
APPLICATION FOR A CERTIFICATE OF SITE COMPATIBILITY

FLICKERTAIL SOLAR PROJECT

Richland County, North Dakota

SUBMITTED TO:
North Dakota Public Service Commission

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October 2024



TETRA TECH

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AC	Alternating Current
APFO	Aerial Photography Field Office
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
Certificate	Certificate of Site Compatibility
CFR	Code of Federal Regulations
CUP	Conditional Use Permit
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted decibel scale
DC	Direct Current
DEM	Digital Elevation Model
Distribution	Relatively low-voltage lines that deliver electricity to the retail customer's home or business
DoAQ	Division of Air Quality
DWQ	Division of Water Quality
EMF	Electromagnetic field
ELF	Extremely Low Frequency
EPA	U.S. Environmental Protection Agency
EPC	Engineering, procurement, and construction
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FSA	Farm Service Agency
FEMA	Federal Emergency Management Agency
Geotechnical	A science that deals with application of geology to engineering
GIS	Geographic Information System
GSP	General Stormwater Permit
GW	Gigawatt
Flickertail	Flickertail Solar Project, LLC (Applicant)
ICBM	Intercontinental ballistic missile
IPaC	Information for Planning and Consultation
kV	Kilovolt
LWCF	Land and Water Conservation Fund

Acronyms/Abbreviations	Definition
MET	Meteorological
Minnkota	Minnkota Power Cooperative
MISO	Midcontinent Independent System Operator
MSDS	Material Safety Data Sheets
MW	Megawatt
MWh	Megawatt hour
N/A	Not applicable
NAIP	National Agriculture Imagery Program
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDDEQ	North Dakota Department of Environmental Quality
NDDOT	North Dakota Department of Transportation
NDDH	North Dakota Department of Health
NDDTL	North Dakota Department of Trust Lands
NDDWR	North Dakota Department of Water Resources
NDGF	North Dakota Game and Fish Department
NDGS	North Dakota Geological Survey
NDLMI	Job Service North Dakota Labor Market Information Center
NDPDES	North Dakota Pollutant Discharge Elimination System
NDPRD	North Dakota Parks and Recreation Department
NDSCC	North Dakota Soil Conservation Committee
NDSWC	North Dakota State Water Commission
NEC	National Electrical Code
NESC	National Electric Safety Code
NLCD	National Land Cover Database
NOI	Notice of Intent
NPL	National Priorities List
NPS	National Park Service
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWP	Nationwide Permit
O&M	Operations and Maintenance
PLOTS	Private Land Open to Sportsmen

Acronyms/Abbreviations	Definition
Project, the	Flickertail Solar Project
PPA	Power Purchase Agreement
PSC	North Dakota Public Service Commission
PV	Photovoltaic
Savion	Savion, LLC
SCADA	Supervisory Control and Data Acquisition (communications technology)
SHPO	North Dakota State Historic Preservation Office
SHSND	State Historical Society of North Dakota
Siting Act, the	North Dakota Energy Conversion and Transmission Facility Siting Act
SMD	Surface Management Division
SND	Snowmobile North Dakota
SSURGO	Soil Survey Geographic Database
Substation	A subsidiary station in which electric current is transformed
SWPPP	Stormwater Pollution Prevention Plan
Torque	A force that produces or tends to produce rotation or torsion; also, a measure of the effectiveness of such a force that consists of the product of the force and the perpendicular distance from the line of action of the force to the axis of rotation; a turning or twisting force
Transformer	An electrical device by which the alternating current of one voltage is changed to another voltage
UDP	Unanticipated Discoveries Plan
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
WOTUS	Waters of the U.S.
WQC	Water Quality Certification

1.0 INTRODUCTION

Flickertail Solar Project, LLC (Flickertail), a wholly owned subsidiary of Savion, LLC (Savion), respectfully submits this Application for a Certificate of Site Compatibility (Certificate) to the North Dakota Public Service Commission (PSC) for the Flickertail Solar Project (Project). The proposed Project is located on approximately 3,464 acres north of Galchutt in, or within portions of, Sections 3, 5, 8-12, 14-16, and 22 of Township 134 North, Range 49 West in Abercrombie Township, Richland County, North Dakota (Figure 1). The Project will deliver up to 300 megawatts (MW), enough energy to provide electricity for approximately 59,000 homes annually.

Savion, a Shell Group portfolio company headquartered in Kansas City, Missouri, is assisting Flickertail with development of the Project. Since its founding in 2019, Savion has become one of the largest, most technologically advanced utility-scale solar and energy storage project development companies in the United States. With a growing portfolio of more than 43.3 gigawatts (GW), Savion’s diverse team provides comprehensive services at each phase of renewable energy project development, from conception through construction. As part of this full-service model, Savion manages all aspects of development for customers, partners, and project host communities.

1.1 COMPLIANCE WITH THE ENERGY CONVERSION AND TRANSMISSION FACILITY SITING ACT CHAPTER 49-22

The North Dakota Energy Conversion and Transmission Facility Siting Act (Siting Act), North Dakota Century Code (NDCC) Chapter 49-22, requires a utility proposing to construct an electric energy conversion facility exceeding 50 MW to obtain a Certificate from the PSC to locate, construct, and operate the facility in North Dakota. An application for a Certificate is to demonstrate compliance with the criteria set forth in the Siting Act and North Dakota Administrative Code (NDAC) Article 69-06-08. Siting of an energy conversion facility is to proceed in an orderly manner compatible with environmental preservation and efficient use of resources (NDCC Section 49-22-02).

In this Application, Flickertail presents the information required by the Siting Act and the PSC’s Siting Rules. In the design of the proposed Project, Flickertail considered exclusion and avoidance areas and selection and policy criteria specified in NDCC Chapter 49-22 and in NDAC Section 69-06-08. Flickertail provides information about these considerations in this Application. Moreover, Project design, solar resource, and technical information are provided to allow a thorough evaluation of the proposed Project. Table 1.1 outlines the information required to fulfill the requirements for a Certificate with the PSC and where these requirements are addressed in this document.

Table 1.1. Certificate Completion Checklist

State Authority	Description	Section Addressed
NDAC 69-06-04-01	Certificate of Site Compatibility Application	
Section 2	Contents	
a. (1)	The type of energy conversion facility proposed	1.0, 1.2, and 4.1
a. (2)	The gross design capacity	1.2.7
a. (3)	The net design capacity	1.2.7
a. (4)	The estimated thermal efficiency of the energy conversion process and the assumptions upon which the estimate is based	Not Applicable (N/A)
a. (5)	The number of acres that the proposed facility will occupy	1.2.2
a. (6) a	The anticipated time schedule for obtaining the certificate of site compatibility	1.2.8

State Authority	Description	Section Addressed
a. (6) b	The anticipated time schedule for completing land acquisition	1.2.8
a. (6) c	The anticipated time schedule for starting construction	1.2.8
a. (6) d	The anticipated time schedule for completing construction	1.2.8
a. (6) e	The anticipated time schedule for testing operations	1.2.8
a. (6) f	The anticipated time schedule for commencing commercial production	1.2.8
a. (6) g	The anticipated time schedule for beginning any expansions or additions	1.2.9
b.	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 D, E, F, G, H, I, J, K, L, M
c.	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.	2.1
d.	A description of any feasible alternative methods of serving the need.	2.2
e.	A study area that includes the proposed facility site is of sufficient size to enable the commission to evaluate the factors addressed in NDCC section 49-22-09.	1.2.1
f.	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.	Appendix A
g.	A map identifying the criteria that provide the basis for the specific location of the proposed facility within the study area.	Figures 3 and 4
h.	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.	3.1 through 3.6
i.	A discussion of the mitigative measures that the applicant will take to minimize adverse impacts that result from the location, construction, and operation of the proposed facility.	6.1 through 6.17
j.	The qualifications of each person involved in the facility site location study.	9.0
k.	A map of the study area showing the location of the proposed facility and the criteria evaluated.	Figures 1 through 9
l.	An eight-and-one-half-inch by eleven-inch black-and-white map suitable for newspaper publication depicting the site area.	Figure 10
m.	A discussion of present and future natural resource development in the area.	6.2, 6.9, 6.11
n.	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 through 10
49-22-08	Application for a certificate - Notice of filing - Amendment - Designation of a site or corridor.	

State Authority	Description	Section Addressed
1.	<i>An application for a certificate must be in such form as the commission may prescribe, containing the following information:</i>	
1. a.	A description of the size and type of facility.	1.0, 1.2, and 4.1
1. b.	A summary of any studies that have been conducted on the environmental impact of the facility.	6.1 through 6.17
1. c.	A statement explaining the need for the facility.	2.1
1. d.	An identification of the location of the preferred site for any electric energy conversion facility.	1.2.2
1. e.	An identification of the location of the preferred corridor for any electric transmission facility.	N/A
1. f.	A description of the merits and detriments of any location identified and a comprehensive analysis with supporting data showing why the preferred location is best suited for the facility.	3.1 through 3.6, 6.1 through 6.17, 8.1 through 8.10
1. g.	A description of mitigative measures that will be taken to minimize all foreseen adverse impacts resulting from the proposed facility's location, construction, and operation.	6.1 through 6.17, 8.1 through 8.10
1. h.	An evaluation of the proposed site or corridor with regard to the applicable considerations set out in section 49-22-09 and the criteria established pursuant to section 49-22-05.1.	8.1 through 8.10
1. i.	Other information the applicant may consider relevant or the commission may require.	N/A
49-22-09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	
1.	The commission shall be guided by, but is not limited to, the following considerations, where applicable, to aid the evaluation and designation of sites, corridors, and routes:	8.0
1. a.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	8.1
1. b.	The effects of new electric energy conversion and electric transmission technologies and systems designed to minimize adverse environmental effects.	8.2
1. c.	The potential for beneficial uses of waste energy from a proposed electric energy conversion facility	8.3
1. d.	Adverse direct and indirect environmental effects that cannot be avoided should the proposed site or route be designated.	8.4
1. e.	Alternatives to the proposed site, corridor, or route that are developed during the hearing process and which minimize adverse effects.	8.5
1. f.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	8.6
1. g.	The direct and indirect economic impacts of the proposed facility.	8.7

State Authority	Description	Section Addressed
1. h.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.	8.8
1. i.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	8.9
1. j.	The effect of the proposed site or route on areas unique because of biological wealth or because the areas are habitats for rare and endangered species.	8.10
1. k.	Problems raised by federal agencies, other state agencies, and local entities.	8.11

1.2 PROJECT SUMMARY

The Project will be located in Abercrombie Township, Richland County, North Dakota (Figure 1). The Project Area comprises 3,464 acres in the Agricultural/A-1 Agricultural District of Abercrombie Township. The Project includes an up to 300-MW alternating current (AC) solar energy conversion facility and associated facilities (see Section 1.2.3 below). The estimated construction start date is the first quarter of 2026, with commercial operation starting by the end of 2028.

Flickertail intends to construct a 230-kilovolt (kV) generation tie (gen-tie) line less than one mile in length (approximately 530 feet) to facilitate the Project’s interconnection. The gen-tie line would extend from the Project’s collector substation and interconnect to Minnkota Power Cooperative’s (Minnkota) existing Frontier-Wahpeton 230-kV transmission line via a line tap at a new switching station that will be permitted, constructed, and owned by Minnkota. Pursuant to NDCC Section 49-22-03-6(b), the Project’s gen-tie line is not considered an “electric transmission facility” because it is less than one mile in length. As such, the gen-tie line falls outside the PSC’s siting jurisdiction and is not described in detail or analyzed in this Application. The gen-tie line has been permitted through Abercrombie Township.

1.2.1 Study Area

Flickertail reviewed a study area consisting of a one-mile buffer (Study Area) around the Project Area, which comprises 12,725 acres (excluding the Project Area) of primarily agricultural land in Abercrombie and Colfax Townships, Richland County, North Dakota (Table 1.2; Figure 2). The environmental analysis (Section 6.0) of the Study Area is intended to describe the natural and human environments that have the potential to be indirectly impacted by the Project.

Table 1.2. Townships, Ranges, and Sections Encompassing the Study Area

County	Township Name	Range	Section
Richland	Abercrombie (134 North)	48 West	6, 7, 18
	Abercrombie (134 North)	49 West	1-18, 20-24, 26-28
	Colfax (135 North)	49 West	31-35

1.2.2 Project Area

The Project Area comprises 3,464 acres of primarily agricultural land in Abercrombie Township, Richland County, North Dakota (Table 1.3; Figure 1). The environmental analysis of the Project Area (Section 6.0) is intended to provide a description of the natural and human environment that has the potential to be directly impacted by the Project. Flickertail selected the specific Project Area based on significant landowner and local stakeholder interest, transmission and interconnection suitability, optimal solar resource, and minimal impact on human and environmental resources. Flickertail secured voluntary lease agreements, easement agreements, or purchase options for the Project with landowners.

Table 1.3. Township, Range, and Sections Encompassing the Project Area

County	Township	Range	Section
Richland	Abercrombie (134 North)	49 West	3, 5, 8-12, 14-16, and 22

1.2.3 Project Layout

For this application, Flickertail is providing a preliminary layout, which is subject to final design (Figure 2). Facilities include:

- photovoltaic (PV) solar panels and tracking racking systems;
- inverters;
- transformers;
- underground and aboveground electrical collection cables;
- security fencing and gates and equipment;
- new access roads, ingress/egress points, and improvements to existing roads (as needed);
- an operations and maintenance (O&M) facility;
- a collector substation;
- Supervisory Control and Data Acquisition (SCADA) system;
- control house for protective relay panels and site controllers;
- meteorological (MET) equipment including, but not limited to, anemometer MET monitoring weather stations;
- stormwater basins and/or other stormwater/drainage measures, as needed; and
- additional temporary facilities, including: laydown yard(s), improvements to public and private roads and driveways for delivery of materials and equipment, as needed (see Section 4.0).

Flickertail coordinated and will continue to work diligently with its landowner partners to ensure that the Project integrates successfully with the existing land use, facilities, and infrastructure. The presented layout reflects Flickertail’s effort to maximize the energy production of the Project while complying with applicable setbacks and minimizing and/or avoiding impacts to the land and environmental features. The Project’s final layout will be sited to comply with the PSC siting criteria and Abercrombie Township’s setback requirements, including those required in the Conditional Use Permit (CUP) (Appendix B). The final site plans will be provided to the PSC and Abercrombie Township prior to construction.

1.2.4 Selection of Project Area

Flickertail selected the specific Project Area based on significant landowner and local stakeholder interest, transmission and interconnection suitability, optimal solar resource, and minimal impact on human and environmental resources. All landowners in the Project Area have signed lease agreements, easement agreements, or purchase options with Flickertail.

1.2.5 Project Area Solar Characteristics

A Solar Resource Assessment was completed by Vaisala Inc. in December 2022 using 13 months of measurements collected approximately 3 kilometers north/northwest of the Project site. The measurement period was from June 2021 through June 2022. These observations were used to generate a multi-linear regression equation for the 13 months of coincident measured and modeled data. This equation was then applied to the entire 26+ years of historical satellite-derived modeled irradiance and weather data to remove any model bias and adjust the variance of the modeled data to better match the on-site measurements. A typical meteorological year (TMY) was generated from the site-tuned long-term data. Based on the data collected and analyses conducted, the site will be an economically viable location for solar energy generation.

1.2.6 Project Development History

Flickertail began evaluating the area as a potentially suitable site for a solar project in 2018. Over the following six years, Flickertail refined the Project Area due to numerous environmental studies and in consultation with landowners, environmental agencies, and other stakeholders. Flickertail constructed its first temporary MET tower in June 2021 to assess the solar characteristics of the site.

Beginning in 2022 and continuing in 2024, Flickertail conducted a series of environmental studies and surveys, including an eagle nest survey, unbroken grassland assessment, and grouse lek surveys. Flickertail also identified potential wetlands within the Project Area using the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI). In addition, field wetland delineations were completed at locations within the Project Area, which had the potential for ground disturbance from Project activities. Flickertail also completed a cultural and architectural history resource field survey for the Project. All these studies helped Flickertail refine the Project Area and design the layout to avoid and minimize impacts to wildlife, wetlands, and sensitive resources.

Outreach efforts include meeting with individual landowners and landowner groups, regulatory agencies, local government units, and the general public to discuss the Project and gather comments to address in Project planning, design, permitting, construction, and operation. Below is a summary of stakeholder outreach efforts since 2018:

- Landowners: Flickertail hosted group and individual outreach and meetings from 2018 to 2023 to introduce the Project and provide interested landowners the opportunity to participate, including a solar information forum at Galchutt Seed in September 2022 and a community open house in August 2023. In 2023, Flickertail secured the land rights necessary to construct the Project. In 2023, Flickertail secured good neighbor agreements from neighboring landowners.
- Abercrombie Township: Flickertail gave presentations and conducted outreach to the Abercrombie Township Zoning Commission and Board of Supervisors, including providing information on the Project and working with the township starting in 2022 to amend the township zoning ordinance to address solar energy.
- Agencies: Multiple consultations with staff from various federal, state, and local agencies, including the USFWS, North Dakota Game & Fish Department (NDGF), United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS), the North Dakota Department of Transportation (NDDOT), the State Historic Preservation Office at the State Historical Society of North Dakota (SHSND), the North Dakota Soil Conservation Committee (NDSCC), the Richland County Soil Conservation District, the Richland County Weed Board, and others.

Throughout Project development, Flickertail worked closely with participating landowners, the surrounding community, wildlife agencies, the interconnecting utility, and other stakeholders to refine the proposed layout and the Project Area.

1.2.7 Projected Output

The Project will deliver up to 300 MW, with a projected net annual output of approximately 704,873 megawatt hours (MWh). This projected average annual output assumes a net capacity factor of 25 to 27 percent. Flickertail recognizes that actual Project output would ultimately be determined by the solar resource, final design, and equipment selection and will vary on an inter-annual basis. Flickertail executed a large generator interconnection agreement on August 29, 2023, and a facility construction agreement on July 22, 2024.

1.2.8 Project Schedule

Table 1.4 presents key schedule milestones, including the Certificate through construction and the beginning of operations.

Table 1.4. Anticipated Schedule

Activity	Anticipated Schedule
Land Acquisition	Complete. Flickertail secured voluntary lease agreements, easement agreements, or purchase options for the Project with landowners.
Abercrombie Township CUP	Complete. Flickertail received the CUP on November 20, 2023.
Obtaining the Certificate of Site Compatibility	Flickertail anticipates the Certificate will be issued in the Second Quarter of 2025.
Other Permits	Flickertail will acquire all other permits necessary for construction of the Project prior to conducting the work for which the permit is required.
Construction	Construction of the Project is anticipated to begin as early as the First Quarter of 2026 and be completed in the Fourth Quarter of 2028.
Testing & Commissioning	Testing and commissioning of the Project are anticipated to occur between the First and Fourth Quarters of 2028. They will be completed prior to the commercial operation date (COD) and typically take about three to six months.
Commencing commercial operation	Flickertail anticipates full commercial operation to occur by the end of 2028.

1.2.9 Expansion or Addition

Flickertail does not anticipate expanding the proposed Project.

1.2.10 Project Ownership

Flickertail will develop, construct, own, and operate the Project.

1.2.11 Project Cost

The total installed capital costs for the Project are estimated to be approximately \$375 million, with the Project cost depending on variables including, but not limited to, construction costs, taxes, tariffs, and panel selection, along with associated electrical and communication systems and access roads.

2.0 NEED FOR FACILITY

2.1 NEED ANALYSIS

Flickertail has identified potential offtakers and is currently negotiating to sell the Project or the Project's power to commercial and industrial customers, utilities, and/or municipalities. Flickertail is actively marketing the Project to several potential offtakers and may sell the power in the form of a Power Purchase Agreement (PPA), or the Project could be owned directly by a utility. As an independent power producer, Flickertail can bid into various markets.

Utilities and other customers seeking to diversify and build their energy generation portfolios are attracted to solar energy projects because they can offer high-capacity value and long-term contracts at a fixed and competitive price while simultaneously providing the associated environmental benefits to meet existing and future renewable energy procurement and demand. Generally, renewable energy sources provide lower costs per MWh than conventional sources.¹ In North Dakota, peak solar generation is highly correlated with the Midcontinent Independent System Operator's (MISO's) coincident peak, determining the reserve margins MISO utilities must maintain for reliability and reserve sharing purposes. Recent solar pricing has shown that utility-scale solar provides electricity during daylight hours at a cost per MWh on par with, or less than, many gas-fired electric generators. New solar energy facilities are less expensive to construct than new conventional energy sources, even without government subsidies.² Generally, renewable energy sources provide lower costs per MWh than conventional sources.³ Thus, the Project could help satisfy local, regional, or even national renewable energy demands.

2.2 ALTERNATIVES

Potential alternatives to solar energy include other forms of renewable energy, such as wind energy, hydropower, or biomass. Which renewable resource is preferred depends on many factors, including the nature of the demand and the characteristics of the proposed location. Due to its characteristics, hydropower and biomass are not viable alternatives for this site. Specifically, the site does not have a large water or biomass source. Wind is not a viable alternative for this site because the land available would not be able to produce the same output. Additionally, while wind energy is currently considered one of the most cost-effective means of energy generation, solar energy provides a higher capacity value. It generates most of its energy during peak hours, making it a valuable resource for many offtakers.

2.3 TEN-YEAR PLAN

In accordance with NDCC Section 49-22-04 and NDAC Chapter 69-06-02, Flickertail filed a Ten-Year Plan for years 2024-2034 in June 2024 with the PSC (Case No. PU-24-260) (Appendix C). Flickertail's Ten-Year Plan is consistent with the contents of this application, except the schedule has been updated in this application.

¹ Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 16.0* (April 2023), at 2. Accessed online May 28, 2024. Retrieved from <https://www.lazard.com/media/typdgxmm/lazards-lcoeplus-april-2023.pdf>.

² Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 16.0* (April 2023), at 6. Accessed online May 24, 2024. Retrieved from <https://www.lazard.com/media/typdgxmm/lazards-lcoeplus-april-2023.pdf>.

³ Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 16.0* (April 2023), at 2. Accessed online May 24, 2024. Retrieved from <https://www.lazard.com/media/typdgxmm/lazards-lcoeplus-april-2023.pdf>.

3.0 SITE SELECTION CRITERIA

Flickertail selected the Project Area based on significant landowner and local support, transmission and interconnection suitability, optimal solar resource, compatibility with existing land uses and resources, and minimal impact on human and environmental resources. Site selection was also based on the criteria described in NDAC Section 69-06-08-01, discussed below.

3.1 EXCLUSION AREAS⁴

In accordance with NDAC Section 69-06-08-01(1), geographical areas listed in Table 3.1 shall be excluded from consideration of a site for an energy conversion facility. There are no exclusion areas within the Project or Study Areas.

Table 3.1. Exclusion Areas

Exclusion Area	Present within Project Area	Description	Section Addressed
Designated or registered national areas: 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.	None	N/A	6.7, 6.8, 6.15, 6.16, 6.17
Designated or registered state areas: parks; forests; forest management lands; historic sites; monuments; historical markers; archaeological sites; grasslands; wild, scenic, or recreational rivers; game refuges; game management areas; management areas; and nature preserves.	None	N/A	6.7, 6.8, 6.15, 6.16, 6.17
County parks and recreational areas; municipal parks; parks owned or administered by other governmental subdivisions; hardwood draws; and enrolled woodlands.	None	N/A	6.8, 6.17
Areas critical to threatened or endangered animal or plant species	None	N/A	6.15, 6.16, 6.17
Areas where animal or plant species that are unique or rare to this State would be irreversibly damaged.	None	N/A	6.15, 6.16, 6.17
Areas within 1,200 feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	None	N/A	6.4
Areas within 30 feet [9.14 meters] on either side of a direct line between an 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.	None	N/A	6.4

⁴ As defined in NDAC Section 69-06-01-01(8), exclusion criteria are "criteria that remove areas from consideration for energy conversion facility sites and transmission facility routes." Exclusion areas are characterized by one or more of these limiting criteria.

3.2 AVOIDANCE AREAS⁵

In accordance with NDAC Section 69-06-08-01(3), geographical areas listed in Table 3.2 shall only be approved as a site for an energy conversion facility if the applicant shows that, under the circumstances, there is no reasonable alternative. Avoidance areas within the Study Area and Project Area are depicted in Figure 3.

Table 3.2. Avoidance Areas

Avoidance Area	Present with Project Area	Description	Section Addressed
Historical resources not designated as exclusion areas	Present	One previously documented cultural resource that needs to be evaluated for National Register of Historic Places (NRHP) listing is located in the Project Area. Flickertail will avoid impacts to this resource by installing electrical collection cables via horizontal directional drilling/boring.	6.7, 6.17, Appendix F
Areas within the city limits of a city or the boundaries of a military installation	None	N/A	6.2, 6.17
Areas within known floodplains as defined by the geographical boundaries of the 100-year flood	Present	<p>Floodplains associated with Pitcairn Creek are present in the west-central and east-central parts of the Project Area.</p> <p>Project facilities have been sited to avoid the Zone A flood hazard area to the extent practical. Two access roads totaling approximately 500 linear feet and totaling 0.23 acre of permanent impacts are proposed to be placed within the Zone A flood hazard area. The southernmost access road has no alternative but to cross the 100-year floodplain because the floodplain extends between the adjacent public roads and the array on the participating parcel. The northernmost access road utilized an existing agricultural driveway to avoid impacts to a stream, which necessitates crossing the 100-year floodplain. The placement of these segments of access roads in the Zone A flood hazard area avoids impacts to wetlands, treed areas, and streams. Additionally, the access road will have a gravel base and be constructed at grade; therefore, no increase to the base flood elevation in the area is anticipated.</p> <p>Approximately 6,539 linear feet of electrical collection cable totaling 5.7 acres of temporary impacts will be trenched or horizontal directional drilled/bored in the Zone A flood hazard area. The placement of buried electrical collection cables in the Zone A flood hazard area is not anticipated to have any impact on base flood elevation.</p> <p>The exact amount of access road and electrical collection cable to be placed in Zone A flood hazard</p>	6.12, 6.17, Figures 3 and 8

⁵ As defined in NDAC Section 69-06-01-01(2), avoidance criteria are “criteria that remove areas from consideration for energy conversion facility sites and transmission facility routes unless it is shown that under the circumstances there are no reasonable alternatives.” Avoidance areas are composed of these limiting criteria.

Avoidance Area	Present with Project Area	Description	Section Addressed
		area will be based on final design plans. Flickertail will seek approval for the placement of these facilities with the Richland County Floodplain Administrator.	
Areas that are geologically unstable	None	No Project facilities are located within a landslide deposit, as indicated by the North Dakota Geological Survey's (NDGS's) landslide mapping program.	6.11, 6.17
Woodlands and wetlands	Present	<p>Wetlands, woodlands, and shelterbelts are present within the Project Area.</p> <p>Project facilities have been sited to minimize impacts to the 118.1 acres of treed areas in the Project Area to the extent practical. Three tree rows totaling approximately 12 acres (including tree canopy) and approximately 75 feet of a fourth tree row totaling 0.06 acre located in the south-central portion of the Project Area are proposed to be removed to allow for continuous development in the parcels. The tree rows consist predominantly of Siberian elm (<i>Ulmus pumila</i>) and eastern cottonwood (<i>Populus deltoides</i>); Russian olive (<i>Elaeagnus angustifolia</i>) was also observed. Siberian elm and Russian olive are not native tree species in North Dakota but have been used in shelterbelts due to fast growth and tolerance to poor soils, low moisture, cold winters, droughts, and windy conditions (North Dakota State Library 2024a, 2024b). If left in place, the tree rows would reduce the developable area on this parcel, which would also need to account for additional setbacks due to shading from these tree rows. Additionally, the landowners support removal of the tree rows. Flickertail will comply with the PSC tree and shrub mitigation plan, with a request to clear certain areas wider than 50 feet (see Figure 9). The Project may plant trees/shrubs within portions of the Project Area where Project facilities are not being proposed, or (with landowner support) may explore options within the surrounding community to coordinate on tree/shrub planting or engage in other activities that would provide long-term wildlife habitat and conservation benefits. Any plans for tree and shrub planting in the Project Area will adhere to setbacks outlined by Abercrombie Township (see Section 4.2) and through discussion with participating landowners. Flickertail avoided permanent and temporary impacts to wetlands. Electrical collection cables shown in wetlands in Figure 8 will be horizontally drilled/bored or relocated to avoid impacts.</p>	6.13, 6.14, 6.17, Figures 3, 8, and 9
Areas of recreational significance not designated as exclusion areas	None	N/A	6.8, 6.17

3.3 SELECTION CRITERIA⁶

In accordance with NDAC Section 69-06-08-01(5), a site shall be approved in an area only when it is demonstrated to the PSC by the applicant that any significant adverse effects resulting from location, construction, and operation of the facility in that area, as these relate to the criteria listed in Table 3.3, will be at an acceptable minimum, or that those effects will be managed and maintained at an acceptable minimum.

Table 3.3. Selection Criteria

Selection Criteria	Potential Adverse Effects	Section Addressed
Impact on agriculture:		
(1) Agricultural production	Based on Tetra Tech's land cover assessment, 3,137.7 acres (91 percent) of the Project Area is used for agricultural purposes (2,582.5 acres of cultivated crops and 555.2 acres of hay/pasture) (Table 6.2). When compared to the Project facility impact data presented in Section 6.2.2, up to 1,727.1 acres of agricultural land (1,509.0 acres of cultivated cropland and 218.1 acres of grassland/herbaceous [i.e., hay/pasture]) would be located within fenced perimeters and potentially converted to solar panels and grassland. The remaining cultivated cropland and hay/pasture located outside the fenced perimeters, excluding areas impacted by permanent facilities (i.e., collector substation, O&M facility, and access roads), may continue to be used for cultivated cropland or hay/pasture, converted to pollinator-friendly habitat, treed areas, or some combination of the aforementioned. The conversion of agricultural land to fenced solar facilities will have a minimal impact on the rural character of the surrounding area or Richland County. The PV arrays will be visible from adjacent roadways and parcels, but given their relatively low profile and the fact that all the facilities will be fenced for security, they will not be visible from long distances. Based on the 2021 National Land Cover Database (NLCD) (Dewitz 2023), approximately 14,340 acres (89 percent) of the combined Study and Project Areas (16,189 acres) are classified as agricultural land. The conversion of up to 1,727.1 acres of agricultural land would reduce the amount of agricultural land in the Study and Project Areas by approximately 12 percent. Additionally, the participating landowners have chosen to enter into agreements authoring solar development of their land. Any revenue lost from removing land from agricultural production will be offset by production from solar energy production and the associated solar land lease and easement payments to the associated landowners.	6.9, 6.10, 6.17; Tables 4.2 and 6.1
(2) Family farms and ranches	Conversion of land within the Project footprint currently used for agricultural production (cultivation or pasture) to solar development and grassland will reduce the land available for agricultural use during the life of the Project. However, solar land lease and easement payments to the associated landowners will offset the revenue lost from removing land from agricultural use. As the majority of the land in the Project Area is utilized for cultivated crops, impacts to livestock are not anticipated.	6.9, 6.17, Tables 4.2 and 6.1

⁶ As defined in NDAC Section 69-06-01-01(14), selection criteria is defined as "criteria that guide and govern the selection of energy conversion facility sites and transmission facility corridors and routes in order to minimize adverse human and environmental impact after the exclusion and avoidance criteria have been applied."

Selection Criteria	Potential Adverse Effects	Section Addressed
(3) Land that the owner demonstrates has soil, topography, drainage, and an available water supply that render the land economically suitable for irrigation	Landowners have not expressed concerns about or identified irrigation systems on their properties, and no known irrigation systems are present within the Project Area. Based on discussions with Project landowners, drain tile is present in the Project Area. If damage occurs to drain tile due to construction activities or operation of the Project, Flickertail will work with the affected property owners to repair any damages, as needed.	6.2, 6.11, 6.17
(4) Surface drainage patterns and groundwater flow patterns	No adverse impacts to surface drainage patterns and groundwater flow patterns are anticipated.	6.11, 6.12, 6.17
(5) Agricultural quality of cropland	No adverse impact to the agricultural quality of cropland is anticipated. Flickertail will compensate landowners for the placement of Project facilities on their property and for any crop damages that occur during construction of the Project. Soils will be allowed to rest and rejuvenate throughout the life of the Project, allowing for productive use of the Project Area for agricultural use after decommissioning.	6.9, 6.10, 6.17
Impacts on availability and adequacy of:		
(1) Law enforcement	No adverse impacts to the availability and adequacy of law enforcement are anticipated.	6.3, 6.17
(2) School systems and education programs	No adverse impacts to the availability and adequacy of school systems and education programs are anticipated.	6.3, 6.17
(3) Governmental services and facilities	No adverse impacts to the availability and adequacy of governmental services and facilities are anticipated.	6.3, 6.17
(4) General and mental health care facilities	No adverse impacts to the availability and adequacy of mental health care facilities are anticipated.	6.3, 6.17
(5) Recreational programs and facilities	No adverse impacts to the availability and adequacy of recreational programs and facilities are anticipated.	6.8, 6.17
(6) Transportation facilities and networks	There will be a temporary increase in traffic during construction activities. No impacts to traffic are anticipated during the operational life of the facility.	6.3, 6.17
(7) Retail service facilities	No adverse impacts to the availability and adequacy of retail service facilities are anticipated.	6.3, 6.17
(8) Utility services	No adverse impacts to the availability and adequacy of utility services are anticipated.	6.3, 6.17
Impacts on:		
(1) Local institutions	No adverse impacts are anticipated to local institutions.	6.3, 6.17

Selection Criteria	Potential Adverse Effects	Section Addressed
(2) Noise-sensitive land uses	<p>Noise-sensitive land uses in the Project Area are limited to residences near the solar facility. The results of the noise modeling conducted by technology manufacturers outlined in Table 6.5 show that noise levels will be less than 45 dBA between 450 to 524 feet from the inverter, which may vary slightly depending on which inverter model is selected, and less than 45 dBA at distances greater than 5 feet for the trackers.</p> <p>The nearest residence to the Project is approximately 580 feet from the nearest fence line. The owner of this residence has executed a good neighbor agreement with the Project. Construction of the Project will result in temporary increases in noise in the vicinity of the Project Area. During construction, Flickertail will limit construction activities to daylight hours. No adverse impacts on noise-sensitive land uses are anticipated during construction or operation of the Project.</p>	6.5, 6.17
(3) Light-sensitive land uses	<p>Minimal lighting will be utilized for the Project. Lighting will be used for safety and security purposes and placed at Project entrances, the O&M facility, and inverters. Lighting will be downlit and switch and motion activated. Motion activation for lighting placed at the inverters ensures the lighting will only be used for maintenance activities or if a security risk is detected within the Project boundary. Lighting the Project in this manner will minimize nighttime visual impacts while ensuring safety and security and will be comparable to typical residential porch or workshop lighting. Impacts to light-sensitive land uses are not anticipated.</p>	6.6, 6.17
(4) Rural residences and businesses	<p>No adverse impacts on rural residences and businesses are anticipated during construction or operation of the Project. The Project has been sited to comply with applicable setbacks. Additionally, Flickertail executed good neighbor agreements with all residences located within 0.25 miles of the Project Area.</p>	4.2, 6.2, 6.3, 6.17
(5) Aquifers	<p>The Colfax Surficial Aquifer System is located in the center of the Study Area. Water use during operation will be minimal. O&M water requirements will be satisfied with a single domestic-sized water well or connecting to the Southeast Water Users District. No adverse impacts on aquifers are anticipated.</p>	6.11, 6.17
(6) Human health and safety	<p>No adverse impacts on human health and safety are anticipated.</p>	6.4, 6.17
(7) Animal health and safety	<p>No adverse impacts on animal health and safety are anticipated.</p>	6.15, 6.16, 6.17

Selection Criteria	Potential Adverse Effects	Section Addressed
(8) Plant life	<p>For vegetation (Section 6.14), the values below are based on Tetra Tech's land cover assessment (Table 6.2), which provided a more current and refined estimate of non-cultivated land cover in the Project Area. Three tree rows totaling approximately 12 acres (including tree canopy) located in the south-central portion of the Project Area are proposed to be removed to allow for continuous development in the parcel. Approximately 75 feet of a fourth tree row totaling 0.06 acre is also proposed to be removed in the south-central portion of the Project Area to allow for continuous development in the parcel. The tree rows consist predominantly of Siberian elm (<i>Ulmus pumila</i>) and eastern cottonwood (<i>Populus deltoides</i>); Russian olive (<i>Elaeagnus angustifolia</i>) was also observed. Siberian elm and Russian olive are not native tree species in North Dakota but have been used in shelterbelts due to fast growth and tolerance to poor soils, low moisture, cold winters, droughts, and windy conditions (North Dakota State Library 2024a, 2024b). If left in place, the tree rows would reduce the developable area on this parcel, which would also need to account for additional setbacks due to shading from these tree rows. Additionally, the landowners support the removal of the tree rows.</p> <p>Flickertail will comply with the PSC tree and shrub mitigation plan, with a request to clear certain areas wider than 50 feet (see Figure 9). The Project may plant trees/shrubs within portions of the Project Area where Project facilities are not being proposed, or (with landowner support) may explore options within the surrounding community to coordinate on tree/shrub planting or engage in other activities that would provide long-term wildlife habitat and conservation benefits. Any plans for tree and shrub planting in the Project Area will adhere to setbacks outlined by Abercrombie Township (see Section 4.2) and through discussion with participating landowners.</p> <p>Flickertail will convert up to approximately 1,509 acres of cultivated cropland within fenced perimeters to solar panels and grassland. The ground cover under and between the solar panels will be seeded with native grasses and forb species characteristic of the region (Appendix K). Other areas within the fenced perimeter currently vegetated, including up to approximately 218.1 acres of grassland/herbaceous lands (i.e., hay and pasture areas), are anticipated to remain vegetated after construction. Flickertail will attempt to maintain grassy vegetation in hay and pasture areas throughout construction; any areas requiring reseeded will utilize seed mixes outlined in Appendix K. Seed mixes appropriate to the region were identified through consultation with the USDA-NRCS (Section 8.11.2).</p> <p>Portions of the Project Area located outside the fenced perimeters, excluding areas impacted by permanent facilities (i.e., collector substation, O&M facility, and access roads), may continue to be used for cultivated cropland or hay/pasture, converted to pollinator-friendly habitat, treed areas, or some combination of those above.</p>	6.14, 6.17

Selection Criteria	Potential Adverse Effects	Section Addressed
(9) Temporary and permanent housing	During construction, construction personnel will utilize existing temporary housing, such as hotels. Flickertail anticipates sufficient temporary housing will be available within Richland County and the surrounding area to accommodate construction personnel. Up to three full-time personnel will be required during the operation of the Project, and sufficient long-term housing exists in Richland County and the surrounding area. No adverse impacts are anticipated.	6.1, 6.17
(10) Temporary and permanent skilled and unskilled labor	Skilled and unskilled labor is expected to be available in Richland County or North Dakota to serve the Project's basic infrastructure and site development needs. Specialized labor will be required for certain aspects of the Project. Hiring specialized labor from other areas of North Dakota or neighboring states may be necessary because the relatively short construction duration often precludes special training of local or regional labor. Skilled and unskilled labor would receive short-term economic benefits during construction. No adverse impacts are anticipated.	6.1, 6.17
Cumulative Impacts:		
Cumulative effect of location of the facility in relation to existing and planned facilities and other industrial development	The Project is located approximately 1.3 miles from Galchutt and approximately 2 miles from Colfax. At these distances, the Project will not interfere with any potential future expansion of these communities. There is abundant property in the Project vicinity and Richland County to accommodate other possible industrial development.	6.2, 6.17
Impacts upon:		
Military installations, assets, and operations.	No impacts on military installations, assets, and operations are anticipated.	6.4, 6.17, 9.3

3.4 POLICY CRITERIA⁷

Per NDAC Section 69-06-08-01(6), the PSC may give preference to an applicant who would maximize the benefits resulting from adopting policies and practices listed in Table 3.4 and may require adopting such policies and practices as appropriate.

Table 3.4. Policy Criteria

Policy Criteria	Potential Adverse Effects	Section Addressed
Recycling of conversion byproducts and effluents	The selected construction contractor typically develops a plan to remove, dispose of, and/or recycle waste as appropriate.	6.4, 6.17
Energy conservation through location, process, and design	The Project has been designed to maximize energy output and optimize solar resources.	1.2, 3.0

⁷ As defined in NDAC Section 69-06-01-01, policy criteria are 'criteria' that guide and govern the selection of energy conversion facility sites and transmission facility corridors and routes in order to maximize benefits during the construction and operation of a facility.

Policy Criteria	Potential Adverse Effects	Section Addressed
Training and utilization of available labor in this State for the general and specialized skills required	Flickertail will create new local construction job opportunities for various trade professionals and anticipates using skilled and trained labor from North Dakota or the surrounding region. The Project will also provide up to 3 operations positions.	6.1, 6.17
Use of a primary energy source or raw material located within the State	The energy generated will come from the state's available solar resources. In addition, gravel will likely be obtained from a local source for access roads and foundations.	1.2.5
Non-relocation of residents	No residents will be relocated as a result of the proposed Project.	6.1
Dedication of an area adjacent to the facility to land uses such as recreation, agriculture, or wildlife management	The Project will not interfere with adjacent land uses. Additionally, Flickertail will utilize a pollinator-friendly seed mix, potentially benefitting and increasing the overall populations of wildlife species in the area, including small mammals, birds, reptiles, amphibians, and pollinator insects. Further, land adjacent to the Project Area is privately owned and not under Flickertail's control. For these reasons, Flickertail does not plan to dedicate an area adjacent to the Project to the specified land uses.	6.2, 6.14, 6.17
Economies of construction and operation	As an up to 300-MW solar project, Flickertail will benefit from economies of scale related to Project construction and operation. Solar energy projects have one-time costs that remain relatively stable despite the scale of the project. Therefore, a larger project will have cost advantages compared to a smaller project because the fixed costs are spread out over more units of output. Some examples of solar project costs that remain similar despite the project size are an onsite office space and substation procurement and construction.	3.6
Secondary uses of appropriate associated facilities for recreation and enhancement of wildlife	The site will utilize a pollinator-friendly seed mix, potentially benefitting and increasing the overall populations of wildlife species in the Project and Study Areas, including small mammals, birds, reptiles, amphibians, and pollinator insects.	6.14, 6.15, 6.17
Use of citizen coordinating committees	Flickertail coordinated and will continue to coordinate with participating landowners and non-participating landowners adjacent to the Project Area, as well as Abercrombie Township and Richland County. Therefore, a citizen coordinating committee is not needed.	1.2.6
A commitment of a portion of the energy produced for use in this State	The Project will interconnect to the grid at the existing Minnkota Frontier–Wahpeton 230-kV transmission line, and the energy generated by the Project may be injected into MISO's transmission system. Minnkota and MISO services areas include a portion of North Dakota.	1.2
Labor relations	Impacts to labor relations are not anticipated.	6.1, 6.17
Coordination of facilities	Existing facilities were considered in the location of the Project.	3.5, 6.3, 6.4, 6.17

Policy Criteria	Potential Adverse Effects	Section Addressed
Monitoring of impacts	Flickertail will monitor construction activities and use Best Management Practices (BMPs) throughout Project construction. During Project operation and restoration, Flickertail will monitor the Project, assess impacts, and comply with all requirements set forth in the Certificate.	5.1, 5.2, 6.17

3.5 DESIGN AND CONSTRUCTION LIMITATIONS

Flickertail considered the following design and construction limitations: solar resources, interconnection to the electrical transmission system, landowners and local support, and environmental constraints. As discussed in Section 1.2.5, Flickertail studied the meteorological conditions of the Project Area and confirmed that an economically viable solar resource is available.

Further, capacity for interconnection to the existing electrical transmission system was also a significant factor in Project development and design. The interconnection capacity in this location is expected to be more than sufficient for the Project. On August 29, 2023, Flickertail executed a large generator interconnection agreement; on July 22, 2024, Flickertail executed the facility construction agreement.

Landowner and local support, along with site control, are also key components for the Project’s siting and design. Flickertail secured voluntary lease agreements, easement agreements, or purchase options with supportive landowners in the Project Area and has executed good neighbor agreements with all residences located within 0.25 miles of the Project Area.

Furthermore, site-specific constraints were considered in the design and siting of the Project. Flickertail sited the Project to avoid or minimize impacts to sensitive environmental resources to the extent possible. PSC and Abercrombie Township setback requirements were also considered in the design and siting of the Project. The Project complies with all applicable PSC and Abercrombie Township setbacks, including those required pursuant to Flickertail’s CUP. Section 6.0 includes a more detailed discussion of site-specific resources and the BMPs and mitigation measures that will be implemented to avoid or minimize impacts to these resources.

Environmental constraints also affected the Project’s design and will factor into construction; these constraints are discussed in Section 6.

3.6 ECONOMIC CONSIDERATIONS

The Project will utilize North Dakota’s strong solar resource to generate and distribute renewable energy. For example, the Project will generate enough energy to power up to approximately 59,000 homes annually. Additionally, the Project will provide meaningful economic benefits to landowners, local governments, and communities, including the following:

- Provides reliable income in the form of solar land lease and easement payments to landowners.
- Allows landowners to diversify their operations with minimal disruption to existing agricultural use.
- Creates up to approximately 300 skilled and unskilled temporary jobs at the peak of Project construction.
- Creates up to three full-time jobs during operations.

- Provides significant and measurable indirect economic benefits to the general area, including increased retail and service activity at restaurants, gas stations, and local purchases of construction materials and supplies.
- Generates personal income by circulation and recirculation of dollars paid out by the Project as business expenditures, state and local taxes, as well as associated increases to the local tax base.
- Diversifies economic development in the Township.

In addition to direct payments to participating landowners, the creation of jobs, and other economic activities, the Project will also generate significant direct economic benefits in the form of payments in lieu of property taxes paid to state and local taxing authorities. Based on the current statutory formula for payments in lieu of property taxes, which is based on the Project’s nameplate capacity and electricity production, Flickertail anticipates paying the estimated taxes annually and over the life of the Project (Table 3.5).

Table 3.5. Production and Nameplate Capacity Tax Revenue Generated by the Project^{8, 9}

Taxing Authority/Recipient	Approximate Amount (average per year)	Approximate Amount (over 35-year life of Project)
North Dakota	\$8,200	\$286,800
Richland County	\$257,800	\$9,024,400
Richland School District ¹⁰	\$303,800	\$10,634,200
Abercrombie Township	\$89,200	\$3,121,900
Abercrombie Fire District	\$22,300	\$780,500
Total	\$681,400	\$23,847,900

The long-term beneficial impacts to Abercrombie Township's tax base as a result of the Project's construction and operation are expected to positively impact the local economy in this area of North Dakota. The Project is designed to be socioeconomically beneficial to participating landowners, local governments, and communities.

⁸ All information provided on economic benefits of the Project are estimates only subject to change due to factors including, but not limited to, modifications in tax rates, tax policy, project size, actual energy produced, and are contingent upon the Project being constructed.

⁹ These figures are based on a delivery up to 300 MW and onsite meteorological data (i.e., anticipated weather conditions).

¹⁰ School districts in North Dakota are primarily funded through local tax revenue and North Dakota’s state aid formal, the purpose of which is to ensure every student in North Dakota has the same amount of funding. A portion of all property taxes and payments in lieu of property taxes that are collected by a school district are either contributed to North Dakota’s state aid formula or used to offset the amount of state aid a school district receives. As applied to the Project, the amount of state aid Richland School District receives will be offset by an amount equal to 75% of the payments in lieu of property taxes that are distributed to Richland School District. As a result, Richland School District will recognize an increase in revenue from the Project equal to 25% of the total amounts received from payments in lieu of taxes.

4.0 DESCRIPTION OF THE PROPOSED FACILITY

4.1 PROJECT COMPONENTS

In this Application, Flickertail is providing a preliminary site plan (Figure 2) depicting the proposed Project layout, which is subject to final field studies and engineering design. Project facilities show the conceptual general footprint and layout, including the proposed facility location. Minnkota's planned interconnection facilities are also shown in Figure 2. The final locations of Project facilities will be within the Project Area and will be provided to the PSC and Abercrombie Township prior to commencement of construction.

4.1.1 Solar Panels

The Project will utilize PV panels with tempered glass varying in size, approximately eight feet long, four feet wide, and two inches thick. The panels will be installed on a tracking rack system that utilizes steel and/or aluminum piles for the foundations and a frame with a motor that allows the racking to rotate from east to west throughout the day. The piles will be buried approximately eight feet below grade; the completed geotech study will determine the final depth. Each tracking rack will contain multiple panels within a fenced perimeter (i.e., a PV array). On the tracking system, panels will be approximately 17 feet in height from the ground to the top of the panels when at a maximum tilt angle and approximately seven feet when horizontal to the ground. Height may vary due to manufacturer, geotechnical results, topography, and vegetation constraints. To limit reflection, solar PV panels are constructed of dark, light-absorbing materials. Today's panels reflect as little as two percent of the incoming sunlight depending on the angle of the sun and assuming the use of anti-reflective coatings. Flickertail anticipates that the panels used for the Project will use an anti-reflective coating.

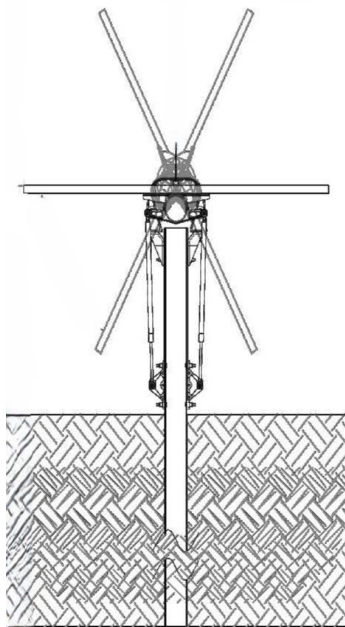


Photo credit: Savion. Brazoria West Solar Project. Brazoria County, TX. Developed by Savion. Owned and operated by Shikun & Binui USA.

Caption 1. A typical view of PV panels on a linear axis tracking system.

4.1.2 Linear Axis Tracking System

A linear axis tracking system tracks the solar resource throughout the day. The panels are generally aligned in rows north and south and face east in the morning, perpendicular to the ground during mid-day, and then west in the afternoon. The panels are rotated by a small motor to slowly track the sun throughout the day. The tracking rack system allows the Project to optimize the angle of the panels in relation to the sun throughout the day, thereby maximizing the production of electricity and the capacity value of the Project. The tracking rack system, along with the SCADA system, allows for the panels to be stowed at an angle necessary to limit any potential damage during a wind or hail event. The system is mounted on top of steel piles typically driven into the ground without excavation or concrete to install the piers. Geotechnical soil testing will determine the final installation process.



Caption 2. A plan profile of a linear axis tracking system.



Caption 3. A view of linear axis tracking system under construction, prior to the installation of the PV panels.

4.1.3 Inverters

Electrical wiring will connect the panels to inverters, which will convert the direct current (DC) output of the panels to AC, which is required for delivery to the electrical transmission grid. The final number of inverters for the Project will depend on the inverter size, inverter, and panel availability, as well as the final panel configuration and facilities selected for construction. Inverters will be located within the interior portion of the fenced area of the Project Area. Inverter skids will be utilized at locations throughout the Project Area and include a transformer to which the inverters will feed electricity. These skids provide the foundation for the inverter, transformer, and SCADA system. The skids will be placed atop a concrete slab or pier foundations and typically measure approximately 9.5 feet wide by 20 feet long, with a structure height of roughly eight feet above grade, depending on the final equipment procured and final engineering studies. The skids could be elevated via steel piles, or concrete foundations could be poured onsite or precast and assembled off-site.



Caption 4. A typical view of an inverter on a concrete pad within a solar site.

4.1.4 Electrical Collection System

After the inverter has converted the electricity from DC to AC, the electricity is stepped up via a transformer from low voltage to medium voltage (up to 34.5 kV) and brought via the electrical collection system cables to the Project's collector substation. Electrical collection system cables will be placed underground at a depth of at least three feet below grade, where possible, depending on geotechnical results. Portions of the electrical collection system may be located aboveground, depending on the manufacturer and site constraints.

4.1.5 Access Roads

Permanent gravel access roads will be installed to facilitate O&M of the Project. Preliminary access road locations are included in the site plan. The final length and location of the access roads will depend on the equipment selected and final engineering. These roads are up to 16 feet wide and wider along curves. There are several access points from existing public roads, as indicated on the site plan. Entrances to the Project will have locked gates.

Flickertail designed access roads for effective and efficient O&M access and safe ingress and egress of employees, visitors, and emergency responders. By minimizing the number of access roads for the Project, Flickertail minimized the amount of ground disturbance and new impervious surfaces while providing effective and efficient site access.

Some upgrades or other changes to the public roads may be required for construction or operation of the Project. Flickertail will work with the Township and other appropriate road authorities, as needed, to facilitate and pay for required upgrades to support such Project construction or operation that meet the required public standards. Upgrades or changes could include, but are not limited to, road improvements, addition of turning radii, additional aggregate, field access, or driveway changes. Flickertail will obtain any required permits for this work from the appropriate road authorities, as applicable.

4.1.6 Supervisory Control and Data Acquisition System

The Project will use a SCADA system, which allows remote control and monitoring of the status of the Project. The monitoring system provides status views of electrical and mechanical data, operation and fault status, MET data, and grid station data.

4.1.7 Fencing

Permanent security fencing will be installed along the perimeter of the solar arrays and collector substation. Fencing along the perimeter of the solar arrays will be an approximately seven-foot-tall agricultural-style fence (non-chain link, without barbed wire). Fencing around the collector substation will be seven feet above grade and may include one or more feet of three or more strands of barbed wire to comply with the National Electric Code (NEC). Fencing will be designed to prevent the public from gaining access to electrical equipment. All access points will have gates.

4.1.8 Lighting

The Project will utilize minimal lighting. Lighting will be used for safety and security purposes and placed at Project entrances, the O&M facility, and inverters. Lighting will be downlit and switch and motion activated. Motion activation at the inverters ensures lighting will only be used for maintenance activities or if a security risk is detected within the Project boundary. Lighting the Project in this manner will be comparable to typical residential porch or workshop lighting and will minimize nighttime visual impacts while ensuring safety and security.

4.1.9 MET Stations

The Project will include several MET stations, each with a height of approximately eight feet. Locations and quantity of the MET stations will depend on final engineering. All MET stations will be within fenced perimeters and comply with industry standards, PSC siting requirements, and applicable Abercrombie Township setback requirements.

4.1.10 Collector Substation

The Project's collector substation will be a 34.5/230-kV step-up substation with metering and switching gear required to connect to the transmission grid. The collector substation is anticipated to include a control house for protective relay panels and site controllers and will be designed and constructed in accordance with the applicable codes and standards, including but not limited to applicable NEC and National Electric Safety Code (NESC) requirements. The substation's footprint will be approximately 5 acres, with the substation fenced, as described above.

4.1.11 Operations and Maintenance Facility

An O&M facility may be constructed to provide workspace and storage for Project maintenance and operations personnel. It would be located on approximately 2 acres within the Project Area, adjacent to the collector substation and point of interconnect switching station. The buildings typically used for this purpose are approximately 5,000 to 7,000 square feet and house specific equipment to assist in operating and maintaining the Project. A gravel parking area will be located adjacent to the O&M building. This will accommodate parking for full-time employees and meet Abercrombie Township's minimum off-street parking requirements. The O&M facility may require a septic system and use rural water service supplied by the Southeast Water Users District or a new private well water supply. All applicable permits will be obtained.

4.1.12 Stormwater/Drainage Measures

The Project may include stormwater basins and/or other stormwater/drainage control measures. Flickertail will conduct further analyses to determine the appropriate stormwater basin and/or other stormwater/drainage measures required for the Project. Final stormwater basins and/or other stormwater/drainage control measures will be determined following the results of Flickertail's further analyses and final engineering. All stormwater basins will comply with all applicable regulations, including obtaining coverage under the North Dakota Pollutant Discharge Elimination System (NDPDES) General Stormwater Permit (GSP), which requires preparation of a Stormwater Pollution Prevention Plan (SWPPP).

4.1.13 Temporary Laydown Areas

Temporary laydown areas will serve as a parking area for construction personnel and staging areas for Project components. The laydown areas will be temporary in nature and will be located outside of the fenced perimeters containing the PV panels. They will be revegetated and stabilized following the completion of construction.

4.2 PROJECT LAYOUT

The Project has been designed to optimize electrical generation and efficiency while complying with applicable setbacks and minimizing and/or avoiding potential impacts to the land and environmental features. Flickertail has worked and will continue to work diligently with its landowner partners throughout Project development.

The Project has been sited to comply with the PSC's and Abercrombie Township's setback requirements. Table 4.1 provides applicable setbacks and Project-specific CUP design requirements, as shown in Figure 4. Setbacks are measured from the perimeter fence to the applicable feature.

Table 4.1. Setback Requirements

Feature	Requirement	Project Compliance
PSC Setbacks		
The geographic center of an ICBM launch facility or launch control facility	Areas within 1,200 feet of the geographic center.	N/A
Direct line between an ICBM launch facility and a missile alert or launch control facilities to avoid microwave interference	Areas within 30 feet (9.14 meters) on either side of a direct line between an ICBM launch facility and a missile alert or launch control facility.	N/A
Inhabited rural residence	500 feet*	Aboveground Project components, including fencing, will be located at least 500 feet from any inhabited rural residence unless a waiver is obtained. The nearest residence to an aboveground Project component (fencing) is 580 feet away. The residence owner has signed a good neighbor agreement with the Project.
Abercrombie Township Setbacks/Design Requirements		
Inhabited rural residence	500 feet*	Aboveground Project components, including fencing, will be located at least 500 feet from any inhabited rural residence unless a waiver is obtained. The nearest residence to an aboveground Project component (fencing) is 580 feet away. The residence owner has signed a good neighbor agreement with the Project.
County and state highways	Aboveground Project components, including fencing, shall be set back at least 150 feet from the centerline of county and state highways.	Aboveground Project components, including fencing, comply with this setback.

Feature	Requirement	Project Compliance
Township road rights-of-way	Aboveground Project components, including fencing, shall be set back at least 150 feet from the centerline of township road rights-of-way.	Aboveground Project components, including fencing, comply with this setback.
Tree plantings and shelterbelts	120 feet from the centerline of any road	Tree and shelterbelt plantings, if any, will be designed at a later stage and will comply with this setback.
Front yard	Aboveground Project components, including fencing, shall be set back at least 150 feet from the centerline of the township road and other rights-of-way.	Aboveground Project components, including fencing, comply with this setback.
Rear yard, measured from the rear lot line	The minimum rear yard, measured from the rear lot line, shall not be less than 50 feet.	Aboveground Project components, including fencing, comply with this setback.
Side yard, measured from the side lot line	The minimum side yard, measured from the side lot line, shall not be less than 50 feet.	Aboveground Project components, including fencing, comply with this setback.
Village of Galchutt	The Project Area must be at least 1 mile from the northern boundary of the SW ¼ of Section 26-T134N-R49W.	The Project Area is located at least 1 mile from the northern boundary of the SW ¼ of Section 26-T134N-R49W.
Section 26-T134N-R49W (no laydown yards)	There are no laydown yards in Section 26-T134N-R49W.	Laydown yards are not sited in Section 26-T134N-R49W.
No construction traffic on the portions of Galchutt Drive, 172 ½ Avenue SE, Galchutt Street, or Galchutt Avenue located within Section 26	Flickertail may not utilize the portions of Galchutt Drive, 172 ½ Avenue SE, Galchutt Street, or Galchutt Avenue located within Section 26 for construction traffic.	Flickertail will comply with this restriction.

*As set forth in NDCC Section 49-22-05.1(3), the setback may be waived by the owner.

4.3 ESTIMATED PROJECT FACILITY IMPACTS

The estimated impacts for Project facilities are presented in Table 4.2 and represent a maximum build of approximately 360-MW AC, but only up to 300-MW AC will be constructed. Accordingly, the actual areas that will be disturbed are expected to be smaller than those reported in Table 4.2 and discussed below.

A total of 1,766.8 acres will be located within fenced perimeters containing PV panels, access roads, buried electrical collection cables, inverters, stormwater basins (as needed), and METs. With the exception of the access roads, inverters, and METs (totaling 18.4 acres), the remaining portions within the fenced perimeters will be vegetated with a seed mix characteristic of the region; this includes areas under the PV panels, above buried electrical collection cables, and within the stormwater basins.

Areas outside the fenced perimeter (1,697.2 acres) will include the collector substation, the O&M facility, and access roads, which will result in permanent surface impacts of 11.5 acres during the duration of the Project. Other Project facilities outside the fenced perimeters include stormwater basins (as needed), buried electrical collection cables, and laydown areas; these areas will be revegetated after the installation of the facilities.

Approximately 1,620.8 acres are not currently proposed to be used for Project facilities; Flickertail will maintain these areas and may include the following uses: continue to use the areas for cultivated cropland, hay, or pasture, conversion to grassland or pollinator habitat, or conversion to trees and shrubs.

Table 4.2. Estimated Project Facility Impacts

Project Location	Project Facility	Project Impacts	Impact in Acres
Within Fenced Perimeters (1766.8 acres)	PV panels, buried electrical collections cables, stormwater basins (as needed), and continued current use	Temporary surface impacts; areas revegetated after installation of facility, and continued use	1,748.4
	Access roads, inverters, and METs	Permanent surface impact	18.4
Outside Fenced Perimeters (1,697.2 acres)	Collector substation (assumes one 5-acre area)	Permanent surface impact	5.0
	O&M facility (assumes one 2-acre area)	Permanent surface impact	2.0
	Access Roads	Permanent surface impact	4.5
	Electrical collection system (assumes a 50-foot-wide corridor)	Temporary surface impacts; areas revegetated after installation of facility	44.4
	Laydown Areas	Temporary surface impacts; areas revegetated after installation of facility	20.5
	Other maintained areas (under control of the Project)	May include continued current use, stormwater basins (as needed), conversion to grassland or pollinator habitat, or conversion to trees and shrubs.	1620.8
Total			3,464.0¹¹

¹¹ Approximately 5 acres of the total Project Area acreage includes the Minnkota POI switching station, which will be transferred to the utility in the future.

5.0 PROJECT CONSTRUCTION, OPERATION, AND DECOMMISSIONING

5.1 PROJECT CONSTRUCTION

A variety of activities must be completed to carry the Project through construction. Preconstruction, construction, and post-construction activities for the Project are expected to include:

- Pre-construction:
 - Environmental and natural resource surveys;
 - Geotechnical and hydrologic evaluation/analysis;
 - Underground utility and other existing infrastructure;
 - Design solar array, access roads, and O&M facility
 - Design gen-tie line, electrical collection system, substation, and battery storage system;
 - Procure all necessary facility components;
 - Procure road permits and any road use and maintenance agreements; and
 - Procure utility permits.
- Construction
 - Site preparation, grubbing, and minimal grading, as necessary;
 - Construct laydown areas and set up temporary construction management facility;
 - Construct fencing;
 - Civil construction of access roads;
 - Install PV mounting posts;
 - Install collection system;
 - Install electrical enclosure/inverter;
 - Tracker installation;
 - PV panel installation;
 - Construct collector substation;
 - Construct O&M facility; and
 - Construct gen-tie line.
- Post-construction
 - Restore all disturbed areas not intended for permanent above-ground facilities;
 - Seed permanent vegetation;
 - Test facility; and
 - Begin commercial production

5.1.1 Construction Activities

After the necessary permits are received, construction will begin with the initial site preparation work (such as installing erosion and sediment controls, vegetation removal, and grading, as needed), workforce mobilization, and construction of general site improvements, such as access improvements (if necessary) and the staging/laydown areas. Minimal areas of the site may need to be graded; in those instances, they will have topsoil and organic matter stripped and segregated from the subsoil. Topsoil shall have temporary and permanent stabilization measures established in accordance with the Project's SWPPP. Internal roads will be constructed of inorganic fill (road aggregate base) to match the surrounding ground elevations and allow drainage patterns to persist. Once the necessary grading is complete, subsoil will be replaced, followed by topsoil, blending the grade into existing topography.

Typically, the foundation is a steel or aluminum pile driven into the ground with a hydraulically powered high-frequency hammer mounted on a tracked carrier. The piles are installed at pre-defined locations throughout the

array area to a typical depth of approximately eight feet below grade, depending on soils, frost depth, and other factors determined by geotechnical studies.

The electrical collection system includes buried cables connecting the solar arrays to the inverters and the inverters to the Project substation. The cables will be installed in trenches or ploughed into place at a depth of at least three feet below grade. During trench excavation, the topsoil and subsoil will be removed and stockpiled separately. Once the cables are laid in the trench, the area will be backfilled with subsoil followed by topsoil.

The solar energy system (solar arrays and collection and distribution systems) will be installed along with any access roads within the arrays. The solar facilities will be constructed in blocks, and multiple blocks could be constructed simultaneously.

Electrical testing and equipment inspections will be conducted on each solar energy system. If concrete foundations are used for electrical equipment (inverters, transformers, or other electrical cabinets), they could be poured onsite or precast and assembled off-site.

Equipment and work vehicles would travel to and from the site during construction. Construction is anticipated to be consistent throughout the construction season when most access road construction and electrical and substation work occurs. Typical construction equipment such as scrapers, dozers, dump trucks, watering trucks, motor graders, vibratory compactors, and backhoes will be used during construction. Specialty construction equipment that may be used during construction will include:

- Skid steer loader;
- Vibratory pile driver;
- Medium duty crane;
- All-terrain forklift;
- Concrete truck and boom truck;
- High-reach bucket truck; and
- Truck-mounted auger or drill rig.

Upon completion of construction, heavy equipment will be removed from the site.

5.1.2 Construction Management

Flickertail will designate an on-site construction manager. This manager's responsibilities include scheduling and coordinating the activities of engineering, procurement, and construction (EPC) contractors. The construction manager will be supported by other Flickertail team members specializing in engineering, permitting, meteorology, environmental compliance, real estate, and Geographic Information Systems (GIS) mapping. Flickertail will continue coordinating with residents, farmers, and the government.

Throughout the construction phase, ongoing coordination occurs among the Project's development, design, and construction teams. The construction manager coordinates the execution of the work. This coordination includes safety and quality control programs, cost and schedule forecasting, as well as site security, and ongoing communication with local officials, citizen groups, and landowners.

Following commissioning and commercial operation, the care, custody, and control of the facility transfers from the construction team to the operations staff. The construction manager works with the operations staff, equipment suppliers, and other construction and maintenance personnel to ensure a smooth transition from the start of construction to the commercial operation date of the Project. The operations staff will have full responsibility for the facility to ensure O&M are conducted in compliance with approved permits, prudent industry practice, and the equipment manufacturer's recommendations.

5.1.3 Commissioning

Upon completion of the construction phase, the Project will undergo inspection and testing procedures before being commissioned. Inspection and testing will occur for each component of the solar array and the associated communication, MET, collection, and SCADA systems.

5.2 PROJECT OPERATION AND MAINTENANCE

Following commissioning and commercial operation, the care, custody, and control of the facility transfers from the construction team to the operations staff. The operations staff will have full responsibility for the facility to ensure O&M are conducted in compliance with approved permits, prudent industry practice, and the equipment manufacturer's recommendations. The Project will be professionally maintained and operated by Flickertail. Primary tasks include scheduled annual inspection(s) of electrical equipment, vegetation management, and snow removal on access drives. Flickertail estimates that the Project will result in up to three full-time permanent positions to operate and maintain the facility.

Once construction is complete, the Project will generally see one to two trucks on-site daily and at intervals associated with the maintenance schedule described below during normal operations. The generating facility will be operated through a real-time control system for most operations functions.

5.2.1 Supervisory Control and Data Acquisition System

The solar arrays will communicate directly with the SCADA system for remote performance monitoring, energy reporting, and troubleshooting. The SCADA system provides data on solar generation and production, availability, meteorology, and communications. It allows 24/7 monitoring of and communications with the Project and relays alarms and communication errors. Flickertail will oversee on-site service and maintenance for the Project. Permanent, full-time staff will remain on-site to perform these duties.

5.2.2 Equipment Inspection

Inspection of the main equipment will occur at regular intervals, including:

- PV panels: visual check of the panels, tracking system, and surrounding grounds to verify the integrity of the panels and tracking structure, the presence of animals and nests, etc.
- Inverters, transformer, and electrical panels: visual check of the devices, including the connection cabinet and the grounding network. Check for the presence of water and dust;
- Electrical check: measurement of the insulation level and dispersion. Check of the main switches and safety devices (fuses);
- Noise: check for abnormal sounds; and
- Cabling and wiring: Visually check the buried and aerial electrical lines and connection boxes to verify their status.

5.2.3 Performance Monitoring

Performance monitoring of the Project facilities will consist of a weekly or monthly analysis by the operations staff of the operations data acquired by the SCADA system (energy produced, alarms, faults, etc.).

5.2.4 Facility Maintenance

Housekeeping of the Project facilities will include road maintenance, vegetation maintenance (method is to be determined; either traditional mowing or sheep and/or lamb grazers will be utilized), fence and gate inspection,

lighting system checks, and PV panel washing (if required; minimal to no washing is anticipated to be needed at Project facilities due to the naturally occurring and frequent precipitation).

5.2.5 Maintenance Schedule

Information on the anticipated frequency of the O&M tasks associated with the Project is presented in Table 5.1. The table represents the anticipated preliminary frequency of these tasks; inspection frequency may vary based on facility demands and experience with the performance of certain components and Project features.

Table 5.1. Operations and Maintenance Tasks and Frequency

Device	Task	Anticipated Frequency
PV Field	PV Modules visual check	Twice Yearly
	Wirings and junction boxes visual check	Twice Yearly
	PV strings measurement of the insulation	Annually – insulation integrity is continuously monitored by the inverters
	PV strings and string boxes faults	Twice Yearly
	PV panels washing	No regular washing planned (only as site-specific conditions warrant)
	Vegetation Management	Up to three times a year, depending on site conditions
Electric Boards	Case visual check	Twice Yearly
	Fuses check	Twice Yearly
	Surge arrester check	Twice Yearly
	Torque check	Twice Yearly
	DC voltage and current check	Twice Yearly
	Grounding check	Twice Yearly
Inverter	Intake and filter inspections	Twice Yearly
	Conversion stop for lack of voltage	Twice Yearly
	AC voltage and current check	Twice yearly
	Conversion efficiency inspection	Twice yearly
	Datalogger memory download	Twice yearly
	Fuses check	Twice yearly
	Grounding check	Twice yearly
	Torque check	Twice yearly
Support Structures	Visual Check	Twice yearly
	PV modules torque check on random sample	Twice yearly

5.2.6 Operations and Maintenance Building

As described above, the O&M facility will be located adjacent to the Project Substation. The size of a typical building used for this purpose is approximately 5,000 to 7,000 square feet. It will house the necessary equipment to operate and maintain the Project. The O&M building will allow maintenance staff to conduct on-site diagnostics, repairs,

predictive maintenance, and preventive maintenance activities. This facility will also serve as the warehouse for critical spare parts and accommodate parking for full-time employees.

5.3 DECOMMISSIONING AND RESTORATION

The expected service life of the Project is 35 years, but it may be extended through equipment upgrades. At the end of the Project's useful life, Flickertail must comply with the North Dakota Solar Facility Decommissioning Guidelines (NDAC Chapter 69-09-10). Unless waived by the PSC, these actions will include the following:

- Dismantling and removal of all panel racking, PV modules, supports, anchors, towers, fencing, overhead cables, inverters, transformers, substations, and other equipment;
- Removal of underground cables to a depth of 24 inches;
- Removal of pilings and anchors, foundations, buildings, and ancillary equipment to a depth of 4 feet.
- Site restoration and reclamation to the approximate original topography that existed prior to construction of the facility with topsoil respread over the disturbed areas at a depth similar to that in existence prior to the disturbance; and
- Grading and restoring topsoil of areas disturbed by the facility and reseeding according to natural resource conservation service recommendations.

In accordance with NDAC Section 69-09-10-06, Flickertail will submit a decommissioning plan to the PSC prior to the commencement of operation of the Project. Flickertail will comply with the PSC's financial assurance requirements.

6.0 ENVIRONMENTAL ANALYSIS

The environmental analysis for the Application includes a review of the Project and Study Areas, where applicable.

A detailed environmental analysis was conducted for the Project. The environmental data described below includes publicly available information and data collected from field surveys, which include a Class III cultural resource inventory, a ground-based eagle nest survey (for the Project Area plus a 660-foot buffer), and lek surveys.

A wetlands and waters survey and land cover assessment were conducted for 3,315 acres of the 3,464-acre Project Area. The remaining 149 acres of the Project Area were not field surveyed for wetlands and waters or land cover because no facilities are proposed to be located on those 149 acres. These 149 acres include portions of the U.S. Interstate 29 right-of-way, the Red River Valley & Western Railroad right-of-way, two parcels landlocked between the U.S. Interstate 29 right-of-way and the Red River Valley & Western Railroad right-of-way, and a narrow north-south parcel located west of the U.S. Interstate 29 right-of-way. A desktop review of wetlands and waters and a land cover assessment were conducted for these 149 acres. These acres are included in the Project Area to provide flexibility in selecting the final location for an electrical collection cable crossing of the U.S. Interstate 29 right-of-way and the Red River Valley & Western Railroad right-of-way, in coordination with the Red River Valley & Western Railroad Company and NDDOT.

Currently, the electrical collection cables are proposed to be located across the center of the 149-acre area (shown in Figures 2 and 8). They are proposed to be installed via boring, and the bore locations have been field surveyed for wetlands and waters and for the land cover assessment. If the proposed bore locations are relocated into an unsurveyed area, Flickertail will conduct the necessary field surveys.

6.1 DEMOGRAPHICS

6.1.1 Existing Conditions

The Study Area is predominantly rural, approximately 15 miles northwest of Wahpeton and 30 miles south of Fargo. The nearest town is Galchutt, roughly 0.3 miles south of the Study Area. The Project is located in a rural area of Richland County with low population density. According to the Job Service North Dakota Labor Market Information Center (NDLMI), Richland County's 2023 resident population was 16,558, a one-year numeric change of -16 or a change of -0.1 percent (NDLMI 2024). The unemployment rate for Richland County in June 2024 was 2.7 percent. One year prior, the unemployment rate was 2.1 percent. There were 204 job openings in Richland County in July 2024. On average, in the first quarter of 2024, the private industry in Richland County employing the largest number of workers was manufacturing. The private industry with the highest average weekly wage in the first quarter of 2024 was professional and technical services.

In Richland County, agriculture is an integral part of the economy, with 894 farms located in the county (USDA NASS, 2024). According to the 2022 Census of Agriculture, the total market value of agricultural products produced in Richland County was \$472,690,000, 96 percent of which was from crops and 4 percent from livestock. The principal crops include soybeans, corn, wheat, and sugar beets, and the primary livestock are cattle.

In August 2024, Richland County had 70 homes for sale, with several listings in Wahpeton (Zillow, 2024). U.S. Census Bureau data from the 2020 census indicates approximately 7,501 housing units in Richland County, of which 791 are vacant (U.S. Census Bureau, 2024).

6.1.2 Demographic Impacts and Avoidance/Minimization Measures

The Project is expected to result in socioeconomic benefits for the local population and will not impact long-term population trends. The Project will be socioeconomically beneficial to landowners, local governments, and communities because it will provide additional income in the form of lease payments to landowners, which could raise the per capita income in Richland County. Flickertail designed the Project to minimize impacts to family farms and ranches to the extent practicable, and any economic losses due to taking agricultural land out of production for the life of the Project are anticipated to be minimal compared to the additional consistent income provided by the Project. The supplemental income from the Project to landowners is expected to stabilize farm incomes and ensure the continued viability of farming in the Project and Study Areas. Furthermore, the Project will increase the local tax base, benefitting local governments and communities (see Table 3.5 above).

The Project will create approximately 300 temporary construction jobs during the approximately 18 to 24-month construction period. Limited general skilled labor is expected to be available in the county or the state to serve the basic infrastructure and site development needs. Specialized labor will be required for certain components of Project development. It may be necessary to import specialized labor from other areas of North Dakota or neighboring states, as the relatively short duration of construction often precludes special training of local or regional labor.

During construction, out-of-town laborers will likely use lodging facilities in and around Abercrombie, Wahpeton, and Fargo. Although the Project may increase demand for housing during the construction phase, according to the U.S. Census Bureau, 791 vacant housing units may be present within Richland County. This number of potentially vacant housing units would be enough to house non-local workers throughout Project construction. Furthermore, demand for lodging could temporarily increase revenue in the area.

Construction of the Project could also temporarily increase revenue in the area through increased demand for food services, fuel, goods, and services. Personal income could also be generated by the circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes.

The Project will create approximately three full-time O&M jobs, including one site manager and two technicians. These employees are expected to reside locally.

Long-term beneficial impacts to the tax bases of Richland County, as a result of the construction and operation of the Project, will have an additional positive impact on the local economy in this area of North Dakota (see Section 3.6 and Table 3.5). In addition, lease payments paid to landowners will offset potential financial losses associated with removing a portion of their land from agricultural production.

The proposed Project could increase the labor force in Richland County and demand for local housing during construction; however, the construction period is only temporary. Overall, Flickertail anticipates that the Project will be socioeconomically beneficial to the local population and will not impact long-term population trends. Further, the Project would not result in the relocation of residences, and the Project complies with applicable setbacks from occupied residences. Thus, no mitigation measures are needed.

6.2 LAND COVER, LAND USE, AND ZONING

6.2.1 Existing Conditions

NLCD Land Cover and Land Use

The Study Area is predominantly rural. The 2021 NLCD (Dewitz, 2023) provides a high-level assessment of land cover based on Landsat imagery and geospatial ancillary datasets.

Based on the 2021 NLCD (Dewitz, 2023), land cover in the Study Area is primarily associated with agricultural purposes (86 percent cultivated crops and less than 1 percent hay/pasture); other land covers within the Study Area include wetlands (8 percent), developed (4 percent), deciduous forest (1 percent), and herbaceous (1 percent) (Figure 5; Table 6.1). Approximately 95 percent of the Project Area includes land covers associated with agricultural purposes in the NLCD (95 percent cultivated crops and less than 1 percent hay/pasture); other NLCD land covers within the Project Area include developed (3 percent) and emergent herbaceous wetland (1 percent) (Figure 5; Table 6.1).

Table 6.1. NLCD Land Cover within the Project Area and Study Area

Land Cover	Acres in Project Area	Percent of Project Area	Acres in Study Area	Percent of Study Area
Cultivated Crops	3,291	95	10,994	86
Developed, Open Space	74	2	354	3
Developed, Low Intensity	45	1	148	1
Emergent Herbaceous Wetland	27	1	701	6
Developed, Medium Intensity	11	<1	55	<1
Hay/Pasture	9	<1	46	<1
Woody Wetlands	5	<1	250	2
Developed, High Intensity	<1	<1	5	<1
Deciduous Forest	<1	<1	81	1
Herbaceous	<1	<1	74	1
Barren Land	<1	<1	1	<1
Evergreen Forest	0	0	8	<1
Open Water	0	0	7	<1
Shrub/Scrub	0	0	<1	<1
Mixed Forest	0	0	<1	<1
Total	3,464	100	12,725	100

Land Cover and Use Type Based on Land Cover Assessment

Tetra Tech completed a land cover assessment to better estimate land cover/use type in the Project Area. The land cover assessment consisted of a desktop review and classification of land cover within the Project Area using the 2021 National Agriculture Imagery Program (NAIP) aerial photography (USDA FSA APFO 2021), followed by a field visit by a Tetra Tech biologist in June 2024. The site visit documented the extent of land cover by category in all portions of the Project Area, even the 149 acres that could not be directly accessed; these areas were observed from adjacent parcels where current land cover could be confirmed. For parcels that Tetra Tech could access, dominant plant species were recorded.

Approximately 75 percent, or 2,582.5 acres, were observed as cultivated cropland, and roughly 16 percent, or 555.2 acres, were observed as grassland/herbaceous lands (i.e., hay or pasture). Other land cover/use types within the Project Area include trees (118.1 acres), road and railroad rights-of-way (79.6 acres), wetlands and ponds (95.6 acres), and streams (10.2 acres) (Table 6.2).

Table 6.23. Land Cover/Use Type based on Land Cover Assessment.

Land Cover/Use Type		Acres in Project Area	Percent of the Project Area
Cultivated Cropland		2,582.5	75
	<i>Cultivated Cropland</i>	2,582.5	75
Developed		79.6	2
	<i>Road and Railroad Rights-of-Ways</i>	79.6	2
Grassland/Herbaceous		555.2	16
	<i>Hay</i>	485.4	14
	<i>Pasture</i>	69.8	2
Riparian		22.8	1
	<i>Grasses or Forbs</i>	22.8	1
Stream		10.2	<1
	<i>Ephemeral</i>	0.1	<1
	<i>Intermittent</i>	2.3	<1
	<i>Perennial</i>	7.8	<1
Trees		118.1	3
	<i>Cluster of Trees</i>	2.4	<1
	<i>Individual Tree</i>	1.0	<1
	<i>Riparian</i>	3.0	<1
	<i>Small Woodlot</i>	15.3	<1
	<i>Tree row</i>	90.9	2
	<i>Forested Wetland</i>	5.5	<1
Wetlands and Ponds		95.6	3
	<i>Emergent Wetland</i>	95.0	3
	<i>Pond</i>	0.6	<1
Total		3,464	100

Other Land Uses in the Study and Project Area

No concentrated residential developments are present within the Study Area or Project Area, though residences and farmsteads are present in both areas. Based on a review of Google Earth 2024 aerial imagery, approximately 31 occupied or occupiable residences and one church are located throughout the Study Area (Figure 5). The nearest residence to an aboveground Project component (fencing) is 580 feet away. Flickertail executed a good neighbor agreement with this property owner. A residence located in the cut-out in the southeast corner of the Project Area is an active farmstead with shelterbelts on the property's north, west, and south sides. The nearest Project facility (a fence line) is approximately 790 feet north of this residence. Flickertail executed a good neighbor agreement with this property owner and all non-participating landowners living within 0.25 miles of the Project Area. Agricultural outbuildings and grain bins are located in the cutout in the northwest portion of the Project Area.

The Project Area does not contain occupied or occupiable structures; the only structure there is a former granary (see Section 6.7). No center pivot irrigation systems were observed in the Google Earth 2024 aerial imagery within the Project Area or Study Area. Based on discussions with Project landowners, drain tile is present in the Project Area. Based on a review of the United States Geological Survey (USGS) 1960 Galchutt, North Dakota, and the 1959 Mooreton NW, North Dakota 7.5-Minute Topographic Quadrangles, and the available historical Google Earth aerial photography for the region, no aggregate pits were observed in the Project or Study Areas.

In North Dakota, Private Land Open to Sportsmen (PLOTS) lands are private lands open to public use for hunting and bird watching. The PLOTS program offers rental payments to landowners in exchange for walk-in access for hunters during the state's hunting seasons. PLOTS lands are administered through an agreement between the NDGF and individual landowners and are managed by the NDGF. Within the Project Area, one 80-acre parcel (PIN 08-0000-01848.000) is currently enrolled in PLOTS (Agreement 3019010) (Figure 5).

The Southern Valley Snowmobile Trail is located on the western edge of the Project Area, within the County Road 1 (169th Avenue Southeast) right-of-way (Figure 5). The Southern Valley Snowmobile Trail originates at the intersection of County Road 1 and County Road 6 in the Study Area and continues north through the Project and Study Areas. Approximately 1.3 miles are located along the western boundary of the Project Area, and 1.3 miles are located in the Study Area. The North Dakota Parks and Recreation Department (NDPRD) contracts the Snowmobile North Dakota (SND) Trail Program to manage the state snowmobile program under the general administration and direction of the Department (SND 2024). SND is a non-profit 501 (c) 3 organization that oversees the recreation of snowmobiling across the state. The NDPRD contracts SND to manage the state snowmobile trail system, which comprises snowmobile clubs and individual/family and business memberships. The trail program receives contract dollars from the NDPRD to assist with operating the state snowmobile trail system.

Zoning

Pursuant to Section 5.1.3.17 of the Abercrombie Township Zoning Regulation, "utilities" (defined to include solar energy generating systems and associated facilities) located in the Agricultural District require a conditional use permit. Abercrombie Township issued a conditional use permit to Flickertail for the Project on November 20, 2023 (Appendix B).

6.2.2 Land Use and Zoning Impacts and Avoidance/Minimization Measures

Land Use

Agricultural land will be converted from agricultural use to solar energy use for the life of the Project. Soils under PV panels will be preserved and given the opportunity to rest and regenerate. Table 6.3 provides the total acres of each land cover type that would be affected by the construction and operation of the Project.

Table 6.34. Estimated Land Cover Impacts Based on Land Cover Assessment

Project Location	Project Facility	Project Impacts	Land Cover Impacts Based on Land Cover Assessment							Total
			Cultivated Cropland	Developed	Grassland/Herbaceous	Riparian	Stream	Trees	Wetlands & Ponds ¹²	
Within Fenced Perimeters (1766.8 acres)	PV panels, buried electrical collections cables, stormwater basins (as needed), and continued current use	Temporary surface impacts; areas revegetated after installation of facility, and continued use	1,509.0	0	218.1	0	0	13.0 ¹³	8.3	1,748.4
	Access roads, inverters, and METs	Permanent surface impact	16.2	0	2.1	0	0	0.1	0	18.4
Outside Fenced Perimeters (1,697.2 acres)	Collector substation (assumes one 5-acre area)	Permanent surface impact	0	0	5.0	0	0	0	0	5.0
	O&M facility (assumes one 2-acre area)	Permanent surface impact	0	0	2.0	0	0	0	0	2.0
	Access Roads	Permanent surface impact	3.0	0	1.5	0	0	0	0	4.5
	Electrical collection system (assumes a 50-foot-wide corridor)	Temporary surface impacts; areas revegetated after installation of facility	28.5	2.3	9.9	0.4	0.2	0.5	2.6	44.4
	Laydown Areas	Temporary surface impacts; areas revegetated after installation of facility	17.1	0	3.4	0	0	0	0	20.5
	Other maintained areas (under control of the Project)	May include: continued current use, stormwater basins (as needed); conversion to grassland or pollinator habitat; or conversion to trees and shrubs.	1,008.7	77.3	313.2	22.4	10.0	104.5	84.7	1620.8
Total			2,582.5	79.6	555.2	22.8	10.2	118.1	95.6	3,464.0

¹² No wetlands, ponds, or streams are proposed to be temporarily or permanently impacted by Project facilities.¹³ Of the 13.1 acres of trees in the fenced perimeters, approximately 12 acres are proposed to be impacted (Section 6.14).

Within the fenced areas, the majority of the Project impacts (1,745.4 acres) will be to cultivated cropland and grassland/herbaceous lands (i.e., hay and pasture) (Table 6.3). Up to 1,509.0 acres of cultivated cropland located within fenced perimeters would be converted to PV panels and grasslands. The existing 218.1 acres of grassland/herbaceous lands within fenced perimeters will be preserved to the extent practicable and re-seeded as needed (Section 6.14 and Appendix K). A total of 18.4 acres of impervious surfaces (i.e., access roads, inverters, and METs) will be located within the fenced perimeters. Of the 13.1 acres of trees in the fenced perimeter, approximately 12 acres are proposed to be removed (Section 6.14). No wetlands, ponds, or streams are proposed to be temporarily or permanently impacted by Project facilities (within and outside the fenced perimeters).

A total of 11.5 acres of impervious surfaces (i.e., collector substation, O&M building, and access roads) will be located outside the fenced perimeters. The remaining land cover located outside fenced perimeters may continue with current use or be converted to pollinator-friendly habitat, treed areas, or some combination of the aforementioned.

The conversion of agricultural land to solar facilities and grassland will have a minimal impact on the rural character of the surrounding area or Richland County. The PV arrays will be visible from adjacent roadways and parcels, but given their relatively low profile and the fact that all the facilities will be fenced for security, they will not be visible from long distances. Based on the 2021 NLCD (Dewitz, 2023), approximately 14,340 acres (89 percent) of the combined Study and Project Areas (16,189 acres) are classified as agricultural land. The conversion of up to 1,727.1 acres of agricultural land would reduce the amount of agricultural land in the Study and Project Areas by approximately 12 percent.

Flickertail is committed to working with landowners to avoid and minimize detrimental impacts to agricultural land and crops during construction. If drain tile is damaged due to construction activities or the operation of the Project, Flickertail will work with the impacted property owners to repair any damages, as needed.

Other Land Uses

There are no residences or occupiable structures within the Project Area. Flickertail has executed good neighbor agreements with all non-participating landowners within 0.25 miles of the Project Area.

The PLOTS parcel within the project area is being removed from the program in coordination with the NDGF and the landowner.

One driveway access is proposed to cross the Southern Valley Snowmobile Trail. This driveway access will be similar to existing agricultural driveways located along the trail. No adverse impacts to the snowmobile trail are anticipated.

Zoning

As noted above, Abercrombie Township issued a Conditional Use Permit to Flickertail for the Project on November 20, 2023 (Appendix B). Flickertail designed the Project to comply with applicable Abercrombie Township requirements.

6.3 PUBLIC SERVICES

6.3.1 Existing Conditions

Local Services

The Project and Study Areas are located in a rural part of southeastern North Dakota mainly used for agriculture. The town of Galchutt is approximately 1.3 miles southeast of the southernmost portion of the Project Area and has no public services except the Galchutt Lutheran Church. Most public services and infrastructure near the Project Area are located in the town of Abercrombie, approximately 2.8 miles northeast of the easternmost portion of the

Project Area (Figure 6). Abercrombie has a church, city parks, commercial businesses, a community hall, a grocery store, a postal office, a public elementary school, and a volunteer fire department. The Richland County Sheriff's Department provides law enforcement in the Project and Study Areas.

Electrical Service

Dakota Valley Electric Cooperative provides electrical service in the Study Area (Dakota Valley Electric Cooperative 2024). Minnkota's existing Frontier-Wahpeton 230-kV transmission line runs east-west through the Project Area (Figure 6). Multiple small overhead distribution lines are also connected to farmsteads throughout the Study Area.

Transportation

The Project and Study Areas are bisected north-south by U.S. Interstate 29 (Figure 6). Other roads within the Study Area are county or township roads that are either paved or graveled (Figure 6). The Red River Valley and Western Railroad traverse both the Project and Study Areas in a southeast-to-northwest direction (Figure 6). No public or private airports exist in the Study Area (NDIT NDGIS 2023a). The closest public airport is the Harry Stern Airport, located approximately 15 miles southeast of the Study Area in the town of Wahpeton. The nearest private airport (Gorder Farm) is located 1.5 miles south of the southernmost portion of the Project Area, beyond the Study Area. According to AirNav.com (2024), Gorder Farm is a private-use heliport with one aircraft and a turf landing area.

Traffic

According to NDDOT traffic counts, the 2023 average daily traffic volumes indicated 8,880 vehicles on U.S. Interstate 29 in the vicinity of the Project Area (NDDOT 2024). Limited traffic data is available for the county and township roads in the Project Area. County Road 6 (68th Street Southeast) runs east-west through the center of the Project Area and had an average daily count of 60 vehicles in the Project Area in 1991. County Road 1 (169th Avenue Southeast) runs north-south along the west side of the Project Area and had an average daily count of 160 vehicles near the Project Area in 2021. The Project and Study Area roadway traffic can be attributed to agricultural-related traffic and local use.

Water Supply

Rural water is supplied to the Study Area by the Southeast Water Users District (North Dakota Department of Water Resources [NDDWR], 2023). It is common for rural residences in the area to utilize private wells for alternative uses, such as agriculture. According to the NDDWR MapService (2024), there is one stock well (drilled in September 2011) located in the south-central portion of the Project Area (Figure 6). One well noted as plugged and abandoned was also located in the south-central portion of the Project Area. An additional 10 wells were identified in the Study Area (Figure 6). These include four stock wells, four domestic wells, and two domestic/stock wells. Two wells are located adjacent to the Project Area, and eight wells are located approximately 0.5 miles or farther from the Project Area.

6.3.2 Public Service Impacts and Avoidance/Minimization Measures

Local Services

Impacts to local services in the Project and Study Areas are not anticipated; therefore, no mitigation is required.

Electrical Service

The Project's O&M facility is anticipated to tie into the Dakota Valley Electric Cooperative powerlines. Since no impacts to the existing electrical infrastructure are expected, no mitigation measures are required.

Transportation

Access to the Project will be via existing roads, such as U.S. Interstate 29 and county and township roads. With the limited possible exception of minor field access or driveway changes depending on the final design, changes to existing roadways are not anticipated. Flickertail will coordinate with Abercrombie Township, Richland County, and the NDDOT, as needed, on anticipated road use permits. Flickertail will also acquire all required permits to cross/bore state, county, and township roads and install its electrical collection cables. Flickertail will negotiate a road use and maintenance agreement with Abercrombie Township and, if needed, other relevant road authorities. Flickertail committed to Abercrombie Township that the Project will not utilize the portions of the following roads in Section 26 for construction traffic: Galchutt Drive, 172 ½ Avenue Southeast, Galchutt Street, or Galchutt Avenue.

In a letter dated November 22, 2023, the NDDOT indicated the Project should have no adverse impact on the NDDOT highways; however, the Project would need to obtain a Utility Permit from the NDDOT Fargo District Office before installing any electrical lines within the Interstate Highway ROW (Section 8.11.5).

The Project is not expected to impact the existing Red River Valley and Western Railroad in the Project or Study Areas. Flickertail will work with the railroad to acquire the necessary approvals to install electrical collection cables under the railroad rights-of-way via horizontal directional drilling/boring; therefore, no mitigation is proposed.

No impacts are anticipated regarding the Harry Stern Airport, located approximately 15 miles southeast of the Study Area, and the nearest private airport (Gorder Farm), located 1.5 miles south of the southernmost portion of the Project Area. The Federal Aviation Administration (FAA) Notice Criteria Tool indicated that the Project did not exceed the Notice Criteria.

Traffic

During the construction phase, temporary impacts are anticipated on some public roads in the vicinity of the Project, primarily through additional traffic and the potential for slow-moving construction vehicles. Construction traffic will use the existing public roadway system to access the Project facilities and deliver construction materials and personnel. Increased traffic during the construction phase may be perceptible to area residents, but the slight increase in volume is not expected to impact traffic function. Slow-moving construction vehicles may cause delays on smaller roads, similar to the impact of farm equipment during planting or harvest. However, these delays should be minimal for the relatively short construction delivery period. Overweight or oversized loads are unlikely. If they are required, Flickertail will obtain the appropriate approvals. Flickertail will coordinate with the applicable road authorities regarding the selection and use of haul roads as part of the road use and maintenance agreements.

After construction is complete, traffic impacts during the operations phase of the Project will be negligible. A small maintenance crew driving through the Project Area in pickup trucks on a regular basis will monitor and maintain the facilities as needed, but traffic function will not be impacted as a result.

A glare analysis did not identify any glare from the Project Area for a standard vehicle at 5 feet above ground surface or a standard commercial truck at 9 feet above ground surface on the assessed segments of U.S. Interstate 29, 66th Street Southeast, 67th Street Southeast, County Road 6 (68th Street Southeast), 69th Street Southeast, 70th Street Southeast, County Road 1 (169th Avenue Southeast), 170th Avenue Southeast, 171st Avenue Southeast, 172nd Avenue Southeast, 173rd Avenue Southeast, and 174th Avenue Southeast (Appendix E).

Water Supply

There is one stock well in the Project Area. Flickertail will work with the landowner to cap and abandon this well or avoid it and leave it in place.

Impacts to domestic and stock wells within the Study Area are not anticipated as a result of the proposed Project. Flickertail will coordinate with the Southeast Water Users District on water supply use for the Project as necessary. The Project will not require appropriation of surface water or permanent de-watering. If the Project requires temporary ground or surface water dewatering during Project construction, it will be conducted under the requirements of the NDPDES-GSP and SWPPP. Flickertail will follow the Construction and Environmental Disturbance Requirements provided by the North Dakota Department of Health (NDDH).

Flickertail will construct the septic system for the O&M facility in accordance with Requirements for On-Site Treatment Systems, Richland County (Richland County Health Department 2024), and will obtain necessary permits prior to construction (see Section 7.0). The Project may require one low-volume well or tie into the Southeast Water Users District for the O&M facility, if deemed necessary, and would obtain required permits prior to construction, if applicable. Water use for operations will be negligible, and the Project will not require water appropriations beyond those provided at the O&M facility. If the PV arrays need washing, the water would be trucked into the PV arrays.

The water supply for local nearby communities is not anticipated to be affected by the Project. Therefore, mitigation measures for impacts to the water supply are not required.

6.4 HUMAN HEALTH AND SAFETY

6.4.1 Existing Conditions

Electromagnetic Fields

The term electromagnetic fields (EMFs) refers to electric and magnetic fields that are present around any electrical device. Electric fields result from the voltage or electrical charges, and magnetic fields result from the flow of electricity or current that travels along transmission lines, electrical collection cables, substation transformers, house wiring, and electrical appliances. Electric field intensity is associated with the voltage of the line, and magnetic field intensity is related to the current flow through the conductors (wire). EMF can occur indoors and outdoors. No discernible health impacts result from EMF associated with power lines (NIEHS 2002). The general consensus is that electric fields pose no health risk to humans (New Zealand Ministry of Health, 2013).

PV arrays generate EMF in the same extremely low frequency (ELF) range as electrical appliances and wiring found in most homes and buildings. With the proposed Project, the sources of EMF will be from electrical collection cables (which will be buried underground), inverters, and transformers. The minimal amount of non-ionizing EMFs generated by the Project is comparable to that of home appliances, cell phones, and computers. EMF from underground electrical collection cables dissipates very close to the lines because they are installed belowground within insulated shielding. The electrical fields are negligible, and the small magnetic field directly above the lines quickly dissipates on either side of the installed cable. Additionally, since the transformers are enclosed in a grounded metal case (shielded), they typically do not emit much EMF.

Hazardous Materials and Waste

The location of the Project in rural North Dakota makes contamination from large industrial or commercial activities unlikely in the Study Area. Based on a search of the North Dakota Department of Environmental Quality (NDDEQ, 2024a) list of Underground Storage Tanks (USTs), there are no USTs in the Study Area or Project Area. No landfill locations or hazardous waste handler sites were listed by NDDEQ within the Study Area (NDDEQ, 2024b).

The U.S. Environmental Protection Agency (EPA) Superfund National Priorities List (NPL) database was reviewed, and no NPL sites or proposed NPL sites are in North Dakota (EPA, 2024).

Solid waste materials, including packaging materials (cardboard, pallet wood, plastic), scrap cables, and other typical municipal solid waste, will be generated during construction. No hazardous waste is expected to be generated during construction or operation. During construction, the following materials will be stored and used on-site: diesel fuel, gasoline, motor oil, hydraulic fluids, lubricating oils for machinery and vehicles, solvents and adhesives, approved herbicides, batteries, paints, thinners, cleaning solvents, and transformer oil. During construction, spill response kits will be placed in the immediate vicinity of diesel fuel and gasoline storage tanks. They will include the following items: 55-gallon drums, bags of absorbent, absorbent pads, plastic sheeting, Tyvek suit and booties, nitrile gloves, safety goggles, 20-gallon portable preventive spill kit for each refueling truck, shovels, and fire extinguishing equipment.

Transformer oil, grease, and relevant material safety data sheets (MSDS) will be stored on-site during operations. Appropriately sized spill kits will also be on-site.

Security

The Project is located in an area with a relatively low population density and crime rate. The Richland County Sheriff's Department provides law enforcement in the Project and Study Areas.

There are no ICBM sites in Richland County. In an email dated September 9, 2024, the Department of Defense (DoD) reviewed the information provided regarding the proposed Project and provided a letter response (dated September 6, 2024) that indicated the Project, as proposed, will have minimal impact on military operations conducted in the area (Section 8.11.3).

Air Quality

North Dakota meets all federal and state air quality standards (NDDEQ, 2024c).

6.4.2 Human Health and Safety Impacts and Avoidance/Minimization Measures

Electromagnetic Fields

The Project facilities are not significant sources of EMF exposure. The electrical collection cables will be buried to a depth of at least three feet below the surface and generate levels of EMF comparable to those generated by household appliances. As outlined in Section 6.2, the nearest residence to the Project's fenced perimeter is 580 feet, and even greater distances to the nearest inverter and Project substation. As such, impacts from EMF are not anticipated.

Hazardous Materials and Waste

Hazardous materials or petroleum products used during construction will be stored per manufacturers' recommendations in addition to applicable federal and state regulations. During operations, limited quantities of hazardous materials or petroleum products will be stored in the O&M building.

Hazardous waste is not anticipated to be generated or encountered during construction. If hazardous waste is encountered or discovered, Flickertail will comply with all applicable regulations. Any hazardous materials used to construct the Project will be contained according to the NDPDES-GSP. In addition, a SWPPP will be developed as part of the NDPDES-GSP.

Security

No impacts on the security and safety of local residents are expected from the construction and operation of the Project.

Flickertail plans to coordinate with local emergency management and the local fire department to develop an emergency response plan. Further, during Project operations, Flickertail coordinates with local emergency management and the local fire department regarding emergency response procedures and training. Construction will comply with applicable federal, state, and local regulations. Established industry safety procedures will be followed during construction and operations. This will include posting signage during all phases of construction and fencing of all facilities to limit unauthorized access.

The solar facilities will include seven-foot tall agricultural-style fences (non-chain link, without barbed wire around the panel arrays). A seven-foot above-grade chain link fence will enclose the Project substation and may include one foot or more of three or more strands of barbed wire at the top to comply with the National Electric Code. This fencing will be designed to prevent the public from gaining access to electrical equipment. All access points will have gates. The O&M building will also be a secure and locked facility.

Air Quality

Temporary air quality impacts caused by construction-vehicle emissions and fugitive dust from construction activities may occur but will be minimal and temporary. Consistent with the recommendations in the letter from NDDEQ dated July 2, 2024, Flickertail will take appropriate measures to minimize fugitive dust emissions during construction (Section 8.11.4). Should any complaints arise, they will be addressed efficiently and effectively. No impacts to air quality from the operation of the Project are anticipated.

6.5 SOUND

6.5.1 Existing Conditions

Noise is measured in decibels (dB) units on a logarithmic scale. Because human hearing is not equally sensitive to all sound frequencies, specific frequencies are given more “weight.” The A-weighted decibel scale (dBA) reflects the selective sensitivity of human hearing. This scale puts more weight on the range of frequencies that the average human ear perceives and less on those we do not hear, such as very high and very low frequencies. Common sources of sound within a rural, agricultural area include but are not limited to, traffic on roadways, farm equipment, birds, and wind rustling through the vegetation. Typically, the ambient acoustic environment of a rural agricultural area has equivalent continuous sound levels (Leq, which is an energy-based time-averaged noise level) ranging from 30 dBA to 60 dBA.

Background noise in the vicinity of the Study and Project Areas is typically caused by vehicle traffic on U.S. Interstate 29 and local roads, railroad traffic on the Red River Valley and Western Railroad, farming equipment/operations, and the wind. Table 6.4 (U.S. Department of Labor–Occupational Safety and Health Administration, 2024) describes typical noise-generating sources for various dBA levels.

Table 6.45. dBA Levels of Common Noise Sources

Sound Pressure Level (dBA)	Description
130	Jet taking off (200 feet away)
120	Operating Heavy Equipment
110	Night Club (with music)
100	Construction Site

Sound Pressure Level (dBA)	Description
90	Boiler Room
80	Freight Train (100 feet away)
70	Classroom chatter
60	Conversation (3 feet away)
50	Urban residence
40	Soft whisper (5 feet away)
30	North rim of Grand Canyon
20	Silent study room

6.5.2 Sound Impacts and Avoidance/Minimization Measures

During construction, noise will be emitted by the construction vehicles and equipment. The amount of noise will vary based on what type of construction is occurring at the facility on a given day. These noise impacts will be temporary. Typically, the loudest construction activity is pile installation, which requires pile drivers that move throughout the site installing the piles. This and other activities can overlap throughout the construction period and move from one array location to another with an approximate 8-month window that will be the peak construction delivery and installation time. Flickertail plans to limit construction activities to daylight hours during construction, which will vary based on season.

During operations, the primary noise source will be emitted from the inverters and, to a lesser extent, from the transformers and rotation of the tracking system. North Dakota, Richland County, and Abercrombie Township have yet to define noise standards for solar facilities. However, the PSC requires a maximum of 45 dBA within 100 feet of an occupied residence for wind energy conversion facilities. As a solar energy facility, the operational noise is different from that of a wind energy facility; a solar energy facility is significantly quieter and only generates noise during daylight hours. Table 6.5 summarizes the estimated distance to reach 45 dBA from a potential inverter and tracker under consideration for use at the Project. The solar energy facility will not generate sound when the PV panels are not generating electricity, such as overnight.

Table 6.56. Inverter and Tracker Noise Levels

Facility	Equipment Model	Distance to 45 dBA
Inverter	Sungrow SG4400UD-MV	450 to 524 feet
Tracker	NEXTracker	5 feet

The results of the noise modeling conducted by technology manufacturers outlined in Table 6.5 show that noise levels will be less than 45 dBA between 450 to 524 feet from the inverter, which may vary slightly depending on which inverter model is selected. The closest home to the facility is 580 feet from the nearest fenced perimeter and should not experience noise levels from the Project during operations greater than 45 dBA within 100 feet of the residence, even if the loudest inverter were near the Project perimeter. Further, because the inverters are typically located within the middle of the solar arrays, the noise levels from Project equipment are not expected to be discernible from background noise levels at nearby homes. The nearest residence is located more than 1,100 feet from the nearest inverter on the proposed preliminary plan. No noise impacts are anticipated during operation; therefore, no mitigation measures are proposed.

6.6 VISUAL

6.6.1 Existing Conditions

The Project and Study Areas lie on a nearly flat plain ranging in elevation from 920 to 975 feet above sea level. The lowest elevations are found on the eastern side of the Study Area in the Wild Rice River valley, and the highest are found on the western side of the Study Area, which is a more hummocky area. As discussed in Section 6.2, land use within the Project and Study Areas is predominantly agricultural. U.S. Interstate 29, the Red River Valley and Western Railroad, and Minnkota's existing Frontier-Wahpeton 230-kV transmission line transect through the Project and Study Areas. Based on Tetra Tech's land cover assessment, several tree lines are present in the Project Area.

Based on a review of recent aerial imagery in Google Earth, there are 31 residences and one church in the Study Area; none of the residences or the church are located in the Project Area. This assessment was conservative in that potential occupiable structures were considered residences. The nearest residence is 580 feet from the nearest Project fence; this residence and all residences within 0.25 miles of the Project Area (six total) have executed a good neighbor agreement with the Project.

6.6.2 Visual Impacts and Avoidance/Minimization Measures

Construction activities will occur during daylight hours, limiting the impacts of lighting on light-sensitive land uses.

Flickertail will convert up to 1,766.8 acres of land (predominantly cultivated cropland) into a solar facility enclosed by an agricultural-style fence. The PV panels will be arranged in rows oriented north-south in the fenced perimeter and employ glass panels designed to maximize absorption and minimize reflection to increase electricity production efficiency. Solar PV panels are constructed of dark, light-absorbing materials to limit reflection and are covered with an anti-reflective coating. Today's panels reflect as little as two percent of the incoming sunlight depending on the angle of the sun and assuming the use of anti-reflective coatings. The east-west spacing between the rows of panels within the fenced perimeters will be determined based on the manufacturer's specifications for the modules chosen for the Project. The inverters will be located within the interior of the fenced array and will have a minimal visual impact beyond the fenced perimeter. Most of the facility, including the PV arrays, will be low-profile. The PV arrays will be visible from adjacent roadways and parcels, but given their relatively low profile and the fact that all the facilities will be fenced for security, they will not be visible from long distances.

A glare analysis was performed for the Project to assess impacts to road traffic and receptors (i.e., the 31 residences and one church) in the Project and Study Areas (Appendix E). The analysis did not identify any glare for the first (6 feet above ground surface) or second (16 feet above ground surface) stories from the Project Area to 31 residences (including the residence located 580 feet from the fenced perimeter) or the church.

The Project substation and O&M building will be located off County Road 1 (68th Street Southeast), approximately 0.2 miles west of the intersection of County Road 1 (68th Street Southeast) and 172nd Avenue Southeast. The nearest residence to the Project substation and O&M building is 1.2 miles west. No impacts are anticipated based on the distance between the Project substation and the O&M building from residences in the Study Area.

Minimal lighting will be utilized for the Project. Lighting will be used for safety and security purposes and placed at Project entrances, the O&M facility, and inverters. Lighting will be downlit and will be switch and motion activated. Motion activation for lighting placed at the inverters ensures the lighting will only be used for maintenance activities or if a security risk is detected within the Project boundary. Lighting the Project in this manner will minimize nighttime visual impacts while ensuring safety and security and will be comparable to typical residential porch or workshop lighting. Impacts to light-sensitive land uses are not anticipated, given the rural Project location coupled with minimal required lighting for operations.

6.7 CULTURAL AND ARCHAEOLOGICAL RESOURCES

6.7.1 Existing Conditions

A Class I cultural resources literature review of the Project Area plus a one-mile buffer was conducted. Tetra Tech also completed a Class III Cultural Resources Inventory for the portions of the Project Area that will host facilities or be disturbed by construction activities (Appendix F).

Class I File Review

A file review was completed at the SHSND to determine if previously documented cultural resources (i.e., archaeological or historic sites and historic architectural resources) were present in the Project Area and one-mile buffer. The file review also included previous cultural resource inventories completed within the Project Area and a one-mile buffer. One historic archaeological site lead was recorded in the center of the Project Area. The historical archaeological site lead is currently unevaluated for listing on the NRHP. Seven additional resources, including five architectural, one historical archaeological, and one archaeological, were recorded in the one-mile buffer outside the Project Area. These resources are unevaluated or ineligible for listing on the NRHP.

Field Surveys

Tetra Tech completed a pedestrian survey of the Project Area in late October/early November 2023. Additional pedestrian surveys were undertaken in May 2024 to resurvey areas with poor surface visibility during the Fall 2023 survey. Shovel probing was also undertaken to assess the presence or absence of cultural material at isolated finds recorded in 2023. In total, Tetra Tech documented six resources within the Project Area, including four Native American chipped stone isolated finds (32RIX408, 32RIX409, 32RIX410, 32RIX411), one former granary (32RI930), and one Euro-American artifact scatter (32RI931) (Table 6.6). Of the resources identified, all are recommended as not eligible for NRHP listing.

Evidence of Site Lead 32RIX0061 was not observed in the Project Area. Previous development in this area likely destroyed any cultural materials if the site lead was present in this location.

Table 6.67. Newly Documented Resources within the Project Area

Site No	Type	Description	Recommended NRHP Status
32RIX408	Archaeological	Native American Isolated Find	Not Eligible
32RIX409	Archaeological	Native American Isolated Find	Not Eligible
32RIX410	Archaeological	Native American Isolated Find	Not Eligible
32RIX411	Archaeological	Native American Isolated Find	Not Eligible
32RI930	Architectural	Former Grain Bin	Not Eligible
32RI931	Historic Archaeological	Euro-American Artifact Scatter	Not Eligible

Isolated Finds 32RIX408 and 32RIX409 consisted of Native American chipstone artifacts within cultivated fields. Evidence of cultivation was observed as far back as 1952. Nine shovel probes were placed at each isolated find; all failed to document additional cultural materials in the subsurface. Due to the absence of identified archaeological materials and a low potential for significant intact subsurface deposits at these isolated finds, they would not provide significant archaeological research potential or information. As a result, the isolated finds are recommended not eligible for listing on the NRHP.

Isolated Finds 32RIX410 and 32RIX411 also consisted of Native American chipstone artifacts within cultivated fields with evidence of cultivation observed as far back as 1952. Due to limited archaeological materials and a low potential

for significant intact subsurface deposits at these isolated finds, they would not provide significant archaeological research potential or information. As a result, the isolated finds are recommended not eligible for listing in the NRHP.

Site 32RI930 consists of an isolated granary first appearing in the 1961 aerial photograph. The current landowner stated that his father and uncle (previous owners) constructed the building in the 1950s for grain storage, and it has not been used since the 1960s. The other buildings formerly located on the parcel included another wood granary and a shed/shop that housed tools, which was destroyed by fire. The granary is now unused and contains trash (old bed frames, crates, and wood). It is in disrepair and generally in poor condition.

The building is not recommended eligible for listing under the NRHP.

Site 32RI931 consisted of a surface artifact scatter associated with a former farmstead initially observed on an 1897 plat map. The site is recommended not eligible for listing on the NRHP.

Reporting and State Historical Society of North Dakota/North Dakota State Historic Preservation Office Review

On behalf of Flickertail, Tetra Tech has submitted the Class III cultural resource inventory results to the SHSND/North Dakota State Historic Preservation Office (SHPO). Once received, the SHSND/SHPO response will be provided to the PSC.

6.7.2 Cultural and Archaeological Resources Impacts and Avoidance/Minimization Measures

One Site Lead (32RIX0061; unevaluated) was previously identified in the Project Area; however, it appears to have been destroyed during previous development. Proposed electrical collection cables are located immediately adjacent to this unevaluated Site Lead. While it no longer appears to be present, the site will also be avoided by any potential Project facility impacts, as the electrical collection cables will be horizontally directional drilled/bored adjacent to the site. As a result, impacts to cultural resources are not anticipated.

Flickertail prepared an Unanticipated Discoveries Plan (UDP) outlining the steps to be taken if previously unrecorded cultural resources or human remains are encountered during construction (Appendix G).

6.8 RECREATIONAL RESOURCES

6.8.1 Existing Conditions

No designated recreation areas or public or private parks exist in the Project or Study Areas. Approximately 1.4 miles of the North Country National Scenic Trail intersects the northeast portion of the Study Area, approximately 0.5 miles north of the northernmost portion of the Project Area (Figure 3). The trail follows 66th Street Southeast and 172nd Avenue Southeast in the Study Area. In a letter dated November 17, 2023, the NDPRD indicated the Project does not appear to affect properties NDPRD owns, leases, or manages or protected under Section 6(f) of the Land and Water Conservation Fund (LWCF) (Section 8.11.10).

6.8.2 Recreational Resources Impacts and Avoidance/Minimization Measures

The North Country National Scenic Trail is 0.5 miles from the Project Area and is not anticipated to be impacted by the Project. As such, no mitigation is proposed.

6.9 LAND-BASED ECONOMIES

6.9.1 Existing Conditions

Agriculture

According to the USDA's 2022 Census of Agriculture, 4 percent of state agriculture sales come from Richland County (USDA-NASS, 2024). Of the approximately 925,323 acres that comprise Richland County, approximately 795,490 acres (86 percent) are farmland. Eight hundred ninety-four individual farms are located in Richland County, with an average farm size of 890 acres. The top crops (in sales) include grains, oilseeds, dry beans, dry peas, and other crops and hay. The top livestock (in sales) include cattle and calves; sheep, goats, wool, mohair, and milk; other animals and animal products; and hogs and pigs. The market value of agricultural production in Richland County in 2022 was approximately \$472,690,000. Crop sales accounted for roughly 96 percent of the total value of agricultural production, while livestock, poultry, and their products account for the remaining 4 percent (USDA-NASS, 2024).

Woodlands

As noted in Sections 6.2.1 and 6.14, 118.1 acres of treed areas are within the Project Area, consisting predominantly of tree rows used for shelter belts or windbreaks. Trees within the Project Area are not utilized for economic activities, such as logging or timber trading.

6.9.2 Land-Based Economies Impacts and Avoidance/Minimization Measures

Agriculture

Flickertail designed the Project and will continue to work with landowners to avoid and/or minimize impacts to cultivated land and crops. If unavoidable impacts to crop planting, crop damage, or soil compaction occur during construction, Flickertail will compensate landowners or use restorative techniques as mitigative measures. Based on discussions with landowners, drain tile is present in the Project Area. If damage occurs to drain tile due to construction activities or operation, Flickertail will work with the affected property owners to repair any damages, as needed.

Within the fenced perimeters, up to 1,509.0 acres of cultivated cropland and up to 218.1 acres of grassland/herbaceous lands (i.e., hay and pasture) would be converted to solar panels and grassland. An additional 16.2 acres of cultivated cropland and 2.1 acres of grassland/herbaceous lands would be converted to access roads, inverters, and METs. Outside the fenced perimeters, an additional 3.0 acres of cultivated cropland and 1.5 acres of grassland/herbaceous lands would be converted to access roads, and 7 acres of grassland/herbaceous lands would be converted to the collector substation and the O&M facility.

The conversion of approximately 1,756.9 acres of agricultural land (1,528.2 acres of cultivated cropland and 228.7 acres of grassland/herbaceous lands) will not significantly impact land-based economies in the Project Area. The solar land lease and easement payments to the participating landowners will offset the potential revenue from agricultural production lost (i.e., cultivation crops, hay, or pastureland). Areas disturbed during construction will also be repaired and restored to pre-construction contours and characteristics to the extent practicable. This restoration will allow the Project's land surfaces to drain properly, blend with the natural terrain, re-vegetate naturally where possible, and avoid erosion.

Approximately 105 acres in the Project Area are used for cattle pasture. Roughly 70 acres are pasture, and the other 35 acres consist of wetlands, trees, and scrubs. The solar land lease and easement payments to the participating landowners will offset the potential revenue from livestock production lost.

The remaining cultivated cropland and grassland/herbaceous lands located outside fence perimeters and not being utilized by the Project may continue to be used for cultivated cropland or grassland/herbaceous lands or converted to pollinator-friendly habitat, planted with trees/shrubs, or some combination of the aforementioned.

Woodlands

The treed areas within the Project Area consist predominantly of tree rows comprised of Siberian elm (*Ulmus pumila*), Russian olive (*Elaeagnus angustifolia*), and eastern cottonwood (*Populus deltoides*) and are not utilized for economic activities, such as logging or timber trading.

6.10 SOILS

6.10.1 Existing Conditions

According to the USDA-NRCS Soil Survey Geographic Database (SSURGO) (USDA NRCS, 2023), there are 29 soil map units in the Project Area (Appendix H). Soils in the Project Area are primarily classified as clayey or sandy and formed in glaciofluvial or glaciolacustrine deposits (USDA, NRCS 2023). Three soil map units (Bearden silt loam, moderately saline, clayey substratum, 0 to 2 percent slopes, Hilaire-Espelie loamy fine sands, 0 to 2 percent slopes, Aberdeen-Galchutt-Fargo complex, 0 to 2 percent slopes) comprise nearly 41 percent of the soils in the Project Area.

The majority of soils in the Project Area are predominantly non-hydric (2,659 acres or 77 percent). Hydric and predominantly hydric soils represent 14 percent (approximately 498 acres) of the Project Area. The remaining soils are partially hydric (307 acres or 9 percent). All of the soils in the Project Area (with the exception of approximately 49 acres of areas mapped as Orthents-Aquents-Urban Land, highway complex, 0 to 35 percent slopes) have low to high susceptibility to erosion by water (i.e., K-factors from 0.17 to 0.55) (USDA, NRCS 2001). Soils in the Project Area are in Wind Erodibility Groups 2, 3, 4, 4L, 5, or 6, which correspond to Wind Erodibility Indices between 134 tons/acre/year and 48 tons/acre/year (USDA, NRCS 2002). Approximately 1,017 acres of soils within the Project Area (29 percent) are classified as prime farmland; 1,528 acres (44 percent) are classified as not prime farmland; 419 acres (12 percent) are classified as prime farmland if drained; and 520 acres (15 percent), are classified as farmland of state importance.

6.10.2 Soils Impacts and Avoidance/Minimization Measures

Soils will be impacted during the Project's construction stages. The facilities may require some grading to provide a level surface for the solar arrays; however, minimal grading is anticipated due to the level nature of the Project Area. Additional soil impacts during construction will come from the installation of the direct-embedded piers that support the structural framework of the solar arrays, areas of foundations for the inverters and O&M structures, the collector substation, and access roads.

Based on the Project facility impacts presented in Section 4.3, proposed Project facilities with impervious surfaces will permanently impact approximately 29.9 acres. The majority of the permanent impacts will result from the development of access roads and the collector substation. Topsoil removed for permanent facilities may be thin spread in adjacent areas or used to level low-lying (i.e., non-wetland) areas in the Project Area.

The majority (approximately 1,813 acres) of soil impacts will not result in significant soil disturbances. With the exception of access roads and inverters, the majority of the soils within the fenced perimeters will not be graded, excavated, or removed. Piers for the solar racking and fence posts for the security fence will be hydraulically driven into the ground. Electrical collection cables will be trenched in the majority of locations in the Project Area. The topsoil will be segregated from the subsoil and backfilled accordingly.

To minimize the impacts of surface water runoff, BMPs in accordance with a SWPPP will be implemented, including silt fencing to control erosion and stormwater runoff and directing surface flow away from cut-and-fill slopes and into ditches that discharge to natural drainages. Additionally, Flickertail will obtain coverage under the NDPDES - GSP, which requires the preparation of a SWPPP.

The laydown areas will be stripped of topsoil, and class 5 gravel will be laid down to facilitate parking and material storage. The topsoil will be stockpiled adjacent to the laydown areas. The laydown areas will be utilized for the duration of Project construction; therefore, the stockpiled topsoil will be vegetated and stabilized in accordance with the Project's SWPPP. The class 5 gravel will be removed upon completion of construction activities, and the adjacent topsoil will be redistributed in the former laydown area to the pre-construction contours. The completion of construction typically includes the restoration of areas temporarily disturbed during the various phases of construction. Soil erosion, compaction, and other related disturbances will be addressed prior to the completion of construction activities on-site.

Prior to construction of the Project, a nurse or cover crop will be planted to control soil erosion and suppress weed growth during the construction process (Appendix K). The seed mixes for nurse or cover crops were identified through consultation with the USDA-NRCS (Section 8.11.2). If temporary cover crops are not used and sufficient crop stubble is absent, a noxious weed-seed-free mulch may be used to control soil erosion. Maintenance of the nurse, cover crop, or mulch will occur throughout construction to control soil erosion and suppress weed growth.

Following construction, Flickertail will restore disturbed areas to pre-construction conditions to the extent practical. Soil erosion, compaction, and other related disturbances will be minor and short-term and minimized by implementing environmental protection measures. These measures will include BMPs for erosion and sediment control, such as temporary seeding, permanent seeding, mulching, filter strips, erosion blankets, and sod stabilization. Seed mixes appropriate to the region were identified through consultation with the USDA-NRCS (Section 8.11.2). During operation, Flickertail will maintain vegetation within the Project Area to prevent soil erosion and control weeds. Soils revegetated in grasslands or pollinator habitats will rest and regenerate over the life of the Project. In addition, if more than 1,320 gallons of oil are stored on-site during construction, Flickertail will complete and implement a Spill Prevention, Control, and Countermeasure (SPCC) Plan and has minimized permanent impacts to soils to the extent practical. The majority of the soils will be temporarily impacted by the Project and allowed to rest and regenerate over its lifetime. Therefore, further mitigation of soil impacts is not anticipated.

6.11 GEOLOGIC AND GROUNDWATER RESOURCES

6.11.1 Existing Conditions

The Study Area lies within the Red River Valley of the Central Lowlands physiographic region in southeastern North Dakota (Bluemle, 2000). The Red River Valley is characterized by flat plains created from sedimentation on the floor of glacial Lake Agassiz. Lake Agassiz was formed when glacial ice blocked the route of the Red River to Hudson Bay. Surface geology within the Study Area consists of the Quaternary Oahe Formation, which consists of river sediment and windblown sand (NDIT NDGIS, 2023b).

The Colfax Surficial Aquifer System is located in the center of the Project and Study Areas (Figure 7). The Colfax Aquifer is a regional aquifer in Richland County formed in buried sandy outwash sediments and found at depths of 100 to 150 feet below the ground surface (NDGS, 1967). The water is high in sodium, sulfate, and chloride and is of rather poor quality for drinking. The Wahpeton Buried Valley Aquifer System is located in the easternmost portion of the Study Area and is comprised of three aquifers: the Wahpeton Shallow Sand, the Wahpeton Sand Plain, and the Wahpeton Buried Valley (USGS, 1998). The Wahpeton Buried Valley, Wahpeton Sand Plain, and Wahpeton Shallow Sand aquifers are composed of fine-grained to coarse-grained sand mixed with gravel and have variable depths depending on the aquifer.

According to the NDDWR MapService (2024), there is one stock well (drilled in September 2011) located in the south-central portion of the Project Area (Figure 6). One well noted as plugged and abandoned was also located in the south-central portion of the Project Area. An additional 10 wells were identified in the Study Area (Figure 6). These include four stock wells, four domestic wells, and two domestic/stock wells. Two wells are located adjacent to the Project Area, and eight wells are located approximately 0.5 miles or farther from the Project Area.

A review of USGS topographic maps revealed no sand, gravel, or other mines within the Project or Study Area, and no oil or gas fields or associated wells are located there (NDGS, 2024).

6.11.2 Geologic and Groundwater Resources Impacts and Avoidance/Minimization Measures

Construction or operation of the Project is not anticipated to impact geologic resources. Once the crops are harvested, a geotechnical analysis is planned to be performed in the Project Area in the fourth quarter of 2024.

Impacts to groundwater resources, including the Colfax Aquifer, are not anticipated during construction or operation as water supply needs are expected to be limited. Water needed during construction will be from the existing rural water supplied by the Southeast Water Users District, a new well, or trucking in water as needed. Based on the small amount of increased impervious surface area created by the Project (29.9 acres), any impact on regional groundwater recharge will be minimal and temporary. Any dewatering required during construction will be discharged to the surrounding ground surface, allowing it to infiltrate back into the ground to minimize potential impacts.

Water use during operation will be minimal. The O&M facility's water requirements will be satisfied with a new single domestic-sized water well or by connecting to the Southeast Water Users District. There is one stock well in the Project Area. Flickertail will work with the landowner to cap and abandon this well or avoid it and leave it in place. The proposed Project does not anticipate any other impacts on domestic and stock wells.

6.12 SURFACE WATER AND FLOODPLAIN RESOURCES

6.12.1 Existing Conditions

Surface Waters

The Wild Rice River flows northerly through the eastern part of the Study Area. Pitcairn Creek flows from the western part of the Study Area, through the Project Area, and then northeast through the Study Area into the Wild Rice River, approximately 1.8 miles northeast of the northmost portion of the Project Area (Figure 3). Surface drainage throughout much of the Study Area is poor (Thompson and Joos 1975). Drainage within the Project and Study Areas is relatively poor but is facilitated by ditches that generally flow toward Pitcairn Creek, located in the central portion of the Project Area. Most runoff is removed from the area through tile systems and manmade drainage ditches that drain into the Wild Rice River.

Surface waters in the Project Area were field delineated by Tetra Tech in April 2024 and May 2024 (Figure 8, Appendix I). The field surveys found that approximately 1.5 miles of Pitcairn Creek flow to the east through the west-central part of the Project Area. This section of Pitcairn Creek has been straightened and flows through an excavated channel. Another approximately 0.7 mile of Pitcairn Creek flows east-northeast through the east-central part of the Project Area. This section of Pitcairn Creek has not been straightened, and meanders are across the Project Area.

Four unnamed tributaries to Pitcairn Creek are also present in the Project Area, including an approximately 0.5-mile-long tributary located between agricultural fields in the northwestern part of the Project Area, approximately 1.0 mile of tributary along 170th Avenue Southeast in the northwest part of the Project Area, 0.3 miles of tributary along 170th Avenue Southeast in the west-central part of the Project Area, and approximately 0.5 miles of tributary along 171st Avenue Southeast in the south-central part of the Project Area. These tributaries are all man-made excavated ditches.

Floodplains

There are approximately 307 acres of Federal Emergency Management Agency (FEMA) Zone A flood hazard area (i.e., 100-year floodplain) mapped within the Project Area (Figures 3 and 8). The flood hazard areas are located in the central part of the Project Area along Pitcairn Creek. An additional 902 acres of FEMA Zone A flood hazard area are mapped within the Study Area (Figures 3 and 8). The flood hazard areas are located in the western, central, and northeastern parts of the Study Area along Pitcairn Creek and the eastern part of the Study Area along the Wild Rice River.

6.12.2 Surface Water and Floodplain Impacts and Avoidance/Minimization Measures

Surface Waters

The Project has been sited to avoid impacts (both permanent and temporary) to surface waters. No Project facilities will be placed in Pitcairn Creek or its tributaries. Electrical collection cables intersecting Pitcairn Creek or its tributaries will be horizontally directional and drilled/bored under the creek, thereby avoiding impacts.

If the discharge of dredge or fill material (temporarily or permanently) into the Waters of the U. S. (WOTUS) occurs, Flickertail will obtain coverage under a Section 404 Clean Water Act permit. Flickertail anticipates that if there are unavoidable impacts on the jurisdictional waters of the United States Army Corps of Engineers (USACE), these activities will be permitted under the Nationwide Permit (NWP) program.

The Project will also comply with EPA regulations regarding stormwater runoff, including the creation of a SWPPP. The SWPPP will address the construction-related temporary measures and permanent restoration methods to slow stormwater runoff and avoid sediment reaching streams and rivers. Flickertail will also implement appropriate erosion and sediment control BMPs. Additionally, Flickertail will obtain coverage under the NDPDES-GSP, which requires the preparation of a SWPPP. In addition, SPCC Plans will be implemented for the construction and operation phases of the Project, if needed. As such, impacts to surface waters from stormwater discharges are not anticipated from the Project.

Floodplains

Project facilities have been sited to avoid and/or minimize impacts to the 100-year floodplain to the extent practical.

Approximately 6,539 linear feet of electrical collection cable totaling 5.7 acres of temporary impacts will be trenched or horizontal directional drilled/bored in the 100-year floodplain. The placement of buried electrical collection cables in the 100-year floodplain is not anticipated to have any impact on base flood elevation.

Two access roads totaling approximately 505 linear feet and 0.23 acre of permanent impacts are proposed to be placed within the 100-year floodplain. The southernmost access road has no alternative but to cross the 100-year floodplain because the floodplain extends between the adjacent public roads and the array on the participating parcel. The northernmost access road utilized an existing agricultural driveway to avoid impacts to a stream, which necessitates crossing the 100-year floodplain. The siting of these segments of access roads in the 100-year floodplain also avoids impacts to wetlands, treed areas, and streams. Additionally, the access road will have a gravel base and be constructed at grade; therefore, no increase to the base flood elevation in the area is anticipated.

Final design plans will determine the exact amount of access road and electrical collection cable to be placed in the 100-year floodplain. Flickertail will seek approval from the Richland County Floodplain Administrator for the placement of these facilities in the floodplain.

6.13 WETLANDS

6.13.1 Existing Conditions

Potential wetlands in the Study Area were identified using the USFWS (2023) NWI dataset. The NWI data identified approximately 218 acres of freshwater emergent wetlands, 49 acres of riverine, 2 acres of freshwater ponds, 1 acre of freshwater forested/shrub wetlands, and 1 acre of other.

Wetlands in 3,315 acres of the Project Area were field delineated by Tetra Tech in April and May 2024 (Figure 8, Appendix I). The field surveys identified 134 wetlands totaling 73.4 acres in the surveyed portions of the Project Area (i.e., 3,315 acres) (Figure 8). Wetlands documented in the Project Area included isolated prairie potholes (i.e., shallow, water-holding depressions of glacial origin with great variability in size, depth, water permanence, and water chemistry) and wetlands in natural and man-made drainages and ditches. Many wetlands in cultivated areas are likely partially drained to support crop production. Within the 149 acres of the Project Area that were not field surveyed, Tetra Tech conducted a desktop analysis based on the aerial photograph review, digital elevation model (DEM), and the USFWS (2023) NWI. Five wetlands totaling approximately 64 acres were identified in the desktop review in the 149 acres.

6.13.2 Wetlands Impacts and Avoidance/Minimization Measures

The Project has sited facilities to avoid permanent and temporary wetland impacts. Wetlands located within the fenced perimeters containing solar panels have been avoided and will be seeded with wet prairie species characteristic of the region (Appendix K). In limited locations where underground electrical collection cables intersect wetlands, Flickertail plans to install the electrical collection cables via horizontal directional drill/bore under the wetlands, thereby avoiding impacts. Based on these measures, no impacts to wetlands are anticipated.

If the discharge of dredge or fill material (temporarily or permanently) into WOTUS will occur, Flickertail will obtain coverage under a Section 404 Clean Water Act permit; Flickertail anticipates that if there were unavoidable impacts to USACE jurisdictional waters, these activities would be permitted under the NWP program.

6.14 VEGETATION

6.14.1 Existing Conditions

Approximately 75 percent, or 2,582.5 acres, were observed as cultivated cropland, and roughly 16 percent, or 555.2 acres, were observed as grassland/herbaceous lands (i.e., hay or pasture). Other land cover/use types within the Project Area include trees (118.1 acres), road and railroad rights-of-ways (79.6 acres), wetlands and ponds (95.6 acres), and streams (10.2 acres) (Table 6.2).

6.14.2 Vegetation Impacts and Avoidance/Minimization Measures

Vegetation will be removed from areas of permanent infrastructure footprints for the life of the Project. These areas include inverters, access roads, METs, collector substation, and the O&M facility.

Grassland Conversion

The Project will result in the conversion of up to approximately 1,509 acres of cultivated cropland within fenced perimeters to solar panels and grassland. The ground cover under and between the solar panels will be seeded with native grasses and forb species characteristic of the region (Appendix K). Other areas within the fenced perimeter that are currently vegetated, including up to approximately 218.1 acres of grassland/herbaceous lands (i.e., hay and pasture areas), are anticipated to remain currently vegetated after construction. Flickertail will attempt to maintain grassy vegetation in hay and pasture areas throughout construction; any areas requiring reseeding will utilize seed mixes outlined in Appendix K. Seed mixes appropriate to the region were identified through consultation with the USDA-NRCS (Section 8.11.2).

Grassland and the establishment of prairie plant species in the first two to three years must focus on controlling noxious weeds and other invasive vegetation. Species currently listed as noxious in North Dakota (NDDA, 2023) include:

- Absinth wormwood (*Artemisia absinthium*)
- Canada thistle (*Cirsium arvense*)
- Dalmatian toadflax (*Linaria genistifolia*)
- Diffuse knapweed (*Centaurea diffusa*)
- Houndstongue (*Cynoglossum officinale*)
- Leafy spurge (*Euphorbia esula*)
- Musk thistle (*Carduus nutans*)
- Palmer amaranth (*Amaranthus palmeri*)
- Purple loosestrife (*Lythrum salicaria*)
- Russian knapweed (*Acroptilon repens*)
- Saltcedar (*Tamarix chinensis*, *T. parviflora*, *T. ramosissima*)
- Spotted knapweed (*Centaurea maculosa*)
- Yellow toadflax (*Linaria vulgaris*)

Flickertail will employ the following management tasks during the establishment of the revegetation areas: site-wide mowing, spot-mowing, hand weeding, or spot-spraying to reduce the shading of native seed and prevent invasive weeds from developing seed.

Portions of the Project Area outside the fenced perimeters and outside the collector substation and O&M building may also be seeded with native grasses and forb species characteristic of the region (Appendix K).

Tree Impacts and Avoidance/Minimization Measures

Project facilities have been sited to minimize impacts to the 118.1 acres of treed areas in the Project Area to the extent practical (Figure 3). Three tree rows totaling approximately 12 acres (including tree canopy) located in the south-central portion of the Project Area are proposed to be removed to allow for continuous development in the parcel. Approximately 75 feet of a fourth tree row totaling 0.06 acre is also proposed to be removed in the south-central portion of the Project Area to allow for continuous development in the parcel. The tree rows consist of predominantly of Siberian elm (*Ulmus pumila*) and eastern cottonwood (*Populus deltoides*), and Russian olive (*Elaeagnus angustifolia*) was also observed. Siberian elm and Russian olive are not native tree species in North Dakota but have been used in shelterbelts due to fast growth and tolerance to poor soils, low moisture, cold winters, droughts, and windy conditions (North Dakota State Library 2024a, 2024b). If left in place, the tree rows would reduce the developable area on this parcel, which would also need to account for additional setbacks due to shading from these tree rows.

Flickertail will comply with the PSC tree and shrub mitigation plan, with a request to clear certain areas wider than 50 feet (see Figure 9). Flickertail may plant trees/shrubs within portions of the Project Area where Project facilities are not being proposed or (with landowner support) may explore options within the surrounding community to coordinate tree/shrub planting or engage in other activities that would provide long-term wildlife habitat and conservation benefits. Any plans for tree and shrub planting in the Project Area will adhere to setbacks outlined by Abercrombie Township (Section 4.2) and through discussion with participating landowners.

6.15 WILDLIFE

Flickertail conducted the following studies for the Project to evaluate potential impacts to wildlife:

- Unbroken Grassland Assessment (Appendix J) – Requested by the NDGF;
- Ground-Based Eagle Nest Survey (Appendix L) – Completed to demonstrate compliance with the Bald and Golden Eagle Protection Act (BGEPA); and
- Lek Survey (Appendix M) – Requested by and conducted in coordination with the NDGF.

As discussed further in Section 8.11.8, Flickertail coordinated closely with the USFWS, NDGF, and North Dakota Parks and Recreation (NDPR) regarding wildlife and species habitat. Specifically, the USFWS provided information related to federally listed threatened and endangered species, eagles, and other migratory birds. The NDGF provided information relating to species of conservation priority (SCP), particularly relating to conserving habitat for these species. This included concerns relating to potential impacts to native prairie (also referred to interchangeably by NDGF as unbroken grasslands), wetlands, sharp-tailed grouse, and greater prairie chicken. The NDPR performed a review of the North Dakota Natural Heritage biological conservation database. No resources were identified within the Project Area, and the NDPR deferred further comment on the Project's potential to impact wildlife to the NDGF and USFWS.

6.15.1 Existing Resources

6.15.1.1 Federally Listed Species

The Endangered Species Act (ESA) directs the USFWS to identify and protect endangered and threatened species and their critical habitats and provide a means to conserve their ecosystems. The ESA provides a framework for the conservation of threatened and endangered plants and animals and the habitats in which they are found. Under the ESA, an endangered species is in danger of extinction throughout all or a significant portion of its range. A threatened species is likely to become endangered in the foreseeable future. A proposed species is officially proposed in the Federal Register to be listed under Section 4 of the ESA. A candidate species is a plant or animal for which the USFWS has sufficient information on its biological status and threats to propose it as endangered or threatened under the ESA but for which other higher-priority listing activities preclude the development of a proposed listing regulation. While candidate species are not legally protected under the ESA, it is within the spirit of the ESA to consider said species as having significant value and being worth protecting. Finally, critical habitat includes specific areas occupied by a species at the time of listing or unoccupied areas considered essential to the conservation of a species. Critical habitat must contain physical or biological features essential to the conservation of the species and may require special management considerations or protection.

The USFWS Information for Planning and Consultation (IPaC) tool was initially reviewed on September 26, 2023, and reviewed again on September 6, 2024. The September 26, 2023 IPaC identified one federally endangered species (northern Long-eared bat [*Myotis septentrionalis*]), two threatened species (Dakota skipper [*Hesperia dacotae*] and western prairie-fringed orchid [*Platanthera praeclara*]), and one species that is a candidate for listing (monarch butterfly [*Danaus plexippus*]) as having the potential to occur in the Project Area.

The September 6, 2024, IPaC identified two federally threatened species (Dakota skipper and western prairie-fringed orchid), one proposed threatened species (western regal fritillary [*Argynnis idalia occidentalis*]), and one species that is a candidate for listing (monarch butterfly) as having the potential to occur in the Project Area. As proposed threatened, the take prohibitions of Section 9 do not protect the western regal fritillary, consistent with any protective regulations finalized under Section 4(d) of the ESA, until the rule to list is finalized (USFWS, 2024a). As a candidate species, monarch butterflies do not receive statutory protection under the ESA (USFWS, 2024a).

On January 30, 2024, the Project, Tetra Tech, USFWS, and NDGF discussed potential impacts to biological resources in the Project Area. The USFWS did not identify any specific concerns regarding impacts to federally endangered or threatened species (Section 8.11.8.3). On September 6, 2024, the USFWS indicated that, at this time, they would not request any other additional pre-construction surveys (Section 8.11.8.6).

6.15.1.1.1 Northern Long-eared Bat

The northern long-eared bat was reclassified by the USFWS as endangered under the ESA on November 29, 2022, with an effective date of March 31, 2023. The northern long-eared bat roosts underneath the bark or in cavities or crevices of live and dead trees during the summer and hibernates in caves and mines during the winter (USFWS, 2024b). Tree rows and individual trees have the potential to serve as summer roosting habitats for the northern long-eared bat. Approximately 118.1 acres of treed habitat comprised of clusters of trees, individual trees, riparian corridors, small woodlots, tree rows, and forested wetlands are located in the Project Area. Potential summer roosting habitat for the northern long-eared bat may also be present in treed areas in the Study Area, including the riparian corridor along the Wild Rice River in the eastern portion of the Study Area. A Determination Key review through the USFWS IPaC for potential effects of the Project on the northern long-eared bat resulted in a “may affect, but not likely to effect” finding (Appendix D).

6.15.1.1.2 Dakota Skipper

The Dakota skipper is a small butterfly that lives in high-quality mixed and tallgrass prairie (USFWS 2024c). They are found in two types of prairies: one type is moist bluestem prairie in which three wildflower species are usually blooming when Dakota skippers are adults: wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*) and smooth camas (*Zygadenus elegans*); the second type is upland prairie that is relatively dry and often found on ridges and hillsides. Bluestem grasses and needlegrasses dominate these prairies; purple coneflower (*Echinacea angustifolia*) is typical of high-quality sites that support this skipper, although it also uses other flowers for nectar. Both of these habitat types are unlikely to be re-established on a site that has been plowed.

Although its historical range once consisted of vast, unbroken native prairie in the north-central United States and south-central Canada, its current range is now limited to scattered remnants of high-quality native prairie in Minnesota, the Dakotas, and southern Canada (USFWS, 2024c). Dakota skippers may survive in areas where high-quality native prairie has experienced some grazing or haying as the species is dependent on habitats that experience periodic disturbance; however, Dakota skippers disappear when these disturbances become too intense.

The nearest USFWS-designated critical habitat for Dakota skipper is North Dakota Unit 1, located 24 miles southwest of the Project Area (80 FR 59248). Per the 2018 *Dakota Skipper (Hesperia dacotae) North Dakota Survey Protocol*, Dakota skippers were observed in the western and southern parts of Richland County (USFWS, 2018). The nearest township to the Project Area where Dakota skippers were observed is approximately 10 miles west-northwest. The USFWS IPaC North Dakota determination key completed on September 6, 2024, determined the Project would have no effect on the Dakota skipper (Appendix D).

Based on Tetra Tech’s unbroken grassland assessment (Appendix J), no unbroken grasslands are present in the Project Area (Section 6.14). Based on these observations, the grasslands present in the Project Area would not likely be considered a suitable habitat for the Dakota skipper.

6.15.1.1.3 Western Regal Fritillary

The western regal fritillary is a butterfly found in the native grasslands of the central and northern Great Plains and parts of the Midwest (USFWS, 2024d). The species need violets to support larval growth, nectar sources that sustain breeding females from late summer into autumn, and native grasslands with tall vegetation that provide shelter for all life stages. The western regal fritillary is not in immediate danger of extinction but is likely to be in danger of extinction in the foreseeable future due to these primary threats: habitat loss, grassland conversion resulting from agricultural and urban development, pesticide use, invasive plants, climate change, drought, and local climate events (USFWS, 2024d). The USFWS is proposing an accompanying 4(d) rule for the western regal fritillary under the ESA to allow for tailored landscape management actions to balance conservation and land management considerations. The proposed rule recognizes the vital role of grazing practices in maintaining grassland ecosystems. As a result, the proposed 4(d) for the western regal fritillary would exempt most activities associated with livestock grazing from incidental take, so ranchers would not need approval from the USFWS to continue those activities.

The current range for the western regal fritillary is in the midwestern portion of the United States, spanning 14 states. According to the USFWS ECOS Current Range mapper, the species is present in Richland County (USFWS, 2024e). As noted in Section 6.15.1.1.2, no unbroken grasslands were identified in the Project Area; therefore, the identified grasslands would not likely be considered suitable habitat for the western regal fritillary.

6.15.1.1.4 Monarch Butterfly

The monarch butterfly, known for its orange and black wings with white spots, lives in prairies and grasslands across much of North America. Monarch butterflies lay their eggs on milkweed plants (*Asclepias* spp.), where the larvae later emerge and feed on the plant (USFWS, 2024f). A majority of monarchs live only a few weeks, but some are able to live for up to nine months to migrate to either central Mexico or the California coast as the temperatures drop in their northern habitats (Monarch Joint Venture, 2024).

The monarch butterfly is listed as a candidate species and, therefore, does not receive protection under the ESA. However, it still faces threats to its survival, such as the loss of habitat, specifically the loss of milkweed plants, as prairies and grasslands are converted into agricultural fields and used for urban development (National Park Service [NPS], 2023). Potential monarch butterfly habitat may be present in the Project and Study Areas.

6.15.1.2 Federally Protected Species

Under the authority of the BGEPA, 16 USCA 668–668d, bald and golden eagles are afforded additional legal protection. The BGEPA prohibits the take, sale, purchase, barter, offer of sale, transport, export, or import, at any time or in any manner of any bald or golden eagle, alive or dead, or any part, nest, or egg thereof, 16 USCA 668. The BGEPA also defines take to include any action to “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb” an eagle, 16 USCA 668c and includes criminal and civil penalties for violating the statute. In 50 CFR 22.3, the term “disturb” is defined as agitating or bothering an eagle to a degree that causes, or is likely to cause, injury to an eagle or either a decrease in productivity or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Under 50 CFR 22.26, Eagle Incidental Take Permits are available for incidental take associated with otherwise lawful activities (81 FR 91494).

The USFWS IPaC tool indicated that there is the potential for bald and/or golden eagles to occur in the Project Area and that there is the potential for bald eagles (*Haliaeetus leucocephalus*) to breed from December 1 through August 31 in the Project Area. Per the NDGF (2022), the Project and Study Area are not within the known golden eagle (*Aquila chrysaetos*) nesting range.

To assess the presence of eagle nests in the Project Area, Tetra Tech undertook a ground-based eagle nest survey in late fall 2023 (Appendix L). Prior to the survey, Tetra Tech completed a desktop review to determine potential eagle nesting habitat within the Project Area plus a 660-foot buffer (Eagle Nest Survey Area). Potential nesting habitat within the Eagle Survey Area was identified using 2021 NAIP aerial photographs (USDA FSA APFO) and totaled 158 acres. All treed areas (e.g., forests/woodlots, tree rows, isolated clusters of trees, and individual trees) were classified as potential eagle nesting habitat.

A Tetra Tech avian biologist completed ground-based surveys on October 31, 2023. The biologist reviewed all potential eagle nesting habitat identified through desktop review and noted the presence or absence of eagle nests within each area. Potential nesting habitat in the Project Area was reviewed from public rights-of-way or accessed on foot if participating parcel access was available. Potential nesting habitat within the Eagle Survey Area, but outside of the participating parcels, was surveyed from the nearest public rights-of-way or from an adjacent participating parcel using binoculars and a spotting scope, as needed. The biologist additionally noted whether any area could not be fully reviewed due to visual obstructions.

During the field survey, no eagle nests were identified within the Eagle Survey Area. Leaves were not present on deciduous trees, and weather conditions were conducive to the survey. On September 12, 2024, Tetra Tech received information from the NDGF that no known eagle nests have been identified within 2 miles of the Project Area. The closest known eagle nest was for a bald eagle and is more than 3 miles from the Project Area.

6.15.1.3 State Species of Conservation Priority

The State of North Dakota does not have a state threatened and endangered species list; instead, the NDGF maintains a list of SCP. North Dakota has identified SCP that are the focus of its Wildlife Action Plan (NDGF, 2024). Currently, there are 36 Level I, 44 Level II, and 35 Level III species.

The NDPRD maintains the North Dakota Natural Heritage Inventory database, which contains the known locations of rare animal and plant species and significant ecological communities within the state. In a letter dated November 17, 2023, the NDPRD indicated that no known plant or animal species of concern or significant ecological communities are documented within or immediately adjacent to the Project (Section 8.11.10).

6.15.1.3.1 Grassland Breeding Birds

NDGF also expressed concerns regarding the use of grasslands in and around the Project Area for sharp-tailed grouse (*Tympanuchus phasianellus*) and greater prairie chicken (*Tympanuchus cupido*) leks and requested listening surveys be completed in a later consultation on March 27, 2024 (see Section 8.11.8.4).

The listening surveys were completed following the protocols outlined in *Recommended Wildlife Survey Methods of the Key Wind Energy Development in North Dakota, Best Management Practices* (NDGF, 2021b). Tetra Tech reviewed land use data collected from the Class III Cultural Resource Inventory in October 2023 to identify areas in the Project Area that were not cultivated (i.e., pastures, hay/alfalfa fields, grassy ditches, and planted grassy fields). These areas were buffered by 1 mile to create the listening survey area. Within the listening survey area, 51 listening stations were established in 0.5-mile intervals along public road rights-of-way. Listening stations were not placed along U.S. Interstate 29.

The surveys were conducted on April 9-10, April 23-24, and May 7-9, 2024 (Appendix M). During the surveys, no active leks were observed during any observation period. On April 24, a lone female sharp-tailed grouse was observed visually during the listening survey in a hayfield outside of the Project Area but within the listening survey area before flying towards the observer and banking away, flying out of view.

6.15.1.4 Avian Species

The Project and Study Areas are located within the Prairie Potholes Bird Conservation Region (BCR) (North American Bird Conservation Initiative [NABCI] 2021). The Prairie Pothole region is a glaciated area of mixed-grass prairie in the west and tallgrass prairie in the east and is the most important waterfowl production area on the North American continent, despite extensive wetland drainage and tillage of native grasslands (NABCI, 2021). Breeding dabbling duck density may exceed 100 pairs per square mile in some areas during years with favorable wetland conditions. The region comprises the core of the breeding range of most dabbling duck and several diving duck species, as well as providing critical breeding and migration habitat for over 200 other bird species, including such priority species as Franklin's gull, yellow rail, and piping plover. Baird's sparrow, Sprague's pipit, chestnut-collared longspur, Wilson's phalarope, marbled godwit, and American avocet are among the many priority non-waterfowl species breeding in this region. Wetland areas also provide key spring migration sites for the Hudsonian godwit, American golden plover, white-rumped sandpiper, and buff-breasted sandpiper.

The USFWS identified three bird species within the Prairie Potholes BCR as Birds of Conservation Concern (BCC); BCC are avian species that represent the agency's highest conservation priorities (Appendix D). The species include the bald eagle, grasshopper sparrow (*Ammodramus savannarum perpallidus*), and northern harrier (*Circus hudsonius*). All three birds may breed in the Project and Study Areas.

Land cover in the Study Area is primarily cultivated cropland (86 percent), with emergent herbaceous wetlands (6 percent), developed open space (3 percent), and woody wetlands (2 percent) (Table 6.1). Land cover in the Project Area is primarily cultivated cropland (75 percent), with grassland/herbaceous (18 percent), trees (3.4 percent), developed (2 percent), and wetlands and ponds (1.1 percent) (Table 6.2).

The limited treed areas in the Project and Study Areas may provide nesting habitat for bald eagles; however, no documented bald eagle nests are known within the Project or Study Areas, and no eagle nests were identified during Tetra Tech's ground-based eagle nest survey (Section 6.15.1.2; Appendix L). The grasshopper sparrow and the northern harrier are ground nesters within grasslands and may utilize grasslands in the Project and Study Areas (NDGF, 2019a, 2019b). Waterfowl and waterbirds may utilize the limited wetlands and ponds in the Project and Study Areas.

6.15.1.5 Other Wildlife Species

In addition to birds, other groups of wildlife that may occur in the Study Area include mammals, reptiles, amphibians, fish, and insects. As noted in Section 6.15.1.4, land cover in the Project and Study Areas is primarily cultivated cropland, with lesser amounts of grassland/herbaceous, treed areas, and wetlands. Developed areas such as U.S. Interstate 29 and paved and graveled county and township roads can limit species mobility in the Project and Study Areas.

Common land mammals that may be present include badger (*Taxidea taxus*; NDGF, 2019c), beaver (*Castor canadensis*; NDGF, 2019d), coyote (*Canis latrans*; NDGF, 2019e), fox squirrel (*Sciurus niger*; NDGF, 2019f), gray fox (*Urocyon cinereoargenteus*; NDGF, 2019g), long-tailed weasel (*Mustela frenata*; NDGF, 2019h), mink (*Mustela vison*; NDGF, 2019i), muskrat (*Ondatra zibethicus*; NDGF, 2019j), raccoon (*Procyon lotor*; NDGF, 2019k), red fox (*Vulpes vulpes*; NDGF, 2019l), Richardson's ground squirrel (*Uroditellus richardsonii*; NDGF, 2019m), white-tailed deer (*Odocoileus virginianus*; NDGF, 2019n) and Virginia opossum (*Didelphis virginiana*; NDGF, 2019o). Common bats that may be present include the big brown bat (*Eptesicus fuscus*; NDGF, 2019p) and the little brown bat (*Myotis lucifugus*; NDGF, 2019q).

Reptiles and amphibians that may occur in the Project and Study Areas include the American toad (*Anaxyrus americanus*), boreal chorus frog (*Pseudacris maculata*), Canadian toad (*Anaxyrus hemiophrys*), common garter snake (*Thamnophis sirtalis*), Cope's Gray Treefrog (*Hyla chrysoscelis*), great plains toad (*Anaxyrus cognatus*), gray treefrog (*Hyla versicolor*), northern leopard frog (*Lithobates pipiens*), painted turtle (*Chrysemys picta*), plains garter snake (*Thamnophis radix*), prairie skink (*Plestiodon septentrionalis*), red-bellied snake (*Storeria occipitomaculata*), snapping turtle (*Chelydra serpentina*), tiger salamander (*Ambystoma spp.*), wood frog (*Lithobates sylvaticus*), and Woodhouse's toad (*Anaxyrus woodhousii*) (NDGF, 2015).

Open water in the Study Area is limited to Pitcairn Creek and the Wild Rice River and only Pitcairn Creek in the Project Area. Common fish species expected to be in these waters include members of the pike family (perch family, sunfish family, drum family, catfish family, sucker family) and the minnow family (NDGF, 2019r). Common mussels expected to be present in open waters in the Project and Study Areas include the mapleleaf (*Quadrula sp.*; NDGF 2019s) and pink heelsplitter (*Potamilus alatus*; NDGF, 2019t).

Pollinator insects, including native bees, butterflies, and moths, may be present in the study and project areas.

6.15.2 Wildlife Impacts and Avoidance/Minimization Measures

6.15.2.1 Federally Listed and -Protected Species

6.15.2.1.1 Northern Long-eared Bat

Potential impacts to bats could occur as a result of tree removal. Flickertail designed the Project to minimize tree clearing to the extent practicable; however, the Project will require the clearing of some tree rows, as discussed in Section 6.14.2 above.

A Determination Key review through the USFWS IPaC for potential effects of the Project on the northern long-eared bat resulted in a "may affect, but not likely to effect" finding (Appendix D). Additionally, Flickertail is committed to winter tree clearing between November 1 and April 14, when most bats are hibernating or inactive (USFWS, 2024g). Based on the results of the northern long-eared bat determination key through IPaC and the commitment to winter tree clearing, no impacts to northern long-eared bats are anticipated.

6.15.2.1.2 Dakota Skipper

No unbroken grassland was identified in the Project Area (Appendix J). Based on these observations, grassland in the Project Area would not be considered suitable Dakota skipper habitat and impacts to Dakota skippers are not anticipated. Additionally, the USFWS IPaC North Dakota determination key completed on September 6, 2024 determined the Project would have no effect on the Dakota skipper (Appendix D).

6.15.2.1.3 Western Regal Fritillary

No unbroken grassland was identified in the Project Area (Appendix J). Based on these observations, grassland in the Project Area would not be considered suitable western regal fritillary habitat and impacts to western regal fritillary are not anticipated.

6.15.2.1.4 Monarch Butterfly

Monarch larvae feed exclusively on milkweeds, including the 11 confirmed species of milkweed present in North Dakota (NDGF 2018). Common milkweed (*Asclepias syriaca*) and showy milkweed (*Asclepias speciosa*) are listed as county noxious weeds and may be controlled through chemical treatments (NDSU, 2023). The overall abundance of milkweed species in the Project and Study Areas is unknown. Through the introduction of pollinator-friendly habitat, the Project will introduce plants required for the monarch larval development and for the adult life cycles, such as blazing stars (*Liatris spp.*), wild bergamot (*Monarda fistulosa*), asters (*Aster spp.*), coneflowers (*Echinacea spp.*), and goldenrods (*Solidago spp.*) (NDGF, 2018). Areas dedicated to pollinator-friendly habitats are expected to benefit the monarch butterfly and other pollinator insects.

6.15.2.1.5 Bald and Golden Eagles

Approximately 158 acres of treed areas were identified in the Eagle Survey Area, which may be suitable nesting habitat for eagles. Tetra Tech's ground-based eagle nest survey in October 2023 did not identify any potential eagle nests in the Eagle Nest Survey Area (Appendix L). On September 12, 2024, Tetra Tech received information from the NDGF that no known eagle nests have been identified within 2 miles of the Project Area. The closest known eagle nest was for a bald eagle and is more than 3 miles from the Project Area. Flickertail will consult with the USFWS if eagles are observed nesting in the Eagle Nest Survey Area in the future.

6.15.2.2 State Species of Conservation Priority

Per comment from the NDPRD, no known plant or animal species of concern or significant ecological communities are documented within or immediately adjacent to the Project. The Project will result in the conversion of up to approximately 1,509.0 acres of cultivated cropland within fenced perimeters to solar panels and grassland. The ground cover under and between the solar panels will be seeded with native grasses and forb species characteristic of the region (Appendix K). The remaining land cover located outside fenced perimeters may continue with current use or be converted to pollinator-friendly habitat, treed areas, or some combination of the aforementioned. These new grassland areas may become suitable habitat for these species.

6.15.2.3 Grassland Breeding Birds

The listening survey did not identify any sharp-tailed grouse or greater prairie chicken lek use in the listening survey area (Appendix M). No impacts to sharp-tailed grouse or greater prairie chickens are anticipated. The Project will result in the conversion of up to approximately 1,509.0 acres of cultivated cropland within fenced perimeters to PV panels and grassland. The ground cover under and between the solar panels will be seeded with native grasses and forb species characteristic of the region (Appendix K). The remaining land cover located outside fenced perimeters may continue with current use or be converted to pollinator-friendly habitat, treed areas, or some combination of the aforementioned. These new grassland areas may become suitable habitat for these species.

6.15.2.4 Avian Species

Temporary displacement of avian species is expected during construction. It is expected that avian species will move from active areas of the Project to inactive areas of the Project or portions of the Study Area. This movement of avian species would be similar during seasonal farming operations such as planting, harvesting, or cutting/baling hay. Construction activities in grassland and pasture areas during the nesting season have the potential to impact ground-nesting birds. While this may impact individuals, no population-level impacts are expected.

Approximately 12 acres of tree removal are proposed during construction; these areas may provide nesting habitat for avian species. Additional nesting habitat is present in the Project and Study Areas. Additionally, Flickertail is committed to winter tree clearing between November 1 and April 14, when most avian species are not nesting in the region. Minimal impacts to tree-nesting avian species are anticipated.

Potential impacts to avian species are also expected to be minimal during operations. Flickertail will minimize the impacts to ground-nesting avian species by mowing outside the breeding season. Collision risk to avian species will be minimized through the use of tracked panels with anti-reflective coating. Although some individuals may be impacted, no population-level impacts are expected, and no species-specific mitigation is proposed.

The Project also anticipates providing additional grassland habitat due to the conversion of 1,509.0 acres of cultivated cropland within fenced perimeters to PV panels with planted grassland under and between the panels. Open areas within fenced perimeters not hosting PV panels will also be planted in grassland or pollinator-friendly habitat. Farmed wetlands within the fenced perimeters will also be revegetated with wetland species characteristic of the region. These restored wetlands may provide additional benefits to waterfowl and waterbirds in the Project Area. Areas outside the fenced perimeters may continue to be used for cultivated cropland or grassland, may be converted to grassland or pollinator habitat, or converted to trees and shrubs. Avian species in the Project and Study Areas are expected to benefit from the additional grassland habitat and restored wetlands in the Project Area.

6.15.2.5 Other Wildlife Species

As noted in Section 6.15.1.4, land cover in the Project and Study Areas is primarily cultivated cropland, with lesser amounts of grassland/herbaceous, treed areas, and wetlands. Developed areas such as U.S. Interstate 29 and paved and graveled county and township roads can limit species mobility in the Project and Study Areas. Flickertail committed to 150-foot setbacks from state, county, and township roads; therefore, the Project is not anticipated to create additional barriers to wildlife movement in the Project and Study Areas. Areas not hosting facilities are expected to be cultivated cropland, grassland, or pollinator habitat. Additionally, portions of Pitcairn Creek and the adjacent riparian corridor within the Project Area will not be fenced, allowing wildlife to continue to use this area.

Temporary displacement of wildlife is expected during construction. Wildlife is expected to move from active areas of the Project to inactive areas of the Project or portions of the Study Area. This movement of wildlife would be similar during seasonal farming operations such as planting, harvesting, or cutting/baling hay. BMPs will be used during construction to prevent erosion and runoff into Pitcairn Creek and reduce potential impacts to fish and mussels. Construction of the Project is expected to have minimal temporary impacts on individual wildlife species.

Approximately 12 acres of tree removal are proposed; these areas may provide potential summer roosting habitat for bats. Additional summer roosting habitat is present in the Project and Study Areas; therefore, removing the 12 acres is not anticipated to significantly impact summer roosting habitat for bats. Additionally, Flickertail is committed to winter tree clearing between November 1 and April 14, when most bats are hibernating or inactive (USFWS 2024g). No impacts to bats are anticipated.

Potential impacts on wildlife are also expected to be minimal during operations. Access road speed limits are expected to reduce any potential vehicle/wildlife collision on Project access roads. If used, the seasonal mowing strategy can also potentially temporarily displace ground-based wildlife. Operation of the Project is expected to have minimal temporary impacts on individual wildlife species.

The Project also anticipates providing additional grassland habitat due to the conversion of 1,509.0 acres of cultivated cropland within fenced perimeters to PV panels with planted grassland under and between the panels. Open areas within fenced perimeters not hosting PV panels will also be planted in grassland or pollinator-friendly habitat. Farmed wetlands within the fenced perimeters will also be revegetated with wetland species characteristic of the region. Areas outside the fenced perimeters may continue to be used for cultivated cropland or grassland, may be converted to grassland or pollinator habitat, or converted to trees and shrubs. Wildlife species in the Project and Study Areas are expected to benefit from the additional grassland habitat and restored wetlands in the Project Area.

6.15.2.6 Anticipated Additional Studies

No additional preconstruction surveys are planned. Flickertail will continue to coordinate with the NDGF on the scope of work for post-construction biological studies.

6.16 RARE AND UNIQUE NATURAL RESOURCES

6.16.1 Existing Conditions

The Project Area does not contain critical habitat for federally listed species identified in the IPaC (Section 6.15.1). On January 30, 2024, the Project, Tetra Tech, USFWS, and NDGF discussed potential impacts to biological resources in the Project Area. The USFWS and NDGF did not identify any rare and unique natural resources in the Project Area (Section 8.11.8). Additionally, the NDPRD indicated that no known plant or animal species of concern or significant ecological communities are documented within or immediately adjacent to the Project (Section 8.11.10).

6.16.1.1 Western Prairie-fringed Orchid

The western prairie fringed orchid is a member of the orchid family and is found in moist tallgrass prairies and sedge meadows in Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and Manitoba, Canada, with the largest populations found in North Dakota, Minnesota, and Manitoba, Canada (USFWS, 2024h). In North Dakota, it is commonly found with sedges, reed grass, and rushes or where those plants meet big bluestem, little bluestem, and switchgrass.

Per the *Western Prairie Fringed Orchid Recovery Plan* (USFWS, 1996), western prairie fringed orchids were recorded in Richland County on private land and in roadside ditches. Suitable habitat in Richland County includes the Sheyenne Delta geologic formation, which includes the Sheyenne National Grassland and historic Lake Agassiz beachlines. Portions of the Sheyenne Delta geologic formation appear to be located in the Project Area.

The USFWS IPAC North Dakota determination key completed on September 6, 2024, determined that the Project may affect the western prairie fringed orchid (Appendix D). To assist with identifying whether grasslands in the Project Area contain potentially suitable western prairie fringed orchid habitat, Tetra Tech completed an unbroken grassland assessment that failed to identify unbroken grasslands in the Project Area (Appendix J). Based on these observations, grassland in the Project Area would not be considered suitable western prairie fringed orchid habitat.

6.16.2 Rare and Unique Natural Resources Impacts and Avoidance/Minimization Measures

6.16.2.1 Western Prairie-fringed Orchid

No unbroken grassland was identified in the Project Area; therefore, the identified grasslands would not likely be considered suitable habitat for the western prairie-fringed orchid.

No rare and unique natural resources are in the Project Area; therefore, no impacts are anticipated.

6.17 SUMMARY OF IMPACTS AND AVOIDANCE/MINIMIZATION MEASURES

Table 6.7 summarizes the impacts discussed in Section 6.0 and the mitigation Flickertail will implement to address them.

Table 6.78. Summary of Impacts.

Resource	Potential Impact	Proposed Avoidance, Minimization, and/or Mitigation
Demographics	The Project will result in an increase in socioeconomic benefits for landowners, local governments, and communities. The income provided to landowners through solar energy lease payments will provide an additional, stable form of income that will help assure the continued viability of farming in the Project Area. The Project will create approximately three full-time O&M jobs. These employees are expected to reside locally. No long-term changes to demographics are anticipated.	No mitigation is proposed.
Land Use and Zoning	Up to 1,509.0 acres of cultivated cropland and 218.1 acres of grassland/herbaceous lands (i.e., hay and pasture) would be located within fenced perimeters and converted to solar panels and grassland. A total of 18.4 acres of impervious surfaces (i.e., access roads, inverters, and METs) will be located within the fenced perimeters. Of the 13.1 acres of trees in the fenced perimeter, approximately 12 acres are proposed to be removed. A total of 11.5 acres of impervious surfaces (i.e., collector substation, O&M building, and access roads) will be located outside the fenced perimeters. The remaining land cover located outside fenced perimeters may continue with current use or be converted to pollinator-friendly habitat, treed areas, or some combination of the aforementioned. Three residences are within 500 feet of the Project Area; these three residences, plus all additional residences within 0.25 miles of the Project Area, have executed good neighbor agreements.	After construction, the ground cover under and between the solar panels will be seeded with native grasses and forb species characteristic of the region (Appendix K). Other areas within the fenced perimeter currently vegetated will be preserved to the extent practicable and re-seeded as needed. Flickertail will attempt to maintain grassy vegetation in hay and pasture areas throughout construction; any areas requiring reseeded will utilize seed mixes outlined in Appendix K. Seed mixes appropriate to the region were identified through consultation with the USDA-NRCS. Portions of the Project Area located outside the fenced perimeters, excluding areas impacted by permanent facilities, may continue to be used for cultivated cropland or hay/pasture, converted to pollinator-friendly habitat, treed areas, or some combination of the aforementioned. Lease payments will be paid to landowners for the placement of Project facilities to offset the loss of income from permanent impacts on agricultural land. The Project is compatible with existing land uses and has been designed to comply with local zoning requirements.
Public Services	During the construction phase, temporary impacts are anticipated on some public roads within the vicinity of the Project, primarily through additional traffic and the potential for slow-moving construction vehicles. Traffic impacts associated with the operations phase after construction will be negligible. A glare analysis did not identify any glare for roads in the Study Area. There is one stock well in the Project Area.	Flickertail will coordinate with the applicable road authorities regarding the selection and use of haul roads as part of the road use and maintenance agreements. Flickertail will work with the landowner to have this well-capped and abandoned or avoided and left in place.

Resource	Potential Impact	Proposed Avoidance, Minimization, and/or Mitigation
Human Health and Safety	No adverse impacts are anticipated. Solid waste will be generated during construction, but no hazardous waste is expected to be generated during construction or operation. Hazardous materials and petroleum products will be stored and used on-site during construction and operations.	Flickertail sited Project facilities in compliance with PSC and Abercrombie Township setback requirements. The nearest residence to the Project is approximately 580 feet from the nearest fence line. This residence and all residences within 0.25 miles of the Project Area have signed a good neighbor agreement with Flickertail. If hazardous waste is generated or encountered, construction will be suspended, and the NDDEQ will be contacted immediately to determine the best method for clean-up and disposal. Appropriately sized spill kits will be available on-site during construction and operations. Flickertail will coordinate with local emergency management and the local fire department to develop an emergency response plan.
Sound	There will be increased noise during construction. Based on the inverter options under consideration and the distance to the nearest residence (580 feet), noise levels from the Project equipment are not expected to be discernible from background noise levels at homes near the Project during operations.	During construction, Flickertail will limit construction to daylight hours, as practicable. No mitigation is proposed during operations.
Visual	The Project will have visual and potential aesthetic impacts. Flickertail will convert up to 1,766.8 acres of land (predominantly cultivated cropland) into a solar facility enclosed by an agricultural-style fence. A glare analysis was performed for the Project to assess potential impacts to road traffic and receptors (i.e., 31 residences and one church) in the Project and Study Areas. The analysis did not identify any road glare, the 31 residences (including the residence 580 feet from the fenced perimeter), or the church. The Project will utilize minimal lighting. Lighting will be used for safety and security purposes and placed at Project entrances, the O&M facility, and inverters.	Compliance with applicable setbacks is anticipated to minimize visual impacts. Additionally, Flickertail executed good neighbor agreements with all landowners within 0.25 miles of the Project. PV panels will employ glass panels designed to maximize absorption and minimize reflection to increase electricity production efficiency. PV panels are constructed of dark, light-absorbing materials to limit reflection and are covered with an anti-reflective coating. Today's panels reflect as little as two percent of the incoming sunlight depending on the angle of the sun and assuming the use of anti-reflective coatings. Most of the facility, including the PV arrays, will be low-profile. The PV arrays will be visible from adjacent roadways and parcels, but given their relatively low profile and the fact that all the facilities will be fenced for security, they will not be visible from long distances. During construction, Flickertail will limit construction to daylight hours, as practicable and any night lighting will be downlit. During operations, lighting will be downlit and will be switch and motion activated.
Cultural and Archaeological Resources	Ground-disturbing activities during construction have the potential to impact known or unknown cultural and historic architectural resources in or adjacent to the Project Area. One previously documented cultural resource (currently unevaluated for listing on the NRHP) is located in the Project Area.	Class I and III surveys and an associated report have been completed for the Project. Project infrastructure has been sited to avoid archaeological and historic architectural resources identified and recommended for avoidance in the Project's Class I and III report. Project facilities have avoided the previously documented cultural resource, which is currently unevaluated for listing on the NRHP. Flickertail also prepared a UDP.

Resource	Potential Impact	Proposed Avoidance, Minimization, and/or Mitigation
Recreational Resources	No designated recreation areas or public or private parks exist in the Project or Study Areas. Approximately 1.4 miles of the North Country National Scenic Trail intersects the northeast portion of the Study Area, approximately 0.5 miles north of the northernmost portion of the Project Area. Impacts to recreational resources are not anticipated.	The North Country National Scenic Trail is 0.5 miles from the Project Area and is not anticipated to be impacted by the Project. As such, no mitigation is proposed.
Land-Based Economies	Within the fenced perimeters, up to 1,509.0 acres of cultivated cropland and up to 218.1 acres of grassland/herbaceous lands (i.e., hay and pasture) would be converted to solar panels and grassland. An additional 16.2 acres of cultivated cropland and 2.1 acres of grassland/herbaceous lands would be converted to access roads, inverters, and METs. Outside the fenced perimeters, an additional 3.0 acres of cultivated cropland and 1.5 acres of grassland/herbaceous lands would be converted to access roads, and 7 acres of grassland/herbaceous lands would be converted to the collector substation and the O&M facility.	The conversion of approximately 1,756.9 acres of agricultural land (1,528.2 acres of cultivated cropland and 228.7 acres of grassland/herbaceous lands) will not significantly impact land-based economies in the Project Area. The solar land lease and easement payments to the participating landowners will offset the potential revenue from agricultural production lost (i.e., cultivation crops, hay, or pastureland). Areas disturbed during construction will also be repaired and restored to pre-construction contours and characteristics to the extent practicable. This restoration will allow the Project's land surfaces to drain properly, blend with the natural terrain, re-vegetate naturally where possible, and avoid erosion. Approximately 105 acres in the Project Area are used for cattle pasture. Roughly 70 acres are pasture, and the other 35 acres consist of wetlands, trees, and scrubs. The solar land lease and easement payments to the participating landowners will offset the potential revenue from livestock production lost. The remaining cultivated cropland and grassland/herbaceous lands located outside fence perimeters and not being utilized by the Project may continue to be used for cultivated cropland or grassland/herbaceous lands, converted to pollinator-friendly habitat, planted with trees/shrubs, or some combination of the aforementioned.

Resource	Potential Impact	Proposed Avoidance, Minimization, and/or Mitigation
Soils	Approximately 29.9 acres will be permanently impacted by proposed Project facilities with impervious surfaces. The majority (approximately 1,813 acres) of soil impacts will not result in significant soil disturbances. With the exception of access roads and inverters, the majority of the soils within the fenced perimeters will not be graded, excavated, or removed. Piers for the solar racking and fence posts for the security fence will be hydraulically driven into the ground. Electrical collection cables will be trenched in the majority of locations in the Project Area.	Prior to construction of the Project, a nurse or cover crop will be planted to control soil erosion and suppress weed growth during the construction process. If temporary cover crops are not used, and if sufficient crop stubble is not present, a noxious weed-seed-free mulch may be used to control soil erosion. Maintenance of the nurse or cover crop, or mulch, will occur throughout the construction process to control soil erosion and suppress weed growth. Impacts to soils within the Project Area will be localized to the areas where Project activities occur and minimized through the use of BMPs. BMPs may include erosion and sediment control measures, noxious weed control, segregation of topsoil, and reseeding as needed. Seed mixes appropriate to the region were identified through consultation with the USDA-NRCS. Flickertail will obtain coverage under the NDPDES-GSP, which requires the preparation of a SWPPP. Due to the level nature of the Project Area, minimal grading is anticipated. Following construction, Flickertail will maintain vegetation to prevent soil erosion and control weeds. The soils in the fenced perimeter will be allowed to rest and regenerate over the life of the Project.
Geologic and Groundwater Resources	Impacts to geologic resources are not anticipated. There is one stock well in the Project Area.	Flickertail will work with the landowner to cap and abandon the existing stock well or avoid it and leave it in place.
Surface Water and Floodplain Resources	Construction of Project facilities could potentially impact surface water runoff within the Project Area. Ground-disturbing construction activities have the potential to cause sedimentation, but these impacts are expected to be minimal and will only occur during construction. Electrical collection cables are proposed to cross Pitcairn Creek and its tributaries. They will be horizontally directional drilled/bored, thereby avoiding impacts. Two access roads totaling approximately 505 linear feet and 0.23 acre of permanent impacts are proposed to be placed within the 100-year floodplain. Approximately 6,539 linear feet of electrical collection cable totaling 5.7 acres of temporary impacts will be within the 100-year floodplain.	No Project facilities will be placed in Pitcairn Creek or its tributaries. Electrical collection cables that intersect Pitcairn Creek or its tributaries will be horizontally directional drilled/bored under the creek, thereby avoiding impacts. The siting of these segments of access roads in the 100-year floodplain avoids impacts to wetlands, treed areas, and streams. The access road will also have a gravel base and be constructed at grade; therefore, no increase to the base flood elevation is anticipated. The electrical collection cables will be trenched or horizontal directional drilled/bored in the 100-year floodplain. The placement of buried electrical collection cables in the 100-year floodplain is not anticipated to have any impact on base flood elevation. Flickertail will seek approval for the placement of these facilities with the Richland County Floodplain Administrator. If unavoidable impacts to USACE jurisdictional waters were to occur, these activities would be permitted under the NWP program. Flickertail will also implement appropriate erosion and sediment control BMPs and obtain coverage under the NDPDES-GSP, which requires the preparation of a SWPPP.

Resource	Potential Impact	Proposed Avoidance, Minimization, and/or Mitigation
Wetlands	Field surveys identified 134 wetlands totaling 73.4 acres in surveyed portions of the Project Area (3,315 acres). The desktop review identified an additional five wetlands totaling 64 acres in unsurveyed portions of the Project Area (149 acres). Project facilities have been sited to avoid permanent and temporary impacts to wetlands.	The Project has been designed to avoid impacts to wetlands. Electrical collection cables will be horizontally directional drilled/bored under wetlands, thereby avoiding impacts. If unavoidable impacts to USACE jurisdictional waters occur, these activities will be self-certified under the NWP Program.
Vegetation	Project facilities have been sited to minimize impacts to the 118.1 acres of treed areas in the Project Area to the extent practical. Three tree rows totaling approximately 12 acres (including tree canopy) and 75 feet of a fourth tree row (totaling 0.06 acre), located in the south-central portion of the Project Area, are proposed to be removed to allow for continuous development in the parcels. Up to approximately 1,509 acres of cultivated cropland within fenced perimeters will be converted to solar panels and grassland.	Flickertail will comply with the PSC tree and shrub mitigation plan, with a request to clear certain areas wider than 50 feet (see Figure 9). The planting of trees per the mitigation plan may occur within portions of the Project Area not being proposed for Project facilities, or (with landowner support) the Project may explore options within the surrounding community to coordinate on tree/shrub planting or engage in other activities that would provide long-term wildlife habitat and conservation benefits. Any plans for tree and shrub planting in the Project Area will adhere to setbacks outlined by Abercrombie Township and through discussion with participating landowners. The ground cover under and between the solar panels will be seeded with native grasses and forb species characteristic of the region.
Wildlife	Wildlife impacts are anticipated to be minimal. However, the project may temporarily relocate wildlife during construction. The potential for federally listed and -protected species and state species of conservation priority to occur in the Project Area is low due to limited potential habitat; therefore, impacts to these species are not anticipated. The Project will result in the removal of approximately 12 acres of treed habitat, which may be potential summer roosting habitat for the northern long-eared bat.	Flickertail coordinated with the USFWS and NDGF and designed the Project to avoid and/or minimize potential impacts on wildlife, including federally listed and protected species, state species of conservation priority, sharp-tailed grouse, and greater prairie chicken, and associated habitat. A Determination Key review through the USFWS IPaC for potential effects of the Project on the northern long-eared bat resulted in a “may affect, but not likely to effect” finding. Flickertail is also committed to winter tree clearing between November 1 and April 14, when most bats are hibernating or inactive. Based on the results of the northern long-eared bat determination key through IPaC and the commitment to winter tree clearing, no impacts to northern long-eared bats are anticipated. No unbroken grassland was identified in the Project Area. Based on these observations, grassland in the Project Area would not be considered suitable habitat for Dakota skipper or western regal fritillary, and impacts to these species are not anticipated. Areas dedicated to pollinator-friendly habitats are expected to benefit the monarch butterfly and other pollinator insects. Flickertail conducted a bald and golden eagle nest survey; no eagle nests were identified. Flickertail will consult with the USFWS if eagles are observed nesting in the Eagle Nest Survey Area in the future.

Resource	Potential Impact	Proposed Avoidance, Minimization, and/or Mitigation
		<p>Flickertail conducted lek surveys; no active sharp-tailed grouse or greater prairie chicken leks were observed. Additionally, Flickertail will convert approximately 1,509.0 acres of cultivated cropland to PV panels and grassland. The remaining land cover located outside fenced perimeters may continue with current use or be converted to pollinator-friendly habitat, treed areas, or some combination of the aforementioned. These new grassland areas may become suitable habitats for these species.</p> <p>The Project also anticipates providing more grassland habitat due to the conversion of 1,509.0 acres of cultivated cropland within fenced perimeters to PV panels with planted grassland under and between the panels. Open areas within fenced perimeters that do not host PV panels will also be planted in grassland or pollinator-friendly habitats. Farmed wetlands within the fenced perimeters will also be revegetated with wetland species characteristic of the region. These restored wetlands may provide additional benefits to waterfowl and waterbirds in the Project Area. Areas outside the fenced perimeters may continue to be used for cultivated cropland or grassland or may be converted to grassland or pollinator habitat or trees and shrubs. Avian species in the Project and Study Areas are expected to benefit from the additional grassland habitat and restored wetlands in the Project Area. Flickertail will minimize the impacts to ground-nesting avian species during operations by conducting mowing outside the breeding season. Collision risk to avian species will be minimized through the use of tracked panels with anti-reflective coating. BMPs will be used during construction to prevent erosion and runoff into Pitcairn Creek and reduce potential impacts to fish and mussels. During operations, speed limits on access roads are expected to reduce any potential vehicle/wildlife collision on Project access roads.</p>
Rare and Unique Natural Resources	The potential for the western prairie fringed orchid to occur in the Project Area is low due to limited potential habitat; therefore, impacts are not anticipated.	Based on the grassland assessment, grassland in the Project Area would not be considered suitable western prairie-fringed orchid habitat, and impacts to this species are not anticipated.

7.0 IDENTIFICATION OF POTENTIAL PERMITS/APPROVALS

Table 7.1 lists potential permits, clearances, and approvals that may be needed for the Project's development and operation.

Table 7.1. Potential Permits/Approvals

Agency	Permit	Applicability	Permit Status and Timing
Federal			
USACE, Omaha, Nebraska District	Section 404 of the Clean Water Act (CWA) NWP	Required if there will be a discharge of dredge or fill material to a WOTUS. These discharges may be permitted by an NWP, provided the activity meets the permit conditions. Typically, cumulative, permanent impacts of up to 0.5 acre of WOTUS may be permitted under an NWP, with mitigation typically required if permanent impacts exceed 0.1 acre. Pre-construction notification is required if the discharge results in the loss of greater than 0.1 acre of WOTUS.	To be obtained prior to activity subject to permit, if needed.
USFWS – North Dakota Ecological Services Field Office	Review for Threatened and Endangered Species	Consultation regarding potential impacts to species protected under the ESA.	Coordination with the USFWS has been ongoing since April 2022.
FAA	Form 7460-1 Notice of Proposed Construction or Alteration (Determination of No Hazard)	Construction or alteration of structures higher than 200 ft Above Ground Level (AGL), structures near airports, or siting within line of sight of radar of an air defense facility.	N/A - FAA Notice Criteria Tool indicated the Project did not exceed Notice Criteria.
State			
PSC	Certificate of Site Compatibility	Required for the development of any wind energy conversion facility capable of producing more than 0.5 MW of electricity.	Flickertail is seeking a Certificate of Site Compatibility.
NDDEQ – Division of Water Quality (DWQ)	401 Water Quality Certification (WQC)	Required in conjunction with Section 404 permit for filling jurisdictional WOTUS.	Incorporated into Section 404 NWPs.

Agency	Permit	Applicability	Permit Status and Timing
NDDEQ – DWQ	NDPDES-GSP (includes SWPPP)	Required for all construction projects that disturb more than 1 acre of land. As part of the permit, a Notice of Intent (NOI) and SWPPP are also required, although submittal of the SWPPP is not required unless requested by the NDDEQ – DWQ.	To be obtained prior to activity subject to permit.
North Dakota State Water Commission (NDSWC), Office of the State Engineer	Temporary Water Permit	Required for temporary uses of water, except when the volume of water to be impounded, withdrawn, or diverted is less than 12.5 acre-feet (4,073,137 gallons), and the water is used for domestic, fish, livestock, wildlife, or recreational purposes.	To be obtained prior to activity subject to permit, if needed.
NDSWC, Office of the State Engineer	Conditional Water Permit	Required for water uses where the use period will exceed 12 months, except when the volume of water to be impounded, withdrawn, or diverted is less than 12.5 acre-feet, and the water is used for domestic, fish, livestock, wildlife, or recreational purposes.	To be obtained prior to activity subject to permit, if needed.
NDSWC, Office of the State Engineer	Drainage Permit	Required prior to drainage of a waterbody, pond, lake, slough, or sheet water, or any series thereof, that has a watershed area of at least 80 acres.	To be obtained prior to activity subject to permit, if needed.
SHSND/SHPO	Cultural Resources Review	Consultation required in connection with other agency permitting requirements, such as the PSC.	The Project is coordinating with SHSND/SHPO on cultural resource survey results.
NDDEQ – Division of Air Quality (DoAQ)	Air Quality Permits – Permit to Construct and Minor Source Permit	Required for defined air contaminant sources capable of directly or indirectly causing or contributing to air pollution. Cement manufacturing facilities are considered air contaminant sources.	A concrete batch plant for the Project is not anticipated.
NDDOT – Fargo District Office	Utility Occupancy Permit	Required prior to siting electrical lines within an NDDOT highway rights-of-way.	To be obtained prior to activity subject to permit, if needed.
NDDOT – Fargo District Office	Highway Access (Driveway) Permit	Required to = widen or build an approach to NDDOT highway rights-of-way.	To be obtained prior to activity subject to permit, if needed.

Agency	Permit	Applicability	Permit Status and Timing
NDDOT – Fargo District Office	Temporary Modification Permits	Required for temporary modifications to NDDOT rights-of-way.	To be obtained prior to activity subject to permit, if needed.
North Dakota Highway Patrol	Oversize/Overweight Permit	Required for oversized or overweight load movement that exceeds North Dakota vehicle size and weight limits. The maximum weight on a single axle is 22,000 pounds.	To be obtained prior to construction, if necessary.
North Dakota Department of Trust Lands (NDDTL) – Surface Management Division (SMD)	Construction/Infrastructure Permit	Required if siting facilities on State Trust Land.	Not anticipated as the Project is not located on State Trust Land.
North Dakota State Electrical Board	Electrical Wiring Certificate/Inspection	Required for all electrical installations with a value greater than \$500. Certificate must be submitted by the Master, Class B, or Power Limited Electrician supervising the installation.	To be obtained prior to activity subject to permit, if needed. To be obtained prior to construction.

Richland County

Richland County Health Department through Fargo Cass Public Health	On-site Sewage Treatment Systems Permit	Required for installation of septic system.	To be obtained prior to activity subject to permit, if needed.
Richland County Highway Department	Right-of-Way Permit	Required for any work performed within the Richland County road rights-of-way.	To be obtained prior to activity subject to permit, if needed.
Richland County Highway Department	Utility Permit	Required for the installation of utilities within the Richland County road rights-of-way.	To be obtained prior to activity subject to permit, if needed.
Richland County Highway Department	Driveway Permit	Required to install a driveway within the Richland County road rights-of-way	To be obtained prior to activity subject to permit, if needed.
Richland County Highway Department	Single Trip Permit	Required for legal size divisible load vehicles that exceed Richland County's gross vehicle weight cap of 80,000 pounds to move on the Richland County highway system.	To be obtained prior to activity subject to permit, if needed.
Richland County Highway Department	10% Weight Exemption Permit	A 10% increase in the maximum allowable weight can be issued to either expedite the haul of farm products during harvest (July 15 through December 1) or when highway roadbeds are frozen (December 1 through March 7).	To be obtained prior to activity subject to permit, if needed.

Agency	Permit	Applicability	Permit Status and Timing
Richland County Water Resource District	Drainage Permit	Required when draining a pond, slough, lake, or sheet water with a watershed of 80 acres or more or prior to the installation of a subsurface water management system comprising 80 acres or more. Impacting existing drainage systems requires review by the Richland County Water Resource District	To be obtained prior to activity subject to permit, if needed.

Abercrombie Township

Abercrombie Township	Conditional Use Permit	Required for solar energy generating system and associated facilities	Obtained November 20, 2023.
Abercrombie Township	Building/Zoning Permit	Required to construct, reconstruct, relocate, or alter a building.	Obtained March 19, 2024.
Abercrombie Township	Certificate of Occupancy or Use	Required following inspection of a completed building.	To be obtained prior to activity subject to permit, if needed.
Abercrombie Township	Road Access Permit	Required for access (i.e., driveways) to township roads.	To be obtained prior to activity subject to permit, if needed.
Abercrombie Township	Utility Permit	Required for the installation of utilities within the Abercrombie Township road rights-of-way.	To be obtained prior to activity subject to permit, if needed.
Abercrombie Township	Sign Permit	Required to locate, erect, move, reconstruct, extend, enlarge, or structurally alter a sign.	To be obtained prior to activity subject to permit, if needed.
Existing Infrastructure Owner(s)	Crossing License(s)/Permit(s)	May be required to cross existing easements (e.g., railroad ROW).	To be obtained prior to crossing existing infrastructure and easements, if needed.

8.0 FACTORS CONSIDERED

The Siting Act (see NDCC Section 49-22-09) lists the following factors to guide the PSC in assessing and designating the site for the proposed facility.

8.1 PUBLIC HEALTH AND WELFARE, NATURAL RESOURCES, AND THE ENVIRONMENT

Potential Project impacts on public health and welfare, natural resources, and the environment are discussed throughout this Application. In addition, Section 6.17 provides a summary of impacts and proposed mitigation measures to minimize these impacts. As discussed in this Application, the Project has been designed to avoid and/or minimize potential impacts to public health and welfare, natural resources, and the environment.

8.2 MINIMIZING ADVERSE ENVIRONMENTAL EFFECTS

Flickertail has, or will, use the most current available technologies to site, construct, and operate the Project in order to optimize the utilization of solar resources while also minimizing or avoiding potential adverse environmental impacts. Avoidance, minimization, and mitigation measures associated with various resources are identified in their corresponding sections within Section 6.0.

8.3 POTENTIAL FOR BENEFICIAL USES OF WASTE ENERGY

Solar energy does not create waste energy; therefore, no use of waste energy is associated with this Project.

8.4 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Unavoidable adverse environmental effects are described for each resource area in Section 6.0. The unavoidable direct ground disturbance will include the conversion of primarily agricultural land to a renewable energy generation resource for the life of the Project. The direct impacts will total 29.9 acres from the conversion of agricultural land to access roads, inverters, and the Project substation and O&M facility. Flickertail may also convert up to 1,748.4 acres of agricultural land (primarily cultivated cropland) to solar panels and grassland. The ground cover under and between the solar panels will be seeded with native grasses and forb species characteristic of the region (Appendix K). The grasslands in the fenced perimeter will also allow soils to rest, rejuvenate, and provide wildlife habitat.

Flickertail proposes to remove three tree rows totaling approximately 12 acres (including tree canopy) and 75 feet of a fourth tree row (totaling 0.06 acre) located in the south-central portion of the Project Area. These tree rows are proposed to be removed to allow for continuous development in the parcels. If left in place, the tree rows would reduce the developable area in the Project Area, which would need to account for additional setbacks due to shading from these tree rows.

Flickertail will comply with the PSC tree and shrub mitigation plan, with a request to clear certain areas wider than 50 feet (see Section 6.14.2). Flickertail may plant trees/shrubs within portions of the Project Area where Project facilities are not being proposed or (with landowner support) may explore options within the surrounding community to coordinate tree/shrub planting or engage in other activities that would provide long-term wildlife habitat and conservation benefits. Any plans for tree and shrub planting in the Project Area will adhere to setbacks outlined by Abercrombie Township (see Section 4.2) and through discussion with participating landowners. Flickertail selected the Project site to minimize unavoidable environmental impacts and will implement appropriate mitigation measures throughout Project development.

8.5 ALTERNATIVES TO THE PROPOSED SITE

As discussed in Section 1.2, Flickertail selected the proposed Project Area based on various factors, including suitable solar resource, landowner and agency coordination, site-specific studies, transmission and interconnection proximity and availability, and engineering considerations. The Project has been sited to avoid and minimize environmental and land-use impacts. Flickertail believes the proposed site represents the best location for the Project.

8.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF NATURAL RESOURCES

Renewable energy projects, including the Project, require relatively few irreversible and irretrievable commitments of natural resources. In the case of the Project, construction-related activities are expected to be the primary source of the irreversible and irretrievable commitment of natural resources. Natural resources will be used to manufacture and prepare construction materials, including aggregate, concrete, and steel. In addition, transportation of vehicles and equipment to and from the site during construction will require the use of hydrocarbon fuel. Although they would not be retrievable after use, the supply of these materials is not sparse, and their use would not be expected to significantly impact resource availability. Further, the limited commitment of natural resources for the Project would be balanced against the anticipated benefits resulting from project development.

8.7 DIRECT AND INDIRECT ECONOMIC IMPACTS

As Section 3.6 outlines, the Project will provide meaningful long-term economic benefits through lease and easement payments to landowners and property taxes paid to state and local taxing authorities. The Project will also create three full-time jobs during operations.

Short-term economic benefits will include the creation of up to approximately 300 temporary jobs, both skilled and unskilled, at the peak of Project construction and significant and measurable indirect economic benefits to the general area, including increased retail and service activity at restaurants and gas stations and local purchases of construction materials and supplies.

The development of solar energy in this region can contribute to the diversification and strengthening of southeastern North Dakota's economic base.

8.8 EXISTING DEVELOPMENT PLANS OF THE STATE, LOCAL GOVERNMENT, AND PRIVATE ENTITIES AT OR IN THE VICINITY OF THE SITE

The Project is not anticipated to conflict with the existing plans of state and local government or private entities within the Project Area. Flickertail met with North Dakota, Richland County, and Abercrombie Township officials on various occasions regarding the Project. No issues related to existing development plans were raised at those meetings. Additionally, the Project will comply with the Abercrombie Township zoning ordinance.

8.9 EFFECT OF SITE ON CULTURAL RESOURCES

Project infrastructure has been sited to avoid cultural resources. Although the resource appears to no longer be present, the Project will avoid impacts to the one previously documented unevaluated cultural resource located adjacent to electrical collection cables through installation via HDD. Flickertail also prepared a UDP (Appendix G).

8.10 EFFECT OF SITE ON BIOLOGICAL RESOURCES

Extensive efforts have been made to avoid or minimize impacts to biological resources in siting the Project, and efforts will continue during construction and operation. The Project has been designed to minimize impacts to wildlife.

8.11 COMMENTS FROM AGENCIES

On October 19, 2023, January 25, 2024, June 6, 2024, and June 13, 2024, Flickertail mailed or emailed Project notification letters to the local, state, and federal agencies listed in NDAC Section 69-06-01-05. The Project notification letters included a description of the Project and a map of the Project Area. The following sections summarize agency coordination efforts to date, organized by agency. Appendix D includes a list of agencies consulted; copies of agency correspondence are provided in Appendix D.

8.11.1 United States Army Corps of Engineers

In an email dated November 8, 2023, the USACE reviewed the information provided regarding the proposed Project and provided a letter response (dated November 7, 2023) that indicated a USACE Section 404 permit may be required for the Project. Flickertail anticipates that impacts to USACE jurisdictional waters will be primarily temporary and permitted under the NWP program.

8.11.2 United States Department of Agriculture – Natural Resources Conservation Service

Flickertail contacted the USDA-NRCS on June 17, 2024, to provide an update on the Project and the preparation of the vegetation management plan. The USDA-NRCS responded in an email on June 17, 2024, stating that coordination and site preparation will be key components in a successful vegetation establishment and management strategy. The USDA-NRCS provided comments regarding the anticipated seed mix and seeding specifications as well as noxious weed control measures and considerations.

Flickertail developed a vegetation management plan based on guidance provided by the USDA-NRCS and will seek approval from the agency on this plan. On September 27, 2024, the Project submitted the vegetation management plan to the USDA-NRCS for comment, and the USDA-NRCS provided some additional minor suggestions regarding seed mix composition and species. The recommendations were incorporated into an updated vegetation management plan (Appendix K), and the updated plan was provided to the USDA-NRCS on October 7, 2024.

8.11.3 United States Department of Defense

In an email dated September 9, 2024, the Department of Defense (DoD) reviewed the information provided regarding the proposed Project and provided a letter response (dated September 6, 2024) that indicated the Project, as proposed, will have minimal impact on military operations conducted in the area.

8.11.4 North Dakota Department of Environmental Quality

In a letter dated July 2, 2024, NDDEQ stated that the Project overlies the Colfax glacial drift aquifer and that the Project should take steps to avoid spills of any materials that may have an adverse effect on groundwater quality. The NDDEQ also noted that measures should be taken to minimize fugitive dust emissions during construction and that all solid waste materials must be managed and transported in accordance with the state's solid and hazardous waste rules. NDDEQ also stated that a permit for discharging stormwater runoff may be needed if the Project plans to disturb more than 1 acre. Flickertail will obtain coverage under and construct the Project in compliance with the requirements of the NDPDES-GSP.

NDDEQ also stated that it owns no land in or adjacent to the proposed Project and has no planned projects in the area. It believes the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for North Dakota.

On September 12, 2024, the NDDEQ provided a signed response letter indicating that the original response, sent on July 2, 2024, was unsigned.

8.11.5 North Dakota Department of Transportation

In a letter dated November 2, 2023, NDDOT stated that the Project should have no adverse impact on the NDDOT highways; however, the Project would need to obtain a Utility Permit from NDDOT Fargo District Office before installing any utilities within the Interstate Highway ROW. Once the exact utility crossing has been determined, Flickertail plans to seek a utility permit from the NDDOT Fargo District Office.

8.11.6 North Dakota Department of Trust Lands – Surface Management Division

In an email dated October 25, 2023, NDDTL-SMD stated that the Project will not impact state trust lands, so the Department does not have a specific comment on it.

8.11.7 North Dakota Department of Water Resources

In a letter dated November 14, 2023, NDDWR indicated there is a FEMA floodplain in the Project Area, and the Project should work with a local floodplain administrator. Flickertail will seek approval from the Richland County Floodplain Administrator for the placement of project facilities in floodplains. The NDDWR requested notification regarding proposed Project impacts to water resources (streams, rivers, agricultural drains, wetlands, dikes, and levees). The NDDWR also noted it should be contacted if surface or groundwater is needed for the Project and notified if water observation wells are encountered.

Currently, impacts to streams, rivers, agricultural drains, wetlands, dikes, and levees are not anticipated. If future changes to Project facilities result in impacts to streams, rivers, agricultural drains, wetlands, dikes, and levees, Flickertail will coordinate with the NDDWR. The NDDWR stated that it maintains wells across the state to monitor water levels and quality in glacial and bedrock aquifers. It asked to be contacted if an observation well is encountered during Project activities and must be removed. If water observation wells are encountered or Flickertail determines surface or groundwater will be needed, Flickertail will coordinate with NDDWR as needed.

8.11.8 Wildlife Agencies (United States Fish and Wildlife Service and North Dakota Game and Fish Department)

Flickertail began coordinating with the USFWS in 2022 and with NDGF in 2023. Meetings and iterative reviews of Project information with the USFWS and NDGF helped confirm appropriate resource surveys and protocols for the Project and measures to avoid, minimize, and monitor potential impacts and incorporate adaptive management strategies. This coordination was used to refine the Project design. Meetings were held in addition to email communication. Copies of correspondence with the USFWS and NDGF are provided in Appendix D. Significant meetings and communications are summarized below.

8.11.8.1 April 21, 2022, USFWS Letter

In 2022, Flickertail provided an initial outreach letter to USFWS, which responded in a letter dated April 21, 2022. Although the Project was modified after the USFWS's April 2022 letter, the USFWS indicated in an email dated January 4, 2024, that its letter remained applicable to the Project.

8.11.8.2 December 14, 2023, NDGF Letter

In a letter dated December 14, 2023, the NDGF provided comments on the Project. The NDGF indicated that the Project is one of the first solar projects to be introduced in North Dakota, and there is uncertainty about the risk solar projects pose to wildlife. The guidance focused on the following topics: 1) site selection, 2) micro-siting, 3) stormwater management, 4) pre-construction monitoring, 5) construction, 6) post-construction monitoring, 7) pollinator opportunities, and 8) voluntary offsets.

8.11.8.3 January 30, 2024, USFWS and NDGF Meeting

Flickertail met with USFWS and NDGF to introduce the Project and its development team. Flickertail presented the preliminary results of desktop and field studies that had been completed. This included information pertaining to land cover, USFWS wetland and grassland easements, PLOTS parcel, IPaC results, ground-based nest survey results, and ongoing wetland surveys. NDGF noted concerns regarding unbroken grasslands and recommended surveys to identify them. NDGF also noted that if no unbroken grasslands will be impacted by the Project, no Dakota skipper surveys would be needed. NDGF also raised potential concerns regarding the presence of sharp-tailed grouse and greater prairie chicken and recommended lek surveys. The agencies and Flickertail also discussed potential approaches to post-construction monitoring. NDGF also asked whether Flickertail was pursuing voluntary offsets for impacts on unbroken grassland and wetlands.

8.11.8.4 March 2024 NDGF Correspondence and Meeting

Through emails in March 2024, Flickertail and NDGF discussed the sharp-tailed grouse survey protocols. NDGF recommended a survey protocol that included buffering the grass (both planted and native, as both are suitable nesting habitat) by 1 mile and surveying that area within the Project boundary. The NDGF indicated that it is likely that any leks in the area would be captured in that effort. NDGF provided the *Key Wind Energy Development in North Dakota, Best Management Practices* (NDGF, 2021b); Appendix D: Recommended Wildlife Survey Methods outlines grouse survey protocols.

On March 27, 2024, Tetra Tech (on behalf of Flickertail) and the NDGF held a virtual meeting to discuss lek survey protocols. The NDGF requested a lek survey be completed within 1 mile of grasslands/hay fields in the Project Area and provided specific recommended listening points for the survey.

8.11.8.5 July 2024 USFWS and NDGF Correspondence

On July 9, 2024, Tetra Tech provided the completed lek survey to the NDGF and requested confirmation that NDGF was not requesting any other pre-construction wildlife surveys for the Project.

On July 15, 2024, Tetra Tech provided USFWS with the lek survey, the IPaC results from September 26, 2023, and the northern long-eared bat Determination Key dated September 26, 2023. Tetra Tech also requested confirmation that USFWS was not requesting any other pre-construction wildlife surveys for the Project. On July 18, 2024, the USFWS confirmed receipt of this email and indicated that a response would be provided.

8.11.8.6 September 2024 USFWS Correspondence

On September 6, 2024, the USFWS responded to Tetra Tech's July 15, 2024, request and indicated that the agency is not requesting any other pre-construction surveys at this time. The USFWS indicated that the northern long-eared determination key was in the process of being updated, and depending on the Project construction timeline, the Project may need to rerun the northern long-eared bat determination key when released. However, the USFWS also noted that they do not foresee a change to the effect determination it produced for this specific Project already. The USFWS also noted that the western regal fritillary, as proposed, threatened with a Section 4(d) rule and that a grassland quality assessment may be helpful with the future listing of the western regal fritillary. Lastly, the USFWS encouraged the Project to use the North Dakota determination key to see an effect determination regarding the Dakota skipper and Western Prairie Fringed Orchid.

On September 6, 2024, Tetra Tech responded via email to the USFWS regarding grassland quality in the Project Area. Tetra Tech indicated that a natural resource inventory was conducted in June 2024 to document the extent and dominant species composition of non-cultivated lands in the Project Area. The inventory noted that many grassland areas were dominated by Kentucky bluegrass, Canada bluegrass, smooth brome, quack grass, and foxtail. We would consider these species characteristic of a highly manipulated grassland.

8.11.8.7 September 2024 NDGF Correspondence

On September 5, 2024, Tetra Tech requested NDGF records on known eagle nest locations within 2 miles of the Project Area. On September 12, 2024, Tetra Tech received information from the NDGF that no known eagle nests have been identified within 2 miles of the Project Area. The closest known eagle nest was for a bald eagle and is more than 3 miles from the Project Area.

8.11.9 North Dakota Geological Survey

In an email on October 25, 2023, NDGS recommended site-specific geotechnical engineering and materials testing consistent with the current standard of care for similar construction projects in the Red River Valley, given the scope and extent of this Project. Flickertail will complete a geotechnical survey, and the results will be incorporated into the Project design.

8.11.10 North Dakota Parks and Recreation Department

In a letter dated November 16, 2023, NDPRD indicated that the Project does not appear to affect properties protected under Section 6(f) of the LWCF. Additionally, NDPRD indicated that no known plant and animal species of concern or significant ecological communities are documented within or immediately adjacent to the Project.

8.11.11 North Dakota Soil Conservation Committee

In an email dated December 11, 2023, the NDSCC indicated interest in having a Project representative attend an NDSCC board meeting to provide an overview of the Project and answer any questions. Flickertail agreed to attend, as requested. On January 18, 2024, Flickertail provided information regarding the Project in advance of the scheduled January 2024 meeting. Upon receipt of the information, on January 22, 2024, the NDSCC notified Flickertail that attendance at the meeting was no longer necessary. The NDSCC stated it was pleased to see that the Project was coordinating with the local weed management board, Richland County Board of Commissioners, NRCS office, and Richland County SCD.

8.11.12 State Historical Society of North Dakota

In a letter dated November 22, 2023, the SHSND recommended completing a Class I literature review and a Class III survey of areas that would be disturbed by Project construction activities. Flickertail completed a Class I literature review and Class III survey of the Project Area. These results were submitted to the SHSND on September 17, 2024.

8.11.13 Richland County Soil Conservation District

In an email on June 17, 2024, the Richland County Soil Conservation District indicated that the Project Area is in a very high salt area, which should be considered when planning the seed mix. The District also provided recommendations regarding potential appropriate seed mixes and comments regarding noxious weed control.

The Project developed a vegetation management plan (Appendix K) based on guidance provided by the Richland County Soil Conservation District and will seek approval from the agency on this plan, which contains weed control measures consistent with the provided recommendations. On September 27, 2024, Flickertail submitted the vegetation management plan to the Richland County Soil Conservation District for comment. On September 27, the Richland County Soil Conservation District provided suggestions regarding seed mix composition and species from the USDA-NRCS. The recommendations were incorporated into an updated vegetation management plan, and the updated plan was provided to the Richland County Soil Conservation District on October 7, 2024.

8.11.14 Richland County Weed Board

On November 20, 2023, Project staff discussed the Richland County Weed Board's concerns and the Project's request for their review and input into the vegetation management plan. The Richland County Weed Board indicated that their biggest concern was leafy spurge in the area. On September 27, 2024, Flickertail submitted the vegetation management plan to the Richland County Weed Board for comment. Based on the recommendations provided by the USDA-NRCS and Richland County Soil Conservation District on September 27, 2024, the vegetation management plan was revised. The revised vegetation management plan was submitted to the Richland County Weed Board on October 7, 2024.

9.0 QUALIFICATIONS OF CONTRIBUTORS TO SITING STUDY

Christina Martens—Director of Permitting & Environmental, Savion

Ms. Martens is a Michigan licensed landscape architect (PLA) with expertise in planning and local regulations, zoning ordinances, and local and state permitting. Her experience includes permitting and review of renewable energy, transmission, and other energy-related projects. Ms. Martens' background includes large-scale projects ranging from planning to zoning and permitting. She manages projects based on the client's desired outcomes and the municipalities' regulations. Ms. Martens is also experienced in the conceptual, site plan, and landscape plan design and Michigan Department of Environment, Great Lakes and Energy (EGLE) wetland permitting. She has successfully permitted multiple utility-scale wind and solar projects throughout the Midwest region. The projects have involved local township conditional or special use permit approvals, local county approvals, and several state permits. In addition to the use permits, Ms. Martens has assisted with wetland permits, preliminary site plans, and landscape screening plans. She has a B.A. in Landscape Architecture from Michigan State University with a minor in Environmental Studies. Ms. Martens has worked as the Director of Permitting & Environmental at Savion for the past two years, focusing on the northern mid-west solar projects, including Flickertail.

Nick Schuler—Development Director, Savion

Mr. Schuler manages the company's existing solar portfolio projects and helps identify new projects for development. His responsibilities include land origination and control, identifying and evaluating strategic sites for possible development, initiating and facilitating generation interconnection activities, managing subcontractor relationships during project development, overseeing project technical design through the transmission and interconnection application processes, and exploring the market for acquisition and sale opportunities. Nick has a bachelor's degree in energy management from the University of Oklahoma.

Lindsey Weisman—Project Engineer, Savion

Lindsey supports the engineering design and layouts of solar facilities. Her role includes reviewing and incorporating technical details such as geotechnical investigations, hydrology studies, and equipment selection into the design, creating early-stage layouts, assisting with highly detailed design packages, and coordinating with other team members to ensure all engineering requirements are met. She has a bachelor's degree in mechanical engineering from the University of Dayton.

Mollie Smith—Attorney, Fredrikson & Byron, P.A.

Ms. Smith assists clients with wind farm, solar, pipeline, and transmission line permitting matters in North Dakota, South Dakota, and Minnesota. At the state level, Mollie represents clients in certificate of corridor compatibility, route permit, certificate of site compatibility, and rulemaking proceedings before the PSC; energy facility permit proceedings before the South Dakota Public Utilities Commission; and certificate of need, route permit, and site permit proceedings before the Minnesota Public Utilities Commission. At the local level, Mollie advises and assists clients with a variety of permitting-related matters, including obtaining conditional use/special exception permits, variances and subdivision approvals, and participating in zoning ordinance amendment processes. Mollie has a Bachelor of Arts in English from Northern State University, Aberdeen, SD; a Master of Arts in Literature from Colorado State University, Fort Collins, CO; and a Juris Doctor from the University of Minnesota Law School, Minneapolis, MN.

Bridget Duffus—Attorney, Fredrikson & Byron, P.A.

Ms. Duffus assists clients with wind farm, solar farm, transmission line, and pipeline permitting matters in North Dakota, South Dakota, and Minnesota. At the state level, Bridget represents clients in certificate of corridor compatibility, route permit, and certificate of site compatibility proceedings before the North Dakota Public Service Commission and certificate of need, route permit, and site permit proceedings before the Minnesota Public Utilities Commission. At the local level, Bridget advises and assists clients with a variety of permitting-related matters, including obtaining conditional use permits and variances. Bridget has a BA in Psychology from the University of St. Thomas, St. Paul, MN, and a JD from the University of St. Thomas School of Law, Minneapolis, MN.

Adam Holven—Project Manager and Principal Investigator for Archaeology, Tetra Tech, Inc.

Mr. Holven has 17 years of experience assisting clients with environmental surveys and permitting support for utility-scale solar and wind projects, telecommunications projects, transmission line projects, and pipeline projects in the Midwest, the Upper Midwest, and the Northern Plains. As a Project Manager, he oversees cultural resources, biological and environmental due diligence, and wetlands and waters investigations and often works closely with clients and regulators. As a Principal Investigator for Archaeology, Mr. Holven has extensive experience conducting Class I and Class III Cultural Resource Investigators in North Dakota, many of which were completed in support of certificates of site compatibility. He has a B.S. in Geology and a B.A. in Anthropology from the University of Northern Iowa, Cedar Falls, Iowa, and an M.A. in Anthropology from Iowa State University, Ames, Iowa.

Kathy Bellrichard—Senior Wetland Biologist, Tetra Tech, Inc.

Ms. Bellrichard has a diverse background in the environmental field with a focus on wetland delineation and permitting, and National Environmental Policy Act (NEPA) projects. She is an experienced wetland delineator and has completed wetland surveys and delineations in Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin. She is experienced with wetland permitting processes, including those with the USACE, USFWS, Indiana Department of Environmental Management (IDEM), Minnesota Department of Natural Resources (DNR), and Minnesota Board of Water Resources (BWSR) Wetland Conservation Act (WCA), including consultation with administering Local Government Units (LGUs). USACE permitting activities include self-certified NWP review, pre-construction notification (PCN) preparation, preliminary and approved jurisdictional determination (PJD/AJD) applications, and form preparation. Ms. Bellrichard has a B.S. in Environment and Natural Resources from the University of Minnesota, Twin Cities.

Kimberely Gorman—Senior Biologist, Tetra Tech, Inc.

Ms. Gorman is a technical expert and regulatory strategist with over 27 years of professional consulting experience in the natural resource and environmental fields. She has extensive project management experience in renewable energy projects, focusing on permitting, environmental assessment, and planning. Project experience highlights include National Environmental Policy Act (NEPA) analysis and compliance with various lead and cooperating agencies and renewable energy projects, including wind, solar, and battery energy storage, green hydrogen, and electrical transmission line projects. Ms. Gorman manages state and federal wildlife compliance through assessment of project risk to wildlife, management of field surveys, consultation with regulatory agencies, development of avoidance and minimization strategies, and coordination of incidental take permits as needed. Ms. Gorman's client and regulatory agency liaison skills are highly valued at Tetra Tech and have been integral to the successful completion of many projects. She has a B.S. in Biology and a Masters of Geographic Information Systems from the University of Minnesota.

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