PJM Facilities Study Report

For

Network Upgrade N9646

Transition Cycle #1

June 2025

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff and PJM Manuals. The Transmission Owner (TO) is Virginia Electric and Power Company (VEPCO or Dominion).

A. Project Description

The System Impact Study for PJM Interconnection Transition Cycle #1 has identified the need for PJM Network Upgrade N9646. The scope of this Network Upgrade includes the following:

- Upgrade 7.94 miles of 230 kV Line 2092 between West Albemarle DP and South Hertford.

The Preliminary Scoping Document located in the Appendices, Attachment #1, and #2.

B. Transmission Owner Facilities Study Results

1. Detailed Scope of work for Network Upgrade N9646:

The following is a detailed description of Transmission Owner Upgrades for Network Upgrade N9646. These facilities shall be designed according to the Transmission Owner's Applicable Technical Requirements and Standards. Once built the Transmission Owner will own, operate, and maintain these facilities.

See Preliminary Scoping Summaries located in the Appendices, Attachment #1, and #2.

2. MILESTONE SCHEDULE FOR COMPLETION OF DOMINION WORK

Facilities outlined in this report are estimated to take 43 months to construct, from the time of full execution of the Generation Interconnection Agreement and completion of a construction kickoff call. This schedule may be impacted by the timeline for procurement and installation of long lead items and the ability to obtain outages to construct and test the proposed facilities.

Description	Start month	Finish month
Engineering	1	30
Permitting/Procurement	3	38
Construction	36	43

3. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- The preliminary construction schedule is dependent on outage availability.
- See Attachment 1 – Preliminary Scoping Summary – Substation for additional assumptions
- See Attachment 2 – Preliminary Scoping Summary – Transmission line for additional assumptions

4. LAND REQUIREMENTS

Dominion will be responsible for the following expectations in the area of Real Estate:

- Any additional land needed for Storm Water Management, Landscaping, and Wetlands/Wetlands Mitigation.
- Any other Land/Permitting requirements required by the Network Upgrade

5. ENVIRONMENTAL AND PERMITING

Dominion will be responsible for the following expectations in the area of Environmental and Permitting:

- Assessment of environmental impacts related to the Network Upgrade including:
    - Environmental Impact Study requirements
    - Environmental Permitting
- A stormwater easement and/or specific stormwater design BMP's to allow access to and use of the facilities, including a maintenance agreement for said stormwater facilities.
- Conditional Use Permit for Substation
- Any additional land needed for Storm Water Management, Landscaping, and Wetlands/Wetlands Mitigation
- Any other Permitting requirements required by the Network Upgrade

C. APPENDICES

Attachment #1: Preliminary Scoping Summary – Substation South Hertford

Attachment #2: Preliminary Scoping Summary – Transmission

Attachment #1

Project Number: N9646 – South Hertford Substation

Project Description: Replace Line Lead for Line 2092

SUBSTATION SCOPE OF WORK

Date: 06/20/2025

Revision Number: 0

Project Summary

Network upgrade N9646 provides for the uprate of line 2092 at South Hertford Station in Hertford, North Carolina.

Assumptions & Clarifications:

1. *The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary.*

Purchase & install substation material - Network Upgrade:

1. Conductors, connectors, and grounding materials as per engineering standards

Attachment #2

230 kV LINE #2092

West Albemarle DP – South Hertford Substation

PROJECT N9646

PRELIMINARY SCOPING SUMMARY

This project serves to reconductor 230 kV line 2092 from West Albemarle DP to South Hertford Substation for approximately 7.94 miles, which is located in Perquimans and Chowan Counties, NC. See **Figure 1** for the project location. Line 2092 is located within a railroad easement and has a 10' right of way for spotting structures. Since the proposed work is using existing structures and is not proposing any major changes, this project requires no additional land. The project will not install new structures, and the Certification of Public Convenience and Necessity (CPCN) filing is not expected.

The existing line consists mainly of weathering steel monopole structures built in 2011. The existing single (1) 1192.5 ACSR 45/7 conductor will be replaced with twin bundled (2) 768.2 ACSS/TW (20/7) "Maumee" conductor.

Design Considerations:

EXISTING FACILITIES TO BE REMOVED:

1. Remove approximately 7.94 miles of single (1) 1192.5 ACSR 45/7 conductor from existing structure 2092/52B to existing structure 2092/172.
    a. This includes the removal of the risers connecting to the West Albermarle DP tap.

2. Remove one (1) existing 3000 Amp switch 209286 on the following one (1) structure:
    a. Structure 2092/171.

EXISTING FACILITIES TO BE MODIFIED:

1. Replace three (3) conductor strain assemblies [Reference Drawing 32.630], three (3) conductor crossing strain assemblies [Reference Drawing 32.338], three (3) training insulator assemblies [Reference Drawing 32.645] and three (3) jumper loop assemblies [Reference Drawing 39.227] on the following one (1) structure:
    a. Structure 2092/52A.

2. Replace three (3) conductor crossing strain assemblies [Reference Drawing 32.338] on the following one (1) structure:
    a. Structure 2092/52B.

3. Replace six (6) conductor strain assemblies [Reference Drawing 32.630], three (3) training insulator assemblies [Reference Drawing 32.645] and three (3) jumper loop assemblies [Reference Drawing 39.227] on the following one (1) structure:

a. Structure 2092/170A.

4. Replace three (3) conductor braced post insulator assemblies [Reference Drawing 32.710] on the following one hundred eighteen (118) structures:
    a. Structures 2092/53 – 2092/170.

5. Replace six (6) conductor strain assemblies [Reference Drawing 32.630] on the following one (1) structure:
    a. Structure 2092/171.

6. Replace three (3) conductor strain assemblies [Reference Drawing 32.630] on the following one (1) structure:
    a. Structure 2092/172.

7. Replace one (1) set of 3-phase single (1) 1192.5 ACSR jumper loop assemblies with twin bundled (2) 768.2 ACSS/TW/HS “Maumee” jumper loop assemblies between existing structures 2092/171 and 2092/172. This includes the installation of the following items:
    a. Six (6) conductor jumpers [Reference Drawing 39.227] on structure 2092/171.
    b. One (1) set of 3-phase risers in the midspan between structures 2092/171 and 2092/172.
    c. Three (3) conductor jumpers [Reference Drawing 39.227] on structure 2092/172.

PERMANENT FACILITIES TO BE INSTALLED:

1. Install approximately 7.94 miles of 3-phase twin bundled (2) 768.2 ACSS/TW (20/7) “Maumee” conductor from existing structure 2092/52B to existing structure 2092/172.

2. Install one (1) 4000 Amp switch attachment on the following one (1) existing structure:
    a. Switch 209286 on structure 2092/172.

CONCEPTUAL SCOPE NOTES:

1. No PLS-CADD modeling was done for this project. Instead, a design span was used to determine the difference in sags between the existing and proposed conductors at max sag conditions. The resulting change in max sags is approximately -0.2’. This change in sags is expected to be feasible to reconductor the line.
    a. Design Span Length = 400 feet
    b. Existing Design Tension = 14,125 lbs NESC Heavy
    c. Proposed Design Tension = 7,000 lbs NESC Heavy

2. It is assumed for detailed engineering that a LiDAR survey will be required.

3. An existing right of way width of 10’ is likely a pole line easement since there is an adjacent

railroad paralleling the line. Since no additional structures are being installed for the project, no additional right of way will need to be acquired for this project. The existing right of way will need to be confirmed and analyzed in detailed engineering.

4. A wetland delineation has not been completed as part of this conceptual package.

5. Due to no structures being replaced, wire reel lengths are not accounted for in this design. The longest section from deadend to deadend is approximately 7.85 miles. This would require three (3) tension splices on the conductor, assuming 12,000-foot reels.

6. Line 2092 falls within an avian protected area including structures 2092/52A to 2092/60.

7. It is assumed that there will be no fiber/shield wire installations on this project since it is a reconductor. In detailed engineering, this project will need to discuss this design approach with the telecommunications group.

8. This project assumes that project N9646 occurs prior to the other network upgrades included in Transition Cycle 1, Phase 3. The following projects may impact the project scope if this assumption is incorrect:
    a. N9111 – Uprate Line 2092 from South Hertford to Winfall
    b. N9377 – Uprate Line 2092 between Pembroke Creek and West Albermarle DP.

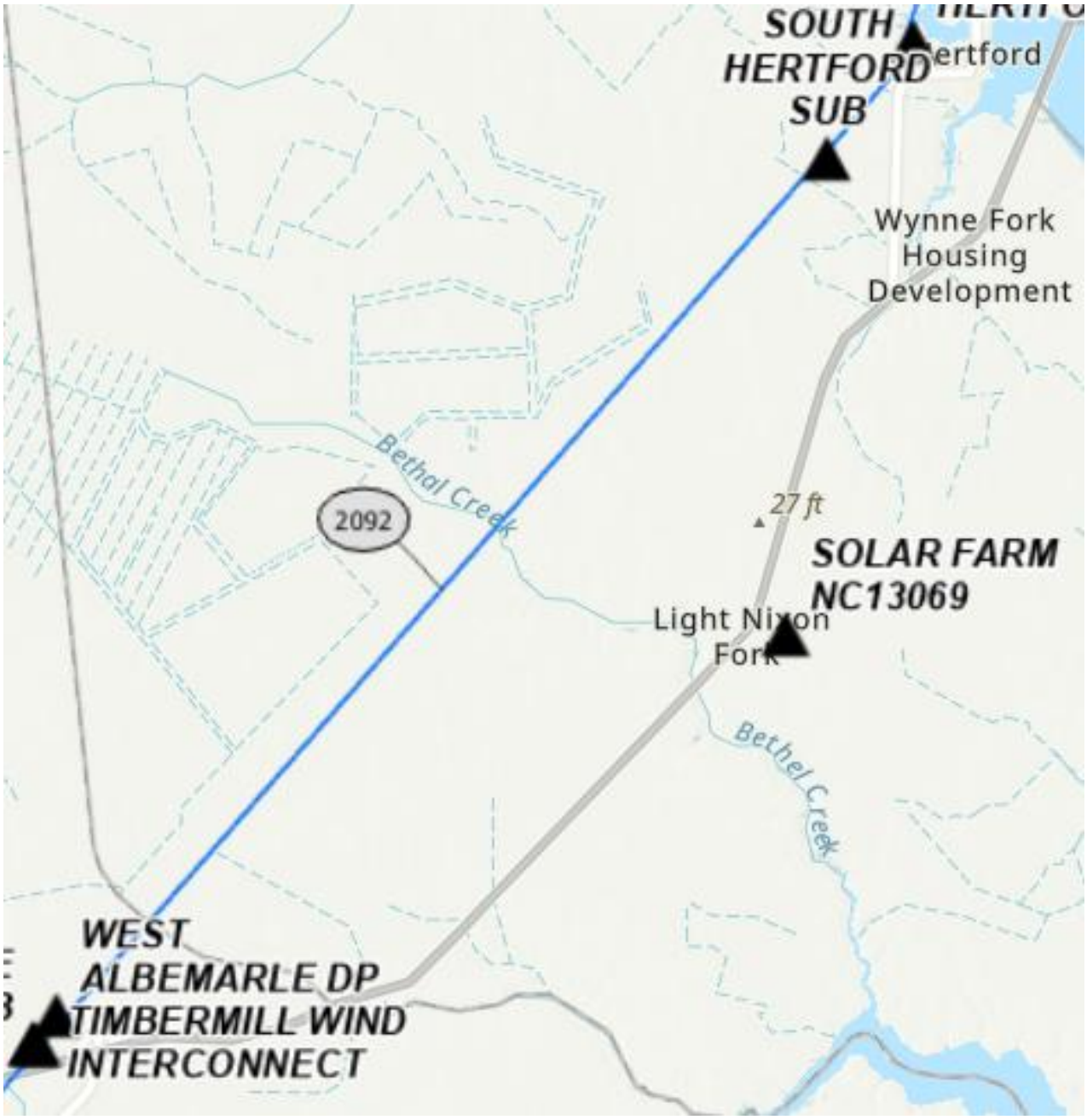
CONCEPTUAL ESTIMATE NOTES:

1. The conceptual estimate assumes that a laydown yard is required for this project.

2. Due to the time allotted to create an estimate, stakeholders were not consulted for their respective costs. Stakeholder costs were derived as follows:
    a. DEES Permitting, Right of Way Management (Encroachment), Forestry, Rehab and Access costs were based on a cost per mile based off comparable projects in the TC#1 Phase 3 Cycle. Project N9213, which is rebuilding 115 kV line 136 from Tunis Sub to Ahoskie Sub for approximately 7.98 miles, was used to develop these costs per mile due to similar project scope and location. However, most of this project has structure installation which may result in costs being more than necessary.
    b. Siting and Permitting costs were derived using the permitting spreadsheet but not verified by the permitting team.
    c. Real estate acquisition costs were assumed to be $0 due to no additional land needed to be acquired.
    d. Surveying costs were based on the typical cost to acquire approximately ten (10) miles of survey. These costs were provided by the surveying team as part of TC#1 Phase 3 process.

e. Communications (Marketing Manager) costs are assumed to be Tier 3 - $200K based off similar linear lengths and locations to project N9213.
f. Telecommunications costs are assumed to be $0 due to no fiber being installed for this project.

Figure 1 – Project Location



Required Material Summary

Item	Qty
12,000-Ft Conductor Reels	24