SITING AND LAND USE REPORT

Elements #1 to #3 of the Nucleon Report to the Advanced Nuclear Committee of North Dakota

ABSTRACT

A concise report that details power transmission-linked capacity screening, water use, land use, and social siting considerations. It highlights areas of North Dakota where development of Small Modular Reactors may be considered.

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NUCLEON ENERGY

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Glossary of Terms

AC	Alternating Current
AFB	Air Force Base
ATC	Available Transfer Capability
BTS	Bulk Transmission System
CCGT	Combined Cycle Gas Turbine
CFR	Code of Federal Regulations
CNSC	Canadian Nuclear Safety Commission
CT	Combustion Turbine
DC	Direct Current
ERAG	Eastern Interconnection Reliability Assessment Group
GI	Generator Interconnection
GIS	Geographic Information System
GT	Gas Turbine
HRSG	Heat Recovery Steam Generator
HVDC	High Voltage Direct Current
ISO	Independent System Operator
LUS	Land Use and Social
MAF	Million Acre Feet
MISO	Midcontinent Independent System Operator
MW	Megawatt
ND	North Dakota
NDC	Net Dependable Capacity
NDTA	North Dakota Transmission Authority
NRC	Nuclear Regulatory Commission
NUREG	NRC regulatory guide and report series (NUREG)
OEM	Original Equipment Manufacturer
OTDF	Outage Transfer Distribution Factor
PSC	Public Service Commission
PTDF	Power Transfer Distribution Factor
REGDOC	Regulatory Document (CNSC REGDOC series)
RFP	Request for Proposals
SEO	Seasonal Expected Output
SMR	Small Modular Reactor
SPP	Southwest Power Pool
STG	Steam Turbine Generator

Executive Summary

North Dakota is at a stage where it can begin to thoughtfully consider the role of Small Modular Reactors in its long-term energy and economic future. The purpose of this study has been to understand whether advanced nuclear technologies could reasonably be explored in different parts of the state, and whether any regions appear to have characteristics that would make them suitable for early discussions.

The results of the work suggest that North Dakota has seven Areas of Interest available to it, with no single one emerging as the only viable location. Instead, the findings point to a broad, statewide opportunity landscape that could support further engagement, planning, and learning if the state chooses to move in that direction.

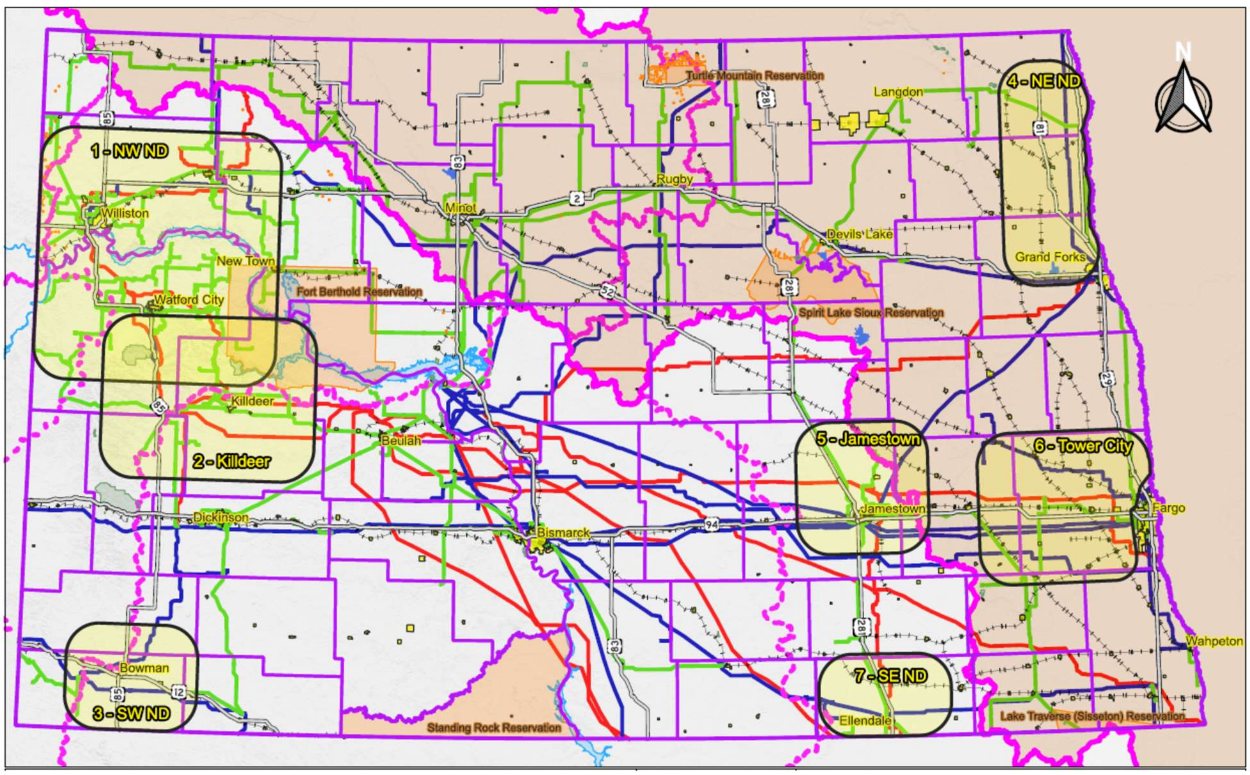

Figure 1: Map of the seven Areas of Interest

A notable conclusion is that all seven Areas of Interest examined in this study appear technically capable of supporting SMR development under present conditions. This does not mean that any site would ultimately proceed, nor does it imply that detailed federal licensing outcomes can be predicted at this time. Rather, it indicates that each region has a workable combination of land availability, transmission strength, water resources or cooling alternatives, access to logistical infrastructure, and workforces that make continued exploration possible. This provides policy makers with flexibility. Decisions about future engagement or next steps do not need to be constrained by geography, and the state can maintain optionality while it develops a broader understanding of how nuclear technology might fit within its long-term energy system.

Another finding relates to scale. The study looked not only at whether a single SMR could be accommodated, but also at whether paired deployments or larger combinations could reasonably be supported. The analysis suggests that every Area of Interest appears capable of hosting at least two 100 MW reactors and a subset of the Areas of Interest can host two 300 MW reactors. Several regions, particularly in eastern North Dakota, could likely support larger configurations, if the state's utilities or private developers found value in doing so. This pairing is important because it creates the potential for improved economies of scale, shared infrastructure, and simplified development. It also allows North Dakota to consider projects that would be meaningful, full-scale contributors to the grid or to industrial development.

In parallel with this, it is relevant that SMR technology developers are pursuing a range of designs and sizes, including larger reactors in the 300-megawatt electrical class. The hosting capacity available in the eastern Areas of Interest is generally sufficient to accommodate these larger units, including potential paired 300-megawatt configurations. In the western Areas of Interest, by contrast, the more limited transmission capacity would tend to favour smaller units or more modest combinations. From a policy and planning perspective, this means that early site permitting or other long lead planning activities in the east could expose the state and its partners to a wider range of technology options, including larger designs, while maintaining the ability to host smaller units as well. As a result, the technology risk associated with committing to a site envelope in the eastern Areas of Interest may be somewhat lower, because more of the SMR technology spectrum could realistically fit with current grid and siting constraints.

Eastern North Dakota emerged as the area with the most robust combination of favourable characteristics. Hosting capacity on the grid tends to be higher in these regions, in some cases exceeding what would be required for several hundred megawatts of nuclear electricity generation. Proximity to existing loads and to areas expected to experience industrial or data center growth further strengthens the eastern profile. These regions also tend to offer more flexibility in identifying siting envelopes with compatible land use, manageable population density, and good access to transportation corridors. While these factors do not guarantee project viability, they do suggest that the east may provide the greatest range of options and the fewest limitations, should the state decide to further investigate nuclear development, especially if it wishes to preserve access to both smaller and larger SMR technologies over time.

At the same time, western North Dakota offers a different kind of opportunity. The hosting transmission system capacity in the west is generally more limited, but the region maintains strong alignment with existing industrial activity, particularly in the oil and gas sector. In these areas, SMRs could be considered as dedicated or near-site power sources for industrial decarbonization, synthetic fuel production, co-located industrial technologies, or other emerging applications that benefit from clean and reliable energy inputs. Western regions also possess energy-related workforces, infrastructure built around large-scale resource extraction, and community economies that have long participated in energy development. This suggests that the west could play a meaningful role in nuclear development if North Dakota were interested in using SMRs to support or evolve its existing industrial base, even if the specific technologies deployed there tended to be in the smaller or mid-range of the SMR scale spectrum.

A further observation emerging from the transmission assessment is that North Dakota appears reasonably well positioned to support new, energy intensive customers who often require reliable, low emitting power. This includes data centers, hydrogen production facilities, advanced agricultural processing, and other large industrial loads. The eastern Areas of Interest are particularly notable in this regard. Their hosting capacities and grid topology could allow SMR generation to be connected without major new backbone transmission investments, which often present significant barriers in other jurisdictions. This alignment between nuclear potential and industrial demand offers a possible avenue for economic development and competitive positioning should North Dakota wish to pursue new industry attraction strategies.

It is important, however, to distinguish between what the existing grid can accommodate on a project-by-project basis and what might be required if several SMR developments were to proceed in parallel across multiple Areas of Interest. Similarly, the addition of multiple large new electrical loads could similarly shift the outlook. The present screening focuses on what the system can host at individual locations, assuming incremental additions in specific regions. If North Dakota were to contemplate a broader program in which multiple SMR projects advanced at roughly the same time, a more cumulative view of the transmission system would be needed. In that scenario, coordinated planning studies with the regional transmission organizations and utilities would be required to understand how several new nuclear plants might interact with one another, what reinforcements or operational changes could be necessary, and how best to stage projects so that system reliability and cost effectiveness are preserved. The current findings therefore indicate that the grid can support SMRs in each Area of Interest when considered individually, while also signalling that a more integrated analysis would be appropriate if a large, multi-site build out were ever under consideration.

Community engagement is another area where the study's findings may prove valuable for policy makers. Because all seven Areas of Interest demonstrate technical feasibility, early engagement, if pursued, can be inclusive and exploratory rather than selective. No community should be excluded from the conversation at this stage. This has practical advantages. It allows counties and municipalities to learn about nuclear energy at their own pace, create space for questions and concerns, and build a foundational understanding before any decisions are contemplated. Experience in other jurisdictions suggests that a broad based, education-first approach reduces the likelihood that communities feel targeted or preselected and increases the likelihood that genuine interest, if it exists, will emerge naturally over time. Such an approach may also help align local, state, and industry perspectives before more detailed or site-specific work is considered.

As the state reflects on these findings, it may wish to keep in mind several themes that consistently appeared throughout the study:

- North Dakota has multiple regions that show credible technical potential for SMR development, without any single area dominating to the exclusion of others.
- The eastern part of the state offers the most flexibility and the strongest transmission system hosting capacity today, particularly for grid connected deployments or support of new industrial growth, including the ability to host larger, 300-megawatt class SMR designs.
- Western regions, while more limited in hosting capacity, may align well with industrial energy needs and opportunities for decarbonization or new energy technologies, likely using smaller or mid-sized SMR configurations.
- Paired reactor deployments appear feasible statewide, opening opportunities for scale, cost effectiveness, and meaningful grid or industrial contributions.

- Early engagement can occur across all Areas of Interest, enabling a transparent, community - led understanding of nuclear opportunities and considerations.

These themes do not compel action, but they do suggest that North Dakota possesses an unusually strong starting point, should it wish to explore nuclear energy further. Many jurisdictions face significant barriers, such as dense populations, limited transmission, inadequate water resources, or strong land use conflicts that make SMR development highly challenging. North Dakota's conditions are comparatively favourable. This does not eliminate the need for careful planning, regulatory diligence, and community support, but it does indicate that the state has room to maneuver if it chooses to proceed with additional study or engagement.

As these findings are considered, it may be helpful to frame potential next steps as options rather than commitments. The intent at this stage is not to decide whether North Dakota will develop SMRs, but to clarify what kinds of further work could position the state to make informed choices in the future, should it wish to do so.

If the state chooses to build on this work, the Advanced Nuclear Committee may wish to consider the following near-term next steps:

- Initiate broad, education-focused outreach in all, or a portion of, the seven Areas of Interest, providing communities, Tribal governments, local officials, and industry with accessible information on SMRs, the siting work completed to date, and the range of potential benefits, risks, and trade-offs.
- Engage utilities and regional transmission organizations in more detailed discussions about how individual SMR projects might proceed through formal interconnection processes, and what additional cumulative transmission studies would be required if multiple Areas of Interest were to advance in parallel.
- Explore technology agnostic planning options that preserve flexibility, with particular attention to eastern Areas of Interest where both smaller and larger 300-megawatt class SMR designs could be accommodated, thereby reducing technology selection risk for any early site planning efforts.
- Begin on a voluntary basis, the early stages of parcel identification and evaluation in those Areas of Interest where local stakeholders have expressed a strong affinity toward SMR development, focusing on understanding land tenure, potential host communities, and local priorities without prejudging any specific project.

These steps would not in themselves, commit North Dakota to nuclear development. Rather, they would help ensure that, if/or when the state wishes to make decisions about SMRs, it does so with a well-developed understanding of its options, the views of its communities, and the practical implications for the grid and the wider economy. North Dakota has long demonstrated leadership in energy production, technological adoption, and responsible resource development. Advanced nuclear energy presents another potential tool that could support reliability, economic growth, and low emission energy pathways in the decades ahead. The conclusions of this study do not suggest a predetermined path, but they do indicate that the state has a meaningful opportunity, one with flexibility, geographic choice, and alignment with existing infrastructure and workforce strengths. With continued dialogue, careful evaluation, and community involvement, North Dakota could position itself to make informed decisions about whether and how SMRs, including both smaller units and larger 300-megawatt class designs, might contribute to its long-term prosperity.

1. Introduction

This Siting and Land Use Report is one of several coordinated deliverables that Nucleon Energy Inc. has been asked to prepare for the Advanced Nuclear Committee of North Dakota under its broader advanced nuclear work program. It responds to RFP Items 1 through 3 by identifying where Small Modular Reactors (SMRs) could credibly be developed in the state from a transmission, water, land use, and social compatibility perspective. The document is intended to give the Committee and its partners a clear view of the physical and planning context for SMR siting in North Dakota, using a transparent, defensible methodology that can be revisited and refined as new information becomes available.

Within that mandate, the report provides the geographic and technical foundation that the other Nucleon reports will build upon. It starts with an assessment of where the existing transmission system can physically accommodate new SMR generation, then overlays water availability and cooling feasibility, before introducing a structured screening and scoring framework that aggregates these factors at a county scale. The result is a set of seven Areas of Interest, together with comparative scores and qualitative profiles that show how grid realities, water options, land use patterns, and social context come together to shape practical SMR opportunities in North Dakota.

The report is therefore best understood as a screening level planning tool that narrows the field to technically and socially plausible Areas of Interest, rather than as a vehicle for selecting projects, technologies, or specific sites. It is designed to inform the Committee's deliberations, to support future engagement with utilities, agencies, Tribal Nations, local governments, and communities, and to interface with companion work on markets, policy, regulatory readiness, and waste management being prepared under the same RFP. If the Committee chooses to explore advanced nuclear options further, the findings in this document can serve as the siting backbone for those future conversations and decisions.

2. Transmission and Interconnection Assessment (RFP Element #2)

This section is a technical summary of how North Dakota's existing transmission system and electrical loads shape the practical siting envelope for small modular reactors in the state. This section of the report focuses only on transmission considerations and only on areas that can physically accommodate SMR interconnection. The results are based on predicted transmission system topology and loads for the 2034 outlook. They do not include additional areas that may be enhanced through future transmission investment in the State.

2.1 Areas with Transmission Interconnection

This section describes seven areas of North Dakota where the existing transmission system can physically accommodate interconnection of new small modular reactor generation, based solely on the 2034 load characteristics and grid topology. The analysis screens only for electrical hosting capacity physical characteristics of the network and does not consider other siting constraints such as cooling water, land use, environmental sensitivities, or community acceptance, which are addressed and weighted elsewhere in the report.

The seven "Areas of Interest" are defined at a regional scale and are numbered and named as follows: Area 1 - Northwest North Dakota; Area 2 - Killdeer Area; Area 3 - Southwest North Dakota; Area 4 - Northeast North Dakota; Area 5 - Jamestown; Area 6 - Tower City; and Area 7 - Southeast North Dakota.

On the eastern side of the state (Areas 4, 5, 6, and 7), existing transmission provides capacity for generation sites up to roughly 600 MW, which allows a wide range of grid scale SMR technologies to be considered. On the western side (Areas 1, 2, and 3), existing transmission supports generation sites up to roughly 200 MW, which limits feasible options to a subset of grid scale SMRs. In most cases, the practical and economic configuration is a pair of units in each location, such as 2×100 MW up to 2×300 MW.

These results align with the recent North Dakota Transmission Authority "Future Proofing North Dakota's Electrical Infrastructure" study, which finds that the eastern portion of the state has more room to accommodate large energy intensive loads[1] compared with the west, once transmission constraints and voltage performance are considered. In this

[1] **FUTURE-PROOFING NORTH DAKOTA'S ELECTRICAL INFRASTRUCTURE TO ENABLE EXPANSION IN AN EVOLVING ENERGY LANDSCAPE** – Summary, October 2025, Page 3 of 7, Table 1, East 1400 MW.

report, the same spatial pattern appears when the lens is shifted from accommodating large loads to accommodating new generation. The capacities summarized below reflect the 2034 transmission topology and base case load forecast; combinations of additional transmission investment and new large loads can change these values over time and may introduce new opportunity areas or expand existing ones.

Figure 2-1: Transmission Interconnection Opportunity Areas for SMRs in North Dakota

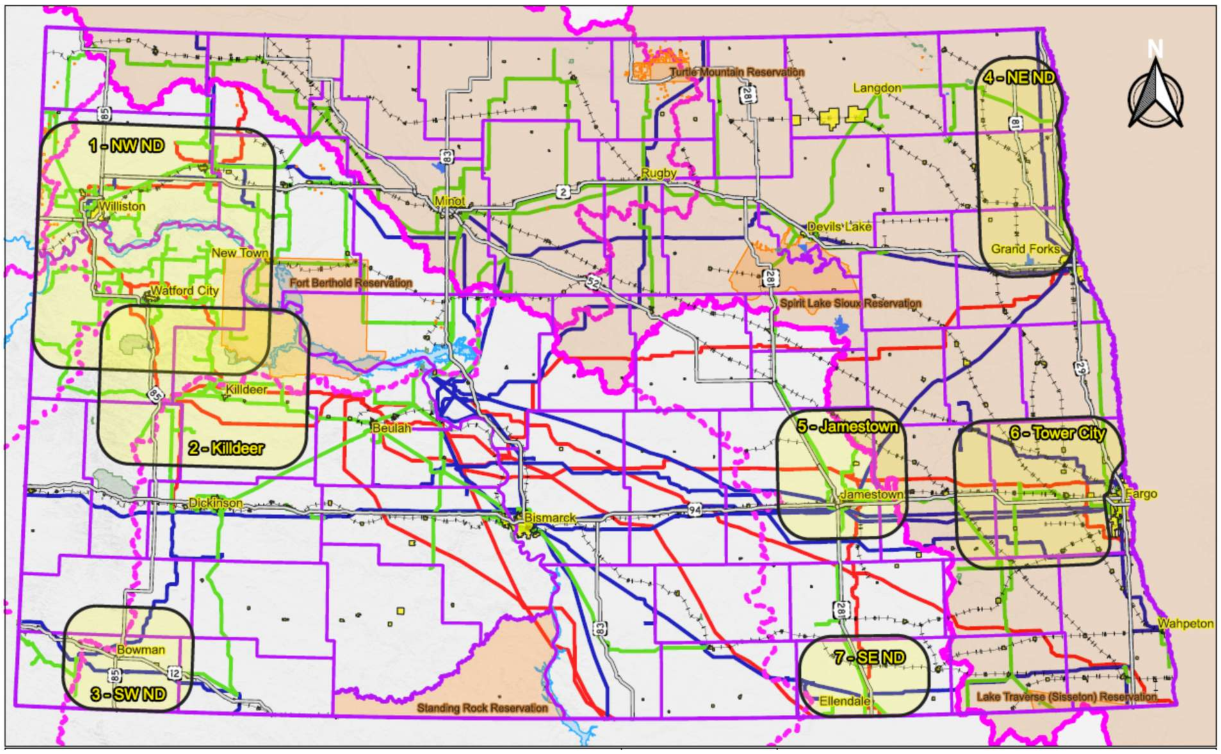

Table 2 1: Indicative SMR Interconnection Capacity by Opportunity Area

Area No.	Area Name	Indicative Seasonal SMR Area Capacity (MW)	Indicative SMR Area Rating[2] (MW)
1	Northwest North Dakota	Winter = 409.1 / Summer = 297.5	**297.5**
2	Killdeer Area	Winter =524.6 / Summer = 266.2	**266.2**
3	Southwest North Dakota	Winter =227.2 / Summer = 211.6	**211.6**
4	Northeast North Dakota	Winter = 889.4 / Summer = 719.7	**719.7**
5	Jamestown	Winter =922.0 / Summer = 913.0	**913.0**
6	Tower City	Winter = 698.4 / Summer = 636.8	**636.8**
7	Southeast North Dakota	Winter = 820.0 / Summer = 750.0	**750.0**

[2] Indicative SMR Area Rating refers to the lesser of the seasonal limit, generally Summer, that triggers a thermal violation or force a transmission system upgrade.

Taken together, the map and table give readers a concise picture of where the existing grid can host SMR generation and at what scale. Eastern opportunity areas (4, 5, 6, and 7) support larger blocks of new generation, which opens competition to a broader set of SMR technologies and vendors. Western areas (1, 2, and 3) remain attractive for SMRs that match the smaller interconnection envelope, particularly when co - located with existing or planned industrial loads that value on site or near site nuclear generation.

This section remains intentionally narrow in scope. It identifies where the grid can accept new nuclear generation, but it does not state where SMRs should be built. The balance of the report layers in safety case considerations, water and cooling, land use, environmental and social factors, and economic and policy criteria to rank specific sites within and across these opportunity areas.

2.2 Transmission Modeling Approach and Assumptions

This study is a systematic, screening-level assessment of where North Dakota's existing and planned bulk transmission system (BTS) appears most capable of supporting SMR development. The analysis is intended to identify transmission locations and broader areas that can accommodate additional firm generation without overloading the BTS under both normal and single-contingency operating conditions. It is not intended to replace the formal interconnection studies conducted by the Regional Transmission Organizations (RTOs); rather, it informs where those efforts may be most productively focused.

For readers who require additional technical detail, a full description of the modeling assumptions, data sources, and analytical steps—including case construction, ATC configuration, and contingency treatment—is provided in the Appendix A3. The discussion below is intended as a non-technical overview of the approach and its implications for SMR siting.

The assessment considers the 115 kV, 230 kV, and 345 kV components of the BTS network in North Dakota. For each high-voltage node, the study simulates incremental injections of new generation and determines the maximum level of additional megawatts that can be accommodated before any transmission line or transformer exceeds its emergency thermal rating. This is done first under normal conditions (all facilities in service) and then under standard "N-1" conditions, where a single line or transformer is assumed to be out of service. Throughout this report, the term "injection limit" refers to the N-1 limit: the maximum amount of new generation that can be connected at a node without violating thermal limits following the loss of any single major element. Nodes with an N-1 injection capability of at least 200 MW are treated as viable candidates for SMR development and are subsequently grouped into a set of broader, transmission-supported areas.

The modeling is carried out using PowerWorld Simulator (Version 24) and its Available Transfer Capability (ATC) analysis module. The underlying power flow cases represent not only the North Dakota BTS network, but the broader Eastern Interconnection. As a result, when additional generation is injected at a node in North Dakota, the resulting power flows are allowed to follow realistic regional paths across neighboring states and along major transmission BTS backbones, rather than being artificially confined to the state. This regional context helps ensure that the thermal limits identified in the study are consistent with how the grid is expected to perform in practice, given the interconnected nature of the system.

The analysis relies on outlook cases for Summer and Winter 2034[3] Series (2024). These cases incorporate the expected transmission topology, generation mix, and load levels for that planning horizon. The choice of 2034 reflects the practical development timeline for SMR projects: several years are required for feasibility work, regulatory approvals, and project structuring, followed by an additional three to six[4] years for generator interconnection studies and approvals under the tariffs of the Midcontinent Independent System Operator (MISO) and the Southwest Power Pool (SPP). A project initiated in the near term is therefore more likely to reach commercial operation in the early-to-mid 2030s than earlier. Using 2034 cases aligns the screening with the system conditions that are expected to prevail when an SMR could realistically enter service.

For each 2034 seasonal case, all nodes energized at 115–345 kV in North Dakota are treated as potential injection points. Incremental generation is injected at each node and balanced against a distant reference point (i.e. a swing bus in Alabama) that serves as a realistic sink from the region. As the injection is increased, the analysis monitors thermal loading on transmission lines and transformers within North Dakota and at the interstate boundaries on neighboring-system elements. Whenever a thermal rating has reached N-1 conditions, that level of injection is recorded as a limit, and the associated line or transformer is identified as the constraining element.

To ensure that the study focuses on constraints that are genuinely driven by the candidate SMR location, only those lines and transformers that carry a meaningful share of the

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[3] The files were secured from the EASTERN INTERCONNECTION RELIABILITY ASSESSMENT GROUP (ERAG) and downloaded from Reliability First at www.rfirst.org.

[4] January 2025 Resilience of the Electric Grid in North Dakota, Page 32 of 87.

incremental power are retained. This avoids over-interpreting remote or weakly affected facilities and concentrates attention on elements that are materially influenced by the new injection. For each node, the analysis identifies the five most constraining single-contingency conditions—those that yield the lowest allowable N-1 injection levels. The smallest of these becomes the representative N-1 injection limit for that node. No attempt is made to redesign the system; if a thermal limit is reached, it is treated as a binding constraint for screening purposes. Any reinforcements or remedial measures that might increase hosting capacity would be considered later through standard interconnection assessment or planning processes.

The resulting N-1 limits provide a clear view of both the inherent strength of each nodal location and its sensitivity to single-element outages. In addition, the frequency with which lines or transformers appear as limiting elements across many different nodes and scenarios is tracked. For the 2034 Summer and Winter cases, the thirty most frequently binding constraints are identified. This information helps highlight “chronic” constraints on facilities that repeatedly limit injection capacity and may warrant closer attention in future planning if significant new generation is contemplated.

The nodal N-1 injection limits are then used to identify and map candidate SMR locations. All nodes with an N-1 capability of at least 200 MW are catalogued and grouped into seven hosting areas, based on both their geographic proximity and the similarity of their hosting capacity. These areas should be understood as general locations where the existing and planned 2034 BTS appears comparatively well-positioned to accommodate SMR additions, from a thermal perspective. They are not prescriptive site selections. To reflect practical land-use considerations, nodes located in or immediately adjacent to populated areas are excluded, and a setback on the order of 10–20 miles from towns and industrial centers perimeters is assumed when considering potential SMR siting, recognizing that transmission can reasonably span that distance.

There are important boundaries to this approach. The analysis is based on DC ATC modeling and considers only thermal loading on lines and transformers. It does not explicitly evaluate voltage performance, reactive power margins, or dynamic stability. Generation dispatch and load levels are fixed to the 2034 planning cases; the study does not attempt to simulate all possible operating patterns or market outcomes. In addition, the study uses a fixed set of planned facilities as represented in the ERAG-based planning models and, for new generation, explicitly adds only the Bison Generating Station beyond what is embedded in those cases.

For these reasons, the electrical results in this report should be understood as technically grounded but directional. They represent a screening of the transmission system's ability to accommodate SMR injections at various locations, not a substitute for an interconnection study. The areas identified in this assessment are expected to overlap with locations that a formal SPP or MISO study would view as relatively strong candidates, because they are based on the same underlying system. However, the exact upgrade scope, cost allocation, and timing for any specific SMR project will only be established through the applicable SPP or MISO interconnection process, using their tariff-defined study procedures.

For transparency, the following items will be listed in Appendix A3: Power Flow Modeling Assumptions:

- Source, date, and case names for the steady state power flow datasets used.
- List of major planned transmission projects assumed to be in service for the screening.
- Screens or thresholds used to classify a node or corridor as a "candidate" for firm generation.
- Notes on coordination with NDTA and utilities where data was provided on a non-public basis.

3. Water Availability and Cooling Feasibility

To understand possible water resource availability in the context of SMR process and cooling design requirements, WaterSMART Water Management Solutions ("WaterSMART") was contracted to conduct a preliminary overview assessment of North Dakota's surface and groundwater resources. WaterSMART is a trusted and seasoned water resources consultancy that became part of Hazen and Sawyer in 2024. Their review also assessed larger current uses of water in relevant regions of North Dakota. This section summarizes their findings, describes the technical options for SMR cooling and their associated water requirements, and explains how these elements are combined to assess the cooling feasibility of potential SMR sites in North Dakota.

North Dakota's surface water system is defined by a continental divide that splits the state into two major drainage basins: the Missouri River Drainage draining south from the State, and the Hudson Bay Drainage, draining north to Hudson Bay. The primary sources of surface water are major rivers and their tributaries, as well as a significant number of natural lakes and man-made reservoirs. The flow in all North Dakota streams is highly seasonally variable, driven largely by spring snowmelt runoff, which has important implications for both water availability and the reliability of different cooling concepts.

The subsections that follow elaborate on these themes in 3 parts: Sections 3.1 to 3.3 provide an overview of water resources, Section 3.4 outlines the technical options for cooling SMRs, and the associated water demands that underpin subsequent site feasibility screening, and Section 3.5 describes how these first two elements are brought together to score and rank sites.

3.1 Surface Water

Of major benefit to North Dakotans, the Missouri River represents a massive, renewable, and largely available asset. It is the only water source in the state capable of supporting significant new usage expansion. The Missouri River system carries an average annual flow of approximately 17.6 million acre-feet (MAF)[5] and only a minor fraction of this volume is currently committed to ongoing licensed uses.

Unlike groundwater, which sits in storage, surface water is transient. Approximately 5.05 MAF evaporates or is consumed annually before even reaching Garrison Dam. Water

[5] Nucleon retained WaterSMART (A Hazen Company) to assess North Dakota water availability. Quantities referenced are from that report and assessment.

that is not diverted for beneficial use within the state flows downstream to benefit other states or is lost to the atmosphere.

The following summarizes the major rivers in North Dakota, supporting potential surface water usage expansions:

- The Missouri River's main stem flows through the western and central parts of the state, serving as the largest single source of surface water. Its flow is regulated by federal projects.
- The Red River of the North forms the border with Minnesota and flows north. Its basin is notorious for flooding due to its shallow grade and northerly flow, which tends to thaw in the south, meeting ice in the north.
- The Souris River originates in Saskatchewan, loops through North Dakota, and returns to Canada, making it an international river with flow governed by a water compact.
- The James River is a major tributary of the Missouri River, originating in the central drift prairie.

3.2 Lake Sakakawea

Lake Sakakawea is an immense main-stem reservoir on the Missouri River, impounded by the Garrison Dam, which is one of the largest earth-fill dams in the world. Located in west-central North Dakota, the reservoir stretches approximately 178 miles from the dam near Riverdale northwest to Williston.

Its shoreline is a defining feature with its jagged, irregular coast. The lake floods the main Missouri valley and extends into dozens of tributary valleys.

While the main channel can be 2 to 3 miles wide, the Van Hook Arm creates a significantly wider open-water expanse of up to 14 miles. The maximum depth near the dam is approximately 180 feet.

In the national context, Lake Sakakawea is a tier-one reservoir[6], comparable in scale to the desert reservoirs of the Colorado River and is the third largest reservoir in the United States, following Lake Mead and Lake Powell. Its large volume makes it a critical buffer against multi-year droughts in the Missouri River Basin.

[6] Nucleon retained WaterSMART (A Hazen Company) to assess North Dakota water availability. Quantities referenced are from that report and assessment.

The areas surrounding Lake Sakakawea have ample fresh water to accommodate multiple fully evaporatively cooled SMR facilities.

3.3 Groundwater Review

Historically, North Dakota relied heavily on groundwater for municipal and agricultural use. However, current data indicates this resource is reaching its sustainable limit.

Unlike surface water, which renews seasonally, many of North Dakota's deep bedrock aquifers have extremely slow recharge rates. Shallow glacial drift aquifers, which are common in the east part of the state, are largely fully appropriated. New permits for large-scale irrigation or industrial use are increasingly difficult to secure without affecting existing users. These sources are legally and practically committed.

To avoid affecting current groundwater license holders and users, based on current analysis, it is not viewed as feasible to source water continuously for new SMR uses directly from aquifers. This does not necessarily rule out seasonal or occasional groundwater use for hybrid SMR cooling applications; however, this would require further long-term analysis. For this reason, this preliminary Area of Interest review does not assume groundwater resources are sufficient for continuous and reliable SMR cooling use.

3.4 Technical options for cooling SMRs

This section presents the technical options for water use and describes how each option influences site feasibility, Area of Interest prioritization, and deployment sequencing at a statewide scale.

We frame the options along a simple spectrum, with evaporative cooling at one end and dry cooling at the other, and hybrid cooling situated in the middle where water is only available on a seasonal basis or is intermittent. Throughout, we use clearly labeled working numbers that support early planning and public communication. These values help inform feasibility and lightly support the broader prioritization approach, while avoiding any parcel-level commitments or vendor selections at this stage.

The spectrum of technical options for Plant Cooling

Thermal plants must reject heat, and the way this is done has direct consequences for water consumption, auxiliary power demand, net output during the hottest hours of the year, physical footprint, and public perception. In a state as large and varied as North Dakota, it is reasonable to prefer strategies that minimize consumptive withdrawals where water resources are scarce, while keeping credible performance during heat events in regions where summer temperatures coincide with high electricity demand.

The highest water use option is Evaporative Cooling which achieves lower condensing temperatures and therefore preserves hot-day output more effectively, although it requires a dependable supply of make-up water and the management of blowdown streams.

The lowest water use option is Dry Cooling which uses large, air-cooled condensers to minimize consumptive withdrawals, which is attractive where fresh water is not readily available or where communities strongly favor very low draw, although it carries higher fan power and can experience some output reduction during the very hottest conditions.

Hybrid cooling combines both approaches. It operates as dry most of the year and activates a modest evaporative loop only during a limited set of hours when ambient conditions would otherwise incur the deepest performance penalty. This middle path can deliver much of the hot-day adequacy benefit associated with evaporative cooling while keeping annual consumptive use relatively small.

To provide a common reference point for readers, we present working numbers at the scale of a 600-megawatt deployment. These numbers are indicative and are intended to be used for screening purposes only and should be refined with design-specific data in engineering phases. For dry cooling, a working figure of about 50 cubic meters per hour (1765.7 cubic feet per hour) of water covers auxiliary and housekeeping needs and indicates near-zero consumptive use compared to evaporative systems. For evaporative cooling, a working figure of about 1,500 cubic meters per hour (52,972.0 cubic feet per hour) of water represents a typical make-up requirement for this capacity level under hot conditions. Between these bookends, a hybrid configuration uses water only during targeted hours, which means its annual draw depends on the number of hot days, the profile of available reclaimed water, and the operating strategy adopted by the plant.

Key points

- Evaporative preserves hot-day output best and requires reliable surface sources with straightforward make-up and blowdown management.
- Hybrid targets only the small set of costly hours, keeps annual consumptive use comparatively low, and suits areas where reclaimed water is seasonal or intermittent.

- Dry minimizes consumptive withdrawals, becomes the default where non-fresh water is not practical, and trades higher fan power and some hot-day performance for water stewardship.

Table 3-1. Cooling spectrum snapshot with working numbers, 600 MW deployment

Pathway	Indicative water use	Parasitic load tendency	Hot-day performance	Siting Notes
Evaporative	~1,500 m^3 per hour	Lower	Strong	Most suitable where dependable non-fresh sources and short conveyance corridors exist
Hybrid	Variable, targeted hours only	Moderate	Preserves capacity during limited peak hours	Best where reclaimed sources are seasonal or intermittent and storage options are limited
Dry	~50 m^3 per hour	Higher	Some reduction	Minimal consumptive use, larger air-cooled condenser structures and increased footprint

Evaporative cooling fundamentals

Evaporative cooling lowers condensing temperature by evaporating water, which preserves net output and efficiency during the hottest hours. At a 600-megawatt scale, a working figure of about 1,500 cubic meters per hour conveys typical make-up needs under hot conditions, with actual values influenced by weather, tower design, and chemistry control. Visible plumes can occur in certain meteorological conditions and should be explained to the public.

Evaporative systems are most often used where year-round, reliable water at material volumes is available. In practice this often means proximity to rivers or large, resilient water bodies with established intake and discharge regimes, together with the infrastructure and governance needed for make-up and blowdown management. Winter operation in northern climates is routine using freeze protection, heat tracing where necessary, and materials suited to low temperatures. The policy message is that high hot-day performance is achievable when dependable year-round supplies exist and can be responsibly managed.

Hybrid cooling for seasonal or intermittent water

Hybrid systems operate as dry for most hours and enable a modest evaporative loop only during limited peak-temperature windows. A small amount of targeted water can materially improve adequacy in hours that carry the highest reliability and revenue value. Hybrid cooling is well suited where material water volumes are available but on an intermittent or seasonal basis, or when the plant can reuse water from industrial or municipal sources such as effluent or blowdown with appropriate pretreatment and storage.

Effectiveness depends on local temperature profiles, the frequency of heat events, and operational control of the assist window. In North Dakota, conditions vary by county and by linkage to wastewater plants or shared industrial sites. Storage can smooth short gaps, but year-round wet operation is not the goal. Because assisted hours are few, hybrid often restrains annual consumptive use while reducing the size or duty of air-cooled hardware compared with all-dry designs. No single hybrid working number is provided because annual draw depends on assisted hours and source availability.

Dry cooling for minimal consumptive use

Dry cooling transfers heat to the atmosphere using large, air-cooled condensers, which minimizes consumptive water use and performs well in cold seasons. It is best used when water is scarce or largely unavailable for industrial use, or when stakeholders strongly prioritize very low draw. During the hottest periods, higher condensing temperatures increase fan power and reduce net output relative to evaporative systems, effects that can be moderated with added condenser surface and careful controls.

For early planning at 600 megawatts, a working figure of about 50 cubic meters per hour reflects auxiliary and housekeeping needs rather than continuous evaporative losses. This signals strong water stewardship while maintaining dependable operation. The principal trade is physical and logistical, since air-cooled systems require larger structures, more steel and foundations, and careful acoustic design near sensitive receptors.

Economic Trade-offs

Cooling choices influence both upfront capital and ongoing operations, which in turn affect the power cost that consumers and purchasers experience over the life of the plant. Dry configurations generally require larger air-cooled condenser bays, more steel and foundations, and more complex erection logistics than evaporative towers. They also carry higher parasitic load due to fan power, and they operate at higher condensing temperatures during heat events, which reduces net output in those hours. Hybrid configurations narrow these differences by applying a modest amount of water during the limited set of hours that matter most for adequacy and revenue, which can capture a sizable share of the performance advantage of evaporative cooling while keeping annual consumptive use small.

For planning purposes in this report, we adopt a simple anchor comparison so that readers can weigh the trade clearly. Dry cooling is expected to result in an increase of about 8 to 10 percent[7] in power cost relative to an evaporative configuration for the same overall output envelope. This working figure captures the combined effects of higher capital for air-cooled hardware and higher parasitic load plus performance impacts during the hottest periods. It is a planning assumption and will be refined during later techno-economic analysis that uses site-specific temperatures, dispatch profiles, and actual equipment selections. The value side of the ledger also deserves attention. Reducing parasitic load during peak system hours can offset a portion of the penalty because the capacity value of megawatts delivered under stress conditions is higher. For hybrid systems, carefully timed water use can protect output in those critical hours and improve revenue sufficiency while still delivering low annual consumptive use outcomes.

Table 3-2. Economic comparison anchor points

Comparison item	Evaporative	Hybrid	Dry
Levelized power cost vs evaporative	Baseline	Slightly higher, depends on assisted hours	About 8 to 10 percent higher
Upfront capital for heat rejection	Lower	Moderate	Higher
Station service for heat rejection	Lower	Moderate	Higher
Annual consumptive water use	Higher	Low to moderate	Near zero

3.5 Ranking and scoring sites based on water availability

This section describes how the assessments of surface water, Lake Sakakawea, groundwater, and cooling technology are combined into a single "water availability" criterion for ranking potential SMR sites. Each site is evaluated against a consistent set of factors, including reliability of supply across seasons and drought conditions, proximity to

[7] Internal Engineering assessment performed by Nucleon Energy.

suitable sources, compatibility with cooling technology options, and the level of competition with existing or projected users. These factors are expressed as qualitative and quantitative indicators that can be compared across sites and are summarized site by site in Section 5 and Appendix A2.

Water availability is incorporated into the broader siting scoring framework as a dedicated criterion with a weighting from 0 to 90 points. Sites that have limited access to water or rely primarily on groundwater with uncertain yield or quality, receive scores toward the lower end of the range, approaching 0 in the most constrained cases. Sites with significant access to reliable surface water that can support an evaporative cooling approach receive higher scores, approaching 90 where multiple robust options are present.

In practical terms, sites with strong water availability and multiple feasible cooling configurations receive higher overall siting scores and are more likely to advance as preferred candidates. Sites that depend on marginal or highly constrained water supplies receive lower scores, may be flagged for additional study, or can be screened out where limitations cannot reasonably be mitigated. The resulting rankings make the influence of water availability on site selection transparent and traceable within the overall siting framework.

4. Screening and Scoring Framework

This section defines how we compare candidate Areas of Interest in a transparent, repeatable way. It sets out must-have, nice-to-have, and no-go criteria, explains the data behind each, and shows how we translate evidence into numeric scores that non-technical readers can follow. It also groups criteria so that technical, environmental, and social factors are weighed consistently across the state.

The scoring in this report is relative, not absolute. The numbers indicate how Areas of Interest compare to one another under the chosen criteria, rather than declaring any area inherently suitable or unsuitable on its own. Earlier screening has already applied must-have and no-go criteria to remove clearly infeasible areas. Section 5 then applies this scoring framework to the remaining Areas of Interest, using the results to highlight where further work and engagement may be most productive.

4.1 Nucleon's siting process and relationship to regulatory frameworks

The following outlines how Nucleon's siting process underpins this North Dakota screening exercise and how it stays aligned with formal nuclear siting requirements. Nucleon's Process 006[8] – Siting – defines a staged approach that ranges from early, strategic screening through to licensing- grade technical work. Within that process, Procedure 006-01: Jurisdictional Site Screening establishes how Nucleon conducts early-stage siting assessments at the jurisdictional scale (state or province) to develop a numerically ranked list of prospective candidate locations. These Category 3 assessments are non-regulatory, expert-led studies that narrow viable sub-regions using desktop tools, professional judgment, and internal data. They are foundational to project planning and prioritization, but they are not themselves suitable for filing as licensing or environmental submissions.

The scope elements used in Procedure 006-01 are intentionally aligned with formal siting frameworks that would govern later licensing steps. The procedure's 20 "required evaluation categories" have been cross-referenced against United States and Canadian regulatory expectations, including U.S. Nuclear Regulatory Commission guidance such as NUREG-1555[9] (Standard Review Plans for Environmental Reviews for Nuclear Power Plants) and CNSC REGDOC-1.1.1[10] (Site Evaluation and Site Preparation for New Reactor

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[8] Process 006 – Siting is an element of Nucleon's Management System compliant with NRC 10CFR50 "B"
[9] Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan (NUREG-1555) | Nuclear Regulatory Commission
[10] https://www.cnsc-ccsn.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/regdoc1-1-1-v1-2/

Facilities). In the U.S. context, these same themes also appear in the NRC's reactor site criteria in 10 CFR Part 100, which set out how factors such as seismology, hydrology, population, and external hazards must be addressed when proposing a nuclear power plant site. By mirroring the structure and content of those regulatory frameworks, Procedure 006-01 ensures that early Category 3 screening decisions are directionally consistent with the Category 1 and 2 works that will ultimately support licensing.

Appendix A1 shows the full table of Nucleon's twenty required evaluation categories from Procedure 006-01, using the same scope element names and brief descriptions. That Appendix contains the complete set of technical, environmental, logistical, and socio-political factors that Nucleon ultimately expects to address with regulators under the 10 CFR Part 100 and NUREG-1555 frameworks. The main body of this report will then be explicit that, at the county scale, the scoring framework draws only on a purposeful subset of those 20 elements, limited to the ones that can be evaluated reliably using jurisdiction-level data and that meaningfully distinguish counties from one another. The remaining elements are carried forward conceptually and will be fully applied when the work moves down to specific sites inside higher-ranking Areas of Interest.

For the county-level screening in North Dakota, this report will apply ten of the twenty scope elements as quantitative criteria. These ten criteria focus on the fundamentals that can be assessed consistently across counties, including grid access and transmission hosting capacity, population and settlement patterns, transportation access, water supply and discharge options, broad environmental and land-use constraints, and the rights-holder and permitting context. Table 4-1 will summarize these ten county-level criteria, show how each maps back to the underlying Procedure 006-01 scope elements, and indicate how each criterion will function in the screening framework as a must-have, nice-to-have, or potential no-go trigger. Detailed descriptions of the county scale Areas of Interest that are built from this framework, and their physical characteristics will be presented later in Section 5.

4.2 County-level screening criteria

For the county-level analysis, this report draws on a focused subset of Nucleon's 20 scope elements from Appendix A1. Scope elements 1-8,10, and 11 have been selected because they can be evaluated consistently with statewide datasets and they show meaningful variation between counties, which is essential for comparative screening. Table 4-1 in this section lists these ten criteria, links each one back to its underlying scope element in

Appendix A1, and indicates whether it is treated as a must-have, nice-to-have, or potential no-go condition for the purposes of this county-scale ranking.

Each of the ten county-screening criteria is assigned a weighting in the scoring framework. Those weights are informed by Nucleon's siting experience and regulatory expectations, but they remain by design, somewhat subjective. As noted in Section 1, the scoring framework is intended for comparative screening only. In interpreting results, the relative position of counties is more important than any absolute score. A county that scores higher than its peers is being flagged as relatively stronger under the ten element criteria, not as a site that is approved or guaranteed to satisfy all considerations in later licensing stages.

Finally, the county-level framework is deliberately not the last word on siting. Much of the eventual decision about where to develop specific SMR sites will depend on public acceptance and detailed local engagement that cannot be captured in a numbers-only exercise. Procedure 006-01 already anticipates this by treating public and Indigenous participation, land rights, and local history as required evaluation categories, supported by expert memos and dialogue rather than just scores. The county rankings in this report should therefore be read as a structured starting point that helps focus future engagement, not as a substitute for the genuine, consent-based conversations that must occur before any specific site is advanced.

Table 4-1: County-level screening criteria selected

#	Scope Element	Description
1	Transmission system screening and hosting capacity	Evaluation of grid access points, line and transformer capacity, and potential system constraints that may preclude SMR interconnection. Proximity and conceptual routing for thermal conveyance, as applicable.
2	Terrain and general constructability	Assessment of topography, slope, and surface characteristics that would affect facility construction and logistics.
3	Population density and growth corridors	Identification of densely populated areas or expected urban expansion zones that may limit emergency planning flexibility or create public acceptability challenges as well as regional populations sufficient for facility operation and support

4	Geotechnical suitability (desktop level only)	High-level screening of areas known to have unsuitable subsurface conditions, based on geological mapping, LIDAR, or historical borehole data.
5	Volcanic risk, seismic hazard, and tornado zone overlays	Desktop overlays of National Weather Service datasets, classifications, and corridors, with exclusion of areas posing unacceptable natural hazard risk.
6	Road and rail access feasibility	Evaluation of logistics pathways including proximity to major roadways, highways, and railways that can support reactor module and equipment transport as well as year-round operational access, including during periods of extreme weather.
7	Airspace conflicts and restricted zones	Assessment of civil and military flight paths, aerodrome (including airports) proximity, and airspace restrictions that could affect siting or operations.
8	Water supply (surface and groundwater)	Initial feasibility of sourcing cooling or processing water from rivers, lakes, aquifers, or municipal systems.
10	Native American tribal lands and interest areas	Desktop mapping of treaty areas, asserted territories, and known traditional land use regions, based on public data or internal engagement records.
11	Land tenure (Federal, private, institutional), available parcel size and parcel attributes	Classification of land control regimes to identify areas with feasible paths to site control, review of available development area, including review of suitability and potential placement for facilities and associated site security. Consideration for future expansion potential.

4.3 Weighting and scoring of the ten county-level criteria

The screening framework assigns each of the ten county-level criteria with maximum scores that vary by criteria and represent the weighting for that criterion. Nucleon has used its experience to assess weighting amongst the criteria. This weighting can be revisited; however, the real value is in the directional signals that it provides. This mix allows the report to give greater influence on criteria that are more fundamental to SMR feasibility at a regional level, while still capturing the contribution of supporting factors. The range of scoring for each criterion is also provided in Appendix A2.

For each area, the assessment team scored the ten criteria using these weightings, then summed the individual scores to produce a single composite value out of 1000 (the maximum possible score). The simple sum of the scores will provide a relative index for comparing counties and regions across North Dakota. A higher composite score will indicate that taken together, the county performs better under the selected criteria than its peers. The final allocation of scoring to these ten criteria, and the remaining ten criteria in Appendix A1, will be finalized during implementation and can be adjusted in future sensitivity tests, but the basic structure of additive scores and cross-state comparison will remain the same.

4.4 Application to counties and aggregation to Areas of Interest

The ten-criterion framework is applied at a county-level, using common datasets and scoring bands across the state. For each county, the assessment team has used publicly available data for each category, applied the scoring approach described above, and calculated a composite county score as outlined in Appendix A2. This creates a consistent baseline view of relative strengths and weaknesses across North Dakota's counties.

These county scores are then aggregated into a set of Areas of Interest that align with major transmission corridors, water availability, and practical siting geographies. The detailed construction of these areas —including their boundaries and underlying rationale— is described in Section 5. For the purposes of the scoring framework, the county-level results within each Area of Interest will be combined into a single score using a simple, transparent method (for example, a weighted average that reflects the relative contribution and importance of each county within that Area of Interest).

For each Area of Interest, the report presents:

- A composite score derived from the underlying county results.
- A breakdown of group scores across the ten criteria, showing which factors drive the Area of Interest's performance.
- A clear indication of any must-have thresholds met, or no-go conditions triggered at the county scale.

The scoring outputs provide a quantitative lens that will be read alongside the physical descriptions, maps, and Area of Interest narratives presented in Section 5. Together, they show how the framework points to certain parts of the state as relatively stronger candidates for early SMR exploration, without pre-selecting specific sites.

4.5 Regional scoring summary and interpretation

The county-level screening and scoring exercise provides a comparative view of how the Areas of Interest perform under the ten criteria used in this report. The framework highlights where conditions for SMR development appear relatively stronger or weaker and helps indicate which areas may be more attractive for early technical work and engagement. It is important to emphasize, however, that all Areas of Interest that remain in the analysis are considered broadly suitable candidates for development. The differences between them reflect degrees of relative strength, not a binary distinction between acceptable and unacceptable areas. Each Area of Interest brings its own combination of grid access, land use patterns, water options, and community context, and each could host SMR projects once detailed site-level assessments and public engagement work are undertaken.

Readers should treat the results of the scoring framework as a structured guide to where further work may be most productive, rather than as final decisions. Later stages of siting will still need to incorporate public acceptance, Indigenous partnership, detailed local knowledge, and site-specific technical studies before any binding development choices are made. The detailed composite scores for each Area of Interest, the relative ranking that emerges from them, and the broader implications for the North Dakota grid, including indicative SMR capacity ranges in different parts of the state, are presented in Section 5 together with the Area of Interest maps and physical screening results.

5. Siting Locations and Physical Screening

5.1 Approach and Scope

This section applies the screening criteria described in Section 4 to the seven Areas of Interest across the State that Nucleon identified in the Transmission analysis (Section 2) of this report. The screening and scoring framework bring together transmission, water, land use, and access considerations and uses them to provide a high-level description of the boundaries and characteristics of each Area of Interest, while deliberately stopping short of identifying individual parcels or proponents.

This section presents the analysis as indicative rather than determinative. It focuses on identifying, at a regional scale, where SMR projects could appropriately be explored once utilities and communities are at the table. The maps, Area of Interest descriptions, and summary scores highlight relative strengths and constraints, but they do not select specific sites or commit any party to development. Instead, they provide a structured starting point for conversations about where more detailed technical work and engagement should occur next.

5.2 Areas of Interest Profiles

The following describes the seven Areas of Interest and broadly describes, in qualitative terms, the screening and physical information in more detail. The qualitative narratives below are intended to be read alongside the maps and the summary scoring table presented in section 5.4.

Area of Interest 1: Northwest North Dakota

(Williams, Mountrail, McKenzie Counties)

Northwest North Dakota functions as an already industrialized energy corridor anchored by the oil and gas sector. The region hosts multiple high voltage substations that could provide credible interconnection points for one or more SMR units, and it has access to suitable surface water resources that could support conventional cooling options, subject to detailed study. Existing energy infrastructure, workforce familiarity with large industrial projects, and an established logistics network all point to a region that can absorb additional firm generation in support of further industrial growth in the state.

The main constraint in Northwest North Dakota is not the presence of infrastructure but its overall scale. Under current system conditions, the aggregate SMR capacity that could be developed in this region is likely on the order of 200 MW before transmission limitations and operational constraints become binding. This means the region compares well on readiness and co-location benefits but will be better suited to a modest SMR buildout rather than a very large nuclear hub. Subsequent stages of work will need to confirm how much incremental capacity the grid can accommodate and how SMR development can complement, rather than conflict with, ongoing oil and gas activity and local community priorities.

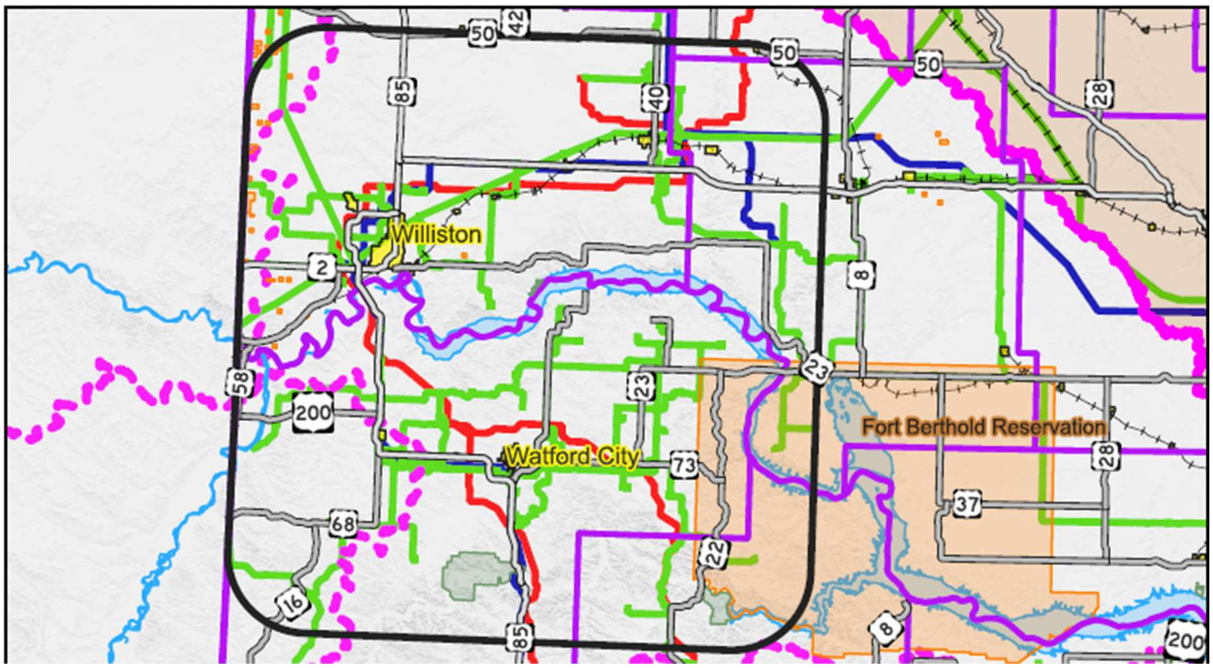

Figure 5-1: Northwest North Dakota - Area of Interest

Area of Interest 2: Killdeer Area

(Southwest of Fort Berthold Reservation)

The Killdeer Area of Interest, centered around Killdeer and extending southwest of the Fort Berthold Reservation (which also includes the Mandan, Hidatsa, and Arikara Nations), shares many characteristics with Northwest North Dakota. It is a mixed agricultural and energy-producing landscape, with active oil and gas developments distributed across the region. Available transmission capacity appears broadly comparable to Northwest North

Dakota, creating credible interconnection opportunities that could support one to two SMR facilities and potentially reinforce future industrial development in the area. From a siting perspective, the central and eastern portions of the Killdeer Area stand out as more favorable, reflecting more manageable topography and a greater prevalence of gently rolling lands relative to the more undulating terrain in the northwest.

Historical wind data indicate that the area has experienced relatively low extreme wind events, which is a favorable attribute for nuclear siting from a risk and design perspective. Road access in the Killdeer Area is established but would require targeted upgrades and routing studies as specific sites are advanced. While there is no rail line within the Area of Interest itself, existing rail infrastructure in the broader region could be leveraged for construction logistics and fuel transport, subject to future corridor planning. Subsequent phases of work will need to confirm the strength of the local grid under higher loading, refine topographic and geotechnical constraints at the site scale, and evaluate how SMR development can align with ongoing oil and gas activity and local land use priorities.

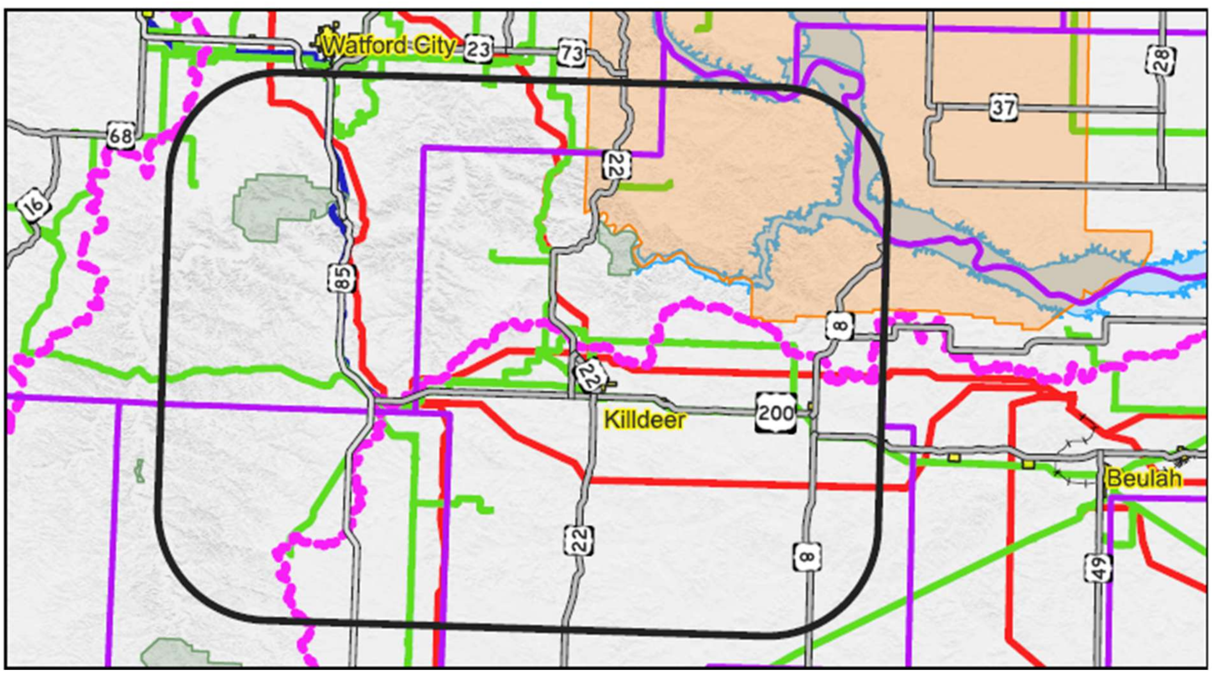

Figure 5-2: Killdeer - Area of Interest

Area of Interest 3: Southwest North Dakota
(centered on Bowman County)

Southwest North Dakota, centered on Bowman County, is characterized by relatively low population density combined with comparatively good access to high-voltage transmission infrastructure. The presence of existing high voltage facilities creates credible interconnection options for SMR development, supported by the region's established road and rail links. The relatively low population density offers a broad range of potential siting locations, providing flexibility to establish buffers and manage land use impacts.

The same low population that benefits siting can create challenges in assembling and sustaining the workforce that SMR development will require, particularly for specialized roles. This suggests that any future project in this area would need intentional strategies for workforce attraction, commuting and/or rotational work arrangements. Water in this portion of the Missouri Basin is primarily associated with groundwater resources. There is potential to support some level of water-based cooling, but additional hydrogeological studies would be required to determine how much cooling capacity is realistically available and under what conditions. Given the fact that the Gascoyne 500 Generating Station was previously planned for the area with the use of dry cooling, it is likely that any SMR would also require dry cooling in the area.

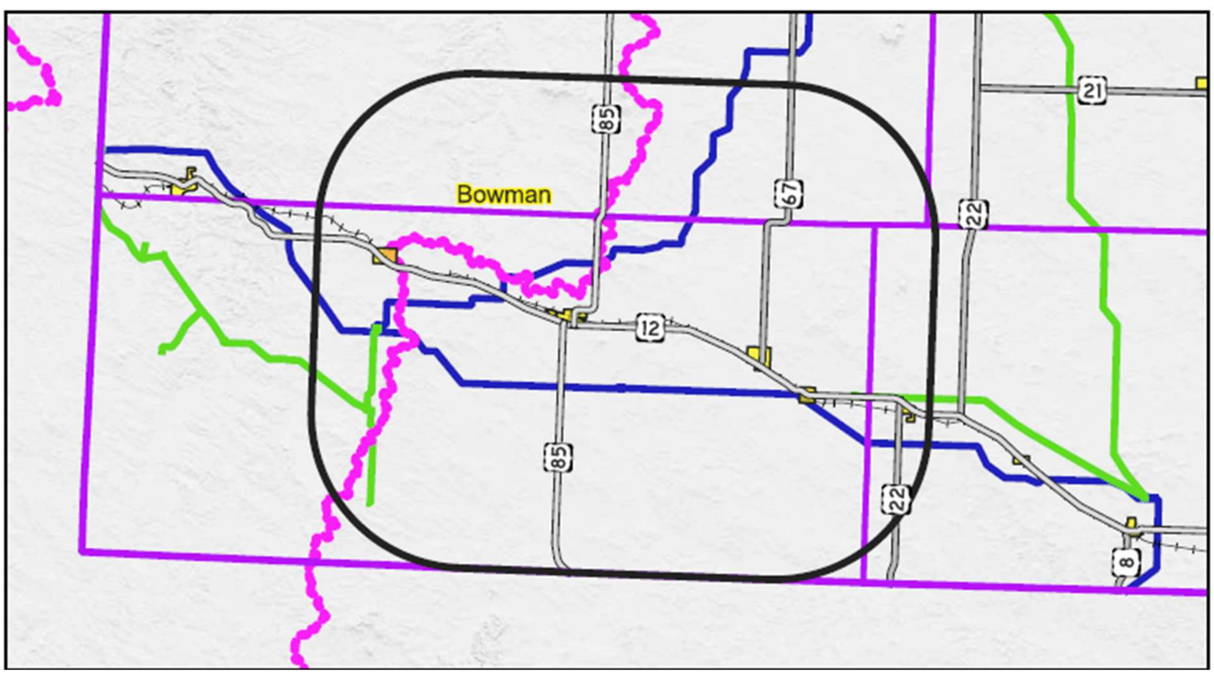

Figure 5-3: Southwest North Dakota - Area of Interest

Area of Interest 4: Northeast North Dakota

(Pembina, Walsh Counties)

Northeast North Dakota, comprising Pembina and Walsh counties, offers a promising balance of grid access, water options, and siting flexibility. The area connects into the transmission system that feeds south toward Grand Forks, providing credible interconnection points for SMR capacity while linking into an existing regional load centre. Proximity to the Red River also presents the potential for water supplies that could support an evaporative cooling design, subject to future technical and regulatory assessment.

From a land use and population perspective, the Area of Interest lies away from major population concentrations yet remains close enough to draw on the workforce and services in Grand Forks and surrounding communities. This combination of setback from dense settlements, access to regional infrastructure, and potential cooling water availability makes Northeast North Dakota a credible candidate for SMR development. Subsequent stages will need to test specific sites against local land use patterns, environmental constraints, and community perspectives, but at the regional level the fundamentals compare favorably with other parts of the state.

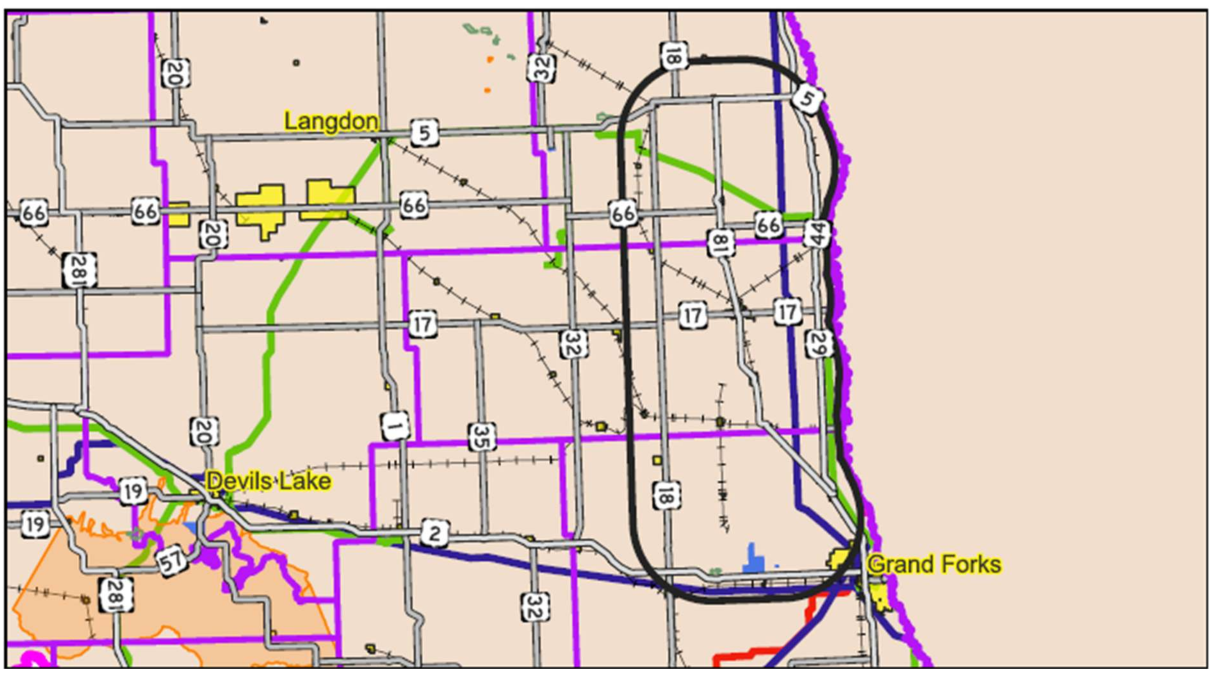

Figure 5-4: Northeast North Dakota - Area of Interest

Area of Interest 5: Jamestown Area

(Stutsman County)

The Jamestown Area, centered in the northeast corner of Stutsman County, benefits from significant available transmission capacity anchored by the Maple River substation, which emerges as a leading interconnection candidate in the state. Proximity to Jamestown, while maintaining physical separation, is advantageous for siting because it combines access to services and workforce with the ability to maintain appropriate buffers and manage land use. Existing data center loads in the area further reinforce the strength and relevance of the local grid, indicating that this portion of the system is already configured to support large, high value loads.

The ability to run interconnection lines on the order of 10 to 20 miles or more opens up additional siting flexibility to the north and east, including parts of Barnes, Griggs, and Foster Counties, while still relying on the Maple River substation as the primary grid anchor. Water availability in and around the Jamestown Area appears promising and could support a range of cooling options, although targeted hydrological work would be required before selecting a specific cooling technology. Overall, the combination of robust transmission, a flexible siting radius, and access to a regional workforce makes the Jamestown Area one of the more versatile Areas of Interest for potential SMR development in North Dakota.

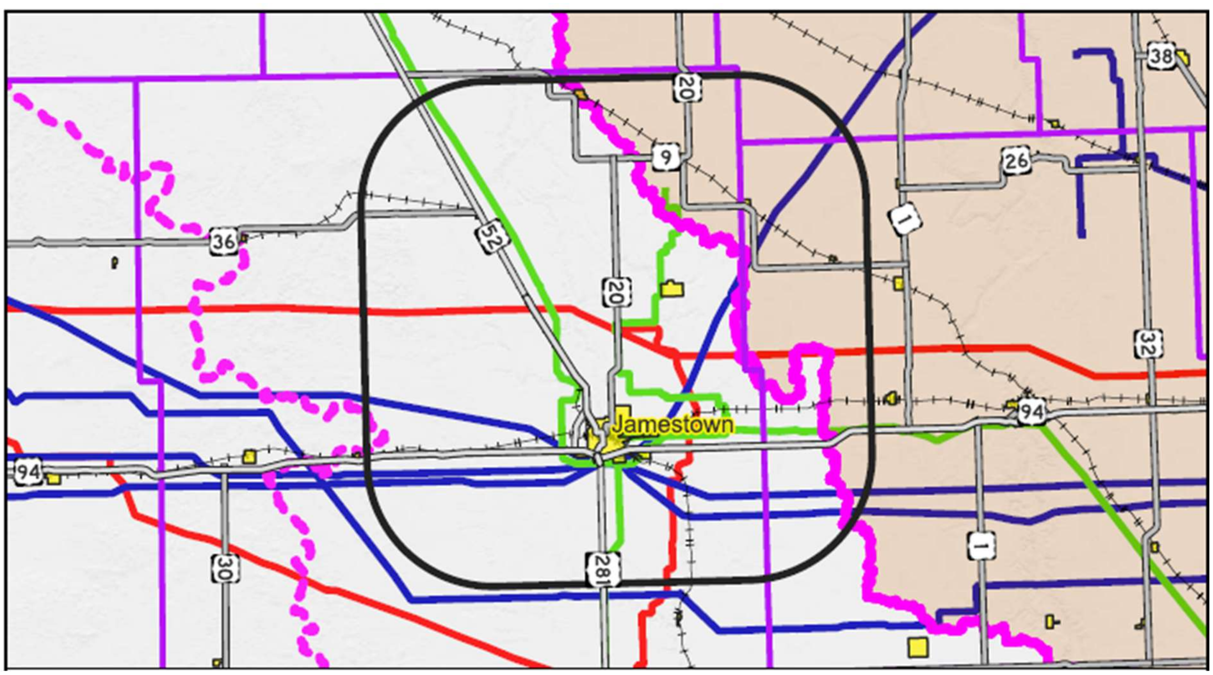

Figure 5-5: Jamestown - Area of Interest

Area of Interest 6: Tower City
(western Cass County)

The Tower City Area of Interest, encompassing the western half of Cass County, is defined primarily by strong transmission capability paired with relatively low population density. The area benefits from its proximity to the Buffalo substation, located west of the Bison and Mapleton substations, which provides a logical interconnection point for SMR capacity while maintaining separation from the core Fargo urban area. This corridor offers sufficient setback from higher-density development to support buffer and land-use considerations yet remains close enough to the Fargo and West Fargo labour markets to draw on a sizable workforce and service base.

Water supply is more constrained in this Area of Interest than in regions situated directly along major rivers. While the Red River could be a potential source, the distance from the river means that any water-dependent cooling solution, if desired, would require careful routing and infrastructure planning. Consequently, the Tower City area scoring relies strongly on grid access and population characteristics, with water availability acting as a moderating factor that future, site-specific assessments would need to address in greater detail.

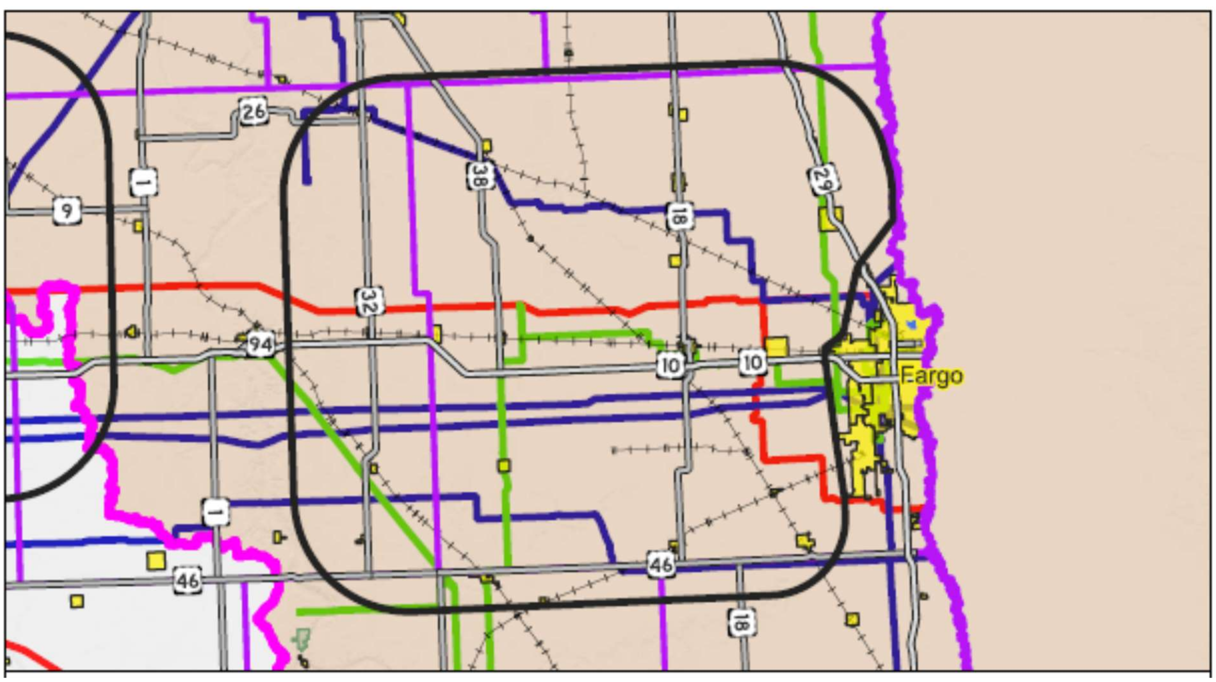

Figure 5-6: Tower City - Area of Interest

Area of Interest 7: Southeast North Dakota
(Dickey County)

Southeast North Dakota, largely centered around Ellendale in Dickey County, is shaped primarily by transmission and population characteristics. A defining feature of this Area of Interest is the strength of the Ellendale substation as a potential interconnection point. Population density across the Area of Interest is relatively low, which provides flexibility for siting while still allowing access to communities and services along the corridor.

Water availability in this Area of Interest will require more detailed, site-specific analysis, as limited information is currently available on specific sources in this part of the state.

West of this Area of Interest, near Lake Oahe, access to surface and groundwater resources appears favorable and could support a range of cooling options, subject to future technical assessment. This is relevant because the transmission line in the area does run west towards the Lake. Further east from Emmons County, water availability is less certain and would need targeted investigation before advancing specific sites. Overall, Southeast North Dakota compares well on grid connectivity and population characteristics, with water emerging as the principal factor for closer study in subsequent phases.

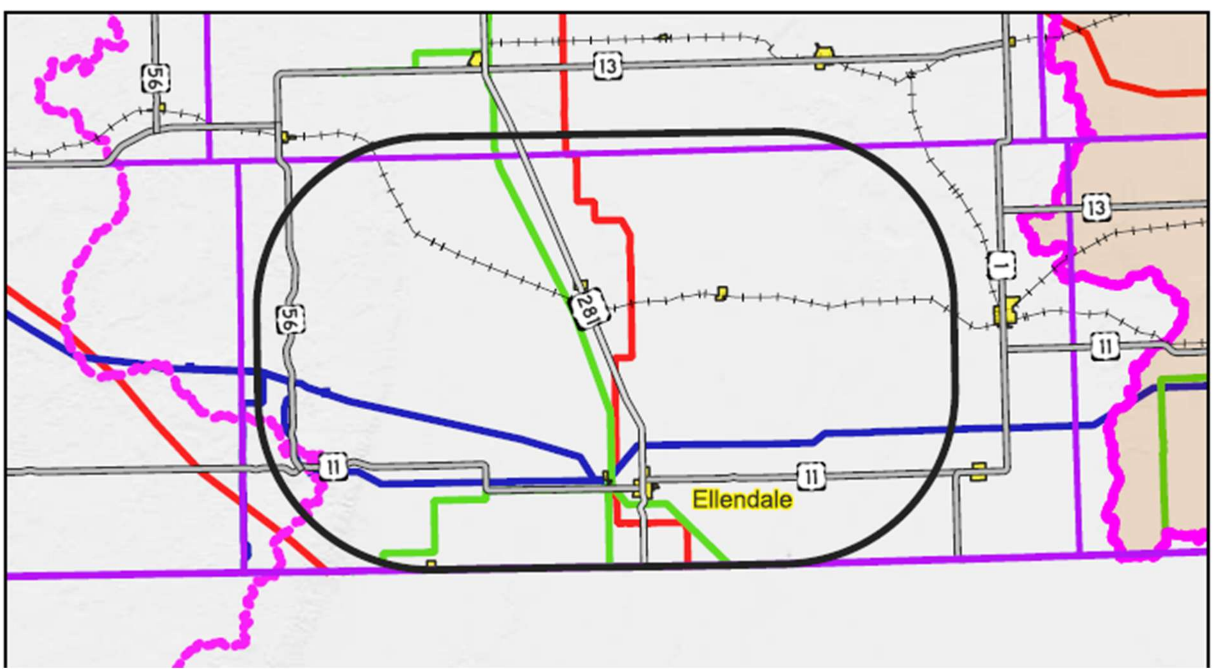

Figure 5-7: Southeast North Dakota - Area of Interest

5.3 Application of Screening Criteria in addition to Transmission and Water

The Areas of Interest were built from the county-level scoring results using a simple and transparent logic, starting with the transmission screening and hosting capacity work. Water availability, both surface and groundwater, was then overlaid to identify areas where cooling options are likely to be technically feasible, even if specific designs will only be confirmed later.

Counties, or portions of the counties, were used as the basic building blocks for assembling Areas of Interest. Where an Area of Interest contains only part of a county, the boundaries follow natural or infrastructure-based features that align with the transmission and water layers. This county scale approach allows communities to see that their area is being considered as part of a broader opportunity, while avoiding the impression that specific parcels or landowners have already been singled out for development.

The result is a set of Areas of Interest that:

- Follow strong transmission corridors and realistic interconnection points.
- Reflect broad water availability patterns.
- Respect county and community identities.
- Preserve flexibility for utilities and private developers to work within the Area of Interest in later phases.

The following describes the approach that was taken with respect to the remaining scoring criteria which are repeated here for reference:

Table 4-1: County-level screening criteria selected (repeated)

#	Scope Element	Description
1	Transmission system screening and hosting capacity	Evaluation of grid access points, line and transformer capacity, and potential system constraints that may preclude SMR interconnection. Proximity and conceptual routing for thermal conveyance, as applicable.
2	Terrain and general constructability	Assessment of topography, slope, and surface characteristics that would affect facility construction and logistics.
3	Population density and growth corridors	Identification of densely populated areas or expected urban expansion zones that may limit emergency planning flexibility or create public acceptability challenges as well

		as regional populations sufficient for facility operation and support
4	Geotechnical suitability (desktop level only)	High-level screening of areas known to have unsuitable subsurface conditions, based on geological mapping, LIDAR, or historical borehole data.
5	Volcanic risk, seismic hazard, and tornado zone overlays	Desktop overlays of National Weather Service datasets, classifications, and corridors, with exclusion of areas posing unacceptable natural hazard risk.
6	Road and rail access feasibility	Evaluation of logistics pathways including proximity to major roadways, highways, and railways that can support reactor module and equipment transport as well as year-round operational access, including during periods of extreme weather.
7	Airspace conflicts and restricted zones	Assessment of civil and military flight paths, aerodrome (including airports) proximity, and airspace restrictions that could affect siting or operations.
8	Water supply (surface and groundwater)	Initial feasibility of sourcing cooling or processing water from rivers, lakes, aquifers, or municipal systems.
10	Native American tribal lands and interest areas	Desktop mapping of treaty areas, asserted territories, and known traditional land use regions, based on public data or internal engagement records.
11	Land tenure (Federal, private, institutional), available parcel size and parcel attributes	Classification of land control regimes to identify areas with feasible paths to site control, review of available development area, including review of suitability and potential placement for facilities and associated site security. Consideration for future expansion potential.

Industrial corridors, brownfield development, and logistical hubs

Within each Area of Interest, the analysis gives preference to areas that can build on or reuse existing industrial and energy corridors. The objective is to lower siting risk and shorten timelines by co- locating SMR development with infrastructure and land uses that are already familiar with large industrial projects.

In **Northwest North Dakota and the Killdeer Area**, the oil and gas sector has created a mature industrial corridor with established roads, laydown areas, camps, and service providers. Existing energy campuses and facilities in Williams, Mountrail, and McKenzie Counties provide examples of locations where reuse or expansion could reduce greenfield disturbance, subject to future site-level analysis and environmental review.

In the **Jamestown Area**, existing data centers and the Maple River substation form an emerging energy and digital infrastructure hub. The presence of high value loads already connected to the system suggests that the local grid is configured to support large, continuous power flows, and that there is an existing base of electrical and civil contractors familiar with complex projects.

In the **Southeast North Dakota** area, the Ellendale substation, together with highway and rail access, creates multiple interconnection and logistics points stretching from Emmons County through to Richland County. Industrial and agricultural processing sites along this corridor may offer brownfield or semi-developed locations that are better candidates for SMR development than untouched farmland.

In **Tower City**, the Buffalo substation and surrounding infrastructure west of the Bison and Mapleton substations represent a logical focus for any future SMR consideration. Here, the proximity to Fargo and West Fargo services is balanced by lower density land uses, creating both opportunities for industrial reuse and workforce access.

The remaining Areas of Interest, **Southwest North Dakota** and **Northeast North Dakota,** also contain smaller industrial and logistics hubs, including rail sidings, highway junctions, and local industrial parks. While this report does not identify or prioritize individual campuses, it is explicit that future site identification within Areas of Interest should begin by examining these established corridors and hubs before considering remote greenfield locations. This principle is intended to guide both technical work and engagement conversations as Nucleon and its partners move from broad Areas of Interest to more detailed siting discussions.

Exclusions and physical constraints at Area of Interest scale

To keep the Areas of Interest realistic and to avoid signalling interest in areas that are very unlikely to support nuclear development, a set of straightforward exclusions and physical constraints has been applied at the area-of-interest scale using public datasets. These filters are coarse by design, but they provide an important check on the maps and the scoring.

The exclusions include:

- National, state, and local parks and protected areas.
- Large wetland complexes and high flood probability areas.
- Clearly incompatible land uses, such as dense urban cores and closely settled residential areas.
- Areas that fall within natural hazard classifications that are generally unacceptable under Nucleon's siting procedure and the regulatory frameworks referenced in Section 4.

In addition, high-level buffers are applied around sensitive features such as towns, critical infrastructure, and certain environmental or cultural assets. These buffers are not intended to replicate the detailed exclusion zones that would be defined at the site stage, but they help ensure that the Areas of Interest shown in this report are not dominated by locations that would clearly fail later screening.

The effect of this physical screening is to highlight parts of each Area of Interest where future SMR siting could plausibly be considered, while still leaving significant flexibility within the Area of Interest boundaries. Detailed geotechnical conditions, parcel specific constraints, and local environmental or cultural features are intentionally deferred to future phases. Those issues will be examined in much greater detail if and when specific sites are considered, once communities have been engaged and additional data have been gathered.

Workforce, services, and constructability indicators

Beyond transmission, water, and basic land use, the constructability and long-term operation of SMRs depend on workforce access, construction services, and logistics. This section summarizes how those factors vary across the Areas of Interest and how they will be used alongside the quantitative scores.

Key indicators considered include:

- Proximity to urban centers and regional hubs that can supply skilled trades and professional staff.
- Presence of established industrial workforces, such as oil and gas or data center operations.
- Highway and rail connectivity for heavy haul and module delivery.
- Availability of laydown space and construction staging areas.

- Seasonal access considerations and exposure to extreme weather conditions that could affect construction windows.

As a caveat to the following, given the low unemployment in North Dakota, it may also make sense to partner with the North Dakota State College of Science, University of Jamestown, UND, MSU, and NDSU to examine how a highly skilled workforce could also be either locally trained or recruited from elsewhere to augment the workforce that already exists in each of the following areas.

Northwest North Dakota and **Killdeer Area** benefit from an existing industrial workforce and service base associated with the oil and gas industry. Heavy equipment, logistics providers, and industrial trades are already active in the region, which is a significant advantage for constructability.

The **Jamestown Area** and **Tower City** Area of Interests would likely draw on the labour markets of Jamestown and the Fargo region respectively. Both areas combine separation from dense urban development with access to a substantial workforce, services, and accommodations.

The **Northeast North Dakota** Area of Interest is more rural, but still close enough to Grand Forks and other centres to attract commuting workers and contractors. The **Southeast North Dakota** area combines low population density with multiple small communities near Ellendale.

The **Southwest** Area of Interest has the lowest population density of the seven Areas of Interest and may face the greatest challenge in assembling and sustaining a full construction and operations workforce locally. Any project there would likely need deliberate workforce strategies, including commuting from regional centres or rotational work arrangements.

These indicators are not converted directly into additional numerical scores. Instead, they are used qualitatively when interpreting the results of the ten-criterion framework. An Area of Interest that scores well numerically but faces clear workforce or constructability challenges will not automatically be preferred over an Area of Interest with slightly lower scores but stronger practical implementation conditions. This helps ensure that the analysis remains grounded in real delivery considerations.

It is also worth noting that SMR development in any of these regions could have a positive and real impact on the housing in the area and would stimulate housing development in the surrounding areas given the high quality, multi-generational employment that would accompany a build out of the nuclear industry.

5.4 Scoring and Ranking Results

The following table summarizes the scores for each of the seven Areas of Interest across the selected county-level siting criteria introduced earlier in this section. These results follow the comparative scoring approach introduced in Section 4. The overall score for each Area of Interest is out of a maximum possible total of 1000.

Nucleon Energy Numerical Area Ranking Form	1. Transmission Capacity	2. Terrain & Constructability	3. Population & Growth	4. Geotechnical (Conceptual)	5. Volcanic, Seismic & Tornado
Weighting	**150**	**90**	**120**	**90**	**100**
Area Number & Name					
4 - Northeast North Dakota	140	90	100	90	60
6 - Tower City	130	90	130	90	50
1 - Northwest North Dakota	70	90	130	90	90
5 - Jamestown	150	70	120	80	60
7 - Southeast North Dakota	150	90	100	90	100
2 - Killdeer Area	70	70	120	90	100
3 - Southwest North Dakota	70	80	70	90	100

Nucleon Energy Numerical Area Ranking Form	6. Road & Rail Access	7. Aerodrome (including airports) & Nav Conflicts	8. Water Availability	10. Indigenous Lands & Uses	11. Land Title Types
Weighting	**90**	**90**	**90**	**90**	**90**
Area Number & Name					
4 - Northeast North Dakota	90	90	90	40	90
6 - Tower City	90	90	70	40	90
1 - Northwest North Dakota	90	90	90	40	90
5 - Jamestown	90	90	70	40	90
7 - Southeast North Dakota	90	90	10	40	90
2 - Killdeer Area	80	90	90	40	90
3 - Southwest North Dakota	90	90	0	40	90

Nucleon Energy Numerical Area Ranking Form	**Overall Score (out of 1000)**
Area Number & Name	
4 - Northeast North Dakota	**880**
6 - Tower City	**870**
1 - Northwest North Dakota	**870**
5 - Jamestown	**860**
7 - Southeast North Dakota	**850**
2 - Killdeer Area	**840**
3 - Southwest North Dakota	**720**

The following table repeats the transmission capacity in each of these Areas of Interest. The best way to interpret the following table is that SMR Area ratings between 200MW-300MW suggest that a pair of 100MW reactors or two to four ~80MW reactors may be suitable for the area. Where the SMR Area rating exceeds 600MW allows for the deployment of a larger number of reactor type and would allow for a pair of 300MW reactors to be deployed which provides for greater technical choice.

Area No.	**Area Name**	**Indicative Seasonal SMR Area Capacity (MW)**	**Indicative SMR Area Rating[11] (MW)**
1	Northwest North Dakota	Winter = 409.1 / Summer = 297.5	**297.5**
2	Killdeer Area	Winter =524.6 / Summer = 266.2	**266.2**
3	Southwest North Dakota	Winter =227.2 / Summer = 211.6	**211.6**
4	Northeast North Dakota	Winter = 889.4 / Summer = 719.7	**719.7**
5	Jamestown	Winter =922.0 / Summer = 913.0	**913.0**
6	Tower City	Winter = 698.4 / Summer = 636.8	**636.8**
7	Southeast North Dakota	Winter = 820.0 / Summer = 750.0	**750.0**

This combination of scoring and physical screening, together with the available transmission capacity in each Area of Interest, supports the development of a prioritized short list of areas that are most suitable for early focus, while confirming that all seven Areas of Interest remain credible candidates for SMR development. Within this portfolio, the eastern areas (Areas 4, 5, 6, and 7) are particularly appealing because they can accommodate a wider range of SMR technologies and align with the load growth

[11] Indicative SMR Arae Rating refers to the lesser of the seasonal limit, generally Summer, that does trigger a thermal violation or force a transmission system upgrade.

opportunities identified in the recent North Dakota Transmission Authority report[12]. At the same time, Areas 1, 2, and 3 remain important to explore given their close linkage to electrification and decarbonization of existing industrial activity in western North Dakota.

These Area of Interest packages will form the bridge between this technical and planning study and future streams of work, including land use and social compatibility analysis, engagement planning, and utility system planning. They are intended to be shared reference materials for policy makers, utilities, and communities as conversations progress.

5.5 Future stakeholder engagement and local support signals (planned)

The Areas of Interest identified in this report create a practical basis for structured engagement. Before any move from an Area of Interest concept to specific sites, there will need to be a structured area-specific program of education and dialogue that is tailored to each area.

At a minimum, that future engagement program would:

- Begin with county and municipal governments in each Area of Interest, explaining the SMR concept, the screening work completed to date, and the potential economic and community implications.
- Involve Tribal Nations and tribal governments, local industry, landowner groups, and community organizations in conversations about opportunities, concerns, and conditions that would need to be in place for support.
- Make clear that no site decisions have been made and that the Areas of Interest are intended to show where it may make sense to explore options, not to pre-commit to specific projects.

As this engagement proceeds, the project team will look for signals that an Area of Interest is suitable for more detailed exploration. These signals might include a demonstrated willingness among local leaders to continue discussions, interest in economic participation or benefit-sharing structures, and an absence of clear, Area-wide opposition. The goal is not to seek unanimity but to build a foundation where further technical and siting work can proceed in good faith, with communities fully informed about what is being considered.

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[12] FUTURE-PROOFING NORTH DAKOTA'S ELECTRICAL INFRASTRUCTURE TO ENABLE EXPANSION IN AN EVOLVING ENERGY LANDSCAPE - Final Report, October 2025.

Findings from this engagement program will be used to refine how the Area of Interest rankings are interpreted and guide decisions about where to invest in additional technical studies. Communities that show strong interest and constructive, ongoing dialogue may move to the front of the line for more detailed evaluation, while Areas of Interest where concerns dominate may be approached more cautiously or set aside for reconsideration at a later stage.

5.6 Future transition rules from Areas of Interest to Candidate Sites (planned)

The movement from Areas of Interest to specific Candidate Sites will be a significant step that should occur only when certain conditions have been met. This section sets out the intended criteria and triggers for that transition so that the process is transparent and predictable.

Indicative triggers include:

- Favorable, or at least promising, results from utility-led transmission and interconnection studies for key substations and lines in the Areas of Interest.
- Confirmation that viable cooling pathways exist, based on more detailed analysis of surface and groundwater resources and potential cooling technologies.
- Evidence of local community and stakeholder engagement that indicates openness to continued discussion and a credible path toward potential support, even if questions and reservations remain.
- Alignment with industrial corridors or brownfield opportunities that can reduce greenfield impacts and support practical delivery.

Once these triggers are met for a particular Area of Interest, Nucleon and its partners would move to assemble a more detailed dataset focused on potential sites. This would include parcel-level land tenure and rights, additional geotechnical and hydrological investigations, site-specific environmental and cultural studies, and more detailed emergency planning considerations.

Confidentiality will be essential at this stage. While high level progress and principles can remain public, the exact location of potential sites and the identity of specific landowners or commercial counterparties will need to be managed carefully. The intent is to maintain public trust by being clear about the process and criteria, while protecting sensitive commercial and private information and avoiding unnecessary speculation or land price impacts.

5.7 Practical next steps and early engagement roadmap

Finally, this section sets out a set of practical next steps that follow naturally from the area-of-interest-based view of the state. The immediate priority is not to move directly to site selection, but to begin structured, area-of-interest-level engagement and education that can shape how siting proceeds.

The recommended next steps are:

1. Targeted outreach to county, municipal and Tribal leadership in each Area of Interest.
   Share the high-level findings of this report, the Area of Interest maps, and the basic SMR concept, and invite initial conversations about local priorities, concerns and expectations.
2. General education sessions in each Area of Interest.
   Organize open sessions that explain what SMRs are, how siting and licensing work, what the potential economic and community benefits could be, and how risks are managed. These sessions should be structured to listen as much as to present.
3. Document early support and concerns.
   Use these engagements to build a clear picture of the landscape in each Area of Interest, including where there is interest in further exploration, where there are strong reservations, and what conditions communities would place on any potential project.
4. Feed engagement results back into planning.
   Update the interpretation of the Area of Interest rankings, future grid studies, and the prioritization of technical work based on what is learned from communities, governments, and local industry.

Only after this early engagement is underway and there is a better understanding of local perspectives should any move from Areas of Interest to potential sites be considered. In this way, the technical and scoring work in Sections 3 and 5 becomes a starting point for dialogue about how SMRs might fit into North Dakota's energy future, rather than a predetermined map of where projects will go.

6. Land Use and Social Compatibility (RFP Element #3)

This section evaluates how existing land use patterns and community context, influence the credibility and schedule of future SMR siting, recognizing that this report has identified higher priority Areas of Interest only at a county scale. It documents how land use and social considerations have already informed the definition of those Areas of Interest and explains how they will be carried forward when future decisions narrow from Areas of Interest down to specific sites. The intent is to show clearly that Nucleon has considered land use and social compatibility issues in a structured way, even though parcel level siting remains a future step.

The analysis focuses on county and Area of Interest scale signals such as zoning and comprehensive plans, agricultural and conservation areas, population distributions, and the proximity of strategic facilities. These signals help distinguish where industrial energy uses are more likely to be compatible and where schedule risk from land use or social opposition may be higher. At this stage, the report does not attempt to resolve parcel level questions. Instead, it sets out the methodology that will guide later decisions and points to Appendix A1, which describes the full twenty criteria Nucleon uses for SMR siting, including the land use and social elements that will be applied in more detail once specific site areas are under consideration.

Public engagement remains a future workstream. This section identifies the topics, constraints, and opportunities that are most likely to matter to communities in each Area of Interest and outlines how they will inform a future education and listening program. Movement from Areas of Interest to parcels will occur only after that program is underway and after additional technical checks are complete. The goal is a clear view of where technical feasibility and social conditions are most likely to align, without pre-judging any individual site.

6.1 Zoning and planned land use compatibility

Zoning and comprehensive plans provide the first indication of where SMR-compatible industrial energy uses are more likely to fit. For each Area of Interest, the assessment has broadly considered county and municipal zoning and proximal industry to understand how current and planned land uses align with large, long-lived industrial facilities. Particular attention is paid to areas already designated for industrial, energy, or heavy commercial uses, and to locations where recent entitlement decisions demonstrate a track record of permitting significant infrastructure projects.

Where zoning and plans show a concentration of industrial and energy uses, the corresponding portions of counties have been included within the Areas of Interest so that potential SMR sites can build on land uses that are already familiar with large projects. Where land use designations emphasize high-value agriculture, active residential expansion, or formally protected areas, those areas have either been excluded or treated as having higher entitlement and schedule risk in the scoring. These signals will be revisited at the parcel scale in future phases, when specific sites are being advanced, but the framework is designed so that land use compatibility is already embedded in the current screening steps.

6.2 Sensitivity overlays and military or critical infrastructure proximity

Land use compatibility also depends on how potential SMR locations interact with sensitive receptors and strategic facilities. The assessment of Areas of Interest also considered features such as military installations, training areas, airports and air corridors, major pipelines, and other critical infrastructure that may require special treatment in siting decisions. The objective is to identify where nuclear development might conflict with the safe operation of these facilities or, conversely, where co-existence is feasible provided appropriate setbacks and coordination are in place.

The assessment relied on desktop overlays of publicly available datasets for civil and military airfields, flight paths and approach surfaces, radar and communications assets, and known military training or restricted use areas. Similar overlays are used for major pipeline and transmission corridors, large industrial facilities, and other strategic infrastructure. Areas where potential SMR locations would fall within or immediately adjacent to protected airspace, safety buffers, or restricted zones are flagged as higher risk. Where setbacks can be achieved while still maintaining practical grid and logistics access, the Areas of Interest are retained, but the need for future coordination with the relevant agencies is highlighted.

6.3 Community and service readiness

Community and service readiness is another dimension of social compatibility. Even where land use designations and sensitivity overlays support SMR development in principle, projects need to be in places where communities can realistically support both the construction and long-term operation of a nuclear facility. For this reason, the assessment considers high level indicators such as proximity to hospitals and emergency care, the distribution of fire and emergency response services, access to policing, and the presence of regional population centres that can provide workforce, housing, and social infrastructure.

These indicators are not intended to rank communities on their willingness to host SMRs, which is a matter for future engagement, but rather to highlight where the basic service platform is already developed. Areas of Interest that are within reasonable travel times of hospitals, fire departments with industrial response capabilities, and regional service hubs are interpreted as having comparatively lower schedule and implementation risk. Areas that are more remote from such services may still be suitable but will likely require more extensive planning for mutual aid, specialized training, and on-site emergency capabilities as part of any future licensing process.

6.4 Integration with scoring and public outputs

Land use and social compatibility are already embedded in the ten-criterion scoring framework described in Section 4 and quantified in Section 5. At the county scale, several of the scoring criteria explicitly reflect land use and social conditions, including population density and growth corridors (Scope Element 3), Tribal Nations title and interest areas (Scope Element 10), and known environmental sensitivities and protected areas (which link back to Scope Element 13 in the broader Procedure 006-01 framework). These elements influence the comparative scores of Areas of Interest, making the role of land use and social factors visible and traceable in the ranking.

Related elements from the full 20-criteria set in Appendix A1 are deliberately held back for application at the parcel scale. Detailed parcel level land use compatibility, specific cultural resource constraints, and local history and use patterns are examples of factors that cannot be reliably evaluated using statewide datasets and therefore remain outside the numeric scoring at this stage. Instead, they are reserved for future, site specific assessments where local governments, rights holders, and community members can participate directly in identifying constraints and opportunities.

7. Potential Co-location with New or Existing Loads

This section assesses where SMRs could sit close to the kinds of big electricity users that North Dakota already has or is likely to attract. The idea is straightforward: if you place firm nuclear power near large, steady loads, it can be easier to connect to the grid and easier to show clear local benefits. The discussion stays technology neutral and does not pick specific projects. Instead, it points to patterns that make sense for future conversations with utilities, industry, and communities once the primary screening has identified suitable areas.

Whenever an SMR is placed beside an existing facility, the site must respect a reactor-specific exclusion zone. Within this zone, land can still be used for many industrial purposes such as laydown, parking, warehousing, and equipment yards, but permanent homes are not allowed. Depending on the design and size of the SMR, this exclusion zone will typically extend approximately 1,300 feet (400 meters), i.e., about 0.25 miles from key plant structures. This does not prevent co-location, but it does mean that existing land uses, parcel size, and industrial density can strongly influence whether a campus style concept is practical in each place.

Within that context, this section focuses on three themes:

1. Existing and prospective data centers already create strong, continuous loads that can support SMR development near them, and SMRs can in turn make those locations more attractive for future data centers.
2. The oil and gas corridor in Northwest North Dakota could host smaller SMRs in the 100-to-200-megawatt range that serve both power and, in future, industrial heat and steam.
3. The existing power generation cluster in Mercer, McLean, and Oliver counties has a strong grid, but its remaining interconnection capacity may be better used for additional fossil or repowered generation rather than new nuclear in the near term.

Taken together, these themes describe commercial opportunities that sit on top of the technical, environmental, and social screening work already completed in the earlier sections of the report.

7.1 North Dakota load landscape and siting implications

North Dakota's load story is shifting from mainly traditional industrial and utility customers to a mix that includes data centers, more electrified oil and gas operations, and value-added agriculture and manufacturing. Each of these has a different demand profile and a different fit with SMRs, once an Area of Interest has already passed the primary screening tests. As summarized in Section 2.1, transmission capacity varies significantly between eastern and western North Dakota. This section focuses on how those patterns interact with current and emerging industrial load centers.

For data centers, including existing ones in the Jamestown and Southeast North Dakota areas, the key feature is that they use a lot of power all day, every day. These loads are already strong enough that utilities have reinforced parts of the grid and upgraded substations. If an SMR were located near one of these nodes, or near future data center deployments, the SMR could supply a large share of that round the clock demand, provide the low carbon power many data centers are seeking, and support future expansions. In return, the presence of a strong, firm generator would make the same area more attractive for additional data center investment. In simple terms, nuclear and data centers can make each other's case stronger, provided the underlying siting fundamentals in the Areas of Interest are sound.

In western North Dakota, the main story is oil and gas. Field facilities, midstream assets, and processing plants already use significant electricity and are likely to electrify further as operators look for lower emissions and more efficient operations. Smaller SMRs could be sited near these hubs to supply power locally, which reduces the need to move large amounts of power over long distances (minimize operating losses on the transmission system). Many SMR designs can also provide industrial heat and steam, which opens the door to serving both electrical and thermal needs on the same site in the future, again assuming the Area of Interest has already been shown to be technically and socially credible for nuclear.

The generation cluster in Mercer, McLean, and Oliver counties is different. The grid there is strong and can still handle more generation, but much of the interconnection "space" is already shaped by large existing plants. Given that history, it may be more realistic, at least in the near term, to use remaining capacity for additional fossil or repowered generation options that fit directly into the existing fleet. For this study, the main SMR development attention is therefore directed to other Areas of Interest where nuclear can anchor new growth or support emerging clusters, rather than competing head-to-head with established assets.

Across all these cases, the availability of suitable land around the load, and the ability to fit a 1300 ft (400 -metre) SMR exclusion zone into that land without displacing critical uses or creating land use conflicts, will be a key practical test for any co-location concept.

7.2 Behind the meter and campus configurations

In some locations, the most attractive pattern will be a campus style arrangement where an SMR sits very close to a major load and supplies it directly, with the wider grid acting mainly as a backup and balancing resource. This subsection explains when that kind of "behind the meter" or campus model is likely to make sense in North Dakota and how exclusion zones shape the options.

For data centers, the picture is straightforward. A large campus near a strong substation within one of the priority Areas of Interest can, in principle, be paired with an SMR that sits on the same or an adjacent industrial parcel. The SMR would supply much of the site's power directly, while the grid handles the rest. To make this work, the site plan must include space for a reactor exclusion zone, typically up to 1300 feet from key plant structures. Within that exclusion zone, permanent houses are not allowed, but data halls, warehouses, parking, laydown areas, and certain other industrial uses could remain. A campus concept is therefore most practical where the data center has access to a large enough industrial site or park to fit both the computing facilities and the SMR exclusion zone without boxing in future expansion.

If these conditions are met, a campus arrangement can reduce interconnection queue risk for the data center, improve reliability and power quality, and send a clear signal to other technology and industrial users that the Area of Interest offers firm, low carbon power. The need to accommodate the exclusion zone simply means that master planning for such sites has to treat the SMR as a central land use from the start rather than something that can be added later into leftover space, and it can only be considered in Areas of Interest that have already passed the primary screening.

In the Northwest oil and gas corridor, a similar pattern could apply, but the campus would be a large industrial complex rather than a digital park. A 100 to 200 megawatt SMR located at or near a major field or midstream hub could serve on-site electrical load, provide process heat and steam, and export surplus power to the grid when capacity is available. In this setting, the exclusion zone would mostly cover parts of existing industrial land such as yards and service areas, rather than residential use. The key question is whether operators have enough contiguous industrial land to host the SMR, its exclusion zone, and their own processing facilities without constraining long term operations or growth. Again, this kind of campus concept is only worth pursuing in locations that already satisfy the safety, environmental, and acceptance conditions identified in the broader siting framework.

In Mercer, McLean, and Oliver counties, any campus-style SMR would sit in a more physically crowded context, alongside large existing plants, ash and waste facilities, and other ancillary uses. While these physical congestions issues are likely surmountable, interconnection constraints mean that, for now, the stronger co-location opportunities are likely to be in Areas of Interest where entirely new campuses can be planned around an SMR from the outset, rather than layered into fully built generation complexes.

Across all Areas of Interest, choosing between a fully grid-facing SMR and a campus-oriented SMR will depend on substation strength, the amount of suitable industrial land, how existing and planned land uses fit within potential exclusion Areas of Interest, and the availability of fiber and control infrastructure. These factors will be tested in more detail when specific opportunities move forward in the higher priority Areas of Interest.

7.3 Integration with the scoring framework and next actions

The scoring framework in this report is designed first and foremost to answer a basic question: *where in North Dakota do the fundamentals for SMR siting look strongest?* Those fundamentals include:

- Proximity to suitable transmission and transport infrastructure.
- Land use, environmental, and natural hazard conditions that can support a robust safety case for the federal regulator, including appropriate buffers and exclusion zones.
- Population and rights-holder patterns that shape the likelihood of stakeholder acceptance and durable social licence.

The ten criteria and their weights are built around these technical, environmental, and social foundations. They deliberately do not assign higher scores simply because a specific data center, plant, or industrial customer is nearby. Instead, they assess the underlying conditions that any SMR would need in place, regardless of who the off taker might be. Co-location with major industrial loads therefore sits on top of the scoring framework as a commercial filter, not as a core screening driver. The sequence is intentional:

1. First, the framework asks whether an Area of Interest clears the primary screens:
   - Is there a realistic path to connect safely to the grid with acceptable reliability and hosting capacity?
   - Do land use, environmental, and community interest patterns allow a defensible safety case and practical buffers, including reactor exclusion zones?
   - Are there plausible conditions for gaining and maintaining social licence over time?
2. Only after an Area of Interest performs well on these fundamentals does it make sense to ask a second question:
   - Are there existing or future loads that could make an SMR commercially attractive here, either as a grid-facing plant or as part of a campus configuration?

Data centers, oil and gas hubs and electrification, and value-added industries are therefore treated as opportunities that can enhance the case for an Area of Interest that is already technically and socially credible, rather than as reasons to relax the underlying siting standards or pull marginal locations into contention.

In practical terms, this means that:

- The scoring matrix remains focused on infrastructure readiness, land and water suitability, population and rights-holder context, and natural hazard considerations.
- Co-location concepts are applied after the scoring and screening work has identified preferred Areas of Interest, to prioritize where commercial discussions might begin, not to change the scores themselves.
- Any future decision to pursue a co-located SMR campus will still need to demonstrate that the site meets all safety, regulatory, and engagement expectations on its own merits, with the load as a partner rather than a justification.

Next actions related to co-location follow this sequence. SMR developers / proponents and their partners would first use the full scoring results across all 20 criteria to identify areas where the fundamentals are strong. Only then would they:

- Work with utilities to understand interconnection capacity, planned upgrades, and preferred arrangements for serving large campus loads, including early testing of land and exclusion zone requirements.

- Begin exploratory conversations with existing and prospective data center operators and major oil and gas companies in those Areas of Interest about nuclear co-location concepts, both grid-facing and campus-style, and how those would fit their current and future site plans.
- Coordinate with local governments and economic development agencies so that zoning, land use planning, and industrial attraction strategies can accommodate SMR campuses where interest exists.

These steps do not commit anyone to an SMR project. Instead, they respect the order implied by the scoring framework: establish where SMRs can plausibly and responsibly go, and only then explore where co-location with major loads might make those projects commercially and economically attractive.

8. Integrated Findings

This section brings the prior analyses together into a single integrated view of where Small Modular Reactors (SMRs) can be responsibly developed in North Dakota. It combines the transmission gate and nodal hosting capacity, the high-level water and cooling feasibility screen, and the land use and social compatibility assessments, and then applies the ten-criterion scoring framework to the seven Areas of Interest. The result is a transparent, comparative ranking that shows how technical readiness, water options, land and social context, and co-location potential converge at a county scale, without prejudging any future parcel level siting decisions.

Across these layers, the primary conclusion is that SMRs can be responsibly sited today in all seven identified Areas of Interest, based on existing electric loads and transmission infrastructure. Each area sits within an established portion of the bulk transmission system, has at least one plausible cooling pathway, and lies in a land use and social context that can credibly support a future nuclear safety case, subject to detailed site work and engagement. The scoring and mapping therefore do not produce "go or no go" outcomes at this stage. Instead, they distinguish where development appears straightforward from a technical and social standpoint, and where schedule and implementation risk may be higher.

That said, the four Areas of Interest in eastern North Dakota would represent areas that should receive the early attention given the ability to include more candidate technologies and the ability to attract additional loads to the area.

8.1 Composite overlays and hosting capacity

The starting point for the integrated findings is the transmission hosting analysis in Section 2. That work identifies seven transmission supported areas where the 2034 bulk transmission system can accommodate at least 200 MW of new SMR capacity on an N-1 basis without major backbone reinforcements. Eastern Areas of Interest (4, 5, 6, and 7) support indicative area ratings on the order of 600 to 900 MW, while western areas (1, 2, and 3) support indicative ratings on the order of 200 to 300 MW. In practical terms, every Area of Interest appears capable of hosting at least a pair of SMR units in the 100-to-300-megawatt range, and several eastern areas could support larger multi-unit configurations over time.

These electrical limits are then overlaid with the water availability scoring, land use and zoning indicators, environmental and social sensitivities, and community and service readiness factors to form a composite picture for each Area of Interest. Areas where strong hosting capacity coincides with favorable water options and compatible land use patterns emerge as comparatively lower risk from a siting perspective. Areas where one or more of these layers is more constrained remain viable but are interpreted as candidates that would require additional planning, mitigation, or targeted infrastructure investment.

Viewed in combination, the overlays confirm that SMRs can be responsibly developed in all seven Areas of Interest, while clarifying how the nature of that development may differ. Eastern areas offer the greatest flexibility for technology choice and future expansion because of their higher indicative hosting capacities. Western areas align more naturally with smaller SMR configurations and with projects that are directly linked to existing or future industrial loads that value nearby firm nuclear generation.

8.2 Comparative ranking of Areas of Interest

The comparative ranking draws together the composite overlays and the ten-criterion scoring framework described earlier in the report. Each Area of Interest receives a single combined score that reflects transmission strength, water availability, land use and social compatibility, proximity to loads, and co-location potential. The resulting values are intended as a directional ordering rather than as precise measurements; what matters is how areas compare to one another under a consistent set of assumptions.

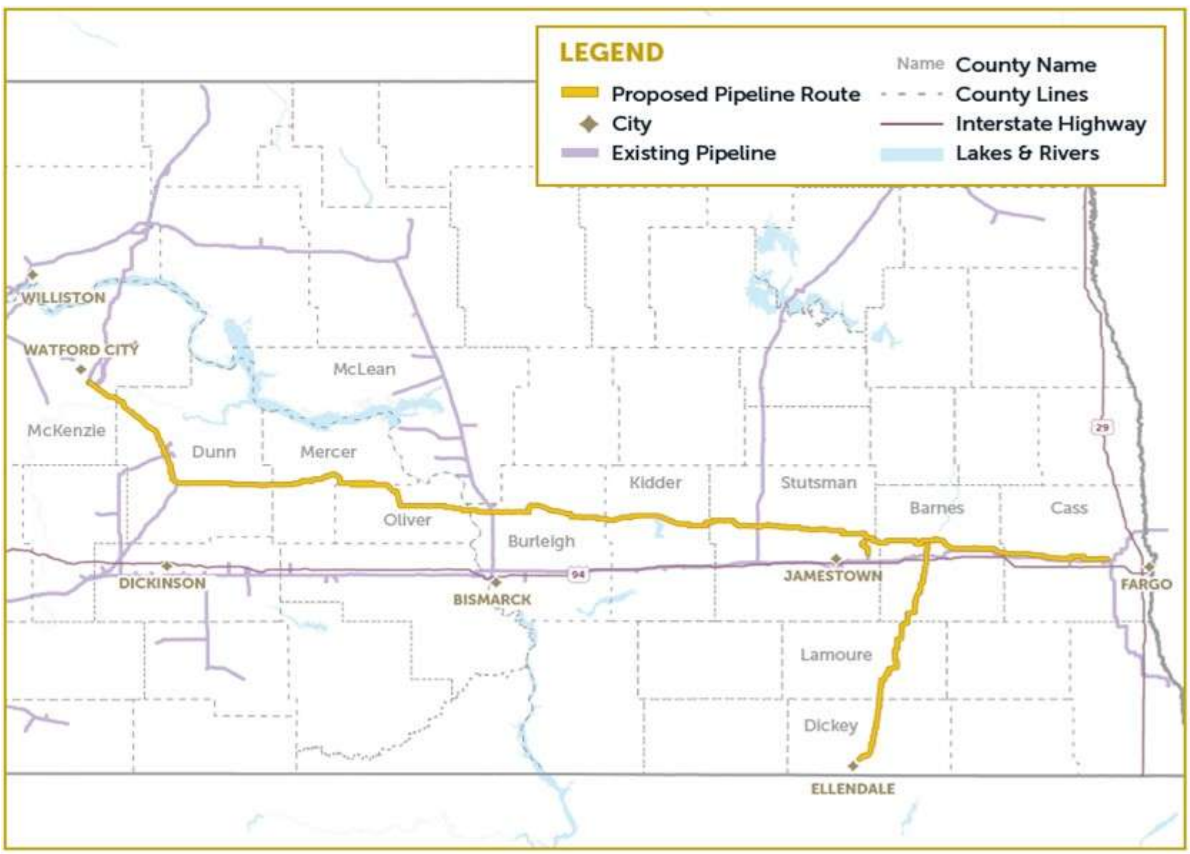
Under this framework, the four Areas of Interest in eastern North Dakota (Areas 4, 5, 6, and 7) emerge with the highest overall scores. Their strong transmission capacity, proximity to existing and prospective large loads, and access to surface water options combine to support both conventional grid-connected SMR projects and future co-located campuses. These findings are consistent with the recent North Dakota Transmission Authority work, which also identifies the eastern portion of the state as being comparatively well positioned to accommodate large, energy intensive loads without major new backbone builds. In this report, the same pattern appears when the focus shifts from serving loads to interconnecting new clean generation.

The three western Areas of Interest (Areas 1, 2, and 3) score slightly lower in relative terms, reflecting smaller indicative hosting capacities and more variable water and land use constraints. They remain credible SMR candidates, particularly for projects sized in the 200-to-300-megawatt range and for configurations that support electrification of oil and gas and other industrial activity in that part of the state. In these locations, SMR development is likely to be most compelling when it can be paired with clear industrial demand and, where necessary, targeted transmission reinforcements rather than very large multi-unit campuses.

Across the seven Areas of Interest, the rankings should be interpreted as comparative guidance, not as go or no-go decisions. The difference between scores reflects relative strength and readiness at a regional scale; it does not pre-judge the outcome of future parcel level siting, community engagement, or interconnection studies. The eastern areas provide the most flexible platform for early, multi-technology deployment and additional large loads, while the western areas offer focused opportunities that align with North Dakota's existing energy economy and industrial base.

8.3 Energy Transition Considerations – linkage to Gas-Fired Generation

The planned Bakken East pipeline project, led by WBI Energy, introduces an additional consideration for understanding how gas-fired generation and SMR development might interact in North Dakota.



Source: www.wbienergybakkeneast.com

The pipeline's routing intersects or passes in proximity to five of the seven Areas of Interest, including Tower City, Ellendale, Northwest Dakota, Killdeer, and Jamestown. This creates a corridor in which new natural gas infrastructure and the Areas of Interest coincide geographically. In practical terms, the pipeline may provide the fuel supply needed for new gas-fired generation in some of the same regions that appear suitable for potential SMR development.

In many jurisdictions, large data center operators and other hyperscale customers have indicated a preference for near-term, physical power additions from natural gas that can be followed by a visible pathway to non-emitting, firm supply over time. These customers often look for locations where both elements can be planned in a coherent way. The Bakken East pipeline improves the feasibility of near-term gas-fired generation in parts of North Dakota, including several Areas of Interest identified in this report. As a result, those regions could be examined as places where gas-fired generation and potential future SMR projects might be planned in sequence, if there is sufficient commercial interest and policy support.

In other regions of North America, near-term gas-fired development and longer-term non-emitting options are sometimes separated by distance or network constraints. In North Dakota, the proximity of the Bakken East pipeline to multiple Areas of Interest means that gas-fired plants and potential SMR sites could, in principle, be located within the same general areas or along the same corridors. This may allow for a staged development concept in which gas-fired generation is considered as an initial source of dispatchable power, while SMRs are evaluated as a possible longer-term option for providing non-emitting, firm supply at the same or nearby locations. Any such approach would require detailed technical, commercial, and regulatory assessment beyond the scope of this screening study.

From an economic and planning perspective, the intersection of the Bakken East pipeline with several Areas of Interest suggests that North Dakota may wish to examine the combined advantages of gas-fired and SMR development in these regions. This could include looking at how new gas capacity enabled by the pipeline might support emerging large loads, and how SMRs might be integrated over time if the state and its partners determine that advanced nuclear is an appropriate long-term option. Further analysis would be required to understand the timing, scale, and feasibility of any such two-phase development model, including transmission planning, environmental considerations, and community perspectives in the affected areas.

8.4 Key constraints, uncertainties, and dependencies

Although the integrated findings are robust at a screening level, several constraints and uncertainties will shape how SMR opportunities ultimately materialize. First, the transmission results are based on DC available transfer capability modeling for 2034 planning cases and consider only thermal loading on lines and transformers. Voltage performance, dynamic stability, and detailed dispatch patterns are not explicitly modeled. The exact interconnection scope, cost allocation, and timing for any specific SMR project can only be established through formal SPP or MISO interconnection processes that use full AC power flow, stability analysis, and tariff defined procedures.

Second, the water assessment relies on best available surface and groundwater information and working cooling numbers at the 600 MW scale. While it is sufficient to determine that multiple cooling pathways exist in each Area of Interest, detailed hydrological and licensing work will be required before a particular cooling configuration is selected at a specific site. In some areas, hybrid or dry cooling is likely to be the default configuration to respect local water constraints and existing users.

Third, land use and social compatibility are evaluated at a county and Area of Interest scale using zoning, planning documents, population data, and known environmental and cultural sensitivities. Parcel level land use constraints detailed Tribal Nations interests, and site-specific environmental conditions are not resolved in this report and must be addressed through future field work and engagement. The ranking therefore identifies where conditions appear promising, but it does not itself constitute a finding of social licence or local support.

Finally, while individual SMR units or small clusters fit within today's grid conditions in each Area of Interest, any cumulative, multi- site build out across the state would benefit from coordinated planning. Significant nuclear additions across multiple areas would interact with other new resources and loads, potentially requiring additional reinforcements or non-wires solutions that lie beyond the scope of this siting assessment.

8.5 Carry - forward products and immediate actions

The integrated findings produce a set of concrete products that can be carried forward into subsequent planning and engagement work. These include:

- Composite GIS layers that stack transmission hosting capacity, water availability, land use and zoning, and social and environmental sensitivities for each Area of Interest.

- A ranked Area of Interest table, with short narrative rationales that explain the decisive criteria for each area and highlight eastern and western strengths.
- A traceable record of the ten criterion scoring inputs and weights, suitable for future updates as new data from utilities, water studies, and land use sources becomes available.

From a strategic standpoint, the integrated message is that North Dakota is well positioned to consider the deployment of advanced nuclear technologies. The state has strong existing infrastructure, abundant and diverse water resources at a statewide scale, and a proven energy heritage that is already accustomed to large, capital-intensive projects. These findings open the door to reliable non emitting energy, thousands of high skill jobs, and durable economic growth for host communities and the State of North Dakota as a whole.

The recommended immediate next step is to initiate general nuclear public education sessions in and around the seven Areas of Interest. The goal is to foster a base level of understanding before any parcel level proposals are brought forward. Nucleon's experience in other jurisdictions shows that this education first approach, built around neutral information and structured listening, can lead to community led project partnerships rather than projects that feel imposed. Communities can then weigh the benefits, risks, and trade- offs of nuclear development in an informed way and decide whether and how they wish to participate in future SMR opportunities. This respects local choice while aligning the technical siting envelope described in this report with the social foundations required for long term success.

9. Strategic Considerations and Next Steps

This section sets out practical pathways the Advanced Nuclear Committee can draw on if it chooses to build on the findings of this siting report. The integrated analysis shows that all seven Areas of Interest are technically and socially credible, at a screening level, for SMR development, with eastern areas (4, 5, 6, and 7) showing particularly strong alignment with grid strength, load proximity, and development readiness. The steps outlined below are presented as options for the Committee, state agencies, utilities, and Nucleon to use or adapt as they see fit, rather than as recommendations that any particular action be taken.

To advance the technical work, the Committee can work through the North Dakota Transmission Authority, the Public Service Commission, and participating utilities to keep any future SMR concepts closely tied to realistic interconnection and transmission planning. Within that coordination, low water SMR design pathways can be examined at a concept level for the higher scoring Areas of Interest, particularly in the east, to demonstrate that conservative water use envelopes are feasible before any parcel level screening begins. In parallel, legal and policy work on potential Century Code changes can move forward toward the capstone report, informed by this siting work but not contingent on specific project proposals.

If the Committee opts to begin public engagement on advanced nuclear, it can plan general nuclear public education sessions in the spring and summer of 2026 with counties in Areas 4, 5, 6, and 7. These eastern counties are natural early candidates for education and listening sessions because of their strong grid positions and proximity to existing and prospective loads. Any such sessions would remain neutral and exploratory, focused on building a base level of understanding about SMRs rather than promoting specific sites or projects.

In parallel, Nucleon will continue to complete the remaining four reports under the broader RFP mandate and to undertake the handshake work outlined in the scope. This includes refining siting GIS products, deepening the understanding of co-location opportunities with major loads, and aligning with utilities and state agencies on data assumptions. If the Committee wishes, the products from this report and the companion studies can then be packaged into briefing materials that support internal decision making and any future public facing engagement. In this way, the Committee keeps full discretion over whether, when, and how to move from this screening level work to more detailed assessment, while maintaining a clear view of the options available to North Dakota if it decides to pursue advanced nuclear development.

Appendix A1 -- Required Evaluation Criteria

#	Scope Element	Description
1	Transmission system screening and hosting capacity	Evaluation of grid access points, substation capacity, and potential congestion or system constraints that may preclude nuclear electrical interconnection. Proximity and conceptual routing for thermal conveyance, as applicable.
2	Terrain and general constructability	Assessment of topography, slope, and surface characteristics that would affect facility construction and logistics.
3	Population density and growth corridors	Identification of densely populated areas or expected urban expansion zones that may limit emergency planning flexibility or create public acceptability challenges as well as regional populations sufficient for facility operation and support
4	Geotechnical suitability (desktop level only)	High-level screening of areas known to have unsuitable subsurface conditions, based on geological mapping, LIDAR, or historical borehole data.
5	Volcanic risk, seismic hazard, and tornado zone overlays	Desktop overlays of National Weather Service datasets, classifications, and corridors, with exclusion of areas posing unacceptable natural hazard risk.
6	Road and rail access feasibility	Evaluation of logistics pathways including proximity to major roadways, highways, and railways that can support reactor module and equipment transport as well as year-round operational access, including during periods of extreme weather.
7	Airspace conflicts and restricted zones	Assessment of civil and military flight paths, aerodrome (including airports) proximity, and airspace restrictions that could affect siting or operations.
8	Water supply (surface and groundwater)	Initial feasibility of sourcing cooling or processing water from rivers, lakes, aquifers, or municipal systems.
9	Potential discharge or effluent routing	Identification of logical water discharge points and preliminary confirmation that effluent management pathways are available. Review of prevailing winds and screening for downwind risks.
10	Tribal Nations title and interest areas	Desktop mapping of treaty areas, asserted territories, and known traditional land use regions, based on public data or internal engagement records.
11	Land tenure (Federal, private, institutional), available	Classification of land control regimes to identify areas with feasible paths to site control, review of available

	parcel size and parcel attributes	development area, including review of suitability and potential placement for facilities and associated site security. Consideration for future expansion potential.
12	Municipal and state permitting feasibility	Evaluation of local and regional permitting compatibility based on existing land use policy, zoning, and precedent.
13	Known environmental sensitivities or protected areas	Overlay of wetlands, wildlife corridors, parks, and protected areas that may disqualify regions from further consideration.
14	Political and regulatory posture (risks and signals)	Evaluation of local and state-level openness to nuclear development, including any historical opposition or enabling policy.
15	Climate and long-term resiliency (wildfire, drought, etc.)	Identification of climate-related vulnerabilities that could affect long-term viability, including flood risk, drought-prone areas or high wildfire risk areas.
16	Historical Resources	Review of documented historical resources, as well as potential for discovery of relevant historical resources.
17	Radiological Baseline and historical contamination	Evaluation of existing radiation levels, potential causes of elevated radiation baseline and potential for historical contamination.
18	Public and Indigenous Participation	Review of documented or expressed willingness to enter into a limited partnership agreement (or limited partner units option agreement) on behalf of one or more relevant communities.
19	Existing Surface Rightsholders	Screening for rightsholder data for potential land use conflict, including trap lines and traditional subsistence hunting areas.
20	Subsurface and Mineral Rights	Review and screening of third-party subsurface title tenures, such as salt, gravel, mine and mineral rights.

Appendix A2 -- Site Scoring and Ranking

Nucleon Energy Numerical Area Ranking Form	1. Transmission Capacity	2. Terrain & Constructability	3. Population & Growth	4. Geotechnical (Conceptual)	5. Volcanic, Seismic & Tornado
Weighting	**150**	**90**	**120**	**90**	**100**
Area Number & Name					
4 - Northeast North Dakota	140	90	100	90	60
6 - Tower City	130	90	130	90	50
1 - Northwest North Dakota	70	90	130	90	90
5 - Jamestown	150	70	120	80	60
7 - Southeast North Dakota	150	90	100	90	100
2 - Killdeer Area	70	70	120	90	100
3 - Southwest North Dakota	70	80	70	90	100

Nucleon Energy Numerical Area Ranking Form	6. Road & Rail Access	7. Aerodrome (including airports) & Nav Conflicts	8. Water Availability	10. Indigenous Lands & Uses	11. Land Title Types
Weighting	**90**	**90**	**90**	**90**	**90**
Area Number & Name					
4 - Northeast North Dakota	90	90	90	40	90
6 - Tower City	90	90	70	40	90
1 - Northwest North Dakota	90	90	90	40	90
5 - Jamestown	90	90	70	40	90
7 - Southeast North Dakota	90	90	10	40	90
2 - Killdeer Area	80	90	90	40	90
3 - Southwest North Dakota	90	90	0	40	90

Nucleon Energy Numerical Area Ranking Form	Overall Score (out of 1000)
Area Number & Name	
4 - Northeast North Dakota	**880**
6 - Tower City	**870**
1 - Northwest North Dakota	**870**
5 - Jamestown	**860**
7 - Southeast North Dakota	**850**
2 - Killdeer Area	**840**
3 - Southwest North Dakota	**720**

Appendix A3 -- Power Flow Modeling Assumptions

The following includes the power flow modeling approach, identification of transmission frequency violations, and assumed generation additions

POWER FLOW MODELING APPROACH & TRANSMISSION FREQUENCY VIOLATIONS

1. Study Objective and Scope

The assessment of the electric transmission system in this study is based on simulating nodal MW injections across the high-voltage transmission network in North Dakota[13]. Injections were performed at nodes operating at 115 kV, 230 kV, and 345 kV, followed by contingency analysis (simulating a line or transformer outage) on the same high-voltage network as previously defined.

The objective of the analysis is to determine, at each node, the maximum MW injection that can be accommodated before a thermal violation occurs under both system-normal (N-0) and contingency (N-1) conditions. Unless otherwise noted, the "injection limit" reported in this study refers to the N-1 (contingency) limit. Nodes meeting the acceptance criterion—an N-1 injection limit of 200 MW or greater—are flagged as viable. The viable nodes are then visually grouped into broader areas that present favorable conditions appropriate for SMR prospecting and development.

For node and area screening, the focus of this assessment is strictly on the thermal performance of transmission lines and transformers; voltage profiling, voltage stability, and dynamic behavior are outside the scope of this screening assessment.

2. Modeling Platform and Base Case

The analysis was performed using PowerWorld Simulator Version 24, utilizing the Available Transfer Capability (ATC) analysis module to automate the nodal injection and thermal screening process. The study model represents the high-voltage transmission network in North Dakota, including all buses and elements energized at 115 kV, 230 kV, and 345 kV that are part of the regional bulk power transfers. The underlying cases reflect the broader Eastern Interconnection footprint so that North Dakota injections are evaluated within a

[13] The North Plains Connector, a planned 420-mile, up-to-525 kV high-voltage direct current (HVDC) transmission line extending between Colstrip, Montana, and two connection points in North Dakota (near Center and St. Anthony), is not included in this study. As the project remains in the permitting phase with approvals anticipated in 2026 and an in-service date projected for 2032, it is not represented in either the ERAG or WECC power flow models.

realistic regional flow context, meaning that power flows are allowed to follow actual parallel paths across neighboring states and regional backbones rather than being constrained to an artificial North Dakota-only island. This ensures that the resulting PTDF/OTDF values and thermal constraints are consistent with how the system would behave in practice.

The intent of the study is to characterize how injections at North Dakota nodes impact thermal loading within the state and at or near the interstate boundaries, and to identify the limiting elements most frequently constraining MW injections, and thereby the respective MW injection limit on a node- by- node basis.

2.1 Future Outlook Cases (2034 Summer and Winter)

The study relies on outlook cases for both summer and winter 2034 Series (2024), reflecting the expected transmission topology, generation mix, and load levels for that planning horizon. These seasonal scenarios were selected to capture conditions under which thermal limits are most likely to be stressed. These are typically higher loading and lower ratings in summer, and different dispatch patterns to represent winter loading conditions. Using both seasons allows the screening results to reflect a range of plausible operating conditions rather than a single, season-specific snapshot.

For each 2034 seasonal case, all nodes energized at 115 kV to 345 kV in North Dakota were included as potential injection points, and contingencies applicable to those voltage levels were modeled. Thermal loading was monitored on transmission lines and transformers with voltage levels greater than 69 kV within North Dakota, inclusive of the interstate boundaries and on adjacent-system elements that could become a limiting element because of North Dakota injections.

2.2 PTDF/OTDF Screening Threshold

To ensure that only thermally limiting elements causally driven by the nodal injection were retained, a 5% PTDF/OTDF threshold was applied. A thermal violation was only flagged and recorded if the corresponding limiting element exhibited a Power Transfer Distribution Factor (PTDF) or Outage Transfer Distribution Factor (OTDF) magnitude of at least 5% with respect to the specific nodal MW injection being studied. This criterion excluded remote or weakly affected facilities and focused the analysis on constraints that are materially influenced by the candidate generation site.

In simple terms, a PTDF tells you how much of the injected power uses a particular line under normal system conditions—for example, a 5% PTDF means that 5 MW will flow on that line for every 100 MW injected at the node (with withdrawal at the sink). An OTDF is the same concept applied after a contingency and shows how much flow will appear on a line when another element is out of service. Using these factors ensures we only count constraints on lines that meaningfully "see" the proposed injection, both in normal operation and under N-1 conditions.

Across the 2034 outlook cases, the analysis identified recurring pairs of contingencies and thermally limiting elements, which are interpreted as consistent constraints likely already recognized by regional planning authorities. For each case, summer or winter, the 30 most frequently occurring thermal violations were tracked, including their end-to-end nodal identification and the frequency of occurrence for the events assessed. This information is presented to help highlight the facilities that most often limit incremental MW injections from prospective new generation additions. The same PTDF/OTDF ≥ 5% criterion was applied when compiling these statistics to ensure that only materially affected elements were included.

2.3 Generator Interconnection Timeline and Justification for 2034 Outlook

The generator interconnection (GI) process in North Dakota typically spans 3 to 6[14] years due to the detailed and iterative nature of the cluster study methodology. Managed by Regional Transmission Organizations (RTOs) like MISO and SPP, the process groups interconnection requests into clusters to assess the transmission upgrades needed for new generation projects. Initial studies often propose costly solutions, leading some projects to withdraw, which requires restudies and extends timelines. For example, the MISO 2017 GI study was completed in 2023, and a 255-MW wind project in the SPP queue has been delayed for six years due to repeated restudies. These timelines reflect the complexity of balancing new generation with existing grid reliability and capacity.

In the context of advancing a Small Modular Reactor (SMR) initiative, selecting a 2034 power flow outlook over a 2029 outlook is a practical and justifiable choice. Developing an SMR project requires significant preparation time, including feasibility studies, regulatory approvals, and project planning, which can take 3 to 4 years to achieve reasonable certainty of advancing the initiative. Once the project is ready to enter the GI process, the additional 3 to 6 years required for interconnection studies and approvals further extends

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the timeline. Taken together, these durations imply that a project initiated in the near term would be expected to reach commercial operation closer to the 2034 horizon than to an earlier planning year. By selecting the 2034 outlook, the planning process aligns with the realistic timeline for SMR development and interconnection, ensuring that the power flow screening data reflects the conditions under which the SMR would be operational. This approach provides a more accurate and reliable basis for assessing the transmission system's capacity and for planning any necessary upgrades to support the SMR.

3. ATC Setup and Transfer Configuration

ATC simulations were performed using DC-based, multi-directional injection analysis. The sink for all transfers was a fixed swing bus located in Limestone County, Alabama. This distant, deeply embedded swing location aligns with the expected export direction from North Dakota (including flows supported by HVDC facilities) and allows AC power flows to follow their natural network paths under both N-0 and N-1 ATC scenarios, rather than forcing them through an artificial local sink. In the absence of detailed information on phase-shifting transformer operating policies for exports the taps were considered fixed, this setup offers a practical and transparent way to reflect how flows would be distributed across the AC system.

Both load and generator dispatch were held fixed throughout the analysis to respect the underlying forecast and dispatch assumptions of the study cases. Only the ATC injection bus and the Alabama swing bus were permitted to vary, allowing thermal limits to be identified strictly as a function of incremental ATC MW injection.

Because the analysis used DC ATC modeling, generator voltage regulation, reactive power capability, and transformer tap positions (including phase shifters) were not adjusted. Existing voltage control and reactive support were implicitly treated as fixed or proportionally tied to active power output. As a result, the study does not evaluate reactive power margin, voltage profiles, or voltage stability limits.

Tie lines to neighboring states were not explicitly and continuously monitored as a separate category, but any thermal violations occurring on these facilities under either N-0 or N-1 conditions would be automatically flagged and recorded.

4. Determination of Nodal Injection Limits

4.1 System-Normal (N-0) Injection Limits

For every node, MW injection was first increased under system-normal (N-0) conditions until a thermal limit was reached; this established the base (system-normal) injection limit for that node. At this point, at least one monitored transmission element reaches its thermal rating. Thermal limits were evaluated against the applicable emergency ratings specified in the 2034 base cases, consistent with the underlying planning assumptions.

Point of clarification: While a prescriptive nodal injection approach formed part of this analysis, forcing a node, such as a midpoint connection of a project onto a line, is not an unusual practice. However, for this study, midpoint connections were treated as outside the scope.

4.2 Contingency (N-1) Injection Limits

In parallel, for each injection node, a full contingency N-1 analysis is performed. For each contingency that produces a thermal violation at that node at the base injection limit, the injection is reduced to the level immediately prior to the violation, thereby establishing the contingency-limited injection level. Each contingency therefore yields a distinct thermal limit for that node.

Point of clarification: for the N-1 analysis, in the absence of a contingency file, the automatic contingency engine assumes that any line between two nodes can be isolated by interrupting breakers. This means that special multi-terminal connections on a line, or three-terminal connections, are assumed to be interrupted on an element-by-element basis and not as a concurrent outage of all elements.

For this study, we tracked the five most constraining contingencies for each node and the associated elements to assess the range of available MW injection limits. “Most constraining” is defined as those elements for which a contingency produces the lowest allowable N-1 injection levels at that node. Among these five elements, the lowest resulting injection limit is taken as the representative node-specific N-1 thermal injection limit. This value reflects the MW injection that can be accommodated at a node while still maintaining the thermal integrity of the transmission system during severe but credible single-element outages without triggering infrastructure upgrades. In other words, the reported N-1 limit represents the maximum injection that can be hosted using the existing network, without triggering any new reinforcements.

For this assessment, the specific nature or remediation of each thermal limitation was not evaluated. Instead, whenever a thermal violation occurred, the corresponding minimum N-1 injection level was recorded as the allowable MW injection, providing a conservative basis for screening. It is anticipated that some thermal limitations could be addressed through cost-effective upgrades or reinforcements; these opportunities are best examined as part of site-specific assessments or during the formal interconnection process.

5. Interpretation of N-0 vs N-1 Capability

This approach allows a clear comparison between the relatively higher system-normal injection limits and the lower contingency-based limits, providing a meaningful range that captures both normal operating capability and performance under N-1 stress conditions. This ensures that each node is evaluated for its ability to host generation without compromising the thermal characteristics of the network.

From this evaluation, we observed recurring contingency/thermal-violation pairs, which we assume reflect known constraints already recognized by North Dakota transmission planners. These repeated limiting elements provide practical insight into where reinforcement or remedial measures may be considered to increase hosting capacity beyond the injection levels identified. In this study, the results are intended to support screening and planning discussions, while any detailed reinforcement planning or project-specific solutions are expected to be developed through subsequent, more targeted studies and formal interconnection processes.

6. Constraint Characterization

For the Summer and Winter 2034 cases, the 30 most frequently occurring thermal violations were identified and their frequency of occurrence tracked. For each violation, the limiting element and its frequency of occurrence across all nodal injections and contingencies were recorded. This allowed us to:

- Identify “chronic” constraints that repeatedly limit injection, and
- Understand how often specific facilities limit plausible MW injection patterns.

These statistics provide a useful bridge between nodal-level results and system-level planning, highlighting which facilities are most likely to constrain future SMR or other large-scale generation additions under the modeled conditions.

7. Injection Capacity Screening Criteria for Candidate SMR Sites

Nodes demonstrating N-1 injection capability greater than 200 MW were tagged as viable sites, catalogued, and mapped across North Dakota. These nodes were then grouped into seven “injection areas” or Areas of Interest by clustering locations with similar N-1 capability and geographic proximity. The resulting Areas of Interest illustrate broader regions where SMR siting appears compatible with the thermal limits of the existing transmission system. They are intended to guide further investigation, rather than to serve as prescriptive site-specific recommendations. Also note, the Areas of Interest present a standalone potential; however, while Areas of Interest can be combined, their combined capability is outside the scope of this assessment.

A minimum screening threshold of 200 MW was applied as an indicative floor for a viable SMR site, though many locations exceeded this threshold significantly. This threshold is broadly consistent with the lower end of feasibly commercial SMR project sizes and reflects a practical minimum for meaningful grid-connected nuclear development.

Nodes located in or adjacent to populated areas were excluded from siting consideration to reduce stakeholder opposition and potential land-use conflicts. For this purpose, “populated areas” were identified based on municipal boundaries and visible settlement patterns from public mapping data. For nodes close to populated or industrial areas with strong transmission hosting characteristics, a setback allowance ranging from 10 to 20 miles was considered as a practical buffer consistent with transmission interconnection feasibility for projects of this scale and with the goal of minimizing potential land-use conflicts and public concern.

8. Summary of Key Assumptions and Limitations

- DC ATC-based analysis (no explicit treatment of reactive power or voltage stability).
- Fixed generation dispatch and load forecast consistent with the 2034 seasonal planning cases (summer and winter).
- Incremental injection at each node balanced by a distant swing bus in Alabama.
- Nodal screening selection by the most restrictive N-1 thermal limits.
- Candidate SMR sites screened on a 200 MW or greater N-1 injection threshold and basic land-use/settlement considerations.
- Only constraints with PTDF/OTDF magnitude greater than 5% relative to the nodal injection were retained, ensuring a causal relationship between the candidate site and the limiting element.
- Thermal violations were assessed against the emergency ratings embedded in the 2034 base cases, consistent with the underlying regional planning assumptions.

- The Areas of Interest present a standalone potential; however, while Areas of Interest can be combined, their combined capability is outside the scope of this assessment.

ASSUMED GENERATION ADDITION – BISON GENERATING STATION

Upon review of the 2034 ERAG models (Series 2024), the Bison Generating Station was not yet represented in the cases. Based on publicly available information, Bison has been modeled and incorporated into the power flow studies for this assessment. The following section describes the modeling assumptions and dispatch approach used for this facility.

Seasonal Capability & Scheduling — Bison Generation Station

This section explains how the summer and winter outputs for the Bison Generation Station were established using publicly available information only. Detailed OEM/contract performance data are not available; hence, all capacities below are indicative and typical values and meant for planning assessment purposes only.

Configuration

- Two combined-cycle trains, each 1×1 (one CT + one HRSG + one STG).
- Onsite 230/345-kV substation; two 230-kV circuits to Wheelock; one 345-kV interconnect to a line located to the south (near Springbrook).

Seasonal Capability (Indicative, Net)

- Per train (net, includes auxiliaries; typical values) Net Dependable Capacity (NDC):
- Per Train Summer Pmax = Winter Pmax: 745 MW
- Plant total: 1490 MW.

Note, the transmission system capability was tested for 1490 MW net injection for both Winter and Summer cases, no thermal violations were observed under system normal conditions.

Scheduling in Power-Flow Studies

Base set-points

To assess the impact and performance of the Bison generating plant, in conjunctions with the SMR assessment, certain assumptions were made around the generator's dispatch level for both summer and winter. In absence of dispatch information, certain assumptions were made to estimate a peak diversified seasonal output. The seasonal peak outputs were estimated by derating the plant nameplate capacity as function of ambient temperature and predicted seasonal availability.

Ambient Factor (typical values):

- Summer: 0.90 ± 0.05 vs ISO rating (hot ambient derates GT output and efficiency).
- Winter: 1.02–1.05 vs ISO rating (cold air boosts mass flow; ST often at or near design).
- Availability = 1 − EFORd − PlannedOutageFraction during the season.
- The EFORd (Demand-weighted Equivalent Forced Outage Rate) for a new CCGT, a conservative planning value for EFORd ~3–6%. Planned Outage Fraction allowance for maintenance or partial derates ~ 5 -10%).
- Seasonal Expected Output (SEO). In absence of OEM performance sheets, SEO values can be used to estimate the maximum seasonal output, i.e., SEO = Ambient Factor x Availability x nameplate output.

Therefore, for the purpose of this analysis, the seasonal output estimate for the Bison generator is as follows:

Winter SEO ≈ 0.95 × 1,490 MW = 1415.5 MW
Summer SEO ≈ 0.83 × 1,40 MW = 1236.7 MW

CONSTRAINED ELEMENTS: THERMAL VIOLATIONS AND FREQUENCY OF OCCURRENCE

This subsection summarizes the transmission elements that most often limit additional generation in the 2034 Summer and Winter outlook cases. For each season, the table below lists the lines and transformers that reach their thermal ratings most frequently for all N-1 nodal injections included in the study. The "Frequency" columns show how many times each element emerged as the binding constraint in the screening runs. Together, these results highlight the "chronic" constraints in the system—facilities that repeatedly limit incremental MW injections and are therefore likely to shape how much SMR or other large-scale generation can be added in different parts of North Dakota without reinforcement.

ID	Thermal Violations (Summer)	Frequency	Thermal Violations (Winter)	Frequency
1	Line SOURIS 7 (603022) TO MALLARD7 (603023) CKT 1 [115.00 - 115.00 kV]	77	Line FOXTAIL 4 (661092) TO TTANKANORTH4 (661096) CKT 1 [230.00 - 230.00 kV]	81
2	Line LEEDS 7 (652447) TO PENN 7 (652465) CKT 1 [115.00 - 115.00 kV]	41	TransformerWinding TANDE___-BE3 (659336) TO TANDESTR (659344) CKT 1 [345.00 - 1.00 kV]	24
3	Line BELFELD4 (652425) TO DICKINSN-BE4 (659124) CKT 1 [230.00 - 230.00 kV]	31	TransformerWinding WAHPETN7 (620229) TO WAHPESTR (620830) CKT 2 [115.00 - 1.00 kV]	14
4	Line SHEYNNE4 (602006) TO FARGO 4 (652435) CKT 1 [230.00 - 230.00 kV]	28	Line BEULAH 7 (661008) TO COYOTE 7 (661018) CKT 1 [115.00 - 115.00 kV]	12
5	Line BEULAH 7 (661008) TO COYOTE 7 (661018) CKT 1 [115.00 - 115.00 kV]	12	Line MAPLE R8 (657801) TO DELVO 8 (657802) CKT 1 [69.00 - 69.00 kV]	11
6	Line MOS-ABDN-ER8 (655087) TO ABERDEEN-ER8 (655262) CKT 1 [69.00 - 69.00 kV]	12	TransformerWinding GRE-MCHENRY4 (615347) TO GRE-MSTR (615350) CKT 1 [230.00 - 1.00 kV]	11
7	Line BISMARK7 (652427) TO ESTBMRK7 (661029) CKT 1 [115.00 - 115.00 kV]	11	Transformer GRNDFKS8 (652202) TO GRNDFKS7 (652443) CKT 1 [69.00 - 115.00 kV]	10
8	Line MAPLE R8 (657801) TO DELVO 8 (657802) CKT 1 [69.00 - 69.00 kV]	11	Line COLEMAN8 (657307) TO BERG 8 (657309) CKT 1 [69.00 - 69.00 kV]	8
9	Line LANGDON7 (657709) TO SWEETWA7 (657720) CKT 1 [115.00 - 115.00 kV]	10	Line LINDAHLS-MW7 (655910) TO LIBERTY -MW7 (655948) CKT 1 [115.00 - 115.00 kV]	7
10	Line BARRBUTE-MW7 (655915) TO STRNDAHL-MW7 (655941) CKT 1 [115.00 - 115.00 kV]	8	Line WATFORD7 (652408) TO CHRRYCRK-MK7 (655840) CKT Z [115.00 - 115.00 kV]	7
11	Line BERG 8 (657309) TO PRAIRIE8 (657904) CKT 1 [69.00 - 69.00 kV]	8	TransformerWinding GRE-RAMSEY 4 (615335) TO GRE-RSTR (615345) CKT 1 [230.00 - 1.00 kV]	7
12	Line LINDAHLS-MW7 (655910) TO LIBERTY -MW7 (655948) CKT 1 [115.00 - 115.00 kV]	7	Line CENTIPED-UM7 (655730) TO HETINGR7 (661048) CKT 1 [115.00 - 115.00 kV]	6
13	Line WATFORD7 (652408) TO CHRRYCRK-MK7 (655840) CKT Z [115.00 - 115.00 kV]	7	Line ELLENDL4 (661026) TO ELLENDL345 4 (661098) CKT Z [230.00 - 230.00 kV]	6
14	Line WILLISTON27 (652391) TO WILISTN7 (652421) CKT Z1 [115.00 - 115.00 kV]	7	Line MOS-ABDN-ER8 (655087) TO ABERDEEN-ER8 (655262) CKT 1 [69.00 - 69.00 kV]	6
15	TransformerWinding BASIN___-BE7 (659109) TO BASINSTR (659207) CKT 1 [115.00 - 1.00 kV]	7	Line SWENSON -MK7 (655847) TO BERG -MK7 (655848) CKT 1 [115.00 - 115.00 kV]	6
16	Line ELLENDL4 (661026) TO ELLENDL345 4 (661098) CKT Z [230.00 - 230.00 kV]	6	TransformerWinding WAHPETN7 (620229) TO WAHPESTR (620331) CKT 1 [115.00 - 1.00 kV]	6
17	Line STEIN 7 (661030) TO NE BISM7 (661117) CKT 1 [115.00 - 115.00 kV]	6	Line BARRBUTE-MW7 (655915) TO STRNDAHL-MW7 (655941) CKT 1 [115.00 - 115.00 kV]	5
18	Transformer GRNDFKS8 (652202) TO GRNDFKS7 (652443) CKT 1 [69.00 - 115.00 kV]	6	Line BOTNU.SE-CP8 (655666) TO METIGOSH-CP8 (655667) CKT 1 [69.00 - 69.00 kV]	5
19	Line JAMSTWN7 (620269) TO SPIRITWD 7 (620270) CKT 1 [115.00 - 115.00 kV]	5	Line DL OTP 7 (620207) TO AUDUBON7 (658112) CKT 1 [115.00 - 115.00 kV]	5
20	Line MERRCRT4 (661093) TO TTANKANORTH4 (661096) CKT 1 [230.00 - 230.00 kV]	5	Line ELLISVIL-MW7 (655954) TO ZAHL -MW7 (655955) CKT 1 [115.00 - 115.00 kV]	5
21	Line SHEYNNE7 (603018) TO MAPLTN 7 (620203) CKT 1 [115.00 - 115.00 kV]	5	Line LANGDON7 (657709) TO SWEETWA7 (657720) CKT 1 [115.00 - 115.00 kV]	5
22	Line SWENSON -MK7 (655847) TO BERG -MK7 (655848) CKT 1 [115.00 - 115.00 kV]	5	Line LEEDS 7 (652447) TO PENN 7 (652465) CKT 1 [115.00 - 115.00 kV]	5
23	Line BERG -MK7 (655848) TO BBCOMPTP-MK7 (655873) CKT 1 [115.00 - 115.00 kV]	4	Transformer THORNE -CP7 (655649) TO THORNE -CP8 (655671) CKT 1 [115.00 - 69.00 kV]	5
24	Line BISEXP 7 (661009) TO ESTBMRK7 (661029) CKT 1 [115.00 - 115.00 kV]	4	Line AVIKO 7 (620271) TO JAMESPK7 (620272) CKT 1 [115.00 - 115.00 kV]	4
25	Line DIXGREENRVR7 (661020) TO WSTMD1 7 (661021) CKT 1 [115.00 - 115.00 kV]	4	Line DIXGREENRVR7 (661020) TO WSTMD1 7 (661021) CKT 1 [115.00 - 115.00 kV]	4
26	Line ELLISVIL-MW7 (655954) TO ZAHL -MW7 (655955) CKT 1 [115.00 - 115.00 kV]	4	Line KENMARE7 (661052) TO STANLEY7 (661080) CKT 1 [115.00 - 115.00 kV]	4
27	Line PIERRE 7 (652489) TO EVANS ST (658180) CKT 1 [115.00 - 115.00 kV]	4	Line SHEYNNE4 (602006) TO MAPLE R4 (657754) CKT 1 [230.00 - 230.00 kV]	4
28	Line WILISTN7 (652421) TO FAIRVIEW 7 (652651) CKT 1 [115.00 - 115.00 kV]	4	Line STATELIN-MW7 (655924) TO MONT -MW7 (655940) CKT 1 [115.00 - 115.00 kV]	4
29	Transformer S.HEART_-RR4 (659309) TO S.HEART_-RR7 (659306) CKT 1 [230.00 - 115.00 kV]	4	Transformer S.HEART_-RR4 (659309) TO S.HEART_-RR7 (659306) CKT 1 [230.00 - 115.00 kV]	4
30	TransformerWinding FRONTER4 (657750) TO FRONTSTR (657786) CKT 2 [230.00 - 1.00 kV]	4	TransformerWinding BASIN___-BE7 (659109) TO BASINSTR (659207) CKT 1 [115.00 - 1.00 kV]	4