

VIA HAND DELIVERY & ELECTRONIC MAIL

October 7, 2022

Mr. Steve Kahl, Executive Director
North Dakota Public Service Commission
600 E. Boulevard Avenue, Dept. 408
Bismarck, ND 58505-0480

Re: Basin Electric Power Cooperative, Phase IV Pioneer Generation Station facility siting application

Dear Mr. Kahl:

Enclosed please find an original and four (4) copies of Basin Electric Power Cooperative's Application for a Certificate of Site Compatibility for the proposed Phase IV Pioneer Generating Station. A check for the application filing fee of \$100,000 and a USB flash drive containing the application in electronic format and corresponding GIS shapefiles are also enclosed. A second check for the newly enacted administrative fee in the amount of \$25,000 is enclosed.

For inquiries regarding the application, please contact Mr. Kevin Solie, Senior Environmental Compliance Administrator, at ksolie@becp.com or at (701) 557- 5495 with copy to Ms. Anine Merkens, Senior Staff Counsel, at amerkens@becp.com or (701) 557-5080. If preferable, correspondence can be sent to their physical business address of 1717 East Interstate Avenue, Bismarck, ND 58503.

Sincerely,


Todd E. Telesz (Oct 7, 2022 11:39 PDT)

Todd E. Telesz
CEO & General Manager

Enclosures

cc: Beth Innis, Williams County Auditor

cc without enclosure: Kevin Solie, Jim Lund, Anine Merkens

1 PU-22-380 Filed 10/07/2022 Pages: 199
Application for Certificate of Site Compatibility
Basin Electric Power Cooperative
Todd Telesz, CEO, GM

Application to North Dakota Public Service Commission for Certificate of Site Compatibility



Basin Electric Power Cooperative

Pioneer Generation Station Phase IV Project

October 2022

Application to North Dakota Public Service Commission for Certificate of Site Compatibility

prepared for

**Basin Electric
Power Cooperative
Pioneer Generation Station
Phase IV Project
Williams County, North Dakota**

October 2022

prepared by

**Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri**

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
AADT	Average Annual Daily Traffic
ACS	American Community Survey
Basin Electric (BEPC)	Basin Electric Power Cooperative
BMP	Best Management Practice
CAA	Clean Air Act
CCCT	Combined Cycle Combustion Turbine
CCPP	Combined Cycle Power Plant
CFR	Code of Federal Regulations
CO	carbon monoxide
dB	decibel
dBA	A-weighted decibel
DSM	Demand-Side Management
EMF	electromagnetic field
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FIRM	Flood Insurance Rate Map
ft	foot/feet
G&T	generation and transmission
GHG	greenhouse gas
H ₂ SO ₄	sulfuric acid

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
HRSG	heat recovery steam generator
Hz	hertz
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ICBM	intercontinental ballistic missile
IPaC	Information for Planning and Consultation
IS	Integrated System
kV	kilovolt
kV/m	kilovolts per meter
kW	kilowatt
L_{dn}	day-night sound level
L_{eq}	average sound level
L_p	sound pressure level
LPG	liquefied propane gas
L_w	sound power level
Metcalf	Metcalf Archaeological Consultants, Inc.
mG	milligauss
MLRA	Major Land Resource Area
MMBtu	Million British thermal units
mph	miles per hour
MW	megawatt
MWEC	Mountrail-Williams Electric Cooperative
MWh	megawatt-hour

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
NAAQS	National Ambient Air Quality Standards
ND AAQS	North Dakota Ambient Air Quality Standards
NDAC	North Dakota Administrative Code
NDDEQ	North Dakota Department of Environmental Quality
NDDOT	North Dakota Department of Transportation
NDGS	North Dakota Geological Survey
NDPSC	North Dakota Public Service Commission
NDPRD	North Dakota Parks and Recreation Department
ND SHPO	North Dakota State Historic Preservation Office
NESC	National Electrical Safety Code
NESHAP	National Emission Standards for Hazardous Air Pollutants
NIH	National Institutes of Health
NLEB	northern long-eared bat
NO ₂	nitrogen dioxide
NO _x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NSPS	New Source Performance Standards
NWI	National Wetland Inventory
OSHA	Occupational Safety and Health Administration
Pb	lead

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
PGS	Pioneer Generation Station
PGS Phase IV	Pioneer Generation Station Phase IV
PM	particulate matter
PM ₁₀	particulate matter 10 microns in diameter or smaller
PM _{2.5}	particulate matter 2.5 microns in diameter or smaller
PSD	Prevention of Significant Deterioration
RICE	reciprocating internal combustion engine
SCCT	simple-cycle combustion turbine
SCR	selective catalytic reduction
SO ₂	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SPP	Southwest Power Pool
SWPPP	Stormwater Pollution Prevention Plan
tpy	tons per year
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
V/m	volts per meter
VOC	volatile organic compound
WAPA	Western Area Power Administration
WEST	Western EcoSystems Technology, Inc.

1.0 INTRODUCTION

Basin Electric Power Cooperative (Basin Electric) submits this application for a Certificate of Site Compatibility to the North Dakota Public Service Commission (NDPSC) for additional generation facilities (Project) at the Pioneer Generation Station (PGS) in Williams County, North Dakota (Figure 1-1). Basin Electric is proposing the construction and operation of additional facilities as presented in this application.

Basin Electric is a regional wholesale electric generation and transmission cooperative owned and controlled by the 131 member cooperatives it serves. It was created in May 1961 as a result of regional efforts by electric distribution cooperatives. Basin Electric serves approximately three million customers in 550,000 square miles covering portions of nine states: Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota, and Wyoming. Basin Electric currently operates within the Southwest Power Pool (SPP).

The Basin Electric service area in northwestern North Dakota is experiencing a rapid increase in development for server farm facilities that host data centers and also crypto currency mining as well as activities associated with oil and gas extraction from the Bakken shale formation, currently concentrated in McKenzie, Mountrail, and Williams Counties. The development that has already occurred and additional development planned for the future require numerous infrastructure upgrades throughout the region, including an increase in electrical generation capacity and reliability.

The Project would be a combination of brownfield and greenfield development, consisting of the addition of six, nominal 18.8-megawatt (MW) natural gas reciprocating internal combustion engines (RICE) that will vent to one combined stack, as well as two 235.7-MW each, F-Class natural gas-fired simple-cycle combustion turbines (SCCTs). The additional generation facilities would be constructed on existing PGS lands west of the City of Williston, North Dakota and adjacent lands recently acquired by Basin Electric. The Project will generate up to approximately 583 MW of power depending on the selected engine and combustion turbine manufacturers. The RICE will also utilize selective catalytic reduction (SCR) systems for nitrogen oxide (NOX) control, requiring on-site storage of urea.

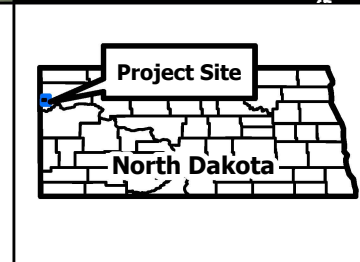
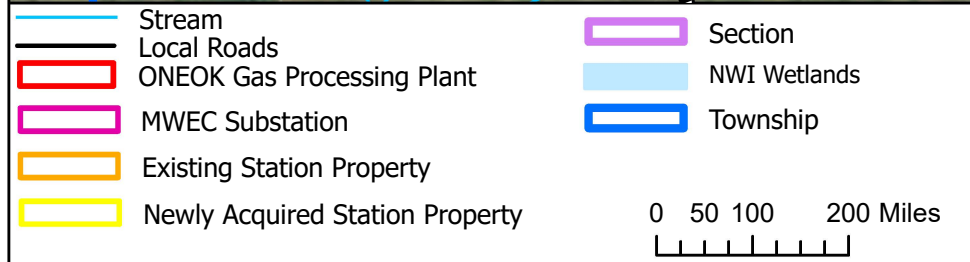
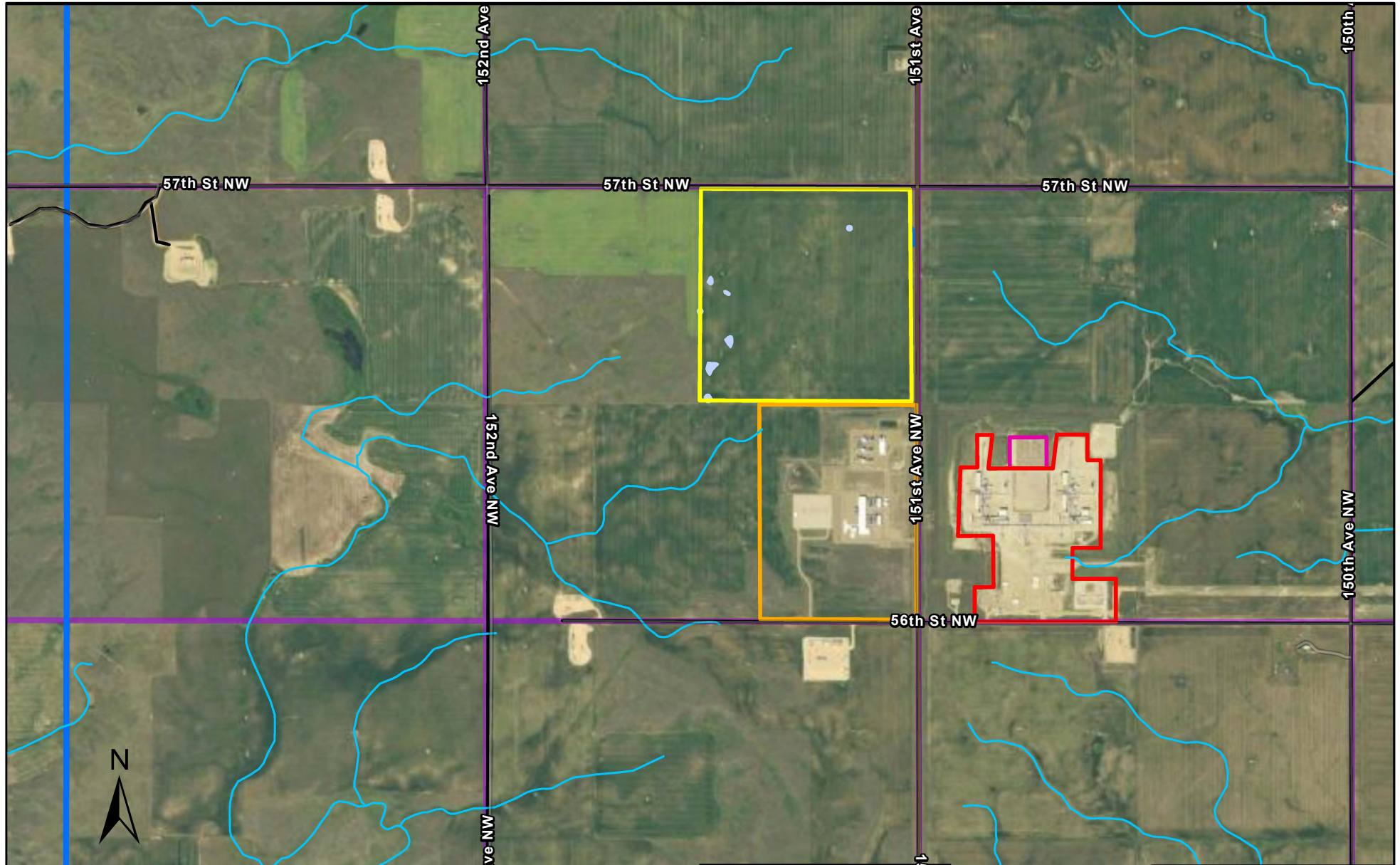


Figure 1-1
Project Location
Pioneer Generation
Station
Phase IV

WBI will construct a new natural gas lateral parallel to the existing natural gas lateral that supplies PGS. In addition to the RICE units, two F-class natural gas-fired simple-cycle combustion turbine generators (CTG) that would produce up to 235.7-MW each would be installed as part of the construction. The CTG's will include a carbon monoxide (CO) catalyst downstream of the CTG exhaust for CO emission controls and the CTG combustion system will be tuned for lower NOX emissions. An electrical switchyard, stormwater retention ponds, temporary laydown areas, and temporary construction parking are included as part of the Project. New high voltage electrical transmission facilities are still in the planning phases and would be considered under separate permits/authorizations.

The RICE will be located south of the current generation station on the same 120-acre parcel. Pending required regulatory approvals, it is anticipated that the RICE units will be operating by May 2025. The SCCTs will be constructed to the north in a 160-acre parcel adjacent to the current generation station. It is anticipated that in June 2025 the first SCCT will be completed, tested, and running for commercial operation. The second SCCT is planned to be running for commercial operation by February 2026.

In accordance with the North Dakota Energy Conversion and Transmission Facility Siting Act, Basin Electric has considered exclusion areas, avoidance areas, the selection criteria, and the policy criteria in the design of the Project. In addition, sufficient generation design and technical information allowed for a thorough evaluation of the reasonableness of the site studied. The proposed Project has been located and designed to minimize environmental impacts by locating the additional generating facilities on and adjacent to compatible existing infrastructure (power generation, gas supply with expansion, water supply, electricity system connections with expansion). See Section 3.1 for additional information related to Site Selection.

Table 1-1 outlines the information required to fulfill the requirements to obtain a Certificate of Site Compatibility from the NDPSA using the NDPSA's Guidelines and identifies where these requirements are addressed in this application.

Table 1-1: Certificate of Site Compatibility Completion Checklist

Chapter	Description	Application Section
1	Form. An application must be reproduced and bound to eight and one-half-inch by eleven-inch size. Accompanying maps must be folded to eight and one-half inches by eleven inches with the title block appearing in the lower right-hand corner.	Application
2	Contents. The application must contain:	

Chapter	Description	Application Section
2a	A description of: <ol style="list-style-type: none"> (1) The type of energy conversion facility proposed (2) The gross design capacity (3) The net design capacity (4) The estimated thermal efficiency of the energy conversion process and the assumptions upon which the estimate is based (5) The number of acres that the proposed facility will occupy and (6) The anticipated time schedule for: <ol style="list-style-type: none"> (a) Obtaining the Certificate of Site Compatibility (b) Completing land acquisition (c) Starting construction (d) Completing construction (e) Testing operations (f) Commencing commercial production, and (g) Beginning any expansions or additions. 	1.1, 1.3, 1.4
2b	Copies of any evaluative studies or assessments of the environmental impact of the proposed facility submitted to any federal, regional, state, or local agency.	Appendices
2c	An analysis of the need for the proposed facility based on present and projected demand for the product or products to be produced by the proposed facility, including the most recent system studies supporting the analysis of the need.	2.0
2d	A description of any feasible alternative methods of serving the need.	2.4
2e	A study area that includes the proposed facility site, of sufficient size to enable the commission to evaluate the factors addressed in North Dakota Century Code section 49-22-09.	1.1.3
2f	A discussion of the utility's policies and commitments to limit the environmental impact of its facilities, including copies of board resolutions and management directives.	1.6
2g	A map identifying the criteria that provides the basis for the specific location of the proposed facility within the study area.	Figures 3-1 and 3-2
2h	A discussion of the criteria evaluated within the study area, including exclusion areas, avoidance areas, selection criteria, policy criteria, design and construction limitations, and economic considerations.	3.0
2i	A discussion of the mitigative measures that the applicant will take to minimize adverse impacts which result from the location, construction, and operation of the proposed facility.	4.0
2j	The qualifications of each person involved in the facility site location study.	8.0
2k	A map of the study area showing the location of the proposed facility and the criteria evaluated.	Figures 3-1 and 3.2

Chapter	Description	Application Section
<i>2l</i>	An eight and one-half-inch by eleven-inch black and white map suitable for newspaper publication depicting the site area.	Appendix G
<i>2m</i>	A discussion of present and future natural resource development in the area.	4.11
<i>2n</i>	Map and GIS requirements. The applicant shall provide information that is complete, current, presented clearly and concisely, and supported by appropriate references to technical and other written material available to the commission. The information must provide the location of the proposed facilities, the proposed site, and the criteria evaluated.	Figures

1.1 Project Description

The following sections provide a description of the proposed Project, including the equipment to be installed and operated and the location of the Project site (Figure 1-1).

1.1.1 Type, Size, and Design

The proposed Project would include six natural gas RICE that produce up to 18.8 MW, each, that will vent to one combined stack, as well as two F-Class natural gas-fired SCCTs that produce up to 235.7 MW each.

Facilities to be constructed on existing Basin Electric property at the existing Pioneer Station as part of this Project are:

- Six 18.8-MW RICE units and auxiliary equipment, occupying approximately 4.9 acres
- Warehouse, approximately 0.7 acres
- RICE stormwater pond, approximately 1.7 acres
- Temporary construction parking and construction trailers, approximately 4.17 acres
- Temporary material lay down and assembly yard, approximately 9 acres

Facilities to be constructed on newly acquired property adjacent to the existing PGS as part of this Project:

- Two F-Class natural gas-fired SCCTs, approximately 22.4 acres
- 345-kV substation, approximately 23.8 acres
- Evaporative Cooler Blowdown Pond, approximately 23.5 acres
- CTG stormwater pond, approximately 2.31 acres

- Temporary construction laydown, parking, and Trailers approximately 21.9 acres

The proposed Project would include up to 6 nominal 18-MW RICE with a nominal gross electrical output of 112 MW and a thermal efficiency of 40.5 percent HHV. Two F-class combustion turbines with a nominal gross output of 235.7 MW each or a total of 471.4 MW and a thermal efficiency of 35.2 percent HHV are also included. In total the project would create approximately 583.4 MW of power.

The RICE would be turbo-charged four stroke lean burn engines. The proposed Project is designed to meet variable electrical demands from as low as three MW to as high as 113 MW if all engines are in service. The RICE would combust natural gas. The SCCTs would have low-NO_x burners and catalytic oxidation and would also meet variable electrical demands from 48 MW to 235.7 MW, each.

For the six RICE, all six engines would be vented to one stack. To control emissions of NO_x, each engine would be equipped with SCR systems and lean-burn combustion systems. To minimize the emissions of sulfur dioxide (SO₂), sulfuric acid (H₂SO₄) mist, and particulate matter (PM)/PM₁₀/PM_{2.5}, the engines would be controlled through the use of low-sulfur/low-ash fuels and good combustion practices.

Table 1-2 summarizes acreages for the various project facilities, both permanent and temporary, for the existing PGS and the newly acquired property. Appendix A contains detailed site layouts labeling the various components for the expansion.

Table 1-2: Project Related Activity Acreage Summary

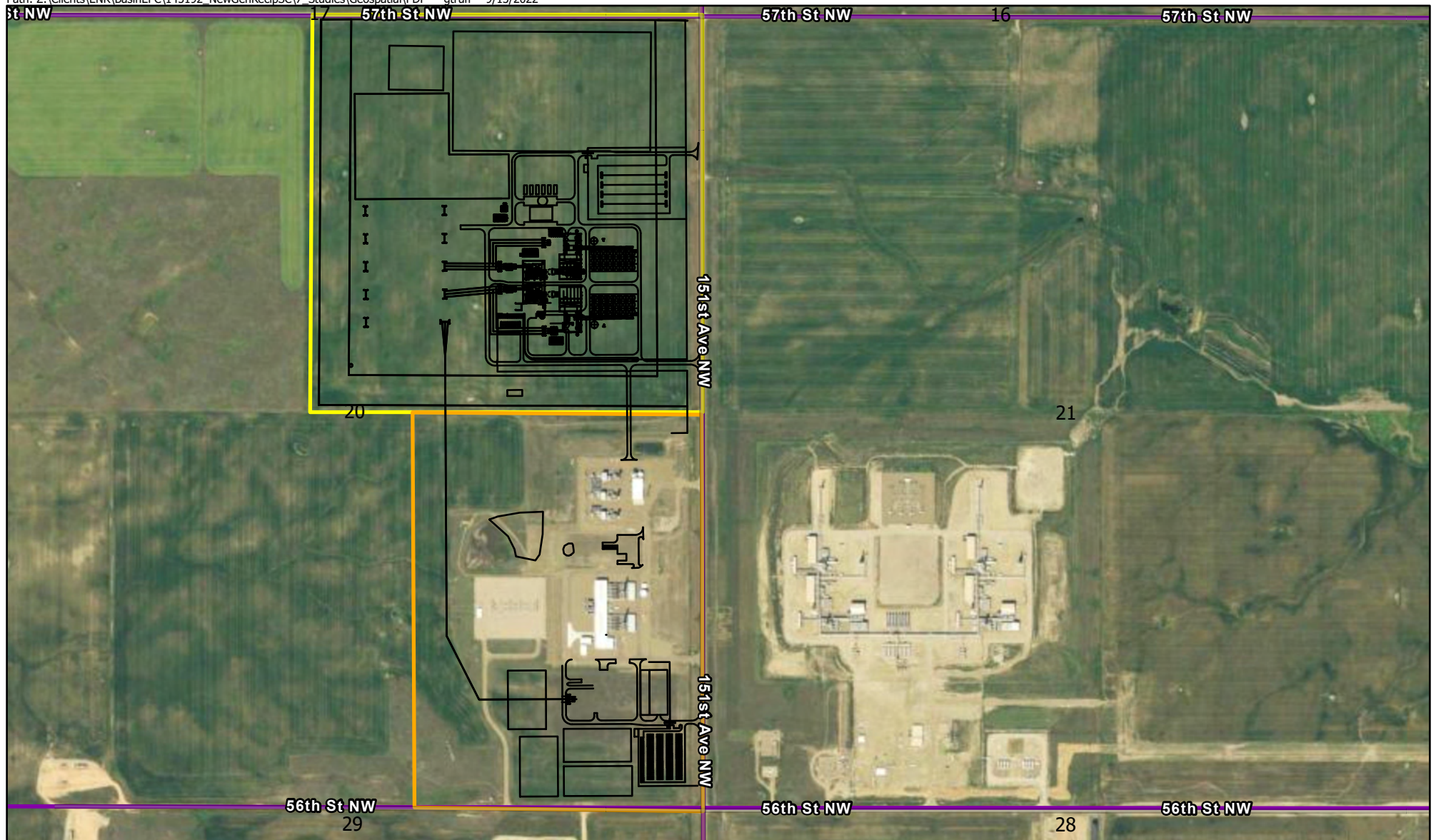
Newly Acquired Property Adjacent to Existing PGS (160 Acre Site)		Existing Pioneer Generation Station Site (120 Acre Site)	
Location	Acres Affected	Location	Acres Affected
Currently Developed	0.0	Currently Developed	58.7
SCCT Turbine Area	22.4	RICE Area	4.9
Substation	23.8	Warehouse	0.7
Blowdown Pond	23.5	-	-
Stormwater Pond	2.31	Stormwater Pond Addition	1.7
Parking Lot	5.1	Parking Lot	3.77
Construction Trailers	4.1	Construction Trailers	0.4
Laydown	12.7	Laydown	9.0
Total Affected Acres	93.91	Total Affected Acres	20.47
Permanently Disturbed Acres	72.01	Permanently Disturbed Acres	7.3
Temporarily Disturbed Acres	21.9	Temporarily Disturbed Acres	13.17
Undisturbed	66.09	Undisturbed Areas	40.83
Total Permanently Disturbed Area (Both Sites)			79.31
Total Temporary Disturbed Area (Both Sites)			35.07





1.1.2 Product

Energy would be generated and distributed to the electrical grid system serving the rapidly increasing electrical load requirements in northwestern North Dakota. The PGS would improve the reliability of service into the area.

1.1.3 Location

The proposed site for new RICE and SCCTs is Section 20, Township 155 North, Range 103 West: Hebron Township; Williams County; North Dakota (Figure 1-1). Figures 1-2 and 1-3 show the layout of the site on the properties where the Project would be constructed with aerial photography and topographic features. The RICE facilities will be in the southeast quarter of Section 20. The simple-cycle CTG's will be in the northeast quarter of Section 20.



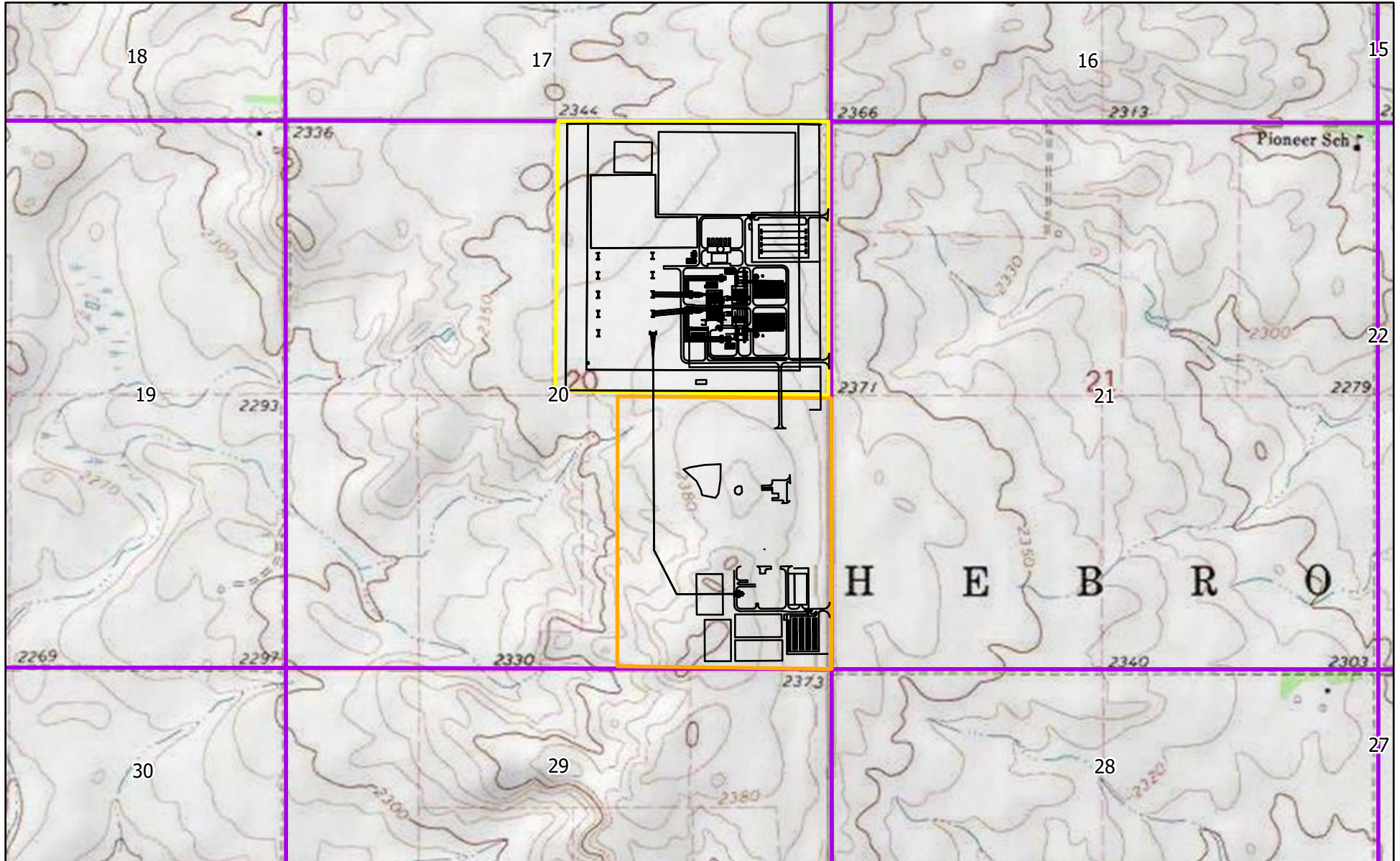
-  Site Layout
-  PGS Existing Property
-  PGS Newly Acquired Station Property
-  Section



0 350 700 1,400 Feet



Figure 1-2
Site Layout
Aerial Imagery
Pioneer Generation Station
Phase IV



- Topographic Lines (m)
- Site layout
- PGS Existing Site
- PGS Newly Acquired Site
- Section

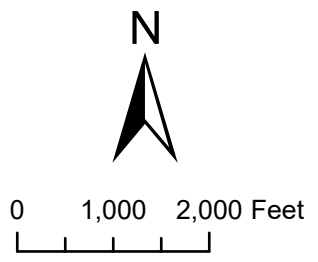


Figure 1-3
Site Layout
Topography
Pioneer Generation Station
Phase IV

1.1.4 Geographical Service Area

The general area to be served by the Project is Basin Electric's service territory, specifically the area in northwestern North Dakota within the Williston Basin.

1.2 Cost

The cost of construction for the Project is estimated to be approximately \$670 Million.

1.3 Project Schedule

The anticipated schedule for the Project is below:

- Submit Site Compatibility Application: October 2022
- Obtain Certificate of Site Compatibility: April 2023
- Start Construction: April 2023
- Complete Construction:
 - Nov 2024 for RICE
 - Feb 2025 for 1st CTG
 - Aug 2025 for 2nd CTG
- Test and commissioning:
 - Nov 2024 – Feb 2025 for RICE,
 - Feb – May 2025 for 1st CTG,
 - Sept 2025 – Jan. 2026 for 2nd CTG
- Commence commercial operation:
 - May 2025 RICE,
 - June 2025 1st CTG,
 - Feb 2026 2nd CTG

Note: Should all approvals be received ahead of schedule, the schedule would be advanced accordingly.

1.4 Future Plans

The existing PGS electricity, gas, and water infrastructure, with some improvements, is capable of supporting this additional generation. At the time of this application, Basin Electric does not have additional plans to increase the generation capacity at PGS beyond the proposed Project.

1.5 Restoration Plans

During construction, crews would limit ground disturbance wherever feasible. Temporary disturbance areas, including laydown areas and construction parking and administration (35.07 acres) would have gravel removed, removed and stockpiled topsoil replaced/re-spread, and would be reseeded to native grass pasture for any area outside the permanent footprint. Reclamation activities include removing and disposing of debris, dismantling all temporary facilities (including staging, administration/construction management, and temporary material storage areas), and leveling or filling tire ruts. Erosion control measures would be implemented during construction to minimize runoff into the stormwater pond. Erosion control measures such as silt fence, rock checks, flow diverters, mulching, seeding, or mesh fabric overlay would be installed when and where appropriate.

Project-specific mitigation measures are described in greater detail in Chapter 4 (Environmental Analysis) for each resource evaluated. Table 4-7 provides a summary of site impacts and mitigation proposed.

1.6 Basin Electric Corporate Commitments to Environmental Quality

Basin Electric has a long history of working to protect the quality of the natural and human environment. Among other things, Basin Electric believes:

- A universally available and affordable supply of safe supply of adequate electricity is vital to the economy and maintaining people's standard of living
- A clean and healthy environment must be maintained
- The energy industry should minimize environmental impacts

In keeping with these beliefs, Basin Electric's Resolution Committee has passed and adopted a number of Continuing and Current Resolutions, many directed at minimizing environmental impacts and improving environmental stewardship. The resolutions applicable to this project have been excerpted and are provided in Appendix B.

2.0 NEED DETERMINATION AND ALTERNATIVES

Basin Electric has identified the need for additional electric generation in northwestern North Dakota as a result of increased demand in the region. This need is determined through the load forecast process developed as a partnership effort between the distribution cooperatives, generation and transmission (G&T) cooperatives, and Basin Electric for its entire service area. Both distribution cooperatives and G&T cooperatives are considered Basin Electric member cooperatives. Subsequent to the completion of the historical database development, regression analysis software is used to identify economic, demographic, and meteorological factors that have affected the member's power requirements. These factors are called explanatory variables as they explain why the electric requirements change. Explanatory variables are first used to develop the econometric models based on historic relationships and are then used to develop the actual forecasts, incorporating historical and forecasted values. Based on the results of Basin Electric's forecasting process, a number of alternatives were considered to meet the identified need. These are discussed later in this section.

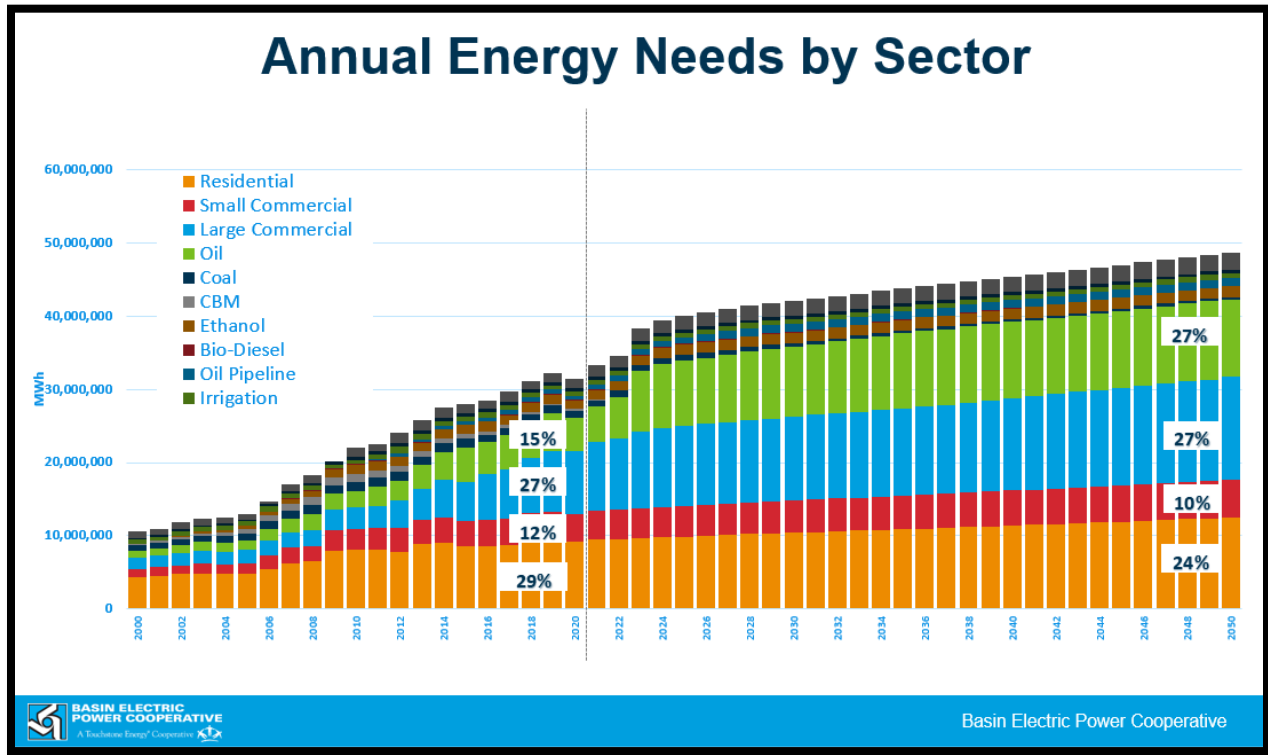
2.1 Basin Electric Load Forecast Sectors

In 2020, Basin Electric's members sold 30 percent of their energy to the residential sector, 29 percent to the large commercial sector, and 12 percent to the small commercial sector (Figure 2-1). The other 29 percent of sales were spread among the remaining sectors.

2.2 Summary of the Latest Load Forecast

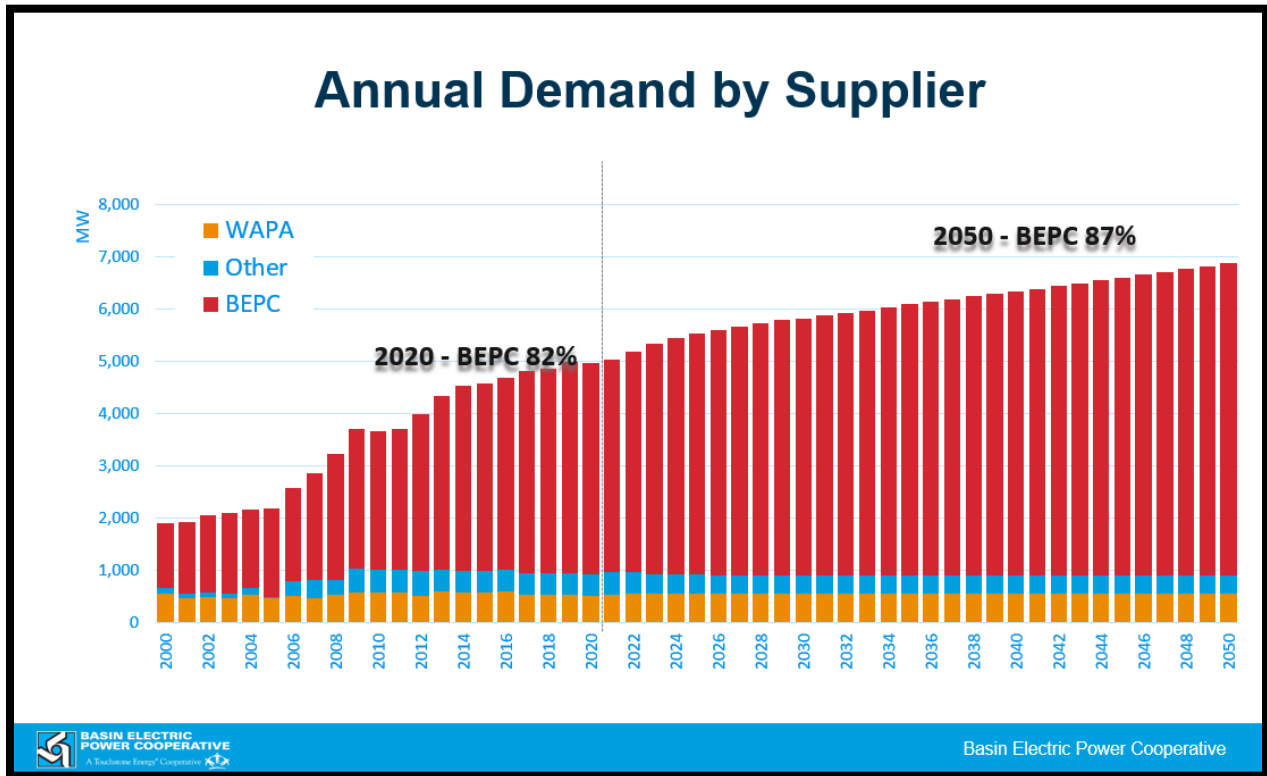
Basin Electric finalized the 2022 Load Forecast, and it was approved by the Basin Electric Board of Directors in January 2022. The load forecast is net of any member's load management activity, which is discussed in more detail later. Figure 2-1 shows actual total member sales by class such as residential, commercial, etc., from 1971 to 2020 as well as projected member sales by class from 2021 to 2050. The need for additional generating capacity is driven by the increasing use of electricity and the resulting load growth, including industrial growth, energy sector (coal, oil, gas, ethanol, and biodiesel) development, and new rural development. Strong growth in the Williston Basin oil sector is underpinned by historically strong residential and non-energy-related commercial sectors.

Figure 2-1: Total Member Requirements by Sector



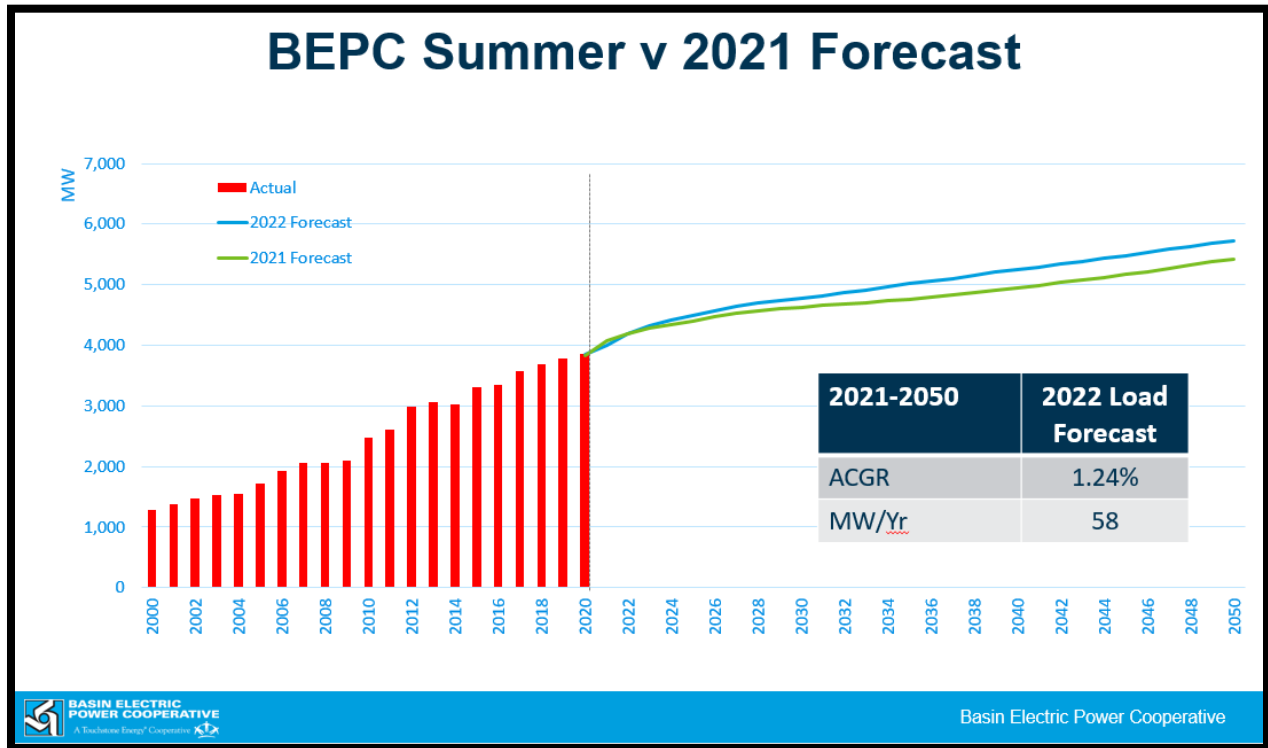
Basin Electric’s supplemental power supply responsibility to its member systems is, in most cases, computed by subtracting the members’ direct Western Area Power Administration’s (WAPA) allocation from their total power requirements (Figure 2-2). In instances where other power supply sources are applicable, contractual arrangements are considered. After other power suppliers’ obligations are considered, the remainders of the loads are Basin Electric’s responsibility. Figure 2-3 depicts the expected summer season demands for Basin Electric.

Figure 2-2: Annual Demand by Power Supplier



WAPA = Western Area Power Administration
BEPC = Basin Electric Power Cooperative

Figure 2-3: Basin Electric Summer Demand

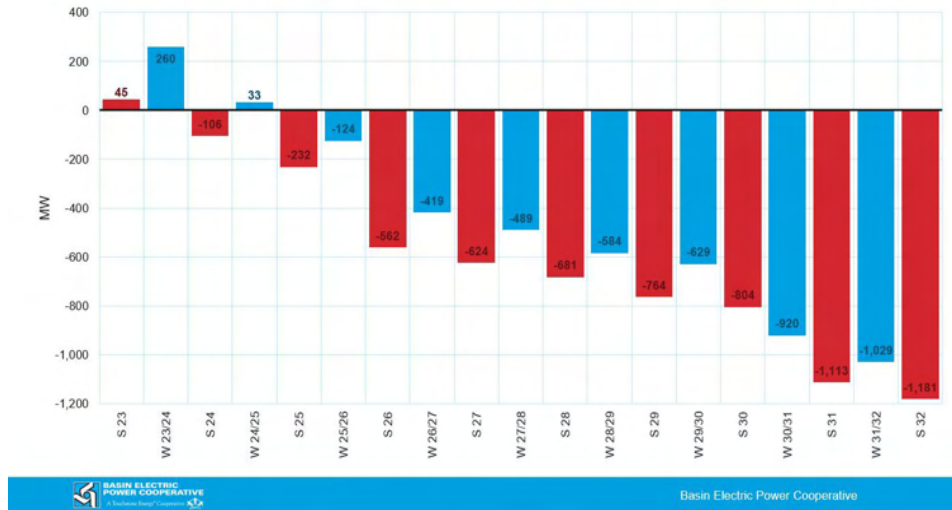


2.3 Project Justification and Support

Basin Electric identified the need for the Pioneer Generation Station Phase IV (PGS Phase IV) through its power supply planning process. This process compared the resources required to satisfy the 2022 Load Forecast to the existing generation fleet and purchase agreements as of the third quarter of 2022. The difference in the load forecast plus other obligations (such as non-member sales, losses, and reserves, less Basin Electric’s system-wide load management) and existing and committed generating resources along with purchases, define the load and capability of the Basin Electric system. Capacity deficiencies or surplus on Basin Electric’s system has been determined on this basis.

The following chart (Figure 2-4) displays Basin Electric’s current SPP system capacity graph without the PGS Phase IV. This highlights the significant need for capacity beginning in 2025 driven by the increased load observed in the 2022 Load Forecast.

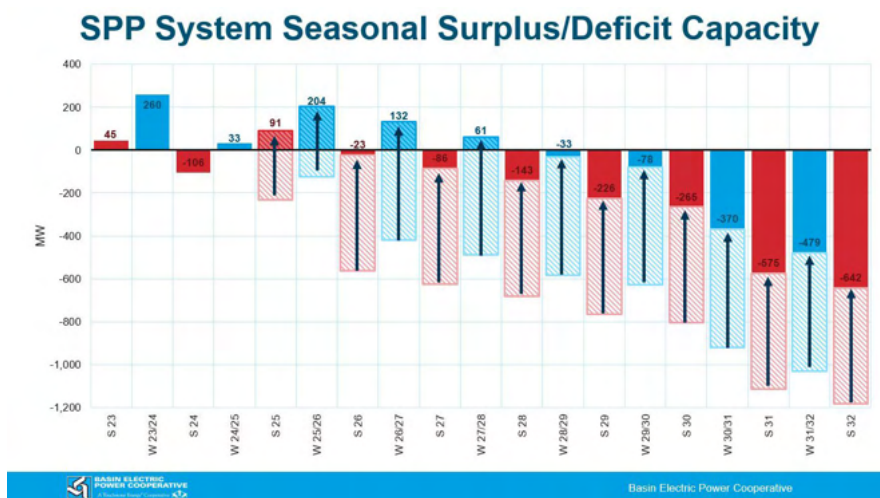
Figure 2-4: SPP System Seasonal Surplus/Deficit Capacity
SPP System Seasonal Surplus/Deficit Capacity



2.4 Power Supply Option

As a result of the power supply planning process, it became apparent there is a need to secure additional capacity in the SPP region to meet the growing demand and provide an adequate supply of electrical power for the membership. The opportunity for additional capacity and energy through the PGS Phase IV Project and the 2022 Load Forecast were used to create the updated system capacity graph, Figure 2-5.

Figure 2-5: SPP System Seasonal Surplus/Deficit Capacity with PGS Phase IV



Basin Electric continues to evaluate the best alternatives in resource planning to meet the substantial demand growth that is projected as well as continuing to monitor the load growth with a new load forecast

to be completed in early 2023. As the load forecast materializes, additional resources will be evaluated to meet the quickly developing demand for electricity within Basin Electric's membership.

2.5 Alternatives

The most economical means of supplying power to a load that varies every hour on an electric power system is to have three basic types of generating assets available for use. These generation assets are commonly referred to as baseload, intermediate, and peaking capacity.

A number of demand-side and supply-side resource alternatives have been considered as a means of meeting the forecasted electrical need for Basin Electric. The alternatives evaluated include:

- Demand-side Management
- SCCTs
- Combined-cycle Combustion Turbines
- RICEs

These alternatives are discussed below.

2.5.1 Demand-side Management

Demand-side Management (DSM) is the process of managing the consumption of energy, generally to optimize available and planned generation resources. DSM refers to actions taken on the customer's side of the meter to change the amount or timing of energy consumption. DSM programs offer a variety of measures that can reduce energy consumption and consumer energy expenses. DSM strategies have the goal of maximizing end-use efficiency to avoid or postpone the construction of new generating plants.

DSM programs aim to achieve three broad objectives: energy conservation, energy efficiency, and load management. Energy conservation can reduce the overall consumption of electricity by reducing the energy required for heating, lighting, cooling, cooking and other energy-dependent functions. Energy efficiency encourages consumers to use energy more efficiently, thus more effectively. Load management allows generation companies to better manage the timing of their consumers' energy use and helps reduce the large discrepancy between on-peak and off-peak demand.

Basin Electric and its members use a variety of conservation and energy efficiency programs. The programs and activities were developed to promote, support, and market such technologies as efficient dual heat, water heaters, heat pumps, air conditioning, storage heating, grain drying, and irrigation. Other examples of programs are solar photovoltaic generation and energy audits. A number of Basin Electric's

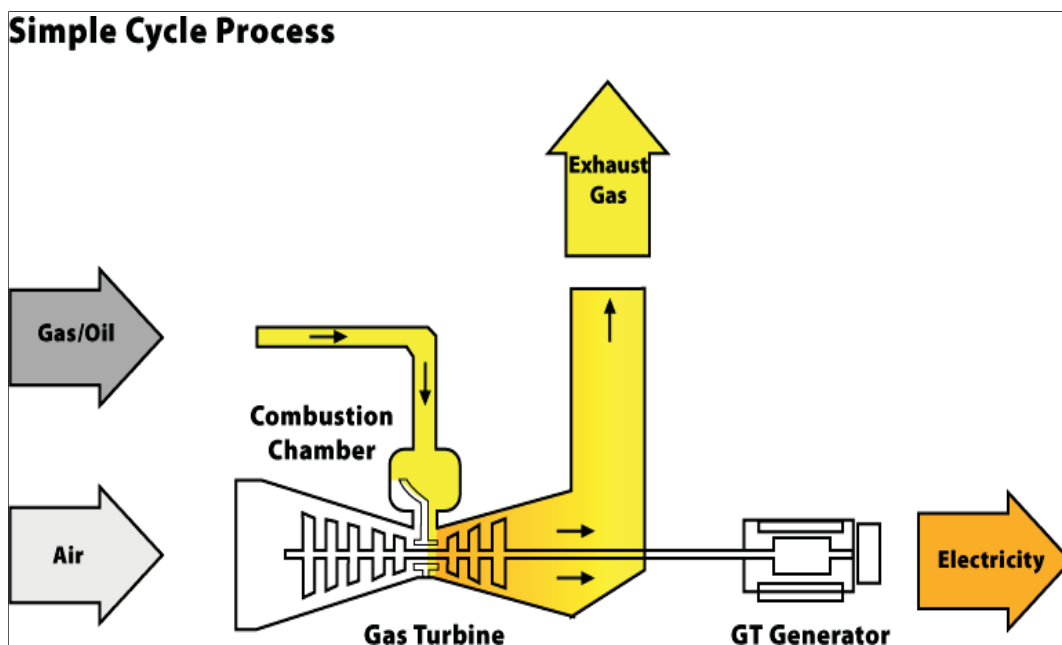
members have developed DSM programs. These vary depending on the cooperative; some elect to utilize rebates, others use energy resource conservation loans, variable rates, a combination, or elect not to adopt any of the programs.

Energy conservation and efficiency programs can lessen the demand for electricity, therefore reducing the capacity needed from additional future generation facilities. However, energy savings through DSM are not enough to alleviate the need for additional capacity and energy resources.

2.5.2 Simple-cycle Combustion Turbines

In SCCT operation, gas turbines are operated alone, without the addition of heat recovery of the energy from the hot exhaust gases. SCCTs require relatively smaller capital investment than coal, nuclear, or combined-cycle natural gas plants, and SCCTs can be designed to generate small or large amounts of power. SCCTs can startup quickly and ramp up and down to support load. Also, the actual construction process for SCCTs is up to one to two years shorter than that of a combined-cycle facility and at least five or more years shorter than that of a baseload coal or nuclear facility. A typical large SCCT may produce anywhere from 45 to 400+ MW of power and have 35 to 40 percent thermal efficiency. Figure 2-6 shows a typical SCCT process flow diagram. Consisting of two simple cycle combustion turbines as a part of this facility, PGS Phase IV is being proposed to meet a portion of Basin Electric's projected local generation requirement.

Figure 2-6: Simple Cycle Unit Process Flow Diagram



There are two types of gas combustion turbines: heavy industrial “frame” machines and aero-derivative machines. Gas turbines are pre-assembled at a factory, skid or baseplate mounted, and then shipped to the site along with other major components including the generator, cooling, lube oil, and electrical modules. The turbines proposed for the Project are frame machines. Because they are pre-assembled and modular, field erection hours are significantly reduced, particularly as compared to a coal-fired plant.

According to Lazard’s Levelized Cost of Energy Analysis- Version 15.0 published in October of 2021, the capital cost component of the SCCT power is approximately \$700 per kilowatt (kW) to \$900/kW for a plant that is assumed to only run about 10% annual capacity factor. While the capital cost for these SCCT resources is low, Lazard’s low capacity factor assumptions results in their calculation of the total levelized cost of energy to appear high at approximately \$151/megawatt-hour (MWh) to \$196/MWh .

Natural gas cost is highly variable and strongly affected by the economy, production and supply, demand, weather, and storage levels. Weather and demand are large factors that affect gas prices and are unpredictable. Traditionally, demand for natural gas peaks in the coldest months, but with the nation’s power increasingly being generated by natural gas, demand also spikes in summer, when companies operate peaking plants to provide more power for cooling needs.

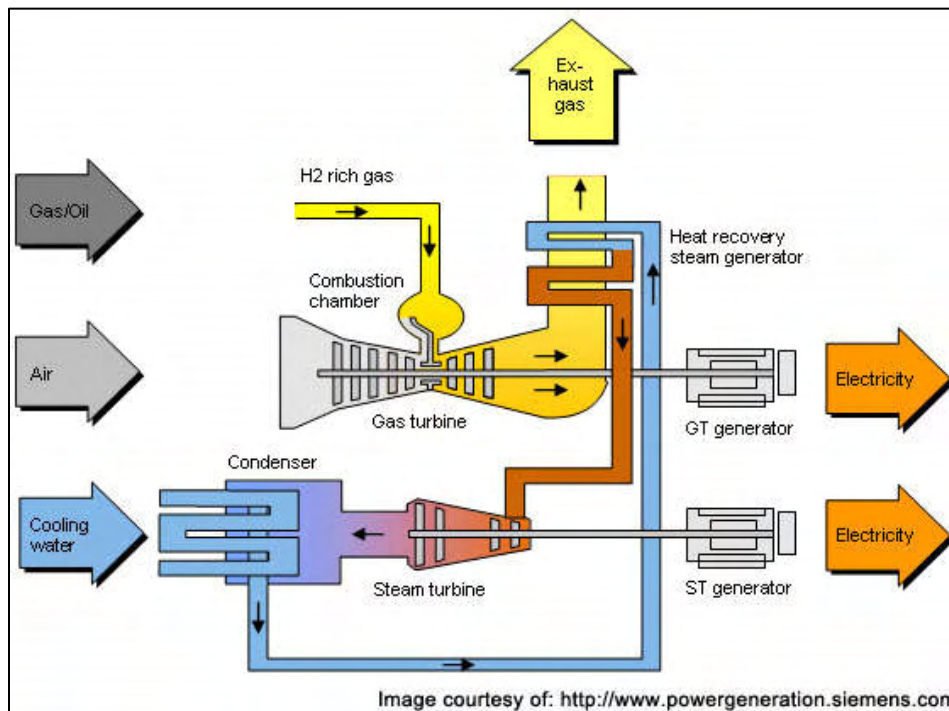
Permitting of SCCTs has an average time frame of 1 to 3 years. This permitting time frame is dependent on the type of machine selected and the area where it is constructed. The construction time for a SCCT is relatively short, ranging from 2 to 2.5 years. This is, of course, dependent on availability of units, transmission, and construction resources. Overall, the total process of building a SCCT from concept to operation is expected to take 3-4 years. SCCTs could fulfill Basin Electric’s power needs as well as local generation need for the Williston Basin area. Natural gas prices have increased in recent years, but natural gas-fired resources are still considered to be a cheap source of dispatchable generation. With the increased oil (and, as a result, natural gas) production in North Dakota and Montana, natural gas-fired generation is considered in Basin Electric’s future resource portfolios.

2.5.3 Combined-cycle Combustion Turbines

Combined cycle is a term used when a power producing engine or plant employs more than one thermodynamic cycle. In a combined-cycle power plant (CCPP) or combined-cycle combustion turbine (CCCT) plant, a gas turbine generator generates electricity and the waste heat (in a heat recovery steam generator) from the gas turbine is used to make steam to generate additional electricity via a steam turbine; this last step enhances the efficiency of electricity generation. In a thermal power plant, high-temperature heat as input to the heat recovery system, usually from burning of fuel, is converted to

electricity as one of the outputs and low-temperature heat as another output. As a rule, in order to achieve high efficiency, the temperature of the heat recovery input should be as high as possible and the temperature of the output heat as low as possible. This is achieved by combining the Rankine (steam power system) and the Brayton (gas turbine) thermodynamic cycles. Figure 2-7 show a typical combined-cycle unit process flow diagram.

Figure 2-7: Combined Cycle Unit Process Flow Diagram



The thermal efficiency of a CCPP is normally in terms of the net power output of the plant as a percentage of the lower heating value of the fuel. In the case of generating only electricity, power plant efficiencies of up to 62% can be achieved. In the case of combined heat and power generation, the efficiency can increase to about 85% since about two-thirds of the energy in the Rankine cycle is typically rejected to atmosphere when condensing the low temperature steam back to water. Typical CCPPs are powered by natural gas, although other sources of fuel can be used such as fuel oil or synthetic gas.

Combined-cycle equipment is pre-engineered, and factory packaged to minimize installation time and cost. All major equipment (gas turbine generator, heat recovery steam generator [HRSG], and steam turbine generator) is shipped to the field as assembled and tested modular components which are integrated during construction. CCCT plants have demonstrated high reliability and low operations and maintenance costs.

The capital cost component of the levelized cost of CCCT power is approximately \$700/kW to \$1,300/kW for a plant that runs about 50% - 70% annual capacity factor. The total levelized cost of CCCT power is projected to be approximately \$45/MWh to \$74/MWh. If a CCCT were operated at 70% annual capacity factor, the levelized cost of power would be about \$45/MWh. Most of the power-generation cost for CCCT is from the variable/fuel cost at approximately \$21-24/MWh, assuming the cost of fuel is about \$3.45/ Million British thermal units (MMBTu). Natural gas cost is highly variable and strongly affected by the economy, production and supply, demand, weather, and storage levels. Weather and demand are large factors that affect gas prices and are very unpredictable. Traditionally, demand for natural gas peaks in the coldest months, but with the nation's power increasingly being generated by natural gas, demand also spikes in summer, when companies fire-up peaking plants to provide more power for cooling needs.

Permitting of CCCTs has an average timeframe of 3-4 years. This permitting timeframe is dependent on the type of machine selected and the area that is identified for construction. If it is on or near environmentally protected area this timeframe would increase. Construction of a CCPP is 3-4 years. This is of course dependent on availability of units, transmission and construction resources. Overall, the total process of building a CCCT from concept to operation is expected to take 4-6 years.

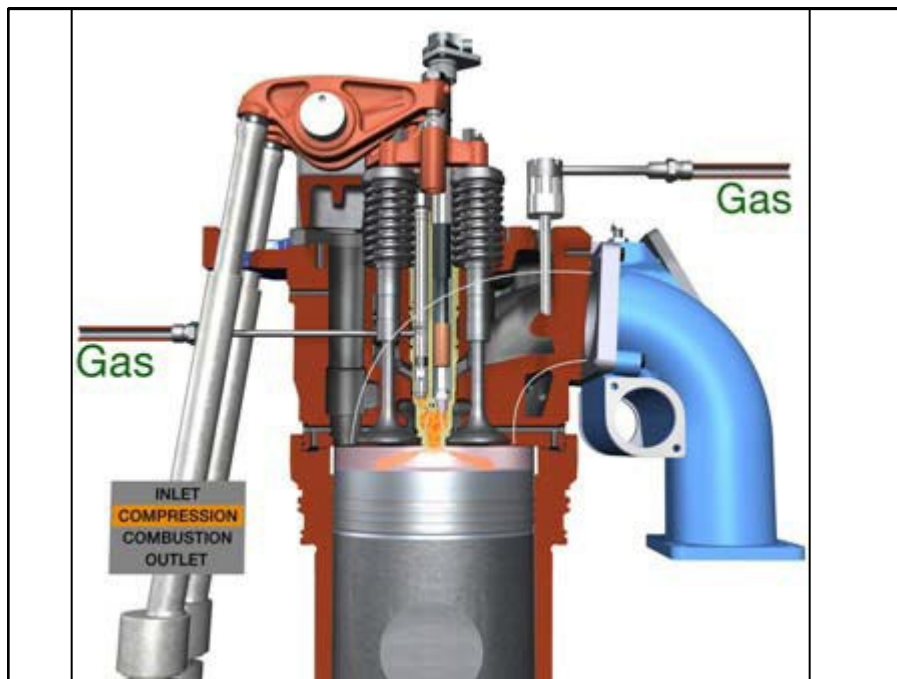
CCCT is a valid option to help meet long term power supply needs in the more distant future. Natural gas prices have increased in recent years, but natural gas-fired resources are still considered to be a cheap source of dispatchable generation. With the increased oil and natural gas production in North Dakota and Montana, natural gas fired generation will continue to be considered in Basin Electric's future resource portfolios.

2.5.4 Reciprocating Internal Combustion Engine

RICE are a well-known technology used in automobiles, trucks, construction equipment, marine propulsion, and backup power applications. Reciprocating engines use the expansion of hot gases to push a piston within a cylinder, converting the linear movement of the piston into the rotating movement of a crankshaft to generate power. While the steam engines that powered the industrial revolution were driven by externally produced steam, modern reciprocating engines used for electric power generation are internal combustion engines in which an air-fuel mixture is compressed by a piston and ignited within a cylinder. RICE engines are characterized by the type of combustion: spark-ignited or compression-ignited/diesel.

The spark-ignited engine is based on the Otto cycle and uses a spark plug to ignite an air-fuel mixture injected at the top of a cylinder. In the Otto cycle, the fuel mixture does not get hot enough to burn without a spark, which differentiates it from the diesel cycle. In diesel engines, air is compressed until the temperature rises to the auto-ignition temperature of the fuel. As the fuel is injected into the cylinder, it immediately combusts with the hot compressed air, expanding combustion gases that then push the piston to the bottom of the cylinder. Figure 2-8 shows a typical spark-ignited reciprocating engine process flow diagram (natural gas operation). The proposed PGS Phase IV facility consists of six natural gas-fired RICE. The operational flexibility of having six relatively small generators that can ramp up and down as needed to follow load and intermittent generation resources makes them a valuable resource to assist in meeting a portion of Basin Electric's projected local generation requirement.

Figure 2-8: Spark ignited Reciprocating Engine During Compression Stroke



RICE for power generation range from 4 to 20 MW. In a power plant, many spark-ignited or diesel engines are grouped into blocks of engines, called generating sets, to provide modular electric generating capacity in standardized sizes (Figure 2-9). RICE power plants are highly efficient with efficiencies of 46 to 49 percent, surpassing the performance of steam electric or simple-cycle gas turbine power plants. The other main advantage of RICE is the ability to be turned on and off within minutes, supplying power during peak demand or during transmission outages.

Figure 2-9: Engine Hall at Goodman Energy Center in Kansas

Permitting of RICE units has an average time frame of 1 to 3 years. This permitting time frame is dependent on the type of machine selected and the area for construction. If it is on or near an environmentally sensitive area, this time frame could increase. The construction period for a RICE unit is relatively small, 1.5 to 2 years. This is of course dependent on availability of units, transmission, and construction resources. Overall, the total process of building a RICE from concept to operation is expected to take 3-4 years. RICE units could fulfill Basin Electric's power needs as well as needs for local area generation to the Williston Basin area. Natural gas prices have increased in recent years, but natural gas-fired resources are still considered to be a cheap source of dispatchable generation. With the increased oil (and, as a result, natural gas) production in North Dakota and Montana, natural gas-fired generation is considered in Basin Electric's future resource portfolios.

Basin Electric needs additional local generation as soon as possible to help with resource adequacy requirements and the continued expansion in the Williston Basin area. The generation types that are capable of meeting Basin Electric's local generation need should be constructed in the area and in the timeframe required to service the increased load. Based on these parameters, some sort of SCCT, RICE, or combination facility is needed. Considering the permitting and construction time limitations associated with natural gas fired CCCTs, the PGS Phase IV project consisting of two SCCT's and six RICE generators was determined to be the most economical and time expedient option to meet Basin Electric's needs.

2.6 Ten-Year Plan

Basin Electric filed a Ten-Year Plan with the NDPSC in June 2022. The 10-year plan identifies that Basin Electric is still identifying additional resource options, so the PGS Phase IV is consistent with the Ten-Year Plan on file with the NDPSC.

3.0 SITE COMPATIBILITY CRITERIA

Basin Electric determined that additional quick-start generation was required in the heart of the Williston Basin to help with transmission load serving issues. This generation is required on an expedited schedule to meet the growth needs in the area; it needs to be commercially operational in 2025. As a result, Basin Electric conducted a site selection investigation focused on identifying a site, in compliance with North Dakota Administrative Code (NDAC) Section 69-06-08-01, that would meet the project need requirements. This investigation included potential sites throughout the Williston Basin. The site selection included an inventory and suitability analysis of criteria listed in NDAC Section 69-06-08-01, including exclusion and avoidance area criteria; selection criteria that relate to minimizing potential land use and environmental impacts; policy criteria that relate to maximizing public benefits; and design and construction limitations. Basin Electric also included economic considerations as part of the analysis.

3.1 Site Selection

Basin Electric evaluated multiple areas for the new generation facility. These included the existing Lonesome Creek Generation Station and PGS. Greenfield areas in Williams County, west and southwest of Williston, as well as greenfield areas in east Bainville, Montana were also evaluated. Due to existing site infrastructure and proximity of natural gas and transmission resources, PGS was selected as the preferred site for the project. Existing infrastructure was determined to accommodate the additional facilities with minimal upgrades, avoiding impacts from development of a new generation site and all the associated infrastructure.

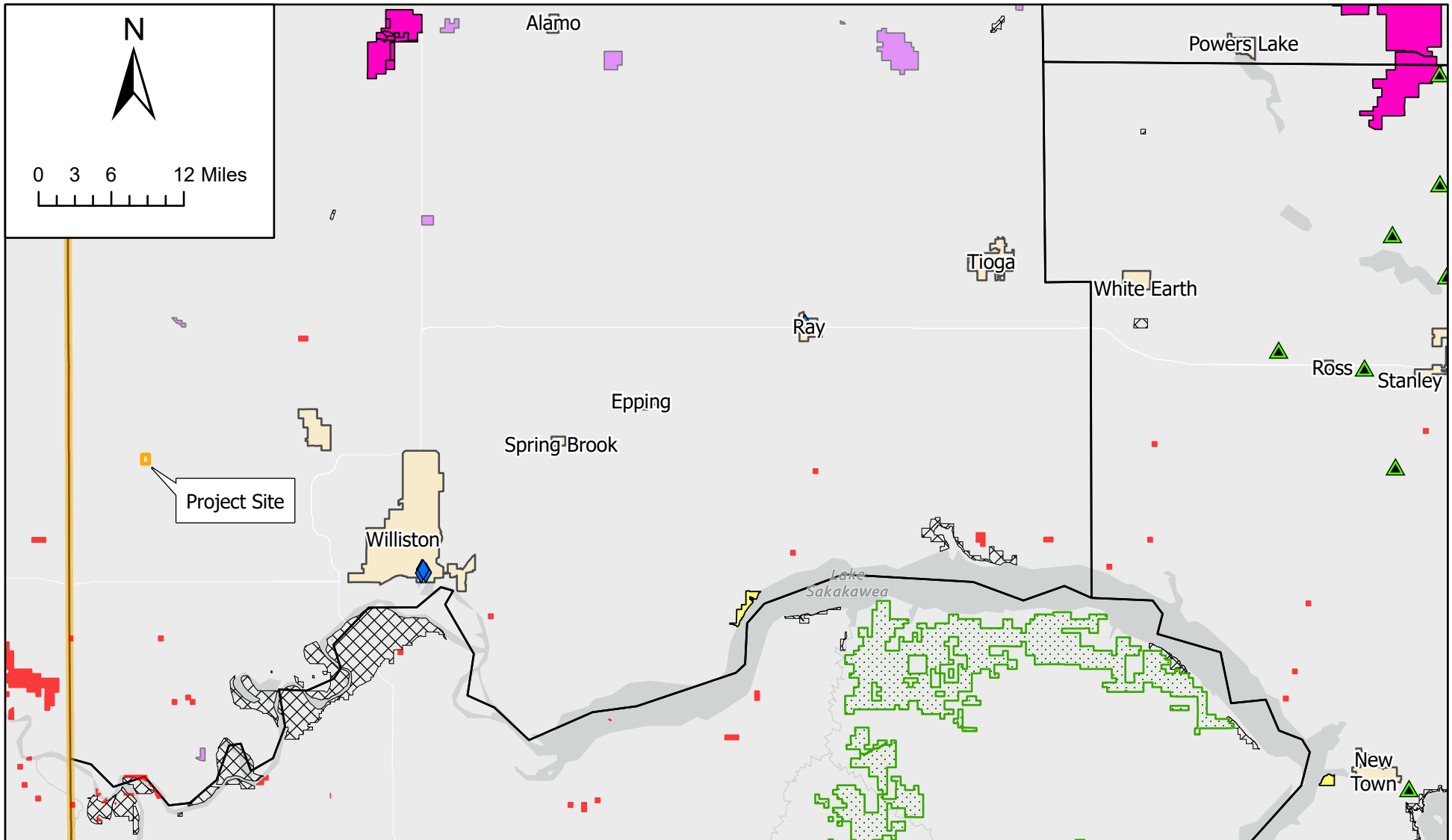
3.2 Exclusion Areas

Per NDAC Section 69-06-08-01(1), the geographic areas listed in Table 3-1 Table 3-1: Exclusion Areas shall be excluded in the consideration of an energy conversion facility and shall include a buffer zone of reasonable width to protect the integrity of the area. No exclusion areas were identified within the Project Site (Figure 3-1).

Table 3-1: Exclusion Areas

Geographic Area	Present within Project Site	Section Addressed
Designated or registered national: parks; memorial parks; historic sites and landmarks; natural landmarks; historic districts; monuments; wilderness areas; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands	Not present	4.9, 4.10
Designated or registered state: parks; forests; forest management lands; historic sites; monuments; historical markers; archaeological	Not present	4.9, 4.10

Geographic Area	Present within Project Site	Section Addressed
sites; grasslands; wild, scenic, or recreational rivers; game refuges; game management areas; management areas; and nature preserves		
County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions; hardwood draws; and enrolled woodlands	Not present	4.4, 4.10
Areas critical to the life stages of threatened or endangered animal or plant species	Not present	4.18
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged	Not present	4.18
Areas within one thousand two hundred feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	Not present	4.3
Areas within thirty feet [9.14 meters] on either side of a direct line between an intercontinental ballistic missile (ICBM) launch facility and a missile alert or launch control facilities to avoid microwave interference. This restriction only applies to aboveground structures, not to surface features, such as roads, or belowground infrastructure.	Not Present	4.3



- | | |
|----------------------------------|---------------------------|
| State Boundary | National Wildlife Refuges |
| Cultural Resource Building Point | PGS Sites |
| State Parks | Missile Launch Locations |
| National Grasslands | Waterfowl Production Area |
| Counties | Bureau of Land Management |
| Wildlife Management Areas | Municipalities |



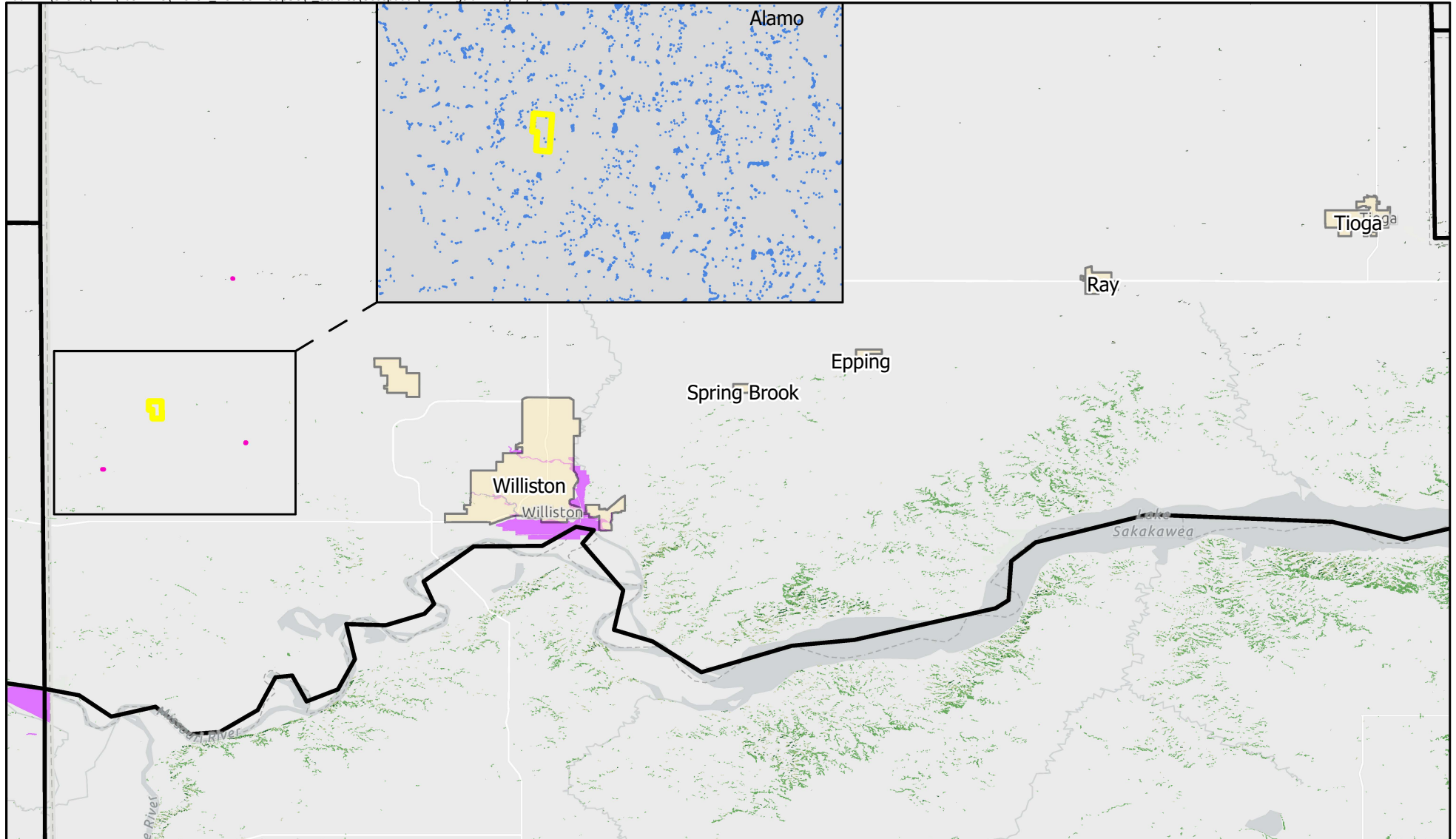
Figure 3-1
Exclusion Areas
Pioneer Generation Station
Phase IV

3.3 Avoidance Areas

The geographic areas listed in NDAC Section 69-06-08-01(3) shall not be considered in the siting of an energy conversion facility unless the applicant shows that under the circumstances there is no reasonable alternative (Table 3-2). In determining whether an avoidance area should be designated for a facility, the NDPSC may consider, among other things, the proposed management of adverse impacts, the orderly siting of facilities, system reliability and integrity, the efficient use of resources, and alternative routes. Economic considerations alone shall not justify approval of these areas. A buffer zone of a reasonable width to protect the integrity of the area shall be included unless a distance is specified in the criteria. Natural screening may be considered in determining the width of the buffer zone. No avoidance areas were identified within the project site (Figure 3-2).

Table 3-2: Avoidance Areas

Avoidance Area	Present within Project Site	Section Addressed
Historical resources which are not specifically designated as exclusion areas	Not present	4.9
Areas within the city limits of a city or the boundaries of a military installation	Not present	4.3
Areas within known floodplains as defined by the geographical boundaries of the 100-year flood	Not present	4.14
Areas that are geologically unstable	Not present	4.13
Woodlands and wetlands	Present	4.11, 4.15
Areas of recreational significance which are not designated as exclusion areas	Not present	4.10



- City Boundaries
- PGS Sites
- Landslides
- Counties
- 1% Annual Chance Flood Hazard
- Forest
- NWI Wetlands



0 75 150 300 Miles

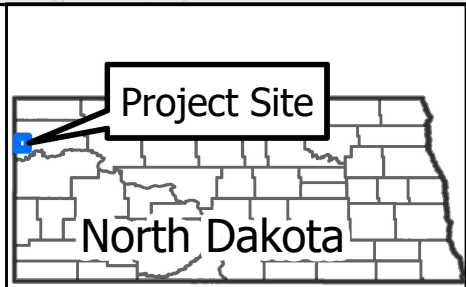


Figure 3-2
Avoidance Areas
Pioneer Generation
Station
Phase IV

3.4 Selection Criteria

Per NDAC Section 69-06-08-01(5), a site shall be designated only when it is demonstrated to the NDPSC by the applicant that, for select criteria, any significant adverse effects resulting from the location, construction, and maintenance of the facility would be at an acceptable minimum, or that those effects would be managed and maintained at an acceptable minimum (Table 3-3).

Table 3-3: Selection Criteria

Selection Criteria	Potential Adverse Effects	Section Addressed
Agricultural production	Construction of the project would result in the disturbance of 114.38 acres from crop production. Conversion of the 79.31 acres of cropland to industrial use for the project and the remaining approximately 35.07 acres converted to hay pasture or back to cropland.	4.3, 4.11
Family farms and ranches	See agricultural production	4.11
Land which the owner can demonstrate has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation	See agricultural production	4.11, 4.12
Surface drainage patterns and ground water flow patterns	No adverse impacts to surface or ground water anticipated.	4.12, 4.13, 4.14
The agricultural quality of the cropland	See agricultural production	4.3, 4.11
Law enforcement	No adverse impacts to local services are anticipated.	4.4
School systems and education programs	No adverse impacts to local services are anticipated.	4.4
Governmental services and facilities	No adverse impacts to local services are anticipated.	4.4
General and mental health care facilities	No adverse impacts to local services are anticipated.	4.4
Recreational programs and facilities	Impacts to recreation would primarily be removal of the site from any recreational use (hunting) and visual in nature and limited to few individuals who previously used the newly acquired adjacent private property surrounding the Project site for nature observation, fishing, or hunting. No adverse effects to recreational resources are anticipated as there are abundant additional	4.4, 4.10

Selection Criteria	Potential Adverse Effects	Section Addressed
	opportunities in the Project vicinity and the visual character of the Project is not anticipated to detract from use of other nearby areas.	
Transportation facilities and networks	The amount of additional traffic generated by Project construction, even at peak levels, would be minor compared to the current levels. No adverse effects are anticipated.	4.4
Retail service facilities	Retail service in local communities such as Williston may experience temporary and minimal increases in business during the construction period in response to activity from construction workers.	4.4
Utility services	Construction of the Project would not adversely affect existing electrical or gas service. No impacts to telephone, fiber optic, television, or radio communication resources are anticipated.	4.4
Local institutions	No adverse impacts to local services are anticipated.	4.4
Noise-sensitive land uses	Noise levels due to operation of the proposed Project are expected to have minimal impact on the closest residences, as designed. Impacts related to construction noise would be minimal.	4.7
Light-sensitive land uses	The Project would not present a change to the visual landscape out of character with other agricultural activities and industrial facilities in and around the county.	4.8
Rural residences and businesses	Retail services in communities such as Williston may experience temporary and minimal increases in business during the construction period in response to activity from construction workers. Noise levels due to operation of the proposed Project are expected to have minimal impact on the closest residences, as designed. Impacts related to construction noise would be minimal.	4.3
Aquifers	No adverse impacts to aquifers are anticipated	4.13
Human health and safety	No adverse effects are anticipated to human health. During construction, potential safety hazards may occur as a result of heavy equipment operation, the presence of overhead materials and cranes, and the use of construction tools. Construction personnel are	4.5

Selection Criteria	Potential Adverse Effects	Section Addressed
	at higher risk than the general public during the construction period of the proposed Project. However, these increased human safety hazards are temporary. Because of the low-population density of the area these impacts during construction and during the operation of the facility are not expected to result in significant safety risks.	
Animal health and safety	See agricultural production	4.11, 4.17, 4.18
Plant life	Construction of the Project would result in the removal of approximately 114.38 acres of agricultural land and vegetation to accommodate the PGS expansion. Of that 114.38, 79.31 would be permanent and 35.07 would be temporary. Following construction, the Project site would no longer be used for crop production and other sections would be reseeded to native grasses.	4.11, 4.16
Temporary and permanent housing	It is anticipated that there would be an adequate supply of temporary housing units available in the Williams County area for use by construction workers relocating on a temporary basis due to the relatively low number of workers necessary compared to the overall workforce in the county and the continued development of housing capacity in the area. Temporary housing would be required during construction and commissioning and is widely available in the area as a result of oil and gas development. After construction housing demand from the Project would end and lodging used would be available for other needs. The small permanent workforce for plant operations would be accommodated by current housing levels and would not generate additional house demand for the area.	4.2
Temporary and permanent skilled and unskilled labor	The majority of construction contractors and workers would temporarily relocate to the Project area as construction of the Project would require a specialized workforce. The operation of the Project would require approximately 15 additional full-time employees for plant operation.	4.2
The cumulative effects of the location of the facility in relation to existing and	Cumulative impacts of the Project are minimized through the use of existing facilities and infrastructure in a predominantly	4.3, 4.11, 4.19, 7.4, 7.5

Selection Criteria	Potential Adverse Effects	Section Addressed
planned facilities and other industrial development.	industrial area. The primary cumulative impact includes the loss of some agricultural lands and production. However agricultural resources are abundant in the region and would not be adversely affected by the Project.	
The impact upon military installations, assets, and operations	No military installation, assets, or operation occur in the vicinity of the Project site. There is no anticipated impact to military operations, installations, or assets.	4.3, Figure 3-1

3.5 Policy Criteria

Per NDAC Section 69-06-08-01(6), the NDPSC may give preference to an applicant that would maximize benefits that result from the adoption of certain policies and practices, and in a proper case may require the adoption of such policies and practices (Table 3-4). The NDPSC may also give preference to an applicant that would maximize interstate benefits.

Table 3-4: Policy Criteria

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
Recycling of the conversion of byproducts and effluents	No byproducts or effluents would be created by this facility.	1.0
Energy conservation through location, process, and design	Basin Electric's policy is to locate and design to minimize environmental impacts and utilize existing developed sites.	1.0, 3.0
Training and utilization of available labor in this state for the general and specialized skills required	Basin Electric would use local labor to the extent practicable.	4.2.2
Use of a primary energy source or raw material located within the state	Basin Electric would use natural gas from within the state to the extent practicable.	1.0, 3.0
Not relocating residents	No residents would be relocated for the Project.	4.2
The dedication of an area adjacent to the facility to land uses such as recreation, agriculture, or wildlife management	Areas outside of the generation facility that are not required to support the PGS would continue to be used for agricultural purposes.	4.11

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
Economies of construction and operation	The Project creates economies of construction and operation by constructing the facility in a location with existing infrastructure such as the highways, transmission line, gas line, and other industrial facilities (adjacent ONEOK Stateline I processing plant).	4.2
Secondary uses of appropriate associated facilities for recreation and the enhancement of wildlife	The Project does not include associated facilities that would be appropriate for recreation or wildlife enhancement.	1.1, 3.0
Use of citizen coordinating committees	The use of citizen coordinating committees is not expected for this Project.	N/A
A commitment of a portion of the energy produced for use in this state	The Project would meet the need for additional electric generation capacity in northwestern North Dakota as a result of increased demand and would meet reliability and system stability requirements for the region.	2.0
Labor relations	No labor relations would be negatively affected by the Project.	4.2
The coordination of facilities	New right of way corridors would not immediately be needed for construction of the PGS Phase IV Project	1.1
Monitoring of impacts	Basin Electric would use Best Management Practices (BMPs) during construction to minimize environmental impacts and would monitor construction compliance with the commitments made in this application and applicable permit conditions, including the NDPSC's Order.	4.0
A commitment to install lighting mitigation technology for wind energy conversion facilities subject to commercial availability and federal aviation administration approval.	This is not a wind energy conversion Project. Basin Electric would use lighting appropriate for the safety and security of the facility and appropriate for the site and surrounding area.	

3.6 Design and Construction Limitations

Project construction and design would meet the requirements of the National Electrical Safety Code (NESC), Basin Electric design criteria, and other applicable local or national building codes.

3.7 Economic Considerations

There are many economic considerations in the design and siting of a power generation facility. Basin Electric has designed the Project to take advantage of the proximity to existing energy supplies (the existing PGS). In general, siting portions of the new PGS Project on a currently zoned industrial site (existing PGS site) minimizes impacts to the surrounding community. Additionally, the close proximity to complementary facilities (energy acquisition and energy distribution) creates efficiency and condenses the development into a compact area.

4.0 ENVIRONMENTAL ANALYSIS

4.1 Overview

This section describes the existing environmental setting in the planned area of disturbance and discusses potential impacts associated with construction and operation of the proposed Project. When applicable to a specific resource, the larger 120-acre and 160-acre PGS property and surrounding vicinity are also discussed. For each resource, a general environmental setting description is provided, followed by a discussion of potential impacts and potential mitigation measures proposed to address the impacts.

The existing plant site was previously disturbed for construction of PGS Phases I and II, and III. PGS Phase I (Unit 1) was non-jurisdictional with regard to the NDPSC Siting Act because the generation capacity (45 MW) and the associated 115-kV transmission line were both below jurisdictional levels. The NDPSC issued a Certificate of Site Compatibility (PU-12-509) for Phase II (Units 2 and 3) in March 2013. The 120-acre PGS property was rezoned from Agricultural to Industrial before the development of Phase I. PGS Unit 1 started commercial operation in September 2013, Unit 2 started commercial operation in February 2014, and Unit 3 started commercial operation in March 2014. The 12 RICE added at PGS as part of Phase III began commercial operation in 2017.

The description of resources subsections describes the resources and environmental settings found on the Project site and in the vicinity. The impact discussion subsections describe the potential effects on each resource from the construction and operation of the Project. The mitigation discussion subsections provide potential measures to reduce or eliminate anticipated impacts identified for each resource. Mitigation measures are not discussed for potential effects that are either not anticipated to occur during construction or operation of the Project or are anticipated to result in a beneficial effect.

Standard mitigation measures have been incorporated into the development and construction of the proposed Project. These mitigation measures are designed to reduce or eliminate anticipated impacts resulting from construction or operation. They include Best Management Practices (BMPs) such as the use of silt fencing and other erosion-control measures.

4.2 Demographics and Socioeconomics

4.2.1 Description of Resources

The Project is located within an area in northwestern North Dakota with relatively low population density. Population data for this section was taken from the U.S. Census Bureau 2009-2020 American Community Survey (ACS) 5-Year Estimates.

The 2020 population of Williams County is 40,950 (Table 4-1). The county seat of Williams County is the City of Williston, which is the closest city to the proposed facility and has a 2020 population of 29,160. The Project site is located in Hebron Township, which has a 2020 population of 45.

Table 4-1: 2020 Population and Economic Characteristics

Location	Population	Per Capita Income	Below Poverty Level
Williams County	40,950	\$43,364	9.6%
City of Williston	29,160	\$43,540	6.6%

Source: U.S. Census Bureau 2020 American Community Survey 5-Year Estimates Data

According to the 2020 ACS 5-Year Estimates, the largest industry category employing residents of Williams County was agriculture and mining (including oil and gas extraction), followed by healthcare, and then retail trade.

4.2.2 Impacts

Construction of the proposed Project could temporarily stimulate additional jobs in the construction trades such as electricians, laborers, and carpenters. Basin Electric would use local labor to the extent practicable, and no labor relations would be negatively affected by the Project. Peak construction labor force for the PGS Phase IV would be approximately 220 employees. With an estimated construction schedule for all the proposed facilities extending over approximately three years, length of employment would range from a few weeks to several months or years, dependent on skill and/or specialty. The majority of construction contractors and workers would temporarily relocate to the Project area as construction of the Project would require a specialized workforce. A small number of local construction workers could be hired for more general activities such as grading and earthwork. However, due to the tight labor market in the region and low unemployment rates, it is anticipated that the majority of the construction workforce would come from outside the region. Gas stations, convenience stores, and restaurants in communities such as the City of Williston may experience minimal increases in business during the construction period in response to activity from construction workers.

There would be short-term and minimal impacts on local housing. Many of the construction workers would seek temporary housing for varying time periods based on their individual roles in the proposed Project. Generally, housing options for construction crews would consist of area hotels, existing crew camps, or RV camps. Arrangement for longer-term housing may be established by the construction contractor, with crews rotating in and out as their assignments begin and are completed. It is anticipated that there would be an adequate supply of temporary housing units available in Williams County for use by construction workers relocating to the area on a temporary basis due to the relatively few workers

necessary compared to the overall workforce in the area, continued development of housing capacity in the area, and the maturing oil and gas industry.

The proposed Project would require 15 additional full-time employees to operate the PGS Phase IV. Because of the low number of personnel required, operation of the proposed Project would not result in a large increase in the number of permanent residents in the communities near the site.

Expenditures made for equipment, fuel, operating supplies, and other products and services would benefit businesses in the county and State of North Dakota. Local governments could also experience short- and long-term benefits from tax revenue collected during construction and operation of the proposed Project. Once the proposed Project is completed, property taxes collected could benefit local and state governments and local projects. Businesses and oil/gas development near the site would not be significantly disrupted by construction or operation of the Project. The ONEOK Stateline I gas processing plant across Highway 5, the only business in the Project vicinity, would potentially be affected during Project construction from increased traffic. During operation, the facility would provide additional natural gas to the PGS for the Phase IV facilities. Any effects would be minimal and temporary during construction. Overall, regional businesses would benefit from the continued reliability of the electrical system.

4.2.3 Mitigation

Socioeconomic impacts associated with PGS Phase IV expansion are expected to be positive, with an influx of wages and expenditures made at local businesses during the construction period. Operation of the proposed Project would create approximately 15 additional jobs at the PGS and would result in reliable power supply for the region. No mitigation is proposed.

4.3 Land Use

4.3.1 Description of Resources

The recently acquired 160-acre site to the north of the existing PGS is currently used for agricultural purposes. Current land uses on the existing 120-acre PGS property are industrial and agricultural. The entire 120-acre PGS property was rezoned from Agricultural to Industrial before construction of Phase I. The existing PGS includes three existing combustion turbine units, 12 existing RICE engines, electrical switching station, stormwater retention pond, material and equipment storage, administration buildings, and parking. Approximately 35.9 acres of the existing PGS is undeveloped and used for agricultural activities. Land to the east of the PGS property (east of County Road 5) is industrial and includes ONEOK's Stateline I Gas Processing Plant and Mountrail Williams Electric Cooperative (MWEC's)

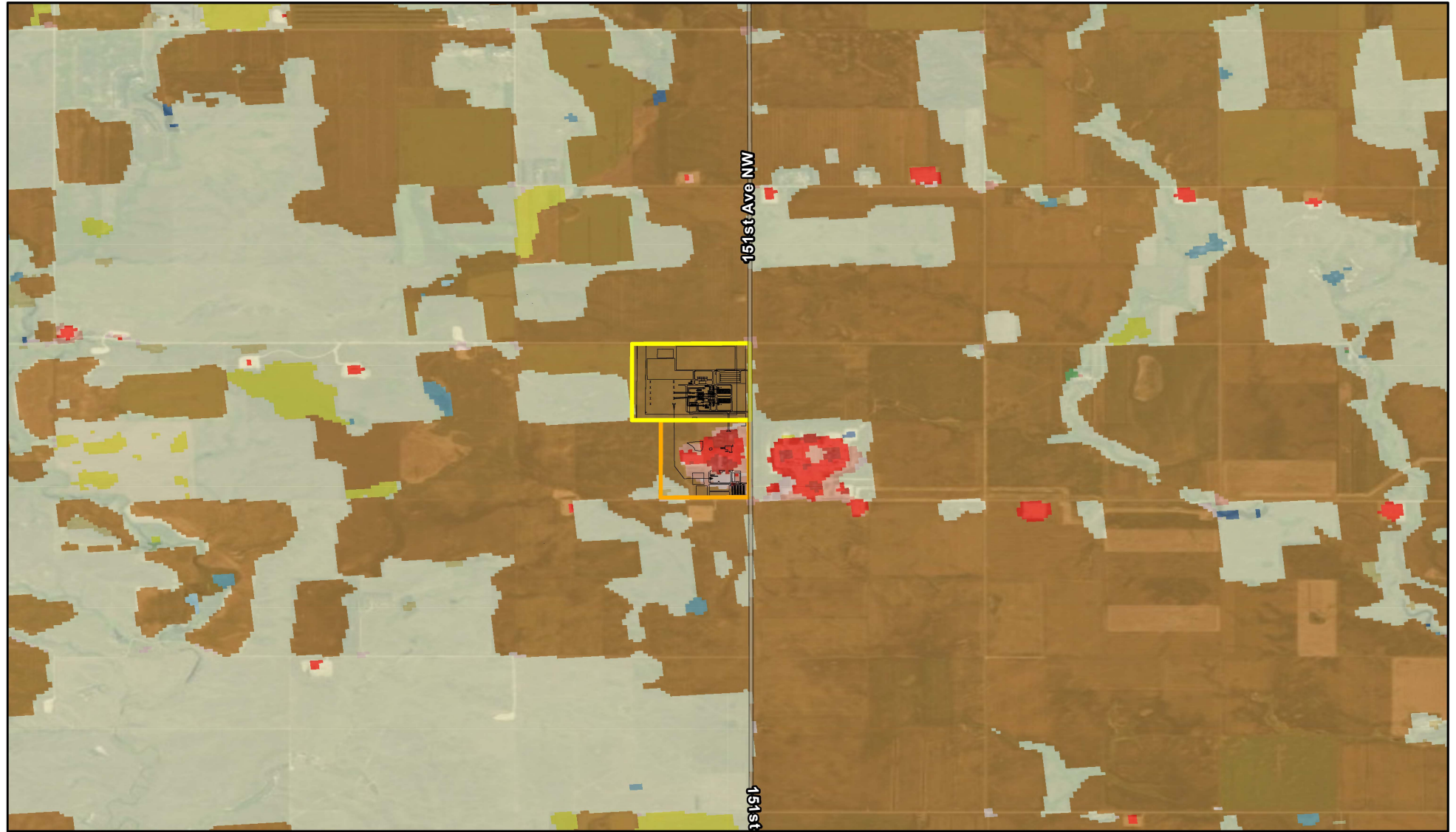
Stateline I Substation. The surrounding area consists of rural agricultural land used for crops and grazing cattle (see Figure 4-1). Oil and gas wells and associated energy development infrastructure are also located throughout the area. None of the property to be developed as part of Phase IV is within a city limit or an area of military installation and would not displace any residences or existing or planned industrial facilities.

4.3.2 Impacts

The new RICE engines, warehouse, and stormwater pond would occupy approximately 7.3 acres on the existing PGS property and would be installed adjacent to the existing turbines on site. Construction of the RICE facilities would result in the conversion of 7.3 acres of agricultural land to industrial use. However, this portion of the property is zoned Industrial; thus, the change in land use would be consistent with current zoning. Areas outside of the generation facility that are not needed to support the PGS could continue to be used for agricultural purposes. Approximately 9.0 acres of the property would be used for laydown areas and an additional 3.77 acres would be use for temporary parking.

The new combustion turbines, 345-kV substation, and the blowdown and stormwater ponds would occupy approximately 72.01 acres on the new site north of the existing PGS property. The new permanent structures would result in the conversion of 72.01 acres of agricultural land to industrial use. Approximately 12.7 acres of the property would be used for laydown area, 9.2 acres would be used for temporary construction trailers and parking. These areas would be temporarily unavailable for agricultural purposes during construction. In total approximately 21.9 acres would be temporarily disturbed during construction. Following construction, these areas would be restored to their original condition to the extent practicable and would be available again for agricultural purposes. On the newly acquired 160-acre parcel for Phase IV expansion, approximately 66.09 acres would be undisturbed by Phase IV construction and development.

As required by Williams County, Basin Electric would apply for and obtain industrial zoning for construction of the additional PGS Phase IV facilities on the 160-acre parcel.



Land Use Types

- Open Water
- Developed, Open Space
- Developed, Low intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Deciduous Forest
- Shrubs
- Herbaceous
- Hay/Pasture
- Cultivated Crops
- Emergent Herbaceous Wetlands

- Existing Station Property
- Newly Acquired Station Property
- Site Layout

N

0 75 150 300 Miles

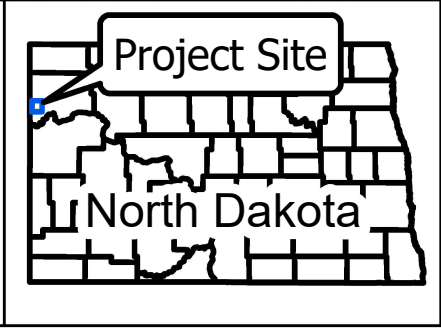


Figure 4-1
Land Use
Pioneer Generation
Station
Phase IV

4.3.3 Mitigation

Impacts to agriculture in Williams County would be minor. Although the new 160-acre Project site is currently used for agriculture, the overall production of crops and total sales would not be noticeably impacted by the 72.01 acres permanently converted to industrial use. Additionally, the existing 120-acre site has already been designated for development. Undisturbed areas would continue to be available for agricultural use and temporary construction areas would be restored and may also be used for future agricultural activities.

4.4 Public Services

4.4.1 Description of Resources

4.4.1.1 Local Services – General Discussion

The PGS is located in a low population density, rural area in northwestern North Dakota. The area has an established transportation and utility network that provides access and necessary services to light industry, homesteads, and farms located near the PGS. Williams County provides emergency and social services and manages several county parks. The closest city to the PGS is Williston, located approximately 15 miles southeast. Williston provides recreation and parks, a community center, a golf course, a community pool, and a community library. Additionally, the Williston's local services include emergency services, such as a fire department, ambulance service, and a police department. There are also hospitals, medical services, and local retail service facilities.

4.4.1.2 Electrical and Gas Service

The PGS site is located within the MWEC service area. MWEC, one of Basin Electric's member cooperatives, is a not-for-profit, member-owned electric distribution cooperative that provides electrical services to northwestern North Dakota. Basin Electric, through the operation of the Integrated System (IS) transmission system, also delivers electrical supply to the area. Sheridan Electric is also a Basin Electric member cooperative. Sheridan Electric presently is interconnected to the PGS Phase III Switchyard.

Natural gas is supplied to PGS by a WBI Energy Transmission, Inc., 1,800-ft-long, 8-inch-diameter pipeline that originates at ONEOK's Stateline I Gas Processing Plant gas interconnection to the Northern Border Pipeline.

4.4.1.3 Roads

County and township (section line) roads characterize the existing roadway infrastructure around the PGS. The PGS is located northwest of the intersection of 56th Street NW and County Road 5 (151st

Avenue NW). The nearest highway, U.S. Highway 2, is located approximately six miles south of the PGS.

4.4.1.4 Traffic

The existing traffic volume on nearby U.S. Highway 2 is documented in Table 4-2. Determining the specific capacity of any highway is a complex process; however, general estimates are used for planning purposes. For purposes of comparison, the functional capacity, or Annual Average Daily Traffic (AADT), of the section of U.S. Highway 2 that runs through the city of Williston is 6143 per day; compared to the section west of Williston (south of the Project Site) has an AADT of 1765 per day. In general, highways near the PGS carry lower levels of traffic than what is average for rural North Dakota.

Table 4-2: Existing Daily Traffic Levels

Roadway Segment	2021 AADT ^a	2021 Commercial Truck Traffic
U.S. Highway 2 west of Williston	1765	361
U.S. Highway 2 – Williston City U	6143	Not Recorded
151 st Avenue NW (County HWY 5) South of Project Site	515	150

Source: 2021 Traffic Volumes from NDDOT, Bismarck
a - Annual Average Daily Traffic

Limited vehicle count data is available for the county and township roads near the PGS. There is recent data for 151st Ave NW (also County Highway 5), the main access road for the existing PGS. However, this data is for a location approximately 8 miles south of PGS but provides an indication of potential traffic levels on 151st Ave NW in the vicinity of PGS. In general, the North Dakota Department of Transportation (NDDOT) provides traffic counts for designated U.S. and state highways and high traffic areas.

4.4.1.5 Water Supply

Hebron Township and the surrounding area have limited public infrastructure services, which is typical of most rural townships in western North Dakota. Homes typically use septic systems and water wells for their household needs. Water is supplied to PGS by the Northwest Rural Water District, which has lines located in this area.

4.4.1.6 Telephone, Fiber Optic, Television and Radio Communications

The PGS would make use of existing underground fiber cable. PGS is interconnected with Basin Electric facilities through Basin Electric's microwave communication system.

4.4.2 Impacts

4.4.2.1 Local Services

Construction workers would potentially use local services, such as emergency services, medical facilities, community facilities, and recreational facilities. Considerable increases in local services have occurred in recent years throughout the area. The Project workforce would be small compared to the overall workforce in the area and the amount of services development. No negative impacts to these local services are anticipated because the existing services/facilities in the City of Williston and Williams County would likely be able to accommodate use by construction workers that would be in the area on a temporary basis.

4.4.2.2 Electrical and Gas Service

Basin Electric has identified the need for additional electric generation in northwestern North Dakota as a result of increased demand and to meet reliability and system stability requirements for the region. Investigations and analyses conducted for the overall power delivery systems found that without improvements, the flow of power along existing lines may result in local line overloads.

Energy would be generated and distributed to the electrical grid system serving the rapidly increasing electrical load requirements in northwestern North Dakota. The PGS Phase IV Project would improve the reliability of service into the area. The current electrical system in the area is not capable of receiving the additional generation without additional equipment or facility upgrades. Upgrades would include both a new switching station to be developed as part of Phase IV at the expanded PGS site, and new transmission lines extending from the PGS. The new transmission facilities are currently in the planning phase and would require a separate authorization from the NDPSA.

4.4.2.3 Roads

The primary access road, which would experience minor wear-and-tear due to increased motor vehicle and construction vehicle activity during the operation and construction of the Project, is County Road 5 (151st Avenue NW). U.S. Highway 2 currently experiences high levels of truck traffic and is designed to support these levels and types of traffic. The amount of additional traffic generated by Project construction, even at peak levels, would be minor compared to the current levels. U.S. Highway 2 is not anticipated to experience any negative impacts as a direct result of the construction or operation of the proposed Project.

4.4.2.4 Traffic

The peak construction labor force for the Project would be approximately 220 employees. The equipment and material deliveries generated by construction are estimated to be approximately 2,200 truckloads over the approximately 30-month period of Project construction, although they would typically be concentrated in the first few weeks before and after the initiation of construction of the different generation components (RICE engines, CT Unit 4, CT Unit 5). Deliveries and workers could use any combination of federal, state, and county highways and other township roads throughout the Project area. The traffic volume in and around Williston has increased significantly with the oil and gas development occurring in the area. U.S. Highway 2, the main road to access the project site, had a reported AADT of 6,143 vehicles per day 2021. Additional vehicles in the area as a result of the PGS would be considerably below these levels and temporary in nature. Vehicle trips resulting from Project construction would be insignificant compared to existing levels. The capacity of any route and level of service on existing roads would not be impacted.

The proposed Project would require 15 additional full-time employees to operate the PGS. This workforce and support services would generate an approximate maximum of 20 additional vehicle trips per day. No impacts to area roads would occur from Project operation.

Truck access to the PGS is served by County Road 5 and U.S. Highway 2. The proposed Project could result in temporary traffic delays on these roads as a result of wide-load or other construction traffic accessing the site. Additional operating permits would be issued by the state, county, and/or township for over-sized truck movements.

4.4.2.5 Water Supply

No additional water supply development would be necessary for the proposed gas engines. Water use during construction would be limited to water used for dust control. The gas engines do not consume water during operation. The only additional water consumption for the proposed Project would be potable water for the 15 additional employees and cooling water makeup. Potable water is supplied to the PGS from the local rural water distribution system and would be adequate to meet the needs of the proposed facilities.

4.4.2.6 Telephone, Fiber Optic, Television and Radio Communications

No impacts to these communication resources are anticipated.

4.4.3 Mitigation

Construction and operation of the Project would be in accordance with applicable federal, state, and local permits and laws, as well as industry construction and operation standards. Due to the minor impacts expected on the existing infrastructure during Project construction and operation, no mitigation is proposed.

4.4.3.1 Local Services

Construction, operation, and maintenance of the Project would not impact local services, and no mitigation is proposed.

4.4.3.2 Electrical and Gas Service

The construction of the Project would not negatively impact existing electrical or gas service; therefore, no mitigation is proposed.

4.4.3.3 Roads

Construction and operation of the proposed Project would be in accordance with applicable federal, state, and local permits and laws, as well as industry construction and operation standards. Due to minor impact expected on the existing infrastructure during the construction and operations of the Project, no mitigation is proposed. Owners would coordinate with the North Dakota Highway Patrol to obtain over height/overweight permits as necessary prior to transporting equipment. Appropriate notification to the Federal Aviation Administration (FAA) would be provided for construction cranes, turbine stacks, and any communications facilities.

Owners would work with the road jurisdictional authority for any necessary road repairs. The transportation of materials and equipment would be conducted in accordance with NDDOT regulations. All necessary provisions would be made to conform to safety requirements for maintaining the flow of public traffic. Construction operations would be conducted to offer the least possible obstruction and inconvenience to public traffic. Public roads would be used, to the extent practicable, to access the proposed Project.

4.4.3.4 Traffic

Construction, operation, and maintenance of the Project would not negatively impact traffic; therefore, no mitigation is proposed.

4.4.3.5 Water Supply

Construction, operation, and maintenance of the Project would not negatively impact local water supply; therefore, no mitigation is proposed.

4.4.3.6 Telephone, Fiber Optic, Television, and Radio Communications

Construction, operation, and maintenance of the Project would not negatively impact telephone, fiber optic, television, or radio communications; therefore, no mitigation is proposed.

4.5 Human Health and Safety

4.5.1 Description of Resources

4.5.1.1 Human Health

Human health risks in and around the PGS site include potential exposure to electromagnetic fields (EMF) associated with existing transmission lines and existing and proposed substations/switchyards. The term EMF references two separate fields: electric fields and magnetic fields. Electric fields are produced by the line voltage, and magnetic fields are produced by the electric current in the lines. An electric field results from the voltage on an electrical wire as caused by electric charges, and electric fields can exert forces on other nearby charges. The intensity of the electric field is related to the voltage of the line and proximity to the conductor. Electric fields are measured in volts per meter (V/m) or kilovolts (kV) per meter (kV/m).

The National Institutes of Health (NIH) indicates that for a 230-kV transmission line, the typical electric field at 50 feet from the centerline is 1.5 kV/m and 19.5 milligauss (mG) and 3.0 kV/m and 29.4 mG at 65 feet from the centerline of a 500-kV line (NIH 2002). Values for a 345-kV line are not provided but would be expected to fall between these levels. All these values are less than the International Commission on Non-Ionizing Radiation Protection (ICNIRP) levels for members of the general public of 4.2 kV/m for electric fields and 833 mG for magnetic fields (ICNIRP, 1998).

4.5.1.2 Human Safety

Occupational hazards include risks associated with construction and construction equipment, installation of equipment, heavy equipment transportation, and contact with electric lines. Potential public hazards include increased traffic volume due to construction vehicles in the area, and large construction vehicles and equipment using local roadways designed for lighter traffic.

Proper safeguards would be implemented during construction and operation of the facility. The transmission line and associated facilities would be designed to meet local, state, NESC, and Basin Electric safety standards. Construction crews would comply with local, state, NESC, and Basin Electric standards regarding the installation of facilities.

4.5.2 Impacts

4.5.2.1 Human Health

The proposed Project would result in potential exposure of PGS employees to EMF associated with the switchyard. EMF would be strongest in and directly adjacent to the switchyard and would decrease with increasing distance from the switchyard or transmission lines.

Based on NIH (2002), the EMF levels at the edge of the PGS property even under maximum operating conditions and normal operating conditions are expected to be below the published ICNIRP Guidelines. The nearest sensitive receptors from the PGS include a church approximately 0.25 mile away and several residences, the closest being nearly one mile from the PGS. No adverse impacts are anticipated.

4.5.2.2 Human Safety

During construction, potential safety hazards may occur as a result of heavy equipment operation, the presence of overhead materials and cranes, and the use of construction tools. Construction personnel are at a higher risk than the general public during this phase of the proposed Project, but the risk is temporary.

Construction and operation of the proposed Project would involve the use and storage of regulated and hazardous materials. During construction, diesel fuel, gasoline, and lubricating oils from heavy equipment and vehicles could be accidentally leaked or spilled. Hydraulic fluid, paints, and solvents would likely be used during the construction phase as well. All used oil generated at the proposed Project site and other potentially hazardous materials (automotive fluids, spray paint cans, etc.) at the site would be collected by a licensed/permitted recycler. To reduce the potential for a release of regulated or hazardous materials during the construction phase of the proposed Project, work would be planned and performed in accordance with Occupational Safety and Health Administration (OSHA) standards and protocols addressing the use of potentially hazardous materials and applicable federal and state environmental regulations. If a hazardous release were to occur, cleanup, management, and disposal of contaminated soils would be conducted according to U.S. Environmental Protection Agency (EPA) and state standards. Conformance to these standards and procedures would reduce the potential for significant impacts resulting from the release of hazardous materials during the construction phase. During plant operation, petroleum products would be stored in areas designed for liquid storage.

The general public would not be allowed to enter any construction areas associated with the proposed Project. The switchyard would be contained within a secured fence to prevent direct contact with energized equipment within the switchyard fence. Standardized agency procedures would be used should the switchyard need maintenance or repair to help maintain the safety of both workers and those in the surrounding area. The major risk to the general public would be from increased traffic volume on the roadways near or adjacent to the proposed Project as a result of commuting construction workers and transportation of equipment and materials. Construction-related traffic would be temporary. Project operation would require only 15 permanent employees as well as periodic materials deliveries, which would not be expected to result in significant safety risks, as discussed in Section 4.4.

4.5.3 Mitigation

4.5.3.1 Human Health

No EMF-related impacts to humans or animals are anticipated; therefore, no additional mitigation is proposed.

4.5.3.2 Human Safety

Construction-related hazards would be effectively mitigated by complying with applicable federal and state occupational safety and health standards, applicable NESC regulations, and utility design and safety standards.

In addition, Basin Electric would develop a Health and Safety Plan to address public and worker safety during the construction and operation of the proposed Project. The Health and Safety Plan would identify requirements for temporary fencing around staging, excavation, and laydown areas during construction. It would also include provisions for worker protection, as required under OSHA with emphasis on Code of Federal Regulations (CFR)1926 – *Safety and Health Regulations for Construction*. During construction, all employees, contractors, and sub-contractors would be required to conform to OSHA safety procedures. Adequate training would be mandatory for all construction workers onsite. Heavy equipment would be in compliance with OSHA requirements for safety devices such as back-up warnings, seat belts, and rollover protection. Personal safety equipment such as hard hats, ear and eye protection, and safety boots would be required for all workers onsite. Accidents and injuries would be reported to the designated safety officer at each site.

Risk of accidental fire during construction could occur from human activities such as refueling, cigarette smoking, and use of vehicles and construction equipment in dry, grassy areas. The Health and Safety Plan would reduce fire-related risks to acceptable levels by imposing restrictions or procedures regarding these

activities. A risk of fire would be present during operation of the proposed Project due to the generation of electricity and the use and storage of fuel and chemicals within the facility. The proposed Project would have a built-in fire suppression system. In addition, implementation of industry-approved design measures for all proposed Project components would help keep fire-related risks acceptably low.

4.6 Air Quality

The following sections provide a description of air quality within or near the Project area and describes potential associated impacts and mitigation measures to be implemented by the Basin Electric.

4.6.1 Description of Resources

Air quality is generally determined by comparing Project pollutant concentrations with regulated standards. The maximum acceptable level of a pollutant is specified by the EPA. The Clean Air Act (CAA) established two types of National Ambient Air Quality Standards (NAAQS), primary and secondary. The EPA has established NAAQS for six criteria air pollutants: SO₂, CO, nitrogen dioxide (NO₂), ozone, respirable particulate matter (PM₁₀ and PM_{2.5}), and lead (Pb). Primary standards set limits to protect human health, and secondary standards set limits to protect public welfare. For the criteria pollutants, the North Dakota Ambient Air Quality Standards (ND AAQS) are the same as the federal NAAQS. Williams County is currently classified as attainment or unclassifiable (to be treated as attainment) for all NAAQS criteria pollutants.

Emissions from all phases of construction and operation of the proposed Project would be subject to applicable state and federal air regulations. Most air quality regulatory programs address emissions from stationary sources of air pollution; these programs would primarily affect ongoing operations of the Project. Air quality regulations affecting construction are primarily concerned with reducing emissions associated with construction equipment and fugitive dust.

Basin Electric proposes to install 6, 18-MW RICE engines as well as 2, 235.7-MW combustion turbines that would all be fired by natural gas. Additionally, various auxiliary equipment are proposed for the Project: three natural-gas fired dew point heaters, two emergency diesel generators, and two small diesel tanks.

The Project's air emission sources would be regulated at the federal level by the CAA, as amended, and at the state level by North Dakota Administrative Rules. Regulations that are applicable to the Project include:

- North Dakota Construction and Operating Permit Rules

- NAAQS
- New Source Performance Standards (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)

Basin Electric would be required to obtain the appropriate air permit(s) from the North Dakota Department of Environmental Quality (NDDEQ). North Dakota air permitting requirements are codified in Article 33-15, Air Pollution Control. Chapter 33-15-14 establishes permit review procedures for all facilities that can emit pollutants to the ambient air. New facilities are required to obtain a Permit to Construct prior to initiating construction activities. Basin Electric is in the process of applying for a Permit to Construct from the NDDEQ for the Project emission sources. The Project would not be considered a major facility or project per the federal Prevention of Significant Deterioration (PSD) regulations. As such, the facility is required to obtain a state Air Permit to Construct from the NDDEQ.

NSPS regulations (40 CFR 60) establish pollutant emission limits and monitoring, reporting, and recordkeeping requirements for various emission sources based on source type and size. The NSPS applies to new, modified, or reconstructed sources. The SCCTs are subject to NSPS Subpart KKKK, Standards of Performance for New Stationary Combustion Turbines which includes NO_x and SO₂ emission limits which the SCCTs would meet. The SCCTs would also be subject to NSPS Subpart TTTT – Standards of Performance for Greenhouse Gas Emissions for Electric Utility Generating Units which regulates carbon dioxide (CO₂) emissions from electric generating units. The combustion turbines would be limited to 120 lb/MMBtu CO₂ emissions which would be readily met with the combustion of natural gas. Further, the turbines would also be limited to annual operation that is equivalent to the efficiency of the turbine.

The natural gas-fired RICE would be subject to NSPS Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. As such, they would be required to each meet NO_x, CO and volatile organic compound (VOC) limitations as well as be stack tested every 3 years or 8,760 hours of operation.

NSPS Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, would apply to the emergency generators. The generators would be certified to meet the emission limits in NSPS Subpart IIII.

NESHAP regulations (40 CFR 63) establish emission limitations and operational procedures to limit emissions of HAPs from various source categories. NESHAP Subpart YYYYY is applicable to SCCTs, which would be required to meet a formaldehyde limit of 96 ppb. The emergency diesel generators are

subject to NESHAP Subpart ZZZZ. The only requirement for emergency equipment is to comply with the NSPS Subpart IIII.

The proposed Project would comply with applicable state and federal air quality regulations and obtain applicable air quality permits prior to commencing construction as needed.

4.6.2 Impacts

Construction of the proposed Project would potentially have minor and temporary impacts on air quality. This would be due to fugitive dust emissions during ground-disturbing activities associated with construction and installation of the equipment and associated infrastructure of the Project. Construction emissions would also result from combustion of fuel in construction equipment/vehicles, fugitive dust associated with site preparation/grading, and movement of construction equipment/vehicles onsite.

Because of their temporary nature, construction emissions would not have a long-term impact on ambient air quality, and the Owners' implementation of proposed emission control measures as well as other measures specified by NDDEQ are anticipated to reduce construction emissions impacts to less than significant levels.

Operation of the proposed Project would result in air emissions from stationary fuel burning equipment. The Project would operate as allowed under applicable air permits obtained prior to construction and operation. Operation of the Project in compliance with the applicable permit limits would not result in an adverse impact to public health and welfare.

SCCTs and RICE are a "non-listed source" per federal PSD regulations (40 CFR Part 52.21). Therefore, the Project may emit up to 250 tons per year (tpy) of any criteria pollutant before the Project would be subject to PSD review. The maximum potential emissions from the Project and PSD applicability are shown in Table 4-3. As this table demonstrates, the Project would not exceed 250 tpy for any pollutant; therefore, the Project would not be subject to PSD review for any pollutant. However, once the Project is operational, the overall PGS would become a major PSD facility.

Table 4-3: Project Potential Emissions and PSD Major Source Thresholds

Pollutant	Preliminary Estimated Potential Emissions (tons per year)^a	PSD Major Source Thresholds (tons per year)	PSD Review Applicable (Yes, No)	NDDEQ Air Modeling Thresholds for Project (tons per year)
NO _x	249	250	No	40
CO	249	250	No	--
SO ₂	25	250	No	40
VOC	105	250	No	--
PM ₁₀ ^b	100	250	No	15
PM _{2.5} ^b	100	250	No	10
CO _{2e} ^c	5,800,000	--	No	--

(a) Numbers in **bold** indicate the PSD significance level is exceeded

(b) Filterable plus condensable

(c) The Project does not trigger PSD review for any other pollutant; therefore, the CO_{2e} PSD threshold does not apply per Utility Air Regulatory Group vs EPA (Case#12-1146, June 23, 2014 before the Supreme Court of the United States).

Although the Project is not subject to PSD review, it is anticipated that NDDEQ may request air dispersion modeling be performed for all pollutants anticipated to be above their modeling thresholds to demonstrate compliance with the NAAQS and ND AAQS. Therefore, an air quality analysis is anticipated to be performed for NO₂, SO₂, and PM₁₀/PM_{2.5}. However, the Project is not anticipated to cause or contribute to any exceedance of the NAAQS or ND AAQS.

The project is expected to emit greenhouse gas (GHG) emissions, including CO₂, methane and nitrous oxide. GHG emissions from the Project would represent a small fraction of one percent of United States emissions. Thus, construction and operation of the Project would not contribute measurably to global GHG emissions. While global climate change in the 21st century is expected to affect northwestern North Dakota through higher temperatures and higher precipitation (Karl, Melillo, and Peterson 2009), this change is not expected to be affected by the Project.

4.6.3 Mitigation

During construction, it is proposed that standard dust control measures be used to reduce generation of fugitive dust due to surface disturbance. Dust control measures would include, but are not limited to, the following:

- Applications of water during grading
- Paving, chemical stabilization, or watering of internal roadways after completion of grading
- Restricting speeds on unpaved areas to 15 miles per hour or less

- Use of sweepers or water trucks to remove “track-out” at any point of public street access
- Stabilization of dirt storage piles by chemical binders, tarps, fencing, or other erosion control

Construction of the proposed Project would also result in exhaust pipe emissions from a variety of sources, including cranes, loaders, excavators, graders, generators, vibratory rollers, concrete emplacement trucks, and crew trucks. It is proposed that the following measures be used to reduce emissions from vehicles and construction equipment during Project construction:

- Properly maintain construction equipment in accordance with manufacturers’ specifications or standard practices
- Limit truck idling to the extent practicable
- Burning waste materials would not be permitted and all waste materials would be disposed of at permitted waste disposal areas or landfills.

The two SCCT would be equipped with low-NO_x burners to control NO_x and oxidation catalysts to control CO emissions. RICE would be equipped with SCR for NO_x control and oxidation catalyst for CO and VOC control and HAP control. Use of these control systems, use of natural gas as the fuel, and compliance with operating limits imposed by required air emissions operating permits are anticipated to mitigate impacts to ambient air quality and maintain compliance with applicable ND AAQS and NAAQS.

4.7 Noise

The following sections provide a description of noise within or near the Project area and describes potential associated impacts and mitigation measures to be implemented by Basin Electric.

4.7.1 Acoustic Background and Terminology

The term “sound level” is often used to describe two different sound characteristics called sound power and sound pressure. Every source that produces sound has a sound power level (L_w). The sound power level is the acoustical energy emitted by a sound source and is an absolute number that is not affected by the environment. The acoustical energy produced by a source propagates through a medium as pressure fluctuations. These pressure fluctuations, also called sound pressure (L_p), are what human ears hear and microphones measure.

Sound energy is physically characterized by amplitude and frequency. Sound amplitude is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 microPascals). The reference sound pressure corresponds to the typical threshold of human hearing. A 3-dB change in a continuous broadband sound is generally considered “just barely perceptible” to the average listener. A 5-

dB change is generally considered “clearly noticeable,” and a 10-dB change is generally considered a doubling (or halving, if the sound is decreasing) of the apparent loudness.

Frequency is measured in hertz (Hz), which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 to 20,000 Hz. Normally, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the low and high frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in A-weighted decibels (dBA). For reference, the A-weighted sound pressure level and subjective loudness associated with some common sound sources are listed in Table 4-4.

Sound in the environment is constantly fluctuating, such as when a car drives by, a dog barks, or an aircraft passes overhead. Therefore, sound metrics have been developed to quantify fluctuating environmental sound levels. These metrics include exceedance and equivalent sound levels. The most common statistical level used to describe the average sound level for a given time period is the equivalent sound level (L_{eq}).

Table 4-4: Sound Pressure Level, Subjective Evaluation and Environment

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 feet (ft)	
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 ft	
120	Threshold of feeling	Elevated train	Hard rock band
110		Jet flyover at 1,000 ft	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 ft, auto horn at 10 ft, crowd sound at football game	
90		Propeller plane flyover at 1,000 ft, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 miles per hour [mph]) at 50 ft	Inside auto at high speed, garbage disposal
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner
60	Moderate	Air-conditioner condenser at 15 ft, near highway traffic	General office
50	Quiet		Private office
40		Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Inside average residence (without TV and stereo)
20		Rustling leaves	Quiet theater, whisper
10	Just audible		Human breathing
0	Threshold of hearing		

Source: Adapted from *Architectural Acoustics*, M. David Egan, 1988 and *Architectural Graphic Standards*, Ramsey and Sleeper, 1994

4.7.2 Description of Resources

The sensitive noise receptors in the area include residential properties on all sides of the Project site. The closest residence is located approximately one and one-quarter miles to the east of the Project. There is existing power generation equipment at the Project site in the form of three (3) SCCTs and a reciprocating-engine power plant. Existing noise sources in the area are expected to include the existing power generation equipment onsite, the gas plant directly to the east of the Project, wildlife noise, and vehicular traffic on local roadways.

4.7.3 Impacts

The following sections describe potential impacts related to noise due to Project construction or operation.

4.7.3.1 Facility Noise

The Project was modeled assuming use of standard equipment and typical or standard mitigation incorporated. Sound levels are outlined in the Williams County Zoning Ordinance and Subdivision Regulations. Chapter 5-7-3 Maximum Noise Standards by District establishes overall sound level limits by the zoning of the receiving property. Residentially zoned properties have the most restrictive noise levels with a limit of 60 dBA during daytime hours and 55 dBA between the hours of 10:00 PM and 7:00 AM.

The parcel of land proposed for the Project and the surrounding parcels are unclassified districts according to the Williams County Zoning Map. Although the neighboring properties are not zoned residential, commercial, or industrial, the Owners have elected to meet the residential nighttime sound level limit of 55 dBA at the neighboring residential structures. Meeting the residential zone sound level limits may not be explicitly required by the code since the land is not zoned residential, however, meeting the residential limits at the residential structure would limit the likelihood of generating “annoying or disturbing” noise as addressed in the code. The Project sound levels would not exceed 55 dBA at the neighboring residential structures. Based on available information for the existing power generation equipment, the Project in combination with the existing equipment would not exceed 55 dBA at the neighboring residential structures. Appendix H contains the Sound Study prepared for the Project.

To determine compliance with the requirements, receivers were placed at neighboring residential structures in the model. The predicted overall operational sound levels, which do not include contributions from ambient sound sources, are predicted to be below the sound level limit of 55 dBA during nighttime hours at neighboring residences. Graphical sound-level contours were generated for the proposed Project during steady state operation. The Project-generated sound level contours are shown in Figure 4-2. These are the expected sound levels of the Project equipment only and do not include background sound sources. Figure 4-2 provides a graphic illustration of the L_{eq} sound levels expected with the proposed Project operating under normal conditions. The predicted sound levels from the Project at each neighboring residential structure are shown below in Table 4-5.

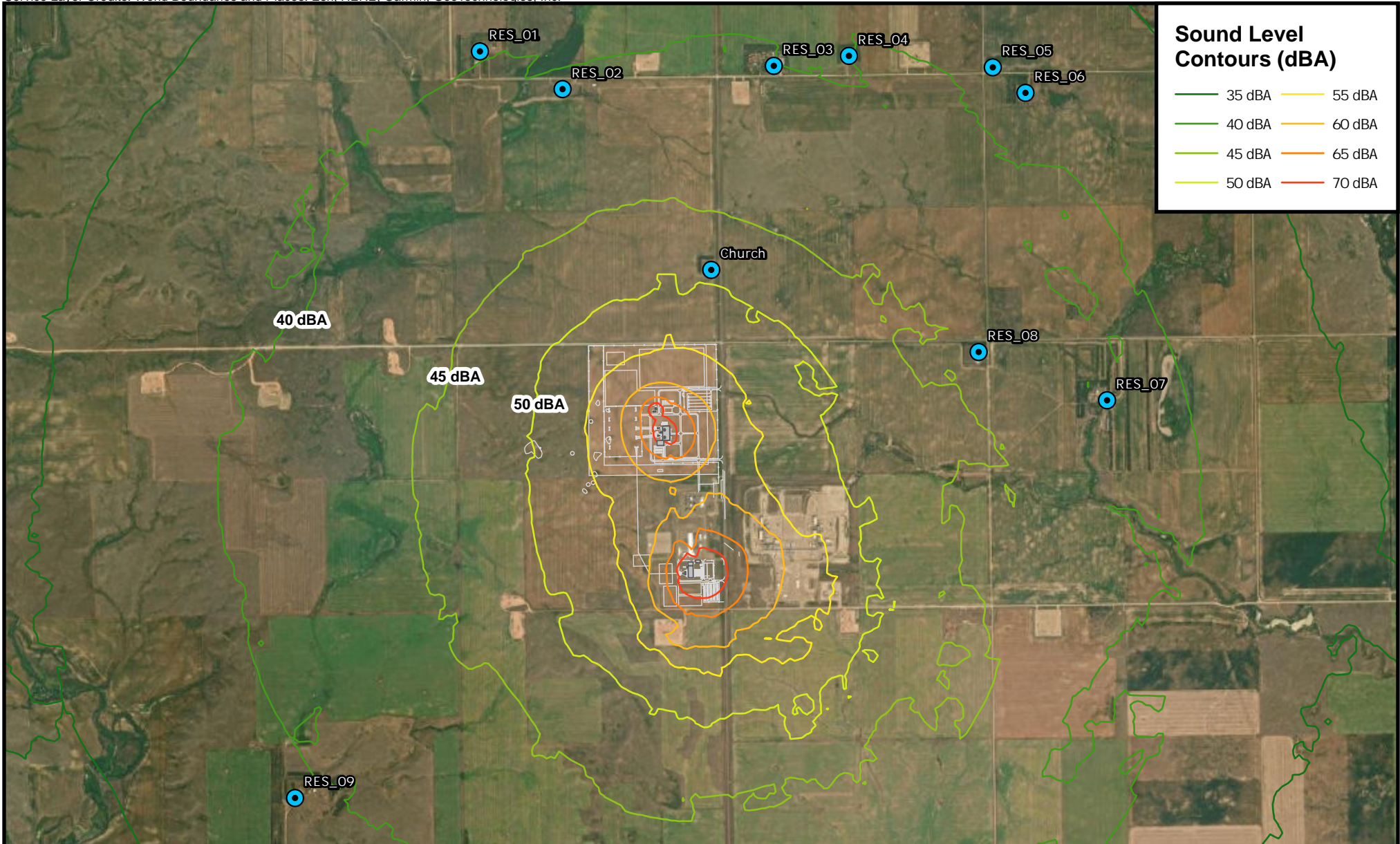


Figure 4-2
Basin Electric
Pioneer Generation Station
Project Sound Level Contours

Table 4-5: Modeled Predicted Sound Level Impacts

Residential Property	Project Modeled Sound Levels (dBA)	Sound Level Limit (dBA)
Residence 1	40	55
Residence 2	41	55
Residence 3	41	55
Residence 4	40	55
Residence 5	38	55
Residence 6	38	55
Residence 7	41	55
Residence 8	43	55
Residence 9	40	55
Church	49	--

During operation of the proposed Project, the maximum L_{eq} sound levels are expected to approach 43 dBA at Residence 8 and would not exceed the sound level limit of 55 dBA at any of the neighboring residential properties. Noise levels due to operation of the proposed Project are expected to have minimal impact on the closest residences. The West Prairie Lutheran Church is located north of the Project. Project-generated sound levels at the church are expected to be approximately 49 dBA. Since beginning operation in 2013 and during subsequent construction phases, there have been no noise complaints regarding PGS.

4.7.3.2 Construction Noise

Project construction has the potential to elevate local noise levels due to traffic and construction of RICE, combustion turbines and associated equipment and facilities. However, these activities and noise levels would occur in undeveloped and sparsely occupied areas and be relatively short and temporary in nature over the construction period for the Project. Therefore, impacts related to construction noise would be minimal.

4.7.4 Mitigation

The predicted operational noise levels shown in Table 4-5 were modeled with the inclusion of typical mitigation. Incorporating typical mitigation, inclusive of standard exhaust stack silencing and buildings enclosing the combustion turbines and reciprocating-engine generators, would be sufficient to quiet noise levels to acceptable levels at the surrounding residences. Noise levels due to the operation of the proposed Project are expected to have little impact on the closest residences. As noted, standard design mitigation would be incorporated into the Project. No additional mitigation is proposed.

4.8 Visual Impacts

The following sections provide a description of visual resources within or near the Project area and describes potential associated impacts and mitigation measures to be implemented by Owners.

4.8.1 Description of Resources

The topography in the vicinity of the PGS is predominantly flat with some rolling hills. Elevation of the PGS is approximately 2,400 feet above sea level. The landscape is characterized by crop fields interspersed with man-made features. These man-made structures are focal points in the dominant open space character of the Project vicinity. Existing electric infrastructure, such as transmission lines, distribution lines and substations, and oil and gas facilities, are scattered throughout the surrounding landscape. The ONEOK Stateline I Gas Processing Plant and the MWEC Stateline Substation I are located adjacent to the PGS, east of County Road 5. Residences and farm buildings (inhabited and uninhabited) are located along the county and township roads. The nearest occupied residences to the PGS are located approximately 1.5 miles north, 1.5 miles northeast, and 1.75 miles south.

4.8.2 Impacts

The PGS is an existing facility and is currently visible in the landscape. The addition of the new unit's infrastructure, particularly the new stacks, on the generation station site would be visible to landowners and community residents who live and travel near the station. The proposed Project would add additional visual elements to a power plant site that already exists and adjacent areas, expanding the visual footprint on the landscape but not conflicting with the existing viewshed or any visual sensitive areas.

4.8.3 Mitigation

Although the PGS Phase IV Project would contrast with the historical surrounding land use, these areas have already recently been impacted visually by the existing power plant, the transmission infrastructure that connects to the Stateline I Substation, the existing ONEOK Stateline I Gas Process facility, and oil and gas facilities in the area. No mitigation is proposed.

4.9 Cultural Resources

4.9.1 Description of Resources

Seven properties in Williams County are listed on the National Register of Historic Places (NRHP), including James Memorial Library, Old Armory, Old U.S. Post Office, and Williston High School in Williston; Ray Opera House in Ray; Fort Buford southwest of Williston; and Fort Union Trading Post west of Buford. None of these properties are close to the proposed Project. A class III cultural resource

inventory was conducted in 2012 by Metcalf Archaeological Consultants, Inc. (Metcalf) for the PGS property prior to construction of Phase I (Appendix C). No historic properties were found.

A class III cultural resource inventory was conducted in 2022 by Metcalf for the expansion site. This inventory included a Class I literature Review, Class III field survey and a Class III report. No historic properties were found on the additional 160 acres surveyed.

4.9.2 Impacts

Given the lack of historic properties on the existing PGS and adjacent property to be acquired for the Phase IV expansion, Metcalf prepared a Class III report recommending a finding that the Project would have No Significant Sites Affected. This report was provided to the North Dakota State Historic Preservation Office (ND SHPO) in a letter dated June 30, 2022; the ND SHPO concurred that the Project would have no effect on cultural resources (Appendix D). Given the lack of evidence supporting any cultural finds on the site, provided by Metcalf, there are no anticipated impacts to scenic areas, cultural resources or paleontological sites. There would be no impacts to cultural resources as a result of the proposed Project.

4.9.3 Mitigation

No mitigation is proposed because no cultural resources would be affected. In the event of unanticipated discoveries, Basin Electric would implement its Unanticipated Discoveries Plan (Appendix E).

4.10 Recreational Resources

4.10.1 Description of Resources

Recreational opportunities in Williams County include camping, hiking, biking, swimming, golfing, hunting, fishing, and nature observation. Review of state and federal databases indicates that no national wildlife refuges, state wildlife management areas, state game refuges, game management areas, nature preserves, or county parks are present within or near the Project site. The primary land use type in the vicinity of the Project is cultivated crops and oil and gas fields. No National Wild and Scenic Rivers or streams on the Nationwide Rivers Inventory (NRI) are located near the Project. Impacts to recreation would primarily be removal of the site from any recreational use (hunting) and visual in nature and limited to few individuals who use private property surrounding the Project site for nature observation, fishing, or hunting. No adverse effects to recreational resources are anticipated as there are abundant additional opportunities in the Project vicinity and the visual character of the Project is not anticipated to detract from use of other nearby areas.

4.10.2 Impacts

Impacts to recreation would primarily be visual in nature and limited to few individuals using private property acquired for and surrounding PGS. No adverse effects to recreational resources are anticipated due to the limited new land acquired and the existing industrial uses in the visual landscape.

4.10.3 Mitigation

Recreational resources would not be impacted by the proposed Project; therefore, no mitigation is proposed.

4.11 Effects on Land-based Economics

4.11.1 Description of Resources

4.11.1.1 Agriculture/Farming

In 2017, Williams County had 999,227 acres (73 percent of the total county area) classified as farmland from 569 farms (U.S. Department of Agriculture [USDA], 2017). Crop sales accounted for the majority of products sold; \$117,426,000 (89 percent) of sales was crops and \$14,355,000 (11 percent) of sales was livestock, poultry, and products. Wheat is the primary crop in Williams County.

4.11.1.2 Woodlands

As described in the previous sections a majority of Williams County (73 percent) is classified as farmland. There is occasional woodland scattered throughout the county but largely the county is used for agricultural purposes. Neither the existing nor the new expansion site have woodland or shrubs that would need to be cleared for construction. This is confirmed during site investigations by Western EcoSystems Technology, Inc. (WEST) on June 9, 2022.

4.11.2 Impacts

4.11.2.1 Agriculture/Farming

Construction of the Project would result in the permanent removal of 79.3 acres of agricultural land to accommodate the new RICE, SSCTs, and associated facilities. However, this is a relatively small percentage of the total farmland in Williams County, and, therefore, the proposed Project would not impact the overall value of agricultural production in the county. No impacts are anticipated to animal health and safety due to the construction or operation of the proposed Project because the site is currently either existing PGS or used for cropland and not pasture. Areas outside of the generation facility that are

not required to support the existing PGS and Project (PGS IV) could continue to be used for agricultural purposes.

Temporary impacts, such as soil disturbance, would occur on the additional 35.07 acres for laydown and parking areas required to support Project construction activities on both sites – existing PGS and newly acquired lands. These areas would be temporarily unavailable for agricultural uses during construction. Following construction, these areas would be restored to its original condition to the extent practicable and would be available again for agricultural uses.

4.11.2.2 Woodlands

Because no forestry resources are located on the site, there would be no impacts to woodlands.

4.11.3 Mitigation

4.11.3.1 Agriculture/Farming

Impacts to agriculture would be negligible. The existing PGS site, although including undeveloped areas currently used for agriculture, is zoned Industrial and is permitted by the county for development of the PGS. The new expansion site is used for agriculture. Given the vast amount of agricultural activity and lands in Williams County, lands permanently removed for PGS IV would be negligible. Basin Electric would have the new lands for Phase IV rezoned to industrial use. Any disturbance to areas outside the construction disturbance area and in temporary construction areas would be restored, any ruts repaired, and revegetated as appropriate. These areas would then be available for agricultural use following construction.

4.11.3.2 Woodlands

No woodlands are located within the PGS site, and no mitigation is proposed.

4.12 Soils

4.12.1 Description of Resources

The project expansion site contains three soil units: Williams-Bowbells loams with 0 to 3 percent slopes, Williams-Bowbells loams with 3 to 6 percent slopes, and Vida-Zahill loams with 2 to 8 percent slopes. The majority of the site contains Williams-Bowbells loams with 3 to 6 percent slopes. Both types of Williams-Bowbells loams units are classified as farmland of statewide importance and neither is considered hydric. The Vida-Zahill loam units are not classified as farmland of statewide importance and is not considered to be hydric soil (NRCS, 2022). The existing site has similar soil characteristics, the

only difference between the sites is the existing site does not have William-Bowbells loams with 0 to 3 percent slopes. The soil units are shown in Figure 4-3.

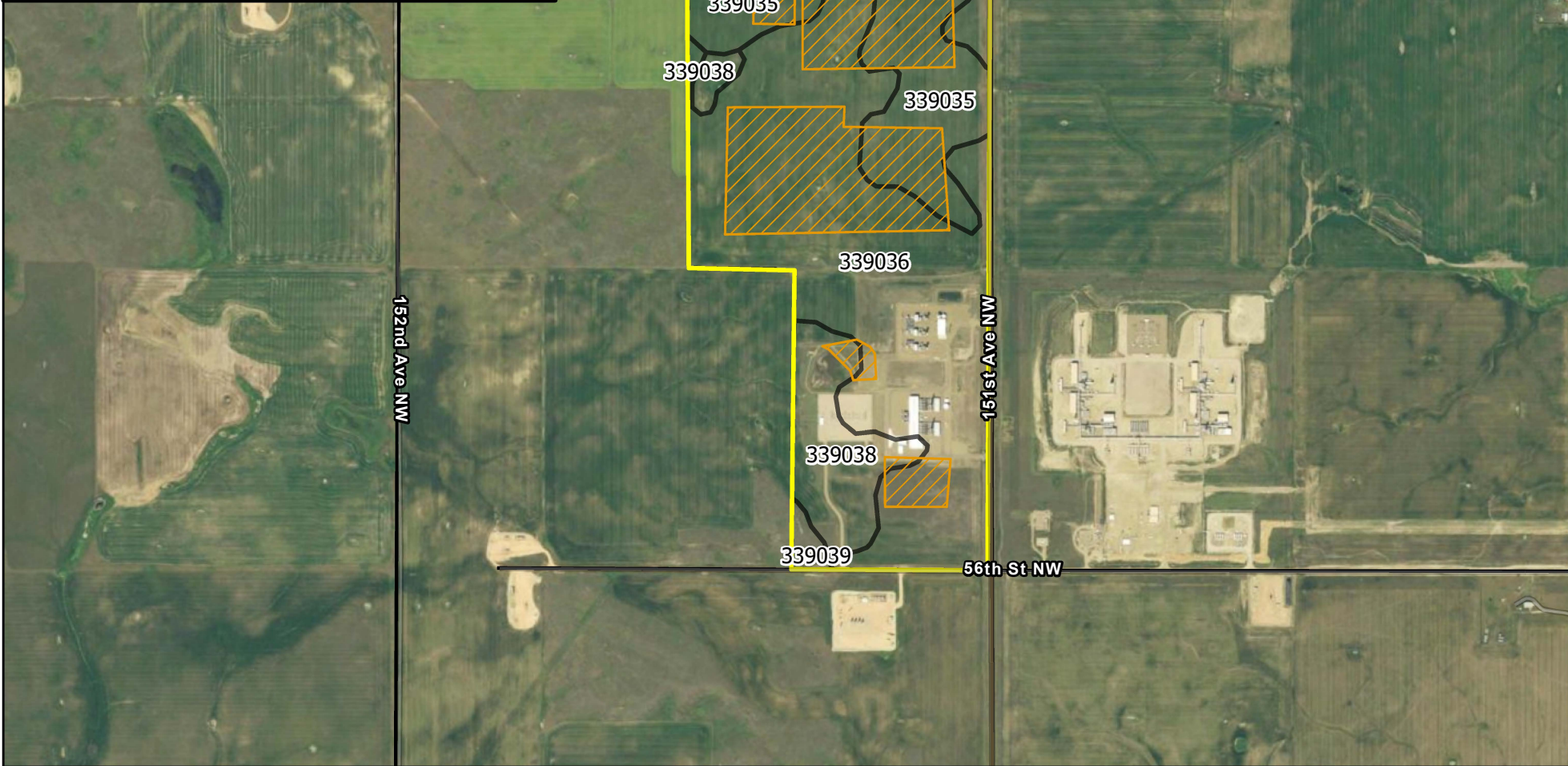
4.12.2 Impacts

Construction at the existing PGS site would result in the permanent conversion of 7.3 acres for the new RICE, warehouse, and stormwater pond. In addition, 13.1 acres would be temporarily affected by laydown sites, parking, and construction trailers. Similarly, the new expansion site would result in the conversion of an additional 72.1 acres from agricultural to industrial use to accommodate the new SCCTs, 345-kV substation, and retention ponds. The temporary disturbance of 21.9 acres of soil would occur during construction. Crews would limit ground disturbance wherever possible, and the laydown and construction parking areas would be restored to original condition to the extent practicable. Basin Electric or their contractor would submit a Stormwater Pollution Prevention Plan (SWPPP) for implementation during construction and follow BMPs for erosion and sediment control.

4.12.3 Mitigation

To minimize erosion during and after construction, BMPs for erosion and sediment control would be utilized. These practices include temporary seeding, permanent seeding, mulching, filter strips, erosion blankets, grassed waterways, and sod stabilization. Erosion control measures would be implemented as necessary for the construction of the Project. Basin Electric or its contractor would prepare a SWPPP for implementation during construction. In addition, a Notice of Intent to Obtain Coverage Under NDPDES General Permit for Discharges Associated with Construction Activity would be prepared and submitted to NDDEQ.

Soil Map Units within Project Property
 339039 - Zahill-Vida loams, 4 to 15 percent slopes
 339038 - Vida-Zahill loams, 2 to 8 percent slopes
 339036 - Williams-Bowbell loams, 3 to 6 percent slopes
 339035 - Williams-Bowbell loams, 0 to 3 percent slopes



PGS Sites	339036
Roads	339038
339035	339039
New Facilities Footprint (Approximately)	

0 100 200 400 Miles

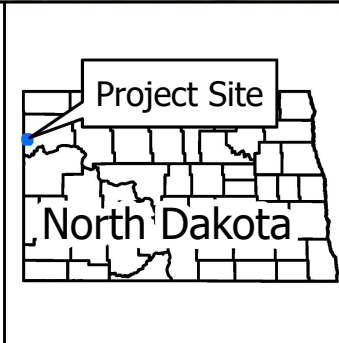


Figure 4-3
 Soil Unit Map
 Pioneer Generation Station
 Phase IV

4.13 Geologic and Groundwater Resources

4.13.1 Description of Resources

The geologic formation underlying the existing PGS, and new expansion property consists of Paleocene Epoch (65.5 to 56 million years ago) Sentinel Butte Formation. The Sentinel Butte Formation consists of alternating beds of grayish brown to gray sandstone, siltstone, mudstone, claystone, and lignite (USGS, 2005). It contains river, lake, and swamp sediment and can range up to 600 feet in thickness.

The surficial geology in the PGS area is Pleistocene Epoch (2.6 million to 11,700 years ago) Coleharbor Formation. The Coleharbor Formation is glacial till consisting of interlayered boulder, cobble, pebble, sand and silty clay deposits. The formation also includes sediment of meltwater and other river deposits and can reach a thickness of 100 to 600 feet. Paleontological resources associated with the Coleharbor Formation may include fossils of animals that lived during the Ice Age, including remains of mammoths, mastodons, giant bison, ground sloths, and horses (Hoganson, 2006).

The Basin Electric service area in northwestern North Dakota also contains extensive oil and gas resources occurring within the Bakken shale formation, currently concentrated in McKenzie, Mountrail and Williams Counties. This area has seen extensive geologic exploration and extraction-related activities and development to access and recover these oil and gas resources.

According to the North Dakota Geological Survey (NDGS), North Dakota is located in an area of very low earthquake probability. There are no known active tectonic features in northwestern North Dakota and the deep geologic formations underlying North Dakota are expected to be geologically stable (Bluemle, 1991). This information is supported by U.S. Geological Survey (USGS) seismic hazard maps, which show that the Project would be located in an area with very low seismic risk (USGS, 2008). Related hazards, such as soil liquefaction, are therefore also unlikely. No landslide areas are known on or in the vicinity of the PGS Phase IV area.

According to the USGS, the PGS area is included in the Northern Great Plains regional aquifer system. Groundwater resources in the PGS area are included in the Fort Union and Fox Hills Formations, along with Tertiary period aquifers. Tertiary aquifers consist mostly of semi-consolidated to consolidated sandstone beds of Oligocene to Paleocene age (USGS, 1996). These water-yielding sandstones are an important water source in the region.

4.13.2 Impacts

There are no anticipated impacts to geologic resources. However, if an unanticipated spill occurs as part of PGS Phase IV construction, Basin Electric has a Spill Prevention, Control, and Countermeasure (SPCC) plan and mitigation in place to avoid introduction of spilled materials into the groundwater.

4.13.3 Mitigation

The construction contractor would minimize the likelihood of spilling fuel, hydraulic fluid, or other regulated materials by limiting refueling to secure areas. Spill kits would be maintained at these sites to contain and clean up any spills that may occur. Construction crew members would be trained in spill prevention and clean up.

4.14 Surface Water and Floodplain Resources

4.14.1 Description of Resources

Only small, isolated wetlands occur on the existing PGS site and the new expansion site area. No waterways or streams cross the properties. The PGS sites are located on the border between two watersheds, the Upper Painted Woods Creek and Upper Little Muddy Creek Watersheds. Painted Woods Creek is an intermittent stream, which drains to Lake Sakakawea, approximately 13 miles southeast of the PGS. Little Muddy Creek, which is also intermittent, drains to the Missouri River approximately 16 miles southwest of the PGS. No surface waters are located on the PGS properties. Flood Insurance Rate Maps (FIRMs) have not been prepared for this portion of Williams County. However, because there are no major streams near the sites, the sites do not appear to be located within a floodplain.

4.14.2 Impacts

A rural water line currently supplies water to the site and has adequate capacity for the proposed Project. Stormwater from the existing PGS facility is captured in a retention pond on the north side of the existing facility, and after achieving discharge quality standards, it is released at a controlled rate and flows offsite. All stormwater runoff from the Project would be diverted to a new second stormwater pond that would serve the new RICE. This pond would be located at the northwest central portion of the proposed Project. After achieving discharge quality standards, water would be released at a controlled rate to the west and offsite, eventually into Muddy Creek. Similarly, the new expansion site would have a stormwater runoff pond to serve the new combustion turbines. Collected stormwater from these ponds would also be released at a controlled rate upon achieving discharge standards. Sanitary wastewater from the Project would be generated as a result of staffing the facility and would be directed to a second state-approved mound septic system. Therefore, construction and operation of the proposed Project would not

result in any long-term or short-term impacts to water quality. Because stormwater would be captured in an onsite pond and because of the distance from PGS to Painted Woods Creek and Muddy Creek, there would be no impacts to surface water or floodplains.

4.14.3 Mitigation

Basin Electric or its contractor would prepare, apply for, and obtain the necessary National Pollutant Discharge Elimination System (NPDES) stormwater permit for the Project. Basin Electric would maintain an NPDES permit for the continued operation of the stormwater retention ponds. No impacts to surface water or floodplains are anticipated; therefore, no additional mitigation is being proposed.

4.15 Wetlands

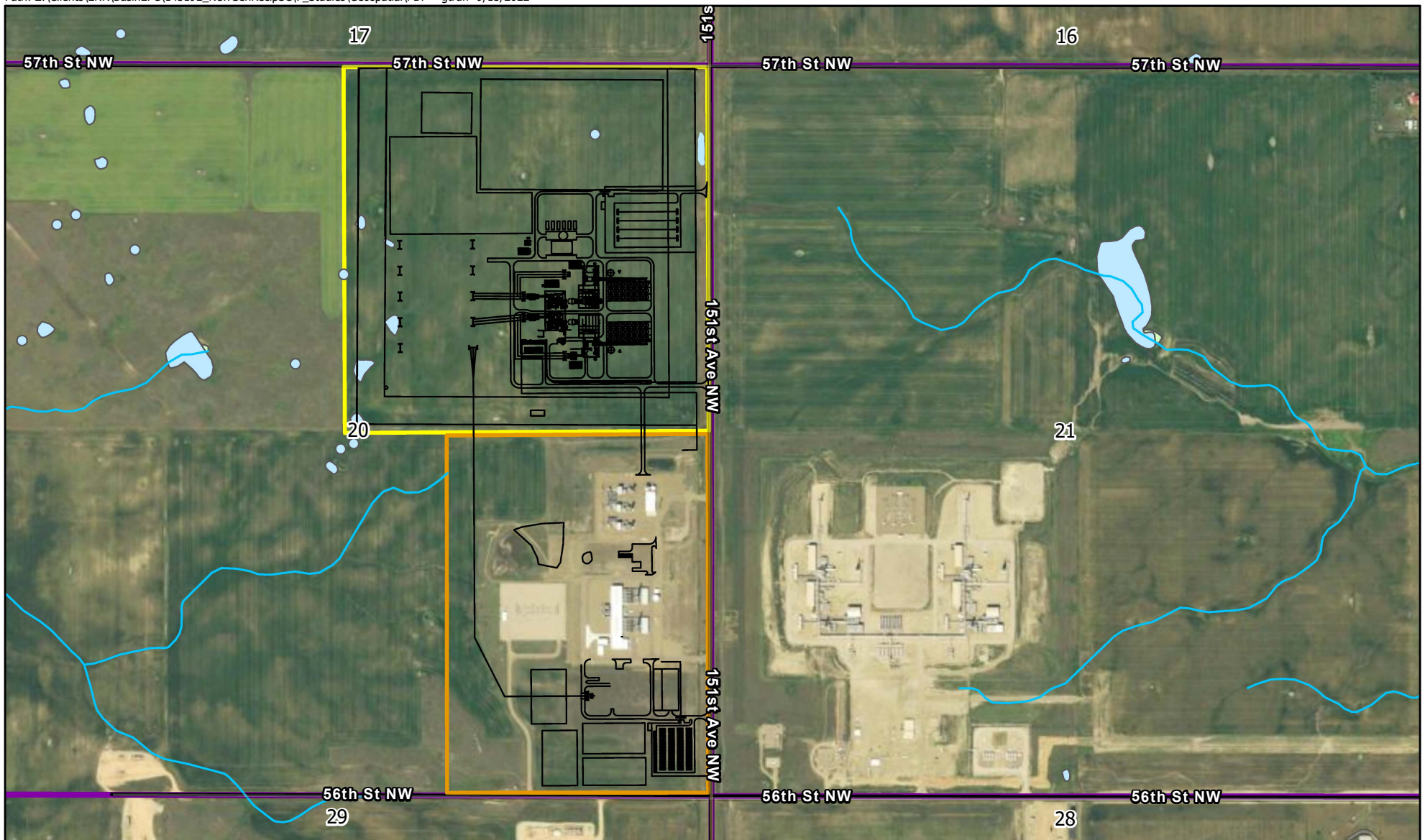
4.15.1 Description of Resources

Basin Electric, during Phase III of the PGS, had identified two emergent wetlands, both less than approximately 0.1 acre, located on the existing PGS property. On February 9, 2012, the U.S. Army Corps of Engineers (USACE) determined that these wetlands are isolated, intrastate, and non-navigable and therefore non-jurisdictional. After this determination, Phase III of the PGS project was built with the current structures.

WEST conducted wetland surveys of the Project lands on June 9, 2022. Using both desktop analysis (including aerial photographs, National Wetland Inventory (NWI) spatial data, and other available sources) and a site visit, WEST prepared a Biological Report (Appendix F) for the Phase IV properties. This report included the review of potentially impacted wetlands and waterbodies. Nine NWI wetlands were identified in the survey. The June 9th site visit found eight of these wetlands not present. One wetland was identified (designated w-ab-01 in the survey) and delineated. Wetland w-ab-01 will be avoided by site construction, with the driveway for construction parking approximately 188 feet away from the wetland. Out of an abundance of caution, Basin Electric has submitted a wetland jurisdictional determination request to the USACE for the mapped (but not present) NWI wetlands that would be affected by the Project. Given the current site layout, the Project is not anticipated to have impacts on jurisdictional wetland with the avoidance of wetland w-ab-01 (Figure 4-4).

4.15.2 Impacts

There would be no jurisdictional wetlands affected by PGS Phase IV. No impacts to jurisdictional wetlands would occur.



- Site Layout
- Roads
- Stream
- NWI Wetlands
- PGS Existing Property
- PGS Newly Acquired Station
- Section

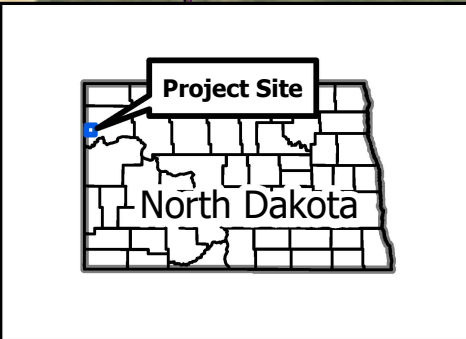


Figure 4-4
Water Features
Pioneer Generation
Station
Phase IV

4.15.3 Mitigation

PGS Implementation of an erosion and sedimentation control plan would include measures to protect jurisdictional wetlands on PGS Phase IV properties.

4.16 Vegetation

4.16.1 Description of Resources

The PGS is located in the Northern Dark Brown Glaciated Plains Major Land Resource Area (MLRA) (NRCS, 2014). Vegetative cover in this region primarily consists of cropland, pastured mixed-grass prairie, and non-native grassland. Native vegetation consists of mixed and tall grass prairie. Spring wheat is a predominant crop with other acreage in flax, oats, and barley. Native prairie vegetation consists of western wheatgrass (*Pascopyrum smithii*), needle-and-thread (*Hesperostipa comata*), green needlegrass (*Stipa viridula*), and blue grama (*Bouteloua gracilis*). Little bluestem (*Schizachyrium scoparium*) may be present on shallow soils, and prairie cordgrass (*Spartina pectinata*), northern reedgrass (*Calamagrostis stricta* spp.), and slim sedge (*Carex praegracilis*) may be present on wet soils. Western snowberry (*Symphoricarpos occidentalis*), stiff goldenrod (*Oligoneuron rigidum*), coneflower (*Echinacea* spp.), and prairie rose (*Rosa arkansana*) are also interspersed throughout the region. Areas of the PGS property outside of the existing facilities, including the proposed Project site, are crop fields.

4.16.2 Impacts

Construction of the Project would result in the removal of approximately 79.31 acres of agricultural land and vegetation to accommodate the new RICE, SCCTs turbines, warehouse, ponds. Temporary laydown yards, construction parking and construction operations within the Project boundary would result in the removal of an additional approximately 35.07 acres for both sites. The total disturbance area for both site would be approximately 114.38 acres (temporary and permanent). Vegetation within the existing PGS area includes a mix of hay and cropland. Newly acquired lands are used for cropland. Following construction, the Project lands used for expansion facilities would no longer be available for crop production or other vegetation. Areas around the immediate area of the facility would likely be landscaped with grasses, shrubs and trees. Gravel would be removed from temporary construction staging and parking areas, and these areas would be reseeded to native grass pasture. Approximately 106.92 acres between both sites would be undisturbed by construction and continue to be available for agricultural use. During construction, movement of vehicles and materials to and from the site could transport invasive plants and noxious weeds which could become established in disturbed areas of the Project site.

4.16.3 Mitigation

Ground disturbance during construction would be limited to the areas needed for construction activities and facilities. Topsoil for agricultural areas would be stockpiled or protected during construction.

Disturbed areas would be restored to pre-construction conditions to the extent practical. Non-agricultural areas would be revegetated or landscaped. Agricultural areas outside permanent facilities would be available for production following completion of restoration activities. Existing vegetation within the construction area would be preserved whenever feasible.

If not returned to use as cropland, surface disturbance areas would be reclaimed using native species, as approved by the Natural Resources Conservation Service (NRCS), and would be planted at the appropriate times in order to reestablish native vegetative cover and minimize the potential for invasion by non-native species.

Erosion and sedimentation controls would be implemented to minimize indirect impacts to wetlands and riparian areas. Mulch and seeds used for revegetation, erosion, and sediment control would be certified as weed-free.

If noxious weeds are observed in the surface disturbance areas, populations would be controlled with the application of herbicides, which would be applied by a certified herbicide applicator in accordance with label instructions and State and local County Weed Board regulations. Herbicides would not be used near surface water.

Prior to the initiation of construction activities, construction vehicles and equipment would be thoroughly cleaned to prevent the possible spread of noxious weed seeds within the Project area. The construction area and other surface disturbance areas would be monitored annually for noxious weeds for a 3-year period following construction and reclamation. Herbicide applications would occur in late spring or early summer to eradicate or control noxious weeds before they mature.

4.17 Wildlife

4.17.1 Description of Resources

The majority of the study area has been disturbed through row crop production and industrial development, which limits its use and value to wildlife. Avian wildlife would generally be restricted to species common to agricultural landscapes in the western portion of North Dakota such as red-winged blackbird (*Agelaius phoeniceus*), ring-necked pheasant (*Phasianus colchicus*), western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), and possibly various waterfowl species using

wetlands for roosting and grain fields for foraging. Raptors such as red-tailed hawks (*Buteo jamaicensis*) and Swainson's hawks (*Buteo swainsoni*) may forage in the area.

Mammalian wildlife is similarly going to be restricted by the land use of the area. Small mammals such as various species of voles and mice may occupy the landscape. Medium-sized mammals such as badger (*Taxidea taxus*), coyote (*Canis latrans*), and striped skunk (*Mephitis mephitis*) may also forage within, traverse through, or burrow on the properties periodically. Potential large mammals that could utilize the project area but are unlikely, include white-tailed deer (*Odocoileus virginianus*), moose (*Alces alces*) and pronghorn antelope (*Antilocapra americana*).

The proposed Project lands include areas of crop fields, which could provide some limited wildlife habitat for foraging, migratory stopover, breeding, and/or shelter. Adverse impacts to general wildlife as a result of PGS Phase IV development are not anticipated due to only cropland being affected and not higher diversity and quality habitats.

4.17.2 Impacts

The Project would take place on greenfield and brownfield sites currently used for crop cultivation. The proposed Project is not anticipated to result in the loss of quality wildlife habitat. While wildlife certainly uses the area, the seasonal disturbance for tilling and harvesting, as well as the monoculture of a crop and limited cover, and industrial nature of the existing PGS, provide limited wildlife habitat. Construction of the Project would result in temporary disturbance of approximately 114.38 acres of land within the Project sites to accommodate the Project. Of that 114.38 acres, approximately 79.31 acres of cropland providing potential wildlife habitat would be permanently removed as required for the operation of the Project and would result in displacement of wildlife species across portions the Project site. Impacts would be low due to the abundance of similar habitat in the surrounding area and the limited area of disturbance across the entire site. Noise and human activity associated with construction may result in short-term, temporary displacement of wildlife species foraging in the surrounding area. The increased noise and human activity would temporarily deter any wildlife species from using the areas in the immediate vicinity of construction; however, following completion of construction, the wildlife species would be expected to return. The 106.92 acres of surrounding property would continue to be used as grassland pasture or cropland and would continue to provide habitat for a variety of wildlife species in this region, particularly those adapted for grassland and cropland habitat types.

4.17.3 Mitigation

No adverse impacts to wildlife are anticipated. No mitigation is proposed.

4.18 Rare and Unique Natural Resources

4.18.1 Description of Resources

The Endangered Species Act (ESA) of 1973, as amended, provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend. Federally listed threatened species are those species likely to become endangered within the foreseeable future throughout all or a significant portion of their range. Federally listed endangered species are those species already in danger of extinction throughout all, or a significant portion of, their range. As identified through the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) online database system, a list of threatened and endangered species known or likely to occur near the Project site was produced and listed in Table 4-6. Williams County may contain suitable habitat for, or have known occurrences of, one federally listed endangered species and four federally listed threatened species.

Table 4-6: Listed Species Known or Likely to Occur Near Project Site

Common Name	Scientific Name	Federal Status	Critical Habitat in Williams County
Piping plover	<i>Charadrius melodus</i>	Threatened	Yes
Rufa Red knot	<i>Calidris canutus rufa</i>	Proposed Threatened	N/A
Whooping crane	<i>Grus americana</i>	Endangered	No
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	No
Dakota Skipper	<i>Hesperia dacotae</i>	Threatened	No

Source: USFWS IPaC Project Review

(a) Piping plover Critical habitat in Williams County is sparsely vegetated sandbars along the Missouri River.

4.18.1.1 Whooping Crane

Whooping cranes (*Grus americana*) are listed as endangered under the ESA (32 FR 4001, 1967 March 11) except where nonessential experimental populations exist. The whooping crane has been listed since 1967. Initially it was considered threatened; it would later be “grandfathered” into the ESA of 1970 and updated to endangered. Whooping cranes migrate twice a year from Wood Buffalo National Park, Canada to Aransas National Wildlife Refuge, Texas. No critical habitat has been identified in North Dakota although a bulk of the whooping crane population migrates through the state. North Dakota offers a variety of habitats including shallow, open wetlands, cropland, and open, grazed pastureland.

Given the impacted nature of the study area and the ongoing expansion activities with PGS whooping cranes are unlikely to use the study area and no impacts to whooping cranes are anticipated from the Project.

4.18.1.2 Piping Plover

In 1987 the Piping Plover (*Charadrius melodus*) was listed as threatened under the ESA. In 2002, the USFWS designated critical habitat for a total of 11 different sites (50 CFR part 17; 2002). The nearest piping plover designated critical habitat is along Lake Sakakawea, approximately 13.5 miles southeast of the project. In North Dakota, piping plovers use the barren shores of inland alkali lakes and barren sand bars or shorelines near the Missouri River as habitat. Although there are identified water features within the PGS Phase IV area, they do not provide suitable habitat, thus no impacts are anticipated to the species from Project development.

4.18.1.3 Northern Long-eared Bat

In 2015 the northern long-eared bat (*Myotis septentrionalis*) was listed under the ESA as threatened (USFWS 202b). The northern long-eared bat (NLEB) has an expansive habitat range; covering eastern portions of Canada and 38 states throughout the central and eastern United States including North Dakota. During the winter NLEB prefers caves and mines for hibernation. Currently there are no known hibernation sites in North Dakota. During the summer months they rely on forested areas for roosts and reproduction as well as buildings. No critical habitat has been identified for the species at this time. The PGS Phase IV expansion area has no caves, mature trees, or old building. No impact to NLEB is anticipated from the Project.

4.18.1.4 Rufa Red Knot

The Rufa red knot (*Calidris canutus rufa*) is a long-distance migrant which breeds in the Canadian Arctic and winters as far south as coastal Argentina. Red knots generally stay along ocean coast during migration but have been documented in most U.S. states. There is little research explaining the occurrence of non-coastal migratory stops. There is no preferred habitat for the red knot within the study area and no impacts are anticipated to the species from this Project.

4.18.1.5 Dakota Skipper

The Dakota skipper (*Hesperia dacotae*) is a butterfly known to occur in North America. It requires high quality, unbroken prairie habitat containing warm season grasses and flowering forbs for nectar. Broken grasslands, native grasslands with high levels of disturbance, and cropland are typically unsuitable for the species. No critical habitat for Dakota skipper has been identified in Williams County. It is possible the closest habitat would be along the Missouri River approximately 18 miles south of the Project location. There is no anticipated impact from the PGS Phase IV Project due to only cropland being affected by the expansion.

4.18.1.6 Bald and Golden Eagles

The migratory Bird Treaty Act of 1918 and the Golden Eagle Protection Act of 1940 protect both bald and golden eagles. Preferred habitat for bald eagles (*Haliaeetus leucocephalus*) includes mature trees near permanent bodies of water with an abundant prey source for their nesting, roosting, and foraging activities. The closest preferred habitat is Lake Sakakawea located approximately 26 miles southeast of the Project area. Golden eagles (*Aquila chrysaetos*) prefer open grasslands, mature trees, and large bodies of water close to prairie dog colonies or other abundant prey sources. The primary land cover of the study area is cultivated croplands and is not the preferred habitat of golden eagles. Desktop review and site observations (June 9, 2022) identified no suitable habitat (Appendix F). It is possible both bald and golden eagles could fly over or forage in the area, but it is unlikely that Project development or operation would have any impact on the species due to the lack of suitable habitat present.

4.18.2 Impacts

Suitable habitat for protected species is not present within the Project site. Therefore, no impacts on rare and unique resources would occur as a result of the construction and operation of the Project.

4.18.3 Mitigation

Because the proposed Project would not impact rare and unique resources, no mitigation is proposed.

4.19 Summary of Site Impacts

Table 4-7 summarizes the resources that would be impacted as a result of the construction of the Project and the appropriate mitigation.

Table 4-7: Summary of Impacts and Mitigation

Resource	Impact	Mitigation
Demographics and Socioeconomics	Socioeconomic impacts are primarily positive due to increased expenditures during construction and long-term benefits of an increased tax base for the county.	No mitigation measures are proposed.
Land Use	Approximately 79.31 acres on the PGS properties would be converted from agricultural to industrial use. Approximately 35.07 acres for laydown and parking areas would be temporarily unavailable for agricultural purposes during construction.	No mitigation measures are proposed.
Public Services	No impacts.	No mitigation measures are necessary.
Human Health and Safety	No impacts.	Basin Electric would develop a Health and Safety Plan and would coordinate with local emergency responders.

<p style="text-align: center;">Air</p>	<p>Construction of the proposed Project would potentially have minor and temporary impacts on air quality due to fugitive dust emissions during construction and combustion of fuel. These emissions would be temporary in nature.</p> <p>Operation of the proposed Project would result in air emissions from stationary fuel burning equipment. The Project would operate as allowed under applicable air permits obtained prior to construction and operation. Operation of the Project in compliance with the applicable permit limits would not result in an adverse impact to public health and welfare.</p> <p>The Project would not exceed 250 tpy for any pollutant; therefore, the Project would not be subject to PSD review for any pollutant.</p> <p>Although the Project is not subject to PSD review, it is anticipated that NDDEQ may request air dispersion modeling be performed for all pollutants anticipated to be above their modeling thresholds to demonstrate compliance with the NAAQS and ND AAQS. Therefore, an air quality analysis is anticipated to be performed for NO₂, SO₂, and PM₁₀/PM_{2.5}. However, the Project is not anticipated to cause or contribute to any exceedance of the NAAQS or ND AAQS.</p>	<p>During construction, it is proposed that standard dust control measures be used to reduce generation of fugitive dust due to surface disturbance. Dust control measures would include, but are not limited to, the following:</p> <ul style="list-style-type: none"> • Applications of water during grading • Paving, chemical stabilization, or watering of internal roadways after completion of grading • Paving of 121st Avenue NW between U.S. Highway 2 and the Project site • Reduction of speed on unpaved roadways to 15 miles per hour or less • Use of sweepers or water trucks to remove “track-out” at any point of public street access • Stabilization of dirt storage piles by chemical binders, tarps, fencing, or other erosion control <p>Construction of the proposed Project would also result in exhaust pipe emissions from a variety of sources, including cranes, loaders, excavators, graders, generators, vibratory rollers, concrete emplacement trucks, and crew trucks. It is proposed that the following measures be used to reduce emissions from vehicles and construction equipment during Project construction:</p> <ul style="list-style-type: none"> • Properly maintain construction equipment in accordance with manufacturers’ specifications or standard practices • Limit truck idling to the extent practicable • Burning waste materials would not be permitted and all waste materials would be disposed of at permitted waste disposal areas or landfills. <p>The two SCCT would be equipped with SCR and low-NO_x burners to control</p>
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Resource	Impact	Mitigation
		<p>NO_x and oxidation catalysts to control CO emissions. Use of these control systems, use of ethane and natural gas as the primary fuel, and compliance with operating limits imposed by required air emissions operating permits are anticipated to mitigate impacts to ambient air quality and maintain compliance with applicable ND AAQS and NAAQS.</p>
Noise	<p>Noise levels due to operation of the proposed Project are expected to have minimal impact on the closest residences, as designed.</p>	<p>Incorporating typical mitigation, inclusive of a building enclosing the combustion turbines, would be sufficient to quiet noise levels to acceptable levels at the surrounding residences. Noise levels due to the operation of the proposed Project are expected to have little impact on the closest residence.</p>
Visual	<p>The proposed Project would add additional visual elements to the landscape where a power generation site already exists.</p>	<p>Because the area has already been impacted by the existing PGS facilities, transmission infrastructure, industrial development, and oil and gas facilities, no additional mitigation is necessary.</p>
Cultural and Archaeological	<p>No impacts.</p>	<p>No mitigation measures are proposed.</p>
Recreational Resources	<p>No impacts.</p>	<p>No mitigation measures are proposed.</p>
Land Based Economies	<p>No impacts.</p>	<p>No mitigation measures are proposed.</p>
Soils	<p>Approximately 79.31 acres of soils would be disturbed and converted to industrial use to accommodate the new RICE, SCCTs, warehouse, and ponds. Approximately 35.07 acres for laydown and parking areas would be temporarily disturbed during construction.</p>	<p>Basin Electric would maintain good water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion. Basin Electric would implement a SWPPP during construction and would limit surface disturbance to only those areas necessary for construction.</p>

Resource	Impact	Mitigation
Geologic and Groundwater Resources	No impacts.	The construction contractor would minimize the likelihood of spilling fuel, hydraulic fluid, or other regulated materials by requiring that refueling takes place at secure areas. Spill kits would be maintained at these sites to contain and clean up any spills that may occur. Construction crew members would be trained in spill prevention and clean up.
Surface Water and Floodplain Resources	No impacts.	A Stormwater Pollution Prevention Plan (SWPPP) would be prepared for implementation during construction. In addition, a Notice of Intent to Obtain Coverage Under NDPDES General Permit for Discharges Associated with Construction Activity would be prepared and submitted to NDDEQ.
Wetlands	No impacts.	No mitigation measures are proposed.

Resource	Impact	Mitigation
<p>Vegetation</p>	<p>Approximately 79.31 acres of soils would be disturbed and converted to industrial use to accommodate the new RICE, combustion turbines, warehouse, and ponds. Approximately 35.07 acres for laydown and parking areas would be temporarily disturbed during construction.</p>	<p>Disturbance to vegetation would be limited to that required for construction. Existing native vegetation within the construction area would be preserved whenever feasible.</p> <p>If not returned for use as cropland, surface disturbance areas would be reclaimed using native species, as approved by the NRCS and will be planted at the appropriate times in order to reestablish native vegetative cover and minimize the potential for invasion by non-native species.</p> <p>Erosion and sedimentation controls will be implemented to minimize indirect impacts to wetlands and riparian areas. Mulch and seeds used for revegetation, erosion, and sediment control will be certified as weed-free.</p> <p>If noxious weeds are observed in the surface disturbance areas, populations will be controlled with the application of herbicides, which will be applied by a certified herbicide applicator in accordance with label instructions and State and local County Weed Board regulations. Herbicides will not be used near surface water.</p> <p>Prior to the initiation of construction activities, construction vehicles and equipment will be thoroughly cleaned to prevent the possible spread of noxious weed seeds within the Project area. The construction area and other surface disturbance areas will be monitored annually for noxious weeds for a 3-year period following construction and reclamation. Herbicide applications will occur in late spring or early summer to eradicate or control noxious weeds before they mature.</p>

Resource	Impact	Mitigation
Wildlife	No impacts.	No mitigation measures are proposed.
Rare and Unique Natural Resources	No impacts.	No mitigation measures are proposed.

5.0 PUBLIC AND AGENCY COORDINATION

Correspondence regarding the PGS Phase IV Project was sent to federal and state agencies for comment. Agency response letters for the Project are included in Appendix D. Responses were received from the numerous agencies and Table 5-1 below summarizes the response received.

Table 5-1: Agency Correspondence

Agency	Contact Name	Response	Summary
Federal			
U.S. Army Corps of Engineers, Omaha District North Dakota Regulatory Office	Jeremy Nygard	Yes	Their office has reviewed the project and determined that a section 404 permit may be required
U.S. Department of Defense Siting Clearinghouse	Steven Sample	No	
U.S. Fish and Wildlife Service	Drew Becker	Yes	Provided technical assistance and contact information for consideration of potential Project-related impacts to threatened and endangered species, migratory birds, bald and golden eagles, and properties with which USFWS has an interest
Federal Bureau of Land Management	Tracy Stone-Manning	Yes	No objection to the proposed project
Federal Aviation Administration-Great Lakes Region	Dave Anderson	No	
USDA – NRCS	Wade Bott	Yes	Farmland Protection Policy Act (FPPA) does not apply to the project. Provided guidance on wetland construction requirements and recommends that impacts to wetlands be avoided.
State			
North Dakota State Historic Preservation Office	Dr. William Peterson	Yes	They concur with a determination of “No Historic Properties Affected” for this project.

Agency	Contact Name	Response	Summary
North Dakota Geological Survey	Fred Anderson	Yes	No mapped landslide areas or abandoned mine locations within the Project area. No economic deposits of lignite were found to be underlying this area.
North Dakota Department of Game and Fish	J.D. Schumacher	Yes	Wetlands are within or adjacent to the proposed project site. Requested steps be taken to protect wetland. Noted unavoidable destruction or degradation of wetlands should be mitigated.
North Dakota Department of Environmental Quality	L. David Glatt	Yes	Stated environmental impacts for the proposed construction will be minor and can be controlled by proper construction methods. The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area
North Dakota Park and Recreation Department (NDPRD)	Kathy Duttenhefner	Yes	Stated the Project does not appear to affect properties that NDPRD owns, leases, or manages, or any properties protected under Section 6(f) of the Land and Water Conservation Fund (LWCF). There are no known rare species or significant ecological communities documented within or adjacent to the Project. No known rare species or significant ecological communities are documented within or immediately adjacent to the Project site by the NDPRD.

Agency	Contact Name	Response	Summary
North Dakota Department of Water Resources	Steven Best	Yes	<p>Indicated there are no identified or mapped floodplains on the lands for Project facilities. The Project does not require a conditional or temporary permit for water appropriation.</p> <p>However, if surface water or groundwater will be diverted for construction or use of the Project, a water permit will be required per North Dakota Century Code § 61-04-02. North Dakota Water Resources requests to be notified regarding a proposed project’s impacts, if any, to water resources, such as watercourses (i.e. streams or rivers), agricultural drains, and wetlands (i.e. ponds, sloughs, lakes, or any series thereof), and dikes, levees, and other water control devices, as any alterations, modifications, improvements, or impacts to those may require a drainage permit(s) or a construction permit(s) from the water resources department.</p>
North Dakota Department of Transportation	Chad Orn	Yes	<p>Indicated Project would have no adverse effect on North Dakota highways. If a delivery weighs more than 400,000 pounds it should be delivered in January and February. If project work is to be done on any highway right of way, appropriate permits and risk management need to be obtained from NDDOT.</p>
Williams County – Water Resource District Board	Kevin Ploof	Yes	<p>Indicated an updated stormwater management plan may be required for review by the Williams County Water Resource District Board if impervious surface is being added.</p>
Williams County – Planning and Zoning Division	Samantha Miller	Yes	<p>Requested a pre-application form and provided a list of questions/comments required to identify the necessary permits required for this Project was also included in response letter.</p>

6.0 IDENTIFICATION OF REQUIRED PERMITS/APPROVALS

The federal and state permits or approvals that have been identified as potentially being required for the construction and operation of the Project are shown in Table 6-1.

Table 6-1: Potential Permits and Approvals

Agency	Type of Approval	Status	Need
Federal			
U.S Army Corps of Engineers	Clean Water Act – Section 404 Permit	Prior to construction	Required to dredge or place fill in a jurisdictional water, including wetlands
U.S Fish and Wildlife Service	Section 7 Threatened and Endangered Species Consultation and Clearance	Prior to construction	If the project will potentially impact protected species or their respective habitat, or if a Section 404 and/or NPDES permit is required
	Migratory Bird Treaty Act / Bald and Golden Eagle Protection Act Compliance	Prior to construction	Required when construction or operation of a proposed facility could impact migratory birds, their nests, and especially threatened or endangered species
Federal Aviation Administration	Notice of Proposed Construction	Prior to construction	Required for the construction of structures 200 feet tall or within the distance to height ratio from the nearest point of a FAA airport runway. Also required for construction equipment reaching heights over 200 feet.
U.S. Environmental Protection Agency	Spill Prevention, Control, and Countermeasure (SPCC) Plan Amendment	Prior to operation	Required if the facility will have 1,320 gallons or more of aboveground petroleum storage capacity in 55-gallon-sized or larger containers
State of North Dakota			
PSC	Certificate of Site Compatibility	Subject of this Application	Included herein

Agency	Type of Approval	Status	Need
North Dakota Department of Environmental Quality	Minor Source Air Construction Permit		A permit to construct is required for any new stationary source or modification to an existing source
	NPDES Permit: General Construction Stormwater	Would be acquired by Owners' Contactor	Permits required if: <ul style="list-style-type: none"> • Land disturbance (clearing, grading or excavating) is greater than or equal to 1 acre, or • Land disturbance is less than 1 acre and the site is part of a larger common plan of development or sale with the total land area disturbed in the development being equal to or greater than 1 acre or, • There is potential for contribution to a violation of a water quality standard or potential for significant contribution of pollutants to waters of the state Permit application requires the preparation of a SWPPP
North Dakota Department of Environmental Quality, Division of Air Quality	Title V Air Operating Permit	Needs to be applied for within 1 year of commencing operation	A Title V air operating permit is required for operation of air emission sources. The Title V permit includes conditions in all construction permits as well as compliance methods.
North Dakota Department of Environmental Quality, Division of Water Quality	Section 401 Water Quality Certification (WQC)	Prior to construction	The purpose of the WQC is to confirm that the discharge of fill materials (Section 404 Permit) will be in compliance with the State's applicable water quality standards.
	NDPDES Operational Discharge Permit	Prior to Construction	The facility would be required to obtain an NDPDES Operational Discharge Permit to address the discharge of wastewaters and stormwater, if operational wastewaters will be discharged to a surface water of the State.

Agency	Type of Approval	Status	Need
	NDPDES Temporary Discharge Permit	During construction as needed	Authorizes the temporary discharge of waters from construction dewatering activities and hydrostatic testing of pipes, tanks, or other similar vessels.
North Dakota State Water Commission	Conditional Water Permit	Prior to construction	Required prior to impounding, diverting, or withdrawing more than 12.5 acre-feet of water for industrial use. Would be required to pump water from a surface water of the State for operational use.
State Historical Society of North Dakota	National Historic Preservation Act – Section 106 Clearance	Prior to construction	Under Section 106 of the National Historic Preservation Act, Federal agencies must work with the State Historic Preservation Office to address historic preservation issues when planning projects or issuing funds or permits that may affect historic properties and archaeological resources listed in or determined eligible for the National Register of Historic Places.
North Dakota State Fire Marshal, Office of Attorney General	Aboveground Fuel Storage Pre-Installation Approval for Fuel Dispensing Sites	Prior to installation	Required for all permanent and non-portable tanks used for the storage of flammable/combustible liquids and exceeding 660 gallons in individual capacity
North Dakota Highway Patrol	Overweight/Overweight Permit	Contractors would obtain as necessary, prior to transporting equipment	Permit required for hauling construction equipment and materials on state highways
County/Local			
Williams County	Industrial Zoning	Prior to construction	Authorization required for construction of power generation facility

Agency	Type of Approval	Status	Need
	Building Permit	Prior to construction	A building permit may be required. Additionally, electrical, mechanical, plumbing permits would likely be required.
	Floodplain Permit	Prior to construction	A permit will be required if constructing within a floodplain.
	Development/Zoning Permit	Prior to construction	Depending on the jurisdiction, a development permit, or zoning restrictions may need to be considered
	Grading Permit	Prior to construction	A separate grading permit may be required for site work
	Driveway Permit	Prior to Construction	Permit may be required to install new driveway off of a county/local road.
	Flammable/Combustible Bulk Storage Permit	Prior to construction	Required for the capacity to store 250 gallons or more of fuel, oil, gasoline, and/or petroleum products on a single parcel of property if the storage is an incidental use to a permitted or conditionally approved primary use.

7.0 FACTORS CONSIDERED

North Dakota Century Code (NDCC) Section 49-22-09 of the North Dakota Energy Conversion and Transmission Facility Siting Act lists 11 factors to guide the NDPSA in evaluation of the site. The following sections address these factors where applicable to the Project.

7.1 Public Health and Welfare, Natural Resources, and the Environment

The preceding sections discuss the potential effects of the proposed Project on public health and welfare, natural resources, and the environment. Chapter 4 details the research and investigations that were used to identify expected environmental impacts and mitigation in relation to the Project. Chapter 3 discussed construction and operation techniques. All impacts evaluated for the Project would be minor.

7.2 Technologies to Minimize Adverse Environmental Effects

Basin Electric would use the most recent generation station technologies and systems that minimize impacts to the environment. Chapter 3 discusses the engineering and operational design of the Project, including the proposed gas engine type. These technologies and techniques are the most appropriate technologies to minimize adverse environmental effects. This is evident in the minimal environmental effects identified by the research and investigations discussed in this application.

7.3 Potential for Beneficial Uses of Waste Energy

This factor is not applicable to this Project.

7.4 Unavoidable Adverse Environmental Effects

Chapter 4 details the research and investigations that were used to identify expected environmental impacts and mitigation in relation to the Project. The environmental effects of the Project would be minor. Unavoidable adverse environmental effects include the visual impacts associated with the PGS Phase IV expansion and noise from operation of the facility. Unavoidable adverse environmental effect includes the visual impacts associated with the Project facilities, noise from the operation and construction of the facility, and the removal 79.3 acres of cropland from future agricultural use. The Project area consist of other pre-existing visual and noise impacts including U.S. Highway 2, transmission lines, and oil and gas development interspersed throughout the area. The proposed facility would not significantly increase these overall impacts within Williams County.

7.5 Irreversible and Irretrievable Commitment of Natural Resources for the Site

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources would have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. The proposed Project would result in the conversion of approximately 79.3 acres of cropland for the construction of the RICE, SCCTs, warehouse, and ponds. This land would be unavailable for agricultural production for the life of the Project. There are few commitments of resources associated with construction of the proposed Project that are irreversible and irretrievable. Resources that would be used to construct the Project include aggregate resources, concrete, steel, paint and solvents, and hydrocarbon fuel. Aside from paints, solvents, and fuels, most construction materials could be recycled or reused.

7.6 Direct and Indirect Economic Impacts of the Proposed Facility

The direct and indirect economic impacts are positive. To the extent that local contractors are used for portions of the construction, total wages and salaries paid to contractors and workers would contribute to the total personal income of the region. Additional personal income would be generated for residents in the county and the state by circulation and recirculation of dollars paid out by Basin Electric as business expenditures and state and local taxes. Expenditures made for equipment, energy, fuel, operating supplies, and other products and services also benefit businesses in the county and the state. Additional reliable electricity capacity would facilitate additional economic development throughout the region.

7.7 Existing Development Plans of the State, Local Government, and Private Entities at or in the Vicinity of the Site

No conflicts with existing development plans were identified as part of this application. In recent years, oil and gas development, as well as other industrial and commercial facilities, have continued to expand in Williams County. It is reasonably foreseeable that areas near the PGS would be considered for gas and oil development. This is evidenced by the existing oil wells. The rural, largely undeveloped location of the existing PGS and PGS Phase IV facilities is not expected to inhibit the potential for future gas and oil, industrial, and commercial development.

7.8 Effect on Scenic Areas, Cultural Resources, and Paleontological Sites

The PGS site is not located in a locally or nationally recognized scenic area or near any known paleontological sites. As indicated in Chapter 4, cultural resource surveys of the PGS properties did not

identify any historic properties and recommended a finding of no historic properties affected. The ND SHPO concurred with this determination. There would be no impacts to cultural resources.

7.9 Effect on Biological Resources

Chapter 4 discusses potential impacts to biological resources such as wetlands, vegetation, wildlife, and rare and unique species. There would be no impacts to wetlands and rare or unique species and only minor impacts to vegetation and wildlife.

7.10 Effects of Site on Sensitive Species and Habitats

Federally listed species are not known to occur within or adjacent to the PGS and PGS Phase IV properties and are not likely to be adversely impacted within Williams County. Habitat for listed species is either completely lacking or is located a significant distance from the Project properties; therefore, no impacts are anticipated as a result of the Project.

7.11 Concerns Raised by Agencies

The area in the vicinity of the PGS was reviewed by state and federal agencies as part of this NDPSC permitting process. Agency comments varied according to agency function and jurisdiction, but agency comments generally emphasized a desire to minimize impacts to environmental resources such as wetlands, wildlife, and cultural resources. These environmental resources are addressed in Chapter 4 of this application. Agency response letters for the Project are included in Appendix D.

8.0 QUALIFICATIONS OF CONTRIBUTORS

Name, Role, and Company	Education and Professional Experience
Kevin Solie Environmental Permitting Basin Electric Power Cooperative	B.S. Geological Engineering M.S. Geology 31 years' experience
Benjamin Hertz Power Supply Planning Basin Electric Power Cooperative	B.S. Mechanical Engineering Registered Professional Engineer 15 years' experience
Garrett Schilling Power Supply Planning Basin Electric Power Cooperative	B.S. Electrical Engineering 8 years' experience
Erin Dukart Air Permitting Basin Electric Power Cooperative	B.S. Biology 15 years' experience
Jim Lund Engineering Basin Electric Power Cooperative	M.S. Mechanical Engineering B.S. Mechanical Engineering Registered Professional Engineer 28 Years' Experience
Dana Jensen Engineering Basin Electric Power Cooperative	B.S. Electrical Engineering Registered Professional Engineer 22 Years' Experience
Steve Thornhill Project Manager Burns & McDonnell Engineering Company, Inc.	B.S. Biology M.S. Biology 32 Years' Experience
Mary Hauner-Davis Air Permitting Specialist Burns & McDonnell Engineering Company, Inc.	B.S. Chemistry M.S. Environmental Engineering 22 Years' Experience
Kevyn Johnson Environmental Scientist Burns and McDonnell Engineering Company, Inc.	B.S. Environmental Science 2 Years' Experience
Gabe Weger Senior Acoustic Consultant Burns and McDonnell Engineering Company, Inc.	B.S. Civil and Environmental Engineering 10 Years' Experience
Gage Ruff Environmental Scientist Burns and McDonnell Engineering Company, Inc.	B.G.S Environmental Studies P.S.M Environmental Impact Assessment 1 Year Experience

9.0 REFERENCES

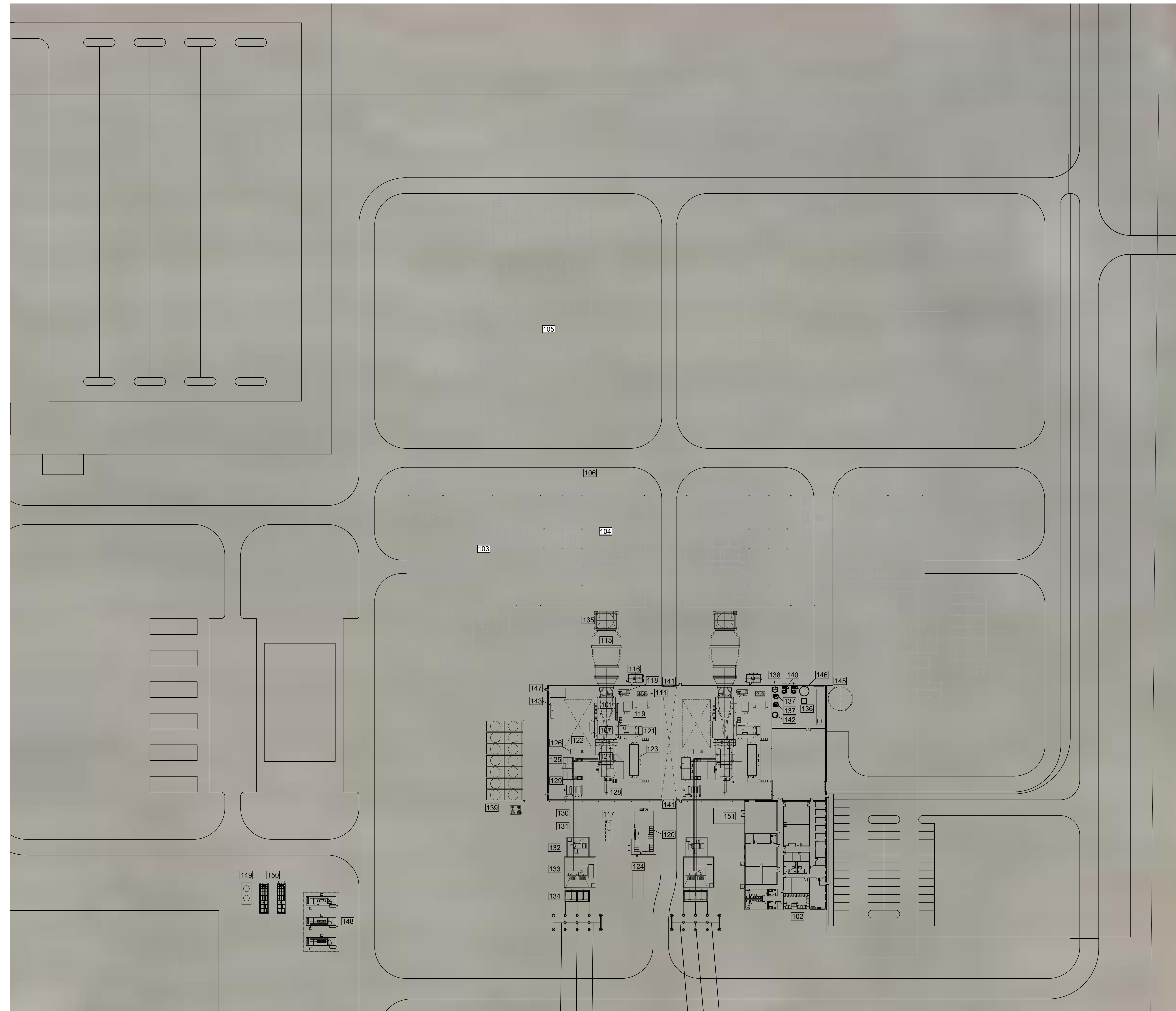
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Appendix A – Site Plan Detail Drawings

EQUIPMENT IDENTIFICATION AND LOCATION LIST	
DWG REF	DESCRIPTION NEW SITE EQUIPMENT
101	UNIT 04 AND 05 GAS TURBINE GENERATOR (CTG)
102	ADMIN CONTROL BLDG
103	FUTURE STEAM TURBINE GENERATOR
104	FUTURE HRSG
105	FUTURE COOLER
106	FUTURE HRSG STACK
107	COMBUSTION TURBINE
111	FINAL SEPARATOR
115	CO CATALYST
116	CEMS ENCLOSURE
117	OIL / WATER SEPARATOR
118	CTG FIRE PROTECTION SKID
119	WASH WATER SKID
120	BOP ELECTRICAL ROOM
121	ACCESSORY MODULE
122	CTG MAINTENANCE AREA
123	PEECC UNIT
124	DIESEL GENERATOR
125	EXCITER & LCI COMPARTMENT
126	DC LINK REACTOR
127	CTG AIR INLET FILTER
128	GENERATOR ROTOR PULL
129	GENERATOR CIRCUIT BREAKER (CTG)
130	EXCITATION TRANSFORMER (CTG)
131	LCI TRANSFORMER (CTG)
132	AUXILIARY TRANSFORMER
133	CTG GSU TRANSFORMER
134	DEAD-END STRUCTURE
135	STACK
136	CO ₂ WATER TREATMENT
137	AIR DRYER SKIDS
138	DRY AIR RECEIVER
139	AIR COOLED CONDENSER (ACC) - COOLING WATER MODULE
140	AIR COMPRESSORS
141	OVERHEAD DOOR
142	WET AIR RECEIVER
143	WASH WATER DRAIN TANK
144	BULK CARBON DIOXIDE STORAGE
145	SERVICE WATER TANK (28' DIA)
146	DEMIN WATER TANK
147	AUXILIARY BOILER
148	FIRED DEWPOINT HEATER AND INLET SCRUBBER
149	FUEL GAS SEPARATOR SKID
150	FUEL GAS REGULATING SKID
151	CTB BUILDING AIR HANDLERS
152	
153	



2-SIMPLE CYCLE SITE

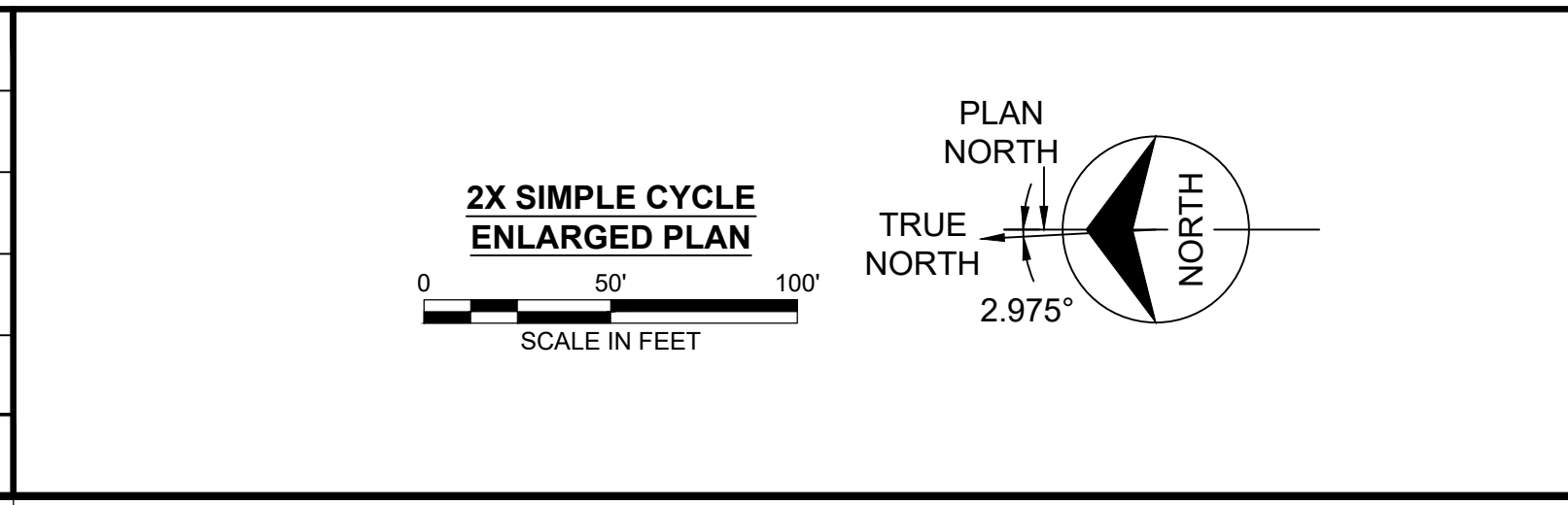


KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION

no.	date	by	ckd	description
C	08/12/22	WRL		REVISED GA PER REDLINED COMMENTS
B	07/07/22	WRL		MODIFICATIONS PER BASIN MEETING
A	06/20/22	WRL		PRELIMINARY

no.	date	by	ckd	description



BURNS MEDONNELL
 9400 WARD PARKWAY
 KANSAS CITY, MO 64114
 816-333-9400

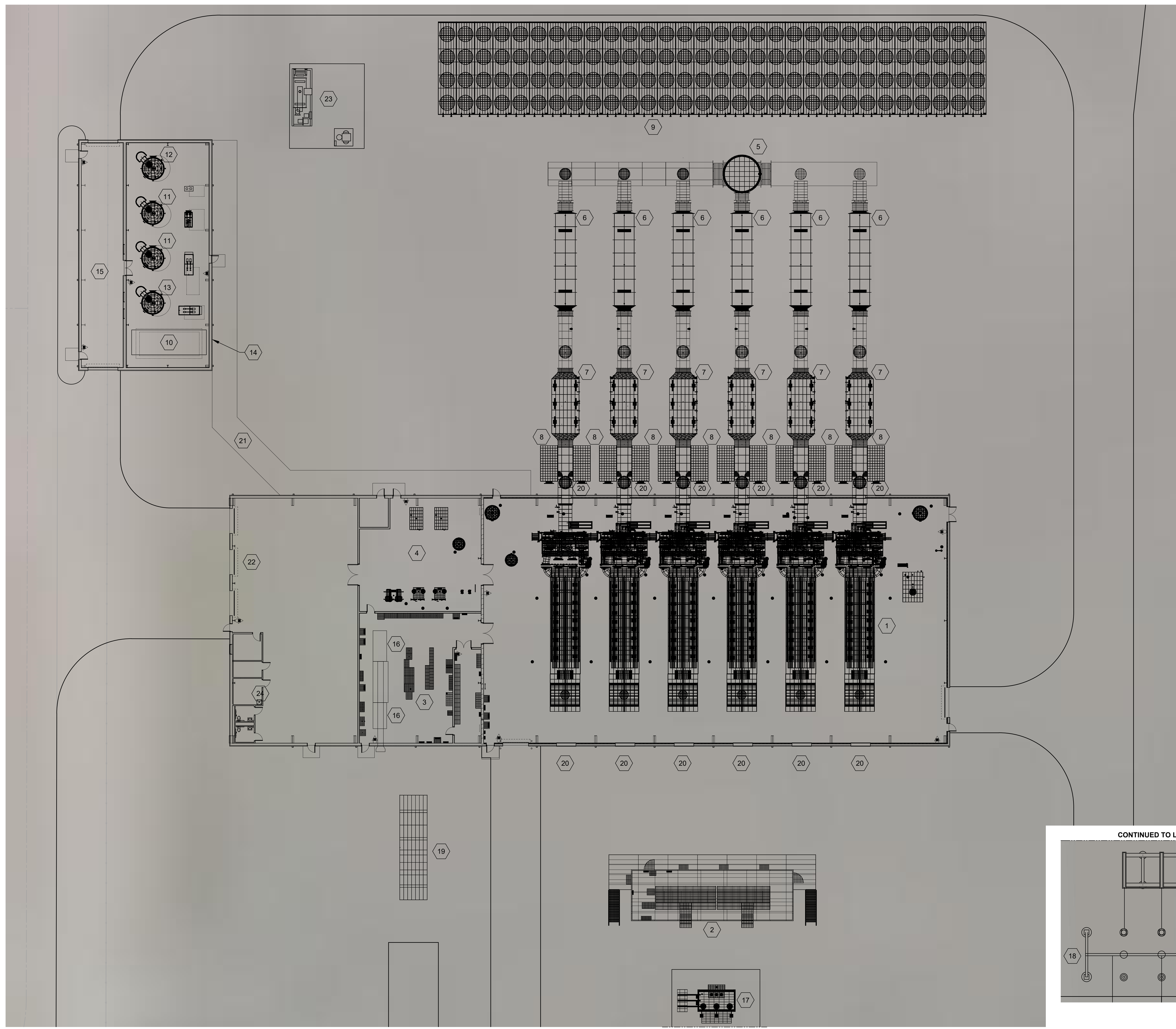
designed: _____ detailed: _____
 W. LESNIAK

BASIN ELECTRIC POWER COOPERATIVE
 A Touchstone Energy® Cooperative

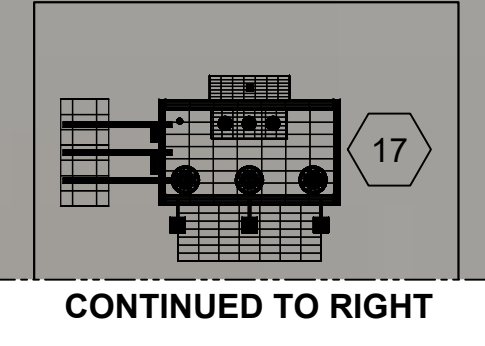
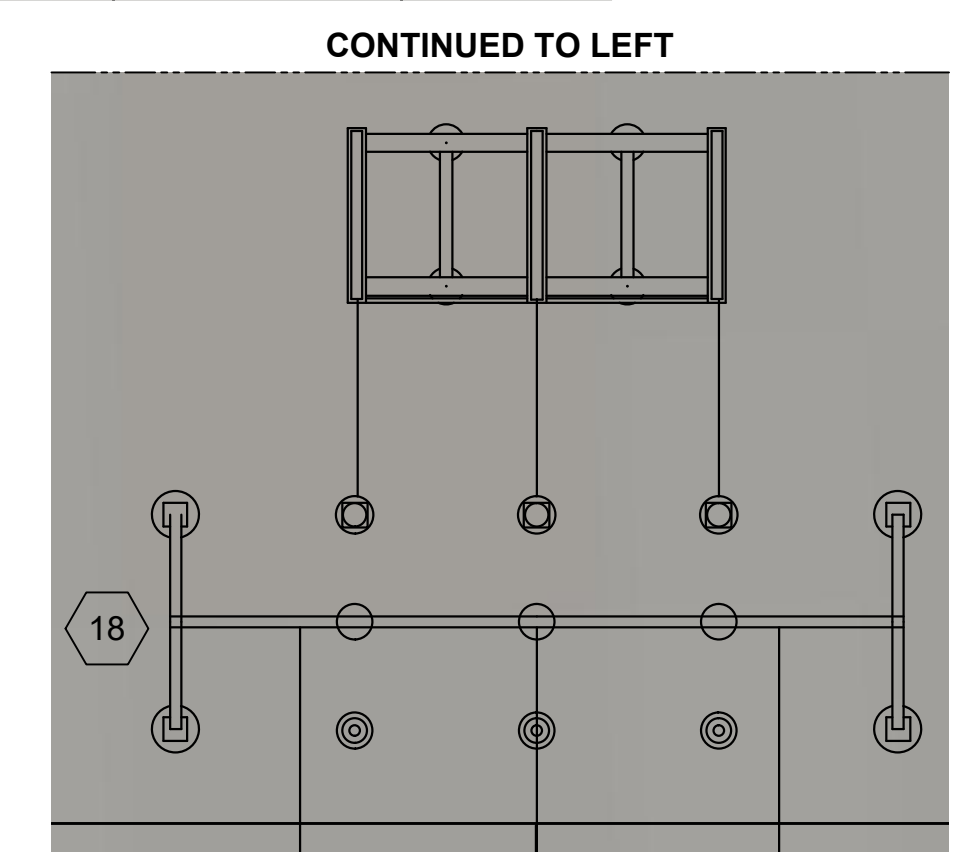
WILLIAMS COUNTY, NORTH DAKOTA

SIMPLE CYCLE AND RICE PLANT UNIT 04 AND 05 ENLARGED PLAN	
project	contract
drawing	rev.
GA101 - C	
sheet	of sheets
file BAS 6X18MW-GA101.DWG	

SITE KEY	
1	ENGINE HALL
2	MEDIUM VOLTAGE BUILDING
3	ELECTRICAL/BATTERY ROOM
4	MECHANICAL ROOM
5	STACK
6	SILENCERS
7	SELECTIVE CATALYTIC REDUCER
8	CHARGE AIR FILTERS
9	RADIATORS
10	UREA TANK
11	NEW LUBE OIL TANK
12	SERVICE LUBE OIL TANK
13	WASTE LUBE OIL TANK
14	TANK CONTAINMENT BUILDING
15	UNLOADING STATION
16	STATION TRANSFORMER
17	GSU TRANSFORMER
18	DEADEND STRUCTURE
19	AUX GENERATOR
20	HVAC UNITS
21	PIPE RACK
22	MAINTENANCE AREA
23	GAS COALESCER
24	CONSUMABLE STORAGE



Scale For Microfitting
Millimeters
Inches



PRELIMINARY - NOT FOR CONSTRUCTION

no.	date	by	ckd	description
C	08/12/22	WRL		REVISED ROAD AT DIESEL GENERATOR
B	07/07/22	WRL		MODIFICATIONS PER BASIN MEETING
A	06/20/22	WRL		PRELIMINARY

PLAN NORTH
TRUE NORTH
2.975°

SCALE IN FEET
0 8' 16' 32'

BURNS MEDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400

designed
detailed
W. LESNIAK

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

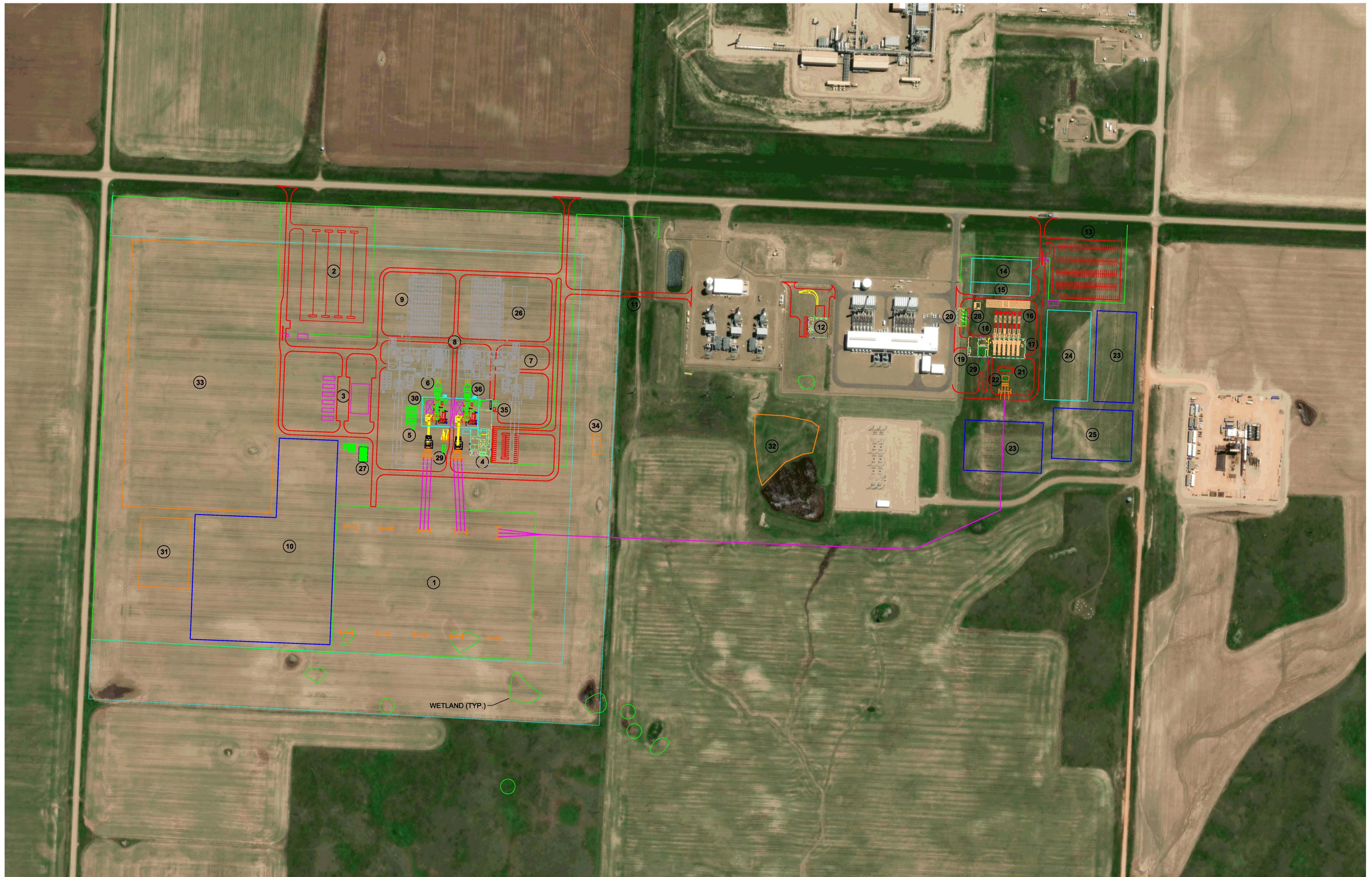
WILLIAMS COUNTY, NORTH DAKOTA

SIMPLE CYCLE AND RICE PLANT
6 x 18MW GAS RECIP ENGINE PLANT
ENLARGED PLAN

project contract
drawing **GA102** rev. **C**
sheet of sheets
file BAS 6X18MW-GA102.DWG

KEY NOTES:

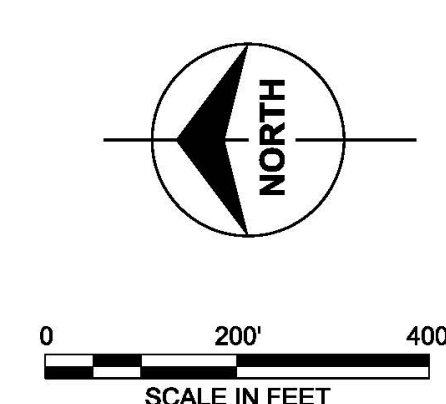
- ① 345KV SUBSTATION
- ② SC CONSTRUCTION PARKING
- ③ SC CONSTRUCTION TRAILERS
- ④ SC ADMIN/CONTROL BLDG
- ⑤ SC COOLER
- ⑥ BYPASS STACK
- ⑦ FUTURE STEAM TURBINE GENERATOR
- ⑧ FUTURE HRSG
- ⑨ FUTURE ACC
- ⑩ SC LAYDOWN
- ⑪ WAREHOUSE/RECIP PLANT ACCESS
- ⑫ WAREHOUSE
- ⑬ RECIP CONSTRUCTION PARKING
- ⑭ RECIP CONSTRUCTION STAFF PARKING
- ⑮ RECIP CONSTRUCTION OFFICE TRAILERS
- ⑯ RECIP COOLER
- ⑰ RECIP ENGINEER HALL
- ⑱ MECHANICAL/LOW VOLTAGE ELEC ROOM
- ⑲ MAINTENANCE
- ⑳ UREA/LUBE OIL UNLOADING/STORAGE
- ㉑ MEDIUM VOLTAGE SWITCHGEAR BLDG
- ㉒ RECIP GSU
- ㉓ RECIP LAYDOWN
- ㉔ ENGINE ASSEMBLY
- ㉕ TSM LAYDOWN YARD
- ㉖ WATER TREATMENT
- ㉗ GAS HEATER
- ㉘ GAS CONDITIONING
- ㉙ EMERGENCY DIESEL GENERATOR
- ㉚ HOT WATER HEATER
- ㉛ CT STORMWATER POND
- ㉜ RECIP STORMWATER POND
- ㉝ EVAP COOLER BLOWDOWN POND
- ㉞ SEPTIC TANK LATERAL FIELD
- ㉟ DEMIN WATER STORAGE TANK
- ㊱ CO CATALYST



A
B
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PRELIMINARY - NOT FOR CONSTRUCTION

no.	date	by	ckd	description



BURNS MEDONNELL
 9400 Ward Parkway
 Kansas City, MO 64114
 816-333-9400
 Burns & McDonnell Engineering Co., Inc.
 LICENSE NO C016

designed: R. SEDLACEK
 detailed: R. SEDLACEK

BASIN ELECTRIC POWER COOPERATIVE
 A Touchstone Energy® Cooperative

WILLIAMS COUNTY, NORTH DAKOTA

SITE PLAN	
project	contract
drawing	rev.
SKCS001	P
sheet	of sheets
file	

Appendix B – Basin Environmental Resolutions

Excerpts from “**RESOLUTIONS ADOPTED BY THE MEMBERS OF BASIN ELECTRIC POWER COOPERATIVE**” dated November 3, 2020.

STATEMENT OF PURPOSE

The Basin Electric Resolutions Committee shall review all resolutions before presentation to the membership at each Annual Meeting, and that all resolutions are subject to change by the membership at the Annual Meeting.

STATEMENT OF IDEALS AND OBJECTIVES

This statement was initially adopted by the Membership at the 1967 Annual Meeting. It has been reviewed and readopted by the Membership at each subsequent Annual Meeting, and was last revised in 2020.

Basin Electric Power Cooperative (the Cooperative) was organized by its member systems in the Missouri River Basin to provide an adequate wholesale supply of dependable, low-cost electric power under democratic member control, consistent with the public interest.

We believe:

1. That an adequate, universally available and safe supply of affordable electricity is a vital ingredient for maintaining and improving the economy and the people's standard of living. We commit to ensuring that our generation and transmission resources are used for the benefit of the Cooperative and its member-owners, now and in the future, through cooperation with our power-supply partners.
2. That a clean and healthy environment, which we all need and enjoy, must be maintained and that the energy industry should minimize impacts to the environment.
3. That the Cooperative is dedicated to supporting a healthy agricultural economy, which is essential to the greater development of rural areas and the nation's general welfare. Furthermore, our commercial and industrial consumer-members are similarly important to cooperative health and should be encouraged.
4. That the Rural Utilities Service program of providing long-term, low-interest loan funds and loan guarantees to rural electric cooperatives is a vital element in providing low cost electricity for the social and economic benefit of people, and is one of the most beneficial programs ever undertaken by our federal government, and that this program should be continued as an important device to foster the economic development of rural areas and to help improve the standard of living of its consumer-owners.
5. That federal hydropower is an important renewable energy resource in the region, providing competitive cost-based rates to the membership. The long-standing statutory and contractual relationship between the membership and the federal government for preference power from these facilities should continue uninterrupted.

6. That the benefits of the development of our national resources should accrue to the people and that the federal government has the principal responsibility for establishing and maintaining programs and policies to protect the public interest in the multipurpose development, conservation, and utilization of our water and power resources.

7. That the Cooperative was established for all its members and the benefits of its operation should accrue to them on a consistent and uniform basis.

8. That people have the right to organize themselves to provide needed goods and services; that cooperatives and their associated entities can provide a yardstick of costs which benefit all consumers; and that they are consistent and help preserve our private enterprise system.

We pledge:

1. To provide our members with an adequate supply of wholesale electric power and high-quality service at the lowest-possible cost by:

a. Supporting use of the federal hydroelectric generating plants so these facilities continue to serve as the backbone of a region-wide power supply system.

b. Encouraging prudent development of clean and efficient power technologies, legislation, and research in the fuels and energy fields as it affects our lives and environment.

c. Operating the Cooperative's energy production facilities in the most efficient, productive, and safe manner possible consistent with moral and legal obligations to protect civilization and the environment.

2. To maintain a competent staff of dedicated employees by establishing policies which provide challenging careers and fair compensation, and which recognize their rights and responsibilities.

3. To conduct the business affairs of the Cooperative as trustees for the interest of the members on a basis of honesty and equity.

4. To help promote area development throughout the Cooperative's service area by working with member systems in the planning and execution of programs to help develop the natural, human, and economic resources within the region, and to encourage conservative and efficient use of electrical energy.

5. To conduct a vigorous communication and education program to promote the Cooperative's policies, plans, and progress among its employees, members, and the general public.

6. Whenever requested and feasible, to aid other rural electric cooperatives, public agencies, and consumer-controlled organizations to obtain adequate wholesale power at the lowest-possible cost.

7. To encourage development of and work with consumer-owned and other organizations having similar objectives.

Resolution 4 - Environment

Basin Electric Power Cooperative (Basin Electric) supports the care and utilization of our natural resources. We believe that is best accomplished through 1) clear and easily interpreted environmental laws and regulations; 2) single, efficient, and predictable permitting processes; and 3) local oversight of compliance that ensures needed interpretations take into account the realities of the environment and local interests are being fairly considered.

Background:

Basin Electric has provided leadership, resources, and efforts in research to advance state-of-the-art conservation measures, including land reclamation and significant development of renewable generation sources from its inception. Basin Electric, its membership, and member-consumers are committed to maintaining a clean and healthy environment for ourselves and our communities. We also recognize the economic realities that dictate both an achievable environmental standard be maintained while providing satisfactory balance between protecting the environment and sustaining the economy.

Appendix C – Cultural Report

INTRODUCTION

Basin Electric Power Cooperative (Basin) intends to expand the existing Pioneer Station located in Williams County, North Dakota. Basin contracted with Metcalf Archaeological Consultants, Inc. (Metcalf) to conduct a Class III intensive pedestrian inventory of a 160-acre block in the northeast ¼ of Section 20, T. 155N, R. 103W. Basin also intends to expand the Pioneer Station south of this 160-acre block into an 120 acre area surveyed by Metcalf in 2012, MS #12997, under the name “*Basin Electric Power Cooperative’s Pioneer Station: A Class III Cultural Resource Inventory in Williams County, North Dakota*”, ND SHPO Ref: 12-0698. The project area is located in the northeast ¼ of Section 20, T. 155N, R. 103W.

Metcalf personnel included Principal Investigator Daniel Salas, Crew Chief Kimberly Troendle, and Archaeological Technicians Alaina Schurr and Connor Amsk. The inventory was conducted on May 24 and 25, 2022.

THE UNDERTAKING

The proposed project includes the addition of six, 18-MW natural gas reciprocating internal combustion engines (RICE) that will vent to one combined stack, as well as two F-Class natural gas-fired simple-cycle combustion turbines. The additional generation facilities will be constructed on existing PGS lands west of the City of Williston, North Dakota and adjacent lands recently acquired by Basin. In addition to the additional combustion turbine and RICE facilities, an electrical switchyard, storm water retention ponds, temporary laydown areas, and temporary construction parking are included as part of the Project.

METHODS

Requirements for a Class III Cultural Resources Inventory include a Class I Literature Review, Class III field survey and a Class III report. Prior to mobilization, Metcalf field personnel reviewed the Class I Literature Review and utilized Project shapefiles to locate any previously recorded sites, site leads, or points of interest likely to be encountered within the Project area.

The site files search revealed that fifteen cultural resources have been recorded in the search area (Table 1). These consist of five precontact sites, four precontact site leads, one precontact isolated find, three historic sites, one historic isolated find, and one architectural resource. None of these resources are recommended eligible or are listed on the NRHP. Two previously recorded resources overlap with the survey area: 32Wix154 is a precontact site lead recorded by Benson in 1980 as a cultural material scatter. The resource is mentioned in the Hecker Manuscript (March 15, 1938), and is shown on the map of Williams County, (Map 1). Isolated find 32Wix676 consists of a single porcellanite biface recorded in 2014.

The manuscript files search revealed that 17 cultural resource projects have been conducted in the search area (Table 2). These projects consist of 13 related to oil and gas development, two related to water lines, one mining project, and one electrical transmission project. Of these, two projects partially overlap the current study area; MS#15915 and MS# 15773. Both are inventories for the Vantage West Spur Pipeline.

FIELD METHODS

The inventory conformed to *North Dakota's SHPO Guidelines for Cultural Resource Inventories* (SHSND 2020). The archaeologists employed a pedestrian transect methodology with transects spaced no more than 15 meters apart. This methodology was used to inventory the entire undertaking's study area.

During the inventory, Metcalf used handheld Trimble R1 GPS units to map survey area boundaries, took representative digital photographs, and maintained detailed field notes. When encountering a cultural resource, Metcalf photographed the resource(s), recorded measurements, took detailed notes, completed a North Dakota Cultural Resources Survey (NDCRS) form, created a field sketch map, and recorded information via a handheld Trimble R1 GPS unit. Copies of all photos, NDCRS forms, maps, GPS data, and field notes are on file at the Metcalf Bismarck office.

RESULTS

No cultural resources were encountered during the current survey. No evidence was found for either of the previously recorded sites: 32Wix154 and 32Wix676 (detailed above). Metcalf recommended a finding of *No Significant Sites Affected* (North Dakota Century Code, 49-22-09) for the proposed project as surveyed, mapped, and documented herein

A cultural resources report was submitted to the SHSND for review, on June 30, 2022.

Table 1 **Recorded Sites and Avoidance Strategies**

Smith #	Site Category	Site Type	Eligibility for NRHP	Avoidance Strategies
32WIX154	Precontact	Cultural material scatter	Unevaluated	No evidence of the site in the project area, No avoidance
32WIX676	Precontact	Isolated find	Unevaluated	No evidence of the site in the project area, No avoidance

REFERENCES

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2000 *The Face of North Dakota* 3rd Edition. Education Series 26. North Dakota Geological Survey. Bismarck, North Dakota.

Hecker, Thad.

1938 *Williams County*. North Dakota Historical Society, Bismarck, North Dakota.

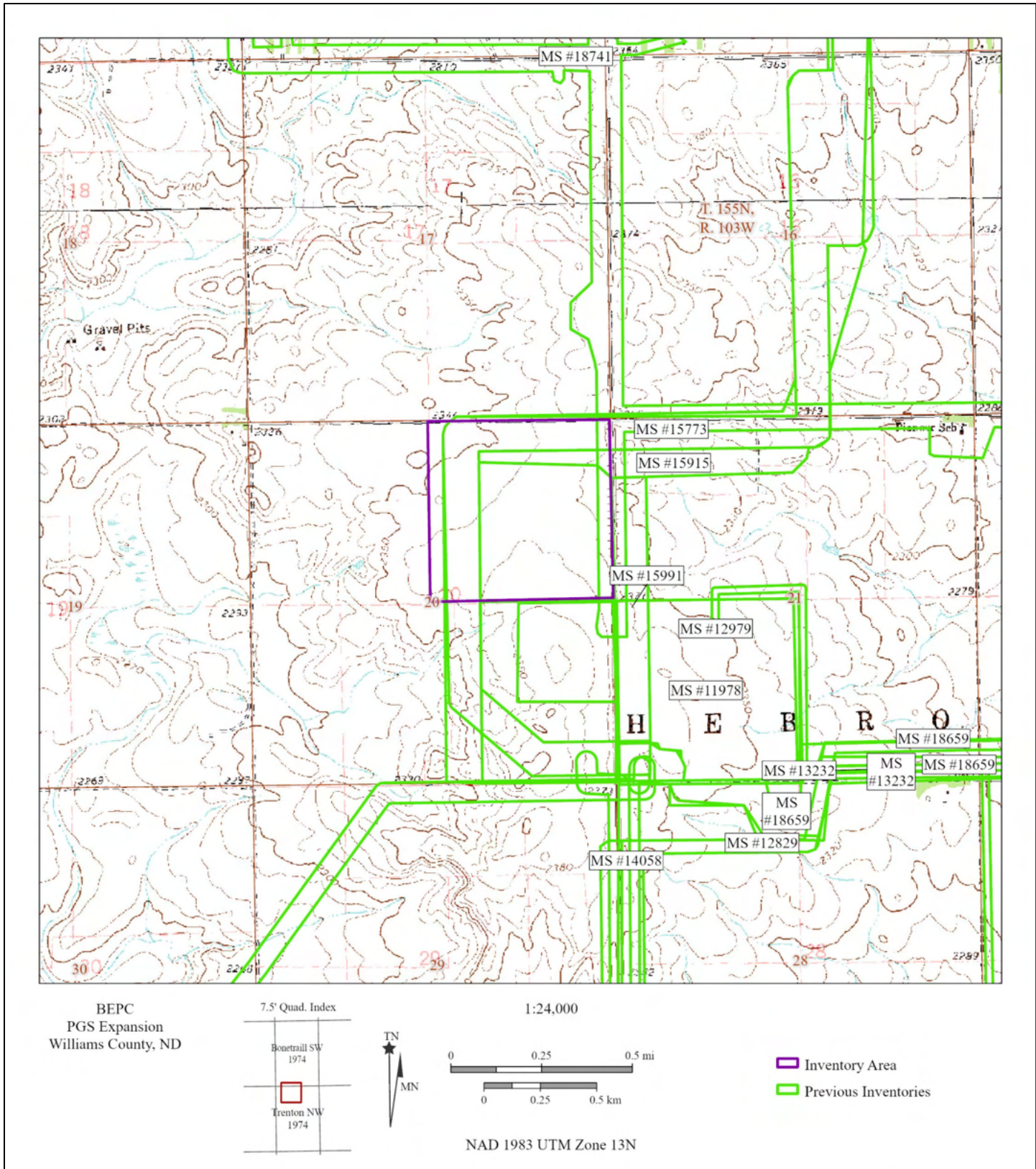
Kinsey, M.

2012 *Basin Electric Power Cooperative's Pioneer Station: A Class III Cultural Resource Inventory in Williams County, North Dakota*

State Historical Society of North Dakota (SHSND)

2016 *The North Dakota Comprehensive Plan for Historic Preservation: Archeological Component*. Electronic document, http://history.nd.gov/hp/stateplan_arch.html, accessed May 2022.

2020 *North Dakota SHPO Guidelines Manual for Cultural Resource Inventory Projects*. Electronic document (Revised Edition: updated 2020), <http://history.nd.gov/hp/PDFinfo/North-Dakota-SHPO-Guidelines-Manual-for-Cultural-Resource-Inventory-Projects.pdf>, accessed May 2022.



Map 1: The location of the project area and previous surveys depicted on the USGS 7.5' Trenton NW (1974) and Bonetrail SW (1974) quadrangle maps.

Appendix D – Agency Correspondence



7/7/22

Re:

Basin Electric Power Cooperative
Pioneer Generation Station Expansion
Williams County, North Dakota

Dear:

Basin Electric Power Cooperative (Basin), with assistance from Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell), is preparing an Application to the North Dakota Public Service Commission (ND PSC) for a Certificate of Site Compatibility for additional generation facilities (Project) at the Pioneer Generating Station (PGS) in Williams County, North Dakota. The proposed Project includes the addition of six, 18-MW natural gas reciprocating internal combustion engines (RICE) that will vent to one combined stack, as well as two F-Class natural gas-fired simple-cycle combustion turbines. The additional generation facilities will be constructed on existing PGS lands west of the City of Williston, North Dakota and adjacent lands recently acquired by Basin. A map showing the location of the Project site and vicinity is included.

In addition to the additional combustion turbine and RICE facilities, an electrical switchyard, stormwater retention ponds, temporary laydown areas, and temporary construction parking are included as part of the Project. The RICE will also utilize selective catalytic reduction (SCR) for NOX control, requiring on-site storage of ammonia or urea. Any additional facilities will be permitted, as appropriate, separately, once the Project site has been determined and approved by the ND PSC. Basin anticipates that existing natural gas and electrical transmission facilities serving the PGS will be sufficient for the additional generation needs.

The Project will apply for a Permit to Construct air construction permit for the Project from the North Dakota Department of Environmental Quality as well as a modification to the existing Title V air operating permit for PGS, prior to operation of the additional facilities. Basin Electric will also obtain the appropriate approvals from Williams County and other applicable regulatory agencies.

At this time, Burns & McDonnell is requesting your input to identify any issues or concerns your agency might have with respect to the proposed project. Input from your agency regarding natural or social resources in the vicinity of the proposed project will be considered in the Certificate of Site Compatibility Application. Resources to be considered may include:



7/7/22
Page 2

- Land use
- Public lands (national and state parks, grasslands, refuges, school lands)
- Conservation easements (CRP, WRP)
- Floodplains, water quality, and wetlands
- Soils and geology
- Biological resources (general wildlife, vegetation and fisheries; threatened and endangered species; migratory birds; invasive species)
- Cultural resources (historic and archaeological)
- Aesthetics
- Air quality
- Socioeconomics and environmental justice
- Noise
- Transportation and roads (airport and roadway expansions, construction, operations and maintenance)
- Human health and safety (electromagnetic fields, hazardous materials, environmental risk management)

Please send your comments to me at gtruff@burnsmcd.com or Gage Ruff, Burns & McDonnell, 9400 Ward Parkway, Kansas City, MO 64114.

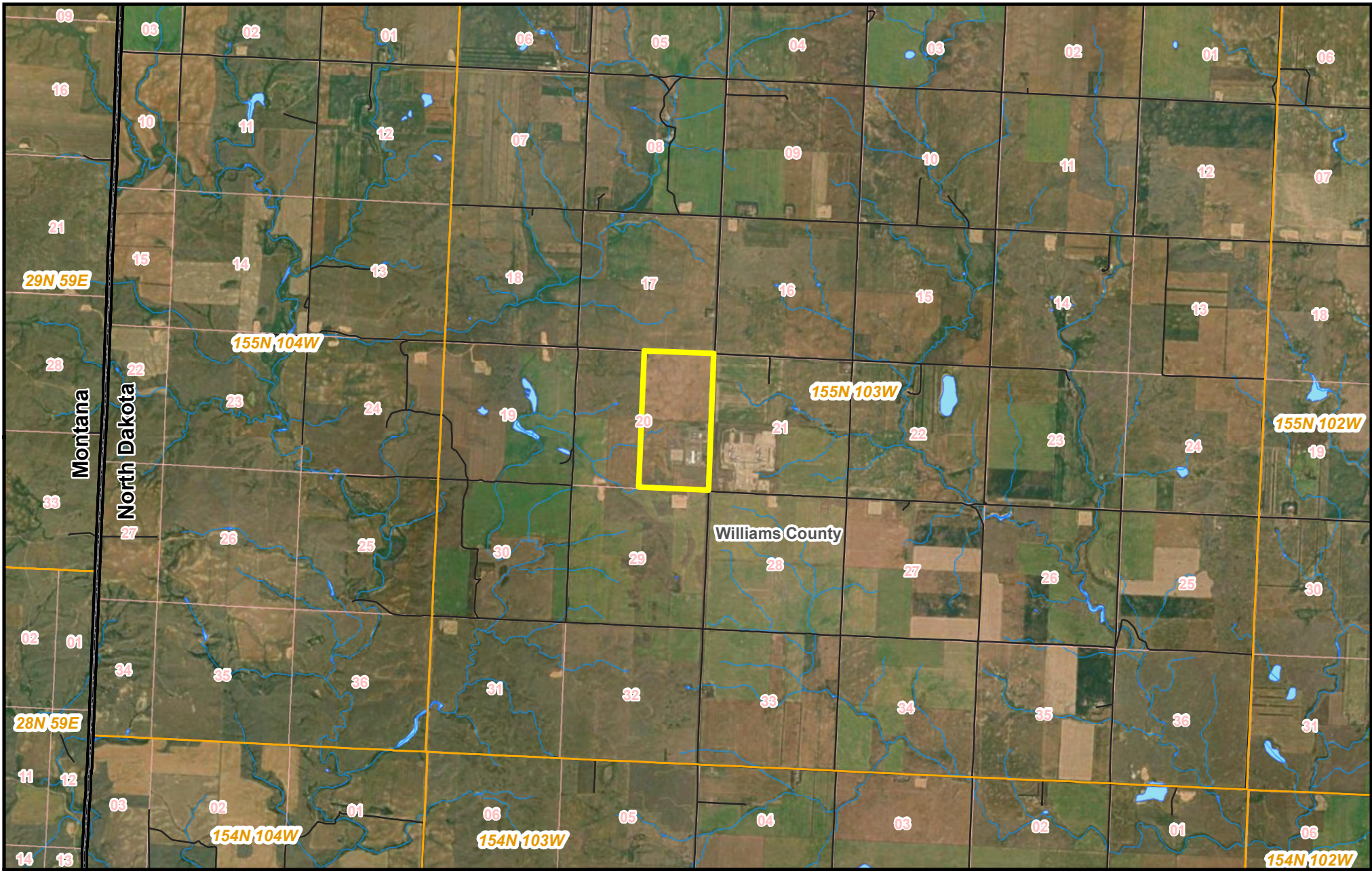
If you have any questions regarding the project or need additional information, please contact me at 816-226-5692. We would appreciate your response by Aug 12, 2022. Thank you for your time and assistance in providing this information.

Sincerely,

Stephen G. Thornhill, LEED AP
Project Manager

Enclosure Attachment: Site Map

cc: Kevin Solie, Senior Environmental Compliance Administrator, Basin Electric Power Cooperative



Legend

Project Site	Township	Waterbody
County Boundary	Local Road	
State Boundary	Section	
	Stream	

0 0.5 1
Miles

North Dakota

**BURNS
MCDONNELL**

Basin Electric
 Power Cooperative
 Pioneer Generation Station
 Project Vicinity Map
 Williams County, ND

Agency Contacts
Pioneer Generation Station Phase IV
October 2022

Title	First name	Last name	Position	Company	Address 1	Address 2	City	State	Zip
Federal									
Mr.	Drew	Becker	Deputy Field Supervisor, North Dakota and South Dakota	U.S. Fish and Wildlife Service	3425 Miriam Avenue		Bismarck	ND	58501-7926
			Regulatory Program Manager	U.S. Army Corps of Engineers, Omaha District, North Dakota Regulatory Office	3319 University Drive		Bismarck	ND	58504
Mr.	Lloyd	Austin, III	Secretary of Defense	U.S. Department of Defense	1400 Defense Pentagon		Washington	DC	20301-1000
				Military Aviation and Installation Assurance Siting Clearinghouse	3400 Defense Pentagon, Room 5C646		Washington	DC	20301-3400
Ms.	Tracy	Stone-Manning	Director	Federal Bureau of Land Management	1849 C Street NW		Washington	DC	20240
State									
Mr.	Dave	Anderson	Assistant Manager, Bismarck Office	Federal Aviation Administration-Great Lakes Region	2301 University Dr, Bldg 23B		Bismarck	ND	58504
Ms.	Mary	Podoll	State Conservationist, North Dakota	Natural Resources Conservation Service	220 E. Rosser Ave., Room		Bismarck	ND	58501
Dr.	Kim	Kenville	Chair	North Dakota Aeronautics Commission	2301 University Drive, Building 22		Bismarck	ND	58504
Mr.	Jonathan	Kelsch	Division Director	North Dakota Department of Water Resources	900 East 900 East Boulevard Avenue		Bismarck	ND	58505
Mr.	Drew	Wrigley	Attorney General	North Dakota Attorney General's Office	600 E. Boulevard Ave Dept. 125		Bismarck	ND	58505
Mr.	Doug	Goehring	Agriculture Commissioner	North Dakota Department of Agriculture	600 E. Boulevard Avenue, Dept. 602		Bismarck	ND	58505
Mr.	Wayde	Sick	Director and Executive Officer	North Dakota Department of Career and Technical Education	600 East Boulevard Avenue	Dept 270	Bismarck	ND	58505
Mr.	James	Leiman	Commissioner	North Dakota Department of Commerce	Division of Community Services-Century Center	1600 E. Century Avenue, Suite 2	Bismarck	ND	58503
Mr.	Dave	Glatt	Director	North Dakota Department of Environmental Quality	918 East Divide Avenue		Bismarck	ND	58501
Dr.	Nizar	Wehbi	State Health Officer	North Dakota Department of Health	600 east boulevard Ave	Dept 301	Bismarck	ND	58505
Mr.	Christopher	Jones	Executive Director	North Dakota Department of Human Services	600 East Boulevard Avenue	Dept 325	Bismarck	ND	58505
Mr.	Richard	Owings	Energy Infrastructure and Impact Office	North Dakota Department of Trust Lands	1707 N 9th ST		Bismarck	ND	58501
Mr.	Joseph	Heringer	Commissioner of University and School Lands	North Dakota Department of Trust Lands	1707 N 9th ST		Bismarck	ND	58501
Mr.	Tom	Claeys	State Forester	North Dakota Forest Service	307 1st Street East		Botineau	ND	58318
Mr.	Jeb	Willimas	Director	North Dakota Game and Fish Department	100 N. Bismarck Expressway		Bismarck	ND	58501
Mr.	Kent	Luttschwager	Section Leader, Wildlife Resource Management	North Dakota Game and Fish Department	Williston Office	5303 Front ST W	Williston	ND	58801
			Director	North Dakota Geological Survey	1016 E. Calgary Ave.	600 East Boulevard Avenue	Bismarck	ND	58505
Mr.	Scott	Davis	Executive Director	North Dakota Indian Affairs Commission	1st Floor Judicial Wing-Room 117	600 East Boulevard Avenue	Bismarck	ND	58505
Mr.	Lynn	Helms	Director of Mineral Resources	North Dakota Industrial Commission	Department of Mineral Resources	600 East Boulevard Avenue,	Bismarck	ND	58505
Mr.	Pat	Bertagnolli	Executive Director	North Dakota Job Service	1601 E Century Ave		Bismarck	ND	58503
Ms.	Erica	Thunder	Commissioner of Labor	North Dakota Labor and Human Rights	600 East Boulevard Avenue	Dept 406	Bismarck	ND	58505
Mr.	Doug	Burgum	Governor	North Dakota Office of the Governor	600 East Boulevard Avenue		Bismarck	ND	58505
Mr.	Cody	Schulz	Director	North Dakota Parks and Recreation Department	604 E Boulevard Ave, Dept. 750		Bismarck	ND	58505
Mr.	Justin	Kringstad	Director	North Dakota Pipeline Authority	State Capitol 14th Floor	600 E. Boulevard Ave. Dept. 405	Bismarck	ND	58505
Mr.	Bill	Peterson	Director	North Dakota State Historical Society	612 East Boulevard Ave.		Bismarck	ND	58506
Mr.	Wes	Frederick	Vice Chair, Area V	North Dakota State Soil Conservation Committee	6667 43rd Avenue		Flasher	ND	58535
Mr.	Steve	Martens	President	State Historical Society of North Dakota	612 East Boulevard Ave.		Bismarck	ND	58506
Ms.	Jennifer	Turnbow	Deputy Director for Planning	North Dakota Department of Transportation		608 East Boulevard Avenue	Bismarck	ND	58505
Mr.	John	Weeda	Executive Director	North Dakota Transmission Authority	State Capitol	600 E. Boulevard Ave. Dept. 405	Bismarck	ND	58502
Mr.	John	Paczkowski	State Engineer	North Dakota Water Commission	900 East Boulevard		Bismarck	ND	58505
Mr.	Michael	Lutton	Major General	Twentieth Air Force	6005 5th Cavalry Ave		FE Warren AFB	WY	82005
Mr.	Cy	Munos	Cable Affairs Officer	Twentieth Air Force - 91st Missile Wing (Minot AFB)	300 minuteman Dr		Minot Afb	ND	58705
Mr.	Daniel	Lewis	PE Chief Missile Engineering	Minot Air Force Base	445 Peacekeeper Pl		Minot Afb	ND	58705
Local									
			Deputy Base Civil Engineer	Grand Forks Air Force Base	525 Tuskegee Airmen Blvd.		Grand Forks AFB	ND	58205
Mr.	Beau	Anderson	District 1: County Commissioner	Williams County	5045 153rd Ave NW		Williston	ND	58801
Ms.	Beth	Innis	County Auditor	Williams County	206 E Broadway		Williston	ND	58802
Mr.	Kameron	Hymr	Director of Development Services	Willimas County	Williams County Administration Building, 2nd Floor	207 East Broadway	Williston	ND	58801
Mr.	Kyle	Christianson	Mayor	City of Parshall	Williston, ND 58801		Parshall	ND	58770



July 18, 2022

Stephen G. Thornhill
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

ND SHPO Ref.: 22-0264 Basin Electric Pioneer Generating Station in portions of [T155N R103W Section 20] in Williams County, North Dakota

Dear Stephen,

We reviewed ND SHPO Ref.: 22-0264 Basin Electric Pioneer Generating Station in portions of [T155N R103W Section 20] in Williams County, North Dakota. A Class III (pedestrian survey) of cultural resources in the project area is needed.

Thank you for the opportunity to review this project to date. We look forward to review of the Class III survey for archaeological resources. If you have any questions please contact Lorna Meidinger, Historic Preservation Specialist at (701) 328-2089 or lbmeidinger@nd.gov

Sincerely,

for William D. Peterson PhD
State Historic Preservation Officer
(North Dakota)

22-0264



September 6, 2022

Kevin Solie
Basin Electric Power Cooperative
1717 E Interstate Ave
Bismarck, ND 58503

ND SHPO Ref.: 22-6217 “Basin Electric Power Cooperative 's Pioneer Expansion Project: A Class III Cultural Resource Inventory in Williams County, North Dakota” in portions of [T155N R103W Section 20] MAC 2022.ND.039

Dear Kevin,

We reviewed ND SHPO Ref.: 22-6217 “Basin Electric Power Cooperative 's Pioneer Expansion Project: A Class III Cultural Resource Inventory in Williams County, North Dakota” in portions of [T155N R103W Section 20] MAC 2022.ND.039 and find the report by Daan Meens acceptable. We concur with a determination of “No Historic Properties Affected” for this project provided it takes place in the location and in the manner described in the documentation and provided all borrow comes from an approved source.

Thank you for the opportunity to review this project. Please include the ND SHPO Reference number listed above in further correspondence for this specific project. If you have any questions please contact Lisa Steckler, Historic Preservation Specialist at (701) 328-3577 or lsteckler@nd.gov

Sincerely,

for William D. Peterson, PhD
State Historic Preservation Officer
(North Dakota)

22-6217

July 19, 2022

Stephen Thornhill, LEED AP
Project Manager
Burns & McDonnell
9400 Ward Parkway,
Kansas City, MO 64114

Re: Basin Electric Power Cooperative Pioneer Generation Station Expansion in Williams County

Dear Mr. Thornhill:

The North Dakota Department of Environmental Quality has reviewed the information concerning the above-referenced project received at the department on July 11, 2022 with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.
2. Projects disturbing one or more acres are required to have a permit to discharge stormwater runoff until the site is stabilized by the reestablishment of vegetation or other permanent cover. Further information on the stormwater permit may be obtained from the department's website or by calling the Division of Water Quality (701-328-5210). Also, cities may impose additional requirements and/or specific best management practices for construction affecting their storm drainage system. Check with the local officials to be sure any local stormwater management considerations are addressed.

Basin Electric Power Cooperative must notify the North Dakota Pollutant Discharge Elimination System program of any planned changes to Pioneer Generating Station which may result in discharging new or different pollutants, or an increased amount of pollutants. This includes facility expansions, production increases and process modifications. Changes which result in a facility being designated a "new source" as determined in 40 CFR 122.29(b) must be reported, also.

3. All solid waste materials must be managed and transported in accordance with the state's solid and hazardous waste rules. Appropriate efforts to reduce, reuse and/or recycle waste materials

918 East Divide Avenue | Bismarck ND 58501-1947 | Fax 701-328-5200 | deq.nd.gov

Director's Office
701-328-5150

Division of
Air Quality
701-328-5188

Division of
Municipal Facilities
701-328-5211

Division of
Waste Management
701-328-5166

Division of
Water Quality
701-328-5210

Division of Chemistry
701-328-6140
2635 East Main Ave
Bismarck ND 58501

are strongly encouraged. As appropriate, segregation of inert waste from non-inert waste can generally reduce the cost of waste management. Further information on waste management and recycling is available from the department's Division of Waste Management at (701) 328-5166.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

A handwritten signature in black ink, appearing to read "L. David Glatt". The signature is written in a cursive, somewhat stylized font.

L. David Glatt, P.E., Director
North Dakota Department of Environmental Quality

LDG:csc
Attach.

Construction and Environmental Disturbance Requirements

The following are the minimum requirements of the North Dakota Department of Environmental Quality for projects that involve construction and environmental disturbance in or near waters of the State of North Dakota. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect waters of the state. All projects must be constructed to minimize the loss of soil, vegetative cover, and pollutants (chemical or biological) from a site.

Soils

Prevent the erosion and sediment loss using erosion and sediment controls. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, and land resources must be prohibited against compaction, vegetation loss and unnecessary damage.

Surface Waters

All construction must be managed to minimize impacts to aquatic systems. Follow safe storage and handling procedures to prevent the contamination of water from fuel spills, lubricants, and chemicals. Stream bank and stream bed disturbances must be contained to minimize silt movement, nutrient upsurges, plant dislocations, and any physical chemicals, or biological disruption. The use of pesticides or herbicides in or near surface waters is allowed under the department's pesticide application permit with notification to the department.

Fill Material

Any fill material placed below the ordinary high-water mark must be free of topsoil, decomposable materials, and persistent synthetic organic compounds; including, but not limited to, asphalt, tires, treated lumber, and construction debris. The department may require testing of fill material. All temporary fills must be removed. Debris and solid waste must be properly disposed or recycled. Impacted areas must be restored to near original condition.

Ruff, Gage T

From: Schumacher, John D. <jdschumacher@nd.gov>
Sent: Friday, August 5, 2022 4:17 PM
To: Ruff, Gage T
Subject: Pioneer Generation Station Expansion Project

Stephen G. Thornhill, LEED AP
Project Manager
Burns & McDonnell

RE: Basin Electric Power Cooperative – Pioneer Generation Station Expansion Project

This project includes the addition of six, 18-MW natural gas reciprocating internal combustion engines that will vent to one combined stack, as well as two F-Class natural gas-fired simple-cycle combustion turbines, to be constructed on existing Pioneer Generation Station lands west of the City of Williston in Williams County, North Dakota. The North Dakota Game and Fish Department has reviewed this project for wildlife concerns.

The National Wetland Inventory indicates various wetlands within or adjacent to the proposed project site. Steps should be taken to protect any wetlands that cannot be avoided, no alterations should be made to existing drainage patterns, and above-ground appurtenances should not be placed in wetland areas. Unavoidable destruction or degradation of wetland acres should be mitigated in kind.

We do not believe this project will have significant adverse effects on wildlife or wildlife habitat provided these recommendations are implemented where appropriate during project construction.

J.D. Schumacher

Resource Biologist

701.328.6321 • jdschumacher@nd.gov • gf.nd.gov

NORTH
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Natural Resources
Conservation Service

Bismarck State Office
PO Box 1458
Bismarck, ND
58502-1458

Voice 701.530.2000
Fax 855-813-7556

July 19, 2022

Gage Ruff
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Dear Mr. Ruff:

The Natural Resources Conservation Service (NRCS) has reviewed your letter dated July 7, 2022 concerning Basin Electric Power Cooperative's construction of multiple gas fired electrical generating facilities with associated infrastructure in Williams County, North Dakota.

NRCS has a major responsibility with the Farmland Protection Policy Act (FPPA) in documenting conversion of farmland (i.e., Prime, Statewide Importance and/or Local Importance) to non-agricultural use when federal funds are utilized. It appears your proposed project is not supported by federal funding; therefore, FPPA does not apply and no further action is needed.

Wetlands

The Wetland Conservation Provisions of the 1985 Food Security Act, as amended, provide that if a USDA participant converts a wetland for the purpose or to have the effect of making agricultural production possible, loss of USDA benefits could occur. NRCS has developed the following guidelines for the installation of permanent structures where wetlands occur. If these guidelines are followed the impacts to the wetland will be considered minimal allowing USDA participants to continue to receive USDA benefits. Following are the requirements:

- Disturbance to the wetland must be temporary.
- No drainage of wetland is allowed (temporary or permanent).
- Mechanized landscaping necessary for installation is kept to a minimum and preconstruction contours are maintained.
- Temporary side cast material must be placed in such a manner not to be dispersed in the wetland.
- All trenches must be backfilled to the original wetland bottom elevation.

NRCS recommends that impacts to wetlands be avoided.

Potentially impacted USDA participants that wish to request a certified wetland determination can be directed to the USDA Farm Service Agency (FSA) to request a Highly Erodible Land Conservation (HELC) and Wetland Conservation (WC) Certification (AD-1026) or they may contact Darrick Ystaas, Designated Conservationist, NRCS, Minot, North Dakota at (701) 721-4805 for information about conservation compliance provisions related to the project.

If you have additional questions pertaining to FPPA, please contact Wade Bott, State Soil Scientist, NRCS, Bismarck, North Dakota, at (701) 530-2021 or email wade.bott@usda.gov.

WADE BOTT

Digitally signed by WADE BOTT
Date: 2022.07.19 13:19:15 -05'00'

WADE D. BOTT
State Soil Scientist

Ruff, Gage T

From: Samantha Miller <SamanthaM@co.williams.nd.us>
Sent: Friday, July 8, 2022 4:01 PM
To: Ruff, Gage T
Subject: Basin Electric Power Coop- Response to Letter

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Gage,

I have a few questions regarding the letter titled "Basin Electric Cooperative Pioneer Generation Station Expansion Williams County, North Dakota". The project site will be located in Section 20, T155N, R101W. We would like to set up a meeting with someone from this team to discuss uses and potential effects of this project. Please fill out this pre-application form and submit to our Planning email at planning@co.william.nd.us.

Thanks,
Sam

Sam Miller

Planning Official
Planning and Zoning Division
Development Services Department
206 E Broadway, Williston, ND 58801
701.577.4565 | www.williamsnd.com





July 15, 2022

Gage Ruff
Burns and McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Re: Basin Electric Power Cooperative, Pioneer Generation Station Expansion, Williams County

Dear Mr. Ruff,

The North Dakota Parks and Recreation Department (NDPRD) has reviewed the above-referenced Basin Electric Power Cooperative, Pioneer Generation Station Expansion project in Williams County, North Dakota.

NDPRD's scope of authority and expertise covers properties that NDPRD owns, leases, or manages; properties protected under Section 6(f) of the Land and Water Conservation Fund (LWCF); rare plants, and ecological communities established through the Natural Heritage Program.

The project does not appear to affect properties NDPRD owns, leases, or manages.

The project does not appear to affect any properties protected under Section 6(f) of the LWCF.

A North Dakota Natural Heritage biological conservation database query determines if any current or historical plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, no known plant and animal species of concern or significant ecological communities were documented within or immediately adjacent to the project site.

We appreciate your commitment to rare plant, animal, and ecological community conservation, management, and inter-agency cooperation. For additional information, please contact me at 701-328-5370, 701-220-3377 (cell), or kgduttenhefner@nd.gov.

Thank you for the opportunity to comment on the proposed project.

Sincerely,

A handwritten signature in cursive script that reads "Kathy Duttenhefner".

Kathy Duttenhefner, Chief
Natural Resources Division

604 E Boulevard Ave Dept. 750 | Bismarck, ND 58505

PHONE: 701-328-5357 | FAX: 701-328-5363 | EMAIL: parkrec@nd.gov | WEBSITE: www.parkrec.nd.gov

Ruff, Gage T

From: Splichal, Chelsie J <csplichal@blm.gov>
Sent: Monday, July 11, 2022 2:45 PM
To: Ruff, Gage T
Subject: Basin Electric Power Cooperative PGS Expansion

Follow Up Flag: Follow up
Flag Status: Flagged

Gage,

Upon review of the proposed Basin Electric Power Cooperative, Pioneer Generation Station Expansion Project, in Williams County, North Dakota the Bureau of Land Management (BLM) has no concerns regarding the proposal, at this time. It does not appear to involve BLM land, but it could potentially impact other Federal or State Lands, in which those agencies may wish to respond.

If you have any questions, you may contact me at the numbers below, or the North Dakota Field Office Manager, Loren Wickstrom at 701-227-7713.

Thank you

Chelsie McKenzie (Splichal)
Realty Specialist
Bureau of Land Management
North Dakota Field Office
99 23rd Avenue West, Suite A
Dickinson, ND 58601
Office: 701-227-7702
Cell: 701-502-1271

Ruff, Gage T

From: Kevin Ploof <Kevin.Ploof@ackerman-estvold.com>
Sent: Thursday, July 14, 2022 8:51 AM
To: Ruff, Gage T
Cc: Ken ; Beth M. Innis; tanner; Drew (drewp@wdwnd.com); Bill; Buckshot (rockyhills@hotmail.com)
Subject: Pioneer Generation Station Expansion SOV Letter Response

Follow Up Flag: Follow up
Flag Status: Flagged

Mr. Ruff,

This email is in reference to the Solicitation of Views (SOV) letter received by Beth Innis, Williams County Auditor, regarding the proposed expansion of the Pioneer Generation Station in Williams County, ND.

The Williams County Water Resource District Board, under agreement with the Board of County Commissioners, is the designated stormwater management plan review authority. The current Pioneer Generation Station SWMP was approved in 2016. If these improvements will add impervious surfaces to the facility, an amendment to the existing SWMP or a new revised SWMP would be required to be submitted to the WCWRD Board for approval.

The Williams County Water Resource District Board's Rules and Regulations along with other important stormwater related information is located on the Williams County website.

<https://www.williamsnd.com/water-resource-district-board/>

Let me know if you have any questions.

Regards,

Kevin

Kevin Ploof, REHS/RS

Williams County Water Board Engineer

Environmental Specialist

Ackerman-Estvold

1907 17th Street SE

Minot, ND 58701

Office: 701.837.8737

Direct: 701.857.9165

www.ackerman-estvold.com

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August 2, 2022

Stephen G. Thornhill, LEED AP
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Dear Mr. Thornhill:

This is in response to your request for a review of the environmental impacts associated the Basin Electric Power Cooperative – Pioneer Generation Station Expansion project located in Williams County, ND.

The proposed project has been reviewed by Department of Water Resources, and the following comments are provided:

- There are no floodplains identified or mapped where the proposed project is to take place. North Dakota has no formal “permitting” authority as a state entity in National Flood Insurance Program-identified floodplains. Floodplain development permitting is completed by the local unit of government with zoning authority at the proposed project location. Please work closely with William County’s Floodplain Administrator for permitting purposes at (701) 577-94565.
- The DWR and Water Resource Districts are responsible for regulating drainage and water management in North Dakota. The DWR is also responsible for regulating the construction and modification of any dike, levee, or other device capable of obstructing or diverting more than 50 acre-feet of water. Consequently, the DWR requests to be notified regarding a proposed project’s impacts, if any, to water resources, such as watercourses (i.e. streams or rivers), agricultural drains, and wetlands (i.e. ponds, sloughs, lakes, or any series thereof), and dikes, levees, and other water control devices, as any alterations, modifications, improvements, or impacts to those may require a drainage permit(s) or a construction permit(s) from the DWR.
- Initial review indicates the project does not require a conditional or temporary permit for water appropriation. However, if surface water or groundwater will be diverted for construction of the project, a water permit will be required per North Dakota Century Code § 61-04-02. Please consult with the Department of Water Resources Water Appropriation Division if you have any questions at (701) 328-2754 or appropinfo@nd.gov.

Thank you for the opportunity to provide review comments. Should you have further questions, please contact me at 701-328-4970 or stevebest@nd.gov.

Sincerely,



Steven Best
Planner III

SB:dm/1570



July 11, 2022

Mr. Gage Ruff
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Re: Basin Electric Power Cooperative: Pioneer Generation Station Expansion – Williams Co., ND

The North Dakota Geological Survey appreciates the notification and opportunity to review and provide comment on the proposed oil and gas infrastructure project. We reviewed the proposed area of expansion against our existing geologic and landslide area mapping and would note that there are no mapped landslide areas in the project area nor any abandoned mine locations based on a review of location data generated by the N.D. Public Service Commission.

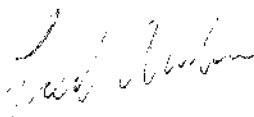
Available shallow drilling records maintained by the N.D. Dept. of Water Resources for this location (15510320ADD) suggest the shallow subsurface geology in this area consists of a thin layer, approximately 18 feet thick, of sandy clay till of the Quaternary Coleharbor Group underlain by sedimentary bedrock of the Paleocene Sentinel Butte Formation, which generally consists of silty shales, claystones, mudstones, and lignite. No economic deposits of lignite were found to be underlying this area based on mapping completed by Murphy (2008).

Geologic and landslide area maps and data, along with LiDAR elevation data sets and mapping products for this project area are available on our website at:
<https://www.dmr.nd.gov/ndgs/landslides/>

If there are any additional questions or comments, please contact us at (701) 328-8000.

Sincerely,

North Dakota Geological Survey:


Fred Anderson
Geologist
fjanderson@nd.gov



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
NORTH DAKOTA REGULATORY OFFICE
3319 UNIVERSITY DRIVE
BISMARCK, NORTH DAKOTA 58504-7565

July 25, 2022

NWO-2012-00167-BIS

Burns & McDonnell
Attn: Mr. Gage Ruff
9400 Ward Parkway
Kansas City, Missouri 64114

Dear Mr. Ruff:

This is in response to information received on July 8, 2022 regarding the proposed Basin Electric Power Cooperative, Pioneer Generation Station Expansion Project. The project is located in the E½ of Section 20, Township 155 North, Range 103 West, Williams County, North Dakota.

U. S. Army Corps of Engineers Regulatory Offices administer Section 404 of the Clean Water Act (Section 404). A Section 404 permit would be required for the discharge of dredge or fill material (temporarily or permanently) in waters of the United States. Waters of the United States may include, but are not limited to, rivers, streams, ditches, coulees, lakes, ponds, and their adjacent wetlands. Fill material includes, but is not limited to, rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mines or other excavation activities and materials used to create any structure or infrastructure in waters of the United States.

On February 9, 2012 our office provided confirmation that no permit was required to fill two wetlands during construction of the existing facilities located in the SE¼ of Section 20. If any of your proposed project is located in new areas outside of your current facility footprint, then our office requests that you complete an aquatic resources delineation for review to make a jurisdictional determination for any waters or wetlands identified in the project area prior to permit application submittal or include an aquatic resources delineation with any permit application submittal. If you decide to submit a permit application, the permit application and instructions for completing the application are enclosed and may also be found at:

<http://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Obtain-a-Permit>. Be sure to accurately describe all proposed work and construction methodology. Once the application is complete, mail it to the letterhead address or to the email address (preferred) below.

The North Dakota Regulatory office prefers that all submissions are sent electronically to the following email address: CENWO-OD-RND@usace.army.mil instead of a hard copy by mail. Please split large attachments (>25 MB) into multiple emails if needed.

Please refer to identification number NWO-2012-00167-BIS in any correspondence concerning this project. If you have any questions, please contact Jeremy Nygard at U.S. Army Corps of Engineers, North Dakota Regulatory Office, 3319 University Drive, Bismarck, North Dakota 58504-7565, by email at Jeremy.S.Nygard@usace.army.mil, or telephone at (701) 255-0015, extension 2006. For more information regarding our program, please visit our website at <http://www.nwo.usace.army.mil/Missions/RegulatoryProgram/NorthDakota.aspx>.

Sincerely,

A handwritten signature in blue ink that reads "Toni R. Erhardt". The signature is written in a cursive style with a large, sweeping initial "T" and "E".

Toni R. Erhardt
Senior Project Manager
North Dakota Regulatory Office

Enclosure

July 26, 2022

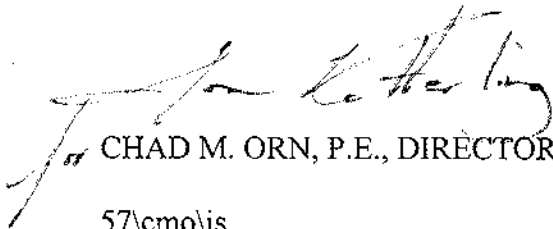
Stephen G. Thornhill, LEED AP
Project Manager
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

NEW TOWN 2022 UTILITY IMPROVEMENTS PROJECT, MOUNTRAIL COUNTY, NEW TOWN, ND

We have reviewed your July 7, 2022, letter.

This project should have no adverse effect on the North Dakota Department of Transportation highways; however, all load grossing of 400,000 pounds should be delivered when the ground is frozen in January and February. Some trucking companies have been calling about the engines and it appears that the load and trailers will exceed 650,000 pounds and we are certain that is what the turbines will weigh at this point. We ask they plan in advance, so the project isn't delayed because of heavy load movements.

Additionally, if because of this project any work needs to be done on highway right of way, appropriate permits and risk management documents will need to be obtained from the Department of Transportation District Engineer, Joel Wilt at 701-774-2700.



CHAD M. ORN, P.E., DIRECTOR - OFFICE OF PROJECT DEVELOPMENT

57\cmo\js

c: Joel Wilt, Williston District Engineer



United States Department of the Interior



FISH AND WILDLIFE SERVICE

North Dakota Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

IN REPLY REFER TO:
Basin Electric Pioneer
Generation Station
Expansion

September 29, 2022

Mr. Gage Ruff
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114
gtruff@burnsmcd.com

Dear Mr. Ruff:

Thank you for your letter dated July 7, 2022, requesting comments on the Basin Electric Pioneer Generation Station in Williams County, North Dakota. The U.S. Fish and Wildlife Service (FWS) has the following comments.

Section 7 of the Endangered Species Act

Section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 *et seq.*) requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the FWS *if they determine their project and associated actions “may affect” listed species or critical habitat*. If Federal agencies or their non-federal representatives determine their project and associated actions will have “no effect” on listed species, their habitats, or designated critical habitat, consultation is not required. However, if a “no effect” is determined, we recommend that you maintain a written record in support of your conclusion.

Consultations on IPaC

We invite you to use a new tool the FWS has designed to help with the consultation process – the Information for Planning and Consultation (IPaC) database (<http://ecos.fws.gov/ipac>). The database provides guidance to help you determine where your action area is, whether endangered species may be found within the action area, and if your project and associated actions may affect listed species. Additionally, the Section 7(a) (2) Technical Assistance webpage (<https://www.fws.gov/midwest/endangered/section7/s7process/index.html>) contains step-by-step guidance for the Section 7(a)(2) consultation process as well as informal consultation letter templates for documenting your findings related to threatened and endangered species.

Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act

Additionally, while not all are listed as threatened or endangered, eagles and migratory birds have protections under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). The BGEPA prohibits take which is defined as, “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb” (50 CFR 22.3). Disturb is defined in regulations as, “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.” The MBTA makes it unlawful without a waiver to pursue, hunt, take, capture, kill, or sell birds listed as migratory birds, including eagles. The statute does not discriminate between live or dead birds and also grants full protection to any bird parts including feathers, eggs, and nests.

FWS Property Interests

As part of the National Wildlife Refuge System, the FWS administers fee title Refuge and Waterfowl Production Areas, as well as wetland and grassland easements, throughout North Dakota. For exact locations of FWS interest lands, please contact the appropriate Wetland Management Districts (WMD) for guidance regarding FWS easements.

Crosby Wetland Management District – Scott Williams; (701) 965-6488; scott_williams@fws.gov

Conclusion

These comments provide technical assistance only and do not constitute the report of the Secretary of the Interior on the project within the meaning of Section 2(b) of the Fish and Wildlife Coordination Act, do not fulfill the requirements under the Endangered Species Act, the Bald and Golden Eagle Protection Act, or the Migratory Bird Treaty Act, nor do they represent the review comments of the U.S. Department of the Interior on any forthcoming environmental statement. Thank you for the opportunity to provide comments early in the planning process. If you have any additional questions or concerns, please contact Heidi Riddle of my staff at (701) 319-6708 or via email at heidi_riddle@fws.gov or contact me at (701) 355-8512 or drew_becker@fws.gov.

Sincerely,

DREW BECKER Digitally signed by DREW BECKER
Date: 2022.09.29 15:47:18 -05'00'

Drew N. Becker
North Dakota Field Office Supervisor

cc: Scott Williams, Crosby WMD

Appendix E – Unanticipated Discovery Plan

Pioneer Generation Station Phase IV

UNANTICIPATED DISCOVERIES PLAN

Introduction

Although Basin Electric has conducted thorough surveys for cultural resources over the property to contain the Pioneer Generation Station Phase IV, the potential exists for exposure of previously unidentified or buried cultural material during excavation and construction of the Project and associated facilities. The purpose of the Unanticipated Discovery Plan (UDP) is to document the procedures to be implemented if cultural resources are discovered during construction.

Unanticipated Discovery

In the event that previously unknown cultural (or paleontological) resources are discovered within the Area of Potential Effects (APE) during construction activities for the PGS Phase IV Project, or should those activities directly or indirectly affect known cultural resources in an unanticipated manner, the following actions, at a minimum, will be initiated by Basin Electric or a representative duly authorized to perform these tasks:

1. All activities will halt in the immediate vicinity of the discovery and all actions will be redirected to areas at least 100 feet from the edge of the discovery.
 - a. Basin Electric's construction coordinator and/or contractor will immediately report the discovery to the appropriate parties identified in the Emergency Contact List found later in this document.
 - b. Ground disturbing construction activities will not occur within 100 feet in any direction from the cultural resource until the site has been properly assessed as described in paragraph 2 (below) and the State Historical Society of North Dakota (SHSND) concurs that construction may resume.
 - c. In the event that a cultural resource specialist or other necessary persons are not immediately available, Basin Electric will require that the discovery be covered or otherwise protected until such time that the cultural resource specialist can be present for inspection and evaluation.
2. Upon arriving at the site of the discovery, the cultural resource specialist will assess the resource. The assessment will include:
 - a. The cultural resource specialist, in conjunction with a tribal monitor if appropriate, will ascertain the nature and the extent of the resource, and the potential for intact deposits. Evaluation will involve an examination of the ground surface, backfill piles, and exposed construction surfaces. The cultural resource specialist will discuss the potential for additional impacts to the resource with the construction manager.

- b. Based on this examination, the cultural resource specialist will recommend the unanticipated discovery location is:
- (1) not a site (e.g., isolated find or less than 50 years in age);
 - (2) not a historic property, i.e. not eligible for inclusion in the National Register of Historic Places (NRHP);
 - (3) a historic property, i.e. eligible for inclusion in NRHP or a culturally sensitive site for which no further impacts are likely to occur;
 - (4) an NRHP-eligible or a culturally sensitive site (e.g. exposed hearths, house pits) that is likely to be impacted with further construction; or,
 - (5) a site for which additional information is required to ascertain extent and NRHP eligibility.

The cultural resource specialist will provide information and a recommendation regarding the potential resource to SHSND to determine the most appropriate course of action.

Emergency Salvage of Cultural Resources

Unstable earth conditions in trenches or other unforeseen natural or man-made events could endanger cultural resources discovered during construction of the Project. If cultural resources are in imminent danger of destruction, Basin Electric will apply prudent methods to stabilize landforms around the unanticipated discovery. Once stabilized, the resource shall be assessed as described above, subject to safety concerns.

Curation or Disposition of Cultural Materials

All cultural materials recovered from privately owned lands are the property of the landowner. After necessary laboratory analysis is completed, Basin Electric will provide the landowner with photographs and descriptions of cultural materials from his/her property. The landowner will be encouraged to contribute the materials for curation at the SHSND. If the landowner desires, Basin Electric will return cultural materials from his/her land to him/her.

Unanticipated Discovery of Human Remains

If construction or other Project personnel identify what they believe to be human remains, they will immediately halt construction at that location and Basin Electric and the cultural resource specialist will be notified immediately. The construction coordinator will ensure that further construction does not occur within an area less than 100 feet in any direction from the edge of the discovery until a cultural resource specialist, in conjunction with Basin Electric environmental personnel, arrive to assess the discovery. The inspector will also secure the area of the apparent human remains to ensure no further disturbance or removal of those remains and associated material.

After arrival at the site, the cultural resource specialist will evaluate the discovery to determine if it does in fact consist of human remains. As required by law, Basin Electric will notify the Williams County Sheriff within 24 hours of the discovery. Basin Electric will also notify the SHSND of the finding.

Basin Electric and/or the contractor will secure the location by means of flagging or roping the perimeter of the avoidance area and covering or otherwise protecting the human remains and any associated materials. The remains will not be further disturbed prior to completion of consultations with respective agencies unless such disturbance is necessary to preserve or

protect the human remains. Any disturbance necessary to preserve or protect the remains must be done in consultation with law enforcement, SHSND, and the cultural resource specialist. The 100-foot-radius avoidance area may be expanded if the context of the human remains suggests additional human remains may exist within the construction area or if construction activities outside the 100-foot-radius area might destabilize or otherwise degrade the context of the human remains.

Law enforcement will determine whether the finding is associated with a crime scene within 15 days. If deemed not a crime scene, law enforcement will notify the SHSND of their findings. No cultural resource investigations of human remains can occur without a permit from SHSND. The cultural resource specialist will work with SHSND to obtain a permit to conduct investigations of the location. If the remains are determined to be Native American, or if the ethnic identity of the remains is unknown, SHSND will notify the Intertribal Re-interment Committee. A meeting of interested parties will be set up as soon as possible, preferably within 36 hours of the decision that there is no evidence of a crime, to ensure that the disturbed remains receive the maximum protection. SHSND, in consultation with the tribes (as appropriate) and Basin Electric, will agree upon a suitable action.

Work cannot proceed until the stipulations of Protection of Human Burial Sites, Human Remains and Burial Goods in North Dakota Century Code (NDCC 23-06-27) and Protection of Prehistoric Sites and Deposits in the North Dakota Administrative Code (NDAC 40-02-03) have been met.

Emergency Contact List

Entity	Name	Role	Telephone Number
Basin Electric Power Cooperative	Lucas Tiegen	Manager of Construction	701.223.0441
Basin Electric Power Cooperative	Kevin Solie	Environmental Coordinator	701.223.0441
Basin Electric Power Cooperative	Jim Lund	Project Manager	701.223.0441
Metcalf and Associates	Ed Stine	Cultural Resource Specialist	701.258.1215
Williams County Sheriff's Office	Verlan Kvande	County Sheriff	701.577.7700
Williams County Coroner	Seth Coughlin	County Coroner	701.577.3738
State Historical Society of North Dakota	Andrew Clark	State Archaeologist	701.328.3574

Appendix F – West Biological Report

Pioneer Generation Station Expansion Biological Report

Date: July 25, 2022

Prepared for:
Basin Electric Power Cooperative
1717 E. Interstate Ave.
Bismarck, ND 58503

This report was prepared by:

Western EcoSystems Technology, Inc.
4007 State St., Suite 109
Bismarck, ND 58503

Martin Piorkowski, Project Manager/ Ecologist
Terri Thorn, GIS Specialist
Alex Brazeal, Field Biologist

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LIST OF APPENDICES

Appendix A. Representative Site Photographs for Pioneer Generation Station Expansion

1.0 Introduction

Basin Electric Power Cooperative (BEPC) is proposing to expand the Pioneer Generation Station (PGS) into T 155N, R103W, Sec. 20, NW1/4 in western Williams County, North Dakota. (Project, Figure 1). The Project consists of a quarter section parcel located approximately 15 miles (mi) west northwest of Williston, North Dakota.

Since the Project would likely require a permit from the North Dakota Public Service Commission (PSC), Western EcoSystems Technology, Inc. (WEST), was retained to conduct baseline biological resource surveys for the proposed site. This effort was completed using both a desktop approach and a site visit conducted on June 9, 2022. The Biological Resources Report is intended to support the development of a potential application to the PSC.

2.0 Study Purpose

The proposed Project is an expansion to an existing -120-acre (ac) energy conversion facility located immediately south of this area (Figure 2). This report outlines the field and desktop survey efforts undertaken to provide biological survey and technical support for BEPC to develop and permit the Project through the PSC. Additionally, a desktop review was completed for the existing energy conversion facility located south of the proposed expansion area.

3.0 Land Cover

For purposes of the desktop analysis a half mile buffer around the Project survey area was considered and is defined here as the Study area. The Study area contains 1,307.6 ac of land. Based on the desktop analysis, land cover within the Study area is predominately cultivated crops (69.2%), herbaceous (16.2%), and Developed (14.1%; Figure 2, Table 1). All other land cover types make less than 1.0% of the Study area (Table 1; see reference photographs Appendix A).

Additionally, we evaluated the proposed Project expansion area (Survey Area) with a total area of 161.9 ac. The predominant land cover type was cultivated crops (93.9%). Developed areas make up 4.4% and herbaceous the remaining 1.7% of the Survey Area (Figure 3 Table 1).

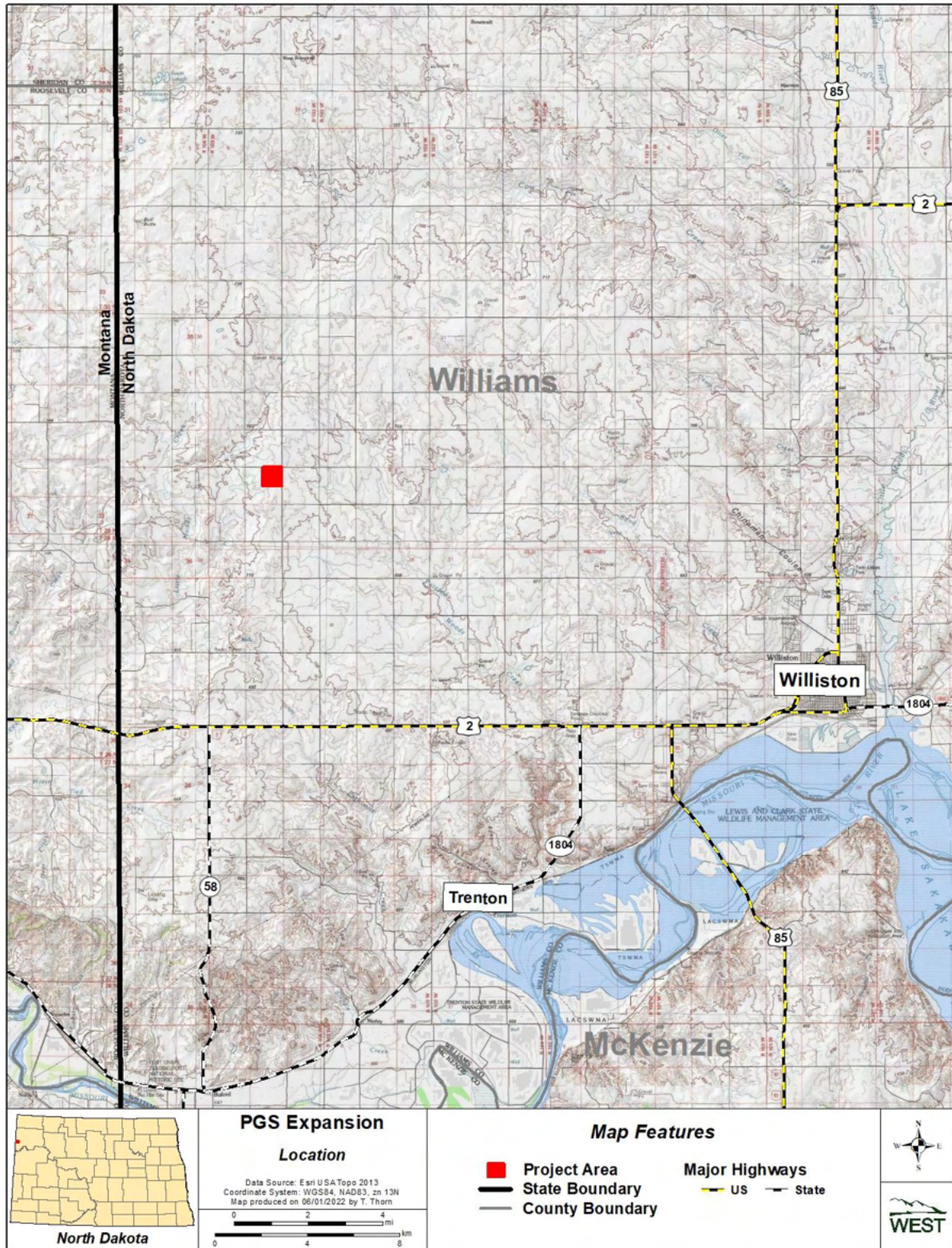


Figure 1. Pioneer Generation Station Expansion Project location Williams County, North Dakota.

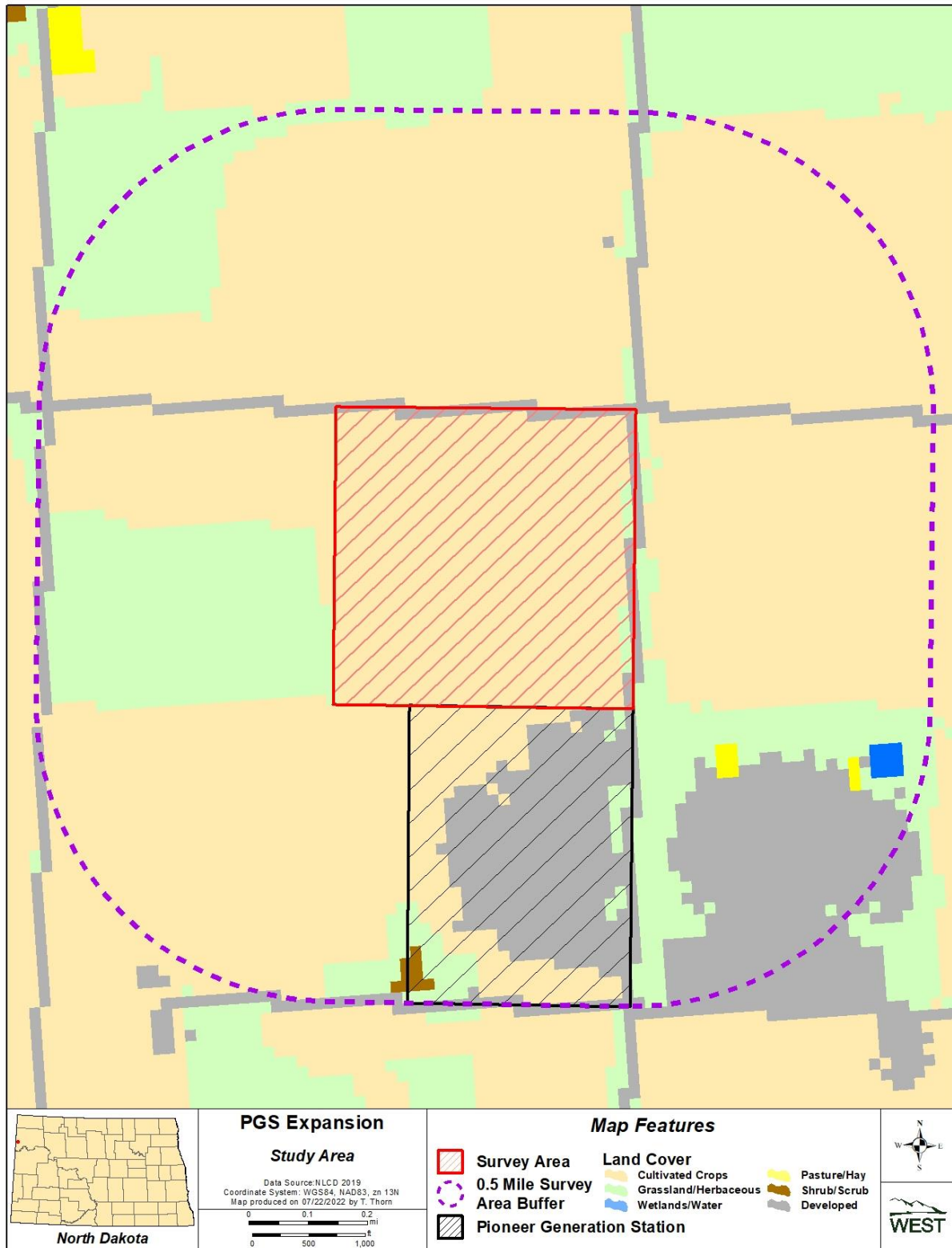


Figure 2: Land cover types within the Pioneer Generation Station Expansion and 0.5-mile boundary Study area used for desktop analysis.



Figure 3: Land cover types within the Pioneer Generation Station Expansion Survey Area.

Table 1. Land cover types and total acreage found within 0.5-mile Study area and within Project survey area of proposed Pioneer Generation Station Expansion.

Land Cover/Use	Acreage within Study Area	Acreage within Project Survey Area
Cultivated Crops	905.1	152.0
Herbaceous	212.4	2.8
Developed	184.1	7.1
Hay/Pasture	2.0	0.0
Shrub/Scrub	2.0	0.0
Open Water	2.0	0.0
Total¹	1,307.6	161.9

¹: Totals may not add up precisely due to rounding of numbers

4.0 Species of Concern Exclusion and Avoidance Review

Information from the PSC requirements outlined in North Dakota Administrative Code language regarding exclusion and avoidance areas (69-06-08-01) was reviewed. The specific Administrative Code language states in part:

Exclusion areas. The following geographical areas must be excluded in the consideration of a site for an energy conversion facility.

d. Areas critical to the life stages of threatened or endangered animal or plant species.

e. Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged.

Avoidance areas. The following geographical areas may not be approved as a site for an energy conversion facility unless the applicant shows that under the circumstances there is no reasonable alternative. In determining whether an avoidance area should be designated for a facility the commission may consider, among other things, the proposed management of adverse impacts; the orderly siting of facilities; system reliability and integrity; the efficient use of resources; and alternative sites. Economic considerations alone will not justify approval of these areas. A buffer zone of a reasonable width to protect the integrity of the area must be included. Natural screening may be considered in determining the width of the buffer zone.

e. Woodlands and wetlands.

To help inform compliance with the exclusion areas provision, a desktop review and analysis of threatened and endangered species, as identified through of the USFWS Information for Planning and Consultation (IPaC) online system (USFWS 2021) as well as state species of concern and likelihood of occurrence within the Study area was conducted (Table 1). To inform avoidance areas (e.g., wetlands and woodlands), a review was completed using the most recent aerial photographs (i.e., 2020 National Agriculture Imagery Program [NAIP]) to identify current vegetation types (e.g., grassland, cropland; Figure 2) in addition to inclusion of National Wetland

Inventory (NWI) information (USFWS 2018)The desktop review was augmented by a field survey to verify landscape conditions and any potential habitat for the species of concern.

Below are short species accounts for federally listed species, bald and golden eagles, and Level I State Species of Conservation Priority that may occur within the county.

4.1 Whooping Crane

Whooping cranes (*Grus americana*) are currently listed as endangered under the Endangered Species Act (32 FR 4001, 1967 March 11) except where nonessential experimental populations exist (66 FR 33903-33917, 2001 June 26; 62 FR 38932-38939, 1997 July 21; and 58 FR 5647-5658, 1993 January 22). In the US, the whooping crane was listed as threatened with extinction in 1967 and endangered in 1970 – both listings were “grandfathered” into the Endangered Species Act of 1973 (ESA 1973). The 2021-2022 winter population within the primary wintering grounds was estimated to be 543 individuals (95% CI – 426.5-781.8; CV – 0.182) with an additional 38 individuals outside of the primary wintering grounds (USFWS 2022). Whooping cranes typically migrate between their breeding grounds in Wood Buffalo National Park, Canada and wintering areas in Aransas National Wildlife Refuge, Texas twice a year. The bulk of the birds pass through North Dakota on each trip. There is no critical habitat designated for whooping cranes in North Dakota. While migrating through North Dakota, whooping cranes will use a variety of habitats including shallow, open wetlands, cropland, and to a lesser extent, open, grazed pasture land.

Limited wetlands exist within the Study area (Figure 2; Figure 4). The cultivated agricultural fields in the area could serve as potential foraging habitat if whooping cranes are roosting nearby. However, given the previously impacted nature of the Study area and ongoing activities associated with PGS expansion, whooping cranes are unlikely to use the Study area and no impacts to whooping cranes are anticipated from the Project.

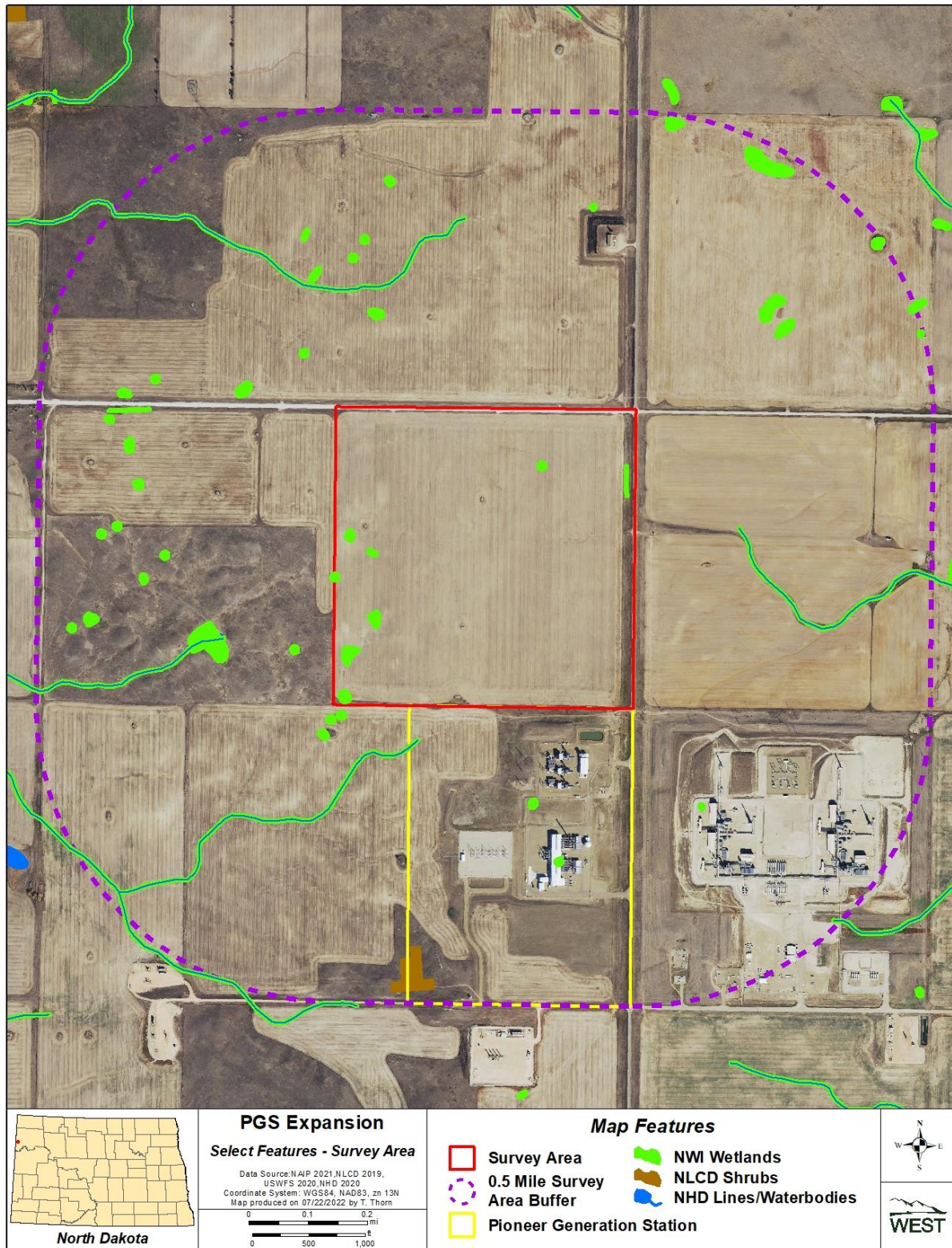


Figure 4. Water and shrub features within and around the Pioneer Generation Station Expansion survey area.

4.2 Piping Plover

The US Northern Great Plains population (Montana, North Dakota, South Dakota, Minnesota, Iowa, and Nebraska) of piping plovers (*Charadrius melodus*) was listed as threatened in 1986 (USFWS 2020a). The US portion of this population was estimated at 682 pairs in 1987 with about one half of those breeding in North Dakota (USFWS 1988). In 2006, this same area had a population estimate of 1,213 pairs and again, a little over half (646 pairs) were recorded in North Dakota (Elliott-Smith et al. 2009). The total number in this population (including Canada) was recently estimated to be 1,398 breeding pairs (USFWS 2020a). On September 11, 2002, the USFWS designated critical habitat for the breeding portion of the Northern Great Plains piping plover population (50 Code of Federal Regulations [CFR] Part 17; 2002). There are 11 different critical habitat units designated in North Dakota (USFWS 2013a). The nearest being along Lake Sakakawea, approximately 13.5 miles southeast of the Project.

In North Dakota, piping plovers utilize barren shores of inland alkali lakes as well as barren sand bars and shorelines of the Missouri River and its' associated reservoirs (USFWS 2012a, 2013a). Approximately 75% of the breeding population utilizes inland lakes while the remaining population nests in and along the Missouri River system (USFWS 2012a, 2013a). Feeding areas are usually within the wetland or along the shore or sandbar the nest is located on (USFWS 1988).

Although there are identified water features within the Study area, they do not appear to be preferred habitat, thus no impacts are anticipated to the species from Project development.

4.3 Rufa Red Knot

Primary threats to the continued existence of this species include climate change as it relates to sea rise, weather patterns, and prey abundance as well as coastal development and shoreline stabilization. In North Dakota, the main threat would be loss of migratory stopover wetlands.

The rufa red knot (*Calidris canutus rufa*) is a long-distance migrant which breeds in the Canadian Arctic and winters as far south as coastal Argentina. They can also be found wintering along the northwest Gulf of Mexico, coastal areas from North Carolina to Florida, the Caribbean, and coastal northern South America. Red knots occur mainly along ocean coasts during migration but have been documented in most U.S. states. Little if any information is available on these non-coastal migratory stopover habitats (USFWS 2013b). Based on energy requirements of long-distance migratory bird species, likely red knot stopover areas often contain abundant food resources. Nonbreeding red knots (probably one year olds) remain south of the breeding grounds and may be observed in small numbers in the Northern Plains (possibly North Dakota).

No preferred habitat for red knots appears to exist within the Study area and no impacts are anticipated to the species from Project development.

4.4 Northern Long-eared Bat

The northern long-eared bat (*Myotis septentrionalis*) was listed as threatened in April 2015 (USFWS 2020b). The northern long-eared bat ranges from the southeast corner of the Northwest Territory, east across each Canadian province, and covers 38 states in the central and eastern part of the United States including all of North Dakota. This medium-sized bat (3 to 3.7 inches long) is insectivorous and utilizes different roost sites during different seasons. In winter, the northern long-eared bat typically hibernates in caves and mines. Preferred hibernation sites have large passages and entrances, constant temperatures, and high humidity with no air currents. It is common for this species to overwinter in sites with other *Myotis* species. There are no known northern long-eared bat hibernacula in North Dakota. During the summer months, this species relies less on caves and more on old growth and late successional forests for roosts and reproduction. During the summer, they roost under the bark of dead and dying trees. Old and mature forests provide habitat (decaying trees, loose bark, tree snags, and stumps) for roosting, feeding, and maternity colonies of northern long-eared bats. In addition, the northern long-eared bat is also known to roost in buildings (USFWS 2020b). No critical habitat for the species has been identified.

Primary threats to the continued existence of the northern long-eared bat include commercialization of caves leading to an increase in disturbance, pesticides and other contaminants, the loss or degradation of hibernacula, destruction of summer habitat such as the loss of forest cover and degradation of forested habitats, and the impacts of disease (rabies, white-nose syndrome, etc.). Of more recent concern is the impact of white nose syndrome (WNS) which has had pronounced effects on some bat population (USFWS 2020b).

Construction and operation of the Project will not impact caves, mature trees, or old buildings. No impacts to northern long-eared bats are anticipated from the Project.

4.5 Bald and Golden Eagles

Both bald and golden eagles are protected by the Migratory Bird Treaty Act (1918) and the Bald and Golden Eagle Protection Act (1940). Bald eagles prefer to use mature trees near permanent bodies of water with an abundant prey source for their nesting, roosting, and foraging activities (Dyke et al. 2015). Lake Sakakawea, approximately 13.5 miles southeast of the Project area, provides habitat preferred by bald eagles. Golden eagles can be found in association with open grasslands, mature tree stands, and large bodies of water close to prairie dog colonies or other abundant prey source (Dyke et al. 2015). They typically nest on cliffs or mature trees. The primary land cover type within the Study area is cultivated croplands and not the preferred habitat of golden eagles.

Based on review of aerial and topographic maps and general site reconnaissance during the site visit (June 9, 2022), no mature trees or large water bodies were located within the Survey area and none were identified within the Study area during the desktop review. While it is possible that both bald and golden eagles could fly through the Project area, given that the Project area and Study area have other disturbances, impacts to either eagle species are unlikely.

4.6 Dakota Skipper

The Dakota skipper requires high quality, unbroken prairie habitat containing areas dominated by warm season native grasses such as bluestem grass species and flowering forbs for nectar sources such as prairie cone flower (USFWS 2020c, NDGFD 2019). Broken grasslands or native grasslands with high levels of disturbance (e.g. over grazing) are typically unsuitable for Dakota skipper. Because this species does not move great distances, isolated populations are vulnerable to habitat fragmentation.

Dakota skipper was not listed in Williams County until recently (USFWS 2021) and no critical habitat for the species occurs within Williams County. Based on information from NDGFD (NDGFD 2019), this species may persist along the Missouri River to the south to the Project. The Project area does not contain unbroken grasslands and impacts to Dakota skipper from the Project are unlikely for these reasons.

4.7 State Unique or Rare Species

The report evaluates North Dakota Game and Fish Department (NDGFD; Dyke et al. 2015) Level 1 Species of Conservation Priority (see Table 2) to address “*Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged*”. According to the NDGFD website, “*these Level 1 species are species which are in decline and receive little or no monetary support or conservation efforts. North Dakota Game and Fish Department has a clear obligation to use State Wildlife Grant (SWG) funding to implement conservation actions that directly benefit these species. Level I species are those having a:*

- *High level of conservation priority because of declining status either here or across their range, or*
- *High rate of occurrence in North Dakota constituting the core of the species breeding range (i.e., responsibility species) but are at-risk range wide.”*
- *Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged”*

Most Level 1 species are unlikely to occur within the Study area or Project (Table 2). The majority of the Study area is cultivated cropland with some developed areas and some grasslands (see Table 1). Habitat for animal or plant species that are unique/rare to the state will not be irreversibly damaged. For aquatic species of concern (i.e., fish and mussels) there is no habitat available within the Project area and are therefore unlikely to occur at the project (Table 2).

Table 2. Evaluated species of concern for Pioneer Generation Station Expansion Project.

Evaluated Species	Habitat Requirements	Potential Occurrence at the Project¹
Birds		
American bittern <i>Botaurus lentiginosus</i>	Wetlands with tall emergent vegetation adjacent to grasslands	Unlikely
Baird's sparrow <i>Ammodramus bairdii</i>	Large tracts of un-grazed or lightly grazed tall- and mixed-grass prairie	Unlikely
Bald eagle <i>Haliaeetus leucocephalus</i>	Permanent water bodies with mature tree stands.	Possible
Black tern <i>Chlidonias niger</i>	Shallow wetland complexes with emergent vegetation and open water adjacent to grasslands	Unlikely
Black-billed cuckoo <i>Coccyzus erythrophthalmus</i>	Brushy margins or openings in woodlands and thickets, riparian areas, shelterbelts, and other wooded areas	Unlikely
Chestnut-collared longspur <i>Calcarius ornatus</i>	Mixed- and short-grass prairie with few shrubs and low litter accumulation	Possible
Ferruginous hawk <i>Buteo regalis</i>	Large tracts of open native grasslands and pastures	Possible
Franklin's gull <i>Leucophaeus pipixcan</i>	Large wetlands with cattail, bulrush, and other emergent vegetation, can forage in agricultural fields	Unlikely
Golden eagle <i>Aquila chrysaetos</i>	Open grasslands, large bodies of water and prairie dog colonies.	Possible
Grasshopper sparrow <i>Ammodramus savannarum</i>	Large tracts of tall- and mixed-grass prairie, Conservation Reserve Program lands, or pasture lands with low litter depth and low density of shrubs	Unlikely
Greater sage-grouse <i>Centrocercus urophasianus</i>	Expansive areas dominated by big sagebrush (<i>Artemisia tridentata</i>)	Unlikely
Horned grebe <i>Podiceps auritus</i>	Ponds/wetlands with emergent vegetation and large areas of open water	Unlikely
Lark bunting <i>Calamospiza melanocorys</i>	Grasslands with a shrub component, such as sagebrush, weedy cropland, Conservation Reserve Program lands, hayland, or pastures	Unlikely
Long-billed curlew <i>Numenius americanus</i>	Rolling mixed-or short-grass prairies as well as level, fallow grounds; often near wetlands	Unlikely
Least tern-Interior <i>Sterna antillarum</i>	Sparsely vegetated sandbars or shorelines	Unlikely
Marbled godwit <i>Limosa fedoa</i>	Forage in a variety of types of wetlands and nests in grazed native prairie	Unlikely
Nelson's sparrow <i>Ammodramus neslsoni</i>	Wetlands with dense emergent vegetation, fens, wet meadows, lake margins, Conservation Reserve Program lands, or native prairies	Unlikely
Piping plover ² . <i>Charadrius melodus</i>	River/reservoir systems and inland wetlands containing barren gravel/sand/alkali areas	Unlikely
Rufa red knot ² <i>Calidris canutus rufa</i>	Little information on inland stopover habitat; possibly shallow wetlands with abundant invertebrates, including snails and small crustaceans	Unlikely
Red-headed woodpecker <i>Melanerpes erythrocephalus</i>	Mature deciduous trees along river bottoms, shelterbelts, and wooded areas	Unlikely

Sprague's pipit <i>Anthus spragueii</i>	Extensive tracts of mixed-grass prairies, un-grazed or lightly-grazed with few shrubs	Unlikely
Swainson's hawk <i>Buteo swainsoni</i>	Mix of grasslands and croplands with scattered trees and thickets	Possible
Whooping crane ² <i>Grus americana</i>	Suitable stopover habitat includes wetlands with un-obstructed viewsheds and gentle sloping banks, harvested crop lands, and grazed pastures	Unlikely
Wilson's phalarope <i>Phalaropus tricolor</i>	Shallow, open water wetlands with adjacent grasslands for nesting	Unlikely
Yellow rail <i>Coturnicops noveboracensis</i>	Fens or wet meadows with shallow water and emergent vegetation	Unlikely
Mammals		
Big brown bat <i>Eptesicus fuscus</i>	Wide range of habitats; insect availability is limiting factor	Possible
Black-tailed prairie dog <i>Cynomys ludovicianus</i>	Level to gently rolling dry areas with short vegetation	Unlikely
Little brown bat <i>Myotis lucifugus</i>	Wide range of habitats; often use human-made structures for roosting, maternity colonies, and hibernating, but also use caves and hollow trees. Foraging occurs near water where flying insects are abundant	Possible
Northern long-eared bat ³ <i>Myotis septentrionalis</i>	Generally associated with old-growth forests and intact forest habitat for foraging, roosting, and breeding. Hibernation occurs primarily in caves, and mines	Unlikely
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	Regularly found in forests and riparian areas in the summer months; maternity and hibernation colonies typically are in caves or mines	Unlikely
Amphibians and Reptiles		
Canadian toad <i>Anaxyrus hemiophrys</i>	Commonly found in permanent water, on margins of lakes, ponds, and a variety of wetlands	Unlikely
Plains hog-nosed snake <i>Heterodon nasicus</i>	Dry, sandy, or gravelly areas in grasslands and open sand prairies	Unlikely
Plains spadefoot <i>Spea bombifrons</i>	Dry, open grasslands with sandy or loose soils	Unlikely
Smooth green snake <i>Opheodrys vernalis</i>	Grazed or un-grazed grasslands, particularly upland hills	Unlikely
Fish		
Blue sucker <i>Cycleptus elongatus</i>	Deep areas of medium to large swift rivers with sand or gravel bottoms	Unlikely
Northern pearl dace <i>Margariscus margarita</i>	Cool, clear headwater streams or pools with slow to moderate current and sand or gravel bottoms	Unlikely
Pallid sturgeon <i>Scaphirhynchus albus</i>	Only found in the Missouri River and parts of the Yellowstone River. Usually in fast current areas with a firm sand or gravel bottom	Unlikely
Sicklefin chub <i>Machyropsis meeki</i>	Large, turbid rivers with sand or gravel bottoms	Unlikely
Sturgeon chub <i>Machyropsis gelida</i>	Main channels of large, turbid rivers with sand or gravel bottoms	Unlikely
Insects		
Dakota skipper <i>Hesperia dacotae</i>	Unbroken tracts of tall and mixed grass prairie. Bluestem is indicative of the habitat.	Unlikely

Monarch butterfly <i>Danaus plexippus</i>	Areas with high nectar sources (native and domestic) and milkweed for caterpillar stage	Possible
Regal fritillary <i>Speyeria idalia</i>	Native tall-grass prairie with extensive stands of violet (<i>Viola</i> spp.)	Unlikely
Freshwater Mussels		
Creek heelsplitter <i>Lasmigona compressa</i>	Headwaters of small- and medium-sized streams	Unlikely
Pink papershell <i>Potamilus ohioensis</i>	Mud, sand, or gravel bottom of medium to large rivers	Unlikely
Threeridge <i>Potamilus ohioensis</i>	Mud, sand, or gravel bottom of large river systems	Unlikely

Sources: Dyke et al 2015; NatureServe 2017; USFWS 2021

¹ Likely: Readily occurs in County and potential habitat within the Project; Possible: Potential to occur or occurs in low abundance in County and potential habitat within the Project; Unlikely: Distribution range does not overlap County or potential habitat not present with the Project.

² Federally endangered

³ Federally threatened

5.0 General Wildlife

Because the majority of the Study area has been disturbed through row crop production and development, the potential for extensive wildlife use is limited. Avian wildlife is likely restricted to species common to agricultural landscapes in the western portion of North Dakota such as red-winged blackbird (*Agelaius phoeniceus*), ring-necked pheasant (*Phasianus colchicus*), western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), and possibly various waterfowl species using wetlands for roosting and grain fields for foraging. Raptors such as red-tailed hawks (*Buteo jamaicensis*) and Swainson's hawks (*Buteo swainsoni*) may forage in the area.

Similar to avian species, extensive use by mammalian wildlife is also likely limited. Small mammals such as various species of voles and mice may occupy the landscape. Medium-sized mammals such as badger (*Taxidea taxus*), coyote (*Canis latrans*), and striped skunk (*Mephitis mephitis*) may also forage within, traverse through, or burrow in the Study area periodically. Potential large mammals that could utilize the project area, include white-tailed deer (*Odocoileus virginianus*), moose (*Alces alces*) and pronghorn antelope (*Antilocapra americana*).

Significant impacts on general wildlife are not anticipated from the Project.

6.0 Wetlands and Waterbodies

A desktop review of wetlands and waterbodies was conducted utilizing recent aerial photographs, National Wetland Inventory (NWI) spatial data, and other available sources to map and evaluate potential features within the project. The desktop effort focused on evaluating wetland locations, types, and any potential connections to other wetlands or waterbodies, especially any navigable waters.

The desktop effort identified nine NWI wetlands within the Survey area (Figure 4). A June 9, 2022 site visit found eight of these features not present. One wetland was delineated and sample points taken (Figure 5; Appendix A4). The Project will not impact wetlands provided that wetlands w-ab-01 (Figure 5) is avoided.

7.0 Tree and Shrub Inventory

Using NLCD land cover data, a small patch of shrub land cover type was identified in the southwestern corner of the existing PGS (Figure 4). Additional efforts using 2020 NAIP imagery did not indicate shrubs present in this locations. The desktop effort did not identify any trees and shrub within the Survey area (Figure 4). The June 9, 2022 site visit confirmed no trees or shrubs with in the Survey area. This Project will have no impacts to woodlands.



Figure 5. Water features assessed within the Pioneer Generation Station Expansion survey area.

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**Appendix A. Representative Site Photographs for Pioneer Generation
Station Expansion**



Appendix A1. Representative photo of cropland in the Pioneer Generation Station Expansion Project Area. Photo looking east toward to existing generation station.



Appendix A2. Representative photo of cropland in the Pioneer Generation Station Expansion Project Area.

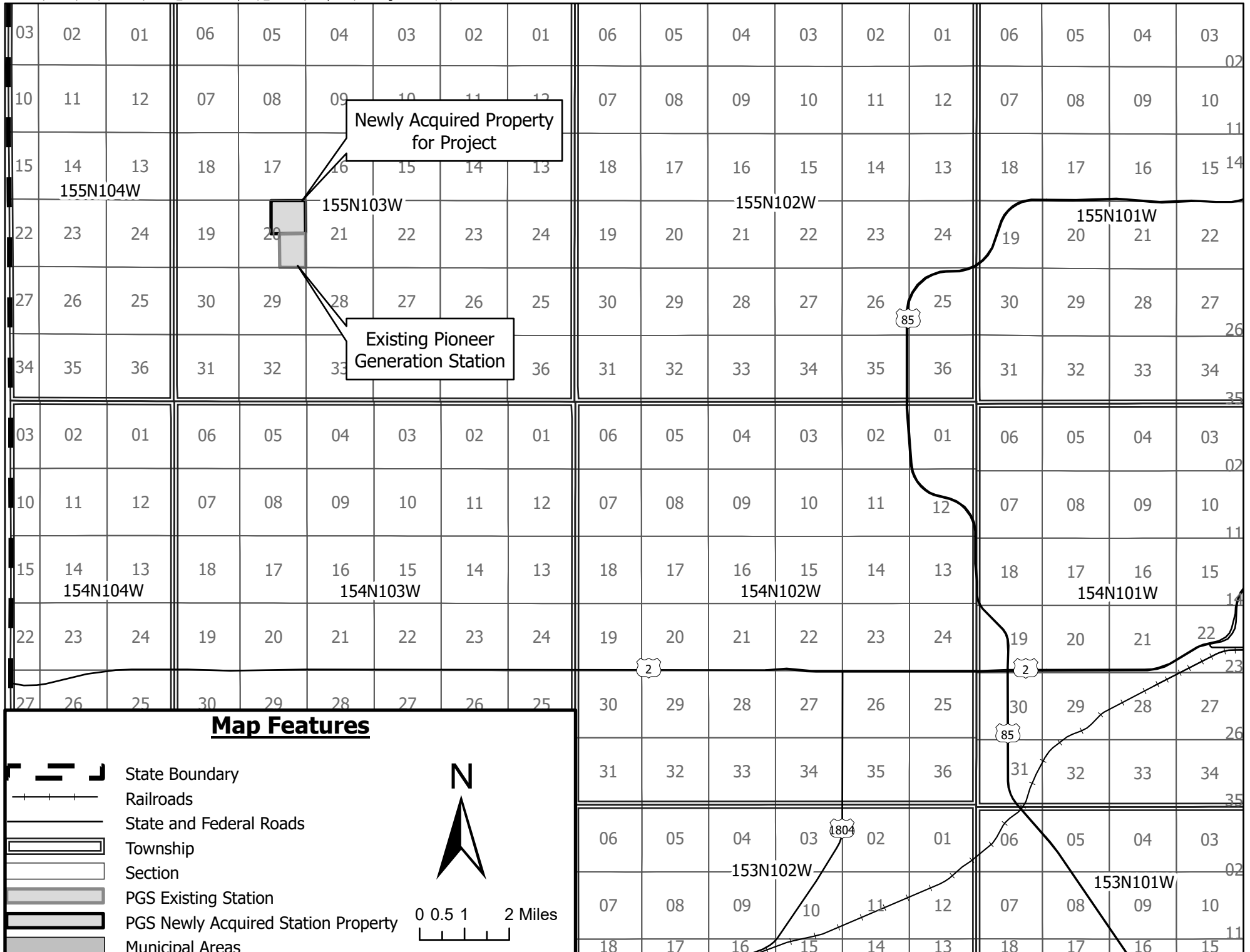


Appendix A3. Photo of rock pile within the Pioneer Generation Station Expansion Project Area.


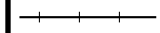
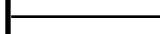







Appendix A4. Photo of wetland along the road on the northeast boundary of the Pioneer Generation Station Expansion Project Area.


Appendix G – Newspaper Publication Map



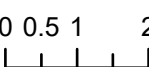
Map Features

-  State Boundary
-  Railroads
-  State and Federal Roads
-  Township
-  Section
-  PGS Existing Station
-  PGS Newly Acquired Station Property
-  Municipal Areas

N

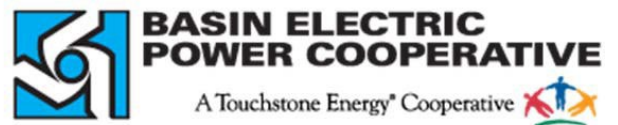


0 0.5 1 2 Miles



Appendix H – Noise Study

Pioneer Generation Station Phase IV Expansion Sound Study



Basin Electric Power Cooperative

Basin Pioneer Generation Station
Project No. 145192

Revision 0
09/26/2022

Pioneer Generation Station Phase IV Expansion Sound Study

prepared for

**Basin Electric Power Cooperative
Basin Pioneer Generation Station
Williams County, North Dakota**

Project No. 145192

**Revision 0
09/26/2022**

prepared by

**Burns & McDonnell
Kansas City, Missouri**

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
Basin	Basin Electric Power Cooperative
BOP	Balance-of-Plant
CadnaA	Computer Aided Noise Abatement
dB	decibel
dBA	A-weighted decibels
EPA	Environmental Protection Agency
Hz	hertz
ISO	International Organization for Standardization
L _p	sound pressure level
L _w	sound power level
MW	megawatt
NRC	Noise Reduction Coefficient
Ordinance	Williams County Zoning Ordinance and Subdivision Regulations
Project	Basin Pioneer Generation Station
STC	Sound Transmission Class

1.0 EXECUTIVE SUMMARY

Burns & McDonnell conducted a sound study for Basin Electric Power Cooperative's (Basin) Pioneer Generation Station expansion (Project) in Williams County, North Dakota. The Project consists of six (6) Wartsila 18V50SG spark-ignited reciprocating engine generators and two simple-cycle F-Class combustion turbine generators. The combustion turbine generators and reciprocating-engine generators will be housed inside buildings.

The study objectives were to identify sound level requirements that are applicable to the Project, develop a noise model to estimate sound emitted by the Project, and to determine the required mitigation for the Project to meet the identified noise requirements.

The Project sound levels are limited by the Williams County Zoning Ordinance and Subdivision Regulations (Ordinance). Chapter 5-7 Acoustic Standards, which limit noise by zoning district of the receiving property. Residentially zoned properties have a limit of 60 A-weighted decibels (dBA) during daytime hours and 55 dBA between the hours of 10:00 PM and 7:00 AM. The parcel of land proposed for the Project and the surrounding parcels are unclassified districts according to the Williams County Zoning Map and would not have numerical noise limits based on the Ordinance. Although the neighboring properties are not zoned residential, commercial, or industrial, Basin has elected to meet the residential nighttime sound level limit of 55 dBA at the neighboring residences. This design goal for the Project is a conservative approach to limit potential noise impacts.

The analysis is based on the F-Class turbines and Wartsila 18-megawatt (MW) reciprocating engine estimated sound power level data. Historical data from the Burns & McDonnell library has been used for the Balance-of-Plant (BOP) equipment.

Noise modeling was completed for the Project to estimate the sound level impacts at the neighboring residential structures. The noise modeling results demonstrate that sound levels generated by the Project, as designed, would not exceed the design criteria of 55 dBA at the nearest residences. The following sections discuss the modeling methodology and results in further detail.

2.0 ACOUSTICAL TERMINOLOGY

The term “sound level” is often used to describe two different sound characteristics: sound power and sound pressure. Every source that produces sound has a sound power level (L_W). The sound power level is the acoustical energy emitted by a sound source and is an absolute number that is not affected by the surrounding environment. The acoustical energy produced by a source propagates through media as pressure fluctuations. These pressure fluctuations, also called sound pressure levels (L_P), are what human ears hear and microphones measure.

Sound is physically characterized by amplitude and frequency. The amplitude of sound is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 micropascals). The reference sound pressure corresponds to the typical threshold of human hearing. To the average listener, a 3-dB change in a continuous broadband sound is generally considered “just barely perceptible”; a 5-dB change is generally considered “clearly noticeable”; and a 10-dB change is generally considered a doubling (or halving, if the sound is decreasing) of the apparent loudness.

Sound waves can occur at many different wavelengths, also known as the frequency. Frequency is measured in hertz (Hz) and is the number of wave cycles per second that occur. The typical human ear can hear frequencies ranging from approximately 20 to 20,000 Hz. Normally, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the lower and higher frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in A-weighted decibels, or dBA. For reference, the A-weighted sound pressure level and subjective loudness associated with some common sound sources are listed in Table 2-1.

Table 2-1: Typical Sound Pressure Levels Associated with Common Sound Sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 feet	--
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 feet	--
120	Threshold of feeling	Elevated train	Hard rock band
110	--	Jet flyover at 1,000 feet	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 feet, auto horn at 10 feet, crowd sound at football game	--
90	--	Propeller plane flyover at 1,000 feet, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 feet	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner
60	Moderate	Air-conditioner condenser at 15 feet, near highway traffic	General office
50	Quiet	--	Private office
40	--	Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Inside average residence (without TV and stereo)
20	--	Rustling leaves	Quiet theater, whisper
10	Just audible	--	Human breathing
0	Threshold of hearing	--	--

Source: Adapted from *Architectural Acoustics*, M. David Egan, 1988, and *Architectural Graphic Standards*, Ramsey and Sleeper, 1994.

3.0 APPLICABLE REGULATIONS

Burns & McDonnell reviewed Federal, State, and local regulations to determine the noise limits applicable to the Project. A discussion of the regulations and a summary of the applicable regulations and Project design goals are provided.

3.1 Federal

The Noise Control Act of 1972 mandated a national policy “to promote an environment for all Americans free from noise that jeopardizes their health or welfare, to establish a means for effective coordination of federal research activities in noise control, to authorize the establishment of federal noise emission standards for products distributed in commerce, and to provide information to the public respecting the noise emission and noise reduction characteristics of such products.” As required by the Act, the Environmental Protection Agency (EPA) published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* in 1974. EPA phased out the Office of Noise Abatement and Control in 1982, transferring the primary responsibility of regulating noise to state and local governments.

3.2 State of North Dakota

The State of North Dakota does not have any identified noise statutes that provide numerical sound limits applicable to the Project.

3.3 Williams County

The Williams County Zoning Ordinance and Subdivision Regulations Chapter 5-7 Acoustic Standards, limits noise by zoning district of the receiving property. Unlawful noise is defined in Chapter 5-7-1 as any, “loud, unnecessary, unnatural or unusual noise which is prolonged, unusual or unnatural in time, place, use, and/or affect, or any noise which either annoys, disturbs, injures, endangers, or is a detriment to the health, comfort, convenience, peace, safety, welfare, or prosperity of others within the County.” Chapter 5-7-3 Maximum Noise Standards by District establishes overall sound level limits by the zoning of the receiving property. Residentially zoned properties have a limit of 60 dBA during daytime hours and 55 dBA between the hours of 10:00 PM and 7:00 AM, nighttime hours.

The parcel of land proposed for the Project and the surrounding parcels are unclassified districts according to the Williams County Zoning Map. Although the neighboring properties are not zoned residential, commercial, or industrial, Basin has elected to meet the residential nighttime sound level limit of 55 dBA at the neighboring residential structures. Meeting the residential zone sound level limits may

not be explicitly required by the code since the land is not zoned residential, but meeting the residential limits at the residential structure would limit the likelihood of generating “annoying or disturbing” noise as addressed in the code.

3.4 Summary of Applicable Regulations and Requirements

There were no identified Federal or State sound level requirements applicable to the Project. The Williams County Zoning Ordinance provides sound level limits which would be applicable to the Project. However, the land surrounding the Project is zoned “Unclassified” which does not have any numerical sound level limits listed in the Ordinance. Because there are residences on some of the properties surrounding the Project, the design goal for the Project is to meet the residential zone nighttime sound level limit of 55 dBA at the neighboring residential structures. This is a conservative approach to limit potential noise impacts from the Project.

4.0 NOISE MODELING

To estimate sound levels emitted by the Project, Burns & McDonnell modeled the sound sources included as part of the Project. The analysis is based on GE F-Class turbine and Wartsila 18-MW reciprocating engine estimated sound power level data, and historical data from the Burns & McDonnell library for the BOP equipment. The overall and octave-band sound power levels for each piece of equipment included in the model are shown in Appendix A. Differences in as-built sound levels from those shown may require additional analysis and possibly discrete mitigation to meet the limits. BOP equipment sound levels were modeled based on historical projects of similar size and scope. Based on the sound level data available to Burns & McDonnell, the Project was modeled to estimate sound levels at the neighboring residential structures.

4.1 Noise Modeling Methodology

Noise modeling was performed using the industry-accepted sound modeling software Computer Aided Noise Abatement (CadnaA), version 2022. The software is a scaled, three-dimensional program, which considers air absorption, terrain, ground absorption, and reflections and shielding for each piece of noise-emitting equipment, and then predicts sound pressure levels at discrete locations and over a gridded area. The model calculates sound propagation based on International Organization for Standardization (ISO) 9613-2:1996, General Method of Calculation. ISO 9613-2 assesses the sound level propagation based on the octave band center-frequency range from 31.5 to 8,000 Hz.

The ISO standard considers sound propagation and directivity. The sound-modeling software calculates omnidirectional, downwind sound propagation using worst-case directivity factors. In other words, the model assumes that each piece of equipment propagates its maximum sound level in all directions at all times. Empirical studies accepted within the industry have demonstrated that modeling may over-predict sound levels in certain directions, and as a result, modeling results generally are considered a conservative measure of the Project's actual sound level.

The modeled atmospheric conditions were assumed to be calm, and the temperature and relative humidity were left at the program's default values. Reflections and shielding were considered for sound waves encountering physical structures. Sound levels around the Project can be influenced by the sound reflections from physical structures onsite. Obstacles onsite were modeled with structured facades, which accounts for the sound reflected and the amount of sound absorbed by the structure itself. The area surrounding the Project has minimal elevation changes, which can scatter and absorb the sound waves. Terrain was included to account for surface effects such as ground absorption. Ground absorption was set

at a value of 0.5. No foliage was considered in the model as a conservative measure. The modeling assumptions are outlined in Table 4-1.

Table 4-1: Sound Modeling Parameters

Model Input	Parameter Value
Ground Absorption	G = 0.5
Foliage	Not Included
Number of Reflections	2
Receptor Height	5 feet above grade
Terrain	USGS topographic land data
Temperature	50 °F
Humidity	70%

Sound level data for the Project combustion turbine equipment was provided by Siemens. The expected sound levels applied to the Project equipment in the model are detailed in Appendix A. Equipment was limited to 85 dBA sound pressure level at 3 feet from the equipment envelope where vendor data was not available. The general arrangement for the Project is provided in Figure B-1 of Appendix B.

4.2 Project Sound Sources

The modeled equipment octave-band sound power levels assumed for each noise emitting source are included in Appendix A. It is assumed that the equipment will meet the levels detailed in Appendix A during all operating conditions. The Project includes multiple pieces of equipment that will be located outdoors as well as equipment housed inside the turbine building and reciprocating engine building. The outdoor sound sources include the exhaust stacks, air inlets, generator step-up transformers, and cooling fan arrays. The sound levels of the outdoor equipment are detailed in Appendix A.

4.2.1 Buildings

Buildings are included in the Project design and mitigate the sound sources installed inside them. Placing sources inside buildings limits the amount of sound emitted to the far-field receivers. The acoustical performance of a building is determined by the amount of sound absorbed by the building material and the amount of sound transmitted through the building material itself. The Noise Reduction Coefficient (NRC) describes the amount of sound reflected and the amount of sound absorbed by the material. An NRC rating of 0.0 represents a fully reflective surface, while a rating of 1.0 is a fully absorptive surface. The Sound Transmission Class (STC) is an integer rating of the transmission loss through the material.

The higher the STC rating, the more effective a material is at blocking sound. The NRC and STC are single number ratings derived from the performance of the material for individual octave bands.

The combustion turbines and generators are located inside the turbine building. For the model, it was assumed that the buildings are constructed of insulated metal panels. The acoustic properties for the wall and roof panels were estimated to be STC 30. It was also assumed that a roof ridge vent is installed on top of the reciprocating engine building for ventilation. Sound passing through the ridge vent was assumed to be unsilenced. The building walls and roof panels were assumed to have an NRC rating of 0.3, to conservatively estimate interior reflections off the insulated surfaces.

The combustion turbine building includes the following major sound sources:

- (2) CT Accessory Skid
- (2) CT Inlet Plenum
- (2) CT Load Compartment
- (2) CT Enclosure
- (2) CT Exhaust Diffuser
- (2) CT Generator Enclosure
- (4) CT Vent Fan
- (4) CT Exhaust Fan

The reciprocating engine building includes the following major sound sources:

- (6) Reciprocating Engine Generator

4.3 Noise Modeling Results

Receivers were placed at neighboring noise-sensitive receiver structures in the model. The modeled sound level impacts at each noise-sensitive receiver and the associated distance to the Project are shown in Table 4-2. During full load operation, the overall sound levels are predicted to be below the design goal of 55 dBA at the residential structures. Graphical sound-level contours were generated for the Project during full load operation. The Project-generated sound level contours are shown in Figure B-2 of Appendix B, and a cumulative facility contour is included as Figure B-3. These are the expected sound levels of Basin sources only and do not include background sources.

Table 4-2: Modeled Sound Level Impacts

Noise Sensitive Receiver	Distance from Receptor to Project (feet)	Assumed Existing Sound Levels¹ (dBA)	Project Modeled Sound Levels (dBA)	Complete Facility Modeled Sound Levels (dBA)	Sound Level Limit (dBA)
Residence 1	6,200	34	40	41	55
Residence 2	5,000	33	41	41	55
Residence 3	5,600	35	40	41	55
Residence 4	6,300	34	40	41	55
Residence 5	7,700	31	38	39	55
Residence 6	7,800	32	38	39	55
Residence 7	5,100	35	41	42	55
Residence 8	7,600	37	43	44	55
Residence 9	8,400	34	39	40	55
Church	1,400	43	49	49	--

1. Sound level based on 2014 modeling of the Basing Pioneer Generation Station

5.0 CONCLUSION

Burns & McDonnell conducted a sound study for Basin Electric Power Cooperative's proposed Pioneer Generation Station expansion in Williams County, North Dakota. The Project sound levels are limited by the Williams County Zoning Ordinance and Subdivision Regulations. Although the neighboring properties are not zoned residential, commercial, or industrial, the design goal for the Project is to meet the residential zone nighttime sound level limits of 55 dBA at the neighboring residential structures.

The analysis is based on the two (2) F-Class turbines and six (6) Wartsila 18-MW reciprocating engine estimated sound power level data, and historical data from the Burns & McDonnell library. Noise modeling was completed for the Project to estimate receiving residential sound level impacts from the Project. The noise modeling results demonstrate that sound levels generated by the Project, as designed, and the facility as a whole, would not exceed the design criteria of 55 dBA at the nearest neighboring residences.

APPENDIX A MODEL INPUT SOUND POWER LEVELS

Appendix A - Modeled Sound Power Levels

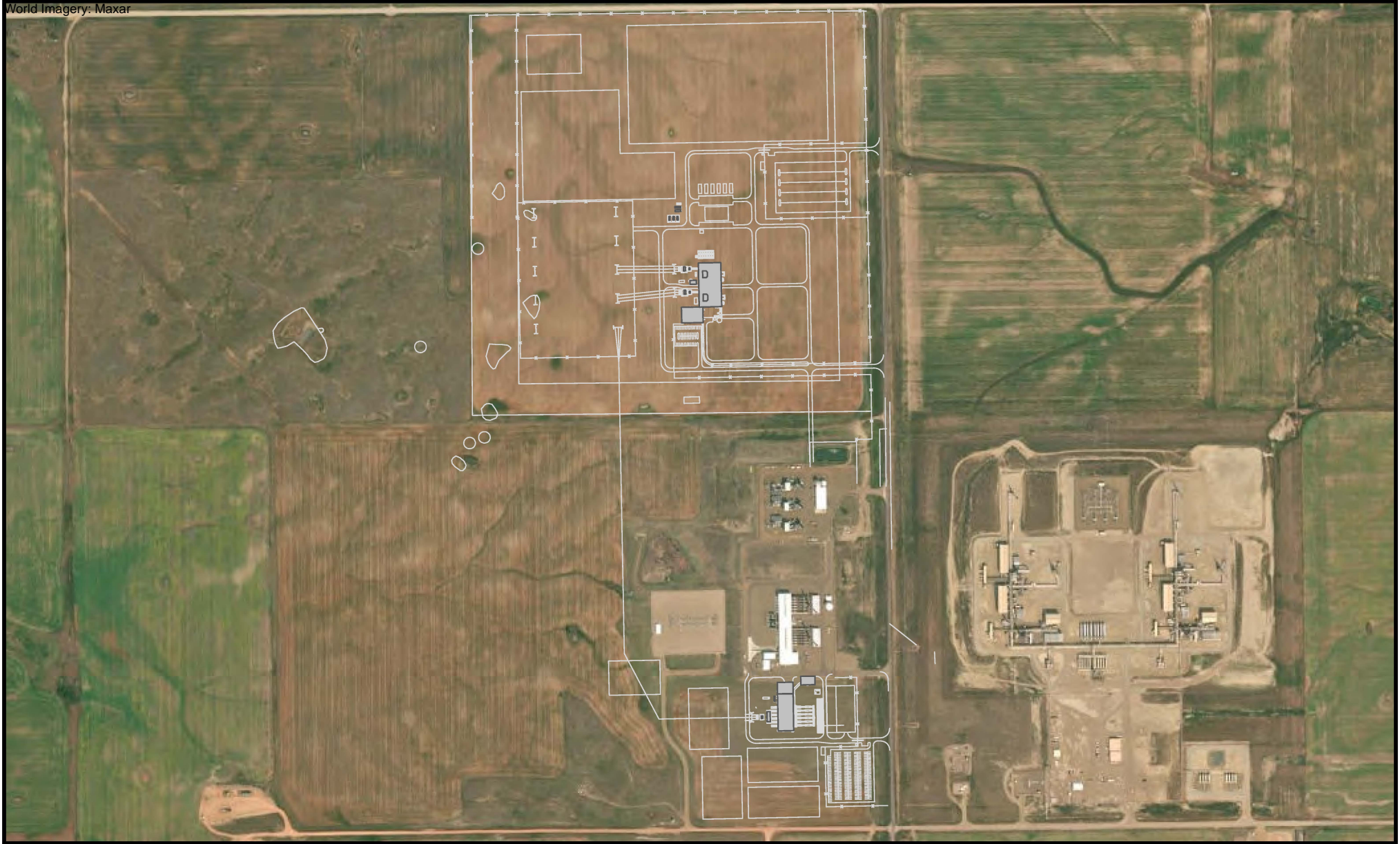
Basin Electric
Pioneer Generation Station

Source	Name	Number of Sources	Sound Power Level (dB) ¹ Octave Band Frequency (Hz)									Overall (dBA)	Notes
			31.5	63.0	125	250	500	1000	2000	4000	8000		
Turbine Building	CT Building Vent	14	101	98	94	87	85	83	84	82	77	90	BMCD Estimate
	CT Stack	2	126	134	132	123	105	100	113	103	88	121	Standard Silencer
	Turbine Building	1	135	128	122	109	99	89	88	90	93	109	STC30 Walls / Roof
	CT Air Inlet Face	2	112	115	115	99	93	94	97	90	78	103	BMCD Estimate
Recip Building	Mech Equipment	6	86	86	95	94	93	92	93	89	83	98	Estimated 85 dBA at 3 feet
	Wartsila W50SG Intake	12	116	112	99	80	71	85	84	84	94	96	Vendor Specification
	Wartsila W50SG Exhaust (Six Units)	1	149	128	109	103	96	86	89	71	--	111	Vendor Specification
	Building Intake	8	86	86	95	94	93	92	93	89	83	98	BMCD Estimate
	Pump	2	79	91	87	90	91	94	89	77	58	97	BMCD Estimate
	Exhaust Duct	6	116	105	100	96	83	76	73	49	--	90	BMCD Estimate
	Intake Duct	12	88	84	76	70	70	78	81	80	80	86	BMCD Estimate
	Wartsila Standard Radiator (Six Units)	1	135	122	120	122	120	119	116	113	112	124	Standard Radiator (64 dBA at 40 m)
	Recip Transformer	1	98	95	96	93	96	93	88	86	76	98	BMCD Estimate
	Ridge Vent	1	109	105	110	98	94	94	101	100	97	106	BMCD Estimate
Engine Hall	1	129	123	131	123	114	104	97	90	83	119	STC30 Walls / Roof	
BOP	Air Dryer	2	106	93	98	94	96	92	71	65	58	96	Estimated 85 dBA at 3 feet
	Air Compressor	2	106	93	98	94	96	92	71	65	58	96	Estimated 85 dBA at 3 feet
	DP Heater Stack	3	113	109	111	101	95	93	93	90	86	101	BMCD Estimate
	ACHE	1	119	117	112	108	106	101	97	95	91	107	BMCD Estimate
	Gas Comp Fin Fan Cooler	1	110	108	103	99	97	92	88	86	82	99	BMCD Estimate
	Gas Compressor	2	110	110	106	113	108	100	104	102	91	111	BMCD Estimate
	DP Heater Tank	3	106	102	104	94	88	86	86	83	79	94	BMCD Estimate
	Transformer	2	104	104	108	108	108	92	87	80	75	106	BMCD Estimate
Aux Transformer	4	94	94	98	98	98	82	77	70	65	96	BMCD Estimate	

Notes:

1. All sound levels are inclusive of modeled attenuation.

APPENDIX B FIGURES



 Project Layout

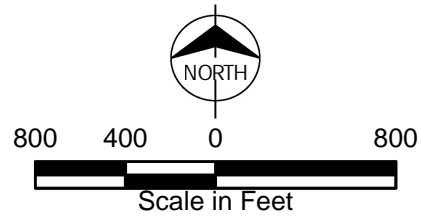
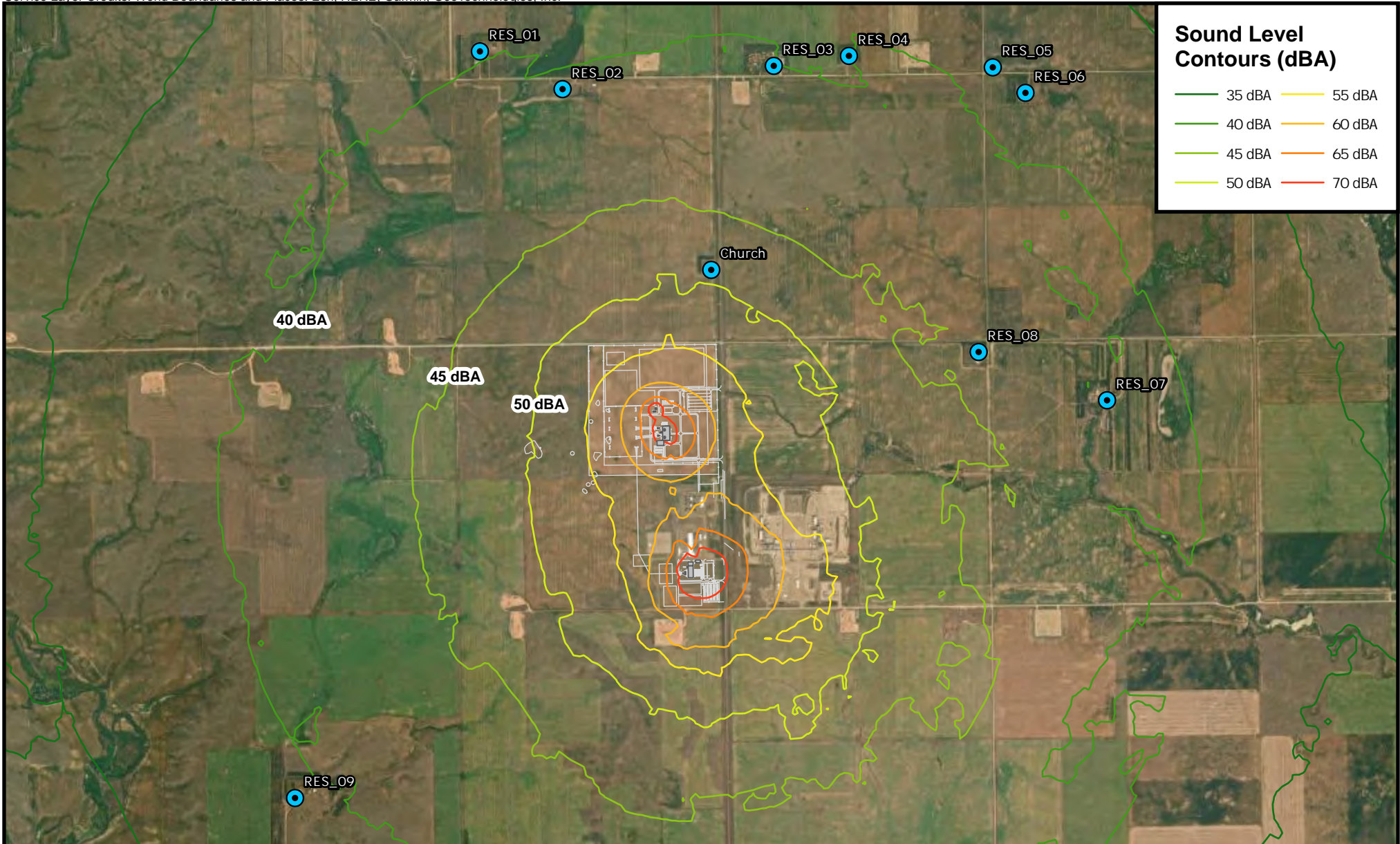


Figure B-1
Basin
Pioneer Generation Station
Project Layout



Sound Level Contours (dBA)

35 dBA	55 dBA
40 dBA	60 dBA
45 dBA	65 dBA
50 dBA	70 dBA

Receiver (blue circle with dot)
Project Layout (grey rectangle)

NORTH

2,500 1,250 0 2,500

Scale in Feet



Figure B-2
Basin
Pioneer Generation Station
Project Sound Level Contours

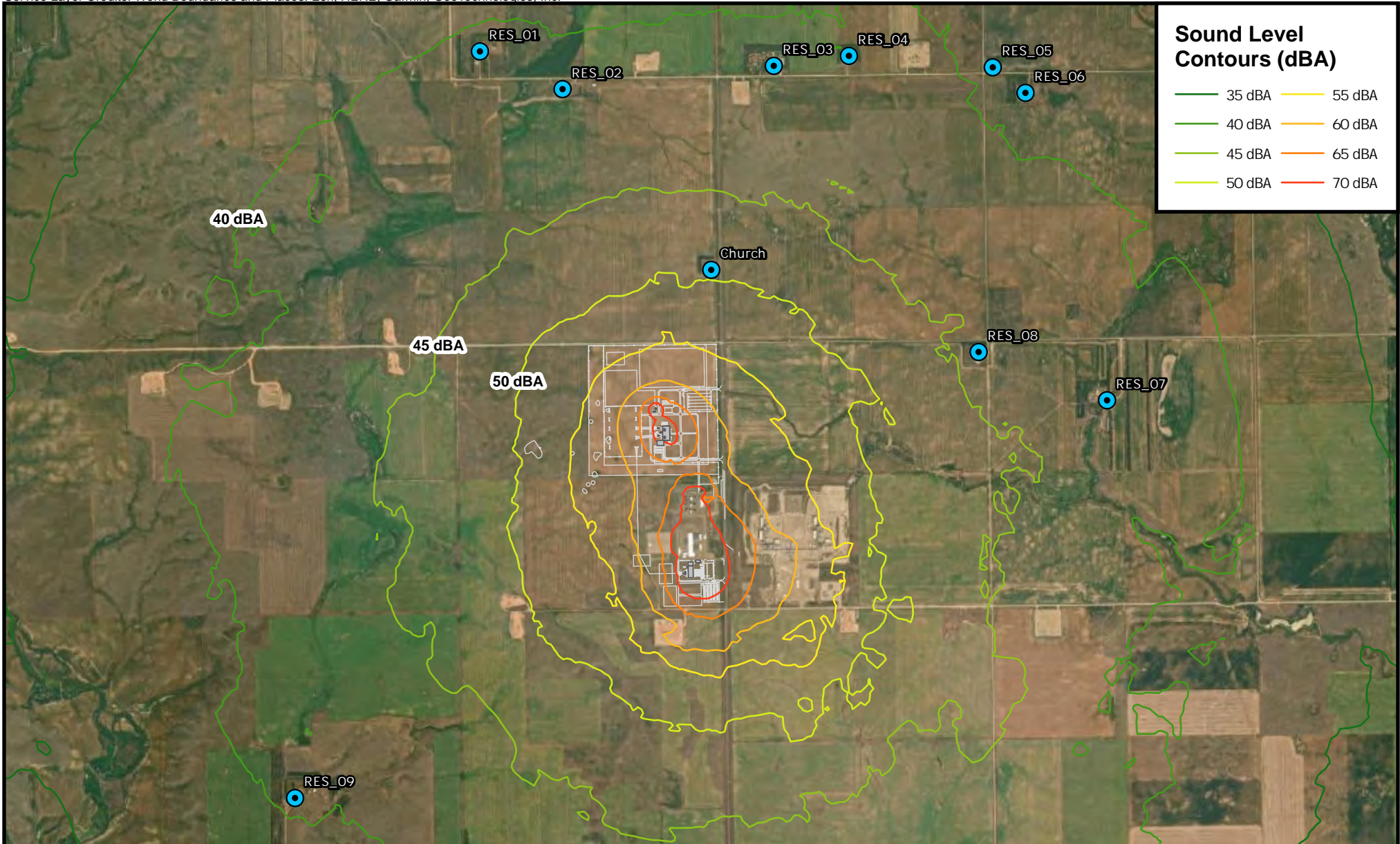


Figure B-3
Basin
Pioneer Generation Station
Total Facility
Sound Level Contours



CREATE AMAZING.

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