INTERCONNECTION FACILITIES STUDY REPORT

GEN-2018-074

Published May 2025

By SPP Generator Interconnections Dept.

REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
May 8, 2025	SPP	Initial draft report issued.
May 19, 2025	SPP	Corrected Upgrade descriptions in Table 2. Report posted as final.

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SUMMARY

INTRODUCTION

This Interconnection Facilities Study (IFS) for Interconnection Request GEN-2018-074 is for a 72 MW generating facility located in Crawford/Carrol Counties, IA. The Interconnection Request was studied in the DISIS-2018-002/DISIS-2019-001 Impact Study for ER. The Interconnection Customer's requested in-service date is January 8, 2027.

The interconnecting Transmission Owner, Western Area Power Administration (WAPA), performed a detailed IFS at the request of SPP. The full report is included in Appendix A. SPP has determined that full Interconnection Service will be available after the assigned Transmission Owner Interconnection Facilities (TOIF), Non-Shared Network Upgrades, Shared Network Upgrades, Contingent Network Upgrades, and Affected System Upgrades that are required for full interconnection service are completed.

The primary objective of the IFS is to identify necessary Transmission Owner Interconnection Facilities, Network Upgrades, other direct assigned upgrades, cost estimates, and associated upgrade lead times needed to grant the requested Interconnection Service.

PHASE(S) OF INTERCONNECTION SERVICE

It is not expected that Interconnection Service will occur in phases. However, full Interconnection Service will not be available until all Interconnection Facilities and Network Upgrade(s) can be placed in service.

COMPENSATION FOR AMOUNTS ADVANCED FOR NETWORK UPGRADE(S)

FERC Order ER20-1687-000 eliminated the use of Attachment Z2 revenue crediting as an option for compensation. The Incremental Long Term Congestion Right (ILTCR) process will be the sole process to compensate upgrade sponsors as of July 1st, 2020.

INTERCONNECTION CUSTOMER INTERCONNECTION FACILITIES

The Generating Facility is proposed to consist of thirty-one (31) GE 2.5 MW wind turbines for a total generating nameplate capacity of 72 MW.

The Interconnection Customer's Interconnection Facilities to be designed, procured, constructed, installed, maintained, and owned by the Interconnection Customer at its sole expense include:

- 34.5 kV underground cable collection circuits;
- 34.5 kV to 230 kV transformation substation with associated 34.5 kV and 230 kV switchgear;
- Two 230/34.5 kV 132/176/220 and 72/96/120 MVA (ONAN/ONAF/ONAF) step-up transformer to be owned and maintained by the Interconnection Customer at the Interconnection Customer's substation;
- An Approximately 17 mile overhead 230 kV line to connect the Interconnection Customer's substation to the Point of Interconnection ("POI") at the 230 kV bus at existing Transmission Owner substation ("Denison 230kV Substation") that is owned and maintained by Transmission Owner;
- All transmission facilities required to connect the Interconnection Customer's substation to the POI;
- Equipment at the Interconnection Customer's substation necessary to maintain a composite power delivery at continuous rated power output at the high-side of the generator substation at a power factor within the range of 95% lagging and 95% leading in accordance with Federal Energy Regulatory Commission (FERC) Order 827. The Interconnection Customer may use inverter manufacturing options for providing reactive power under no/reduced generation conditions. The Interconnection Customer will be required to provide documentation and design specifications demonstrating how the requirements are met; and,
- All necessary relay, protection, control and communication systems required to protect Interconnection Customer's Interconnection Facilities and Generating Facilities and coordinate with Transmission Owner's relay, protection, control and communication systems.

TRANSMISSION OWNER INTERCONNECTION FACILITIES AND NON-SHARED NETWORK UPGRADE(S)

To facilitate interconnection, the interconnecting Transmission Owner will perform work as shown below necessary for the acceptance of the Interconnection Customer's Interconnection Facilities.

Table 1 and **Table 2** list the Interconnection Customer's estimated cost responsibility for Transmission Owner Interconnection Facilities (TOIF) and Non-Shared Network Upgrade(s) and provides an estimated lead time for completion of construction. The estimated lead time begins when the Generator Interconnection Agreement has been fully executed.

Table 1: Transmission Owner Interconnection Facilities (TOIF)

Transmission Owner Interconnection Facilities (TOIF)	Total Cost Estimate ($)	Allocated Percent (%)	Allocated Cost Estimate ($)
Transmission Owner's Denison 230kV GEN-2018-074 Interconnection (TOIF) (WAPA) (UID 156695): Facilitate the interconnection of GEN-2018-074 Estimated Lead Time: 1 Month	$150,000	100.00%	$150,000
Total	**$150,000**		**$150,000**

Table 2: Non-Shared Network Upgrade(s)

Non-Shared Network Upgrades Description	ILTCR	Total Cost Estimate ($)	Allocated Percent (%)	Allocated Cost Estimate ($)
Transmission Owner's Denison 230kV GEN-2018-074 Interconnection (Non-shared NU) (WAPA) (UID 156696): Facilitate the interconnection of GEN-2018-074 Estimated Lead Time: 1 Month ***$0 cost contingent upon the successful interconnection of GEN-2017-222**	Ineligible	*$0	100%	*$0
Northeast Iowa Power Cooperative "NIPCO" New 69 kV Substation cutting off DENISON8 - MANNINGTAP 8 and K338 - K318 circuits (UID170495): Build a new 69 kV tap station cutting off DENISON8 - MANNINGTAP 8 and K338 - K318 circuits. Estimated Lead Time: 16 Months	Eligible	$2,800,000	100%	$2,800,000

Non-Shared Network Upgrades Description	ILTCR	Total Cost Estimate ($)	Allocated Percent (%)	Allocated Cost Estimate ($)
NIPCO Rebuild the circuit from K338 to the new 69 kV tap station (UID 170496) Rebuild the K338WTCT-NI8 to NEWTAP 69 kV line 1 (3.98 miles) to a minimum rating of 79 MVA. Estimated Lead Time: 10 Months	Eligible	$1,101,600	100%	$1,101,600
NIPCO Rebuild the circuit from WAPA Denison to the new 69 kV tap station (UID 170498, 170499) Build a new DENISON8 to NEWTAP 69 kV line 1 (0.82 miles) to a standard rating of 135 MVA. Estimated Lead Time: 12 Months	Eligible	$1,580,500	100%	$1,580,500
NIPCO Rebuild the existing K335AMAI-NI8 to K338WTCT-NI8 69 kV line (UID 170497) Rebuild the K335AMAI-NI8 to K338WTCT-NI8 69 kV line 1 (0.33 miles) to a minimum rating of 79 MVA. Estimated Lead Time: 11 Months	Eligible	$136,800	100%	$136,800
NIPCO Rebuild the DENISON8 to J6BOYER -NI8 69kV Line 1 (UID 170620) Rebuild the existing DENISON8 to J6BOYER -NI8 69 kV line 1 (2.88 miles) to achieve a minimum rating of 125 MVA. Estimated Lead Time: 14 Months	Eligible	$2,073,600	100%	$2,073,600
Rebuild the K335AMAI-NI8 to J6BOYER -NI8 69kV Line 1 (UID 170492) Rebuild the existing K335AMAI-NI8 to J6BOYER -NI8 69 kV line 1 (0.69 miles) to a minimum normal rating of 70 MVA. Estimated Lead Time: 12 Months	Eligible	$463,200	100%	$463,200
Total		**$8,155,700**		**$8,155,700**

SHARED NETWORK UPGRADE(S)

The Interconnection Customer's share of costs for Shared Network Upgrades is estimated in **Table 3** below.

Table 3: Interconnection Customer Shared Network Upgrade(s)

Shared Network Upgrades Description	ILTCR	Total Cost Estimate ($)	Allocated Percent (%)	Allocated Cost Estimate ($)
NA				
Total		**$0**		**$0**

All studies have been conducted assuming that higher-queued Interconnection Request(s) and the associated Network Upgrade(s) will be placed into service. If higher-queued Interconnection Request(s) withdraw from the queue, suspend or terminate service, the Interconnection Customer's share of costs may be revised. Restudies, conducted at the customer's expense, will determine the Interconnection Customer's revised allocation of Shared Network Upgrades.

CONTINGENT NETWORK UPGRADE(S)

Certain Contingent Network Upgrades are **currently not the cost responsibility** of the Interconnection Customer but will be required for full Interconnection Service.

Table 4: Interconnection Customer Contingent Network Upgrade(s)

Contingent Network Upgrade(s) Description	Current Cost Assignment	Estimated In-Service Date
WAPA DENISON8 69 kV Terminal Upgrade (UID 143686): Upgrade the WAPA DENISON8 69 kV Terminal Upgrade to a minimum rating of 125 MVA	**$0**	8/1/2027

Depending upon the status of higher- or equally-queued customers, the Interconnection Request's in-service date is at risk of being delayed or Interconnection Service is at risk of being reduced until the in-service date of these Contingent Network Upgrades.

AFFECTED SYSTEM UPGRADE(S)

To facilitate interconnection, the Affected System Transmission Owner will be required to perform the facilities study work as shown below necessary for the acceptance of the Interconnection Customer's Interconnection Facilities. **Table 5** displays the current impact study costs provided by either MISO or AECI as part of the Affected System Impact review. The Affected System facilities study could provide revised costs and will provide each Interconnection Customer's allocation responsibilities for the upgrades.

Table 5: Interconnection Customer Affected System Upgrade(s)

Affected System Upgrades Description	Total Cost Estimate ($)	Allocated Percent (%)	Allocated Cost Estimate ($)
Midcontinent Independent System Operator "MISO": Add 4×40 MVAR switched cap at Panther 230 kV (615529)	$9,000,000	14.48%	$343,444
Midcontinent Independent System Operator "MISO": Add 4×40 MVAR switched cap at McLeod 230 kV (658276)	$5,500,000	13.69%	$235,330
Midcontinent Independent System Operator "MISO": Add 1×40 MVAR switched cap at Paynesville 230 kV (602036)	$2,000,000	14.69%	$77,135
Total	**$16,500,000**		**$655,909**

CONCLUSION

After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 72 MW can be granted. Full Interconnection Service will be delayed until the TOIF, Non-Shared NU, Shared NU, Contingent NU, Affected System Upgrades that are required for full interconnection service are completed. The Interconnection Customer's estimated cost responsibility for full interconnection service is summarized in the table below.

Table 6: Cost Summary

Description	Allocated Cost Estimate
Transmission Owner Interconnection Facilities Upgrade(s)	$150,000
Non-Shared Network Upgrade(s)	$8,155,700
Shared Network Upgrade(s)	$0
Affected System Upgrade(s)	$655,909
Total	**$8,961,609**

Use the following link for Quarterly Updates on upgrades from this report: https://spp.org/spp-documents-filings/?id=18641

A draft Generator Interconnection Agreement will be provided to the Interconnection Customer consistent with the final results of this IFS report. The Transmission Owner and Interconnection Customer will have 60 days to negotiate the terms of the GIA consistent with the SPP Open Access Transmission Tariff (OATT).

APPENDICES

A: TRANSMISSION OWNER'S INTERCONNECTION FACILITIES STUDY REPORT AND NETWORK UPGRADES REPORT(S)

See next page for the Transmission Owner's Interconnection Facilities Study Report and Network Upgrades Report(s).

Corn Belt Power Cooperative
Facility Study Report
GEN-2018-074

1. Background
   1.1. Per the Generator Interconnection Procedure (GIP), Attachment V, Section 8.11, SPP requests that Corn Belt Power Cooperative (CBPC) perform a facilities study for the following Interconnection and/or Network Upgrade(s):

Network	TBD	Build a new 69 kV tap station cutting off DENISON8 - MANNINGTAP 8 and K338 - K318 circuits	TBD	36
Network	TBD	Rebuild the circuit from WAPA Denison to the new 69 kV tap station	TBD	36

2. Study Requirements:

   CBPC has performed this Facility Study report in accordance with the Generator Interconnection Procedures (GIP), Attachment V, Section 8.11 for the Interconnection and/or Netework Upgrade(s) as described in Section 1.

   2.1. The Facility Study report includes an evaluation of the following:

      2.1.1. Develop an overall construction schedule for completion of the necessary additions and/or modifications

      2.1.2. Point of Change of Ownership. For the purposes of this Facility Study report, the Point of Change of Ownership location is defined as the drops into the NIPCO Substation/Switching Station. NIPCO will build and own the new switching station close to where NIPCO and CBPC's 69 kV lines cross each other.

3. Study Results for GEN-2016-074

   3.1. The following results document the analysis of the required facilities for this Interconnection Request as outlined in Section 1. Corn Belt has determined that the following additions and improvements are required to maintain a safe and reliable interconnection to Corn Belt's transmission system.

   3.2. Line Rebuild

   3.3. Environmental Review

Compliance with all applicable federal, state and local regulations will be strictly adhered to. Additionally, all applicable and required permits and approvals will be obtained prior to construction. For the purposes of this Study, it is anticipated that this rebuild will require minor local permitting.

3.4. Cost Estimate

Denison – NIPCO station (additional cost)	Current Year $
Engineering Labor	$610,000.00
Construction Labor	$760,000.00
Material	$205,500.00
Right of Way	$5,000.00
Line Sub Total	$1,580,500.00

3.5. Construction Schedule

The preliminary project schedule provided is for planning level purposes only and will be adjusted with additional project definition.

Additional lead times	Delays
Executed GIA-Notice To Proceed letter	--
Project Planning	0 Month
Engineering Design	6 Month
Equipment Procurement	0 Month
Advertise and Award Construction Contracts	0 Month
Construction	0 Month
Energize and In-Service Date	0 Month

Attachment A

SPP INTERCONNECTION FACILITIES STUDY REQUEST LETTER

January 14, 2025

Subject: Facilities Study Request for DISIS-2018-002 – DISIS-2019-001

Dear Mr. Baxter:

Per the Generator Interconnection Procedures (GIP), SPP requests that CBPC perform facilities study in accordance with Section 8.11 for the following Interconnection and/or Network Upgrade(s):

Upgrade Type	UID	Upgrade Name	DISIS Cost Estimate	DISIS Lead Time
Network	TBD	Build a new 69 kV tap station cutting off DENISON8 - MANNINGTAP 8 and K338 - K318 circuits	TBD	36
Network	TBD	Rebuild the circuit from WAPA Denison to the new 69 kV tap station	TBD	36

** If the upgrade cost studied is higher than 20% of DISIS estimates, please provide justification in the facility report.*

The scope of the Facilities Study is to determine the cost estimates of equipment, engineering, procurement, and construction as well as the associated lead times.

For the completion of this Facilities Study request, please provide a Facilities Study report to SPP within forty-five (45) calendar days to include all their Interconnection and Network Upgrade(s) listed in the table above. Additionally, please provide an updated and completed Standardized Cost Estimate Report (SCERT) via the Transmission Reporting and Communication (TRAC) tool.

Sincerely,
SPP Generator Interconnection Department
201 Worthen Drive
Little Rock, AR 72223-4936

Interconnection Facilities Study Report

Southwest Power Pool, Inc. (SPP) Generator Interconnection Request GEN-2018-074

(DISIS-2018-002/2019-001)

Western Area Power Administration

Upper Great Plains Region (WAPA-UGP)

March 2025

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1.0 Background:

The Western Area Power Administration Upper Great Plains Region (WAPA-UGP[1]) received a request for an Interconnection Facilities Study in accordance with the Southwest Power Pool Inc. (SPP) Open Access Transmission Tariff (Tariff) for interconnection of a Generating Facility in Crawford and Carroll Counties, Iowa to the 230-kV bus at WAPA-UGP's Denison Substation. SPP generator interconnection request GEN-2018-074 represents a 72 MW nameplate wind generation facility.

GEN-2018-074 will utilize the generator tie-line and collector station to be constructed for GEN-2017-222. The wind generator's collector substation will be located approximately 17 miles Northeast of the WAPA-UGP's Denison 230-kV Substation. The POI will be at the 230-kV bus in WAPA-UGP's Denison 230-kV Substation. The Point of Change of Ownership between Interconnection Customer and WAPA-UGP will be at the points where GEN-2017-222 tie-line conductors, jumpers, and insulators connect to WAPA-UGP's 230-kV take-off structure and the rigid bus underhung from the 230-kV take-off structure, as illustrated in Attachment B.

This Facilities Study does not address transmission service or any delivery component of transmission service; only the interconnection requirements and operating impacts of the interconnection service component of the Generating Facility.

2.0 Study Requirements:

This Facilities Study includes an evaluation of the following:

2.1 Prepare/develop a substation layout, perform a preliminary bus design, and determine all electrical equipment requirements to accommodate the request. Develop/compile cost estimates for all WAPA-UGP labor, overheads, equipment additions, modifications, etc. to accommodate the generator interconnection.

2.2 Review and document any other interconnection/control area requirements. Document these additional requirements (such as indication/metering, monitoring, control, relaying) and include these in the cost estimate.

2.3 Determination of need to develop an Operating Guide for WAPA-UGP's Dispatch to document the conditions under which the new Generating Facility must be operated to protect against unacceptable pre- or post-contingent transient voltage and loading conditions.

2.4 Develop an overall time schedule for completion of the necessary addition/modifications.

[1] WAPA-UGP is also referred to as "Western-UGP" in the SPP Tariff.

3.0 Study Results:

The following results document the analysis of the addition of the Generating Facility to WAPA-UGP's transmission system and fulfill the tasks outlined in Section 2.0 above:

3.1 Required Facility Upgrades by WAPA-UGP: WAPA-UGP has determined the following work is required to maintain a safe and reliable interconnection to WAPA-UGP's transmission system:

- Meter, relay, protection, and communication verifications

WAPA-UGP's estimated cost for labor and other miscellaneous costs for associated verification work is $150,000.

3.1.1 Transmission Owner's Interconnection Facilities: Equipment installed by WAPA-UGP for the sole purpose of this interconnection, such as the Transmission Owner's Interconnection Facilities, which includes equipment between of the Point of Interconnection and Point of Change of Ownership, interrogation, and communication equipment, are considered direct assignment facilities and not subject to inclusion as Network Upgrades. The direct assigned costs for such equipment are estimated at $150,000 based upon WAPA-UGP's understanding of the SPP Tariff provisions and are included in the total cost estimate provided in Attachment A.

3.1.2 Non-Shared Network Upgrades constructed by Transmission Owner: N/A

3.2 Contractual Agreements:

Pursuant to the SPP Tariff, SPP and WAPA-UGP will execute a Generator Interconnection Agreement (or initially an Interim GIA, if applicable, with a subsequent execution of a GIA) with the Interconnection Customer for the interconnection of the Generating Facility. The GIA will address specific funding requirements and provide an advanced payment schedule for facility additions and upgrades to address WAPA-UGP's requirements. The GIA, which discusses the construction and interconnection aspects of this project, will be developed and offered by SPP, pursuant to their obligations and procedures under the SPP Tariff, and forwarded to the Interconnection Customer for review and signature. A schedule for payment(s) based on design, procurement, and construction activities will be included in the GIA consistent with the SPP Tariff provisions.

3.3 Other Interconnection, Metering Requirements:

Basic indication, monitoring, control, and relaying requirements due to a generator interconnection are included in the cost estimate. A list of specific needs will be provided by WAPA-UGP's Operations Office and WAPA-UGP's South Dakota Maintenance Office once design has progressed.

Interconnection Customer shall install metering at their 230/34.5-kV collector substation in accordance with SPP and WAPA-UGP metering requirements. WAPA-UGP's generation metering requirements, as an SPP Transmission Owner, must be also met, unless specific SPP metering requirements are more restrictive, in accordance with the most current ***Western Area Power Administration Meter Policy*** posted at the "WAPA Meter Policy" link at the following Link URL: http://www.oasis.oati.com/WAPA/WAPAdocs/Western-Common-Business-Practices.html

Any WAPA-UGP specific implementation of more restrictive SPP metering requirements are also posted on WAPA-UGP's OASIS home page under the "Effective Business Practices" folder at the "UGP Meter Policy Modifications" link at the following Link URL: http://www.oasis.oati.com/wapa/index.html

WAPA's *General Requirements for Interconnection* must also be met in accordance with the *General Requirements for Interconnection* document posted at the "General Requirements for Interconnection (GRI)" link at the following Link URL: http://www.oasis.oati.com/WAPA/WAPAdocs/Western-Common-Business-Practices.html

3.4 Operating Guide/Operating Agreement:

Prior to energization, an Operating Guide needs to be developed by WAPA-UGP in coordination with SPP, if necessary, to outline any required operating restrictions under which the generation interconnection must be energized (or de-energized) to protect against unacceptable system stability limits and/or pre-contingent and post-contingent voltage and loading conditions. The Operating Guide will be developed by WAPA-UGP's Transmission System Planning Division in coordination with SPP Staff. In addition, an Operating Agreement will be developed by WAPA-UGP's Operations Office, jointly with the Interconnection Customer and SPP, if necessary, as will be set forth in the GIA to outline the necessary operations coordination and requirements not otherwise set forth in the GIA.

3.5 Schedule:

Attachment A outlines WAPA-UGP's estimated schedule for planning, design and construction of the facilities required to accommodate the Interconnection Customer's Request. WAPA-UGP anticipates the meter, relay, protection, and communication verifications would be completed by the Commercial Operations Date (COD). This schedule is based on the GIA (or Interim GIA) being executed prior to December 1, 2025, and issuance of the NEPA Finding of No Significant Impact or Record of Decision by the COD.

3.6 Environmental Review:

The Environmental Review for this project, as described in Attachment V, Sections 3.3.5, and 8.6.1, and any other applicable sections of the SPP Tariff. An Environment Review agreement was executed between WAPA-UGP and Interconnection Customer on March 7, 2023. The Environmental Review is performed at the Interconnection Customer's expense, and those costs

are considered direct assigned costs and are ineligible for credits under the SPP Tariff. Until the appropriate NEPA review is completed (issuance of a FONSI, ROD, or other), no construction activities relating to the Transmission Owner's Network Upgrades may commence.

4.0 <u>Facilities Study Cost:</u>

WAPA-UGP will audit the Interconnection Facilities Study costs and provide a summary of costs once the study is completed or the interconnection request is withdrawn.

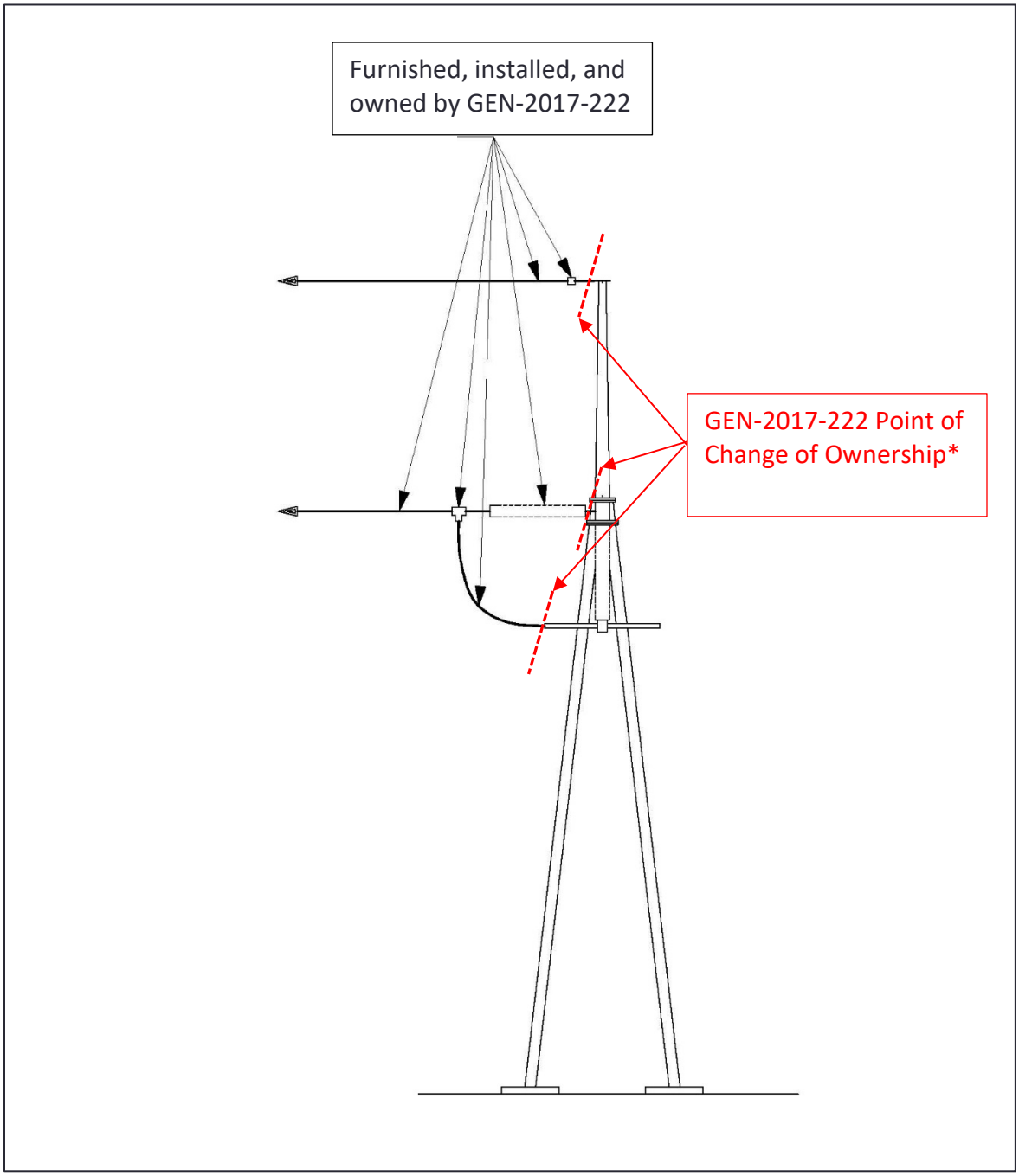
ATTACHMENT A

Meter, replay, protection, and communication verification
AT WAPA-UGP's DENISON 230-kV SUBSTATION

PROJECT ACTIVITY	ESTIMATED START DATE	ESTIMATED COST, MILESTONE PAYMENT DUE
Preconstruction activities – planning, project management, etc.	30 Calendar Days Following GIA Execution*	$50,000
Provide staff and other resources for engineering and design	30 Calendar Days Following GIA Execution*	$50,000
Commissioning and Energization	30 Calendar Days Following GIA Execution*	$50,000
In-Service (Estimated Completion Date)	TBD	
TOTAL ESTIMATED COSTS		$150,000

*Assumes Execution of GIA NLT December 1, 2025
**Includes Transmission Owner Interconnection Facilities costs estimated at $150,000

ATTACHMENT B



*This point represents the Point of Delivery for GEN-2017-222 and GEN-2018-074.

NIPCO
A Touchstone Energy® Cooperative

NORTHWEST IOWA POWER COOPERATIVE
31002 County Road C38
PO Box 240
Le Mars, Iowa 51031-0240
712-546-4141
FAX 877-384-3002
www.nipco.coop

Northwest Iowa Power Cooperative
Interconnection Facilities Study
DISIS-2018-002 – DISIS-2019-001

1. Background:

1.1 Per SPP Generation Interconnection Process 2019 revision[1], Northwest Iowa Power Cooperative (NIPCO) received a request to perform Interconnection Facility Study and/or Network Upgrade(s) Analysis for the following:

Upgrade Type	UID	Upgrade Name	DISIS Cost Estimate	DISIS Lead Time
Network	TBD	Build a new 69 kV tap station cutting off DENISON8 - MANNINGTAP 8 and K338 - K318 circuits (NIPCO)	TBD	36
Network	TBD	Rebuild the circuit from K338 to the new 69 kV tap station (NIPCO)	TBD	36
Network	TBD	Rebuild the K335 to K338 69 kV line 1 (NIPCO)	TBD	36
Network	TBD	Rebuild the K335AMAI-NI8 to J6BOYER_-NI8 69kV Line 1	TBD	36
Network	TBD	Rebuild the circuit from WAPA Denison to the new 69 kV tap station (Corn Belt Power Cooperative)	TBD	36
Network	TBD	Rebuild the DENISON8 to J6BOYER_-NI8 69kV Line 1 (NIPCO)	TBD	36
Network	TBD	Build new Denison – J6/Boyer 69kV line 2 (NIPCO)	TBD	36

[1] SPP Tariff Attachment V Generator Interconnection Procedures (GIP) Section 8.4.4

2. Study Requirements:

NIPCO has performed this Interconnection Facility Study and/or Network Upgrade(s) Analysis in accordance with SPP Tariff Attachment V, Generator Interconnection Procedures (GIP) Section 8.11 for the Interconnection Request(s) and Network Upgrade(s) as described in Section 1.

2.1. The Interconnection Facility Study and/or Network Upgrade(s) Analysis includes an evaluation of the following:

2.1.1. Determine station requirements and a suitable site location for a new 69 kV switching station. Develop cost estimates for all NIPCO labor, overheads, equipment additions, modifications, etc. to accommodate the generator interconnection.

2.1.2. Develop new 69 kV transmission line routes, perform preliminary line designs, determine all electrical equipment requirements to accommodate the Request. Develop/compile cost estimates for all NIPCO labor, overheads, equipment additions, modifications, etc. to accommodate the generator interconnection.

2.1.3. Develop overall construction schedules for completion of the necessary additions and/or modifications.

2.1.4. Point Of Change of Ownership. For the purposes of this Study Analysis, the Point of Change of Ownership location is defined as the drops into the new NIPCO switching station or WAPA's Denison station. NIPCO will build and own the new switching station close to where NIPCO and CBPC's 69 kV lines cross each other.

3. Study Results for DISIS-2018-002 – DISIS-2019-001:

3.1. The following results document the analysis of the required facilities for this Interconnection Request as outlined in Section 1. NIPCO has determined that the following additions and improvements are required to maintain a safe and reliable interconnection to NIPCO's transmission system. The existing system is shown in Figure A0.

3.2 Project Group #1

3.2.1 J17 69 kV Switching Station – "*Build a new 69 kV tap station cutting off DENISON8 - MANNINGTAP 8 and K338 - K318 circuits (NIPCO)"*

A new 69kV switching station, J17, will be built to accommodate the new generation resource interconnection. This switching station will be built near the intersection of the existing lines DENISON8 – MANNINGTAP 8 and K338 – K318. Reference Figure A1. All equipment will follow NIPCO's internal design standards for minimum BIL, ampacity, and fault capabilities.

The associated work for the new 69kV switching station includes the following major equipment:

- Site purchase
- Site grading, rock, and fence
- Ground grid
- Concrete foundations
- Station steel, bus work
- Control building with (5) 69kV Relaying Panels
- (1) Set of bus PTs
- (4) 69kV Breakers
- (4) Sets of 69kV Breaker Disconnect Switches
- (4) Sets of Line Surge Arrestors

Additional associated work will include a review and update to relay/protection schemes and SCADA RTU configurations at NIPCO's J6 and J7 Switching Stations.

3.2.2 Transmission Line Rebuild 1 – "*Rebuild the circuit from K338 to the new 69 kV tap station (NIPCO)"*

A 69kV transmission line will be rebuilt to accommodate the new generation resource interconnection. This rebuild will consist of nearly 0.5 miles of 69 kV double circuit and 1.7 miles of 69 kV single circuit, both rebuilt to accommodate at least 125 MVA. Reference Figure A2. All equipment followed NIPCO's internal design standards for minimum BIL, ampacity, and fault capabilities.

3.2.3 Transmission Line Rebuild 2 – "*Rebuild the K335 to K338 69 kV line 1 (NIPCO)"*

A 69kV transmission line will be rebuilt to accommodate the new generation resource interconnection. This rebuild will consist of nearly 0.4 miles of 69 kV single circuit, rebuilt to accommodate at least 125 MVA. Reference Figure A3. All equipment followed NIPCO's internal design standards for minimum BIL, ampacity, and fault capabilities.

3.2.4 Transmission Line Rebuild 3 – "*Rebuild the K335AMAI-NI8 to J6BOYER_-NI8 69kV Line 1 (NIPCO)*"

A 69kV transmission line will be rebuilt to accommodate the new generation resource interconnection. This rebuild will consist of nearly 0.7 miles of 69 kV single circuit, rebuilt to accommodate at least 125 MVA. Reference Figure A3. All equipment followed NIPCO's internal design standards for minimum BIL, ampacity, and fault capabilities.

3.2.5 Transmission Line Rebuild 4 – "*Rebuild the circuit from WAPA Denison to the new 69 kV tap station (NIPCO)"*

The existing 69 kV line from WAPA Denison to the new 69 kV tap station is owned by Corn Belt Power Cooperative. Corn Belt Power Cooperative will be responsible for providing a rebuild cost estimate, preliminary construction schedule, and rebuilding this line to accommodate the new generation resource interconnection. Reference Figure A4.

Likewise, the 69 kV bus and terminals at WAPA's Denison station are owned by WAPA. WAPA will be responsible for providing a rebuild cost estimate, preliminary construction schedule, and rebuilding to accommodate the new generation resource interconnection. Reference Figure A4.

3.2.6 Transmission Line Rebuild 5 – "*Rebuild the DENISON8 to J6BOYER_-NI8 69kV Line 1 (NIPCO)"*

A 69kV transmission line will be rebuilt to accommodate the new generation resource interconnection. This rebuild will consist of nearly 3 miles of 69 kV single circuit, rebuilt to accommodate at least 125 MVA. Reference Figure A5. All equipment followed NIPCO's internal design standards for minimum BIL, ampacity, and fault capabilities.

Likewise, the 69 kV bus and terminals at WAPA's Denison station are owned by WAPA. WAPA will be responsible for providing a rebuild cost estimate, preliminary construction schedule, and rebuilding to accommodate the new generation resource interconnection. Reference Figure A5.

3.3 Project Group #2

3.3.1 Transmission Line Build – "*Build new Denison – J6/Boyer 69kV line 2 (NIPCO)"*

A new 69kV transmission line will be built to accommodate the new generation resource interconnection. This build will consist of about 6 miles of 69 kV single circuit, built to accommodate at least 125 MVA. Reference Figure A6 for a *preliminary* line route. All equipment followed NIPCO's internal design standards for minimum BIL, ampacity, and fault capabilities.

Likewise, the 69 kV bus and terminals at WAPA's Denison station are owned by WAPA. WAPA will be responsible for providing a build cost estimate, preliminary construction schedule, and building onto their bus to accommodate the new generation resource interconnection. Reference Figure A6.

3.4 Environmental Requirements

Compliance with all applicable federal, state, and local regulations will be strictly adhered to. Additionally, all applicable and required permits and approvals will be obtained prior to construction.

3.5 Cost Estimates

3.5.1 Project Group #1

J17 69 kV Switching Station – "Build a new 69 kV tap station cutting off DENISON8 - MANNINGTAP 8 and K338 - K318 circuits (NIPCO)"	**Current Year $**
Engineering Labor	$50,000
Construction Labor	$1,000,000
Reactive Compensation (Labor & Materials)	$100,000
Material	$1,550,000
Right of Way	$100,000
Station Total	**$2,800,000**
Transmission Line Rebuild 1 – "Rebuild the circuit from K338 to the new 69 kV tap station (NIPCO)"	**Current Year $**
Engineering Labor	$45,900
Construction Labor	$459,000
Reactive Compensation (Labor & Materials)	$183,600
Material	$413,100
Right of Way	$0
Line Subtotal	**$1,101,600**
Transmission Line Rebuild 2 – "Rebuild the K335 to K338 69 kV line 1 (NIPCO)"	**Current Year $**
Engineering Labor	$5,700
Construction Labor	$57,000
Reactive Compensation (Labor & Materials)	$22,800
Material	$51,300
Right of Way	$0
Line Subtotal	**$136,800**
Transmission Line Rebuild 3 – "Rebuild the K335AMAI-NI8 to J6BOYER_-NI8 69kV Line 1 (NIPCO)"	**Current Year $**
Engineering Labor	$19,300
Construction Labor	$193,000
Reactive Compensation (Labor & Materials)	$77,200
Material	$173,700
Right of Way	$0
Line Subtotal	**$463,200**
Transmission Line Rebuild 5 – "Rebuild the DENISON8 to J6BOYER_-NI8 69kV Line 1 (NIPCO)"	**Current Year $**
Engineering Labor	$86,400
Construction Labor	$864,000
Reactive Compensation (Labor & Materials)	$345,600
Material	$777,600
Right of Way	$0
Line Subtotal	**$2,073,600**
TOTAL INTERCONNECTION COST	**$6,575,200**

3.5.2 Project Group #2

Transmission Line Build – "Build new Denison – J6/Boyer 69kV line 2 (NIPCO)"	**Current Year $**
Engineering Labor	$222,000
Construction Labor	$2,220,000
Reactive Compensation (Labor & Materials)	$948,000
Material	$1,998,000
Right of Way	$300,000
Line Subtotal	**$5,688,000**
TOTAL INTERCONNECTION COST	**$5,688,000**

3.6 Construction Schedules

3.6.1 Project Group #1

J17 69 kV Switching Station – "Build a new 69 kV tap station cutting off DENISON8 - MANNINGTAP 8 and K338 - K318 circuits (NIPCO)"			
Activity	**Duration**	**Estimated Start**	**Estimated Finish**
Executed GIA-Notice To Proceed letter	--	Month 0	--
Project Planning	1 Months	Month 0	Month 1
Engineering Design	3 Months	Month 1	Month 4
Equipment Procurement	6 Months	Month 4	Month 10
Advertise and Award Construction Contracts	2 Months	Month 4	Month 6
Construction	10 Months	Month 6	Month 16
Energize and In-Service Date	--	--	Month 16
Transmission Line Rebuild 1 – "Rebuild the circuit from K338 to the new 69 kV tap station (NIPCO)"			
Activity	**Duration**	**Estimated Start**	**Estimated Finish**
Executed GIA-Notice To Proceed letter	--	Month 0	--
Project Planning	1 Month	Month 0	Month 1
Engineering Design	1 Month	Month 1	Month 2
Equipment Procurement	6 Month	Month 2	Month 8
Advertise and Award Construction Contracts	2 Month	Month 3	Month 5
Construction	2 Month	Month 8	Month 10
Energize and In-Service Date	--	--	Month 10
Transmission Line Rebuild 2 – "Rebuild the K335 to K338 69 kV line 1 (NIPCO)"			
Activity	**Duration**	**Estimated Start**	**Estimated Finish**
Executed GIA-Notice To Proceed letter	--	Month 0	--
Project Planning	1 Month	Month 0	Month 1
Engineering Design	1 Month	Month 1	Month 2
Equipment Procurement	6 Month	Month 2	Month 8
Advertise and Award Construction Contracts	2 Month	Month 3	Month 5
Construction	1 Month	Month 10	Month 11
Energize and In-Service Date	--	--	Month 11
Transmission Line Rebuild 3 – "Rebuild the K335AMAI-NI8 to J6BOYER_-NI8 69kV Line 1 (NIPCO)"			
Activity	**Duration**	**Estimated Start**	**Estimated Finish**
Executed GIA-Notice To Proceed letter	--	Month 0	--
Project Planning	1 Month	Month 0	Month 1
Engineering Design	1 Month	Month 1	Month 2
Equipment Procurement	6 Month	Month 2	Month 8
Advertise and Award Construction Contracts	2 Month	Month 3	Month 5
Construction	1 Month	Month 11	Month 12
Energize and In-Service Date	--	--	Month 12

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Transmission Line Rebuild 5 – "Rebuild the DENISON8 to J6BOYER_-NI8 69kV Line 1 (NIPCO)"			
Activity	**Duration**	**Estimated Start**	**Estimated Finish**
Executed GIA-Notice To Proceed letter	--	Month 0	--
Project Planning	1 Month	Month 1	Month 2
Engineering Design	1 Month	Month 2	Month 3
Equipment Procurement	6 Month	Month 3	Month 9
Advertise and Award Construction Contracts	2 Month	Month 3	Month 5
Construction	2 Month	Month 12	Month 14
Energize and In-Service Date	--	--	Month 14

NOTES:

1) Much of the above build or rebuild can occur concurrently. The overall lead time for Project Group #1 is estimated to be 16 months.

2) As noted in the project summary above, WAPA and Corn Belt Power Cooperative will need to provide project lead times for their own line rebuild, station, and terminal upgrades.

3.6.2 Project Group #2

Transmission Line Build – "Build new Denison – J6/Boyer 69kV line 2 (NIPCO)"			
Activity	**Duration**	**Estimated Start**	**Estimated Finish**
Executed GIA-Notice To Proceed letter	--	Month 0	--
Project Planning & ROW	12 Month	Month 0	Month 12
Engineering Design	4 Month	Month 12	Month 16
Equipment Procurement	8 Month	Month 8	Month 16
Advertise and Award Construction Contracts	2 Month	Month 16	Month 18
Construction	3 Month	Month 18	Month 20
Energize and In-Service Date	--	--	Month 20

NOTE: As noted in the project summary above, WAPA will need to provide project lead times for their own station and terminal upgrades.

Figure A0: Existing System

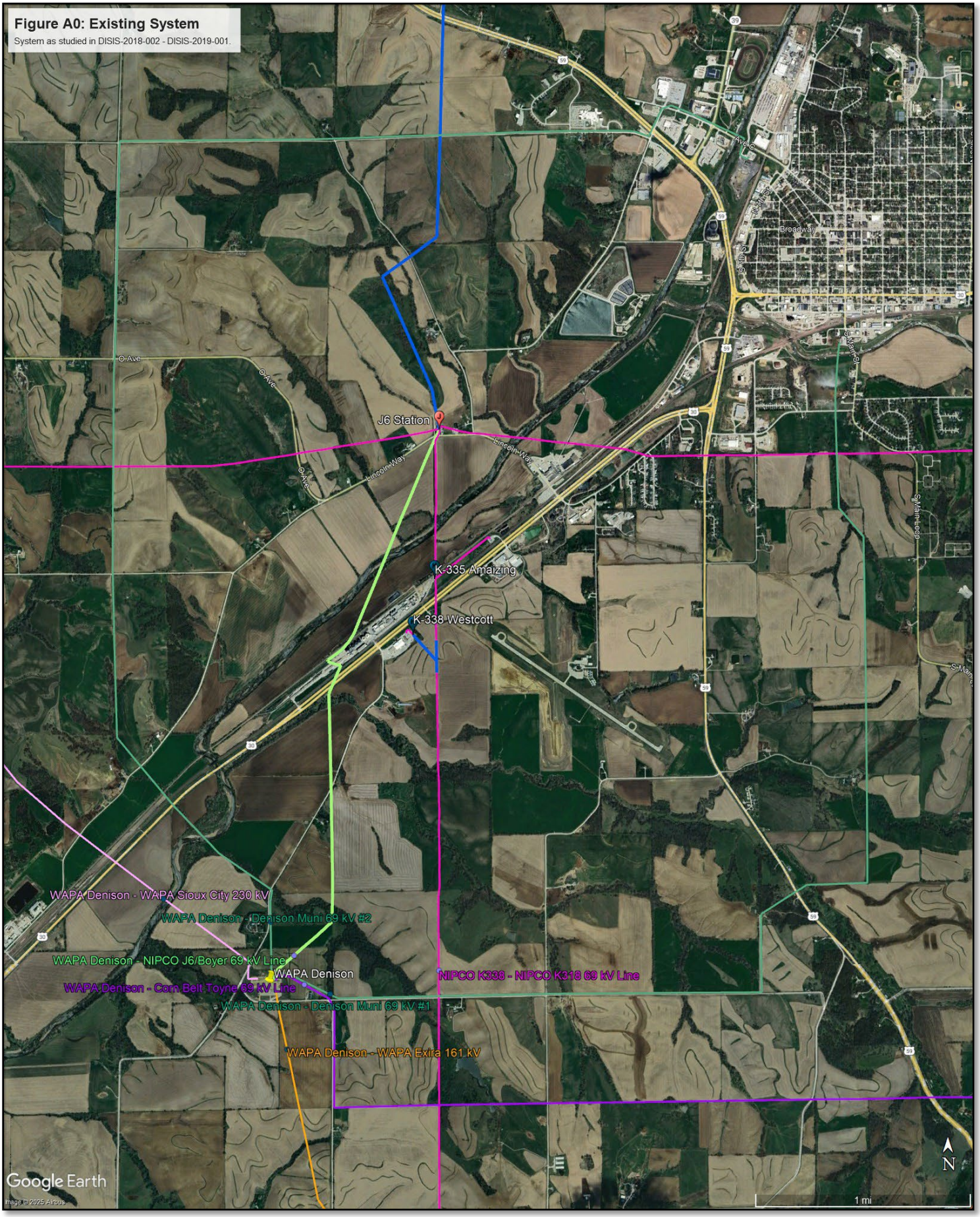


Figure A1: New Tap Station (J17 Switching Station)

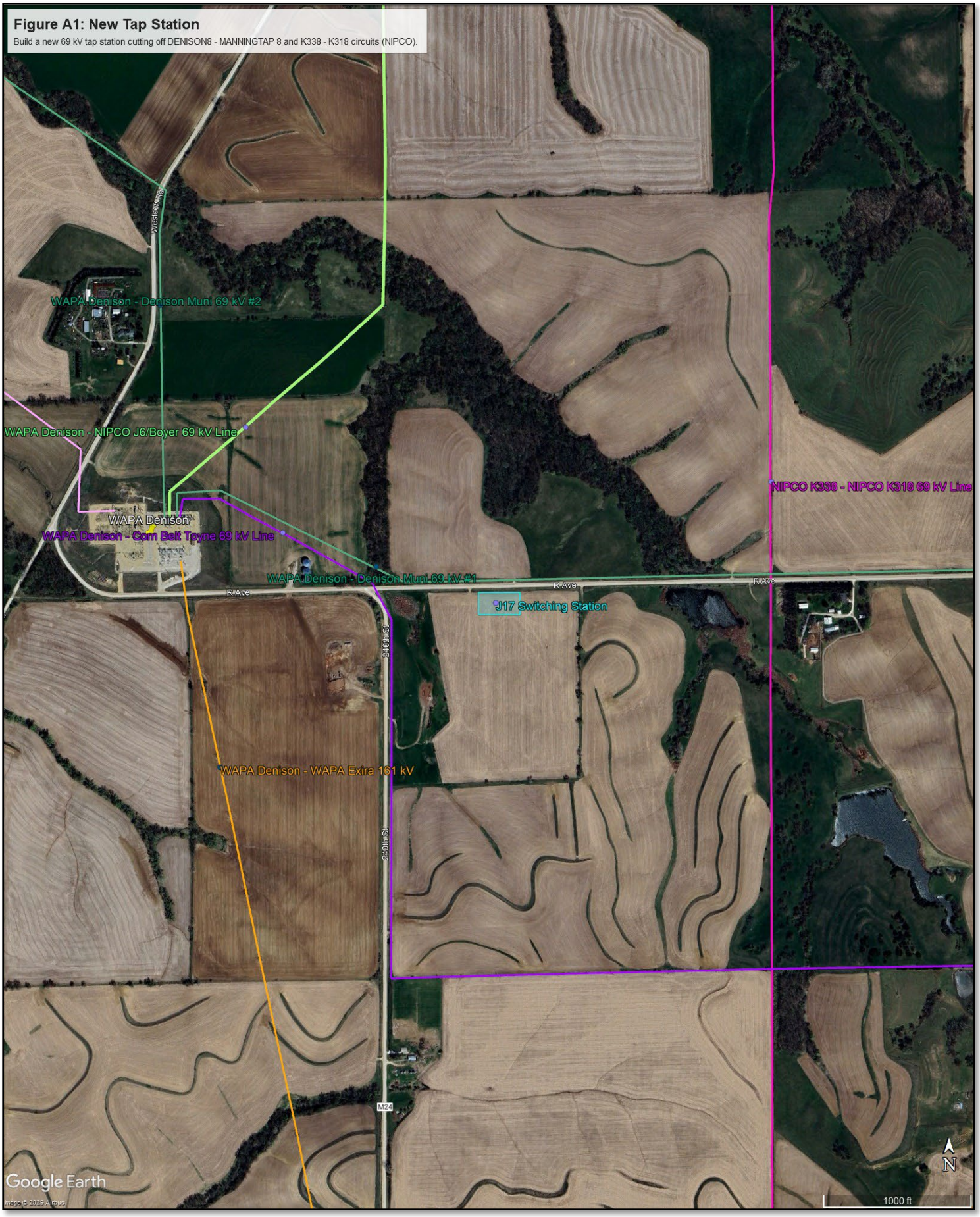


Figure A2: Transmission Line Rebuild 1

Figure A3: Transmission Line Rebuilds 2 & 3

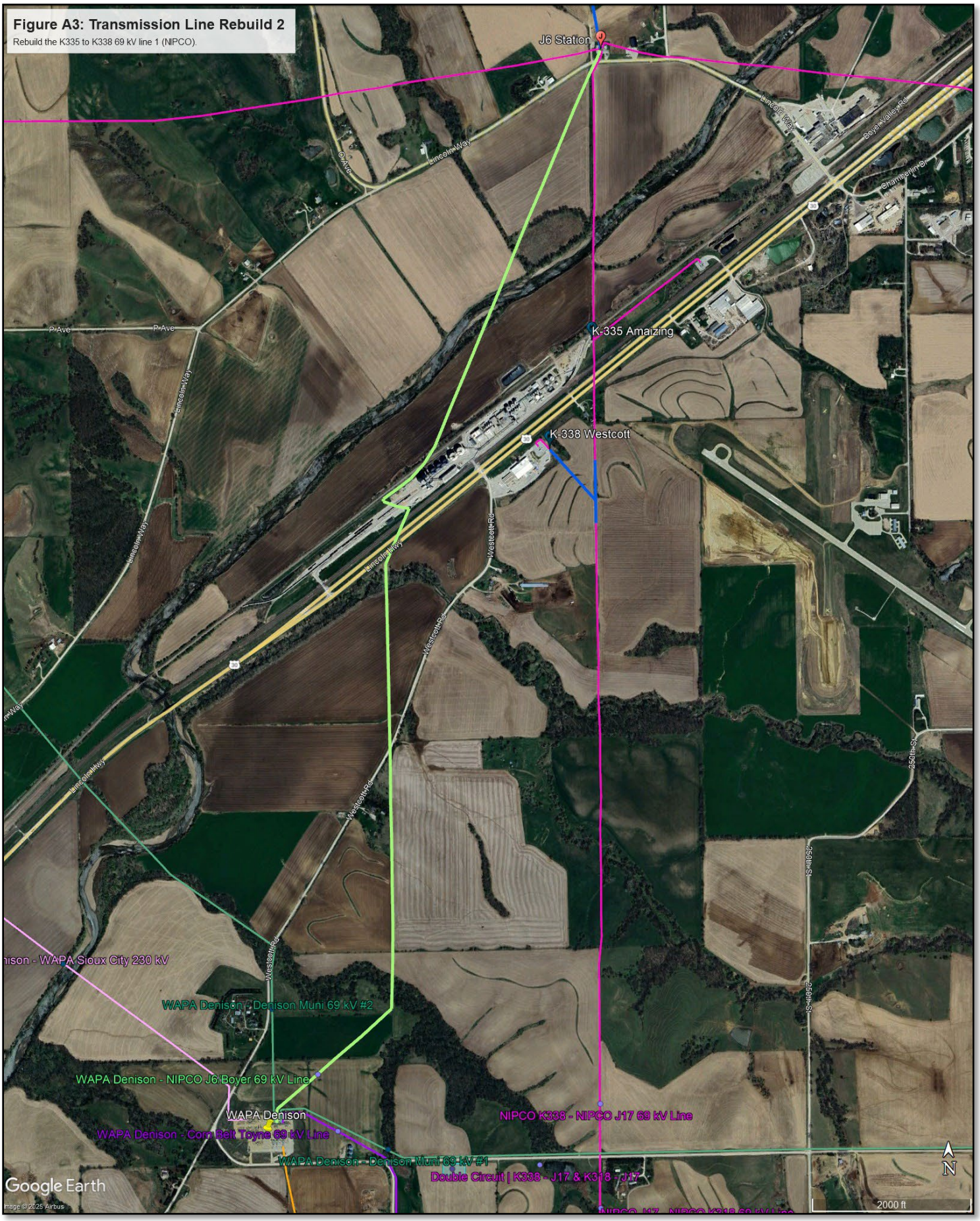


Figure A4: Transmission Line Rebuild 4

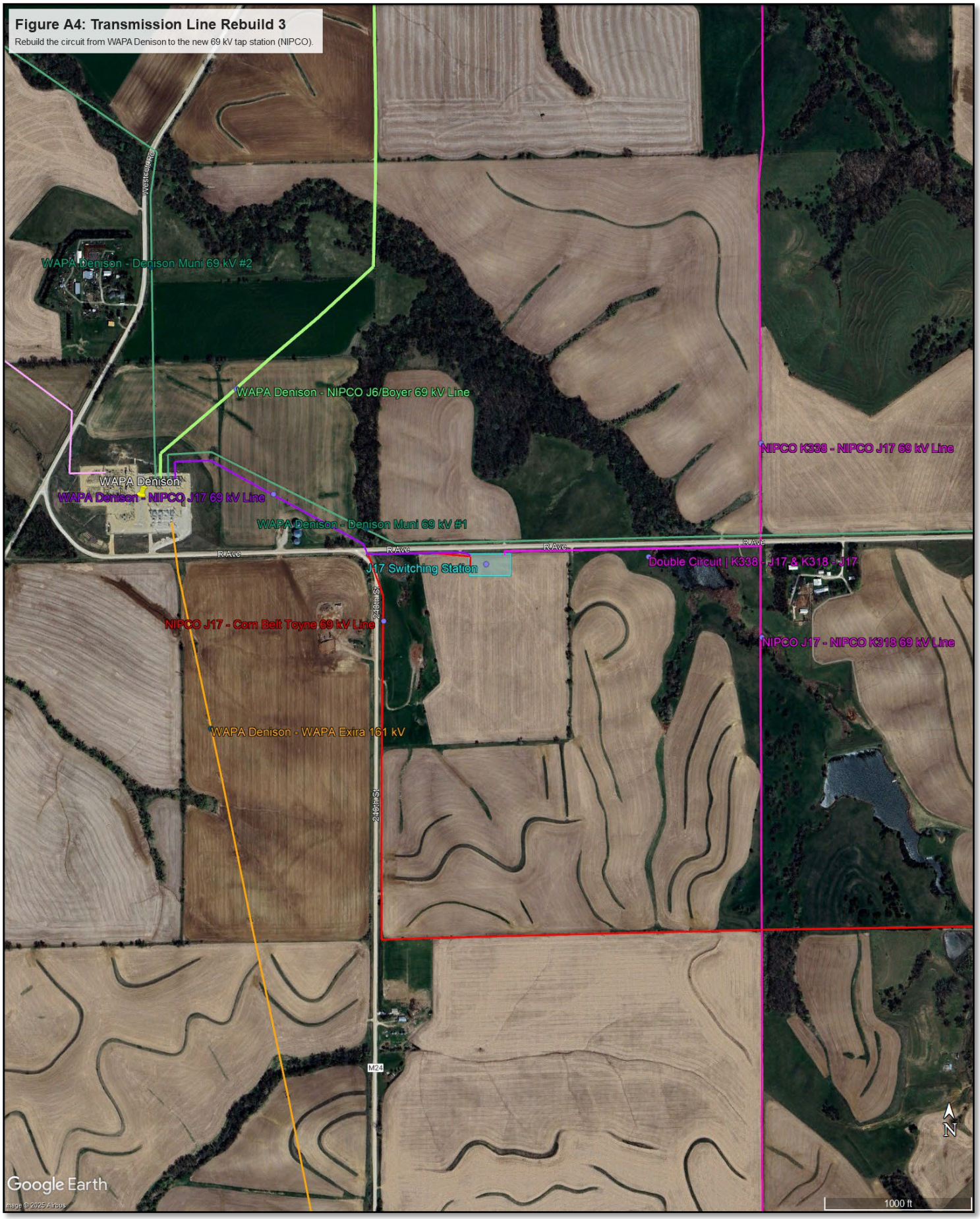


Figure A5: Transmission Line Rebuild 5

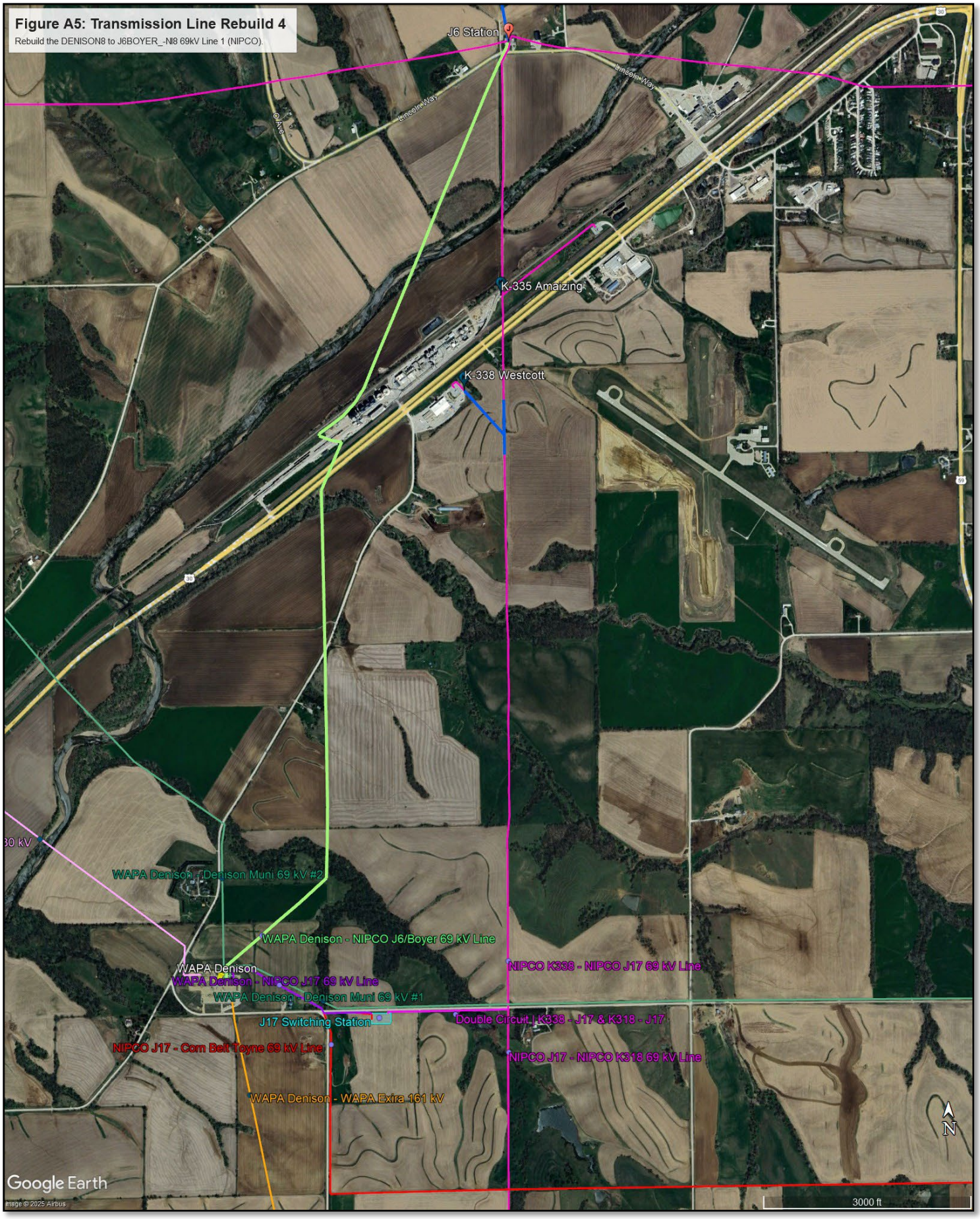
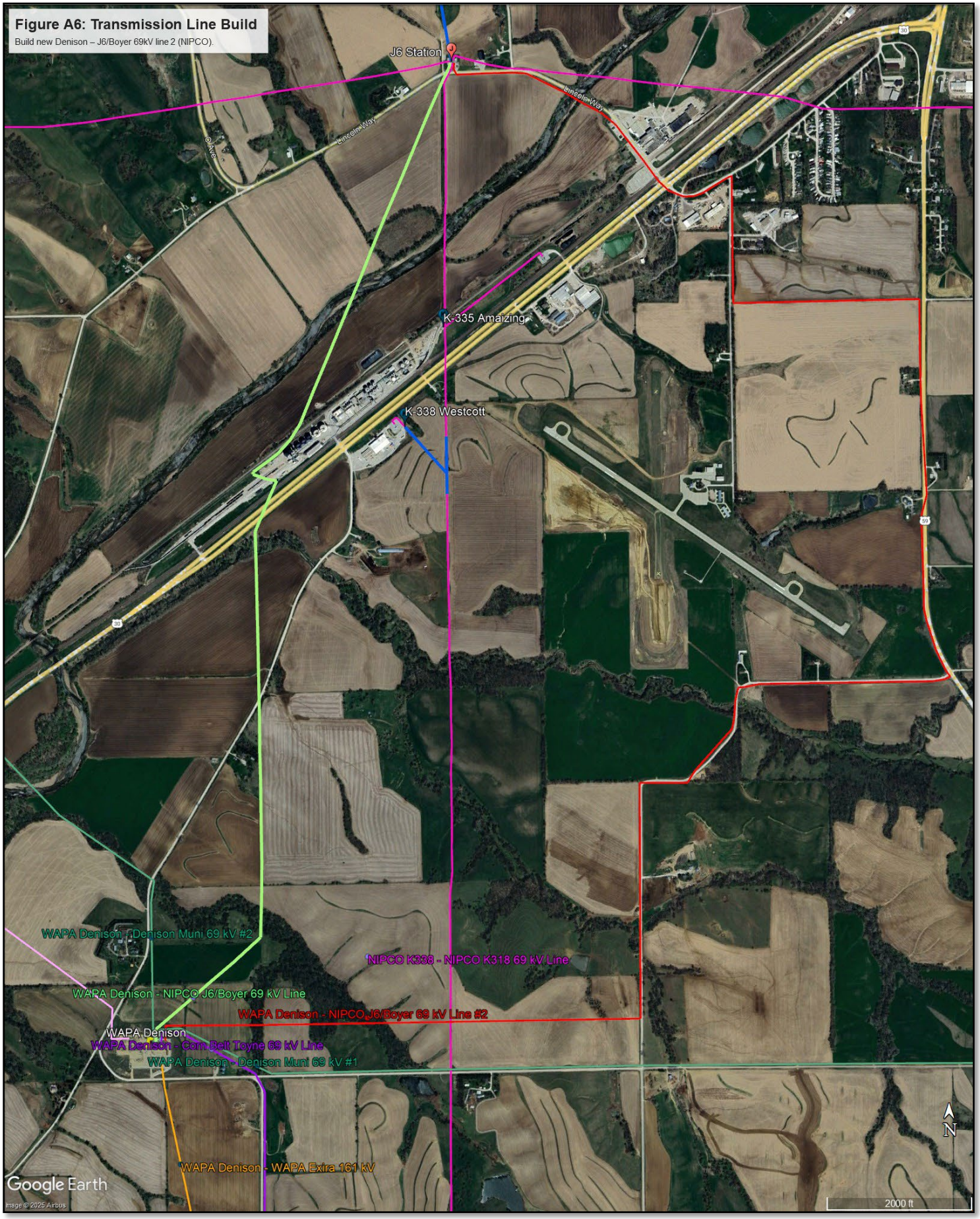


Figure A6: Transmission Line Build



Attachment A

SPP FACILITIES STUDY REQUEST LETTER

January 14, 2025

Subject: Facilities Study Request for DISIS-2018-002 – DISIS-2019-001

Dear Mr. Larson:

Per the Generator Interconnection Procedures (GIP), SPP requests that NIPCO perform facilities study in accordance with Section 8.11 for the following Interconnection and/or Network Upgrade(s):

Upgrade Type	UID	Upgrade Name	DISIS Cost Estimate	DISIS Lead Time
Network	TBD	Build a new 69 kV tap station cutting off DENISON8 - MANNINGTAP 8 and K338 - K318 circuits (NIPCO)	TBD	36
Network	TBD	Rebuild the circuit from K338 to the new 69 kV tap station (NIPCO)	TBD	36
Network	TBD	Rebuild the K335 to K338 69 kV line 1 (NIPCO)	TBD	36
Network	TBD	Rebuild the K335AMAI-NI8 to J6BOYER_-NI8 69kV Line 1	TBD	36
Network	TBD	Rebuild the circuit from WAPA Denison to the new 69 kV tap station (NIPCO)	TBD	36
Network	TBD	Rebuild the DENISON8 to J6BOYER_-NI8 69kV Line 1 (NIPCO)	TBD	36
Network	TBD	Build new Denison – J6/Boyer 69kV line 2 (NIPCO)	TBD	36

** If the upgrade cost studied is higher than 20% of DISIS estimates, please provide justification in the facility report.*

The scope of the Facilities Study is to determine the cost estimates of equipment, engineering, procurement, and construction as well as the associated lead times.

For the completion of this Facilities Study request, please provide a Facilities Study report to SPP within forty-five (45) calendar days to include all their Interconnection and Network Upgrade(s) listed in the table above. Additionally, please provide an updated and completed Standardized Cost Estimate Report (SCERT) via the Transmission Reporting and Communication (TRAC) tool.

Sincerely,
SPP Generator Interconnection Department
201 Worthen Drive
Little Rock, AR 72223-4936