.1	34777	34.8
PCB @ Hollingsworth Ferry 230kV					
401660	63	40488	30.6	36266	42.4
401770	63	40488	30.6	36266	42.4
401880	63	40488	30.6	36266	42.4
401990	63	40488	30.6	36266	42.4
PCB @ Yellow Dirt 230kV					
987710	50	41820	16.4	38945	21.7
987720	50	36037	24.2	32212	34.8
987730	50	37083	16.9	35644	27.8
987740	50	39976	11.2	37699	24.0
987750	50	35600	21.4	31025	37.6
987760	50	37083	16.9	35644	27.8

Breaker Duty margins with 575MW generation at Wansley CC #7 with and System Improvements:

		3 phase		Phase to ground	
PCB @ Wansley 500kV	**Interrupting Rating (kA) [I_cap]**	**Fault Current (A) [I_3ph]**	**Breaker Margin (%) (what's left)**	**Fault Current (A) [I_sph]**	**Breaker Margin (%) (what's left)**
182000	63	43266	25.9	45973	23.4
182010	63	43266	25.9	45973	23.4
182020	63	43266	25.9	45973	23.4
182030	63	43266	25.9	45973	23.4
182040	63	43266	25.9	45973	23.4
182070	63	43266	25.9	45973	23.4
182080	63	43266	25.9	45973	23.4
182090	63	43266	25.9	45973	23.4
182100	63	37854	35.1	39131	34.7
182110	63	43266	25.9	45973	23.4
182116	63	42237	28.2	44103	27.7
182226	63	42237	28.2	44103	27.7
182331	63	42237	28.2	44103	27.7
182776	63	42237	28.2	44103	27.7
182886	63	42237	28.2	44103	27.7
182996	63	42237	28.2	44103	27.7
PCB @ Dresden 500kV					
New to Heard	63	25318	56.9	20717	67.1
PCB @ Dresden 230kV					
New to 500kV T	63	34320	38.7	33887	46.2
988010	40	42316	-17.5	40466	-1.2
988020	40	45129	-24.3	42932	-7.3
988030	40	43662	-20.7	41612	-4.0
988040	50	43662	12.7	41612	16.8
PCB @ Heard County 500kV					
New to Dresden	63	37360	38.3	37331	40.7
914240	63	35214	40.3	36398	40.8
914250	63	31145	46.8	31360	49.5
914260	63	37360	38.3	37331	40.7
PCB @ Tenaska Ga 500kV					
454110	63	34243	42.3	32927	47.2
454220	63	34388	42.0	35720	42.4
454330	63	34388	39.8	35720	42.4
PCB @ Yates 230kV					
050750	43	44690	-6.6	44933	-5.5
050760	63	44690	27.2	44933	28.0
050770	63	44690	27.2	44933	28.0
050780	43	40927	1.6	42180	1.0
050790	43	44690	-14.7	44933	-9.3
050850	43	44690	-6.6	44933	-5.5
050870	43	44690	-6.6	44933	-5.5
050880	43	44690	-6.6	44933	-5.5

050890	43	43435	-3.9	43881	-3.1
050950	63	43435	29.1	43881	29.6
050960	43	44690	-6.6	44933	-5.5
PCB @ Lagrange 230kV					
025100	40	8982	77.5	8021	79.3
025158	40	6637	83.4	6631	83.4
025168	40	8592	77.1	8183	78.2
PCB @ South Coweta 230kV					
903818	40	6290	84.3	4481	88.5
PCB @ Villa Rica 500kV					
159030	63	22550	64.2	16372	74.0
159040	63	19513	67.9	14391	73.9
159050	63	22550	63.7	16372	74.0
PCB @ Villa Rica 230kV Bus 1					
159214	63	44200	27.2	37413	33.5
159238	63	42144	26.9	36643	31.6
159258	63	38805	33.1	34512	35.9
159268	63	42126	27.0	36803	31.4
PCB @ Villa Rica 230kV Bus 2					
159224	63	44200	27.2	37413	33.5
159228	63	41098	28.7	36005	32.8
159248	63	39608	30.7	34877	34.5
PCB @ Hollingsworth Ferry 230kV					
401660	63	40637	30.4	36346	42.3
401770	63	40637	30.4	36346	42.3
401880	63	40637	30.4	36346	42.3
401990	63	40637	30.4	36346	42.3
PCB @ Yellow Dirt 230kV					
987710	50	41967	16.7	39030	21.6
987720	50	36184	23.9	32279	34.7
987730	50	37201	16.7	35717	27.7
987740	50	40122	11.0	37787	23.8
987750	50	35748	23.6	31106	37.5
987760	50	37201	16.7	35717	27.7

Conclusions:

1. The new circuit breakers with 63kA minimum interrupting capability are adequate for the new Dresden to Heard 500kV Line at Dresden and Heard.

2. The following are overstressed circuit breakers that need to be upgraded:

   a) Dresden 230kV (need minimum of 63kA):
      - **a. 988010**
      - **b. 988020**
      - **c. 988030**
      - **d. 988040**

   b) Yates 230kV (need minimum of 63kA):
      - **a. 050750**
      - **b. 050780**
      - **c. 050790**
      - **d. 050850**
      - **e. 050870**
      - **f. 050880**
      - **g. 050890**
      - **h. 050960**

Note:

Small changes in short circuit data, modeling assumptions and study methods could increase or decrease fault duties and thus the margins of these currents with respect to circuit breaker fault duty interrupting ratings. Hence should any of the circuit parameters change, please advise P&C because this may warrant further analysis.

Heard County 500/230kV Substation Estimate Assumptions

6-29-11

The following is a list of assumptions on which the estimate for the subject substation is based.

SCOPE: The scope of this project consists of terminating the Dresden 500kV transmission line into the existing Heard County Substation.

Assumptions:

1. Estimate is based on PDSL 1036-PD1A with the latest revision of April 27, 2011 and drawing 1036-LP2.
2. The existing Hawk Road termination will be relocated to another location on the ring bus and the new Dresden line will be terminated on the ring bus where the existing Hawk Road is terminated. The existing Hawk Road dead end location will be relocated to accommodate the Dresden transmission line angle of entry requirements. New foundations will be poured and we will reuse the existing structure.
3. Assumptions for the site development design:
    - Design will be to match the existing 230kV station. Assumes no rock or high water table.
    - Design will be a balanced site.
    - No perimeter fence and no retaining wall.
    - Pad elevation is estimated to be at ~816.
    - 3:1 Fill slopes and 3:1 cut slopes.
    - Design will tie into existing drainage system.
    - Includes NPDES activity
4. One 500kV switch will be relocated and one new 500kV switch will be added.
5. Estimate assumes the control wiring will be performed under a separate contract.
6. Estimate assumes the transmission line hardware will be provided with the TL project.
7. Estimate assumes that the required station clearances will be approved for construction.
8. A fence expansion is required to the north side of the station for the Dresden line termination. The expansion is approximately 100' x 184' as shown on 1036-LP2.
9. Estimate assumes one 500kV breaker.
10. Estimate assumes #10 AWG copper, XLPE, 1000 volt, shielded insulation control cables.
11. Estimate assumes NO generation re-dispatch expense.
12. Estimate includes 7.5% contingency on the construction contractor labor and material contracts (EC50 only).
13. Estimate includes 3% per year escalation for one year on the construction labor and material contracts.
14. Overheads are based on 2011 methodology – 23% adder to direct costs.

Georgia Transmission Corporation

Primavera Project Manager

Project Estimate Summary

Project: **P85728** **Heard County Power - MSS** Customer: **ITS**

Desc: **TS_MSS** Project Manager: **AKIN**

Scope: Add a 500 kV breaker and terminate Heard - Dresden 500 kV line in the bay previously used for the Hawk Road 500kV line. Modify the connection of Heard County - Hawk Road extention bus.

	Budgeted Cost
Project Total Charges	$4,368,590.15
Direct Charges	$3,482,617.15
50 - Construction Contract Labor	$1,254,202.00
50 - Construction Contract	$1,129,072.00
50 - Site Work Contract	$102,630.00
50 - Environmental Field Compliance	$22,500.00
50 - Transport Transformer	$0.00
20 - GPC Mobile	$0.00
64 - Owner Furnished Material	$1,307,371.00
Labor (40 & 54)	$252,132.15
40 - Associate Salary	$246,503.65
54 - Contract Labor	$5,628.50
56 - Professional Services	$240,600.00
56 - Multiple Discipline	$0.00
56 - Construction Services	$0.00
56 - S/S Design	$12,000.00
56 - Environmental Services	$0.00
56 - Photo Science	$17,600.00
56 - S/S Maintenance	$211,000.00
Other	$8,500.00
Miscellaneous (Expenses, permits, etc)	$5,000.00
Project Contingency & Escalation	$169,812.00
Management Reserve	$250,000.00
Indirect Charges	$885,973.00
Indirects (overheads)	$885,973.00
	$4,368,590.15

GeorgiaTransmission

Georgia Transmission Corporation
2100 East Exchange Place
Tucker, GA 30084-5336
phone 770-270-7400
fax 770-270-7872

Memorandum

DATE: June 23, 2011

TO: See Attached List

FROM: Renée King RK

SUBJECT: Project Release

Northwest Region

85938 Union City (ITS) 500/230 kV S/S Switch Replacement

Southwest Region

86115 Dawson – Morgan (ITS) 46 kV T/L Fault Indicators Installation

RK

Attachments

County: FULTON

Printed on: 04/13/2011

Georgia Transmission Corporation
PROJECT RELEASE

Planning Contact : ZAKIA EL OMARI
Project Manager : GERALD (JERRY) LAWSON

Region: Northwest

Required Cut-In Date: 06/01/2011

GTC Projects:

P85938 Union City(I.T.S.) 500kV/230kV Substation

Approved by ______ Date 4-11-11

Approved by ______ Date 4/21/11

Approved by ______ Date 6/20/2011

Approved by ______ Date 6/20/11

Zakia EL OMARI 4/11/2011

Scopes:

P85938 Replace switch # 133427 with at least a 2000A capacity switch on the East Point 230 kV line (Black). The project, in conjunction with ITS approved line re-conductoring (GPC project ID 13594), is part of the East Point - Union City 230 kV line upgrade.

Justification: Granting the 575MW Transmission Service Request out of Wansley CC7 requires multiple improvement projects including re-conductoring the Union City -Flat Shoals section of the GPC owned Union City - East Point 230 kV line (Black). See attached justification. In order to accommodate the above mentioned project it is necessary to replace the switch # 133427 with at least a 2000 A capacity switch.

	Total Budget	Retirement	Reimbursement	Net Cost	DSF	NET ITS INV
P85938	$75,187			$75,187		$75,187
Totals:	$75,187			$75,187		$75,187

SUBSTATION PROJECT INFORMATION

Project Name: Union City
Met Pt #:
Description: General Substation Modification
Facility Owner:

Area Project:	Wansley CC 7 Improvements						
Op H S KV:	500kV	ITS Crit Proj:	Yes	Capacity Added:	0.00		
Op L S KV:	230kV	Split Bus:	No	Capacity Removed:	0.00	Pro Type:	NA
Land Req'd:	No	EMC Low Side:	No	Control House:	No	RTU:	No
Mobile Req'd:	No	Req'd ITS:		PCD Required:	No	PCD Date:	
Bypass Metering:	No	JSTP Submittal:	ITS Parity Only - Not Fixed Cost	JSTP Cost Type:	N/A		

Transformer ID	Action	Location	Amount

ITS Member Feeder Information

# of Feeders:	0	Regulator Size:	0
Overhd/Undergrd:	NA	Oper. Voltage:	NA

GeorgiaTransmission
An Electric Membership Corporation

Management Authorization to Proceed with Selected Project Activities

To: North Substation Project Team

Cc: "@Stopwork" Distribution List

From: Russ Schussler – Ext. 7565

Date: 3/24/2011

Facility Name: Union City 500/230 kV Substation

EMC and Metering Point Number: N/A

Project Number: P85938

Full Project Scope: Replace switch # 133427 with at least a 2000A capacity switch on the East Point 230 kV line (Black). The project, in conjunction with ITS approved line re-conductoring (GPC project ID 13594), is part of the East Point - Union City 230 kV line upgrade project. Scope includes equipment procurement, engineering/design, installation, commissioning and testing.

This document is to notify you that Management Authorization to Proceed has been granted for selected activities on the subject project. This authorization is limited to performance of the following project activities:

MAPSA Scope (i.e. Authorized Project Activities): All project activities.

Reason MAPSA is Needed: The replacement of the above mentioned switch at Union City 500/230 kV substation on the GPC owned East Point 230 kV line (Black) is needed to address system limitations identified in the Wansley CC 7 System Impact Study. The switch must be ordered and installed prior to 6/1/2011.

Consequences of No Action: Transmission Service out of Wansley CC 7 could be curtailed if the switch is not replaced.

Risk to Corporation:

- Financial: GTC will have $75K of financial investment without ITS approval
- Period of Risk: The period of risk is from the MAPSA issuance to the project release and approval by the JSTP. The project release is in progress and will be submitted to the TPWG and the JSTP prior to June 2011.
- JSTP Approval Probability: The project has a very high probability of being accepted by the ITS members. GPC's project consisting of reconductoring

East Point - Union City 230 kV line (Black) has already been approved by the ITS (project ID 13594).

Comments:

- **History/Context:** Wansley CC 7 identified the GPC owned East Point - Union City 230 kV line (Black) as a limiting facility and recommended re-conductoring the line. The project submitted by GPC (project ID 13594) was approved by the ITS. Given that re-conductoring of the East Point - Union City 230 kV line (Black) is expected to be achieved by June 2011; this project needs to be completed by the same date.

- **Future/Other:** N/A

Record Center: -25.3

Transmission Improvements Plan for 575 MW Network Service Request Wansley CC 7 Generation Facility (OASIS # 143556)

Georgia Transmission Corporation

November 11, 2010

Wansley CC7 Transmission Improvements Plan

PROBLEM STATEMENT

A System Impact Study (SIS) was conducted by the Georgia Transmission Corporation to determine the impact to the Integrated Transmission System (ITS) of granting 575 MW of firm transmission service out of the existing Wansley CC 7 combined-cycle (CC) site in Heard County, GA (OASIS # 143556). The firm 575 MW transmission service request (TSR) was requested for the period 01/01/2010 – 01/01/2020.

Beginning in 2010, the Villa Rica 500/230 kV Transformer can exceed its thermal capacity for the loss of the Villa Rica – Union City 500 kV Line. Also, the Villa Rica – Wansley 500 kV line loads to 100 % of its thermal capacity for the loss of O'Hara – Wansley 500 kV line. Additionally, the Union City - Flat Shoals section of the Union City – East Point 230 kV line (Black) and the Morrow - Murray Lake Junction – Fort Gillem sections of the Grady – Morrow 115 kV line (Black) can exceed their respective thermal capacities under contingency situations. Beginning in 2014, O'Hara – Wansley 500 kV Line may reach 99 % of its thermal capacity for the loss of Villa Rica – Wansley 500 kV Line. The Wansley CC 7 generation is a contributing factor to these loadings.

As no improvements can be implemented in 2010 to address the above limitations, firm service would be limited to 344 MW in 2010. Several major transmission improvements will be required beginning in 2011 to grant full service for the Wansley CC7 generation facility through the requested period. This request was confirmed on May 12, 2010 pending completion of required transmission improvements.

STUDY RESULTS

Villa Rica Related Improvements (2011)

To address the near-term issues, the Wansley CC7 System Impact Study report (3/18/2010) proposed the addition of two 2%, 2000 A, 230 kV series reactors in parallel (equivalent 1%, 4000 A) on the low-side of the existing Villa Rica 500/230 kV transformer (see Diagram 1). While this improvement will alleviate the potential overloads of the Villa Rica 500/230 kV transformer and the Wansley – Villa Rica 500 kV line, it will further increase overloads of the Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) and the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black). The overall plan includes upgrades of these two lines.

Note that Wansley CC7 System Impact Study report identified the above limitations and required transmission improvements as 2012 issues. However, subsequent to the finalization of the report, Georgia Power announced that planned modifications to the existing McDonough generation facility (retirements and additions) will be delayed by one year (from 2011 to 2012). Accordingly, additional analysis indicates that a one year delay in the McDonough generation modifications would result in a one year advancement of the limitations and required transmission improvements (as identified in the Wansley CC7 System Impact Study report) from 2012 to 2011.

Dresden 500/230 kV Improvements (2014)

To address the longer-term issues, the Wansley CC7 System Impact Study report proposed expansion of the existing Dresden 230 kV switching station (see Diagram 3) for 500 kV to accommodate installation of a new 500/230 kV transformer and termination of a new 500 kV line from the Heard County area (see Diagram 2). Note that the Wansley CC7 System Impact Study report recommended a Dresden to Tenaska 500 kV line. However, termination of the Dresden 500 kV line at the Heard County 500 kV Switching Station would result in a cost savings of about $5,000,000. With the completion of the Dresden 500/230 kV project in 2014, the 230 kV series reactors will no longer be needed at Villa Rica.

While the Dresden 500/230 kV project will negate the need for the two proposed Villa Rica 230 kV series reactors beginning in 2014, it also creates a potential overload of the Dresden – Yates 230 kV line beginning in 2014. Therefore, one of the Villa Rica 230 kV series reactors can be moved to Dresden on the Yates 230 kV line in 2014 to address this new overload. Moving one of the 230 kV series reactors to Dresden (on the Yates 230 kV line) also mitigates potential overloads of the Yates – Union City 230 kV line (23 miles) in 2014. The other Villa Rica series reactor could be reused for a future project or as a spare.

Dresden 500 kV Termination Issues

Preliminary routing analysis of the proposed Dresden - Heard County 500 kV line identified that this new line would have to cross the existing Wansley – O'Hara 500 kV and the Dresden – Hollingsworth Ferry 230 kV lines at the same point (see Plan A of Diagram 4). This crossing would create an unacceptable operational issue because a single contingency could result in the simultaneous outage of all three lines. Therefore, alternative methods for routing and terminating the Heard County 500 kV line at Dresden have been evaluated.

Plan B1 (Diagram 5) and Plan B2 (Diagram 6) permit a "crossing" of the existing Wansley – O'Hara 500 kV line and the proposed Dresden - Heard County 500 kV line to occur via bus work within the Dresden 500 kV switchyard. Plan C (Diagram 8), would completely avoid a crossing of the existing Wansley – O'Hara 500 kV line and the proposed Dresden - Heard County 500 kV line by breaking and rerouting the existing Wansley – O'Hara 500 kV line (increases new 500 kV line length by 1 mile). A section of the existing Wansley – O'Hara 500 kV line could then be utilized to terminate the proposed Heard County 500 kV line at Dresden.

Note that for Plans B1, B2 and C, initially the new Dresden - Heard County 500 kV line and the existing Wansley – O'Hara 500 kV line would not interconnect at the Dresden site (a by-pass would be created via 500 kV bus work).

Plan B1 (Diagram 5) and Plan C (Diagram 8) only utilize the north end of the existing Dresden substation property and require additional property acquisition to expand the substation to the east. Plan B1 has a greater risk of simultaneous outages of Dresden 500 kV lines due to shared ROW.

While Plans B1, B2 and C are comparable in electrical performance and costs, Plan B2 is the preferred method for terminating the proposed Heard County 500 kV line at Dresden. Plan B requires less 500 kV line mileage (initially and in future), has the best utilization of the existing Dresden property and has the most flexibility for future expansion of the Dresden substation. A conceptual future build-out of Plan B2 is shown in Diagram 7.

Heard County and Hawk Road 500 kV Improvements (2014)

As previously stated, the Wansley CC7 System Impact Study report recommended a Dresden to Tenaska 500 kV line. While termination of the Dresden 500 kV line at the Heard County 500 kV Switching Station results in a cost savings of about $5,000,000, there are minor modifications required at the Heard County and Hawk Road 500 kV sites.

The preferred route for the new Dresden – Heard County 500 kV line requires the line to be terminated at the existing (occupied) bay in northeast corner of the Heard County 500 kV Switching Station. Presently the 500 kV line from the Hawk Road 500 kV collector bus is terminated at that position. Therefore, the empty 500 kV bay at Heard County will be built-out and the 500 kV line to the Hawk Road 500 kV collector bus will be re-terminated there. This will also require the existing 500 kV line termination equipment on the Hawk Road 500 kV collector bus to be transferred to an existing empty bay at Hawk Road in order to re-terminate the "collector bus" line to Heard County (see Diagram 10).

Wansley CC7 Transmission Improvements Plan

RECOMMENDATION

The following is a summary of the near-term and longer-term improvements **(~$60 M)** that will be required to support the Wansley #7 TSR:

2010: Operating Procedure *(reduce Wansley CC 7 generation as necessary)*

2011: Install two 2%, 2000 A, 230 kV series reactors in parallel on the Villa Rica 500/230 kV transformer (equivalent 1%, 4000 A; see Diagram 1)

2011: Reconductor Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) with 1351 ACSS conductor

2011: Reconductor the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black) with at least 636 ASCR conductor

2012: *(No improvements)*

2013: *(No improvements)*

2014: Construct Dresden - Heard County 500 kV line (~8 miles)

2014: Create a by-pass for the existing Wansley – O'Hara 500 kV line through the Dresden site (via bus work) to avoid crossing of the 500 kV lines (see Plan B2 of Diagram 6)

2014: Build out empty bay at Heard County 500 kV substation and re-terminate 500 kV "collector bus" line from Hawk Road 500 kV substation (see Diagram 10)

2014: Terminate the new Dresden 500 kV line at the existing (occupied) bay in northeast corner of the Heard County 500 kV Switching Station (see Diagram 10)

2014: Transfer the existing termination equipment on the Hawk Road 500 kV collector bus to an existing empty bay at Hawk Road in order to re-terminate the "collector bus" line to Heard County (see Diagram 10)

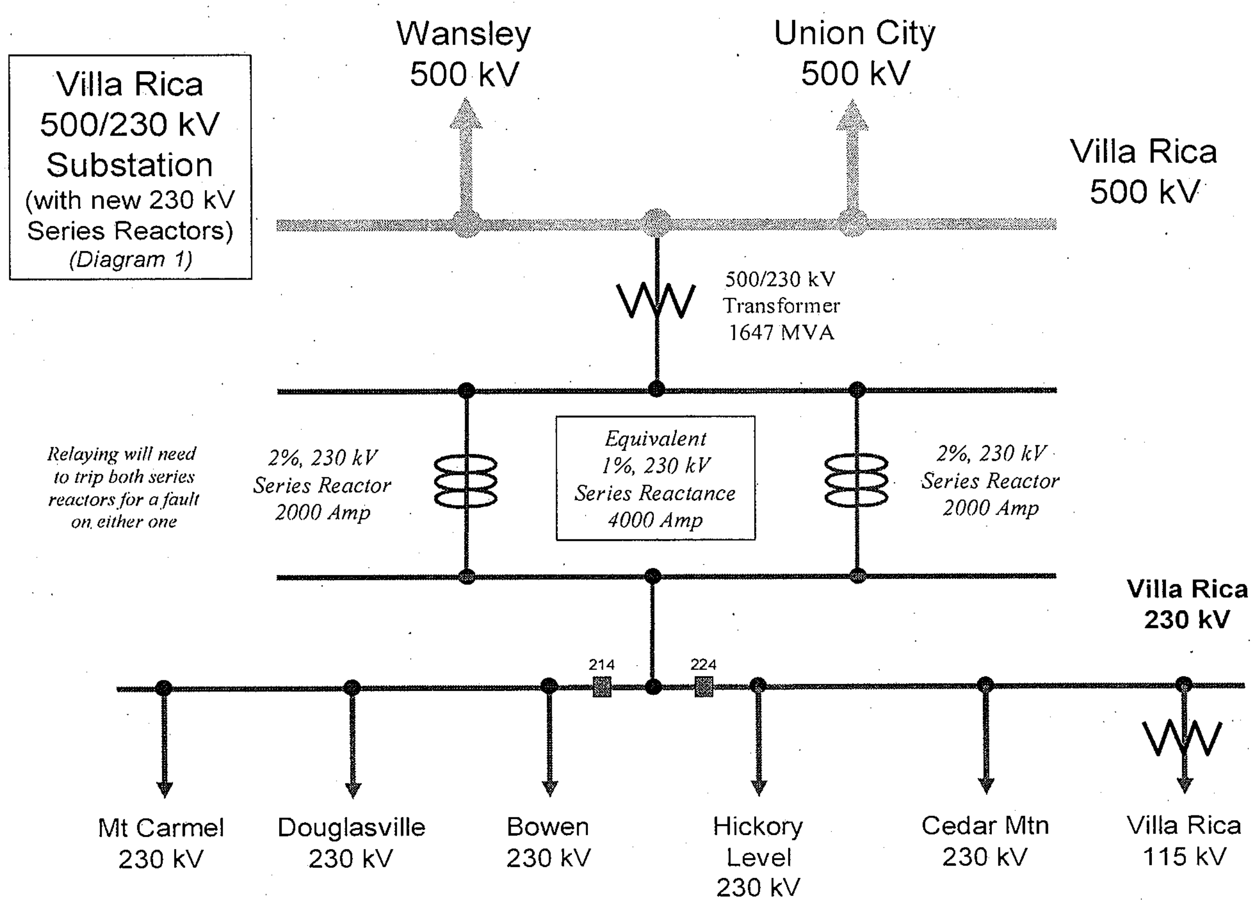
2014: Expand Dresden substation for 500 kV and terminate 500 kV line (see Diagram 6)

2014: Install a 2016 MVA, 500/230 kV transformer at Dresden

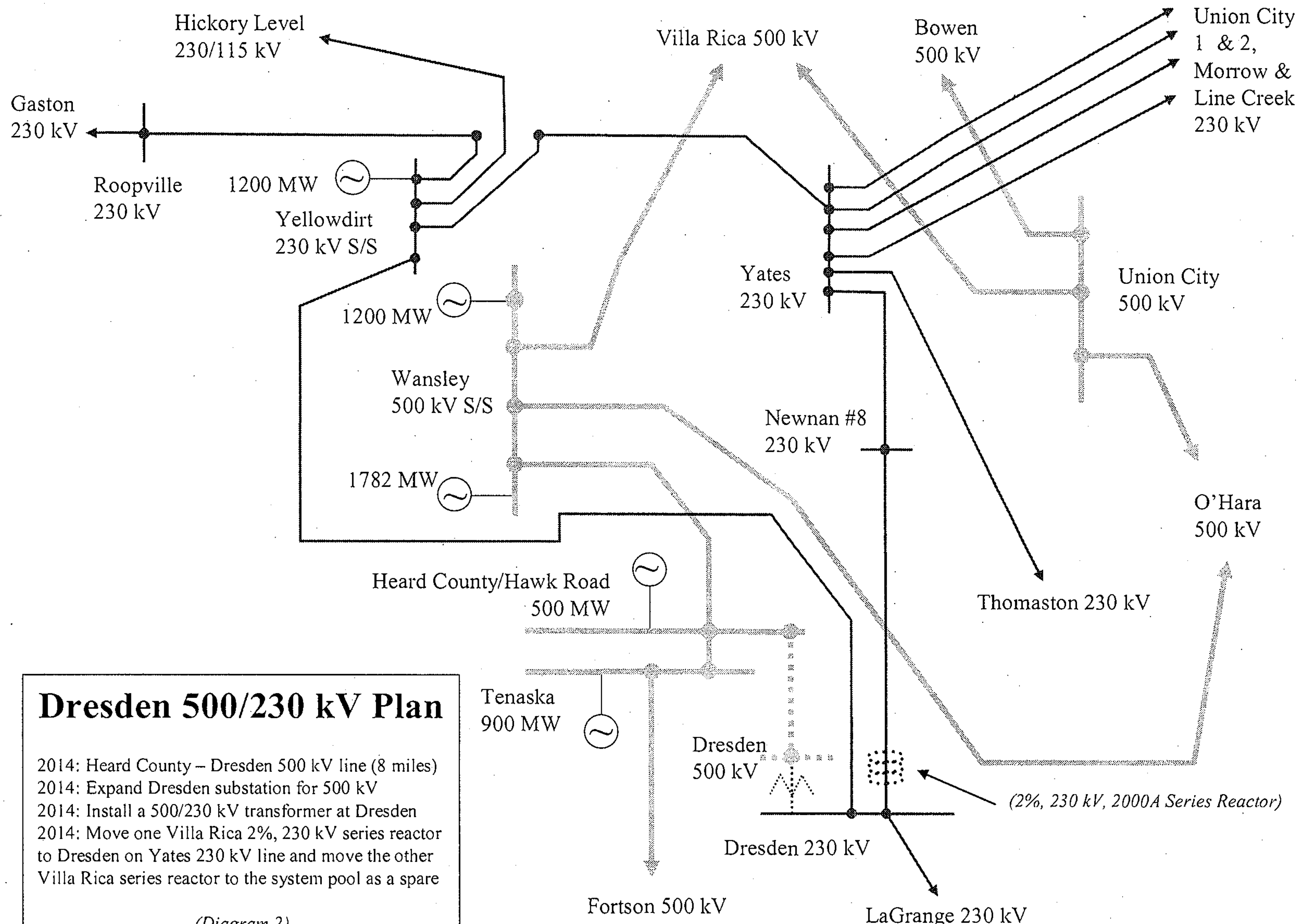
2014: Move one Villa Rica 230 kV series reactor to Dresden on Yates 230 kV line

2014: Remove and reuse second Villa Rica 230 kV series reactor for a future project or as a system spare

Wansley CC7 Transmission Improvements Plan



Wansley CC7 Transmission Improvements Plan



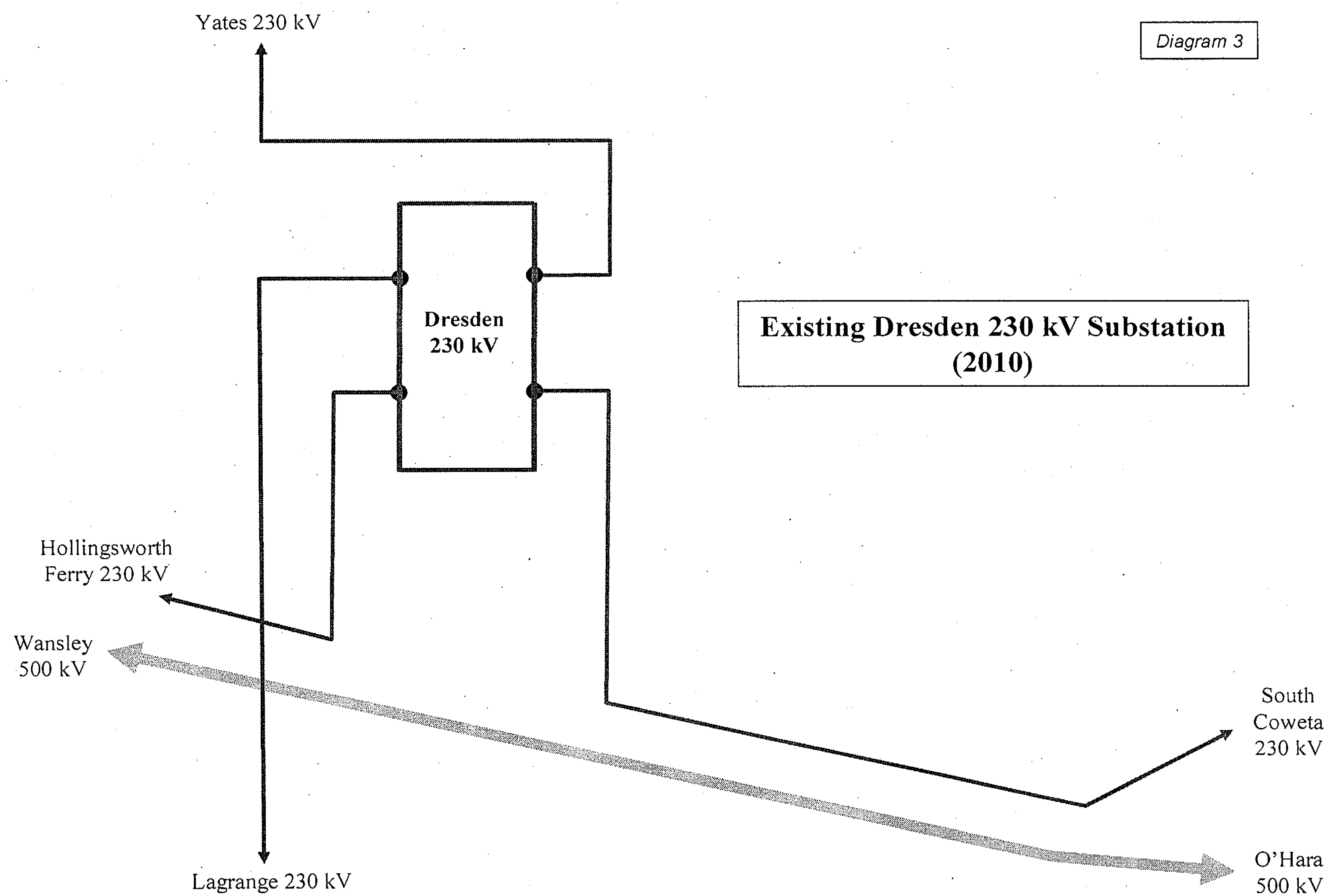
Dresden 500/230 kV Plan

2014: Heard County – Dresden 500 kV line (8 miles)
2014: Expand Dresden substation for 500 kV
2014: Install a 500/230 kV transformer at Dresden
2014: Move one Villa Rica 2%, 230 kV series reactor to Dresden on Yates 230 kV line and move the other Villa Rica series reactor to the system pool as a spare

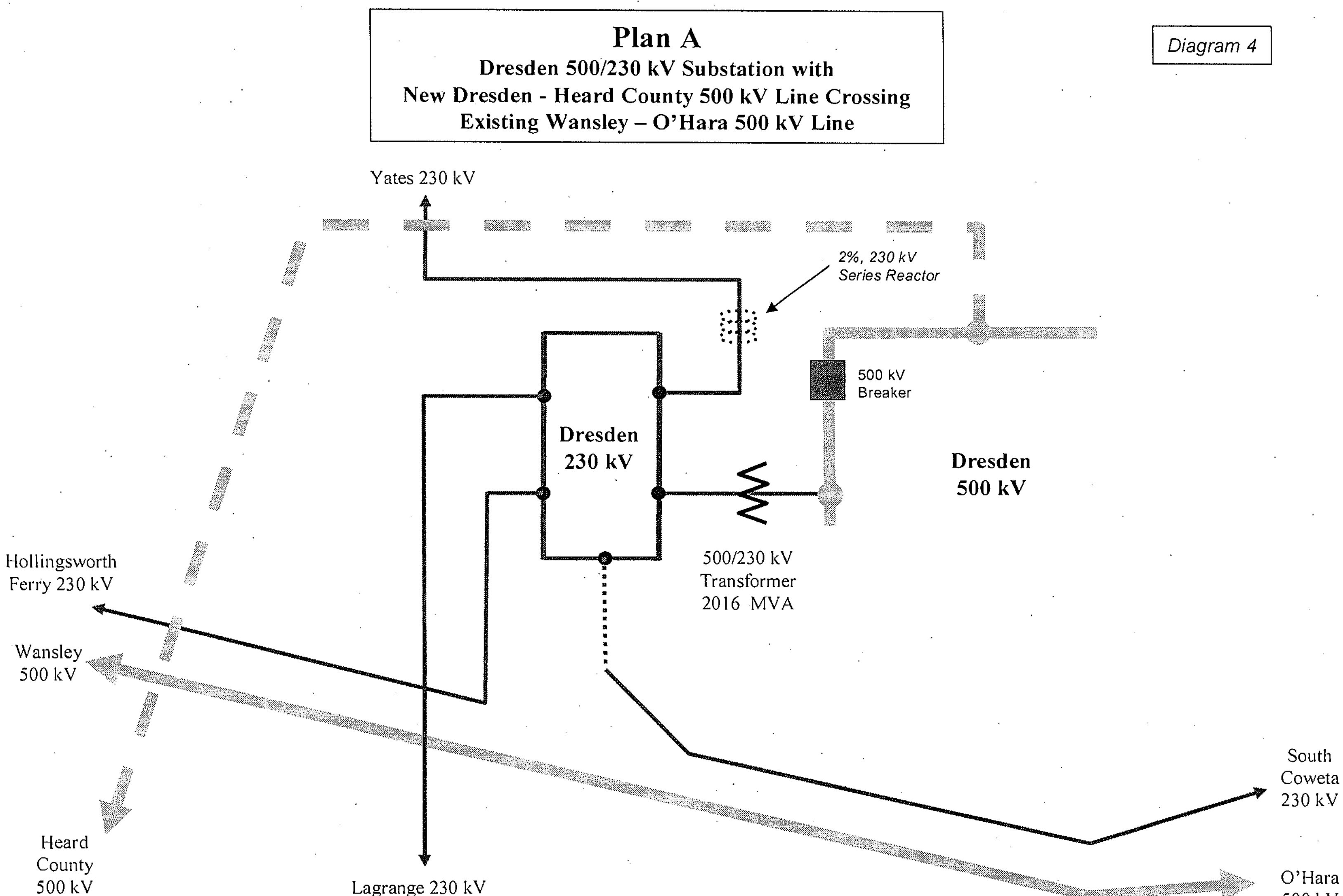
(Diagram 2)

Wansley CC7 Transmission Improvements Plan

Diagram 3



Wansley CC7 Transmission Improvements Plan

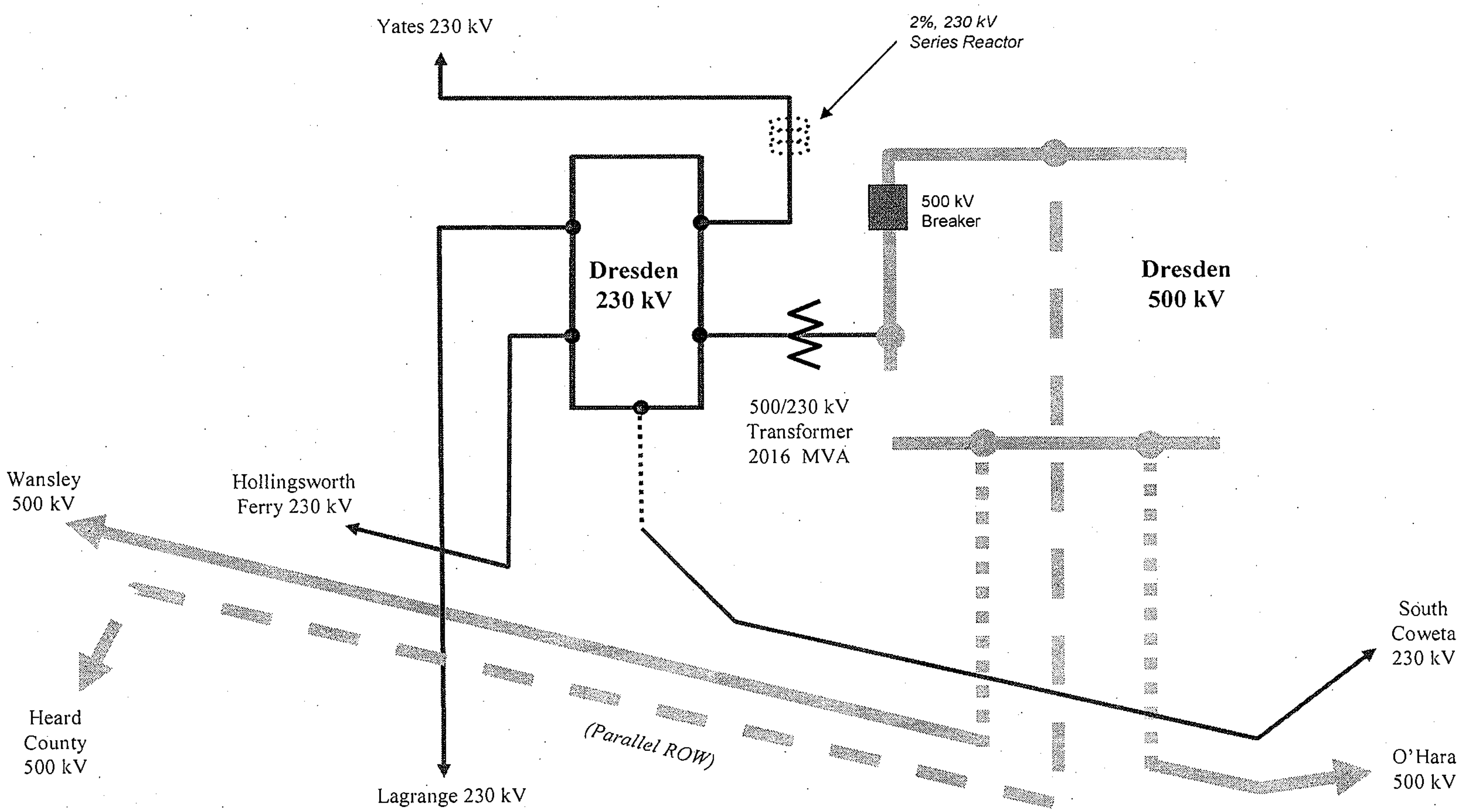


Wansley CC7 Transmission Improvements Plan

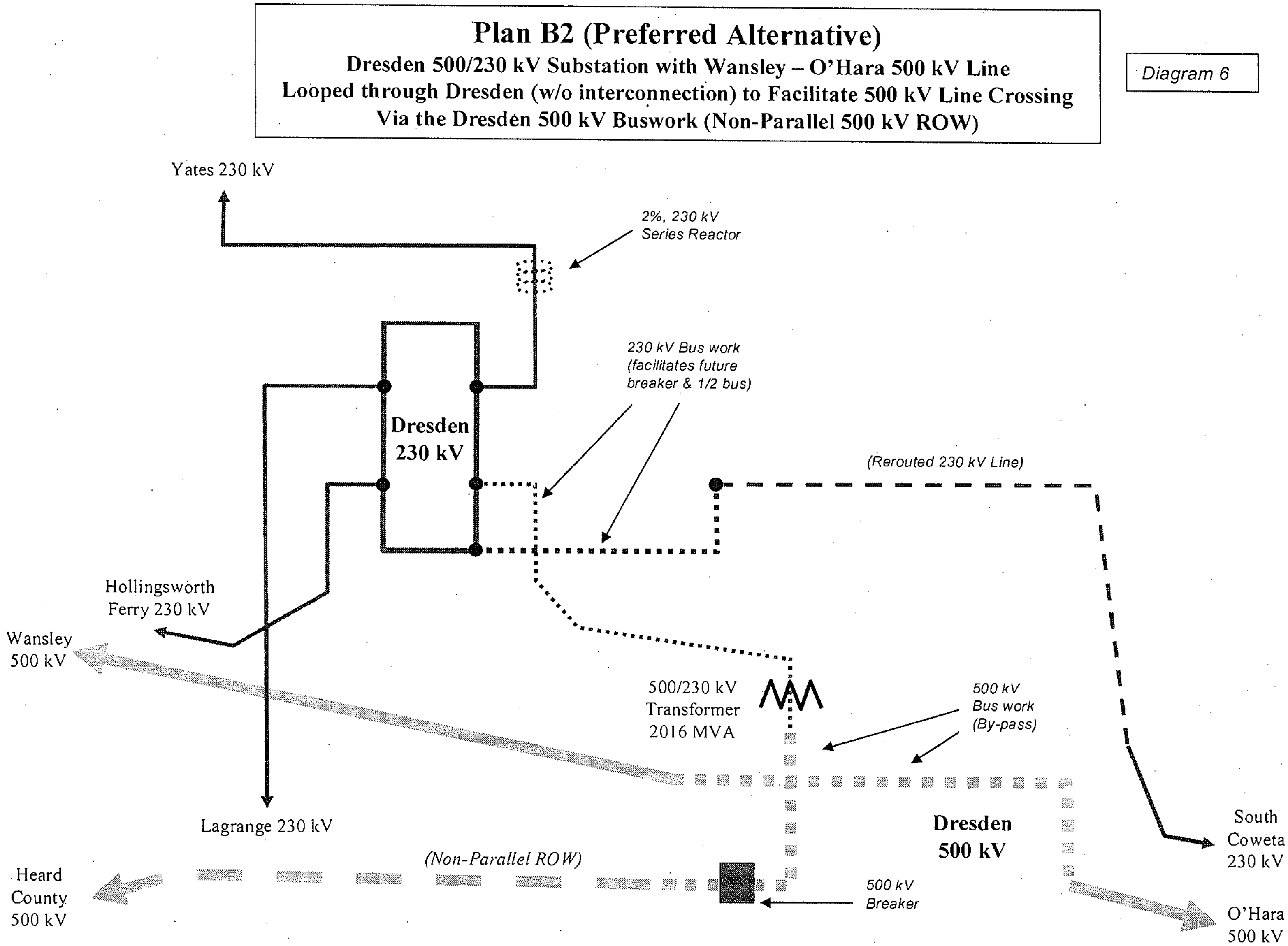
Plan B1

Dresden 500/230 kV Substation with Wansley – O'Hara 500 kV Line Looped through Dresden (w/o interconnection) to Facilitate 500 kV Line Crossing Via the Dresden 500 kV Buswork (Parallel 500 kV ROW)

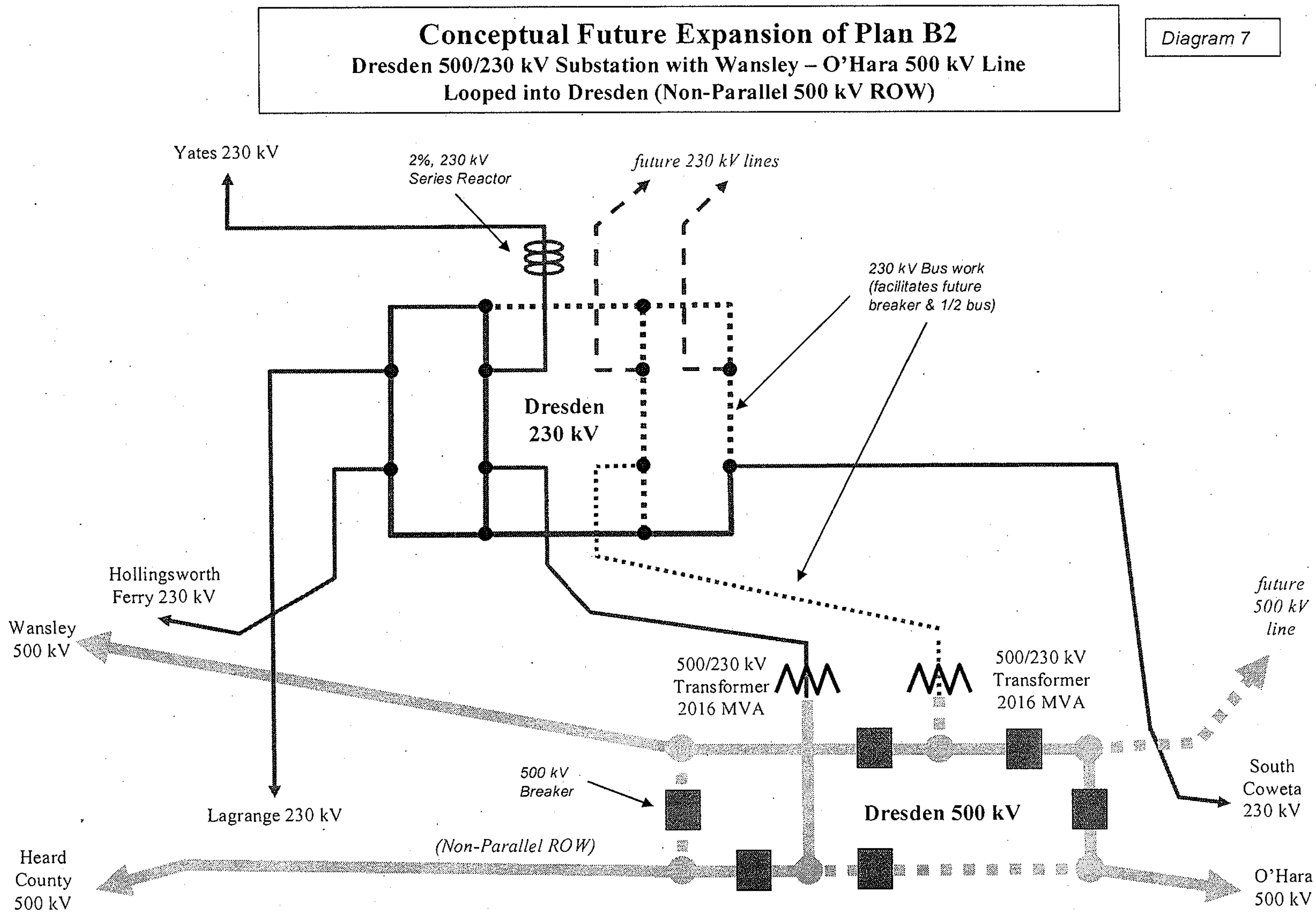
Diagram 5



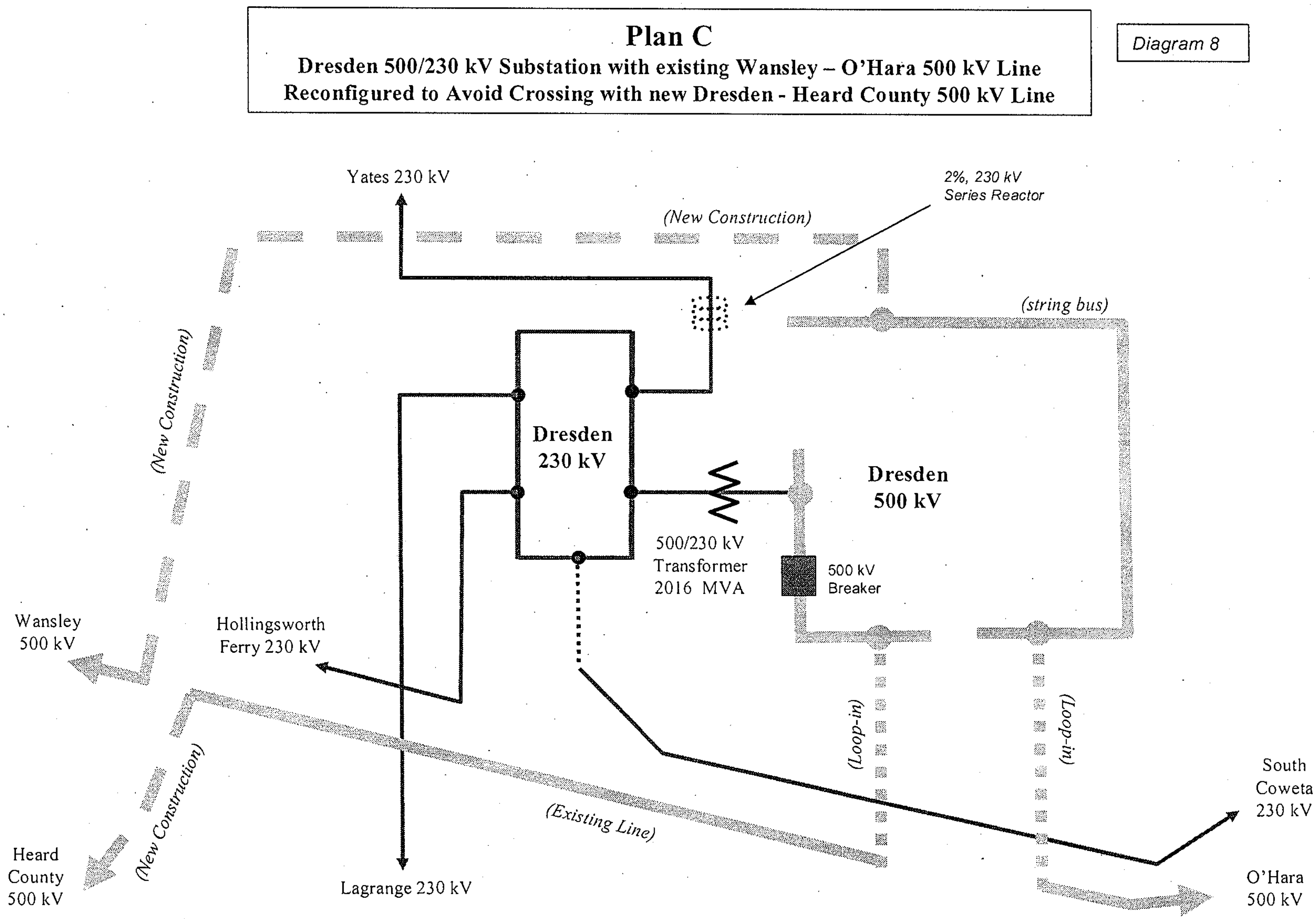
Wansley CC7 Transmission Improvements Plan



Wansley CC7 Transmission Improvements Plan



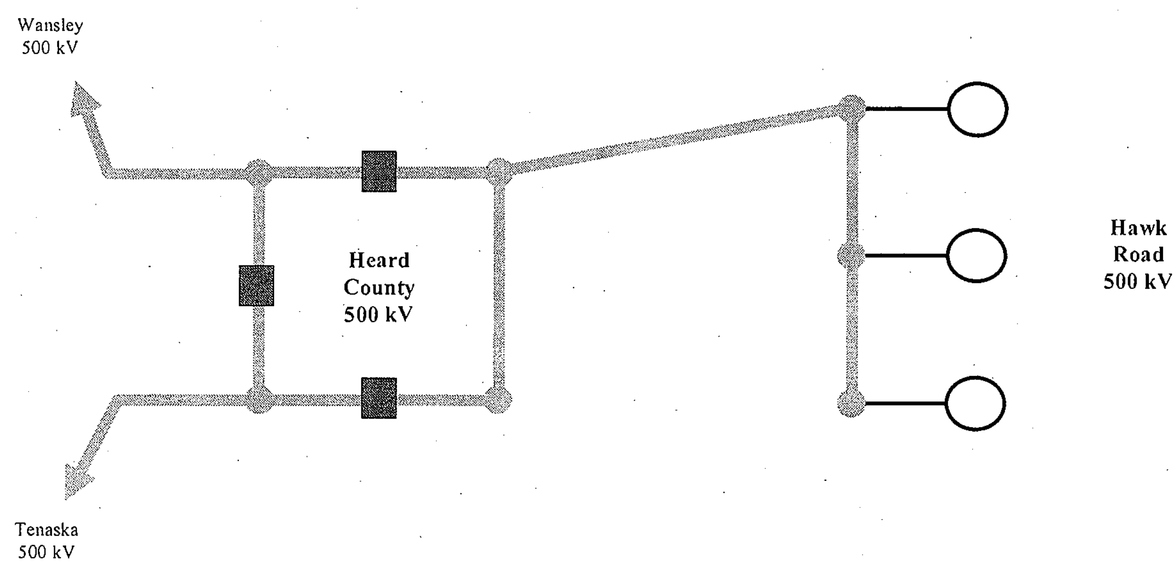
Wansley CC7 Transmission Improvements Plan



Wansley CC7 Transmission Improvements Plan

Existing Heard County and Hawk Road 500 kV Substations

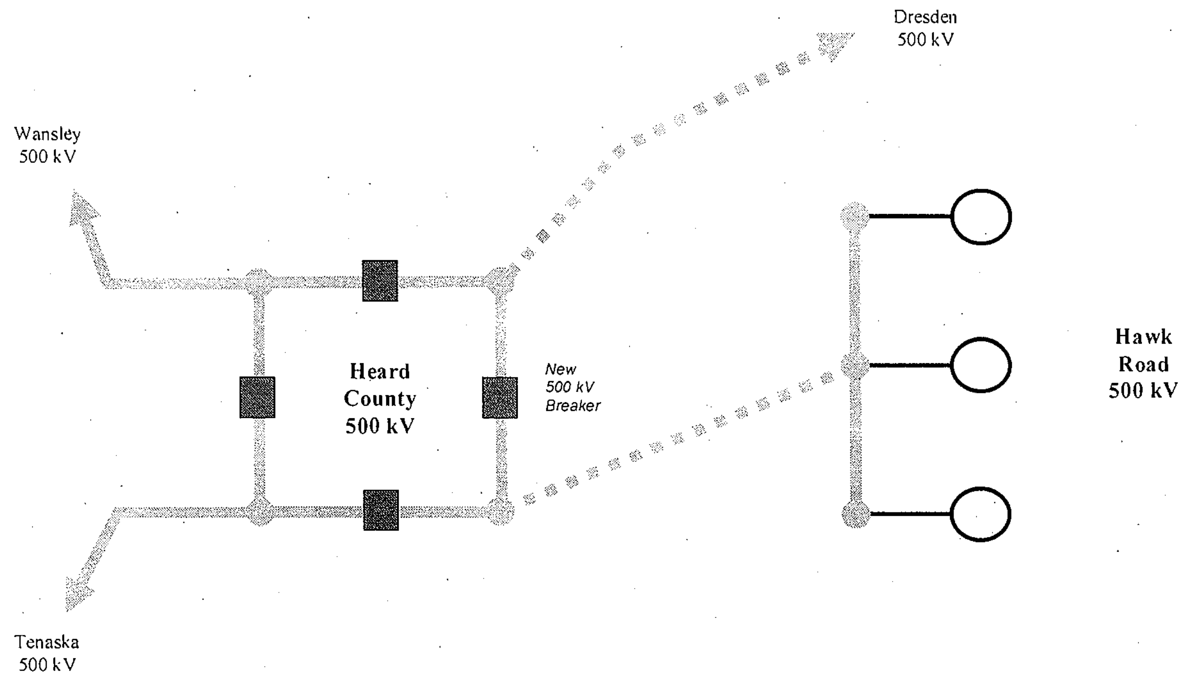
Diagram 9

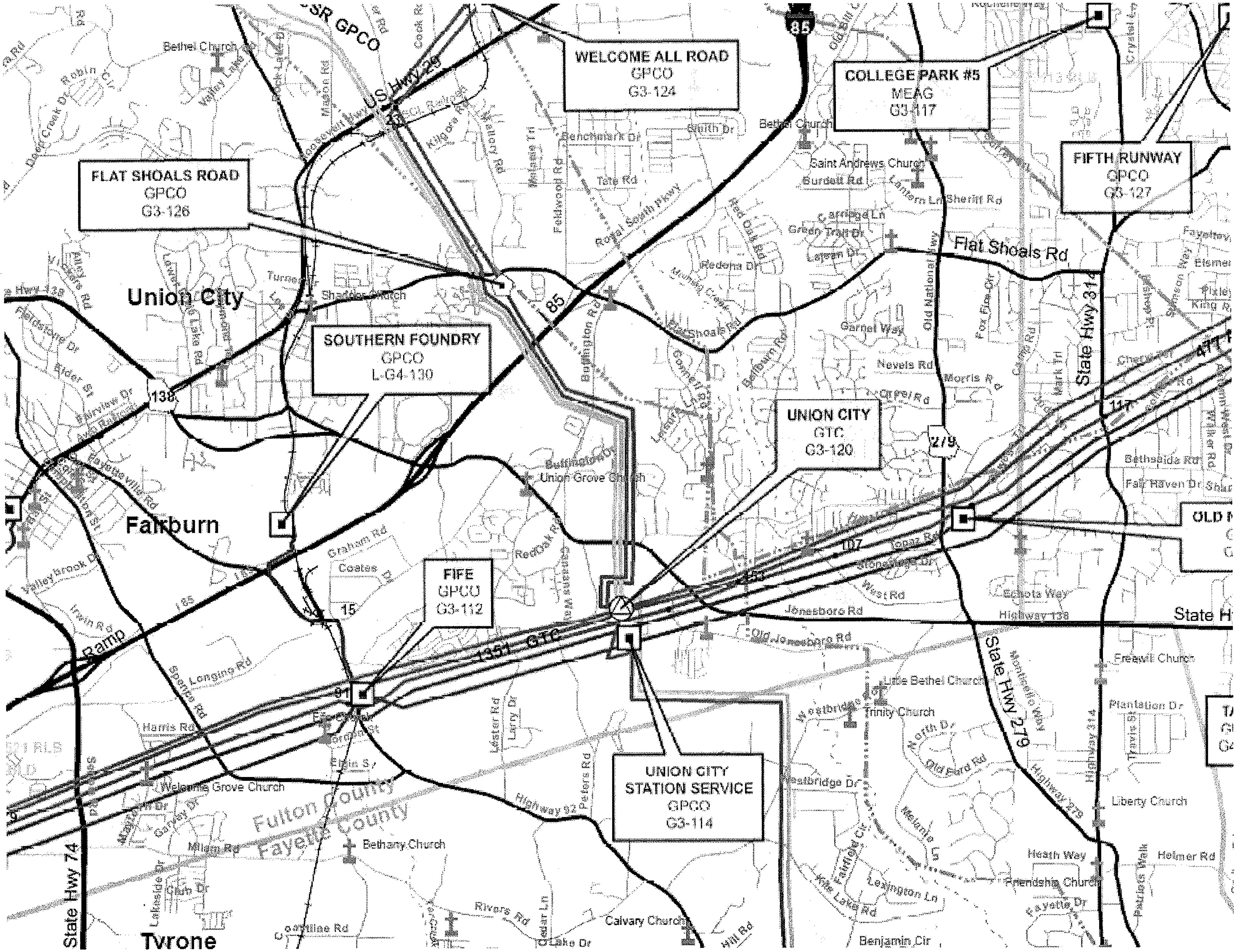


2014 Heard County and Hawk Road 500 kV Substations

Dresden – Heard County 500 kV Line terminated at existing "northeast" bay
Hawk Road 500 kV connection re-terminated at previously empty bay

Diagram 10

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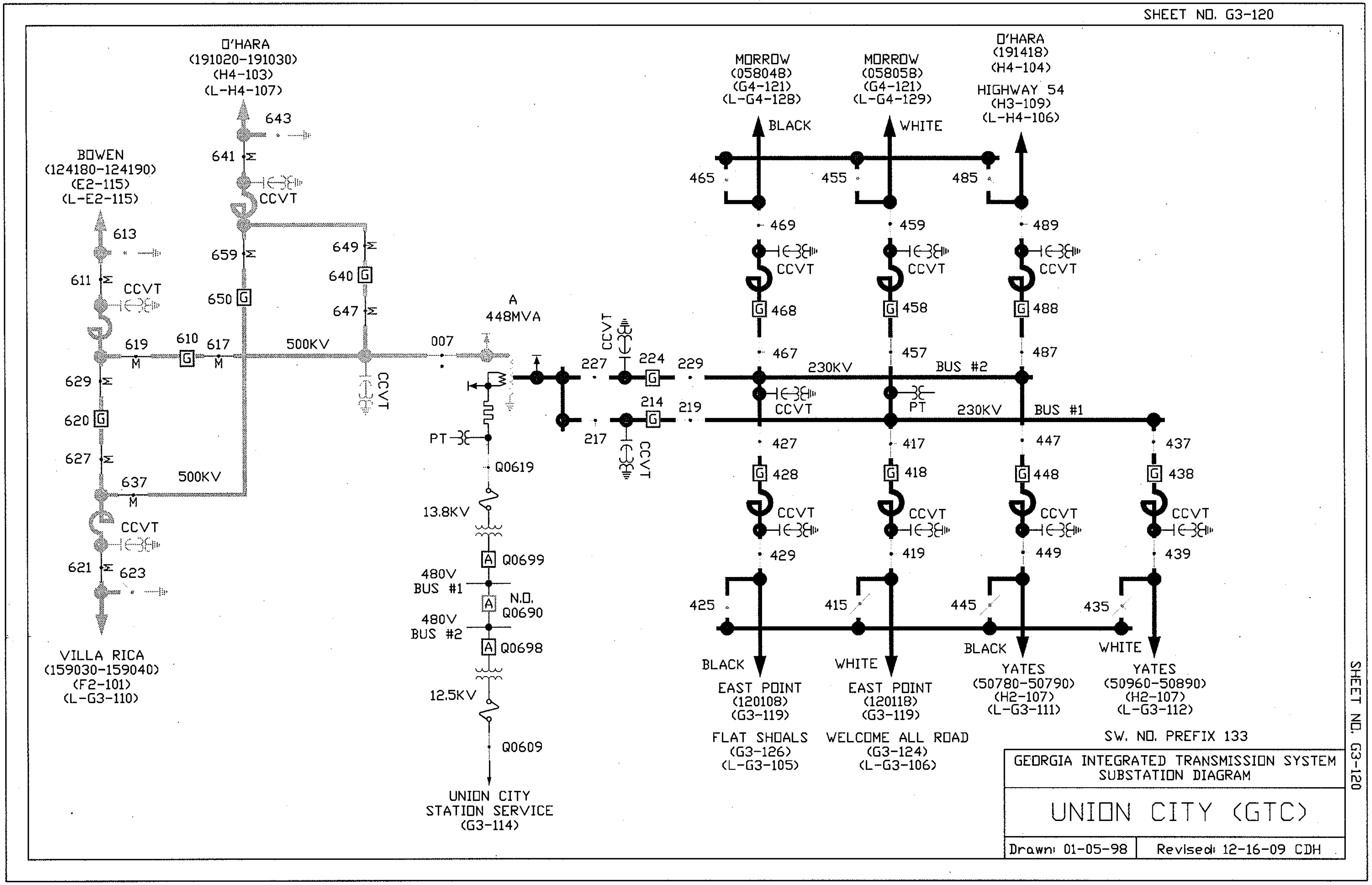
GPCO
G3-124
COLLEGE PARK #5
MEAG
G3-117
FLAT SHOALS ROAD
GPCO
G3-126
FIFTH RUNWAY
GPCO
G3-127
SOUTHERN FOUNDRY
GPCO
L-G4-130
UNION CITY
GTC
G3-120
FIFE
GPCO
G3-112
UNION CITY
STATION SERVICE
GPCO
G3-114
Union City
Fairburn
Tyrone
Fulton County
Fayette County
State Hwy 74
State Hwy 314
State Hwy 279
US Hwy 29
Flat Shoals Rd
1351 GTC
Old National Hwy
Highway 138
Jonesboro Rd
Highway 92
Highway 314
Highway 279
Bethel Church
Saint Andrews Church
Union Grove Church
Welcome Grove Church
Bethany Church
Calvary Church
Little Bethel Church
Trinity Church
Liberty Church
Friendship Church
Freewill Church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(H4-103)
(L-H4-107)
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(E2-115)
(L-E2-115)
MORROW
(058048)
(G4-121)
(L-G4-128)
MORROW
(058058)
(G4-121)
(L-G4-129)
O'HARA
(191418)
(H4-104)
HIGHWAY 54
(H3-109)
(L-H4-106)
BLACK
WHITE
643
641
CCVT
613
611
659
649
640
650
647
619
610
617
500KV
007
A
448MVA
629
620
627
637
M
500KV
621
623
227
224
229
217
214
219
PT
Q0619
13.8KV
Q0699
480V
BUS #1
N.O.
Q0690
480V
BUS #2
Q0698
12.5KV
Q0609
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455
485
469
459
489
468
458
488
467
457
487
230KV
BUS #2
230KV
BUS #1
427
417
447
437
428
418
448
438
429
419
449
439
425
415
445
435
VILLA RICA
(159030-159040)
(F2-101)
(L-G3-110)
UNION CITY
STATION SERVICE
(G3-114)
BLACK
EAST POINT
(120108)
(G3-119)
FLAT SHOALS
(G3-126)
(L-G3-105)
WHITE
EAST POINT
(120118)
(G3-119)
WELCOME ALL ROAD
(G3-124)
(L-G3-106)
BLACK
YATES
(50780-50790)
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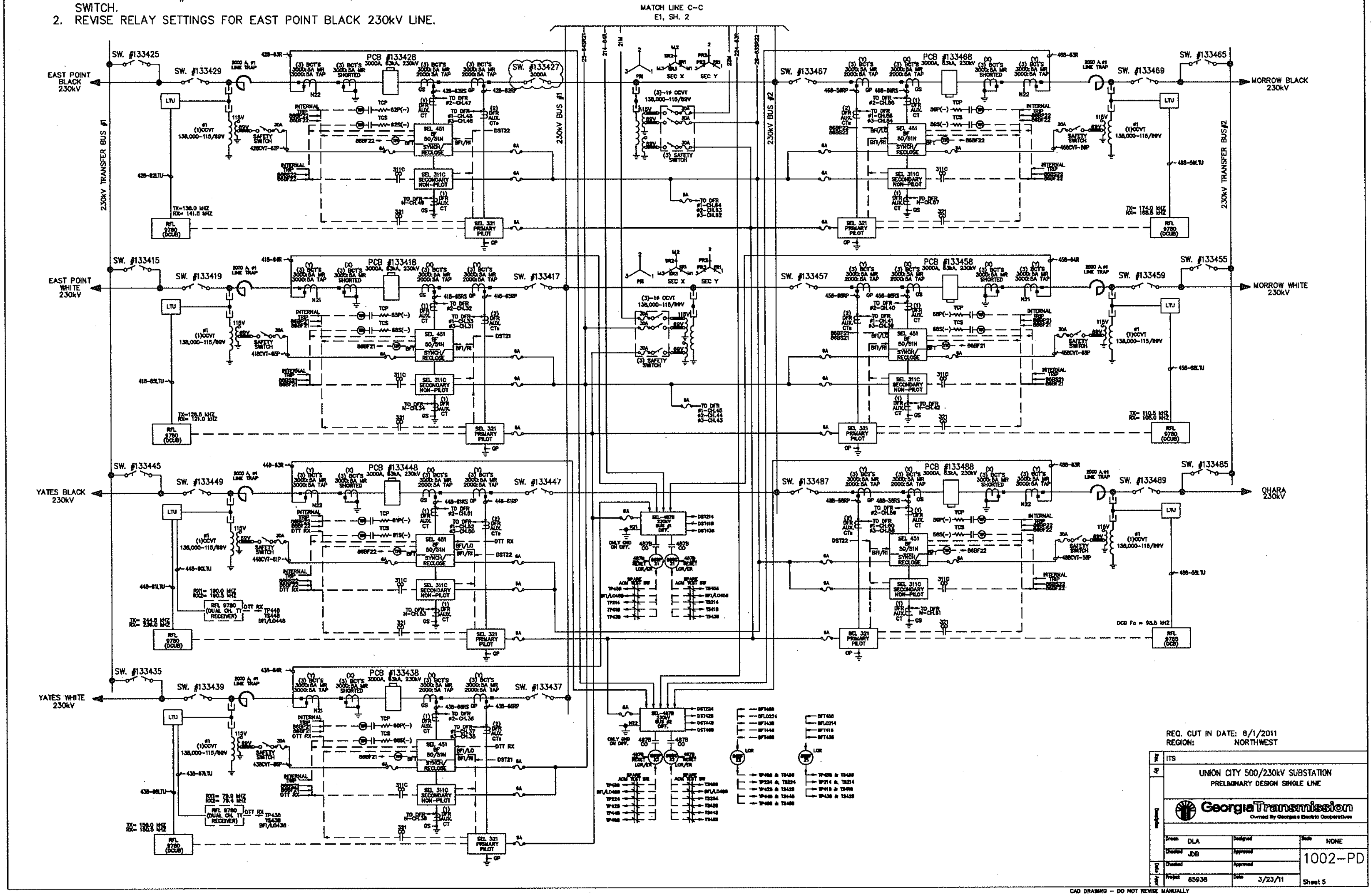
(L-G3-111)
WHITE
YATES
(50960-50890)
(H2-107)
(L-G3-112)
SW. NO. PREFIX 133
GEORGIA INTEGRATED TRANSMISSION SYSTEM
SUBSTATION DIAGRAM
UNION CITY (GTC)
Drawn: 01-05-98
Revised: 12-16-09 CDH
SHEET NO. G3-120

NOTES PER PROJECT #85938

1. REPLACE SWITCH #133427 WITH HIGHER RATED, 2000A SWITCH.
2. REVISE RELAY SETTINGS FOR EAST POINT BLACK 230kV LINE.



REQ. CUT IN DATE: 8/1/2011
REGION: NORTHWEST

UNION CITY 500/230kV SUBSTATION
PRELIMINARY DESIGN SINGLE LINE

Georgia Transmission

Drawn: DLA	Designed	Scale: NONE	
Checked: JDB	Approved	1002-PD	
Project: 85938	Date: 3/23/11	Sheet 5	

CAD DRAWING – DO NOT REVISE MANUALLY

Planning Grade Estimate
Project Planning Services

Project Name: Union City
Project Number: P85938
Description: Replace switch #133427

Estimate Number:

		General	Route/Site	Survey/ Platting	Pre- Construction	Land & Permit	Construction	Total
Direct Cost	EC 50 - Construction Contract Labor						$35,000	$35,000
	EC 64 - OFM						$17,000	$17,000
	EC 40 - Associate Wages	$4,464			$0	$0	$4,464	$8,928
	EC 54 - Contract Workers	$0					$0	$0
	EC 56 - Professional Services	$0					$0	$0
	EC 58 - Legal Services						$0	$0
	EC 60 - Land					$0	$0	$0
	EC 66 - Associate Expenditures	$0					$200	$200
	Total Direct Cost	**$4,464**	**$0**	**$0**	**$0**	**$0**	**$56,664**	**$61,128**
Indirect Cost								
	Overheads/Indirects 23% of direct costs	$14,059						$14,059
	Total Indirect Cost	**$14,059**	**$0**	**$0**	**$0**	**$0**	**$0**	**$14,059**
Total Project Cost:		**$18,523**	**$0**	**$0**	**$0**	**$0**	**$56,664**	**$75,187**
RTU							$0	**$0**
Facility Credit for removal of used materials:							$0	**$0**
Retirement							$0	**$0**
Net Change to Facility Investment:								**$75,187**

Note:
2010 labor rate: $43.34
2011 labor rate $44.64
2012 labor rate $45.98

GeorgiaTransmission

Georgia Transmission Corporation
2100 East Exchange Place
Tucker, GA 30084-5336
phone 770-270-7400
fax 770-270-7872

Memorandum

DATE: June 23, 2011

TO: See Attached List

FROM: Renée King RK

SUBJECT: Project Release

Northwest Region

85938 Union City (ITS) 500/230 kV S/S Switch Replacement

Southwest Region

86115 Dawson – Morgan (ITS) 46 kV T/L Fault Indicators Installation

RK

Attachments

County: FULTON

Printed on: 04/13/2011

Georgia Transmission Corporation
PROJECT RELEASE

Planning Contact : ZAKIA EL OMARI

Region: Northwest

Required Cut-In Date: 06/01/2011

Project Manager : GERALD (JERRY) LAWSON

GTC Projects:

P85938 Union City(I.T.S.) 500kV/230kV Substation

Approved by _______ **Date** 4-11-11

Approved by _______ **Date** 4/21/11

Approved by _______ **Date** 6/20/2011

Approved by _______ **Date** 6/20/11

Zakia EL OMARI 4/11/2011

Scopes:

P85938 Replace switch # 133427 with at least a 2000A capacity switch on the East Point 230 kV line (Black). The project, in conjunction with ITS approved line re-conductoring (GPC project ID 13594), is part of the East Point - Union City 230 kV line upgrade.

Justification: Granting the 575MW Transmission Service Request out of Wansley CC7 requires multiple improvement projects including re-conductoring the Union City -Flat Shoals section of the GPC owned Union City - East Point 230 kV line (Black). See attached justification. In order to accommodate the above mentioned project it is necessary to replace the switch # 133427 with at least a 2000 A capacity switch.

	Total Budget	Retirement	Reimbursement	Net Cost	DSF	NET ITS INV
P85938	$75,187			$75,187		$75,187
Totals:	$75,187			$75,187		$75,187

SUBSTATION PROJECT INFORMATION

Project Name: Union City Met Pt #: Description: General Substation Modification

Facility Owner:

Area Project:	Wansley CC 7 Improvements						
Op H S KV:	500kV	ITS Crit Proj:	Yes	Capacity Added:	0.00		
Op L S KV:	230kV	Split Bus:	No	Capacity Removed:	0.00	Pro Type:	NA
Land Req'd:	No	EMC Low Side:	No	Control House:	No	RTU:	No
Mobile Req'd:	No	Req'd ITS:		PCD Required:	No	PCD Date:	
Bypass Metering:	No	JSTP Submittal:	ITS Parity Only - Not Fixed Cost	JSTP Cost Type:	N/A		

Transformer ID	Action	Location	Amount

ITS Member Feeder Information

# of Feeders:	0	Regulator Size:	0
Overhd/Undergrd:	NA	Oper. Voltage:	NA

GeorgiaTransmission
An Electric Membership Corporation

Management Authorization to Proceed with Selected Project Activities

To: North Substation Project Team

Cc: "@Stopwork" Distribution List

From: Russ Schussler – Ext. 7565

Date: 3/24/2011

Facility Name: Union City 500/230 kV Substation

EMC and Metering Point Number: N/A

Project Number: P85938

Full Project Scope: Replace switch # 133427 with at least a 2000A capacity switch on the East Point 230 kV line (Black). The project, in conjunction with ITS approved line re-conductoring (GPC project ID 13594), is part of the East Point - Union City 230 kV line upgrade project. Scope includes equipment procurement, engineering/design, installation, commissioning and testing.

This document is to notify you that Management Authorization to Proceed has been granted for selected activities on the subject project. This authorization is limited to performance of the following project activities:

MAPSA Scope (i.e. Authorized Project Activities): All project activities.

Reason MAPSA is Needed: The replacement of the above mentioned switch at Union City 500/230 kV substation on the GPC owned East Point 230 kV line (Black) is needed to address system limitations identified in the Wansley CC 7 System Impact Study. The switch must be ordered and installed prior to 6/1/2011.

Consequences of No Action: Transmission Service out of Wansley CC 7 could be curtailed if the switch is not replaced.

Risk to Corporation:

- Financial: GTC will have $75K of financial investment without ITS approval
- Period of Risk: The period of risk is from the MAPSA issuance to the project release and approval by the JSTP. The project release is in progress and will be submitted to the TPWG and the JSTP prior to June 2011.
- JSTP Approval Probability: The project has a very high probability of being accepted by the ITS members. GPC's project consisting of reconductoring

East Point - Union City 230 kV line (Black) has already been approved by the ITS (project ID 13594).

Comments:

- **History/Context:** Wansley CC 7 identified the GPC owned East Point - Union City 230 kV line (Black) as a limiting facility and recommended re-conductoring the line. The project submitted by GPC (project ID 13594) was approved by the ITS. Given that re-conductoring of the East Point - Union City 230 kV line (Black) is expected to be achieved by June 2011; this project needs to be completed by the same date.
- **Future/Other:** N/A

Record Center: -25.3

Transmission Improvements Plan for 575 MW Network Service Request Wansley CC 7 Generation Facility (OASIS # 143556)

Georgia Transmission Corporation

November 11, 2010

Wansley CC7 Transmission Improvements Plan

PROBLEM STATEMENT

A System Impact Study (SIS) was conducted by the Georgia Transmission Corporation to determine the impact to the Integrated Transmission System (ITS) of granting 575 MW of firm transmission service out of the existing Wansley CC 7 combined-cycle (CC) site in Heard County, GA (OASIS # 143556). The firm 575 MW transmission service request (TSR) was requested for the period 01/01/2010 – 01/01/2020.

Beginning in 2010, the Villa Rica 500/230 kV Transformer can exceed its thermal capacity for the loss of the Villa Rica – Union City 500 kV Line. Also, the Villa Rica – Wansley 500 kV line loads to 100 % of its thermal capacity for the loss of O'Hara – Wansley 500 kV line. Additionally, the Union City - Flat Shoals section of the Union City – East Point 230 kV line (Black) and the Morrow - Murray Lake Junction – Fort Gillem sections of the Grady – Morrow 115 kV line (Black) can exceed their respective thermal capacities under contingency situations. Beginning in 2014, O'Hara – Wansley 500 kV Line may reach 99 % of its thermal capacity for the loss of Villa Rica – Wansley 500 kV Line. The Wansley CC 7 generation is a contributing factor to these loadings.

As no improvements can be implemented in 2010 to address the above limitations, firm service would be limited to 344 MW in 2010. Several major transmission improvements will be required beginning in 2011 to grant full service for the Wansley CC7 generation facility through the requested period. This request was confirmed on May 12, 2010 pending completion of required transmission improvements.

STUDY RESULTS

Villa Rica Related Improvements (2011)

To address the near-term issues, the Wansley CC7 System Impact Study report (3/18/2010) proposed the addition of two 2%, 2000 A, 230 kV series reactors in parallel (equivalent 1%, 4000 A) on the low-side of the existing Villa Rica 500/230 kV transformer (see Diagram 1). While this improvement will alleviate the potential overloads of the Villa Rica 500/230 kV transformer and the Wansley – Villa Rica 500 kV line, it will further increase overloads of the Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) and the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black). The overall plan includes upgrades of these two lines.

Note that Wansley CC7 System Impact Study report identified the above limitations and required transmission improvements as 2012 issues. However, subsequent to the finalization of the report, Georgia Power announced that planned modifications to the existing McDonough generation facility (retirements and additions) will be delayed by one year (from 2011 to 2012). Accordingly, additional analysis indicates that a one year delay in the McDonough generation modifications would result in a one year advancement of the limitations and required transmission improvements (as identified in the Wansley CC7 System Impact Study report) from 2012 to 2011.

<u>Dresden 500/230 kV Improvements (2014)</u>

To address the longer-term issues, the Wansley CC7 System Impact Study report proposed expansion of the existing Dresden 230 kV switching station (see Diagram 3) for 500 kV to accommodate installation of a new 500/230 kV transformer and termination of a new 500 kV line from the Heard County area (see Diagram 2). Note that the Wansley CC7 System Impact Study report recommended a Dresden to Tenaska 500 kV line. However, termination of the Dresden 500 kV line at the Heard County 500 kV Switching Station would result in a cost savings of about $5,000,000. With the completion of the Dresden 500/230 kV project in 2014, the 230 kV series reactors will no longer be needed at Villa Rica.

While the Dresden 500/230 kV project will negate the need for the two proposed Villa Rica 230 kV series reactors beginning in 2014, it also creates a potential overload of the Dresden – Yates 230 kV line beginning in 2014. Therefore, one of the Villa Rica 230 kV series reactors can be moved to Dresden on the Yates 230 kV line in 2014 to address this new overload. Moving one of the 230 kV series reactors to Dresden (on the Yates 230 kV line) also mitigates potential overloads of the Yates – Union City 230 kV line (23 miles) in 2014. The other Villa Rica series reactor could be reused for a future project or as a spare.

<u>Dresden 500 kV Termination Issues</u>

Preliminary routing analysis of the proposed Dresden - Heard County 500 kV line identified that this new line would have to cross the existing Wansley – O'Hara 500 kV and the Dresden – Hollingsworth Ferry 230 kV lines at the same point (see Plan A of Diagram 4). This crossing would create an unacceptable operational issue because a single contingency could result in the simultaneous outage of all three lines. Therefore, alternative methods for routing and terminating the Heard County 500 kV line at Dresden have been evaluated.

Plan B1 (Diagram 5) and Plan B2 (Diagram 6) permit a "crossing" of the existing Wansley – O'Hara 500 kV line and the proposed Dresden - Heard County 500 kV line to occur via bus work within the Dresden 500 kV switchyard. Plan C (Diagram 8), would completely avoid a crossing of the existing Wansley – O'Hara 500 kV line and the proposed Dresden - Heard County 500 kV line by breaking and rerouting the existing Wansley – O'Hara 500 kV line (increases new 500 kV line length by 1 mile). A section of the existing Wansley – O'Hara 500 kV line could then be utilized to terminate the proposed Heard County 500 kV line at Dresden.

Note that for Plans B1, B2 and C, initially the new Dresden - Heard County 500 kV line and the existing Wansley – O'Hara 500 kV line would not interconnect at the Dresden site (a by-pass would be created via 500 kV bus work).

Plan B1 (Diagram 5) and Plan C (Diagram 8) only utilize the north end of the existing Dresden substation property and require additional property acquisition to expand the substation to the east. Plan B1 has a greater risk of simultaneous outages of Dresden 500 kV lines due to shared ROW.

While Plans B1, B2 and C are comparable in electrical performance and costs, Plan B2 is the preferred method for terminating the proposed Heard County 500 kV line at Dresden. Plan B requires less 500 kV line mileage (initially and in future), has the best utilization of the existing Dresden property and has the most flexibility for future expansion of the Dresden substation. A conceptual future build-out of Plan B2 is shown in Diagram 7.

Heard County and Hawk Road 500 kV Improvements (2014)

As previously stated, the Wansley CC7 System Impact Study report recommended a Dresden to Tenaska 500 kV line. While termination of the Dresden 500 kV line at the Heard County 500 kV Switching Station results in a cost savings of about $5,000,000, there are minor modifications required at the Heard County and Hawk Road 500 kV sites.

The preferred route for the new Dresden – Heard County 500 kV line requires the line to be terminated at the existing (occupied) bay in northeast corner of the Heard County 500 kV Switching Station. Presently the 500 kV line from the Hawk Road 500 kV collector bus is terminated at that position. Therefore, the empty 500 kV bay at Heard County will be built-out and the 500 kV line to the Hawk Road 500 kV collector bus will be re-terminated there. This will also require the existing 500 kV line termination equipment on the Hawk Road 500 kV collector bus to be transferred to an existing empty bay at Hawk Road in order to re-terminate the "collector bus" line to Heard County (see Diagram 10).

RECOMMENDATION

The following is a summary of the near-term and longer-term improvements **(~$60 M)** that will be required to support the Wansley #7 TSR:

2010: Operating Procedure *(reduce Wansley CC 7 generation as necessary)*

2011: Install two 2%, 2000 A, 230 kV series reactors in parallel on the Villa Rica 500/230 kV transformer (equivalent 1%, 4000 A; see Diagram 1)

2011: Reconductor Union City - Flat Shoals section (3.1 miles) of the Union City – East Point 230 kV line (Black) with 1351 ACSS conductor

2011: Reconductor the Morrow - Murray Lake Junction – Fort Gillem sections (3.3 miles) of the Grady – Morrow 115 kV line (Black) with at least 636 ASCR conductor

2012: *(No improvements)*

2013: *(No improvements)*

2014: Construct Dresden - Heard County 500 kV line (~8 miles)

2014: Create a by-pass for the existing Wansley – O'Hara 500 kV line through the Dresden site (via bus work) to avoid crossing of the 500 kV lines (see Plan B2 of Diagram 6)

2014: Build out empty bay at Heard County 500 kV substation and re-terminate 500 kV "collector bus" line from Hawk Road 500 kV substation (see Diagram 10)

2014: Terminate the new Dresden 500 kV line at the existing (occupied) bay in northeast corner of the Heard County 500 kV Switching Station (see Diagram 10)

2014: Transfer the existing termination equipment on the Hawk Road 500 kV collector bus to an existing empty bay at Hawk Road in order to re-terminate the "collector bus" line to Heard County (see Diagram 10)

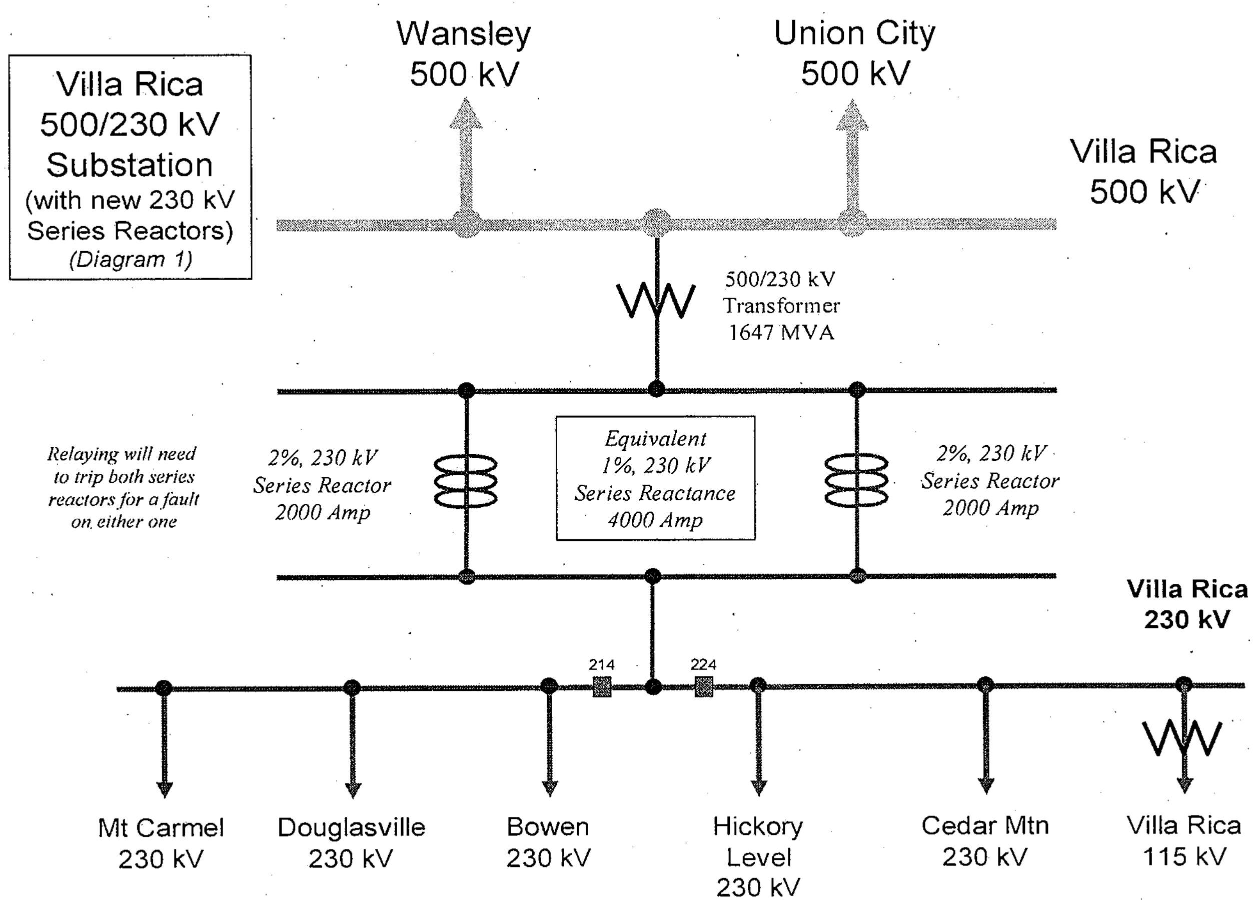
2014: Expand Dresden substation for 500 kV and terminate 500 kV line (see Diagram 6)

2014: Install a 2016 MVA, 500/230 kV transformer at Dresden

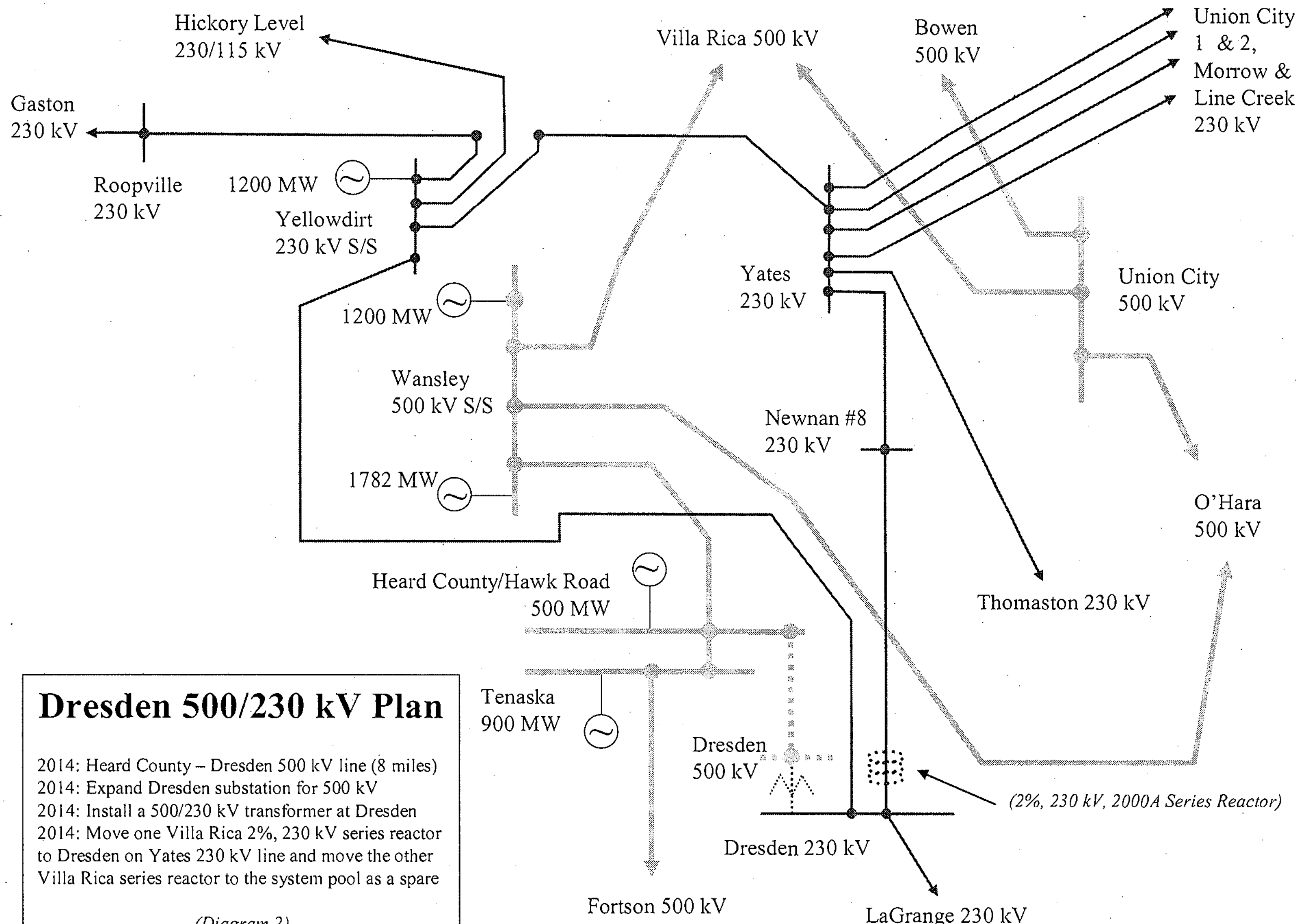
2014: Move one Villa Rica 230 kV series reactor to Dresden on Yates 230 kV line

2014: Remove and reuse second Villa Rica 230 kV series reactor for a future project or as a system spare

Wansley CC7 Transmission Improvements Plan



Wansley CC7 Transmission Improvements Plan



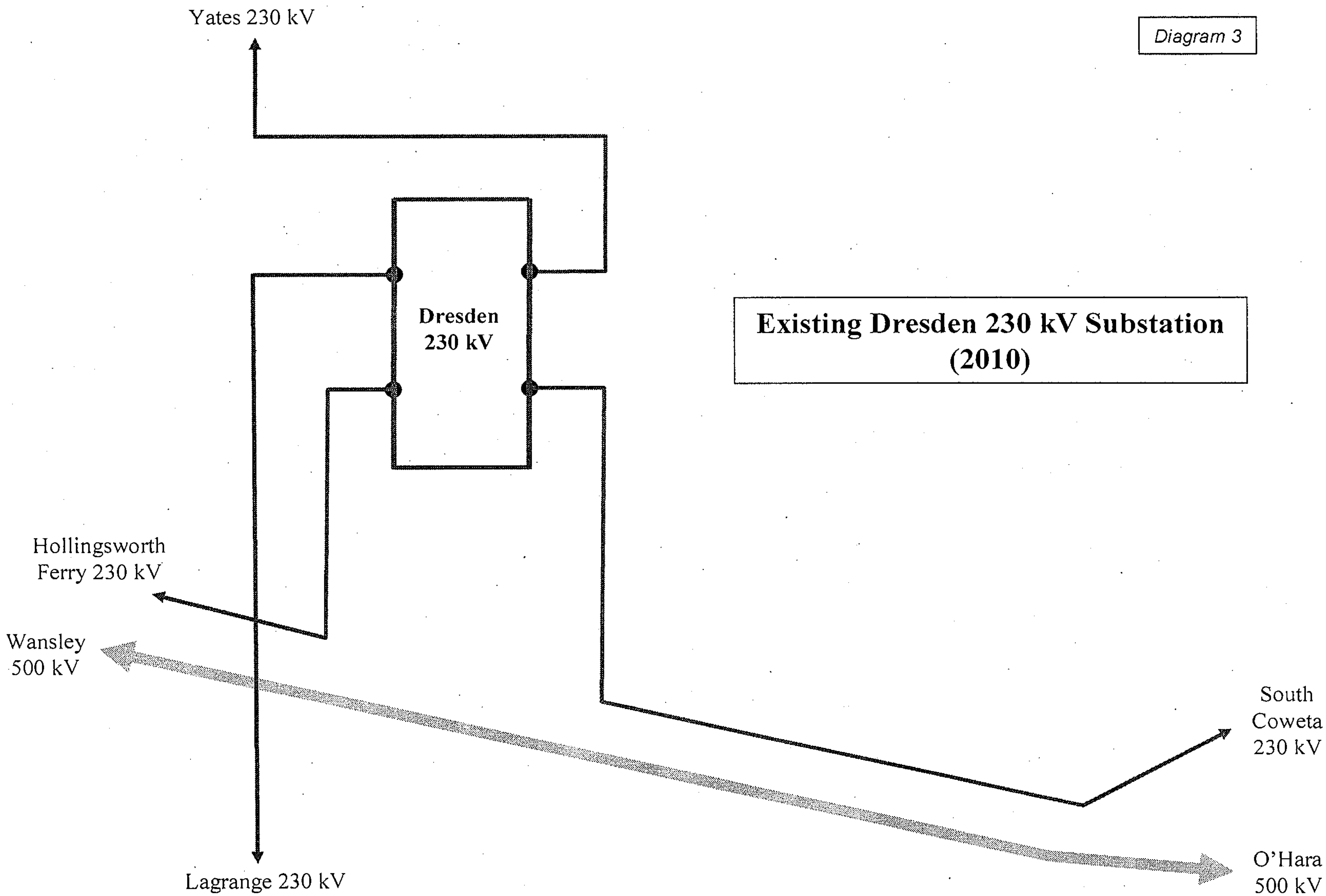
Dresden 500/230 kV Plan

2014: Heard County – Dresden 500 kV line (8 miles)
2014: Expand Dresden substation for 500 kV
2014: Install a 500/230 kV transformer at Dresden
2014: Move one Villa Rica 2%, 230 kV series reactor to Dresden on Yates 230 kV line and move the other Villa Rica series reactor to the system pool as a spare

(Diagram 2)

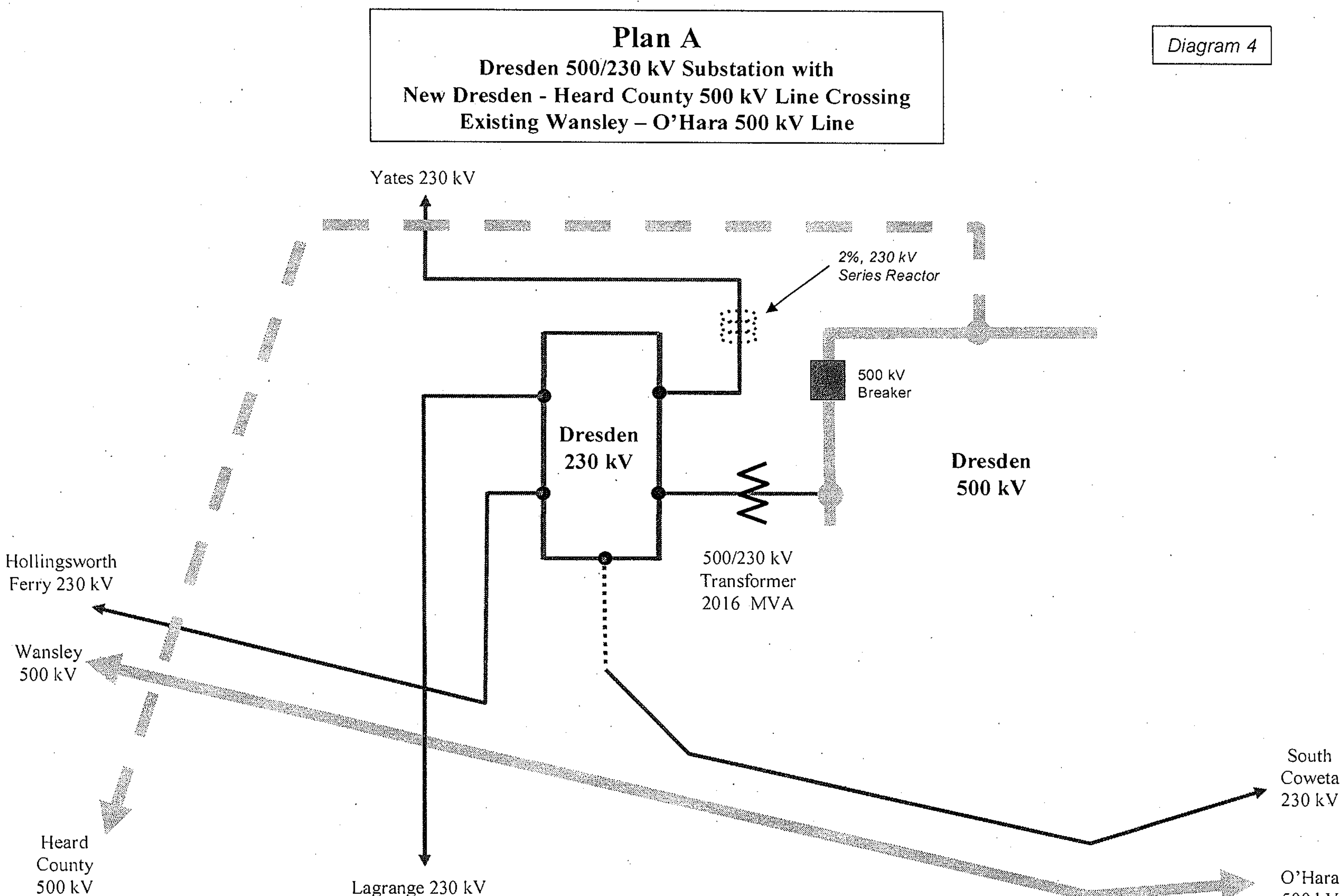
Wansley CC7 Transmission Improvements Plan

Diagram 3



Existing Dresden 230 kV Substation (2010)

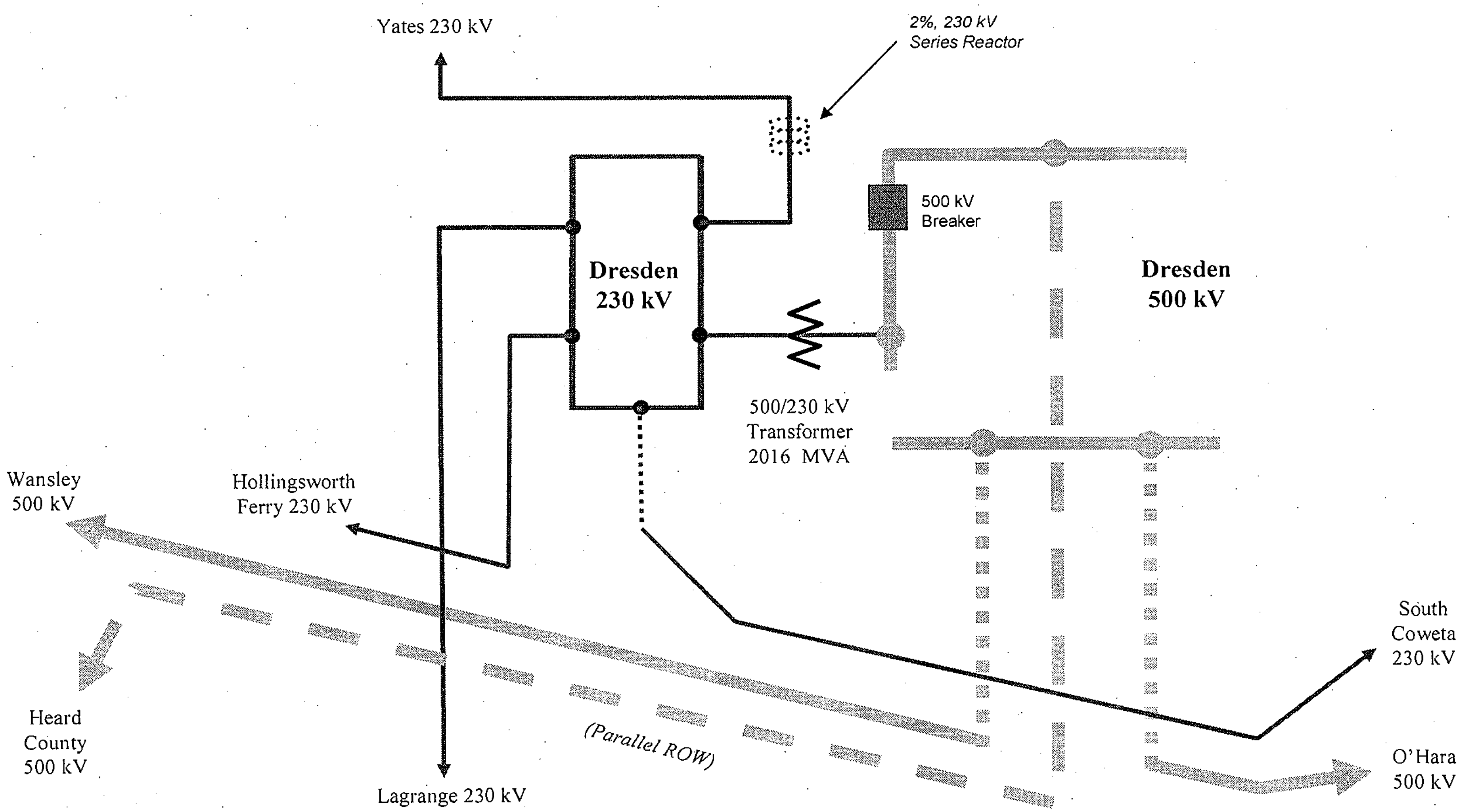
Wansley CC7 Transmission Improvements Plan



Wansley CC7 Transmission Improvements Plan

Plan B1
Dresden 500/230 kV Substation with Wansley – O'Hara 500 kV Line Looped through Dresden (w/o interconnection) to Facilitate 500 kV Line Crossing Via the Dresden 500 kV Buswork (Parallel 500 kV ROW)

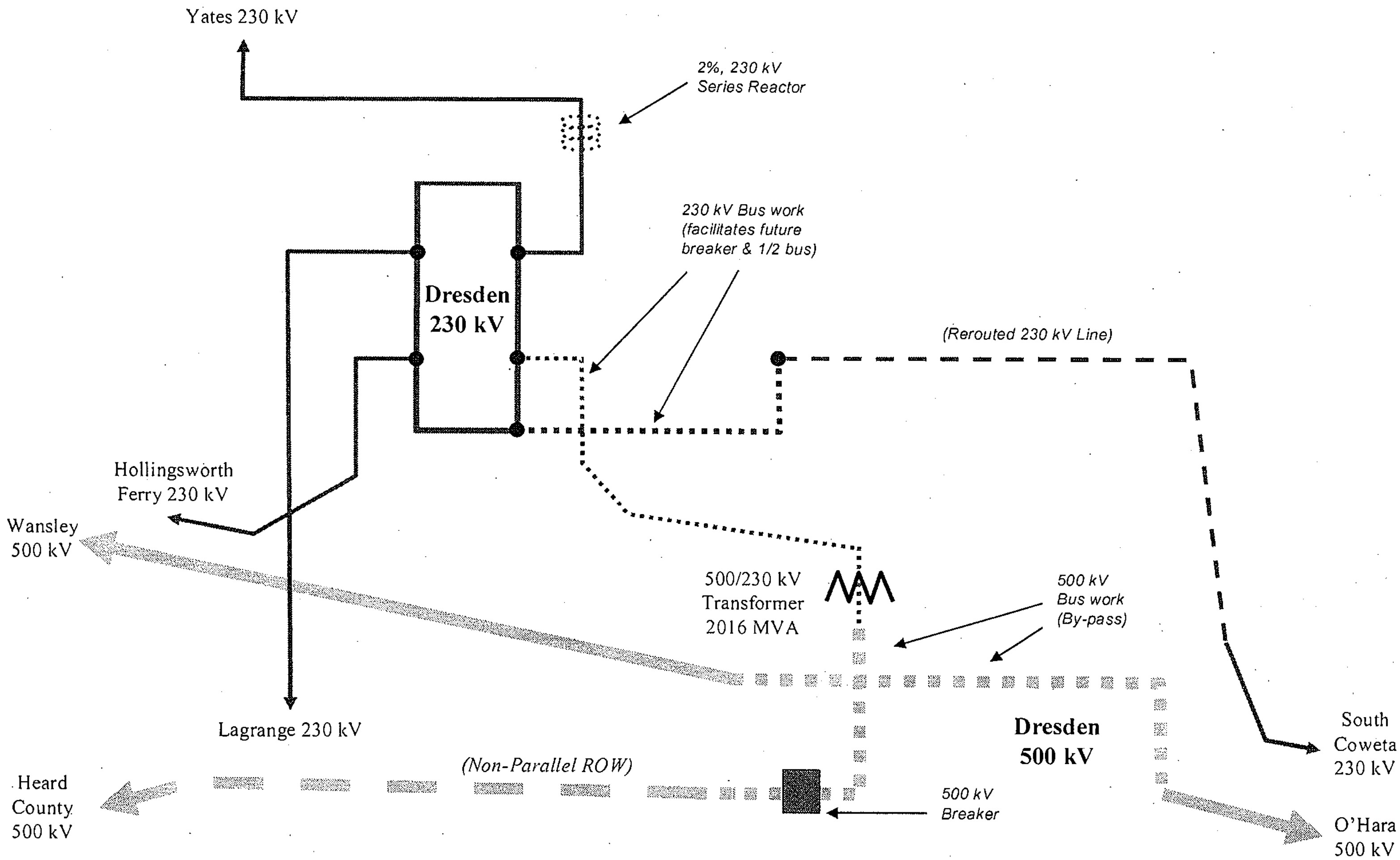
Diagram 5



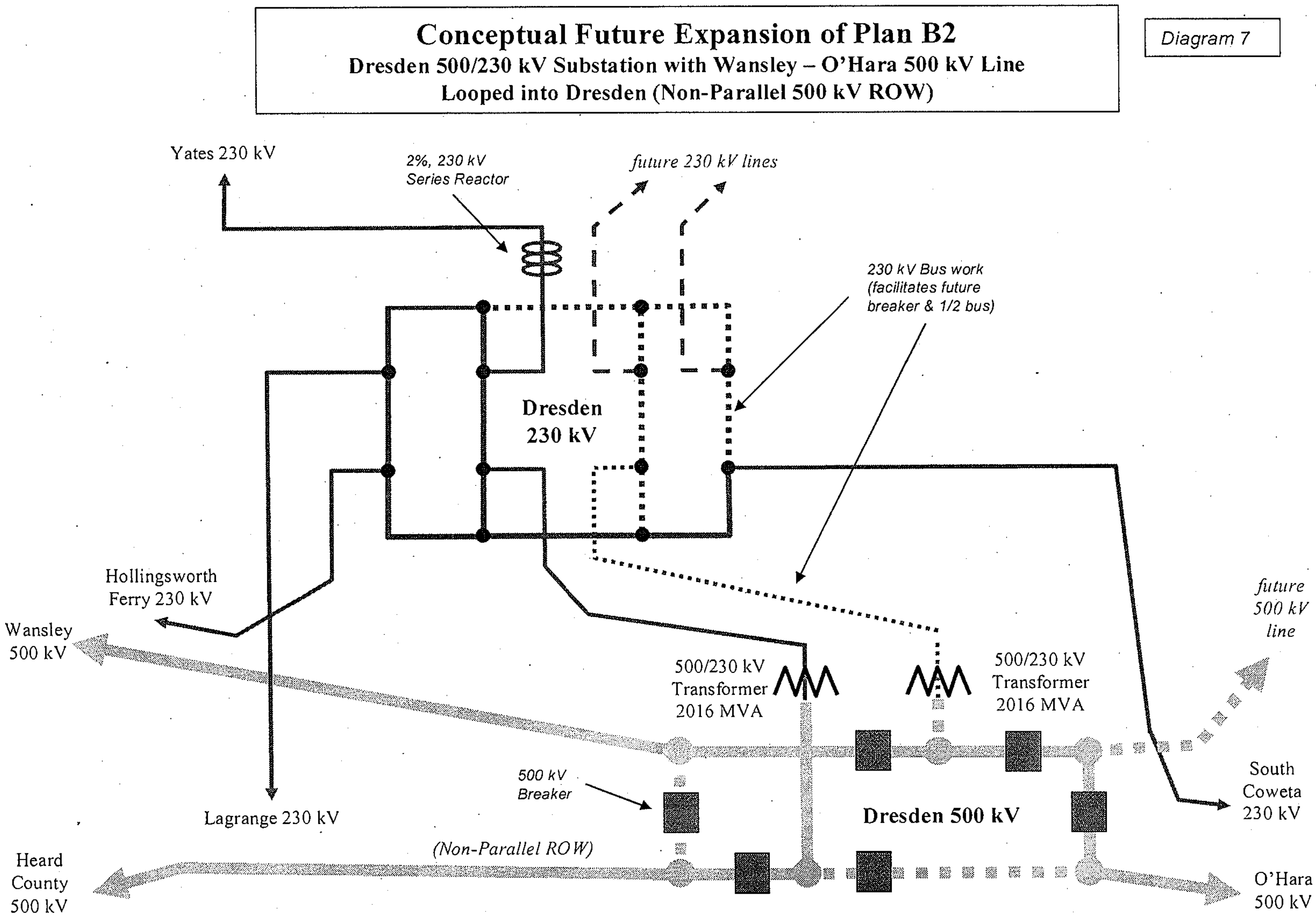
Wansley CC7 Transmission Improvements Plan

Plan B2 (Preferred Alternative)
Dresden 500/230 kV Substation with Wansley – O'Hara 500 kV Line Looped through Dresden (w/o interconnection) to Facilitate 500 kV Line Crossing Via the Dresden 500 kV Buswork (Non-Parallel 500 kV ROW)

Diagram 6



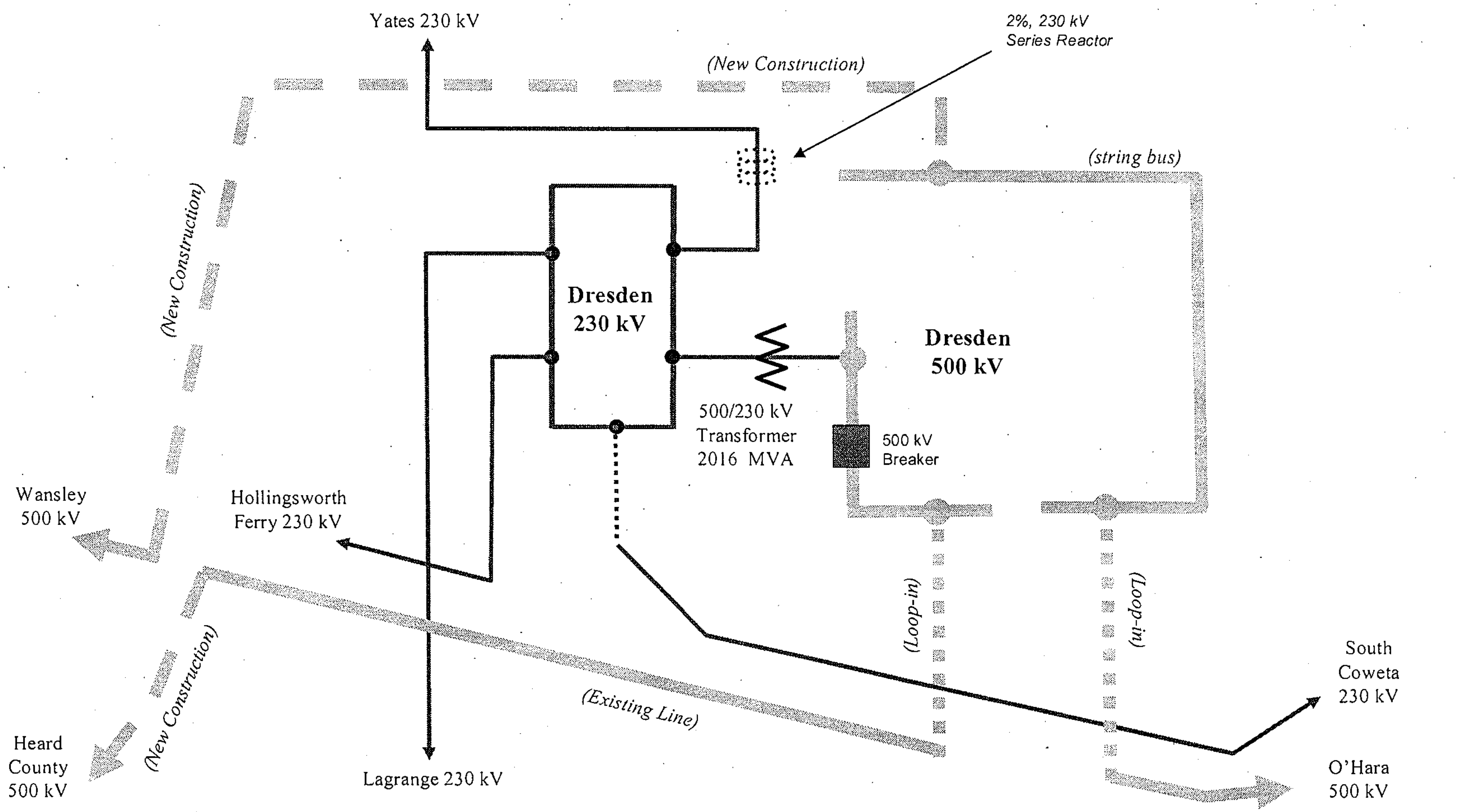
Wansley CC7 Transmission Improvements Plan



Wansley CC7 Transmission Improvements Plan

Plan C
Dresden 500/230 kV Substation with existing Wansley – O'Hara 500 kV Line Reconfigured to Avoid Crossing with new Dresden - Heard County 500 kV Line

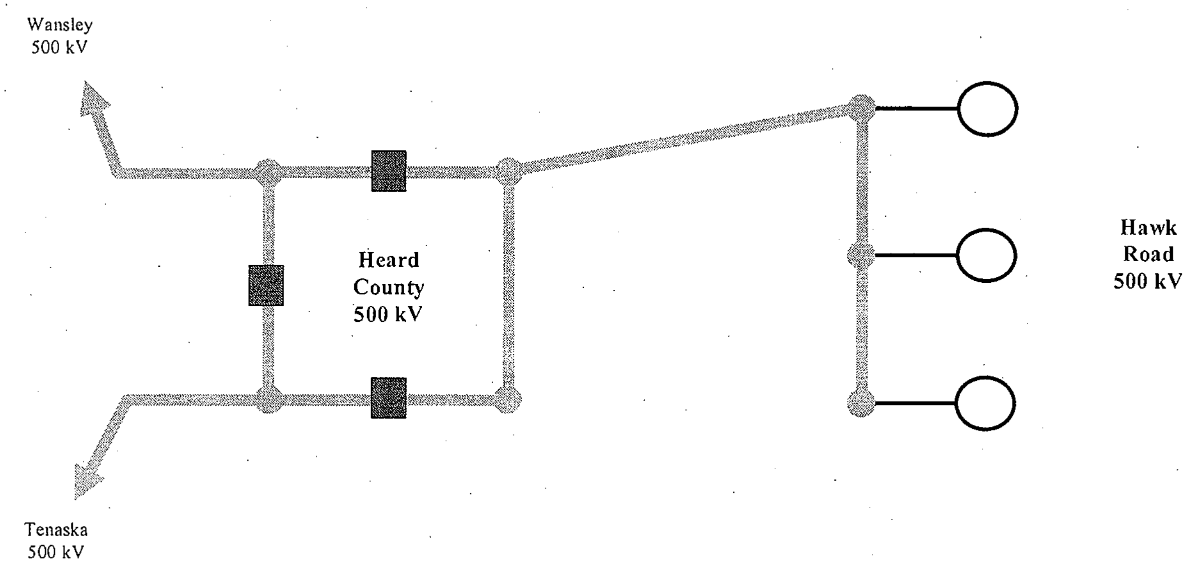
Diagram 8



Wansley CC7 Transmission Improvements Plan

Existing Heard County and Hawk Road 500 kV Substations

Diagram 9

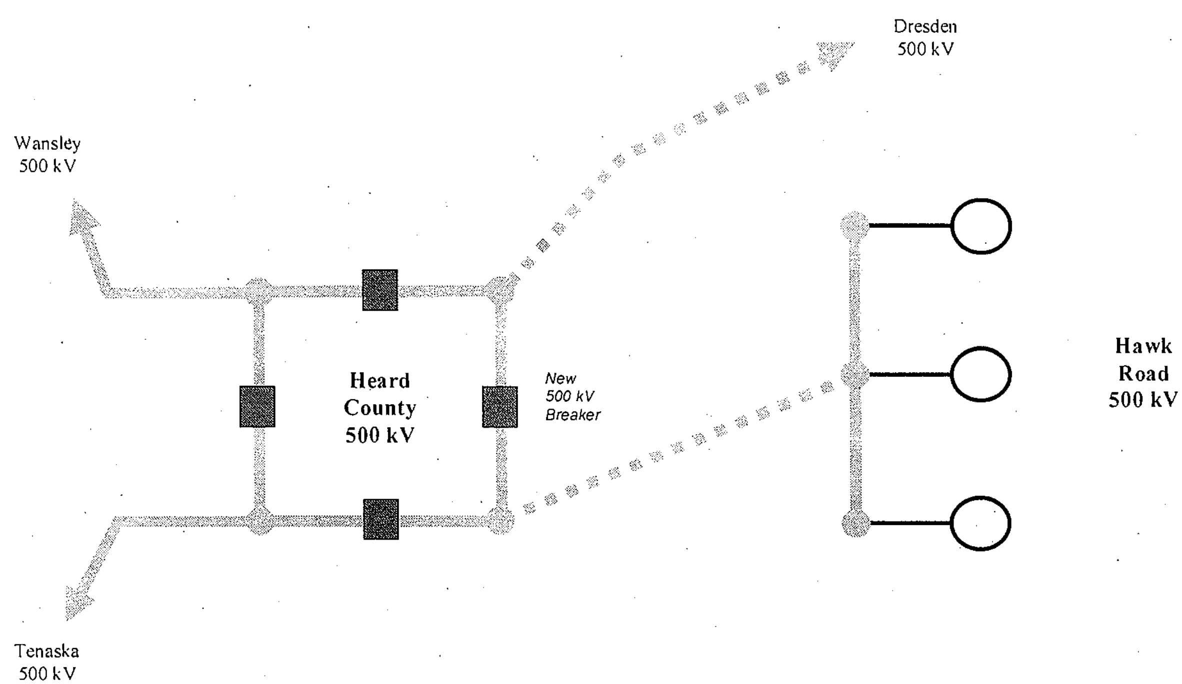


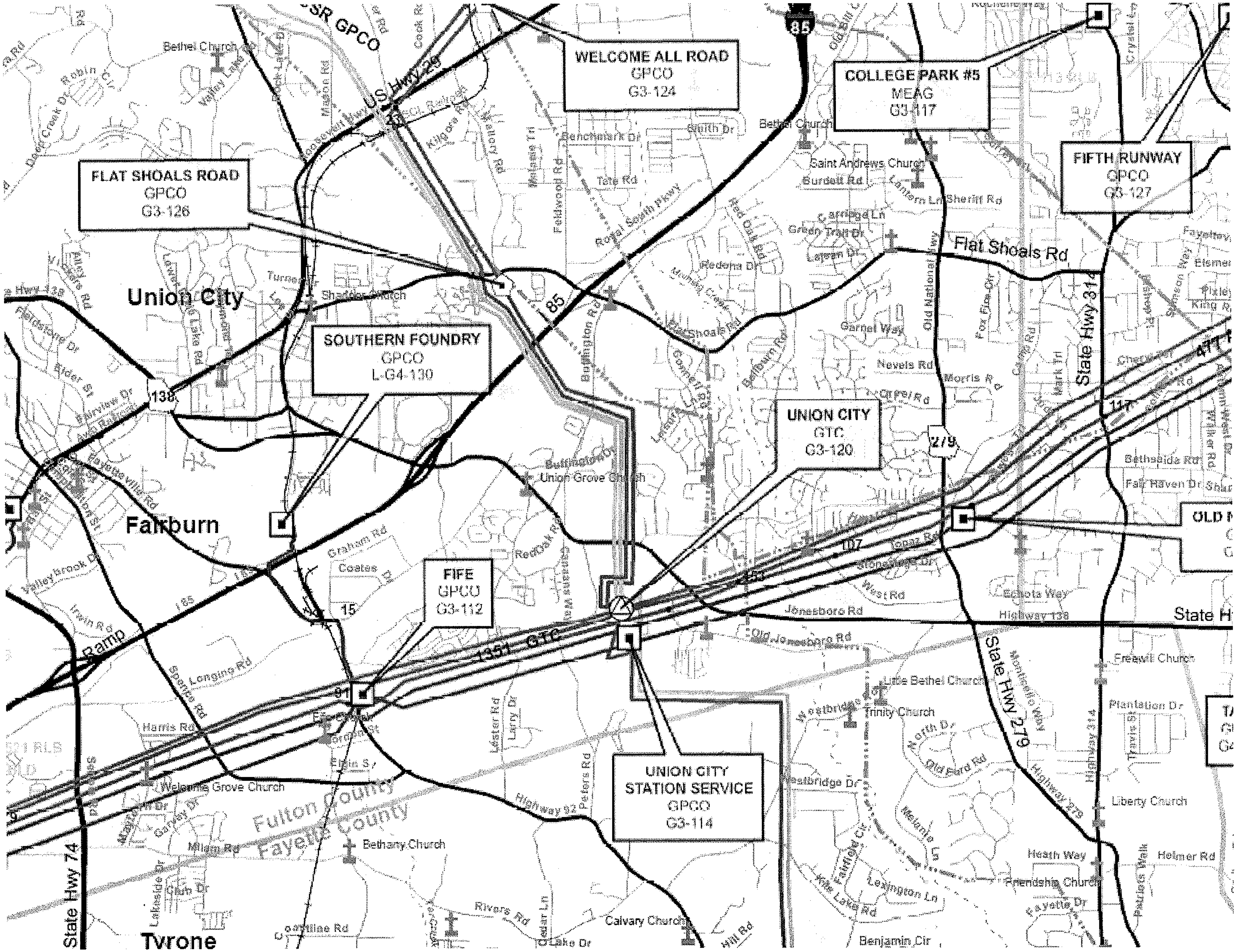
Wansley CC7 Transmission Improvements Plan

2014 Heard County and Hawk Road 500 kV Substations

Dresden – Heard County 500 kV Line terminated at existing "northeast" bay
Hawk Road 500 kV connection re-terminated at previously empty bay

Diagram 10





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FIFE
GPCO
G3-112
UNION CITY
STATION SERVICE
GPCO
G3-114
Union City
Fairburn
Tyrone
Fulton County
Fayette County
State Hwy 74
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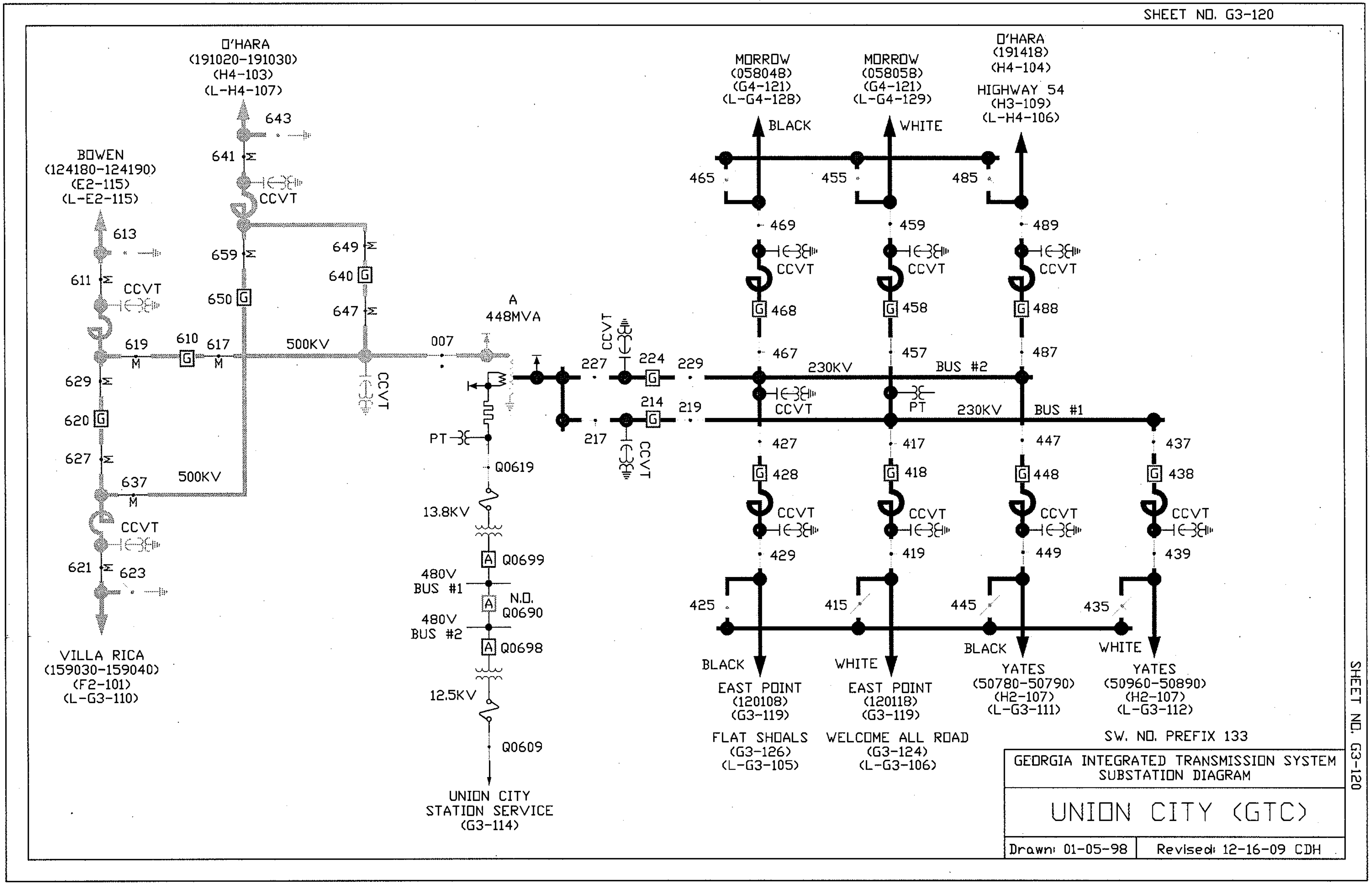
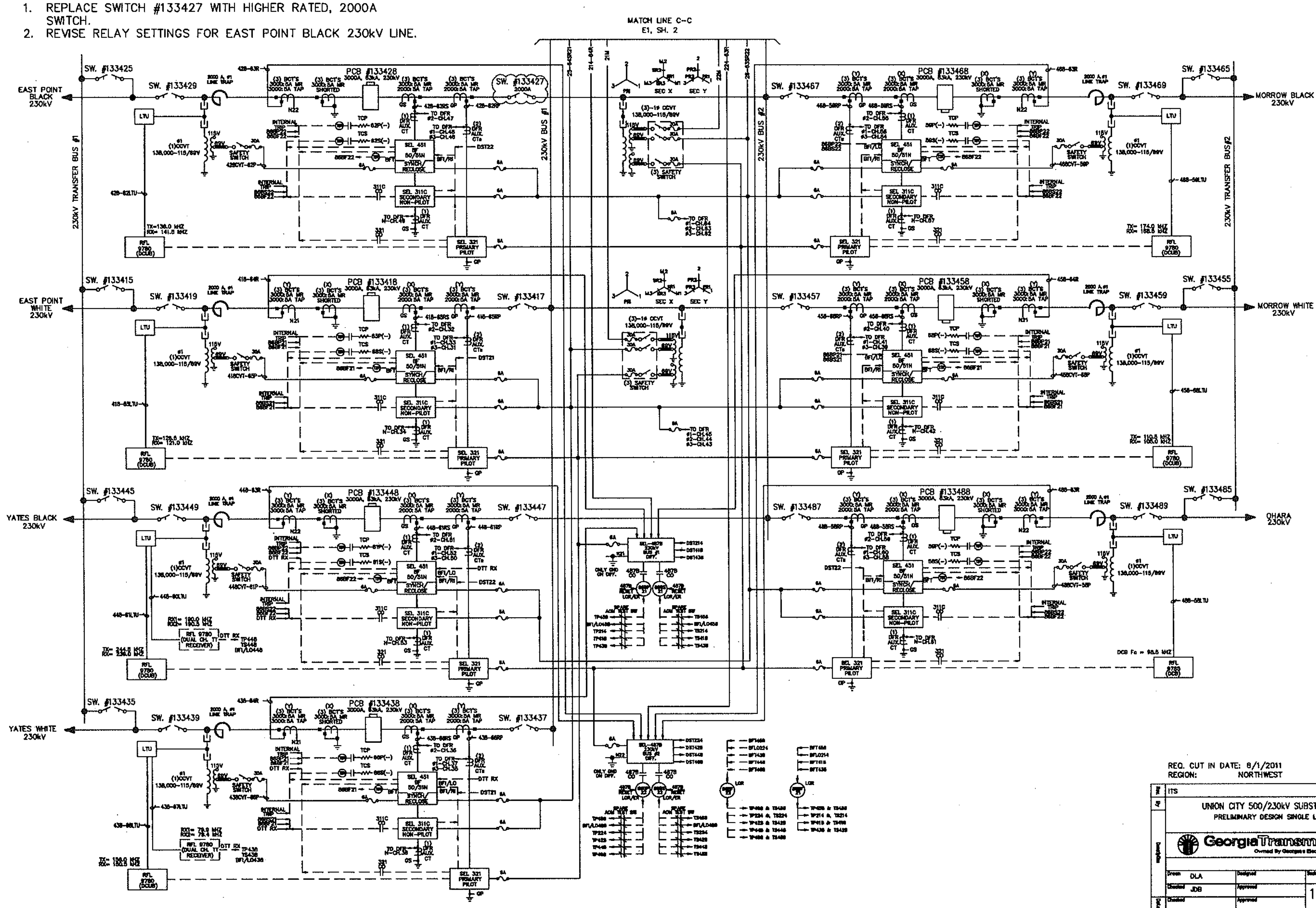
State Hwy 279
US Hwy 29
Flat Shoals Rd
1351 GTC


SHEET NO. G3-120
O'HARA
(191020-191030)
(H4-103)
(L-H4-107)
BOWEN
(124180-124190)
(E2-115)
(L-E2-115)
MORROW
(058048)
(G4-121)
(L-G4-128)
MORROW
(058058)
(G4-121)
(L-G4-129)
O'HARA
(191418)
(H4-104)
HIGHWAY 54
(H3-109)
(L-H4-106)
BLACK
WHITE
643
641
CCVT
613
611
659
649
640
650
647
A
448MVA
007
500KV
619
610
617
629
620
627
637
500KV
621
623
227
224
229
217
214
219
230KV
BUS #2
230KV
BUS #1
PT
Q0619
13.8KV
Q0699
480V
BUS #1
N.O.
Q0690
480V
BUS #2
Q0698
12.5KV
Q0609
465
455
485
469
459
489
468
458
488
467
457
487
427
417
447
437
428
418
448
438
429
419
449
439
425
415
445
435
VILLA RICA
(159030-159040)
(F2-101)
(L-G3-110)
BLACK
EAST POINT
(120108)
(G3-119)
FLAT SHOALS
(G3-126)
(L-G3-105)
WHITE
EAST POINT
(120118)
(G3-119)
WELCOME ALL ROAD
(G3-124)
(L-G3-106)
BLACK
YATES
(50780-50790)
(H2-107)
(L-G3-111)
WHITE
YATES
(50960-50890)
(H2-107)
(L-G3-112)
UNION CITY
STATION SERVICE
(G3-114)
SW. NO. PREFIX 133
GEORGIA INTEGRATED TRANSMISSION SYSTEM
SUBSTATION DIAGRAM
UNION CITY (GTC)
Drawn: 01-05-98
Revised: 12-16-09 CDH
SHEET NO. G3-120

NOTES PER PROJECT #85938
1. REPLACE SWITCH #133427 WITH HIGHER RATED, 2000A SWITCH.
2. REVISE RELAY SETTINGS FOR EAST POINT BLACK 230kV LINE.



REQ. CUT IN DATE: 8/1/2011
REGION: NORTHWEST

UNION CITY 500/230kV SUBSTATION
PRELIMINARY DESIGN SINGLE LINE

Georgia Transmission

Drawn DLA	Designed	Scale NONE	
Checked JDB	Approved		1002-PD
Checked	Approved		
Project 85938	Date 3/23/11	Sheet 5	

CAD DRAWING – DO NOT REVISE MANUALLY

Planning Grade Estimate
Project Planning Services

Project Name: Union City
Project Number: P85938
Description: Replace switch #133427

Estimate Number:

		General	Route/Site	Survey/ Platting	Pre- Construction	Land & Permit	Construction	Total
Direct Cost	EC 50 - Construction Contract Labor						$35,000	$35,000
	EC 64 - OFM						$17,000	$17,000
	EC 40 - Associate Wages	$4,464			$0	$0	$4,464	$8,928
	EC 54 - Contract Workers	$0					$0	$0
	EC 56 - Professional Services	$0					$0	$0
	EC 58 - Legal Services						$0	$0
	EC 60 - Land					$0	$0	$0
	EC 66 - Associate Expenditures	$0					$200	$200
	Total Direct Cost	**$4,464**	**$0**	**$0**	**$0**	**$0**	**$56,664**	**$61,128**
Indirect Cost								
	Overheads/Indirects 23% of direct costs	$14,059						$14,059
	Total Indirect Cost	**$14,059**	**$0**	**$0**	**$0**	**$0**	**$0**	**$14,059**
Total Project Cost:		**$18,523**	**$0**	**$0**	**$0**	**$0**	**$56,664**	**$75,187**
RTU							$0	**$0**
Facility Credit for removal of used materials:							$0	**$0**
Retirement							$0	**$0**
Net Change to Facility Investment:								**$75,187**

Note:
2010 labor rate: $43.34
2011 labor rate $44.64
2012 labor rate $45.98