Interconnection Feasibility Study

Requester: Community Energy, Inc.

#364 – Russellville Solar

Study Performed By:

Interconnection Planning & Special Studies

FINAL

August 12, 2019

CRITICAL ENERGY INFRASTRUCTURE INFORMATION (CEII)
CONFIDENTIAL
BUSINESS SENSITIVE

Executive Summary

The Tennessee Valley Authority (TVA) conducted an Interconnection Feasibility Study (IFS) at the request of Community Energy, Inc. to interconnect a solar Generating Facility with a maximum generating capability of 173.28 MW (gross) to the TVA system in Logan County, KY (see Appendix B).

The objective of the IFS is to identify all Adverse System Impacts on TVA's transmission system in order to maintain system reliability as a result of the Interconnection Request. The IFS will also determine the facility additions, modifications, and upgrades that are needed to maintain a reliable interconnection.

In addition to identifying all Adverse System Impacts on the TVA transmission system, TVA monitors its Local Power Companies (LPCs) as well as neighboring transmission systems for impacts. No potentially affected systems were identified as a result of the proposed interconnection.

The IFS was performed with and without prior requesters within the local study area. Prior requester queue numbers include: Q359, Q362, and Q363.

Due to Q359 having a POI on the same transmission line as Russellville Solar, a controller interaction study will be required prior to the Interconnection Agreement.

Without Priors

The study included steady-state (thermal & voltage) analysis, short circuit analysis, and reactive capability.

- Steady-state loadflow analysis determined that the proposed interconnection will not cause thermal violations on the TVA transmission system.
- Short circuit analysis determined that the proposed interconnection did not cause any breaker duty issues on the TVA transmission system.
- The evaluation of the reactive capability requirement of a 95% power factor (injecting and absorbing) at the Point of Interconnection (POI) did not identify the need for additional reactive support.

The study identified a need for the following system improvements:

Table ES-1: Direct Assignment Facilities & Required Network Upgrades without Priors

Direct Assignment Facilities	Cost Estimate ($k)
Provide new 161 kV three position ring bus station (Russellville SS) on the existing Springfield - Logan Aluminum 161 kV line. Provide generation meters, associated instrument transformers, and required communications path. Includes needed system protection upgrades for required transfer trip and pilot protection.	$9,800
Provide communications equipment for required transfer trip and SCADA at new Generating Facility.	$300
System protection and communications work at remote sites for pilot protection and communications path (Springfield and Logan Aluminum). Includes replacing line relays at Springfield and Logan Aluminum.	$1,000
Network Upgrades	
None.	$0
Total	**$11,100**

Notes:

1. Costs provided for IFS are based on planning level estimates (±50%).
2. Community Energy, Inc. is responsible for the construction and cost of the 161 kV TL and fiber communication path needed between the solar facilities and the TVA station, built to TVA's specifications.
3. Typical project completion time for this scope of work is approximately 3 years after the completion of the Facilities Study and TVA receives authorization to begin work; however, a refined project schedule will be developed during the Facilities Study.

With Priors

The study included steady-state (thermal & voltage) analysis, short circuit analysis, and reactive capability.

- Steady-state loadflow analysis determined that the proposed interconnection will cause thermal violations on the TVA transmission system. These violations will be explained in the following portions of this report.

- Short circuit analysis determined that the proposed interconnection did not cause any breaker duty issues on the TVA transmission system.

- The evaluation of the reactive capability requirement of a 95% power factor (injecting and absorbing) at the Point of Interconnection (POI) did not identify the need for additional reactive support.

The study identified a need for the following system improvements:

Table ES-2: Direct Assignment Facilities & Required Network Upgrades with Priors

Direct Assignment Facilities	Cost Estimate ($k)
Provide additional breaker to Q359 161 kV three position ring bus station on the existing Springfield - Logan Aluminum 161 kV line. Provide generation meters, associated instrument transformers, and required communications path. Includes needed system protection upgrades for required transfer trip and pilot protection.	$2,000
Provide communications equipment for required transfer trip and SCADA at new Generating Facility.	$300
Network Upgrades	
Uprate 0.16 miles of 161 kV transmission line.	$200
Total	**$2,500[4]**

Notes:

1. Costs provided for IFS are based on planning level estimates (±50%).
2. Community Energy, Inc. is responsible for the construction and cost of the 161 kV TL and fiber communication path needed between the solar facilities and the TVA station, built to TVA's specifications.
3. Typical project completion time for this scope of work is approximately 3 years after the completion of the Facilities Study and TVA receives authorization to begin work; however, a refined project schedule will be developed during the Facilities Study.
4. Cost estimates were made under the assumption that a three position ring bus station will be constructed by Q359 (ISD of 06/01/2022). If the Q359 three position ring bus station is not constructed or is delayed, Community Energy, Inc. will be responsible for constructing a three position ring bus on the Springfield – Logan Aluminum 161 kV transmission line.

Table of Contents

List of Tables

1.0 Introduction

The purpose of this IFS is to determine all Adverse System Impacts on TVA's transmission system caused by this Community Energy Interconnection Request. This report identifies the required Network Upgrades and Direct Assignment Facilities in order to maintain the reliability of the TVA system as a result of a new interconnection in Logan County, Kentucky.

Table 1-1: Requester Community Energy, Inc.

Interconnection Location	Requested ISD	Number of Units	Gross AC Max Capacity	Net AC Max Capacity
Springfield – Logan Aluminum 161 kV TL	06/15/2022	57 inverters	173.28 MW/182.4 MVA	171.16 MW

2.0 Model Development

The power flow models utilized in this study originated from the Eastern Interconnection Reliability Assessment Group (ERAG), Multi-Regional Modeling Working Group (MMWG), and the SERC Long Term Study Group (LTSG) 2018 series of power flow base cases. These models are created as part of the ERAG and SERC regional modeling process. The most up-to-date TVA load forecast and generation plans available at the time of case creation were used in the cases, including any projected transmission upgrades. Deviations from the normal generation dispatch may be made, if the request is found to be sensitive to local generation. All confirmed prior Interconnection Requests have priority over TVA's available transmission capacity. Offline generators that have existing Interconnection Rights on the TVA system may be dispatched at the output that was studied through the interconnection process in order to necessarily reflect those rights.

The short circuit models utilized in this study originated from the SERC Short Circuit Database Working Group (SCDWG) 2019 series of short circuit models. The most up-to-date transmission and generation plans, including prior Interconnection Requests were considered during the process of case creation.

A notice concerning assumptions made in the model development process is contained in Appendix A.

3.0 Study Criteria and Methodology

This study was conducted consistent with TVA IFS processes and practices. All studies performed in the IFS are designed to meet applicable reliability standards and TVA's planning practices and procedures. Information regarding contingencies, monitored elements, generation dispatch, and load profiles evaluated in this study are provided upon request.

The analysis of the Interconnection Request was conducted using a combination of software including PTI PSS/E, PowerWorld Simulator, and PowerGEM TARA.

Community Energy, Inc. provided modeling details regarding the proposed interconnection to Transmission Planning.

The interconnection arrangement used for this study can be seen in the interconnection diagram included in Appendix C of this report. Any changes to the proposed interconnection arrangement could result in the need for a new study and/or a change in the estimated costs.

4.0 Study Results

The following sections summarize the facilities required for the interconnection based on the results of steady state, short circuit, and stability studies.

4.1 Without Prior Requesters

4.1.1 Direct Assignment Facilities

4.1.1.1 Interconnection

The table below describes the necessary Direct Assignment Facilities on the TVA system in order to support the interconnection arrangement shown in Appendix C and includes cost estimates.

Table 4-1: Direct Assignment Facilities without Priors

Direct Assignment Facilities	Cost Estimate ($k)
Provide new 161 kV three position ring bus station (Russellville SS) on the existing Springfield - Logan Aluminum 161 kV line. Provide generation meters, associated instrument transformers, and required communications path. Includes needed system protection upgrades for required transfer trip and pilot protection.	$9,800
Provide communications equipment for required transfer trip and SCADA at new Generating Facility.	$300
System protection and communications work at remote sites for pilot protection and communications path (Springfield and Logan Aluminum). Includes replacing line relays at Springfield and Logan Aluminum.	$1,000
Total	**$11,100**

Notes:

1. Costs provided for IFS are based on planning level estimates (±50%).
2. Community Energy, Inc. is responsible for the construction and cost of the 161 kV TL and fiber communication path needed between the solar facility and the TVA station, built to TVA's specifications.
3. Typical project completion time for this scope of work is approximately 3 years after the completion of the Facilities Study and TVA receives authorization to begin work; however, a refined project schedule will be developed during the Facilities Study.

4.1.1.2 Fault Study

The short circuit analysis determined that the proposed interconnection did not cause any breaker duty issues on the TVA transmission system.

4.1.1.3 System Protection

Dual digital pilot protection on the Logan Aluminum – Russellville Solar Switching Station 161 kV TL and the Russellville Solar Switching Station – Springfield 161 kV TL will be required for interconnection. Transfer trip protection will be required from Russellville Solar Switching Station to the Generating Facility. TVA reserves the right to disconnect the Generating Facility for loss of communications between Russellville Solar Switching Station and the Generating Facility. Additionally, transfer trip will be sent from the Russellville Solar Switching Station to Logan Aluminum and Springfield for breaker failure scenarios.

4.1.1.4 Power Quality

TVA will require the Generating Facility to meet harmonic limits of IEEE 519, flicker limits of IEEE 1453, and unbalance limits of IEC 61000-3-13 at the metering point. The power quality of the Generating Facility will be monitored by the meter installed under the Direct Assignment Facilities of this Interconnection. If the power quality does not meet IEEE 519, IEEE 1453, or IEC 61000-3-13 then TVA reserves the right to disconnect the Generating Facility. A TVA-owned PQ relay may be required to trip for harmonic voltage distortion and/or excessive harmonic currents. Specific details including time delay settings will be outlined in the interconnection agreement.

Preliminary harmonic studies reveal voltage distortion above desired levels. Prior to signature of an Interconnection Agreement, TVA will evaluate the need to require harmonic injection limits that are more stringent than IEEE 519.

TVA calculated the Short Circuit Ratio (SCR) to be 6.10 at the POI with the strong source out, using the traditional calculation method. Due to the combination of the weak system strength and the transformer size proposed for this Interconnection, TVA analysis shows voltage dips of approximately 9.6% that occur during transformer energization. TVA will not allow voltage dips over 5% of the nominal voltage (161 kV) during transformer energization. TVA will require Community Energy to provide a method for mitigating this issue and analysis that proves the method chosen is adequate. TVA will supply TVA system information to aid in performing the analysis as needed.

Following construction of the interconnecting facilities, TVA will require Community Energy to set their inverters such that they remain connected during defined frequency and voltage excursions. Exact settings will be documented in the Interconnection Agreement.

4.1.1.5 Reactive Power Capability and Voltage Control

In compliance with FERC Order No. 827, nonsynchronous generators are required to provide dynamic reactive power to ensure 95% power factor (injecting and absorbing) at the generator bus. TVA enforces FERC Order No. 827 and requires 95% power factor (injecting and absorbing) operation at the POI. Static capacitors may be used only to compensate for system losses between the generator bus and the POI. Therefore, TVA will evaluate the dynamic power capability at the generator bus and also confirm that the 95% power factor (injecting and absorbing) is able to be met at the POI.

Table 4-2: Reactive Power Evaluation without Priors

At Generator				At POI			Additional Reactive Power Needed
MW	MVA	Operating PF (Leading & Lagging)	MVAR (injecting & absorbing)	MW (injecting)	MVAR (injecting)	MVAR Needed	MVAR
173.28	182.40	0.95	56.95	171.05	70.05	56.20	0.00

The evaluation of the reactive capability requirement of a 95% power factor (leading and lagging) at the POI did not identify the need for additional reactive support.

The reactive study considered a 32 MVAR capacitor bank, which is planned to be installed by Community Energy, Inc.

The installed inverters must be capable of controlling voltage. Voltage control capability may not be enabled, but is required for interconnection.

In accordance with NERC guidance, TVA asks that the requester designs the inverter controls such that momentary cessation of current injection is avoided.

4.1.2 Network Upgrades

4.1.2.1 Loadflow

Steady-state loadflow analysis determined that the proposed interconnection will not cause any thermal violations on the TVA transmission system.

4.2 With Prior Requesters

4.2.1 Direct Assignment Facilities

4.2.1.1 Interconnection

The table below describes the necessary Direct Assignment Facilities on the TVA system in order to support the interconnection arrangement shown in Appendix D and includes cost estimates.

Table 4-3: Direct Assignment Facilities with Priors

Direct Assignment Facilities	Cost Estimate ($k)
Provide additional breaker to existing 161 kV three position ring bus station (Russellville SS) on the existing Springfield - Logan Aluminum 161 kV line. Provide generation meters, associated instrument transformers, and required communications path. Includes needed system protection upgrades for required transfer trip and pilot protection.	$2,000
Provide communications equipment for required transfer trip and SCADA at new Generating Facility.	$300
Total	**$2,300[4]**

Notes:

1. Costs provided for IFS are based on planning level estimates (±50%).
2. Community Energy, Inc. is responsible for the construction and cost of the 161 kV TL and fiber communication path needed between the solar facility and the TVA station, built to TVA's specifications.
3. Typical project completion time for this scope of work is approximately 3 years after the completion of the Facilities Study and TVA receives authorization to begin work; however, a refined project schedule will be developed during the Facilities Study.
4. Cost estimates were made under the assumption that a three position ring bus station will be constructed by Q359 (ISD of 06/01/2022). If the Q359 three position ring bus station is not constructed or is delayed, Community Energy, Inc. will be responsible for constructing a three position ring bus on the Springfield – Logan Aluminum 161 kV transmission line.

4.2.1.2 Fault Study

The short circuit analysis determined that the proposed interconnection did not cause any breaker duty issues on the TVA transmission system.

4.2.1.3 System Protection

Dual digital pilot protection on the Logan Aluminum – Russellville Solar Switching Station 161 kV TL and the Russellville Solar Switching Station – Springfield 161 kV TL will be required for interconnection. Transfer trip protection will be required from Russellville Solar Switching Station to the Generating Facility. TVA reserves the right to disconnect the Generating Facility for loss of communications between Russellville Solar Switching Station and the Generating Facility. Additionally, transfer trip will be sent from the Russellville Solar Switching Station to Logan Aluminum and Springfield for breaker failure scenarios.

4.2.1.4 Power Quality

TVA will require the Generating Facility to meet harmonic limits of IEEE 519, flicker limits of IEEE 1453, and unbalance limits of IEC 61000-3-13 at the metering point. The power quality of the Generating Facility will be monitored by the meter installed under the Direct Assignment Facilities of this Interconnection. If the power quality does not meet IEEE 519, IEEE 1453, or IEC 61000-3-13 then TVA reserves the right to disconnect the Generating Facility. A TVA-owned PQ relay may be required to trip for harmonic voltage distortion and/or excessive harmonic currents. Specific details including time delay settings will be outlined in the interconnection agreement.

Preliminary harmonic studies reveal voltage distortion above desired levels. Prior to signature of an Interconnection Agreement, TVA will evaluate the need to require harmonic injection limits that are more stringent than IEEE 519.

TVA calculated the Short Circuit Ratio (SCR) to be 2.87 at the POI with the strong source out, using the traditional calculation method. This calculation includes Q359 since the same POI will be used for both with priors. Due to the combination of the weak system strength and the transformer size proposed for this Interconnection, TVA analysis shows voltage dips of approximately 9.6% that occur during transformer energization. TVA will not allow voltage dips over 5% of the nominal voltage (161 kV) during transformer energization. TVA will require Community Energy to provide a method for mitigating this issue and analysis that proves the method chosen is adequate. TVA will supply TVA system information to aid in performing the analysis as needed.

Following construction of the interconnecting facilities, TVA will require Community Energy to set their inverters such that they remain connected during defined frequency and voltage excursions. Exact settings will be documented in the Interconnection Agreement.

4.2.1.5 Reactive Power Capability and Voltage Control

In compliance with FERC Order No. 827, nonsynchronous generators are required to provide dynamic reactive power to ensure 95% power factor (injecting and absorbing) at the generator bus. TVA enforces FERC Order No. 827 and requires 95% power factor (injecting and absorbing) operation at the POI. Static capacitors may be used only to compensate for system losses between the generator bus and the POI. Therefore, TVA will evaluate the dynamic power capability at the generator bus and also confirm that the 95% power factor (injecting and absorbing) is able to be met at the POI.

Table 4-4: Reactive Power Evaluation with Priors

At Generator				At POI			Additional Reactive Power Needed
MW	MVA	Operating PF (Leading & Lagging)	MVAR (injecting & absorbing)	MW (injecting)	MVAR (injecting)	MVAR Needed	MVAR
173.28	182.40	0.95	56.95	171.02	69.06	56.21	0.00

The evaluation of the reactive capability requirement of a 95% power factor (leading and lagging) at the POI did not identify the need for additional reactive support.

The reactive study considered a 32 MVAR capacitor bank, which is planned to be installed by Community Energy, Inc.

The installed inverters must be capable of controlling voltage. Voltage control capability may not be enabled, but is required for interconnection.

In accordance with NERC guidance, TVA asks that the requester designs the inverter controls such that momentary cessation of current injection is avoided.

4.2.2 Network Upgrades

4.2.2.1 Loadflow

Steady-state loadflow analysis determined that the proposed interconnection will cause the following thermal violations on the TVA transmission system:

Table 4-5: Thermal Overload Violations with Priors

Season	Contingency	Overload	Rating (MVA)	Loading % Before	Loading % After	Fix	Cost Estimate ($k)
Summer	Logan Aluminum – Q359_161_POI 161 kV TL	Springfield – Adairville 161 kV	350.0	68.9	100.4	Uprate 0.16 miles of ACSR 2034.5 – 72/7 to 100°C.	$200

4.3 Project Schedule

Typical project completion time for this scope of work with or without priors is approximately 3 years after completion of the Facilities Study and TVA receives authorization to begin work; however, a refined project schedule will be developed during the Facilities Study.

The interconnection of this Community Energy Russellville project to the TVA system shall at all times be in accordance with the terms and conditions of the interconnection agreement. Subject to (a) the completion of all required studies, (b) execution of an appropriate interconnection agreement, and (c) the completion of all TVA and Community Energy Russellville's facilities (including the direct assignment facilities identified in this study) required for a safe and reliable interconnection, no such interconnection shall occur without the prior approval of TVA.

5.0 Conclusion

In conclusion, the identified Direct Assignment Facilities and Network Upgrades on the TVA transmission system (as shown below) are required in order for Community Energy, Inc. to interconnect the Russellville Solar 173.28 MW (gross) solar generating facility to the TVA transmission system.

Without Priors

Table 5-1: Direct Assignment Facilities & Required Network Upgrades without Priors

Direct Assignment Facilities	Cost Estimate ($k)
Provide new 161 kV three position ring bus station (Russellville SS) on the existing Springfield - Logan Aluminum 161 kV line. Provide generation meters, associated instrument transformers, and required communications path. Includes needed system protection upgrades for required transfer trip and pilot protection.	$9,800
Provide communications equipment for required transfer trip and SCADA at new Generating Facility.	$300
System protection and communications work at remote sites for pilot protection and communications path (Springfield and Logan Aluminum). Includes replacing line relays at Springfield and Logan Aluminum.	$1,000
Network Upgrades	
None.	$0
Total	**$11,100**

Notes:

1. Costs provided for IFS are based on planning level estimates (±50%).
2. Community Energy, Inc. is responsible for the construction and cost of the 161 kV TL and fiber communication path needed between the solar facilities and the TVA station, built to TVA's specifications.
3. Typical project completion time for this scope of work is approximately 3 years after the completion of the Facilities Study and TVA receives authorization to begin work; however, a refined project schedule will be developed during the Facilities Study.

With Priors

Table 5-2: Direct Assignment Facilities & Required Network Upgrades with Priors

Direct Assignment Facilities	Cost Estimate ($k)
Provide additional breaker to existing 161 kV three position ring bus station (Russellville SS) on the existing Springfield - Logan Aluminum 161 kV line. Provide generation meters, associated instrument transformers, and required communications path. Includes needed system protection upgrades for required transfer trip and pilot protection.	$2,000
Provide communications equipment for required transfer trip and SCADA at new Generating Facility.	$300
Network Upgrades	
Uprate 0.16 miles of 161 kV transmission line.	$200
Total	**$2,500[4]**

Notes:

1. Costs provided for IFS are based on planning level estimates (±50%).
2. Community Energy, Inc. is responsible for the construction and cost of the 161 kV TL and fiber communication path needed between the solar facilities and the TVA station, built to TVA's specifications.
3. Typical project completion time for this scope of work is approximately 3 years after the completion of the Facilities Study and TVA receives authorization to begin work; however, a refined project schedule will be developed during the Facilities Study.
4. Cost estimates were made under the assumption that a three position ring bus station will be constructed by Q359 (ISD of 06/01/2022). If the Q359 three position ring bus station is not constructed or is delayed, Community Energy, Inc. will be responsible for constructing a three position ring bus on the Springfield – Logan Aluminum 161 kV transmission line.

With and Without Priors

In addition to identifying all Adverse System Impacts on the TVA transmission system, TVA monitors its Local Power Companies (LPCs) as well as neighboring transmission systems for impacts. No potentially affected systems were identified as a result of the proposed interconnection.

If Community Energy decides to move forward with the project, Community Energy will have to request a System Impact Study (SIS), in which a transient stability study will be completed.

Dual digital pilot protection on the Logan Aluminum – Russellville Solar Switching Station 161 kV TL and the Russellville Solar Switching Station – Springfield 161 kV TL will be required for interconnection. Transfer trip protection will be required from Russellville Solar Switching Station to the Generating Facility. TVA reserves the right to disconnect the Generating Facility for loss of communications between Russellville Solar Switching Station and the Generating Facility. Additionally, transfer trip will be sent from the Russellville Solar Switching Station to Logan Aluminum and Springfield for breaker failure scenarios.

TVA will require the Generating Facility to meet harmonic limits of IEEE 519, flicker limits of IEEE 1453, and unbalance limits of IEC 61000-3-13 at the metering point. The power quality of the Generating Facility will be monitored by the meter installed under the Direct Assignment Facilities of this Interconnection. If the power quality does not meet IEEE 519, IEEE 1453, or IEC 61000-3-13 then TVA reserves the right to disconnect the Generating Facility. A TVA-owned PQ relay may be required to trip for harmonic voltage distortion and/or excessive harmonic currents. Specific details including time delay settings will be outlined in the interconnection agreement.

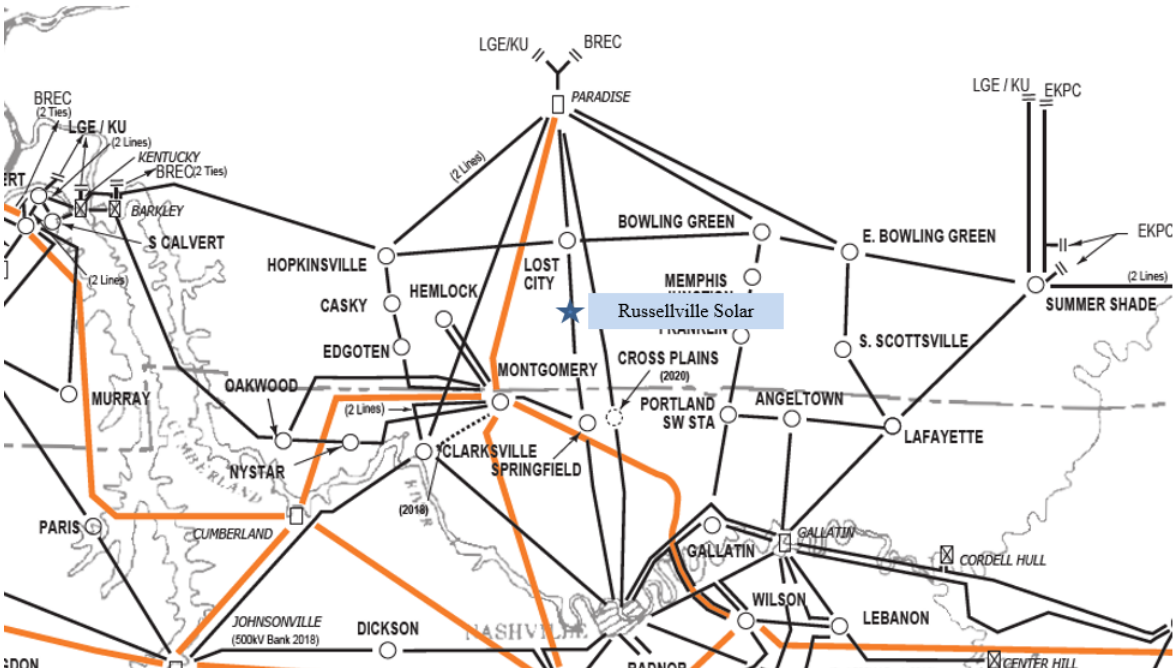
This IFS only evaluates the impacts of interconnecting Community Energy's Russellville Solar Generating Facility to the TVA transmission system. Transmission service may be requested from TVA in accordance with TVA's Transmission Service Guidelines to transfer power from the solar PV project. However, if transmission service is available, service will be contingent on an Interconnection Agreement (which will provide only for the interconnection of the project to the TVA transmission system and will not in any way guarantee the ability of the transmission system to deliver, transmit, or otherwise transfer power from the project) being executed and all TVA and Community Energy Russellville facilities (including the direct assignment facilities identified in this study) required for a safe and reliable interconnection being completed.

Appendix A: Notice Regarding Transmission Planning Study Information

This information has been derived utilizing power flow models of projected future system conditions. These planning models incorporate many assumptions concerning loads, transmission system configuration, generation dispatch, firm transactions, and other information pertinent to building power flow models. TVA uses available information about transmission and generation additions and upgrades that may subsequently change. The system models external to TVA were either obtained from the applicable control area, or from the most recent SERC base cases. TVA is not responsible for the information provided by others in the development of these models. The cases represent TVA's best effort in developing power flow models for use within TVA as a starting point for interconnection studies, at the point in time when the analysis is done. TVA retains the right to update the models as additional information becomes available or as additional possible scenarios are needed. The decision to use the study or underlying assumptions for any particular purpose other than to obtain the requested Interconnection Rights is the sole responsibility of the user.

Scheduling and cost estimates provided in this report do not include time or money to resolve unforeseen issues such as those that may be identified during TVA's review of environmental impacts as required by the National Environmental Policy Act (NEPA).

Appendix B: Interconnection Map

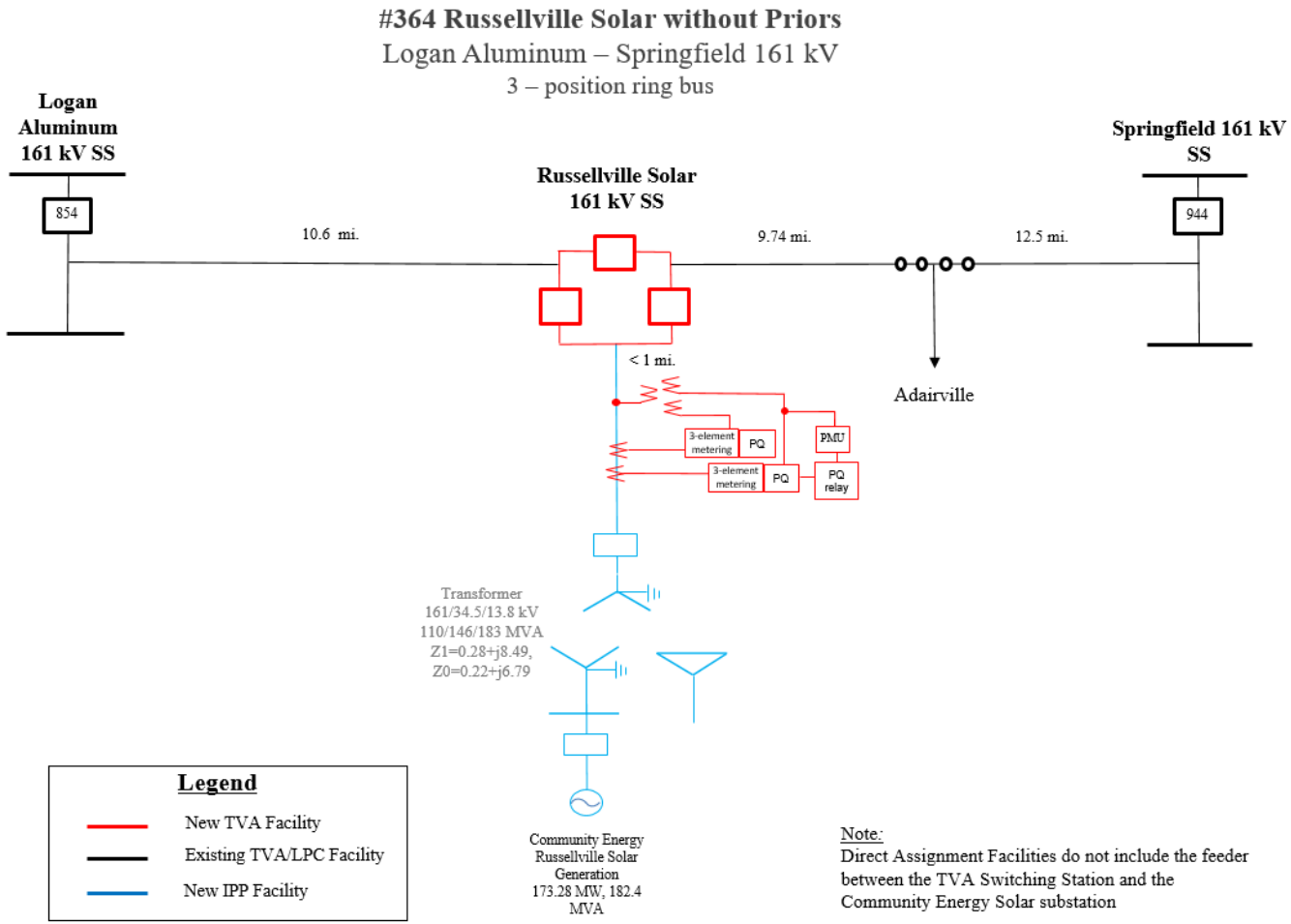


Legend

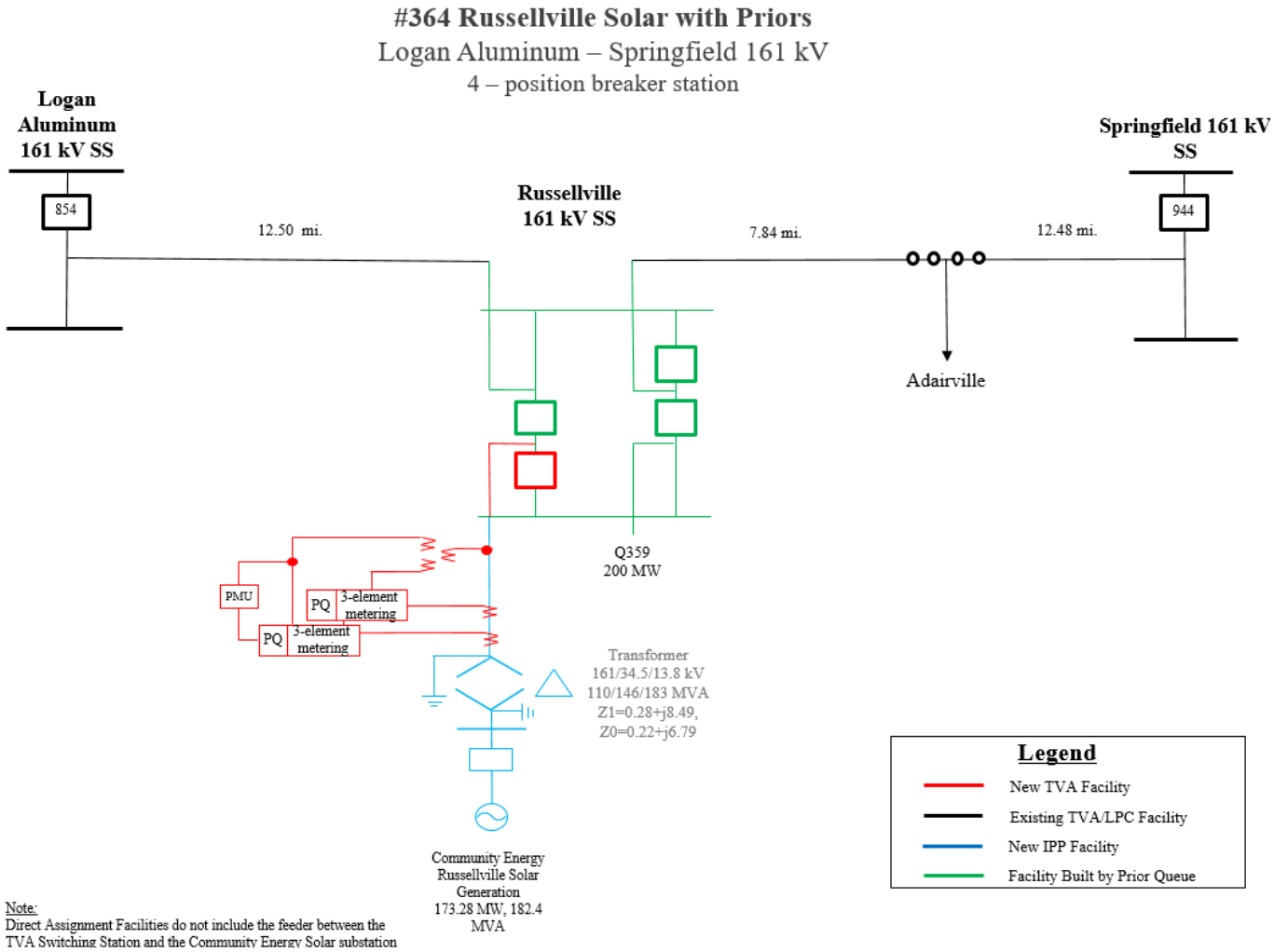
161 kV

500 kV

Appendix C: Interconnection Arrangement Without Priors



Appendix D: Interconnection Arrangement With Priors



Appendix E: Definitions

Glossary of Terms

Adverse System Impact – The negative effects due to technical or operational limits on conductors or equipment being exceeded that may compromise the safety and reliability of the electric system.

Affected System – An electric system other than TVA's transmission system that may be affected by the proposed interconnection.

Direct Assignment Facility – Any additions, modifications, or upgrades that are necessary to physically and electrically interconnect the specified Generating Facility, and are solely for the benefit of the specified Generating Facility.

Direct Transfer Trip (DTT) – Used by TVA to provide remote primary protection for power equipment or remote backup protection for a failed breaker.

ERAG – Eastern Interconnection Reliability Assessment Group

Facilities Study – Process in which TVA (with input from requester) further refines project scope, schedule and cost estimates (± 20%).

Generating Facility – Interconnection Customer's device for the production of electricity identified in the Interconnection Request, but not including the Interconnection Customer's Interconnection Facilities.

Interconnection Customer – Any entity, including TVA, that proposes to interconnect its Generating Facility with TVA's transmission system.

Interconnection Facilities – All facilities and equipment between the Generating Facility and the Point of Interconnection, as well as any other modifications, additions or upgrades that are necessary to physically and electrically interconnect the Generating Facility to TVA's transmission system. Interconnection Facilities are sole use facilities and shall not include Network Upgrades.

Interconnection Request – An Interconnection Customer's request, to interconnect a new Generating Facility, or to increase the capacity of, or make a material modification to the operating characteristics of, an existing Generating Facility that is interconnected with TVA's transmission system.

Interconnection Right – A right to interconnect a specified Generating Facility into TVA's transmission system, contingent upon completion of all required system additions, modifications, and upgrades to accommodate the maximum capacity of the specified Generating Facility.

In-Service Date – The date upon which the Interconnection Customer reasonably expects it will be ready to begin use of TVA's Interconnection Facilities to obtain back feed power.

MMWG – Multi-Regional Modeling Working Group

NERC – North American Electric Reliability Corporation or its successor organization.

Network Upgrades – Any additions, modifications, and upgrades that are required to accommodate the specified Generating Facility, and to enhance either the capacity or the reliability of TVA's transmission system.

SCDWG – Short Circuit Database Working Group

SERC – SERC Reliability Corporation - a regional entity with delegated authority from NERC for the purpose of proposing and enforcing reliability standards.

SIS – Interconnection System Impact Study