Appendix H
Updated Bird and Bat Conservation Strategy

Badger Wind, LLC
February 2024

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Bird and Bat Conservation Strategy
Badger Wind Project
Logan and McIntosh Counties, North Dakota



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TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS vi
1.0 INTRODUCTION 1
1.1 Background 1
1.2 Goals and Objectives 1
1.3 Corporate Policy on Wildlife Conservation 3
1.4 Regulatory Framework 3
1.4.1 Endangered Species Act 4
1.4.2 Bald and Golden Eagle Protection Act 4
1.4.3 Migratory Bird Treaty Act 4
1.4.4 North Dakota Century Code Chapter 20.1-04 5
1.4.5 North Dakota's State Wildlife Action Plan 5
1.4.6 Agency Coordination 6
2.0 PROJECT DESCRIPTION 14
2.1 Facility Description 14
2.2 Environmental Setting and Habitat 14
3.0 DESCRIPTION OF WEG TIERED APPROACH 20
4.0 TIERS 1 AND 2 – PRELIMINARY SITE EVALUATION AND SITE CHARACTERIZATION 22
4.1 Questions and Responses 23
4.1.1 Federally Protected Species Accounts 28
4.1.2 Birds of Conservation Concern 35
4.1.3 North Dakota Species of Conservation Priority 35
4.1.4 Designated Critical Habitat and Habitat for Species of Concern 36
4.1.5 Cave and Tree-roosting Migratory Bats 40
4.1.6 Nesting and Migratory Raptors 41
4.1.7 Breeding and Migratory Birds 42
4.2 Tiers 1 and 2 Decision Point 43
5.0 TIER 3 – FIELD STUDIES TO DOCUMENT SITE WILDLIFE AND HABITAT AND PREDICT PROJECT IMPACTS 44
5.1 Birds 45
5.1.1 Eagle Use and Avian Point Count Surveys 45
5.1.2 Bald Eagle and Raptor Nest Surveys 48
5.1.3 Sharp-tailed Grouse Lek Surveys 51
5.2 Bats 53
5.2.1 Bat Acoustic Surveys 53
5.3 Habitat Assessments and Wetland and Waterbody Assessments 56
5.3.1 2021 Grassland Habitat Assessment 56
5.3.2 2023 Grassland Habitat Assessment 56

5.3.3 Aquatic Resources Inventory 2020 and 2021 58
5.3.4 Aquatic Resources Inventory 2022 58
5.3.5 Wetlands and Waterboy Assessment 2023 58
5.4 Questions and Responses....60
5.4.1 ESA-Listed Avian Species 65
5.4.2 BGEPA Species 66
5.4.3 North Dakota Avian Species of Conservation Priority 67
5.4.4 ESA Listed Bat Species....73
5.4.5 North Dakota Bat Species of Conservation Priority....73
5.5 Tier 3 Decision Point 75
6.0 FACILITY DESIGN TO REDUCE WILDLIFE CONFLICT 80
6.1 Project Facilities Design and Consideration....80
6.1.1 Turbine Locations and Design 80
6.1.2 Facilities 80
6.1.3 Lighting....81
6.2 Measures to Offset and/or Compensate for Habitat-related Impacts....81
6.3 Specific Avoidance Measures....81
6.3.1 Electrocution....82
6.3.2 Collision....82
6.3.3 Habitat Loss 82
6.3.4 Tree Removal....83
6.3.5 Construction Measures....83
6.3.6 Construction/Operational Measures....84
6.4 Bird and Bat Conservation Strategy....85
7.0 TIER 4 – POST-CONSTRUCTION STUDIES TO ESTIMATE IMPACTS....85
7.1 Monitoring Methods 85
7.2 Reporting Mechanisms....86
7.3 Adaptive Management....86
8.0 IMPLEMENTATION OF THE BADGER WIND PROJECT BBCS 88
8.1 Document Availability 88
8.2 Reporting....89
9.0 MITIGATION AND CONSERVATION DURING DECOMMISSING....89
10.0 REFERENCES....90

LIST OF TABLES

Table 1.1. Agency consultation history for the Badger Wind Project, Logan and McIntosh counties, North Dakota. 7

Table 4.1. Federal and State-listed Species or Special Status Species with potential to occur in the Badger Wind Project, Logan and McIntosh counties, North Dakota. 24

Table 4.2. Species of Habitat Fragmentation Concern in Logan and McIntosh counties, North Dakota, and their potential to occur within the Badger Wind Project. 40

Table 5.1. Avian, bat, and habitat monitoring and survey efforts conducted for the Badger Wind Project, Logan and McIntosh counties, North Dakota. 45

Table 5.2. Seasonal occurrence of Species of Concern detected during Tier 3 field surveys (2019 – 2021). 62

Table 5.3. Wind Energy Guidelines Tier 3 Decision Analysis per Ecological Constraint. 76

Table 7.1. Example triggers and responses in the Badger Wind Project Adaptive Management Strategy 88

LIST OF FIGURES

Figure 1.1. Location of the Badger Wind Project in Logan and McIntosh counties, North Dakota. 2

Figure 2.1. Land cover types within the Badger Wind Project in Logan and McIntosh counties, North Dakota. 16

Figure 2.2. Federally administered and state-managed lands within Badger Wind Project in Logan and McIntosh counties, North Dakota. 17

Figure 2.3. National Wetlands Inventory (NWI) wetland types within the Badger Wind Project in Logan and McIntosh counties, North Dakota. 18

Figure 2.4. National Hydrography Dataset (NHD) waterbodies and flowlines within the Badger Wind Project in Logan and McIntosh counties, North Dakota. 19

Figure 4.1. Piping plover critical habitat near the Badger Wind Project in Logan and McIntosh counties, North Dakota. 30

Figure 4.2. Location of the Badger Wind Project in Logan and McIntosh Counties, North Dakota within the whooping crane migration corridor. 32

Figure 4.3. Whooping crane observations and telemetry locations relative to the Badger Wind Project in Logan and McIntosh counties, North Dakota. 33

Figure 5.1. Location of fixed-point avian use survey locations and associated 800-meter radius plots for avian use surveys completed from May 2019 – April 2021 and August 2023 – Present at the Badger Wind Project in Logan and McIntosh counties, North Dakota. 47

Figure 5.2. Raptor nest locations for surveys conducted in 2019 within the Badger Wind Project in Logan and McIntosh counties, North Dakota and a 10-mile buffer. 49

Figure 5.3. Raptor nest locations for surveys conducted in 2020 within the Badger Wind Project in Logan and McIntosh counties, North Dakota and a 10-mile buffer. 50

Figure 5.4. Sharp-tailed grouse lek locations surveyed in 2019 and 2020 at the Badger Wind Project in Logan and McIntosh counties, North Dakota. 52

Figure 5.5. Bat resources within the Badger Wind Project in Logan and McIntosh counties, North Dakota. 55

Figure 5.6. Results of the desktop review and field assessment of potential grassland habitat within the 2021 and 2023 Grassland Survey Areas of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021 and August 17 – 18, 2023....57

Figure 5.7. Aquatic Resources Inventory and Wetlands and Waterbody Assessment results for surveys completed in 2020, 2021, 2022, and 2023 at the Badger Wind Project in Logan and McIntosh counties, North Dakota....59

LIST OF APPENDICES

Appendix A. 2019, 2022, 2023, and 2024 IPaC Analyses for the Badger Wind Project, Logan and McIntosh Counties, North Dakota

Appendix B. Selected Tier 2 and 3 Bird and Bat Study Reports for the Badger Wind Project, Logan and McIntosh Counties, North Dakota

Appendix C. Key Contacts

ACRONYMS AND ABBREVIATIONS

ADLS	Aircraft Detection Lighting System
AKN	Avian Knowledge Network
AWP	Aransas/Wood Buffalo Population (whooping cranes)
APLIC	Avian Power-Line Interaction Committee
AQI	aquatic Resource Inventory
AWWI	American Wind Wildlife Institute
Badger Wind	Badger Wind, LLC
BBCS	Bird and Bat Conservation Strategy
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
CFR	Code of Federal Regulations
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
DST	Local Siting Decision Support Tool
ECPG	Eagle Conservation Plan Guidance
ESA	Endangered Species Act
EVT	Existing Vegetation Type
FAA	Federal Aviation Administration
GenEst	Generalized Mortality Estimator
IBA	Important Bird Area
IPaC	Information for Planning and Consultation
Kaleidoscope	Kaleidoscope Pro 4.2.0
km	kilometer(s)
kV	kilovolt
m	meter
MBTA	Migratory Bird Treaty Act
MET tower	meteorological evaluation tower
MW	megawatt
NDGF	North Dakota Game and Fish Department
NHD	National Hydrography Dataset
NLEB	northern long-eared bat
NDDA	North Dakota Department of Agriculture
NWI	National Wetland Inventory
O&M	Operations and Maintenance
PAD-US	Protected Areas Database of the US
PCMM	post-construction mortality monitoring
PLOTS	Private Lands Open to Sportsmen
Project	Badger Wind Project
RSZ	rotor-swept zone
SCP	species of conservation priority
SOC	species of concern
SWAP	State Wildlife Action Plan
SPCC	Spill Prevention, Control, and Countermeasure
TES	threatened and endangered species
USC	US Code
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WEG	Wind Energy Guidelines
WEST.	Western EcoSystems Technology, Inc.
WMA	Wildlife Management Area
WNS	white-nose syndrome

WOTUS	waters of the US
WPA	Waterfowl Production Area
WTG	wind turbine generator

1.0 INTRODUCTION

1.1 Background

Badger Wind, LLC (Badger Wind) is proposing the development of the Badger Wind Project (Project) located in Logan and McIntosh counties, North Dakota (Figure 1.1). Consistent with the tiered approach presented in the US Fish and Wildlife Service (USFWS) *Land-Based Wind Energy Guidelines* (WEG; USFWS 2012) and the *Eagle Conservation Plan Guidance* (ECPG; USFWS 2013a), Badger Wind has completed iterative desktop assessments and field surveys to evaluate risk in coordination with the USFWS and North Dakota Game and Fish Department (NDGFD). Results from these studies and recommendations from USFWS and NDGFD have been used to inform development of appropriate impact avoidance, minimization, monitoring, and adaptive management measures for the Project, including development of this Bird and Bat Conservation Strategy (BBCS).

Badger Wind initiated Project development in 2019 within a larger assessment area (2019 Study Area) that included portions of Logan and McIntosh counties, North Dakota. This area was refined based on the results of the Tier 1, 2, and 3 surveys to focus within a smaller Project boundary in an effort to reduce impacts to flora and fauna (Figure 1.1). The current Project Boundary (35,226.6 acres [ac]) has been reduced in size from the 2019 Study Area; however, this smaller boundary is almost entirely within the larger 2019 Study Area boundary. A total of 92.7% of the current Project Boundary is within the 2019 Study Area boundary. Therefore, results from the studies discussed in the BBCS are representative of the current Project Boundary.

1.2 Goals and Objectives

The BBCS documents Badger Wind's compliance with relevant wildlife laws and regulations, adherence to the processes outlined in the WEG and ECPG for developing, constructing, and operating wind energy projects, and to explain the analyses, studies, and reasoning that support progressing from one tier to the next in the tiered approach presented in the WEG. The Tier 4 monitoring program proposed in this BBCS has been designed to evaluate risk conclusions along with an Adaptive Management Plan to respond to findings, if necessary. The BBCS also documents the measures to be implemented during siting, construction, and operations that avoid and minimize impacts to federal-listed species and to sensitive species and habitats in North Dakota. This BBCS follows USFWS Region 6 guidance for identifying and implanting actions to conserve birds and bats during project development, construction, operation and maintenance, and decommissioning phases of the Project (USFWS 2020a).
Project Boundary

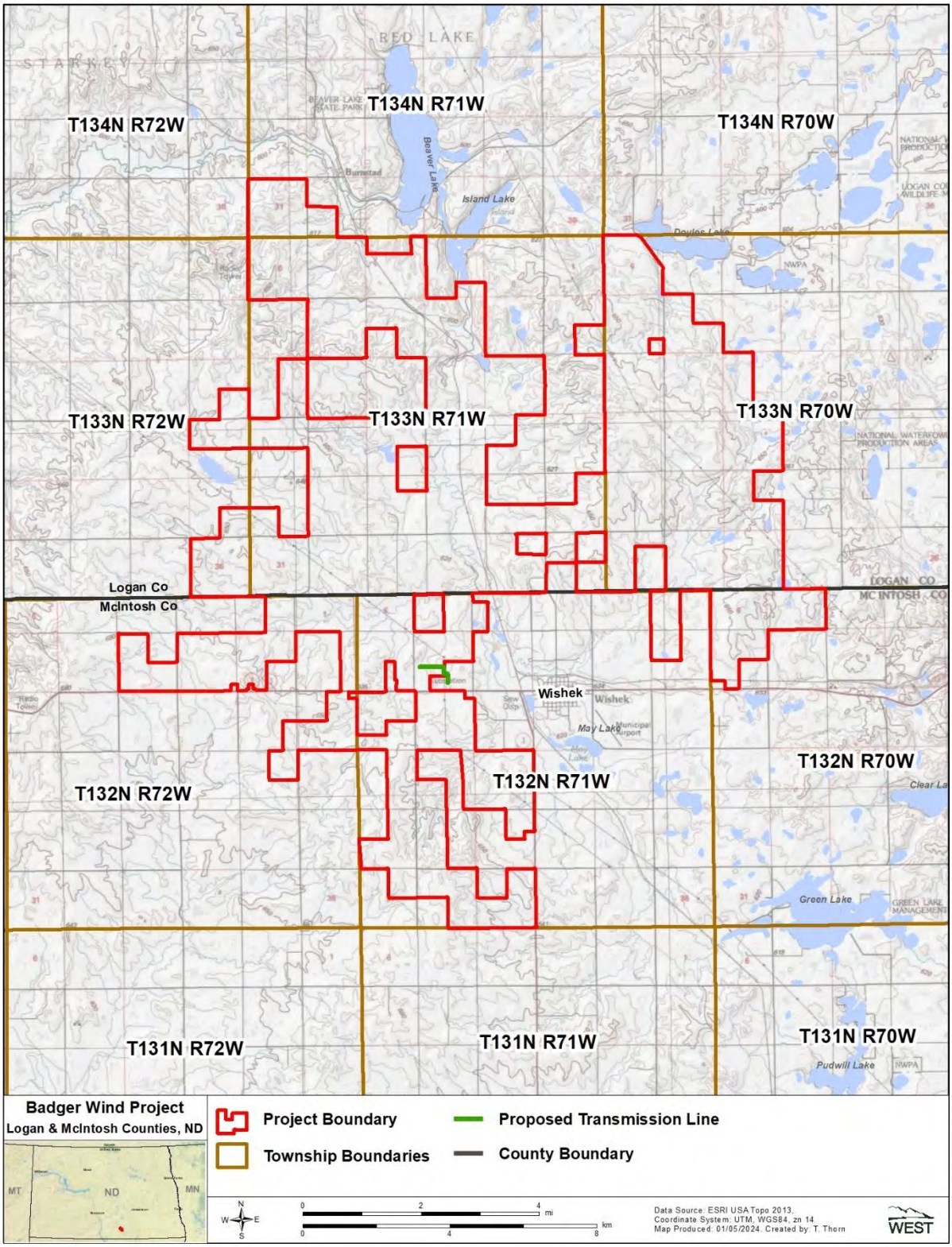


Figure 1.1. Location of the Badger Wind Project in Logan and McIntosh counties, North Dakota.

Badger Wind developed this BBCS to meet the following objectives:

1) Document coordination with federal and state agencies throughout the development of the Project;
2) Document results of the Project's desktop and field surveys and their progression through the WEG Tiers;
3) Assess potential impacts to birds and bats from the Project;
4) Identify measures that, when implemented during construction, operation, maintenance and operations, and decommissioning at the Project, will avoid and minimize potential impacts to birds and bats; and
5) Describe post-construction monitoring and adaptive management procedures.

This BBCS is a living document that will evolve throughout the life of the Project, as needed, in response to changing conditions. Additional information from avian and bat survey results, changes in our understanding of how birds and bats interact with wind turbines, or new minimization measures could be included in updated versions. This BBCS will cover the anticipated life of the Project and covers the development, construction, operation, and decommissioning phases of the Project. Should the Project be re-powered, the BBCS will remain in effect until decommissioning occurs.

1.3 Corporate Policy on Wildlife Conservation

Badger Wind has a strong commitment to protecting biodiversity, and its parent company, Ørsted, has set a goal of delivering a net-positive biodiversity impact from all new renewable energy projects it commissions beginning in 2030 at the latest. When developing new projects, Ørsted will systematically implement initiatives that ensure an overall net-positive contribution to natural ecosystems, habitats, and species in and around the company's new renewable energy projects. The core philosophy of the policy is prevention before mitigation wherever possible.

1.4 Regulatory Framework

This BBCS documents efforts by Badger Wind to comply with federal and state regulations including the Endangered Species Act (ESA) of 1973, Bald and Golden Eagle Protection Act (BGEPA) of 1940, and the Migratory Bird Treaty Act (MBTA) of 1918. North Dakota does not maintain a state-level list of threatened and endangered species. Therefore, only species listed under the ESA are considered threatened or endangered in the state. However, the North Dakota Game and Fish Department (NDGF) identifies and maintains a list of Species of Conservation Priority (SCP) within its State Wildlife Action Plan (SWAP; Dyke et al 2015). The USFWS specifically recommends that a wind energy developer "may prepare a Bird and Bat Conservation Strategy in stages, over time, as analysis and studies are undertaken for each tier" (USFWS 2012). Measures are incorporated into siting, design, and operation of the project in order to reduce or eliminate the potential for impacts to federal and state endangered and threatened species and bird and bat SOC. These measures are described in this BBCS.

1.4.1 Endangered Species Act

The ESA (1973) authorizes the USFWS (while working cooperatively with states) to identify, list, and monitor qualifying species as endangered and threatened. The process by which potential candidates are listed is determined by the vulnerability of the species population and considers a number of different factors. Species that are designated as either endangered or threatened are afforded protection from possession, sale, transport, and take. The definition of take is "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" including "incidental take" or significant habitat modification. Take, however, can be permitted by the USFWS through the ESA Section 7 consultation process among federal agencies or by individual permit under ESA Section 10(a)(1)(B) and an accompanying habitat conservation plan.

The USFWS is responsible for the protection and management of ESA-listed species, as protected under federal law. The USFWS Information for Planning and Consultation (IPaC) is an online resource that allows users to quickly search a comprehensive geo-referenced database to help assess the potential for ESA-listed endangered and threatened species (TES) to occur in an area (USFWS 2021a). The USFWS also has created a list of bird species that have the potential to become listed in the future without additional conservation actions (USFWS 2021b). Information on these species, referred to as Birds of Conservation Concern (BCC), is also included in IPaC reports. BCC species are not afforded any additional regulatory protection under the ESA.

1.4.2 Bald and Golden Eagle Protection Act

Under authority of BGEPA, 16 U.S. Code (USC) 668–668d, bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are afforded legal protections in addition to the MBTA. 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. In 16 USC 668c, the BGEPA also expands the common law scope of "take" to include "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb," and includes criminal and civil penalties for violating the statute (see 16 USC 668). The USFWS further defined the term "disturb" as agitating or bothering an eagle to a degree that causes, or is likely to cause, injury, a decrease in productivity, or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior.

If eagles are identified as a potential risk at a project site, wind energy developers are encouraged by the USFWS to follow the Eagle Conservation Plan Guidance (ECPG; USFWS 2013a). The ECPG describes recommended actions to develop wind energy projects while protecting eagles, including guidance for applicants seeking to obtain the above permits.

1.4.3 Migratory Bird Treaty Act

The MBTA integrates and implements four international treaties that provide for the protection of migratory birds against hunters and poachers. The MBTA prohibits the taking, killing, possession, transportation, import, and export of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior" (16 USC § 703; 1918). The word "take"

is defined by regulation as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 Code of Federal Regulations [CFR] § 10.12; 1973). The USFWS maintains a list of all species protected by the MBTA at 50 CFR § 10.13 (1973). This list includes over one thousand species of migratory birds, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and passerines. There currently is no permit available from the USFWS that authorizes take of migratory birds protected under the MBTA. However, the USFWS is currently evaluating proposed rulemaking that would include regulations that would authorize incidental take of migratory birds under certain prescribed conditions.

1.4.4 North Dakota Century Code Chapter 20.1-04

In accordance with North Dakota Century Code Chapter 20.1-04, no person, without a permit, "shall kill, catch, take, ship, cause to be shipped, purchase, offer, or expose for sale, sell, or have in that person's possession or under that person's control, any harmless wild bird, or any part thereof". Harmless wild birds are defined as all wild birds except blackbirds, magpies, English sparrows, and starlings. Similarly, "no person may hunt, take, kill, posses, convey, ship, or cause to be shipped, by common or private carrier, sell, or barter any game bird or any part thereof…except as provided by this title". Game birds include all varieties of geese, brant, swans, ducks, plovers, snipes, woodcocks, grouse, sagehens, pheasants, Hungarian partridges, quails, partridges, cranes, rails, coots, wild turkeys, mourning doves, and crows.

1.4.5 North Dakota's State Wildlife Action Plan

The SWAP is the principal document for safeguarding rare and declining species of fish and wildlife within the state (Dyke et al. 2015). The SWAP places an emphasis on the protection of diverse native habitats to maximize the preservation of native wildlife diversity. In addition, the SWAP denoted 115 species that are assigned to one of three conservation priority levels based on their risk level and the species-specific sources and availability of conservation funding. The SWAP defines SCP conservation levels as follows (Dyke et al. 2015):

> Level I species are those having a high level of conservation priority because of declining status in North Dakota or across their range; or have a high rate of occurrence in North Dakota, constituting the core of the species breeding range, but may be at risk range wide.
>
> Level II species are those having a moderate level of conservation priority; or a high level of conservation priority but a substantial level of non-state wildlife grant funding is available to them.
>
> Level III species are those having a moderate level of conservation priority but are believed to be peripheral or non-breeding in North Dakota.

It is understood that the SWAP has no regulatory authority over industrial development on private land. Conservation actions in the SWAP for such development include goals to foster/develop entities to administer conservation easements and to urge ecologically responsible ordinances

and suitable reclamation standards. Should project development impact SCP on private land, the SWAP will be consulted for possible mitigation actions to reduce or minimize those impacts.

1.4.6 Agency Coordination

Badger Wind has coordinated with the USFWS and NDGF during development of the Project. Periodic coordination with the wildlife agencies has continued, particularly through the process of assessing and analyzing bird and bat data collected. Coordination has included emails, conference calls, and meetings to discuss study plans and preliminary results from studies, as well as to request data from the agencies. Badger Wind has also requested that USFWS and NDGF provide recommendations to minimize potential impacts to SOC for consideration by Badger Wind. Table 1 includes a timeline of communications and coordination with federal and state wildlife agencies. Badger Wind intends to continue to coordinate with USFWS and NDGF during the development and implementation of this BBCS.

Table 1.1. Agency consultation history for the Badger Wind Project, Logan and McIntosh counties, North Dakota.

Date	Parties Involved	Correspondence Type	Correspondence Content
January 10, 2020	USFWS: Michael Erickson Atwell: Chris McCreedy	Email	Request for grassland and wetlands easements data.
January 14, 2020	USFWS: Michael Erickson Atwell: Chris McCreedy	Email	Response to request for grassland and wetlands easements data.
January 21, 2020	USFWS: Michael Erickson Atwell: Chris McCreedy	Email	Answers to follow-up questions, including how to get shapefile and KMZ spatial data of easements.
January 28, 2020	USFWS: Drew Becker, Heidi Riddle NDGF: Steve Dyke, Elisha Mueller, Sandra Johnson, Kevin Kading, Renae Schultz Ørsted: Jon Baker Atwell: Emily Cooper, Chris McCreedy	Meeting	Agency project introduction meeting—included summary of studies completed to date.
February 12–18, 2020	NDGF: Sandra Johnson Atwell: Chris McCreedy	Email	Request to discuss available data layers NDGF has developed to inform analysis for the Project and to establish a data-sharing agreement. S. Johnson requested shapefiles of the latest project boundary. C. McCreedy sent the shapefiles and set up a follow-up meeting to discuss the shapefiles.
February 25–27, 2020	NDGF: Sandra Johnson Atwell: Chris McCreedy	Email	S. Johnson provided the data-sharing agreement, along with data for sharp-tailed grouse, native grassland, whooping crane, and bald eagle nests, as well as manuscripts to inform impact assessment and recommendations for offsets. C. McCreedy responded confirming the one bald eagle nest in the Project Boundary was the one Atwell identified. C. McCreedy also provided coordinates for that nest, as well as four ferruginous hawk nest locations.

Date	Parties Involved	Correspondence Type	Correspondence Content
February 25–26, 2020	USFWS: Heidi Riddle, NDGF: Elisha Mueller, Kevin Kading, Renae Schultz Ørsted: Jon Baker Atwell: Emily Cooper, Chris McCreedy	Email	C. McCreedy requested final comments on the draft minutes from the January 28 meeting. E. Mueller recommended that developers perform lek surveys and requested that the meeting minutes reflect that recommendation.
March 11–20, 2020	NDGF: Elisha Mueller, Sandra Johnson Atwell: Chris McCreedy	Email	C. McCreedy inquired about the availability of the grassland habitat tool. E. Mueller confirmed NDGF had just received that data and will follow up when they determine how they may be able to share it. In another follow-up, E. Mueller indicated there was a delay due to staff working remotely, but Sandra would be in touch when the data can be shared.
March 12, 2020	NDGF: Sandra Johnson Atwell: Chris McCreedy	Email	Follow-up response to agency meeting requesting to create a data-sharing agreement with the agency to obtain North Dakota grassland habitat decision support tool.
April 3, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller Atwell: Emily Cooper, Chris McCreedy	Meeting	Agency meeting regarding aerial survey safety precautions. Given (a) health concerns regarding the COVID-19 virus and (b) safety concerns stemming from recent incidents during nesting raptor surveys at wind facilities in nearby states. Atwell inquired whether a hybrid aerial survey and ground-based survey approach could meet the goals and expectations for Year 2 pre-construction raptor nest and lek surveys. USFWS and NDGF indicated their acceptance of a hybrid survey approach, with a scaled-back aerial survey focusing on areas within the 2019 Study Area that lack roads and cannot be easily accessed during ground-based survey.
April 22, 2020	USFWS: Heidi Riddle Atwell: Chris McCreedy	Phone Call	Discussion of whooping crane sightings near Wishek.

Date	Parties Involved	Correspondence Type	Correspondence Content
May 15, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller Atwell: Aaron McAlexander	Email	Provided draft bat habitat assessment and Year 1 acoustic monitoring results for review and comment. Recommendation is that summer potential for northern long-eared bats may be limited within the Project Boundary. Requested input on whether the Project should be concerned with impacts to bats, particularly northern long-eared bats, and whether the agencies feel summer presence/probable absence (p/a) surveys (in accordance with the 2020 Range-Wide Indiana Bat Survey Guidelines) are warranted.
May 22, 2020	USFWS: Heidi Riddle Atwell: Aaron McAlexander	Email	Follow-up to May 15, 2021, email.
May 27, 2020	USFWS: Heidi Riddle, Michael Erickson Ørsted: Jon Baker Atwell: Emily Cooper, Tara Corbett	Meeting	Discussion of USFWS wetland easements in Badger Project Boundary.
October 28, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller Atwell: Chris McCreedy	Email	Submitted initial Grasslands Report to agency. Request to schedule meeting to provide update on Project and discuss findings for avian studies and grassland assessment.
October 28, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller, Sandra Johnson, Steve Dyke, Greg Link Atwell: Chris McCreedy	Email	Response to receipt of report and how the contents relate to regulatory guidance and prior January 28, 2020 meeting.
October 30, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller, Sandra Johnson, Steve Dyke, Greg Link Atwell: Chris McCreedy, Maureen O'Shea-Stone	Email (2)	1) NDGF response to grassland assessment, noting specific definition of unbroken grasslands are grasslands that have not been plowed. Presence of haying, grazing, or undesirable species do not indicate disturbance. NDGF noted they… "*are discouraging efforts to try to classify "high quality" or "native" grassland as not worthwhile, and are focusing instead on the unbroken classification as the conservation priority."* 2) NDGF provided contact information for Chuck Loesch, USFWS HAPET and recommendation he would be best contact for moving forward with a wetland/waterfowl impact analysis using the Local Siting Decision Support Tool (DST).

Date	Parties Involved	Correspondence Type	Correspondence Content
October 30, 2020	NDGF: Elisha Mueller Atwell: Maureen O'Shea-Stone, Chris McCreedy	Meeting	Phone meeting to discuss E. Mueller's comments on the draft grassland report. E. Mueller provided contact information (Chuck Loesch, USFWS HAPET) for moving forward with wetland/waterfowl impact analysis; C. Loesch should be able to provide the Local Siting DST.
November 2–6, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller, Steve Dyke, Greg Link, Sandra Johnson Atwell: Tara Corbett, Chris McCreedy, Maureen O'Shea-Stone, Emily Cooper,	Email	E. Mueller responded to M. O'Shea-Stone's email with some edits to her list of understanding points/action items and then asked S. Johnson to add anything she missed. S. Johnson responded and said that she will send the base raster layer for native prairie (unbroken grassland) and attached an email she sent C. McCreedy in February 2020. Revisions to notes re: understanding points and action items were finalized based on E. Mueller's requests.
November 6, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller, Sandra Johnson, Steve Dyke, Greg Link Atwell: Chris McCreedy, Tara Corbett, Maureen O'Shea-Stone	Email	Response to November 2, 2020, email from E. Mueller. Email outlines list of further understanding points from conversations and action items to complete to address issue.
December 8, 2020	USFWS: Heidi Riddle, Drew Becker NDGF: Elisha Mueller, Sandra Johnson, Steve Dyke, Greg Link Ørsted: Sam Lodge, Jon Baker, Nick Lindsey Atwell: Chris McCreedy, Tara Corbett, Maureen O'Shea-Stone	Meeting	Meeting to provide a project update and grassland discussion.
January 15, 2021	NDGF: Elisha Mueller Atwell: Maureen O'Shea-Stone	Phone Call	Discussion of native grassland impacts and voluntary offsets.
January 19, 2021	NDGF: Elisha Mueller Atwell: Maureen O'Shea-Stone	Email	Draft guidance regarding wetland and grassland mitigation.
February 2, 2021	USFWS: Heidi Riddle Atwell: Chris McCreedy	Email	USFWS response to Project, including recommended guidance and required compliance for development of Badger Wind Project.

Date	Parties Involved	Correspondence Type	Correspondence Content
May 20–25, 2021	USFWS: Heidi Riddle NDGF: Sandra Johnson, Elisha Mueller Atwell: Chris McCreedy	Email	Guidance regarding raptor nest buffers and removal.
August 9, 2021	USFWS: Heidi Riddle NDGF: Elisha Mueller Ørsted: Charlie Smith, Francesca Martella, Sarah Aftergood Atwell: Maureen O'Shea-Stone, Tara Corbett, Chris McCreedy	Meeting	Project update meeting.
September 1, 2021	USFWS: Heidi Riddle NDGF: Elisha Mueller Ørsted: Francesca Martella, Charlie Smith, June Marie Gray, Sarah Aftergood Atwell: Christopher Rutledge, Maureen O'Shea-Stone	Phone Call	Informal project update meeting.
September 20, 2021	USFWS: Heidi Riddle NDGF: Elisha Mueller Ørsted: Francesca Martella, Claire Dittrich, Sarah Aftergood WEST: Kurt Smith, Martin Piorkowski Atwell: Christopher Rutledge, Maureen O'Shea-Stone, Tanya Johnson	Meeting	Meeting to discuss grassland assessment, avian species impact analysis, and sharp-tailed grouse leks.

Date	Parties Involved	Correspondence Type	Correspondence Content
December 8, 2021	USFWS: Heidi Riddle NDGF: Elisha Mueller Ørsted: Francesca Martella, June Marie Grey, Lucas Buseck, Sarah Aftergood WEST: Kurt Smith, Martin Piorkowski Atwell: Christopher Rutledge, Tanya Johnson, Caitlin Cyrus, Alan Plumeau Frederickson: Mollie Smith, Bridget Duffus	Meeting	Project update meeting. Ørsted presented the preliminary project layouts, working through how they have been sited to address USFWS and NDGF concerns. Western Ecosystems Technology, Inc. (WEST) presented results of Year 2 grassland habitat surveys and sharp-tailed grouse lek surveys. The remainder of the meeting focused on discussions relating to how to address impacts and potential mitigation measures. The USFWS and NDGF pointed Ørsted toward the Shaffer and Loesch models for calculating offsets to grassland birds and waterfowl.
June 27, 2022	USFWS: Drew Becker NDGF: Greg Link NDPSC: Steven Kahl Ørsted: Sarah Aftergood	Letter	Letter providing comments on BBCS
June 29, 2023	NDGF: Elisha Mueller; Bruce Kreft Ørsted: Mark Crowl, Andrew Krieger, Dr. Chris Farmer WEST: Kristen Chodachek, Martin Piorkowski	Meeting	Project update meeting. Ørsted introduced new Project team, overview of Project and what has been done to date with a focus on the proposed expansion area. Reviewed previous survey efforts, preliminary plan moving forward for the updated layout, and additional planned studies. The remainder of the meeting focused on discussions relating to how to address impacts and potential mitigation measures. The NDGF pointed Ørsted toward the Shaffer and Loesch models for calculating offsets to grassland birds and waterfowl.
August 15, 2023	USFWS: Heidi Riddle NDGF: Elisha Mueller; Bruce Kreft Ørsted: Nick Gebauer, Mark Crowl, Ellen Crivella, Carl Poole, Andrew Krieger, Dr. Chris Farmer WEST: Kristen Chodachek, Martin Piorkowski	Meeting	Project update meeting. Ørsted introduced new Project team, overview of Project and what has been done to date with a focus on the proposed expansion area. Reviewed previous survey efforts, preliminary plan moving forward for the updated layout, and additional planned studies. The remainder of the meeting focused on discussions relating to how to address impacts and potential mitigation measures.

Date	Parties Involved	Correspondence Type	Correspondence Content
August 16, 2023	USFWS IPaC Orsted	Letter	USFWS provided an official list of threatened and endangered species that may occur in the Project or may be affected by the proposed Project
January 30, 2024	USFWS: Heidi Riddle NDGF: Elisha Mueller; Bruce Kreft, Greg Link Ørsted: Andrew Krieger, Mark Crowl, Amanda Coletti, Dr. Chris Farmer WEST: Kristen Chodachek, Clayton Derby NDDA: Adam Miller, Joseph Bialke	Meeting	Orsted reviewed findings of 2023 surveys with the agencies and presented calculated indirect impact acreages for grasslands and wetlands. Discussion with the agencies focused on offset commitments and MOU as well as revisions to the Project BBCS. Orsted will provide relevant reports to the agencies for review, including BBCS and Whooping Crane Contingency Plan.

2.0 PROJECT DESCRIPTION

2.1 Facility Description

The Project Boundary spans approximately 35,227 ac within Red Lake Township and three unorganized townships (T133N R70W, T133N R71W, and T133N R72W) in Logan County, North Dakota, and four unorganized townships (T132N R70W, T132N R71W, T132N R72W, and T131N R72W) in McIntosh County, North Dakota (Figure 1.1).

The Project has proposed an installed nameplate capacity up to 262.26-megawatts (MW), consisting of up to 103 wind turbine generator (WTG) locations, including 93 primary and 10 alternate WTG locations. One, a 0.75-mile (mi)-long transmission line will extend east and south from the central portion of the Project Boundary (2.0 mi west-northwest of Wishek, McIntosh County, North Dakota) to the Wishek Junction 230-kV substation 1.5 mi west of Wishek, McIntosh County, North Dakota. The proposed route travels through Section 8 of T132N R71W in McIntosh County, North Dakota (Figure 1.1).

Project infrastructure would include 56.3 mi of permanent access roads, an underground electric collection line system totaling 79.5 mi, temporary laydown/staging areas totaling 29.9 ac, 2.1 ac for the proposed electric substations, and 1.7 ac for the Operations and Maintenance (O&M) facility. In addition, a haul route with multiple temporary road intersection improvements and temporary disturbance from construction crane paths will be required for construction of the Project. WTGs and permanent infrastructure for the Project layout have been sited to reduce the potential for impacts to sensitive wildlife and habitat to the maximum extent practicable. Total permanent impacts from all project infrastructure will comprise 141.5 ac (0.4% of the Project Boundary), and temporary construction impacts will account for 1,650.0 ac (4.7% of the Project).

2.2 Environmental Setting and Habitat

The Project is predominately within the Missouri Coteau Slope Level IV Ecoregion, with portions of the eastern boundary extending upward into the Missouri Coteau Level IV Ecoregion (Bryce et al. 1996). The Level IV Ecoregions are located within the Northwestern Glaciated Plains Level III Ecoregion. The region was once dominated by prairie grasses (spear, grama, and wheat grasses) and shrubs. Forested area consisting of scrubby aspen, box elder, cottonwood, and willow is limited to shaded slopes in the valleys and river terraces (EPA 2002). The Missouri Coteau is an escarpment of glacial till containing numerous hills, small lakes, and poorly drained depressions that are referred to as “potholes” that receive most of their water from snow melt and precipitation (Bryce et al. 1996). The Missouri Coteau Slope descends westward toward the Missouri River from the Coteau and is characterized by a thinner glacial till layer and integrated drainages that flow toward the Missouri River (Clayton 1962). Soils in the ecoregion consist of mollisols and some entisols.

A review of the NLCD (2021) identified grassland/herbaceous (47.4%) and cultivated crops (42.4%) as the major land cover types within the Project Boundary (Figure 2.1), followed by

hay/pasture (3.7%), developed (3.1%), and water/wetland (2.6%); all other land cover types accounted for 1% or less of the Project (Figure 2.1). According to the U.S. Geological Survey (USGS) Protected Areas Database of the U.S. (PAD-US), protected lands within the Project Boundary consist of several USFWS grassland and wetland easements, as well as one state-owned land parcel. Additional USFWS easements and state-owned lands (including state wildlife management areas) are located within one mi of the Project Boundary (Figure 2.2; USGS 2020a). See Section 4.2 for more detailed information on protected areas or federal- or state-owned lands that occur in and near the Project.

Analysis of aerial imagery, the USGS National Hydrography Dataset (NHD), and USFWS National Wetland Inventory (NWI) databases confirms that scattered woodlots, tree lines, riparian corridors, and mapped surface water features (i.e., streams) and/or wetlands exist within the Project Boundary.

The NWI (USFWS NWI 2023) data includes approximately 1,500 ac of potential wetlands and waterbodies within the Project Boundary, representing 4.3% of the total Project. NWI wetlands are scattered throughout the Project Boundary and appear to be concentrated along stream corridors (Figure 2.3). Freshwater emergent wetlands were the most common NWI category with 1,296 ac (3.6% of the Project), followed by riverine with 99.5 ac (0.3%), and freshwater pond with 71.6 ac (0.2%; Figure 2.3). The remaining categories, including lake (21.9 ac), other (10.9 ac), and freshwater forested /shrub wetland (0.1 ac) combined were less than 0.1% of the Project (Figure 2.3). NHD data includes 141.5 mi of flowlines of watercourse, 222.3 ac (0.6%; USGS NHD 2022) of the Project (Figure 2.4).

The northeastern portion of the Project Boundary appears to have the relatively highest concentration of prairie pothole features with associated emergent wetlands. Prairie potholes are depressional freshwater wetlands found mostly in the upper Midwest. The prairie pothole region is a complex system of wetlands and surrounding grasslands that serves as crucial habitat for waterfowl, grassland species, and migratory birds. However, more than half of the region has been converted to cropland.

Filter strips (also referred to as buffer strips) are common within agricultural areas in this region. Filter strips are vegetated areas similar to pastures and grasslands. These areas serve as buffers to protect surface water from agricultural runoff and provide potential habitat for wildlife.

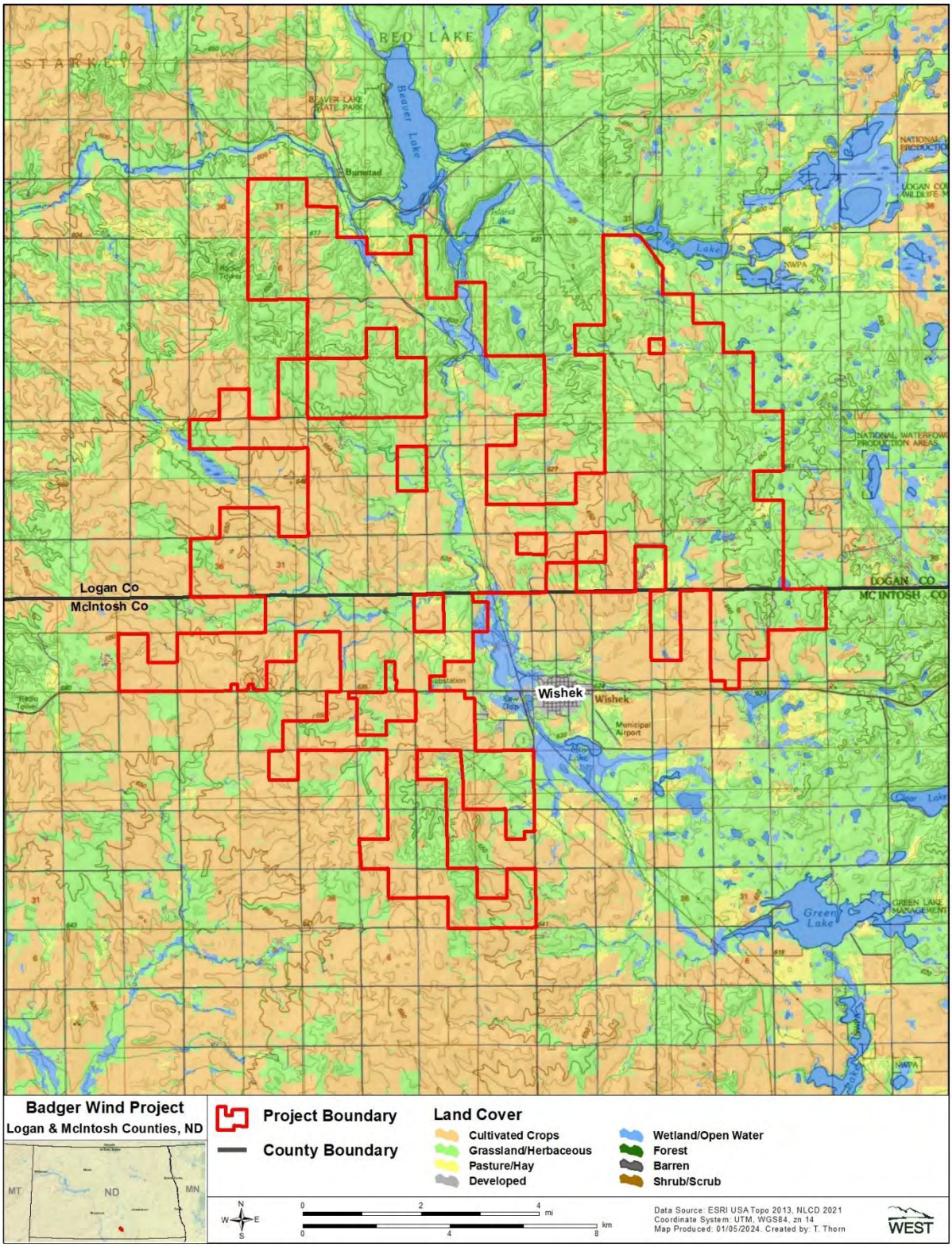


Figure 2.1. Land cover types within the Badger Wind Project in Logan and McIntosh counties, North Dakota.

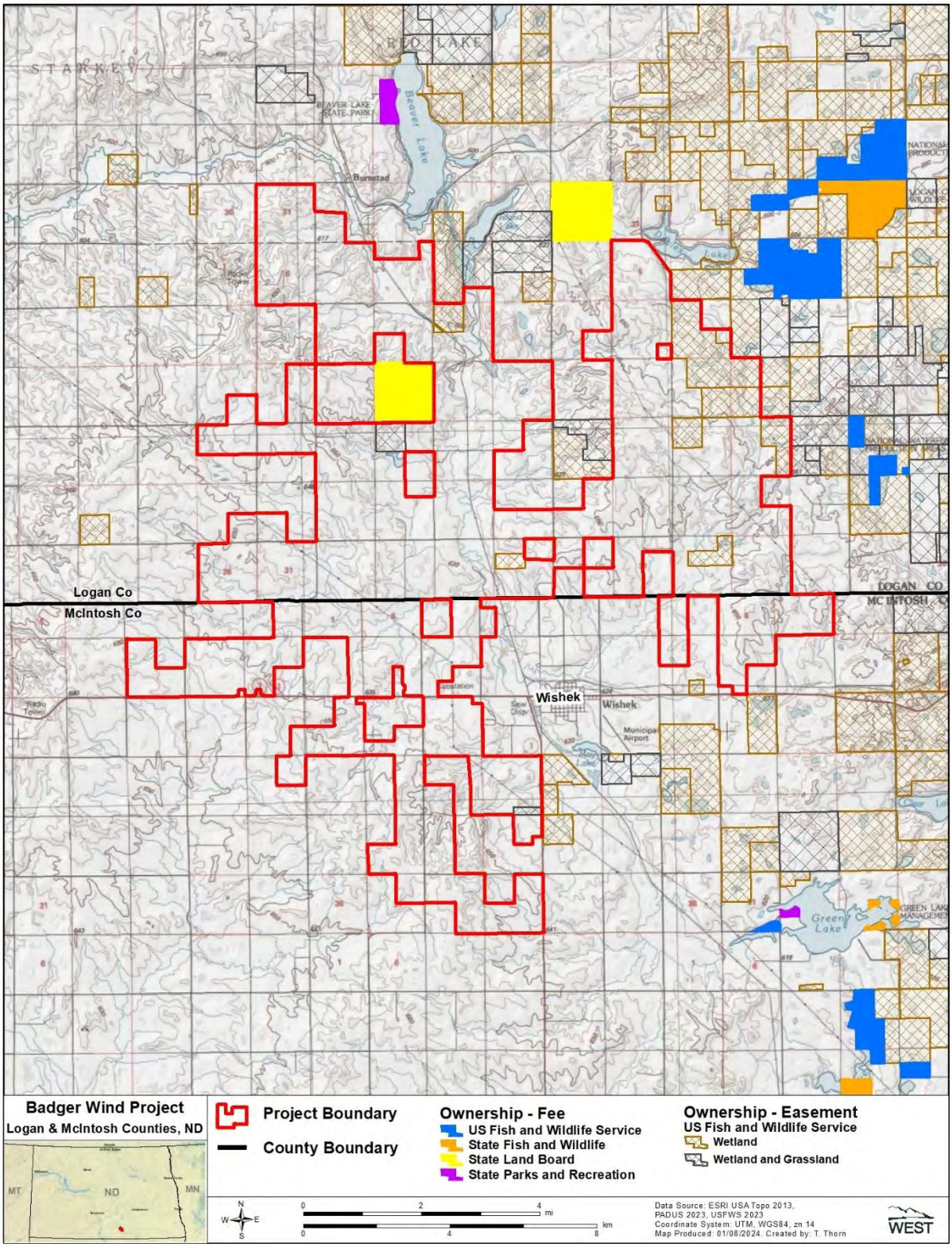


Figure 2.2. Federally administered and state-managed lands within Badger Wind Project in Logan and McIntosh counties, North Dakota.

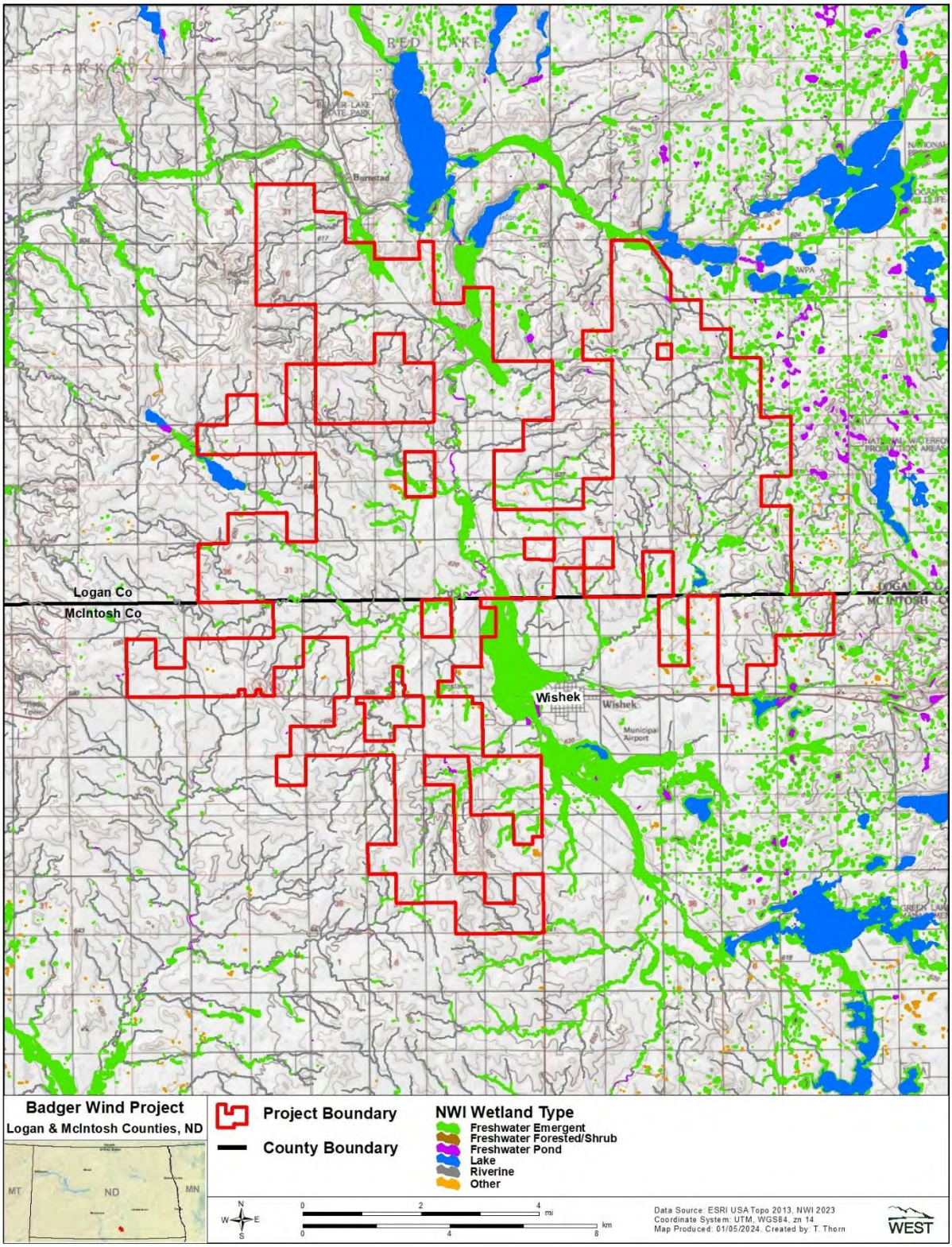


Figure 2.3. National Wetlands Inventory (NWI) wetland types within the Badger Wind Project in Logan and McIntosh counties, North Dakota.

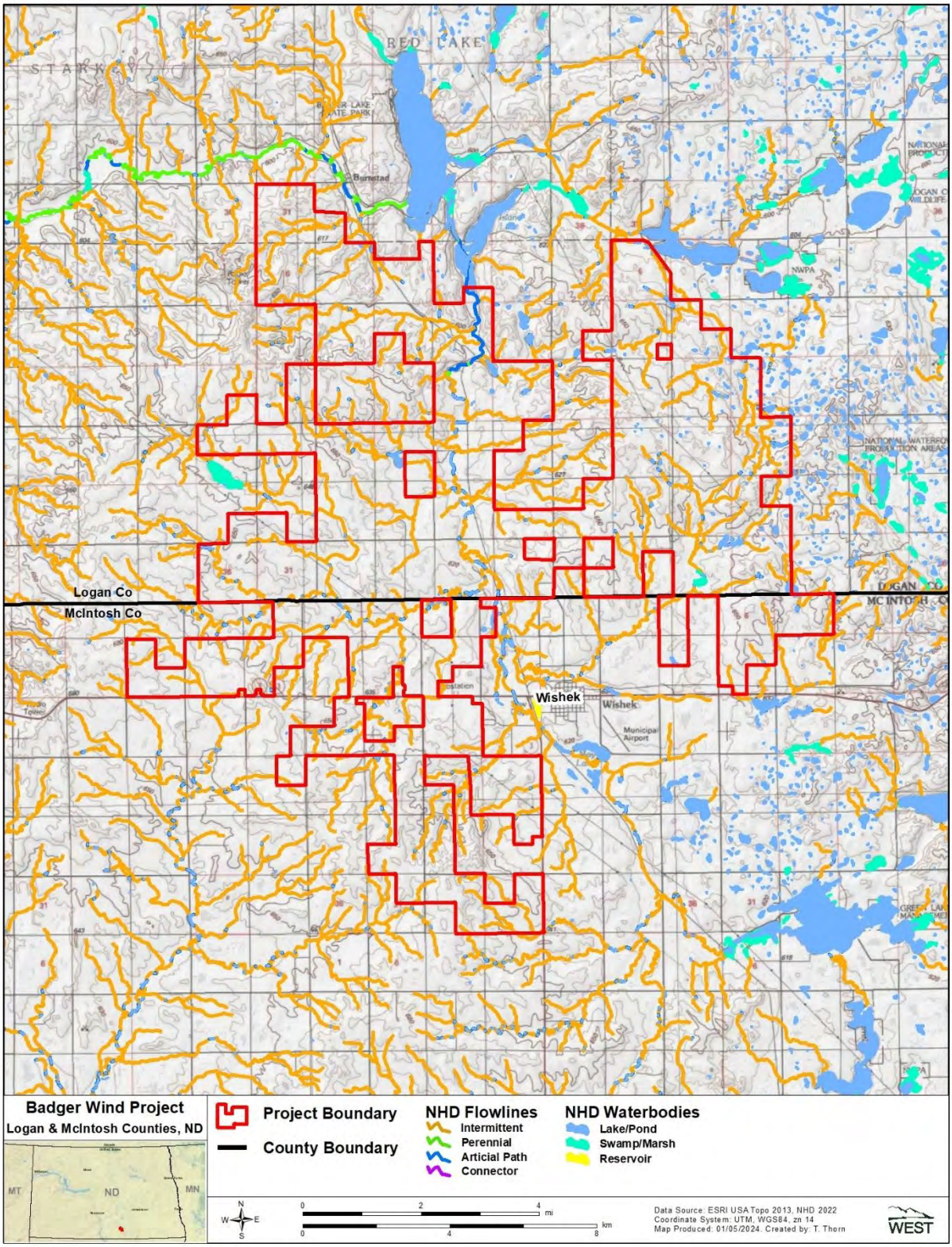


Figure 2.4. National Hydrography Dataset (NHD) waterbodies and flowlines within the Badger Wind Project in Logan and McIntosh counties, North Dakota.

The Project is located in the Prairie Pothole Bird Conservation Region (BCR; NABCI 2021). BCRs are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues. The Prairie Potholes BCR stretches from the prairie provinces in Canada into northern Montana, the Dakotas, western Minnesota, and northern Iowa and is an area characterized by mixed-grass and tallgrass prairie marked by thousands of shallow wetlands (i.e., potholes). This BCR is important to North American waterfowl production, despite years of extensive wetland drainage and agricultural conversion. Dabbling and diving duck densities, in addition to upland nesting shorebird species, can be notably high in this region of North Dakota. Important habitat for dozens of other nesting and migrant conservation priority species is present throughout the BCR (Fitzgerald et al. 1999). Based on USFWS waterfowl nesting density data provided to Atwell in 2017 by the NDGF, the Project is located primarily within a region that supports approximately 40 pairs of waterfowl or less per square mile. This is relatively low compared to much of the region to the north and east of the Project Boundary, which supports more than 100 pairs of waterfowl per square mile (NABCI 2021). The overall landscape within the Project Boundary is fragmented, consisting of 42.9% cultivated crops (NLCD 2021), consistent with the described modern use of this BCR. According to USFWS, 34 species are considered BCC for the U.S. portion of the Prairie Pothole BCR, eight of which do not breed within the BCR (USFWS 2021b). The BCC with potential to occur in the Project are discussed in Sections 4.1 and 5.4 and Tables 4.1, 4.2, and 5.2 below.

3.0 DESCRIPTION OF WEG TIERED APPROACH

In March 2012, the USFWS released the final WEG, which uses a tiered approach as an interactive decision-making process. This tier process collects information in increasing detail to identify avian and bat SOC to determine how a proposed development may impact such species, both directly and indirectly (USFWS 2012). This section provides an overview of the tiered approach outlined in the WEG.

Tier 1 of the WEG is a preliminary site evaluation on a broad geographical scale that is undertaken to understand which SOC may be present, what critical habitat may exist, and whether areas of wildlife concentration are present. Tier 2 typically consists of the same review but on a site-level scale. For Tier 2, the proposed development footprint within site boundaries is evaluated relative to the potential for SOC to occupy the site, and potential impacts to those species are assessed. The specific objectives of the Tier 1 and Tier 2 evaluations as they pertain to the Project include the following:

Tier 1—Preliminary Site Evaluation

- Identify SOC and/or their habitats in the region surrounding the proposed project.
- Identify critical habitats, areas of conservation concern, and state/local habitat areas that could harbor or concentrate species of known conservation concern in the region surrounding the proposed project.
- Review known areas of wildlife concentration, large habitat patches, and known movement corridors in the region surrounding the proposed project.

Tier 2—Site Characterization

- Conduct the same analysis as Tier 1, but on a more refined site-specific scale.
- Review which species of birds and bats are known to be at risk from wind energy development and operation and are likely to use or move through the site.
- Assess potential impacts to SOC.

During Tier 3, field studies are conducted to determine the use of the site by avian and bat species, including SOC. Information gathered from Tier 3 studies is used to evaluate potential risks to birds and bats and to inform the project design to avoid or minimize significant impacts to species and habitats. The specific objectives of the Tier 3 evaluations are summarized as follows:

Tier 3—Wildlife Field Studies and Impact Prediction

- Evaluate potential risks to bird and bat species.
- Design and conduct wildlife surveys/studies to determine use of the site by SOC.
- Use study results to inform project design to avoid and/or minimize significant adverse impacts, identify potential mitigation measures, and determine level of effort needed for post-construction studies.

For the Tier 4 evaluation, potential impacts are evaluated through post-construction mortality studies. If additional information is needed, other post-construction studies or a more formalized research program may be deemed necessary, and these studies may be implemented as part of a Tier 5 process. The specific objectives of the Tier 4 and 5 evaluations include the following:

Tier 4—Post-construction Studies to Estimate Impacts

- Conduct fatality studies to assess whether predictions of fatality risk and direct and indirect impacts were correct.
- Compare fatality rates within the Project, and among other nearby projects, relative to bird and bat use of the Project.
- Assess direct and indirect impacts of habitat loss, degradation, and fragmentation.

Tier 5—Other Post-Construction Studies and Research

- Implement additional post-construction studies or research only if additional information is needed.

Tier 4 studies will be undertaken after the completion of project construction and in accordance with the post-construction monitoring program. The results of these studies may be used to inform updates to this BBCS, as appropriate.

At the conclusion of each tiered analysis, a series of decision points are evaluated prior to moving to the next tier. Decisions are based on the information obtained from answering a series of questions in each tier. Part of the decision process for each tier is an evaluation of risk. Estimates of risk will typically be qualitative but are based on quantitative information.

The BBCS summarizes the results of/answers to questions posed in each tier of the WEG. The BBCS document serves as the primary synthesis of information gathered during the tiered siting process, details each specific question for each WEG tier, provides a response to that question, and ultimately addresses how this information was used to avoid and reduce potential impacts to birds and bats.

4.0 TIERS 1 AND 2 – PRELIMINARY SITE EVALUATION AND SITE CHARACTERIZATION

A preliminary site evaluation was conducted to review habitat characteristics and historic bird and bat occurrence data at a regional level. As part of this evaluation, a Tier 1 analysis was completed to assess the likelihood of federal and state species to occur within the general vicinity of the Project Boundary. IPaC analyses were performed for the 2019 Study Area and a 10-mi buffer in July 2019, February 2022, and August 2023, and the Project Boundary in January 2024 (Appendix A) to provide regional context regarding potential resources relevant to birds and bats in the surrounding area.

Following the Tier 1 evaluation, Tier 2 studies were conducted for the Project, including a desktop bat habitat characterization (with site visit; Atwell 2020a), desktop whooping crane (*Grus americana*) stopover habitat assessment (Atwell 2021a), and a desktop grassland assessment (with site visit; Chodachek and Piorkowski 2024; Appendix B). The bat habitat assessment was conducted for the 2019 Study Area, while the whooping crane stopover habitat assessment was conducted for the December 2020 Project Boundary that was similar to (though slightly larger than) the current Project Boundary, and the desktop grassland assessment was conducted for a preliminary site layout within the Project Boundary. As stated above (Section 1.0), the Project Boundary encompasses 92.7% of the 2019 Study Area; therefore results from the studies discussed hereafter are representative of the Project Boundary.

Publicly available information that was reviewed as part of Tier 1 and Tier 2 analyses included, but was not limited to:

- USGS 7.5-minute quadrangle maps
- USGS PAD-US
- USGS NHD
- USGS National Land Cover Database
- USFWS NWI data
- USFWS Critical Habitat Portal
- USFWS IPaC tool
- USFWS and NDGF websites (including species profiles)
- North Dakota SWAP

Data that were utilized for the preliminary site evaluation were compiled into a site evaluation map (Figure 2.5) that was subsequently used to inform site characterization (Tier 2), baseline avian

and bat studies (Tier 3), project planning and site layout and design, and project infrastructure micrositing.

4.1 Questions and Responses

1. Are known species of concern present on the proposed site, or is habitat (including designated critical habitat) present for these species?

Tier 1 and 2 analyses indicated that the Project Boundary is within the range of 34 SOC, including five ESA-listed threatened, endangered, or candidate species and species listed as USFWS BCC and SCP per North Dakota's SWAP. ESA-listed species identified as having the potential to occur within the Project Boundary include piping plover (*Charadrius melodus*), rufa red knot (*Calidris canutus rufa*), whooping crane, northern long-eared bat (NLEB; *Myotis septentrionalis*), and monarch butterfly (*Danaus plexippus*; Table 4.1). Bald and golden eagles, which are protected under BGEPA, were also identified during Tier 1 and 2 analyses as being likely to occur within the Project Boundary (Table 4.1). Suitable nesting and foraging habitat for bald eagles and piping plovers and potential suitable stopover habitat for golden eagles, rufa red knot, and whooping cranes is present in the Project Boundary and vicinity, which may increase the potential for use of the Project. Limited suitable summer habitat is present for NLEB. Species accounts are provided for those species listed in Table 4.1 that could be a priority for agencies. Additionally, taxa of interest (e.g., bats) to agencies are also discussed below.

Table 4.1. Federal and State-listed Species or Special Status Species with potential to occur in the Badger Wind Project, Logan and McIntosh counties, North Dakota.

Common Name (Scientific Name)	Federal Status[a]	State Status[b]	Habitat Requirements	Likelihood of Occurrence[c]
BIRDS				
American Bittern (*Botaurus lentiginosus*)	BCC[e]	SCP I	Wetlands with tall emergent vegetation or tall grasslands adjacent to wetlands.	Moderate
American Golden-plover (*Pluvialis dominica*)	BCC[f]	N/A	Uses native prairie, pastures, farmland, and shorelines during migration.	Low
Baird's Sparrow (*Ammodramus bairdii*)	BCC[f]	SCP I	A variety of open grassland habitats, including native and tame grasslands, hayfields, no-till croplands, wet meadows, etc., with moderate-to-tall dense vegetation.	Moderate
Bald Eagle (*Haliaeetus leucocephalus*)	BGEPA; BCC[e]	SCP II	Inhabits isolated and undisturbed areas near large waterbodies. Nests in forest stands with large trees near open water, wetlands, or rivers.	High
Black Tern (*Chlidonias niger*)	BCC	SCP I	A variety of wetland types with relatively shallow water and an even mix of open water and emergent vegetation, preferably surrounded by grassland.	Moderate
Bobolink (*Dolichonyx oryzivorus*)	BCC	SCP II	A variety of open grassland habitats, including native and tame grasslands, hayfields, no-till croplands, wet meadows, etc., with moderate-to-tall dense vegetation.	High
California Gull (*Larus californicus*)	BCC[f]	N/A	Utilize large inland freshwater lakes and marshes during the breeding season.	Moderate
Canvasback (*Aythya valisineria*)	N/A	SCP II	Deep, semipermanent wetlands and lakes with emergent vegetation.	Moderate
Chestnut-collared Longspur (*Calcarius ornatus*)	BCC	SCP I	Shortgrass prairie or mixed-grass prairie that has been grazed or mowed.	High
Chimney Swift (*Chaetura pelagica*)	BCC[f]	N/A	Open country, savanna, wooded slopes, and humid forests.	Low
Clark's Grebe (*Aechmophorus clarkii*)	BCC[f]	N/A	Utilize large inland freshwater lakes with a mix of open water and emergent vegetation during the breeding season.	Low
Ferruginous Hawk (*Buteo regalis*)	BCC[f]	SCP I	Expansive open grasslands and shrublands; often nests in solitary trees or shrubs, though will sometimes nest on the ground.	High

Franklin's Gull (*Leucophaeus pipixcan*)	BCC	SCP I	Large prairie wetlands with a mix of open water and emergent vegetation; will use agricultural fields for foraging.	High
Golden Eagle (*Aquila chrysaetos*)	BGEPA	SCP II	Open habitats with nesting often occurring in association with cliffs.	High
Golden-winged Warbler (*Vermivora chrysoptera*)	BCC[f]	N/A	Open woodlands, brushy clearings with patches of weeds, shrubs, and scattered trees.	Low
Henslow's Sparrow (*Centronyx henslowii*)	BCC[f]	N/A	Breed in wet meadows, weedy pastures, lowland prairies, and cultivated hayfields when habitat is limited.	Moderate
Lark Bunting (*Calamospiza melanocorys*)	BCC[f]	SCP I	Mixed-grass prairie with scattered shrubs, such as sagebrush. Will also use tame grasslands, hayfields, no-till croplands, wet meadows, etc., with low-to-moderate height vegetation.	Moderate
Lesser Yellowlegs[f] (*Tringa flavipes*)	BCC	N/A	Fresh and brackish wetlands, including, but not limited to marshes, lake and pond edges, and flooded agricultural fields.	Low
Lesser Scaup (Aythya affinis)	N/A	SCP II	Large wetlands with emergent vegetation and associated upland habitat.	Moderate
Long-eared Owl (*Asio otus*)	BCC[f]	N/A	A variety of open grasslands with scattered trees and shrubs; will also use cropland and pastures.	Moderate
Marbled Godwit (*Limosa fedoa*)	BCC	SCP I	Expansive wetland complexes with associated grasslands; will also use uplands and roadside ditches for foraging.	Moderate
Nelson's Sparrow* (*Ammospiza nelsoni*)	BCC[e]	SCP I	Freshwater wetlands or moist areas with dense emergent vegetation or dense grass.	Moderate
Northern Harrier (*Circus hudsonius*)	BCC[f]	SCP II	Large, open grasslands or marshes with tall, dense vegetation; will also use cropland, pastures, shrubby fields, and fallow fields for foraging.	High
Northern Pintail (*Anas acuta*)	N/A	SCP II	Wetland complexes with open water and associated upland prairie; prefers native prairie but will also use Conservation Reserve Program (CRP) lands, hayfields, pastures, and weedy field borders.	Moderate
Pectoral Sandpiper[f] (*Calidris melanotos*)	BBC	N/A	Wet grassy areas, including, lake and pond edges, and flooded agricultural fields	Low
Piping Plover (*Charadrius melodus*)	FT	SCP II	Alkali lakes, freshwater lakes, reservoirs, and rivers.	Low
Prairie Falcon (*Falco mexicanus*)	BCC[f]	SCP II	Nests along cliffs and rock outcroppings. Forages in open grasslands.	Low

Rufa Red Knot (*Calidris canutus rufa*)	FT	SCP III	Natural wetland features such as freshwater lakeshores and alkali lakes for migration stopover habitat.	Low
Sharp-tailed Grouse (*Tympanuchus phasianellus*)	N/A	SCP II	Mixed-grass prairie with scattered shrubs or small trees; leks are generally found on elevated, less vegetated areas compared to the surrounding area.	Moderate
Sprague's Pipit (*Anthus spragueii*)	BCC[f]	SCP I	Requires large areas of native mixed-grass prairie.	Moderate
Swainson's Hawk (*Buteo swainsoni*)	BCC[e]	SCP I	A variety of open grasslands with scattered trees and shrubs; will also use cropland and pastures. Nests may be placed in small clumps of isolated trees or shelterbelts, though will sometimes nest on the ground.	High
Western grebe (*Aechmophorus occidentalis*)	BCC[f]	N/A	Requires large lakes with emergent vegetation for breeding; open water is preferred for foraging and courtship.	Low
Willet (*Tringa semipalmata*)	BCC	SCP II	Expansive wetland complexes with associated grasslands; prefers shallow wetlands without dense emergent vegetation.	Moderate
Wilson's Phalarope (*Phalaropus tricolor*)	N/A	SCP I	Open wetlands with associated upland grasslands or wet meadows.	Moderate
Whooping Crane (*Grus americana*)	FE	SCP III	Inhabits open habitats such as grasslands, marshes, and agricultural fields. Nest selection varies from natural cavities to fabricated structures.	Moderate
BATS				
Big Brown Bat (*Eptesicus fuscus*)	N/A	SCP I	Habitat generalist, including urban and rural habitats, but often associated with trees; will also use fabricated structures for roosting.	High
Little Brown Bat (*Myotis lucifugus*)	N/A	SCP I	Inhabits caves, mines, forests, and agricultural areas. Colonies can be found in fabricated structures as well.	Moderate
Northern Long-eared Bat (*Myotis septentrionalis*)	FE	SCP I	Interior forest species; however, will use a variety of woodland habitats. Roost generalist. Roosts under bark, cavities, or crevices of dead and living trees during summer. Colonies can be found in fabricated structures as well.	Low
INSECTS				
Monarch Butterfly (*Danaus plexippus*)	FC	SCP I	Breeds and forages on various milkweed (*Asclepias spp*.) within a variety of habitats including rangelands, agricultural areas, riparian habitats, and wetlands.	Moderate

[a] Federal status: BCC= Bird of Conservation Concern (USFWS 2008); BGEPA = Bald and Golden Eagle Protection Act; FE = ESA-listed as endangered; FT = ESA-listed as threatened; FC = ESA-listed as a candidate species; N/A = No federal and/or state status.
[b] State status indicates North Dakota SWAP (Dyke et al. 2015) SCP Level I, II, or III.
[c] Likelihood of Occurrence: Low = species range intersects the Project Boundary but no or minimal suitable habitat is present; Moderate = species range intersects the Project Boundary and suitable habitat is likely present or the species is known to have occurred within the Project Boundary or the general vicinity; High = species range intersects the Project Boundary and high-quality suitable habitat is present within and/or populations are known to exist within the general vicinity of the Project Boundary; Unknown = species range intersects the Project Boundary but the extent of suitable habitat within the Project Boundary is unknown.
[e] At the time of Tier 1 through 3 studies, this species was considered BCC (USFWS 2008). However, the USFWS has since removed this species from their list of BCC for the Prairie Pothole BCR (USFWS 2021a).
[f] At the time of Tier 1 through 3 studies, this species was not considered BCC (USFWS 2008). However, the USFWS has since added this species to their list of BCC for the Prairie Pothole BCR (USFWS 2021a).

4.1.1 Federally Protected Species Accounts

Bald eagle

Bald eagles require large mature trees that have the branch structure necessary in which to build their nests, typically near open water to provide foraging opportunities (Buehler 2020). They have strong nest site fidelity and will often build more than one nest within their territory (Buehler 2000).

A 2009 statewide census did not document any bald eagle nests in Logan or McIntosh counties; however, two occupied nests were documented in southern Kidder County, north of the Project Boundary along the Missouri River (Johnson 2009; specific locations within the county were not disclosed in this report). Since the publication of this report, the nesting bald eagle population in North Dakota has increased from 50 nests in 2008 to nearly 350 nests (NDGF 2022). It is possible that bald eagles may have begun nesting in Logan or McIntosh County since data was last published. For example, citizen science data from Logan County indicates some small lakes, such as Beaver Lake, may host one or more nesting pairs (AKN 2019).

Bald eagles likely utilize the Project Boundary across multiple seasons within the annual cycle, particularly during spring and fall migration periods (AKN 2019). Small, isolated patches of trees associated with wetlands or riparian areas within the Project Boundary may provide suitable bald eagle breeding habitat. Based on the distribution of the species, presence of nesting and foraging habitats, and sightings, occurrence of bald eagles within the Project Boundary is likely.

Golden eagle

Golden eagles inhabit rolling foothills and mountainous terrain including prairies, wide, arid plateaus deeply cut by streams and canyons, and open mountain slopes; this species is most closely associated with open country habitats in mountainous regions during the breeding season (Cornell Lab of Ornithology 2023). Golden eagles exhibit a strong preference for establishing nests and breeding territories on cliffs and rocky outcrops and constructing large platform nests of sticks and greenery on rock ledges or cliffs. While uncommon, golden eagles may also nest in large trees, anthropogenic structures, and occasionally on the ground (Katzner et al. 2020). Golden eagles commonly breed in the western US (Kochert et al. 2020), including western North Dakota (Dyke et al. 2015; AKN 2019).

Golden eagles likely migrate through the Project Boundary and are known to winter within south-central counties of North Dakota (Kochert et al. 2002; AKN 2019). As such, it is possible that golden eagles occur within the Project Boundary across multiple seasons, but are unlikely to nest in the Project.

Piping plover

In the Northern Great Plains, piping plovers nest on the unvegetated shorelines of alkali lakes, freshwater lakes, reservoirs, and river sandbars. In North Dakota, nesting activity is primarily on the Missouri River sandbars. They also can be found in other scattered locations in the State, including the alkali lakes core area in northwestern and central North Dakota, where suitable sandy habitat exists, but distribution is limited and rare outside of the Missouri River system (North

Dakota Department of Agriculture 2023). No critical habitat occurs within the Project Boundary; however, Logan County does contain designated critical habitat for the piping plover within Baltzer Waterfowl Production Area, approximately 3 mi northeast of the Project Boundary (Figure 4.1). McIntosh County also contains critical habitat for this species, 10.5 mi east of the Project Boundary (USFWS 2019d). The northeastern portion of the Project Boundary has the greatest concentration of prairie pothole features with associated emergent wetlands, which may provide potentially suitable habitat for piping plovers, though unlikely as the surrounding areas have similar habitat. As such, piping plovers have a low likelihood of occurrence within the Project.

Rufa red knot

Natural wetland features such as freshwater lakeshores and alkali lakes may also provide suitable migration stopover habitat for the rufa red knot, another ESA-listed threatened migratory shorebird species. Rufa red knots do not breed in North Dakota, and critical habitat has not been designated for this species (USFWS 2019a). In general, the rufa red knot is a scarce migrant within the state (Avian Knowledge Network [AKN] 2019); however, it is possible that rufa red knots could use similar wetland features within piping plover designated critical habitat in Logan or McIntosh counties. As such, the Project Boundary could provide suitable stopover habitat for the rufa red knot; however, likelihood of occurrence is low.

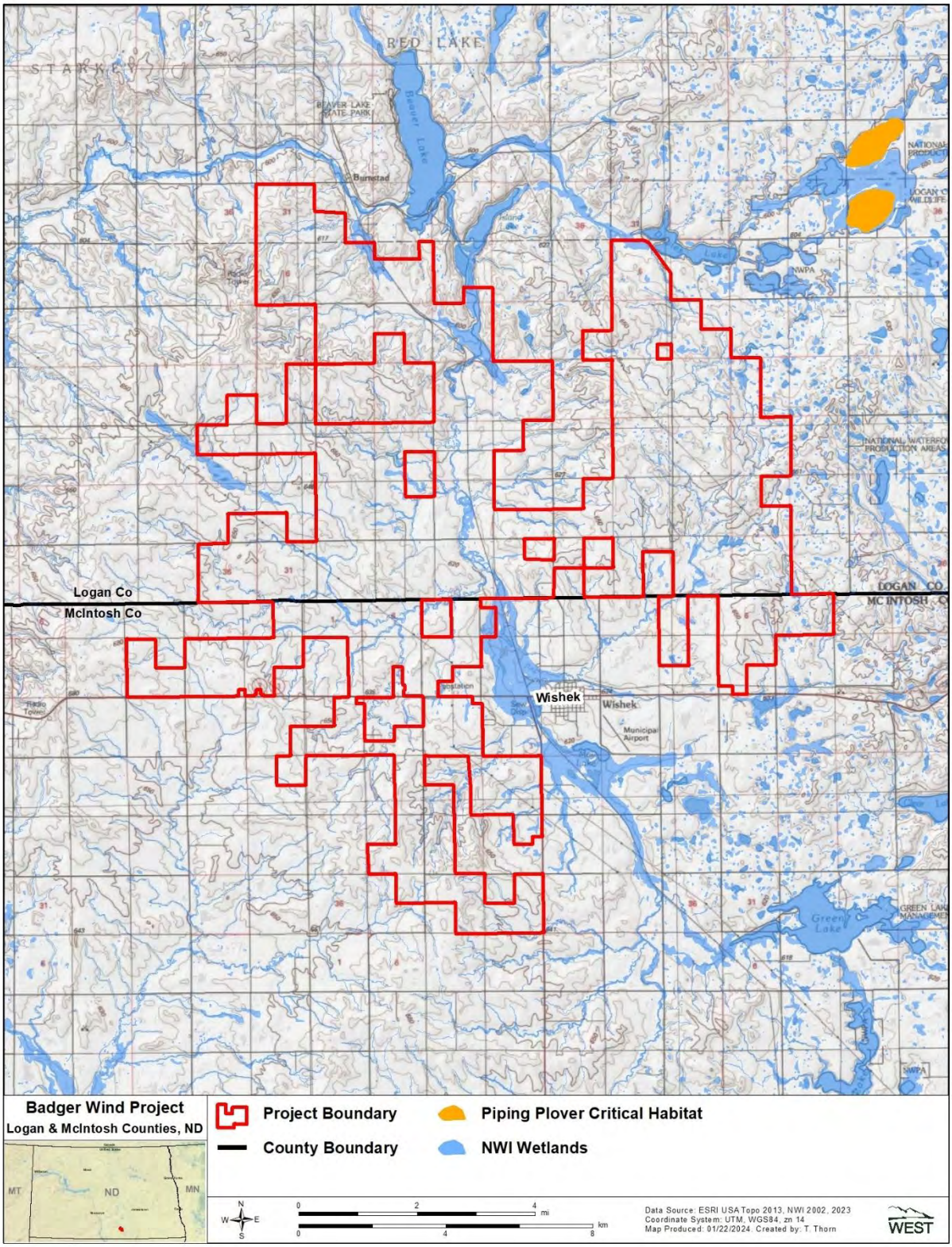


Figure 4.1. Piping plover critical habitat near the Badger Wind Project in Logan and McIntosh counties, North Dakota.

Whooping crane

The whooping crane is ESA-listed as endangered and are a NDGFD SCP LI (Dyke et al. 2015). Only one self-sustaining wild population of this species exists, which breeds in Wood Buffalo National Park in Canada and winters in the coastal marshes of Texas, including in the Aransas National Wildlife Refuge (Urbanek and Lewis 2020). The last survey from the USFWS winter 2022–2023 estimated 536 whooping cranes, indicating the population has remained stable over the past couple years (Butler et al. 2023). Whooping crane spring and fall migration covers approximately 2,500 mi between their breeding and wintering sites, along a migratory corridor through Alberta, Saskatchewan, Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and into Texas (USGS 2018; Figure 4.2). The same path is taken in the spring and fall, with 75% of whooping crane sightings occurring within a 183-mi wide migratory corridor (Pearse et al. 2018).

Whooping cranes occur in North Dakota during the spring and fall migration periods; however, this species does not breed in North Dakota (Urbanek and Lewis 2015). Whooping cranes migrate and stopover along habitats including shallow wetlands and marshes, edges and sandbars of shallow rivers, and agricultural fields near a water source (Baasch et al. 2019). Whooping cranes forage on invertebrates, small vertebrates, berries, and grains, and typically roost or loaf in shallow water wetlands and forage in wet meadows or cultivated agricultural lands (Urbanek and Lewis 2020). Designated critical habitat for whooping crane is not present within Logan or McIntosh counties, North Dakota (USFWS 2016a; USFWS 2019d). Potentially suitable stopover habitat exists within the Project Boundary; including wetlands associated with stream corridors, particularly in the southern and northeastern portions of the Project Boundary and prairie potholes in I northeastern portion of the Project Boundary (Figure 2.1).

No confirmed telemetry observations have been recorded within the Project Boundary (Pearse et al. 2020); however, other confirmed telemetry observations have been reported within five mi of the Project Boundary (USFWS 2022; Figure 4.3). The observations occurred between October 31 and November 6, 2011 and consisted of four individuals loafing in a pond and feeding in nearby fields approximately 5 mi southwest of the Project Boundary. One group of three whooping cranes was recorded within the Project Boundary April 15 – 17, 2020 during avian use surveys (Atwell 2020c; Figure 4.3). Based on the distribution of the species, the Project's location in the migration corridor, and the confirmed sightings, whooping cranes may occur in the Project Boundary during the spring and fall migration.

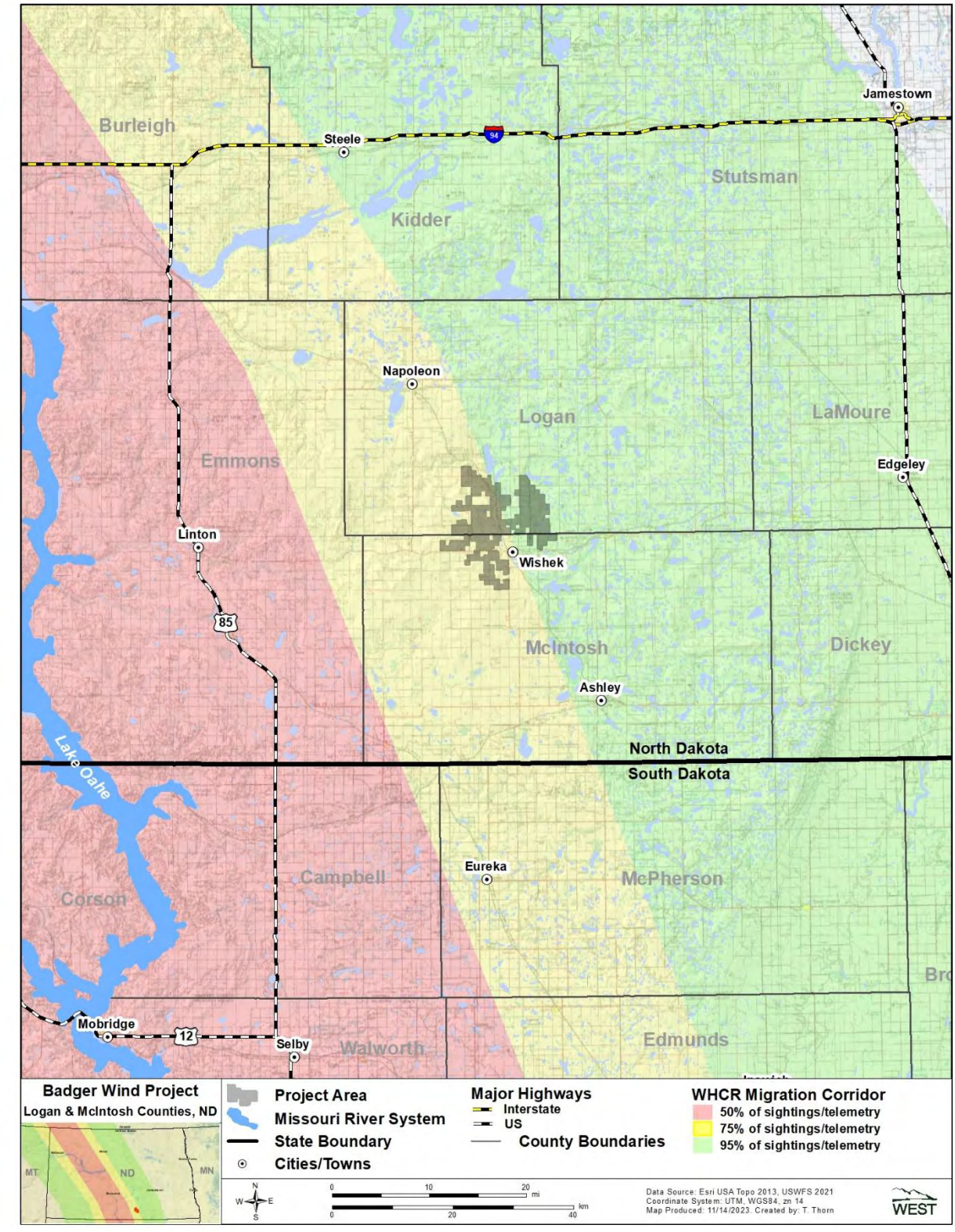


Figure 4.2. Location of the Badger Wind Project in Logan and McIntosh Counties, North Dakota within the whooping crane migration corridor.

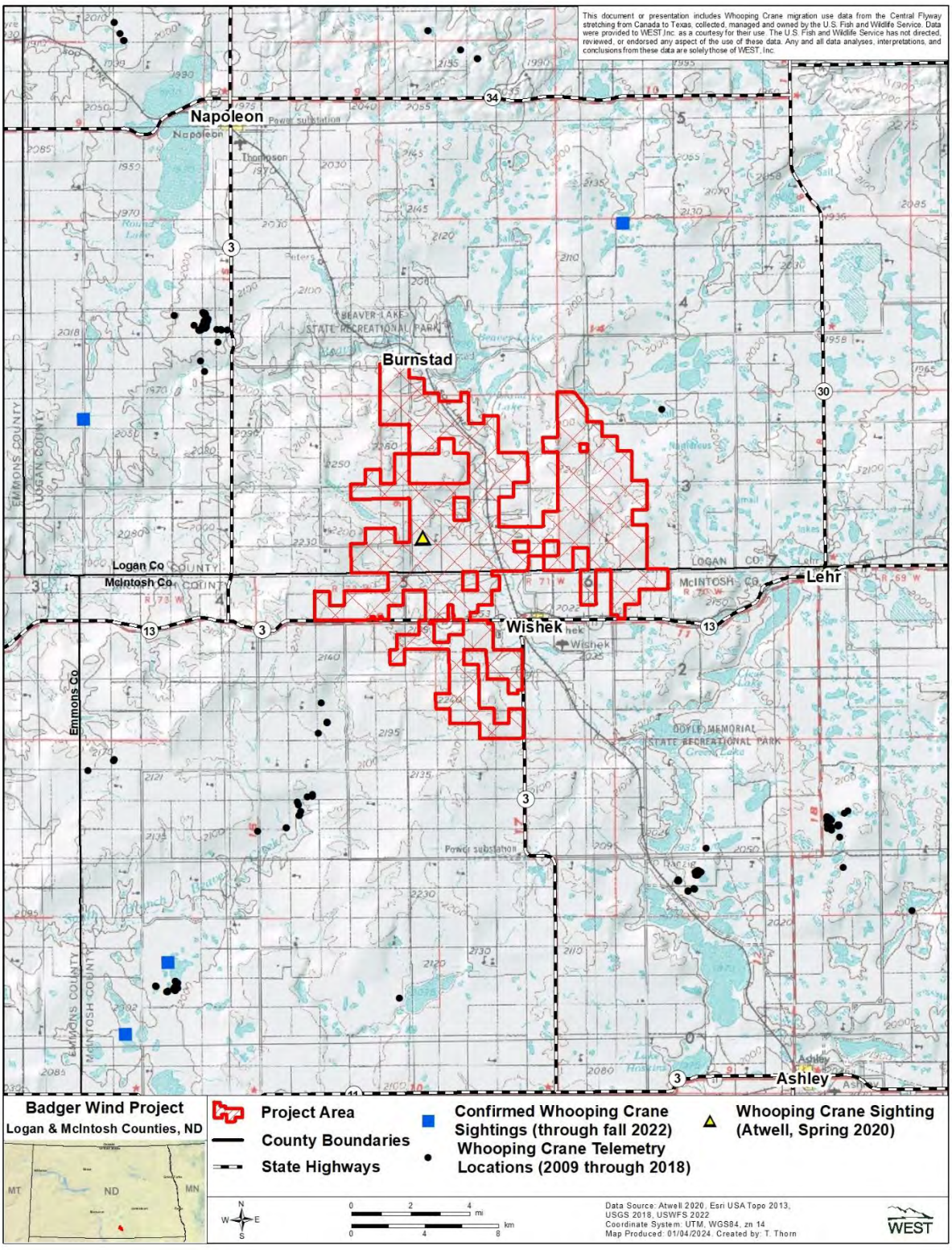


Figure 4.3. Whooping crane observations and telemetry locations relative to the Badger Wind Project in Logan and McIntosh counties, North Dakota.

Northern long-eared bat

The federally endangered (NLEB) can be found in the US from Maine to North Carolina on the Atlantic coast, westward to eastern Oklahoma and northward through parts of South Dakota and North Dakota (USFWS 2023a), and more specifically the Project (USFWS 2023b). The Project Boundary is located within the possible range for NLEB (see Section 5, Figure 5.5; USFWS 2023a; Dyke et al. 2015).

Suitable summer habitat for NLEB consists of a wide variety of forested/wooded habitats, as well as interspersed non-forested habitats (i.e., emergent wetlands, shelterbelts adjacent to agriculture fields, and pastures). NLEB prefer mature forest as foraging habitat but can also use younger riparian forests, open forest corridors, wooded ponds, emergent wetlands, adjacent agriculture fields, and wooded shelterbelts (Foster and Kurta 1999). Linear features, such as fencerows, riparian forests, and other wooded corridors, can serve as suitable habitat for NLEB.

NLEB are roost generalists and utilize a broad array of roost characteristics, including roost types (e.g., cavities, crevices, exfoliating bark) and tree species (Carter and Feldhamer 2005; Timpone et al. 2010). NLEB roost species can vary by geographic location and site characteristics (Whalen and Krusac 2014).

USFWS guidelines define suitable NLEB habitat as forests and woodlots containing potential roost trees; however, buildings, barns, bridges, and bat houses may also be considered potential summer habitat for northern long-eared bat. Trees with a diameter at breast height greater than or equal to 3.0 inches and that have exfoliating bark and/or cavities are defined as potential roosts. NLEB roost trees may include individual trees when they exhibit characteristics of a potential roost and are within 1,000 feet (ft) of other forested/wooded habitat (USFWS 2019c).

No maternity roost trees or hibernacula have been reported for this species in North Dakota (USFWS 2019b); the closest hibernacula and maternity roosts are located in central Minnesota, approximately 200 mi northeast of the Project Boundary (Minnesota Department of Natural Resources and USFWS 2021). The SWAP identifies the Turtle Mountains and riparian corridors of the Little Missouri and Missouri Rivers as key areas of NLEB habitat. The Turtle Mountains are approximately 180 mi north of the Project Boundary; the Missouri River is approximately 33 mi west.

Publicly documented NLEB presence in North Dakota is west of the Missouri River within the Missouri River Valley, the Badlands of North Dakota, and the Moreau Prairie. Confirmed northern long-eared presence via acoustic recordings or mist netting ranged from approximately 53 to 187 mi west and northwest of the Project Boundary (Nelson et al. 2015; Shank et al. 2015).

Tier 2 desktop analysis identified 426.9 ac (0.35% of the 2019 Study Area) of potentially suitable NLEB habitat from 248 forested areas and wooded shelterbelts (see Section 5, Figure 5.5). The median forested area of potential suitable habitat was 1.4 ac. The size of woodlots ranges from 0.09 to 8.65 ac. On-site reconnaissance confirmed that forested area within the 2019 Study Area has low connectivity and high fragmentation, which limits the potential for foraging, commuting,

and suitable NLEB habitat. However, as previously mentioned, NLEB are roost generalists, and roost tree species exhibiting preferential roost characteristics were documented within the 2019 Study Area during a site visit on June 12–June 13, 2019 (Atwell 2020a). Therefore, occurrence of NLEB within the Project is low.

Monarch butterfly

The monarch butterfly is a globally distributed butterfly that is currently listed as a federal candidate species (USFWS 2023c). Within North America, there are two distinct populations, eastern and western, that migrate from their summer range in southern Canada, the Great Lakes region, and the Northeast US down to their overwintering sites in Mexico and California, respectively (NatureServe 2023). Monarch butterflies in North Dakota are part of the eastern North American population. Adult monarch butterflies require a diversity of blooming nectar resources during the migration and breeding periods to ensure their success; additionally, they require their obligatory milkweed host plant (*Asclepias* spp.) for egg laying and larval development (USFWS 2023c; NatureServe 2023). Monarchs are found throughout North Dakota, including Logan and McIntosh counties (Dyke et al. 2015). Based on the information above, the likelihood of the monarch butterfly to occur within the Project is moderate.

4.1.2 Birds of Conservation Concern

The Tier 1 and 2 analysis identified 26 avian species and two bat species designated as BCC that have potential to occur in the Project (Table 4.1; Appendix A). A majority of BCC species identified in the IPaC report (USFWS 2024) are designated as breeders (i.e., species that may breed in the Project Boundary or its vicinity; Table 4.1) and have a moderate-to-high likelihood of occurrence within the Project. The Project Boundary also intersects the primary range for most of these species (Dyke et al. 2015).

4.1.3 North Dakota Species of Conservation Priority

Tier 1 and 2 analyses identified 29 species designated as North Dakota SCP that may occur within the Project (Table 4.1; Appendix A). SCP species are not afforded any additional regulatory protection under the ESA or North Dakota state law. Most of these species have a moderate-to-high likelihood of occurrence within the Project.

The northeastern portion of the Project contains the highest density of grassland habitat and pothole wetlands compared to the remainder of the Project. As a result, this portion of the Project is likely to see relatively higher abundance of grassland and wetland avian species, such as sharp-tailed grouse (*Tympanuchus phasianellus*; SCP Level II); Wilson's phalarope (*Phalaropus tricolor*; SCP Level I); a variety of duck species like northern pintail (*Anas acuta*; SCP Level II), lesser scaup (*Aythya affinis*; SCP Level II), and canvasback (*Aythya valisineria*; SCP Level II); and many of the SCP species listed above, such as chestnut-collared longspur, marbled godwit, and willet.

Raptor species have historically received more attention in collision analyses, due to an apparent higher probability of collision than other bird species given equal exposure to operating turbines (Strickland et al. 2011). Non-eagle raptor SCP species that may occur within the Project, particularly as breeding species, include ferruginous hawks (*Buteo regalis*; SCP Level I),

Swainson's hawks (*Buteo swainsoni*; SCP Level I), and northern harriers (*Circus hudsonius*; SCP Level II).

Eleven bat species are known to occur in North Dakota, six of which may occur within the Project. Of the six species with ranges intersecting the Project Boundary, three species, including the NLEB, big brown bat (*Eptesicus fuscus*), and little brown bat (*Myotis lucifugus*) are considered Level I North Dakota SCP (Dyke et al. 2015; NDGF 2016c; NDGF 2016d; BCI 2019). Given the habitat requirements of these species and the presence of potentially suitable habitat within the Project Boundary, there is a low likelihood for NLEB to occur and moderate-to-high likelihood of occurrence of big brown and little brown bat within the Project Boundary.

4.1.4 Designated Critical Habitat and Habitat for Species of Concern

There is no USFWS designated Critical Habitat for birds or bats within the Project Boundary. The nearest Critical Habitat for piping plovers is approximately 3 mi northeast of the Project Boundary in Logan County (Figure 4.1).

Patches of habitat that may be potentially used by TES and SCP can be found within the Project Boundary. NLCD indicated the Project Boundary contains 47.4% of the Project as herbaceous/grasslands and 3.7% as pasture/hayland cover (NLCD 2021). TES and North Dakota SPC such as bobolink, chestnut-collared longspur, and northern harrier may utilize these hay/pasture areas.

The Project Boundary is dominated by herbaceous/grassland and cultivated cropland with very little wooded habitat and no known caves or other karst landforms. Wooded bat habitat is limited to 7.8 ac of deciduous forest, primarily consisting of small woodlots and shelterbelts scattered throughout the Project Boundary. Most riparian areas in the Project Boundary do not support adjacent woodlands. Although it is possible that TES such as NLEB could use these wooded habitats, because of the limited size and fragmentation of woodlands within the Project Boundary, there is low potential for TES species to use these areas.

In general, use of the Project Boundary by SOC is not anticipated to be higher than the surrounding regional landscape. Some species have potential to move through the Project Boundary during spring and fall migration, though potential stopover habitat that might cause congregations of large groups of migrating birds and bats is generally limited within the Project Boundary.

2. Does the landscape contain areas where development is precluded by law or designated as sensitive according to scientifically credible information?

At the time of the Tier 1 and 2 analyses, USGS PAD-US version 2.0 identified one USFWS Waterfowl Production Area (WPA), two North Dakota State Lands parcels, and one USFWS Wildlife Management Area (WMA) that intersect the Project Boundary (USGS 2018). WPAs are public lands managed by the USFWS to preserve habitat for waterfowl and other wildlife, whereas WMAs are owned by the state of North Dakota and were established to protect and manage lands

and waters for wildlife production, public hunting, trapping, fishing, and other recreational activities. Additional review of spatial data from NDGF indicated that there are no Private Lands Open to Sportsmen (PLOTS) parcels located within or intersecting the Project Boundary (NDGF 2021). The closest PLOTS parcel is one mi south of the Project Boundary. This PLOTS parcel was cross listed as Conservation Reserve Enhancement Program (CREP) easements. The NDGF holds PLOTS agreements with private landowners to conserve habitat for fish and wildlife populations while also allowing walk-in public access for hunting. Normal farming and ranching activities are allowed in these PLOTS parcels.

Review of the USGS PAD-US version 2.1 (USGS 2020b) for the Project Boundary identified 17 locations within or partially within the Project where development is precluded by law of where the areas are identified as sensitive according to scientifically credible information. A 14.6-acre portion of a parcel identified as North Dakota Surface Trust land overlaps the central portion of the Project Boundary (USGS 2020b). In addition, 16 areas contain USFWS wetland or grassland easements, some of which contain both. In total, approximately 2,414 acres of USFWS easements were identified within the Project Boundary, including approximately 275 acres of USFWS grassland easements and 2,138 acres of USFWS wetland easements. Note that in some locations, grassland and wetland easements overlap (USGS 2020b). Refer to Figure 2.2).

Publicly available CRP spatial data were not readily available for Tier 2 studies.

3. Are there plant communities of concern present or likely to be present within the site(s)?

The North Dakota Parks and Recreation Department maintains the North Dakota Natural Heritage Inventory database containing the known locations of rare animal and plant species and significant ecological communities within the state. In a November 2021 guidance letter and a review of the NatureServe online database (NatureServe) in January 2024, the Department indicates there are no known rare species or significant ecological communities documented within or immediately adjacent to the Project Boundary.

Some vegetation communities dominated by grasses have been described as native, or unbroken, prairie by NDGF. These areas are used as a proxy to estimate potential impacts to grassland breeding bird habitat; however, these areas have no jurisdictional protection or management mandates. Field verification of grassland habitat conditions further refined an understanding of where areas defined by NDGF as unbroken have been converted to agricultural production. These areas were used to focus siting Project infrastructure to avoid impacts to unbroken grassland habitat to the extent practicable.

Badger Wind continues to coordinate with USFWS and NDGF to refine a site layout that minimizes impacts to unbroken grassland habitat and wetlands to the extent practicable.

4. Are there known critical areas of congregation of species of concern, including, but not limited to: maternity roosts, hibernacula, staging areas, winter ranges, nesting sites, migration stopovers or corridors, leks, or other areas of seasonal importance?

Based on Tier 2 site reconnaissance and desktop study results, no known critical areas of congregation for SOC were identified within the Project Boundary, though it is possible that the Project supports potential stopover habitat for ESA-listed endangered whooping cranes, nesting habitat for sharp-tailed grouse, and nesting sites for raptors.

No globally or state recognized Important Bird Areas (IBA) are within 10 mi of the Project. The closest IBA is Appam Lake Waterfowl Protection Area (located approximately 16 mi to the north of the Project in Kidder and Logan Counties, N46.655954° W99.56191°). This IBA is a state-recognized IBA (National Audubon Society 2019) and provides important breeding habitat for piping plovers (Chipley et al. 2003).

No maternity roost trees or hibernacula have been reported for NLEB in North Dakota (USFWS 2019b). While some small forests, woodlots, and shelterbelts may provide suitable summer habitat for NLEB, maternity roosts are unlikely within the Project Boundary given a lack of available forested habitat. This species may occur as spring or fall migrants within the Project.

Potential suitable stopover habitat may exist within the Project Boundary for whooping cranes. The Tier 2 desktop stopover habitat assessment was conducted to assess the likelihood of whooping crane stopover use within the Project Boundary relative to four reference areas (Atwell 2021a). This assessment was conducted for a December 2020 Project Boundary (hereafter referred to as the whooping crane assessment area) that is similar in size and location to the current Project Boundary and four reference areas (Atwell 2021a). The reference areas were of equal shape and dimension at equal distances from the Project's centroid in each of the four cardinal directions (north, south, east, and west). The reference areas were spaced to be adjacent to, but without overlapping, the whooping crane assessment area. Due to the whooping crane assessment area configuration and to avoid overlap, the west and east reference areas were slightly farther from the whooping crane assessment area than the north and south reference areas. The results of the analysis generally confirmed that on a regional basis, and in comparison, to four reference areas adjacent to the whooping crane assessment area, the Project had been sited in an area that has relatively lower quality and quantity whooping crane stopover habitat. The whooping crane assessment area primarily comprises croplands, has a relatively low proportion of wetland and water habitat, and is located in the 75th percentile of the whooping crane migration corridor. Areas to the west (which are located in the 50th percentile migration corridor) and to the north and east (which have a relatively higher percentage of wetlands and waters) have relatively more potentially suitable whooping crane stopover habitat (Atwell 2021a).

Sharp-tailed grouse is a North Dakota SCP Level II species that likely occurs year-round within the Project (Dyke et al. 2015). This species utilizes a breeding strategy known as "lekking" in which multiple males gather at a particular site to display and compete for spectating females (i.e., potential mates). The North Dakota SWAP identified Logan and McIntosh counties as being entirely within the primary range for this species and indicates that sharp-tailed grouse are most common within the Missouri Slope region. Preferred habitat includes mixed-grass prairie with scattered shrubs or small trees. Leks are generally found on elevated, less vegetated areas

compared to the surrounding area (Dyke et al. 2015). As such, the Project Boundary is likely to contain habitat to support sharp-tailed grouse leks, particularly in the north and northeastern portions of the Project.

Raptors may migrate over the Project Boundary but are generally expected to be dispersed over the broader landscape prior to reaching the Project. Migrating raptor species will often use ridgelines and shorelines of large bodies of water to assist with thermal lift and navigation during migration (Liguori 2005), potentially resulting in high concentrations near these features during migration. Topography throughout most of the Project Boundary is generally similar to the surrounding landscape and is not expected to attract or concentrate migrating raptors. However, steeper topographic relief associated with the Missouri Coteau in the northern and northeastern portions of the Project has potential to create thermals and attract migrating raptors. Furthermore, grassland and wetland habitats located in the northern and northeastern portions of the Project Boundary may provide a larger prey base for raptors compared to the more cropland-heavy areas in the southern portion of the Project. Therefore, raptor use may be relatively higher in northern and northeastern portions of the Project.

No landscape features identified within the Project Boundary are expected to concentrate migrating passerines, which could result in higher-than-expected fatality rates. The Project is predominantly herbaceous/grassland and cultivated cropland, with very little forested and wetland habitat. No particular habitat resources are likely to attract passerine migrants to the Project.

5. Using best available scientific information has the developer or relevant federal, state, tribal, and/or local agency identified the potential presence of a population of a species of habitat fragmentation concern?

Within North Dakota, there are 19 species identified as Species of Habitat Fragmentation Concern (SHFC; USFWS 2013b) of which 18 have the potential to occur within the Project (Table 3). These bird species are dependent on large tracts of unbroken grasslands and or wetland habitats and may be susceptible to fragmentation from Project infrastructure. Due to the loss of these habitats and increased fragmentation of available habitats, breeding success of these species has declined (USFWS 2013b; eBird 2023; NatureServe 2023). The Project Boundary consists of 47.4% herbaceous/grasslands and 2.6% of water/wetlands (NLCD 2021).

Table 4.2. Species of Habitat Fragmentation Concern in Logan and McIntosh counties, North Dakota, and their potential to occur within the Badger Wind Project.

Common Name	Scientific Name	Status	Potential to Occur[2]
Baird's Sparrow	*Centronyx bairdii*	BCC; SHFC	Y
Burrowing Owl	*Athene cunicularia*	SHFC	Y
Chestnut-Collared Longspur	*Calcarius ornatus*	BCC; SHFC	Y
Clay-Colored Sparrow	*Spizella pallida*	SHFC	Y
Greater Prairie-Chicken	*Tympanuchus cupido*	SHFC	Y
Greater Sage-Grouse	*Centrocercus urophasianus*	SHFC	N
Grasshopper Sparrow	*Ammodramus savannarum*	BCC; SHFC	Y
Lark Bunting	*Calamospiza melanocorys*	SHFC	Y
LeConte's Sparrow	*Ammodramus leconteii*	BCC; SHFC	Y
Long-Billed Curlew	*Numenius americanus*	BCC; SHFC	Y
Marbled Godwit	*Limosa fedoa*	BCC; SHFC	Y
Northern Harrier	*Circus hudsonius*	BCC; SHFC	Y
Savannah Sparrow	*Passerculus sandwichensis*	SHFC	Y
Sedge Wren	*Cistothorus platensis*	SHFC	Y
Sprague's Pipit	*Anthus spragueii*	BCC; SHFC	Y
Upland Sandpiper	*Bartramia longicauda*	SHFC	Y
Western Meadowlark	*Sturnella neglecta*	SHFC	Y
Willet	*Tringa semipalmata*	BCC; SHFC	Y
Wilson's Phalarope	*Phalaropus tricolor*	SHFC	Y

[1]. BCC = Federal Bird of Conservation Concern; SHFC = Species of Habitat Fragmentation Concern.

[2]. Y = Yes: the area overlaps the species' known current distribution, the area contains suitable habitat, or the area contains previous records of the species; N = No: the areas is located outside the species' known distribution, no previous records were found of the species in the area, or the area does not contain suitable habitat.

Sources: USFWS 2013b; eBird 2023; NatureServe 2023.

6. Which species of birds and bats, especially those known to be at risk by wind energy facilities, are likely to use the proposed site based on an assessment of site attributes?

Landscape characteristics within the Project Boundary and publicly available information of distribution ranges, habitat requirements, and known occurrences in North Dakota collectively indicate that several species of birds and bats known to be vulnerable to impacts from wind energy facilities may use the Project on a limited basis. These species also have potential to use relatively higher quality habitat in the vicinity of the Project Boundary. These species include, but are not limited to, cave and tree-roosting migratory bats, nesting and migrating raptors (i.e., bald eagles and other non-eagle raptors), and breeding and migratory birds, including whooping cranes that will likely migrate over the Project during spring and fall migration periods. Project development is not expected to have significant adverse impacts on bird and bat species.

4.1.5 Cave and Tree-roosting Migratory Bats

As previously mentioned, 11 species of bats are known to occur in North Dakota, six of which may occur within the Project Boundary. This includes big brown bat, eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), little brown bat, NLEB, and silver-haired bat (*Lasiurus cinereus*; NDGF 2016c; NDGF 2016d; BCI 2019). The NLEB, is ESA-listed as endangered (USFWS 2023a) and is also considered a Level I North Dakota SCP. Two additional species, big brown bat and little brown bat are also considered Level I North Dakota SCP. SCP are a

conservation priority for the state under the North Dakota SWAP (Dyke et al. 2015) but are not protected under state law. The little brown bat is known for forming maternity colonies in artificial structures and foraging over water (BCI 2019). The little brown bat was heavily impacted by white-nose syndrome (WNS) in the eastern part of its range and is currently under review for federal listing (USFWS 2019e).

Arnett and Baerwald (2013) summarized the results of post-construction bat mortality monitoring studies at wind facilities across five regions in the United States and Canada between 2000 and 2011. The Great Plains region (which includes North Dakota) had moderately high fatality rates on average, though results were highly variable. This region had the second lowest fatality estimate of the five regions examined (Arnett and Baerwald 2013). While Arnett and Baerwald (2013) do not focus heavily on habitat features, they note that wind facilities within the Great Basin/Southwest Open Range-Desert region typically reported the lowest mean fatality rates and were generally located in areas with few roosting and foraging areas, and possibly outside of migratory pathways (Arnett and Baerwald 2013). This suggests that placing turbines away from potential roosting and foraging areas may help to reduce bat fatalities. Given the overall land cover within the Project Boundary, the Project is not expected to take bats at a greater rate than other wind facilities in the Great Plains region.

Migratory tree bats are among the most affected species at wind farms across North America and Canada (Arnett and Baerwald 2013). Collision risk for bats within the Project Boundary is expected to follow national trends with migratory tree bats, such as eastern red, hoary, and silver-haired bats, comprising the majority of fatalities. It is unlikely that bats would utilize the Project for summer roosting given the relative lack of forested roosting habitat within the Project Boundary. More likely utilization of the Project would be during migration.

The known distribution and specific habitat requirements of NLEB indicate that this species could potentially occur within the Project Boundary (USFWS 2019f). In particular, this species may occur as a migrant within the Project, but the absence of high-quality woodlands within the Project Boundary limit the species' likelihood to occur. Limited patches of deciduous woodland that may provide summer roosting habitat and foraging habitat exist within the Project.

Using aerial imagery, potential bat habitat was delineated within the Project Boundary by using a 1,000-ft buffer around forested areas greater than 5 ac and around connective woodlands (i.e., forest patches of less than 5 ac connected to the larger forest parcels; See Section 5, Figure 5.6). The highest concentration of bat habitat occurs south of the Project Boundary and is generally associated with shelterbelts (Figure 5.6). Bat use is expected during the summer months, with potential risk greater during the fall migration period.

4.1.6 Nesting and Migratory Raptors

The predominance of open, agricultural cropland and herbaceous/grassland habitat greatly reduces the Project's suitability for tree-nesting raptors. Occasional shelterbelts and small woodlots identified during site reconnaissance may provide suitable raptor nesting habitat, but the overall density of breeding raptors in the Project is expected to be low. BGEPA species and

state raptor SCP with potential to occur within the Project Boundary are discussed in more detail below.

Bald eagles are known to occur within Logan and McIntosh counties (AKN 2019). This species prefers to nest in tall trees near bodies of water where prey resources (e.g., fish, waterfowl) are available (Buehler 2000). While the Project generally lacks the habitat features typical for nesting bald eagles, the NDGF indicated that bald eagles have nested in Kidder County, north of the Project Boundary (Johnson 2009), and an increasing bald eagle population in the state (NDGF 2022) may indicate a possibility that bald eagle nests exist in Logan and McIntosh counties. Therefore, this species likely uses the Project, most likely during both spring and fall migration periods. The absence of large riparian zones, lakes, and other concentrating natural features may decrease bald eagle use of the Project. Bald eagle winter roosts likely do not occur within the Project Boundary because few habitat features conducive to large winter roosts, such as larger super-canopy trees within a woodland tract near water, are present (Buehler 2000).

As previously mentioned, golden eagles are more likely to nest in the western portion of North Dakota (Dyke et al. 2015; AKN 2019); however, this species is known to have a limited and scattered presence in the vicinity of the Project Boundary and may occur within the Project during spring and fall migratory periods, as well as in winter (AKN 2019).

The Project also has potential habitat to support other species of breeding and migratory raptors, such as red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (SCP Level I), Swainson's hawk (SCP Level I), and northern harrier (SCP Level II) among others. Beston et al. (2016) found that in general, Accipitriformes (i.e., diurnal birds of prey) tended to have a higher proportion of fatalities due to turbines and a higher risk of turbine-caused fatality compared to other species groups. The risk of collision mortality for some raptor species, such as northern harrier, tended to be rather low (Smith et al. 2011; Beston et al. 2016)

Eagles and other raptors are likely to occur during all seasons with the potential risk being greater during the spring and fall migration periods.

4.1.7 Breeding and Migratory Birds

A variety of migratory birds may move through and utilize the Project seasonally. Neotropical migrant species likely move over the Project Boundary during both during the day and nocturnally (AKN 2021). The Project includes limited woodland and/or shrubland habitat that could be used by neotropical migrants during stopover events. Habitat and topographical features found within the Project Boundary are not expected to attract large congregations of birds during migration at a rate greater than the surrounding landscape. Although habitat features (e.g., water bodies, escarpments, conservation areas) that would concentrate large numbers of birds are minimal throughout most of the Project Boundary, the occurrence of any scattered wetlands, small open water features, or seasonally flooded agricultural fields could potentially provide stopover or breeding habitat for shorebirds, waterbirds, and waterfowl species. The northeastern portion of the Project contains prairie potholes and relatively larger tracts of herbaceous land cover. This

area may receive higher use by waterfowl, waterbirds, shorebirds, and grassland birds compared to more southern portions of the Project.

At the time of Tier 1 and 2 studies, the USFWS list of BCC species for the Prairie Potholes BCR contained 27 species. IPaC analyses for the Project Boundary specifically indicate 26 BCC species that are either BCC for the Prairie Potholes BCR or BCC throughout their ranges within the continental United States and Alaska. These include species with potential to breed within or migrate through the Project Boundary (Table 4.1).

Several avian species are common in agricultural areas of North Dakota and have potential to occur in the Project. In particular, the horned lark (*Eremophila alpestris*) is one of the most widely distributed species in North America (Beason 2020), and dramatic declines are widespread (Sauer et al. 2017). Horned Larks are one of the most commonly recorded mortalities at North American wind farms (Erickson et al. 2001; Erickson et al. 2014).

7. Is there a potential for significant impacts to species of concern based on the answers to the questions above, and considering the design of the proposed site?

The potential for significant impacts to SOC within the Project is expected to be low. Like other wind energy projects in the Midwest, there is potential for the Project to impact some bird and bat species of conservation concern, including TES and SCP, migratory bat species, migrating and nesting raptors, and grassland birds. Siting of Project infrastructure in agricultural lands and away from proximate areas of relatively higher quality habitat and the avoidance of herbaceous/grassland is expected to reduce impacts to SOC. Adverse population-level impacts to SOC are unlikely to occur. Minimizing turbine placement within the vicinity of wetland-grassland complexes to the greatest extent practicable will likely reduce direct impacts to avian species, such as collisions with turbines and habitat loss, as well as indirect impacts, such as displacement (Shaffer and Buhl 2016). Reducing turbine placement within suitable bat habitat and a 1,000-ft buffer to the greatest extent practicable may help to reduce impacts to bats during Project operation. Impacts to woodland habitat will be avoided where practicable; if tree removal is unavoidable, this removal will be completed in accordance with tree clearing restrictions for NLEB (USFWS 2023a) or coordinated with USFWS prior to tree clearing activities.

Based on the responses provided to Questions 1-7, adverse population-level impacts to SOC are not expected to occur.

4.2 Tiers 1 and 2 Decision Point

Tier 1 and Tier 2 review results indicated that ESA-listed species have known ranges that intersect the Project Boundary and habitat for these species may exist within the Project Boundary. While a large portion (42.9%) of the Project Boundary consists of active croplands; mixed grass prairie, planted grasslands, and herbaceous riparian areas accounts for 47.4% of the Project Boundary. These communities are present particularly in the northern and northeastern portions of the Project. Open water and wetland habitat (2.6% of the Project Boundary) is also present, including prairie potholes in the northeastern portion of the Project (USGS 2020a). These habitats may

attract a variety of avian SOC, including TES and SCP. Several species identified as SCP are also susceptible to grassland habitat fragmentation.

Several bat species are likely to migrate through the Project. The potential for maternity roosts of protected bat species to occur within the Project Boundary is low, as minimal habitat exists within the Project. While bald eagle nests are not known to occur in Logan or McIntosh counties, the nesting bald eagle population in North Dakota is increasing, and habitat within the vicinity of the Project Boundary may support nests that were not previously known. Furthermore, bald eagles may move through the Project during migration or travel between foraging and breeding or roosting sites. Similarly, a variety of other breeding and migratory raptors, land birds, waterfowl, and shorebirds are likely to use the Project and surrounding region.

Tier 3 field studies provide additional information to further assess potential impacts to bird and bat species that may use the Project, such as migratory tree bats, breeding and migratory birds, sharp-tailed grouse, and nesting and migratory raptors. Based on the Tier 1 and 2 analysis, Tier 3 pre-construction studies were concluded to be warranted to further assess the potential for direct and indirect impacts from the Project on bird and bat species. In the interest of completing a more robust due diligence Badger Wind completed a full suite of Tier 3 field studies including avian point count surveys, nesting eagle and raptor surveys, prairie grouse lek surveys, bat acoustic surveys, whooping crane habitat assessment, grassland habitat mapping, and wetland delineations and mapping.

5.0 TIER 3 – FIELD STUDIES TO DOCUMENT SITE WILDLIFE AND HABITAT AND PREDICT PROJECT IMPACTS

Based on the results of the Tier 1 and 2 reviews and in coordination with USFWS and NDGFD input, Tier 3 surveys (Table 5.1) were designed and completed at the Project Boundary and vicinity to understand wildlife usage, evaluate risk, and inform siting and operational protocols. Tier 3 pre-construction studies for the Project were conducted from May 2019 to November 2023, based on Tier 1 and Tier 2 analyses and coordination with USFWS and NDGF (Table 1.1). As described previously in Section 2, the Badger Wind Project Boundary has been reconfigured over the course of Project development. Tier 3 field studies were developed using various Project boundaries as Badger Wind progressed through the WEG. All map figures included in this BBCS show the Project Boundary. A discussion of applicability of these survey results relative to the 2023 Project Boundary can be found in Section 6 - Facility Design To Reduce Wildlife Conflict. Final reports for Tier 3 studies are provided in Appendix B.

Table 5.1. Avian, bat, and habitat monitoring and survey efforts conducted for the Badger Wind Project, Logan and McIntosh counties, North Dakota.

Study Type	Study Period	Reference
Avian Use Surveys	May 2019 – April 2020	Atwell 2020c
Avian Use Surveys	May 2020 – April 2021	Atwell 2021c
Avian Use Surveys	August 2023 – Present	---
Raptor Nest Survey and Monitoring	April 2019	Atwell 2020c
Raptor Nest Survey and Monitoring	April, May 2020	Atwell 2021c
Prairie Grouse Lek Monitoring	May 2019	Atwell 2020c
Prairie Grouse Lek Monitoring	April 2020	Atwell 2021c
Bat Acoustic Monitoring	May – October 2019	Atwell 2020b
Bat Acoustic Monitoring	April – October 2020	Atwell 2021b
Northern Long-eared Bat Habitat Assessment	January 2020	Atwell 2020a
Whooping Crane Habitat Assessment	September 2021	Atwell 2021a
Sharp-tailed Grouse Conservation Plan	November 2021	LeBeau et al. 2021
Native Grassland Assessment	September 2021 and 2023	Chodachek and Piorkowski 2024
Aquatic Resources Inventory	September and October 2020, September and October 2021, and May 2022	Atwell 2022
Wetlands and Waterbody Mapping	October and November 2023	Chodachek and Welsch 2024

5.1 Birds

5.1.1 Eagle Use and Avian Point Count Surveys

Atwell, LLC (Atwell) conducted eagle use and avian use point count studies between May 2019 and April 2021 (Atwell 2020c; Atwell 2021c; Appendix B) and WEST started eagle use surveys in August 2023. The objective of these surveys was to evaluate species composition and seasonal and spatial use of the Project Boundary by birds, with a particular focus on eagles and SOC. Survey methods were developed in accordance with recommendations outlined in the WEG (USFWS 2012), Appendix C(1)(a) of the ECPG (USFWS 2013), December 2016 Final Eagle Rule (USFWS 2016) and recommendations from USFWS and the NDGFD. Figure 5.1 provides an overview of the points inside the current Study Area and current Project Boundary.

2019 − 2020

Atwell conducted eagle use and avian point count surveys between May 2019 and April 2020 (2020c). A total of 53 point-count stations were included in surveys, which encompassed the Study Area and Project boundary (Figure 5.1). All 53 point-count stations were surveyed for eagles and other raptors out to 800 meters (m; the sample plot) for 60 minutes, typically once per month, when practicable. Due to the inaccessibility of some point count stations between late fall and early spring, some points were not surveyed every month, whereas others were surveyed twice per month to achieve survey effort goals. For avian use surveys, the same 53 point count stations were surveyed for all avian species out to 150 m for small-bodied bird species and 800 m for larger-bodied bird species for 10 minutes, typically once per month (when practicable) during the spring (May 2019 and March and April 2020) and fall (August through November 2019) monitoring periods (Atwell 2020c).

2020 − 2021

Atwell conducted eagle use and avian point count studies at the same 53 point-count stations between May 2020 and April 2021 (2021c). The 53 point-count stations encompassed the Study Area and Project boundary (Figure 5.1). Eagles and other raptors were recorded within the sample plot for 60 minutes, typically once per month, when practicable. Due to the inaccessibility of some point count stations between late fall and early spring, some points were not surveyed every month, whereas others were surveyed twice per month to achieve survey effort goals. For diurnal avian activity surveys, the same 53 point count stations were surveyed for all avian species out to 300 m for small-bodied bird species and 800 m for larger-bodied bird species for 10 minutes, typically once per month (when practicable) during the spring (May 2020 and March and April 2021) and fall (August through November 2020) monitoring periods (Atwell 2021c).

2023 − 2024

WEST began eagle use studies at 12 point-count stations within the Project Boundary in August 2023 (Figure 5.1). Eagles and other large birds are recorded within the sample plot for 60 minutes, typically once per month, when practicable. These surveys are ongoing as of January 2024 and will continue until August 2024.

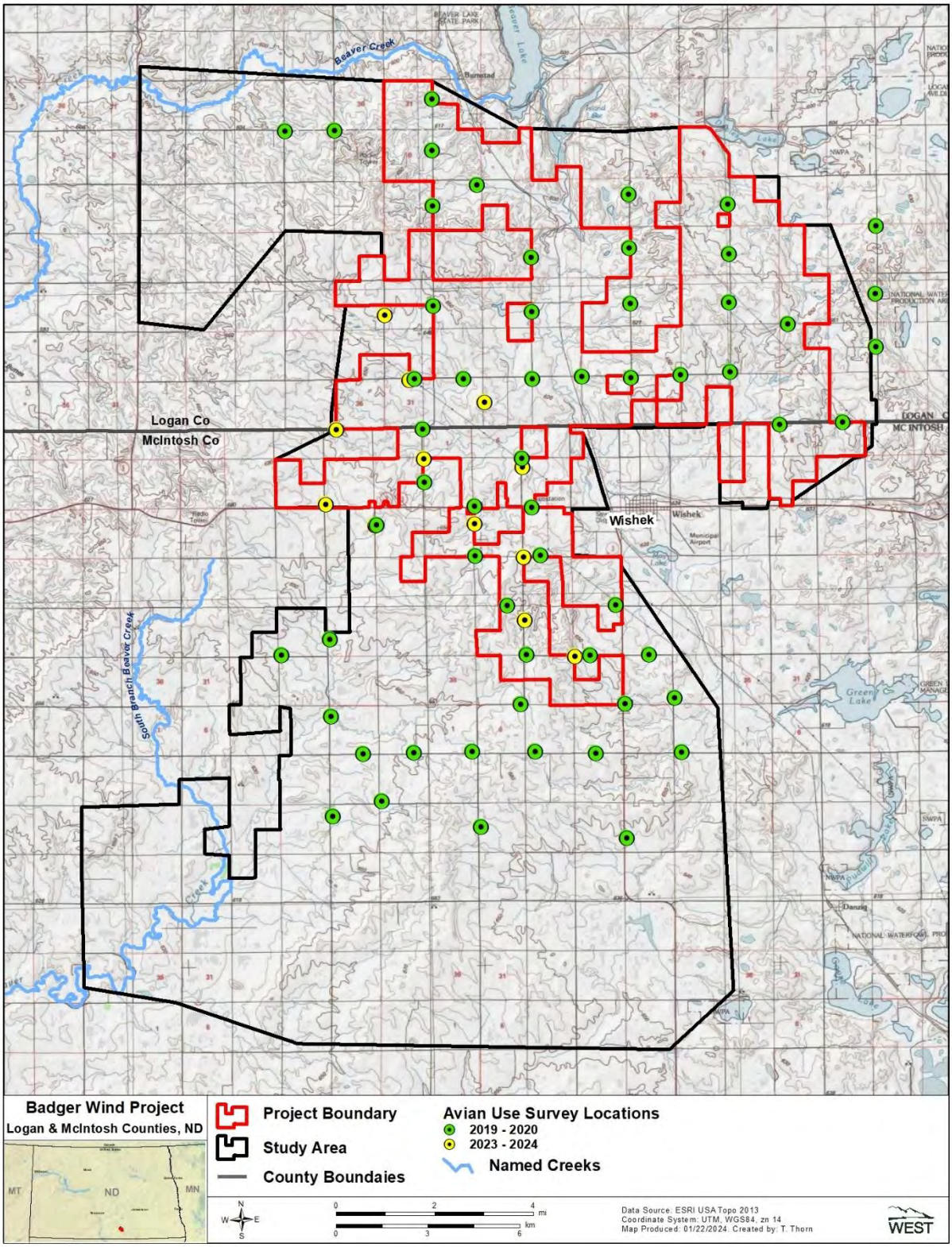


Figure 5.1. Location of fixed-point avian use survey locations and associated 800-meter radius plots for avian use surveys completed from May 2019 – April 2021 and August 2023 – Present at the Badger Wind Project in Logan and McIntosh counties, North Dakota.

5.1.2 Bald Eagle and Raptor Nest Surveys

Atwell, LLC (Atwell) conducted eagle and raptor nest surveys in May 2019 and April and May 2020 (Atwell 2020c; Atwell 2021c; Appendix B). The objective of surveys was identify and record the location and status of all eagle nests within the Project Boundary and surrounding areas. Survey methods were developed in accordance with recommendations outlined in the ECPG (USFWS 2013) and December 2016 Final Eagle Rule (USFWS 2016). Figures 5.2 and 5.3 provide an overview of the survey areas within the current Study Area and Project Boundary.

2019 Surveys

Eagle and raptor nest surveys were conducted by Atwell on May 1–3, 2019 (Atwell 2020c). The raptor nest survey area encompassed the Project Boundary and extended out 2 mi from the Study Area boundary (raptor nest survey area) and 10 mi from the Study Area boundary (eagle nest survey area; Figure 5.2). All non-eagle raptor nests were recorded within the raptor nest survey area and all eagle nests were recorded within the eagle nest survey area. Aerial transect surveys were flown via a fixed-wing Cessna Skyhawk 172M, with transects spaced 0.5 mi apart (Atwell 2020c). One active bald eagle nest (BAEA19_01) was located during the 2020 surveys (Atwell 2020c; Figure 5.2).

2020 Surveys

Eagle and raptor nest surveys were conducted by Atwell during April and May of 2020 through a combination of targeted aerial surveys conducted on April 10, 2020, and ground-based surveys that continued through May 15, 2020 (Atwell 2021c). Flight time was restricted to one day of aerial surveys due to safety concerns regarding: (a) the COVID-19 coronavirus outbreak across the United States, and (b) recent aircraft incidents associated with aerial wildlife surveys at other proposed wind facilities in the region. Areas targeted for aerial surveys included the following:

- Roadless portions of the eagle nest survey area.
- Habitat-based focal areas within the eagle nest survey area, which were identified using desktop analysis of the eagle nest survey area. Large bodies of water, riparian areas, and areas with large trees that could serve as potential eagle nesting sites were prioritized when identifying target areas.
- Known eagle nests and nests of other raptor species that were found during the Year 1 survey in 2019.

Within most targeted areas, north–south oriented transects were flown via a fixed-wing Cessna Skyhawk 172M with transects spaced 0.5 mi apart. However, riparian-based transects were flown along the northern and southern edges of the Beaver Creek riparian corridor between Beaver Lake and the western edge of the eagle nest survey area. All raptor nests were recorded within the Study Area and a 2-mi buffer and all eagle nests were recorded within the Study Area and a 10 mi buffer, both of which encompassed the Project Boundary (Figure 5.3).

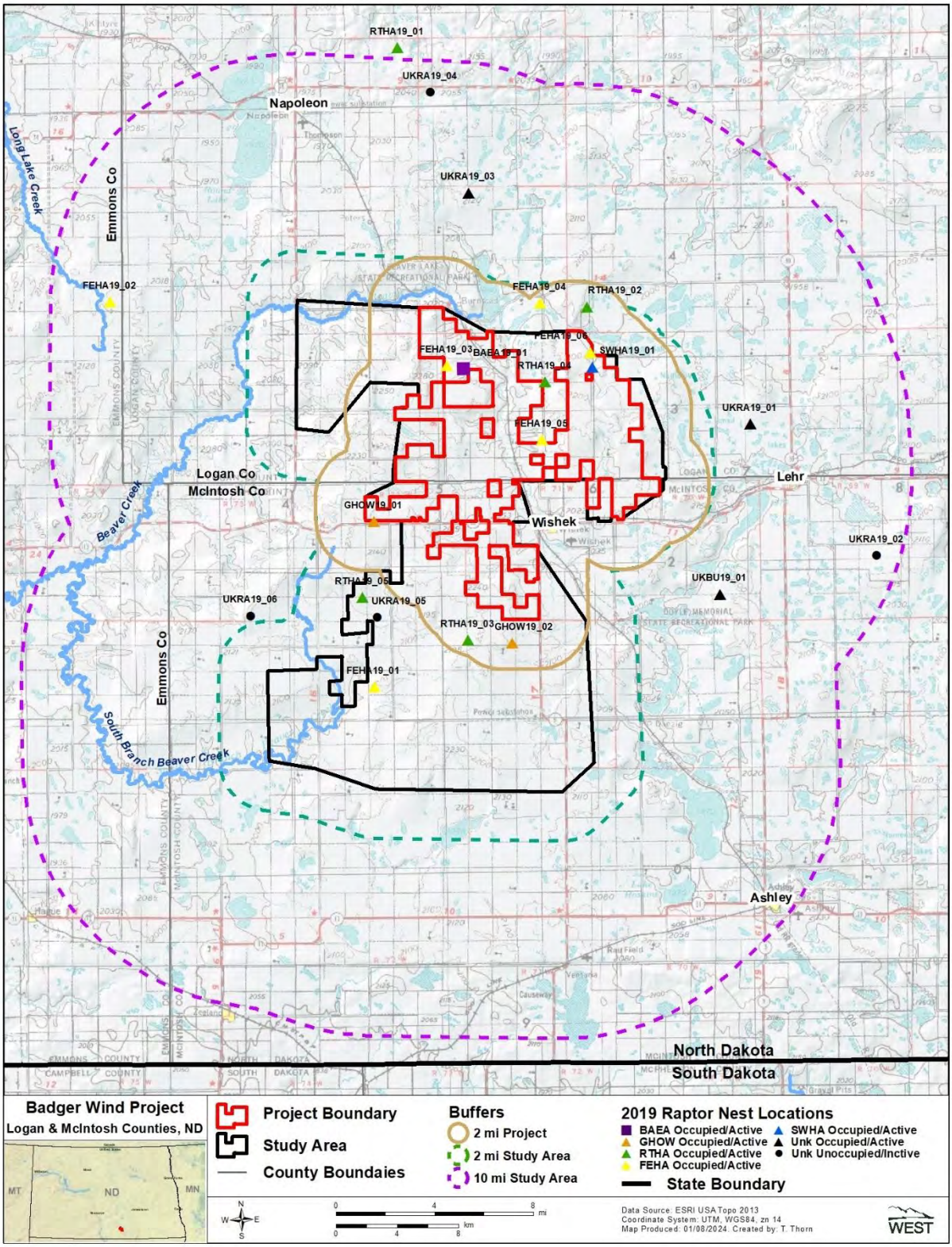


Figure 5.2. Raptor nest locations for surveys conducted in 2019 within the Badger Wind Project in Logan and McIntosh counties, North Dakota and a 10-mile buffer.

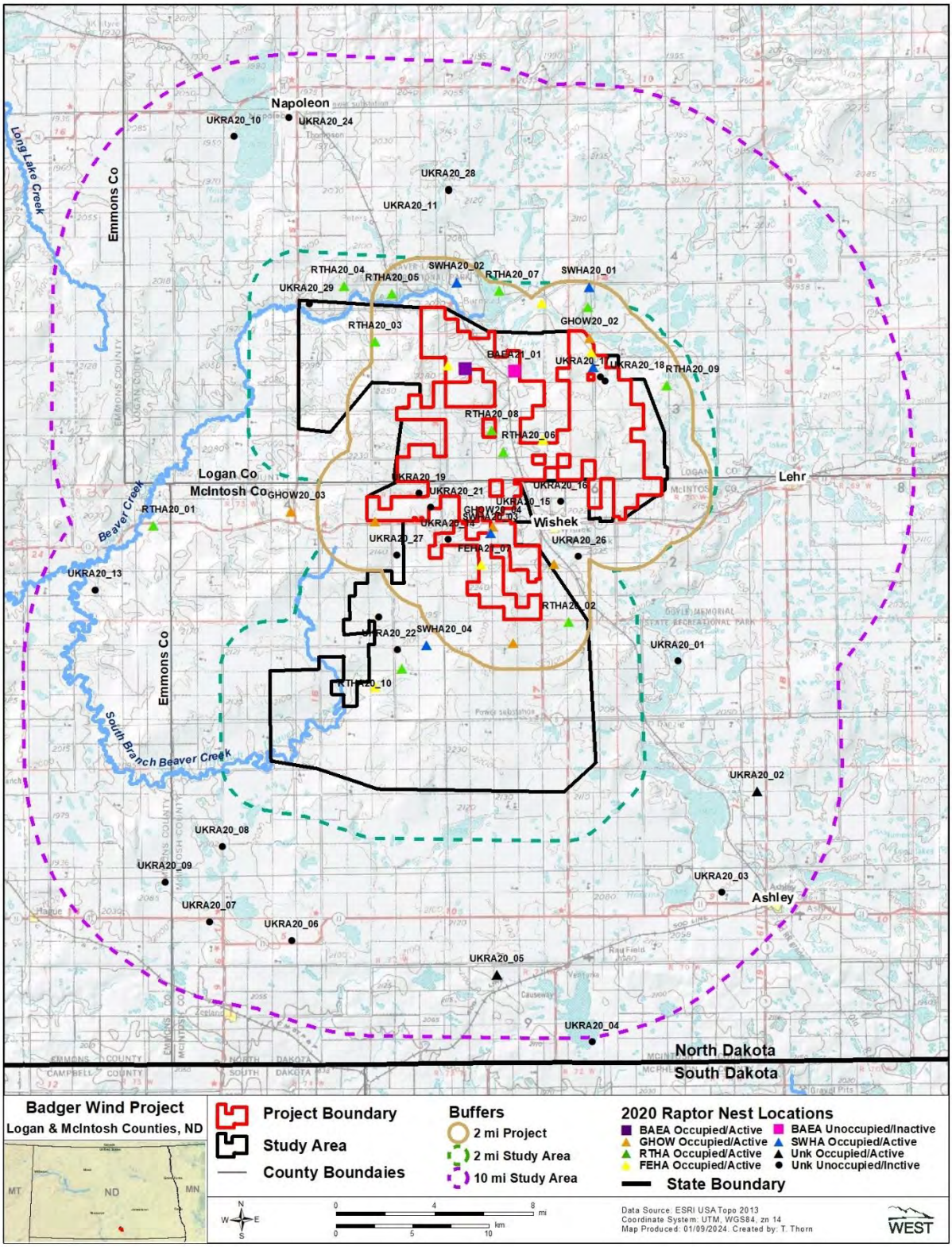


Figure 5.3. Raptor nest locations for surveys conducted in 2020 within the Badger Wind Project in Logan and McIntosh counties, North Dakota and a 10-mile buffer.

In addition to aerial nest surveys, all raptor nests that were incidentally found during other tier 3 surveys and incidentally were also mapped and assessed for nesting status, and were added to the project nest database. Ground-based follow-up surveys were conducted to confirm species and status for nests that could not be attributed to species during the aerial survey (Atwell 2021c). One occupied active bald eagle nest (BAEA19_01) and one unoccupied inactive large stick nest (BAEA21_01) were located during surveys in 2020 (Atwell 2021c; Figure 5.3).

2021 Surveys

Nest surveys were not conducted in 2021; rather Atwell incidentally observed an adult bald eagle on the large stick nest (BAEA21_01) discovered during 2020 surveys (Atwell 2021c). Nest BAEA21_01 was occupied active and after sever nest checks, nest BAEA19_01 was classified as missing (Atwell 2021).

2024 Surveys

A ground-based nest verification check for BAEA19_01 and BAEA21_01 nest locations was conducted by WEST (Chodachek 2024) on January 5, 2024. The biologist spent a maximum of 15 minutes at each nest location to verify their presence from a public road within line of sight of the nest. Data recorded included date of the survey, time of survey, weather conditions at the time of survey, nest status, nest condition, nest substrate, and any relevant comments. Nest BAEA21_01 was present with an undetermined status during the nest check and nest BAEA19_01 was missing (Chodachek 2024).

5.1.3 Sharp-tailed Grouse Lek Surveys

Atwell, LLC (Atwell) conducted aerial and ground based lek surveys in May 2019 and April and May 2020 (Atwell 2020c; Atwell 2021c; Appendix B). The objective of lek surveys was identify and record the location and status of all sharp-tailed grouse leks within the Project Boundary and vicinity. Survey methods were developed in accordance with recommendations outlined in the WEG (USFWS 2012), NDGF SWAP, and the Nebraska Game and Parks Commission Avian Assessment Guidance for Wind Energy Facilities in Nebraska version 3.5 (NGPC 2018). Figure 5.4 provides an overview of the survey area within the current Study Area and Project Boundary.

2019 Sharp-tailed Grouse Lek Surveys

Sharp-tailed grouse lek surveys were conducted by Atwell between May 2 and May 10, 2019 (2020c). The grouse survey area encompassed the Project Boundary and extended 1 mi from Study Area boundary. Aerial transect surveys were flown via a fixed-wing Cessna Skyhawk 172M with transects spaced 0.5 mi apart. Surveys began approximately 10 minutes before sunrise and ended approximately two hours after sunrise. Confirmed leks were defined as two or more birds together, with at least one male displaying. Possible leks were defined as auditory detections of multiple grouse that could not be verified visually after their initial detection on a ground-based survey (Atwell 2020c). One sharp-tailed grouse lek location and two possible lek locations were recorded during surveys (Figure 5.4).

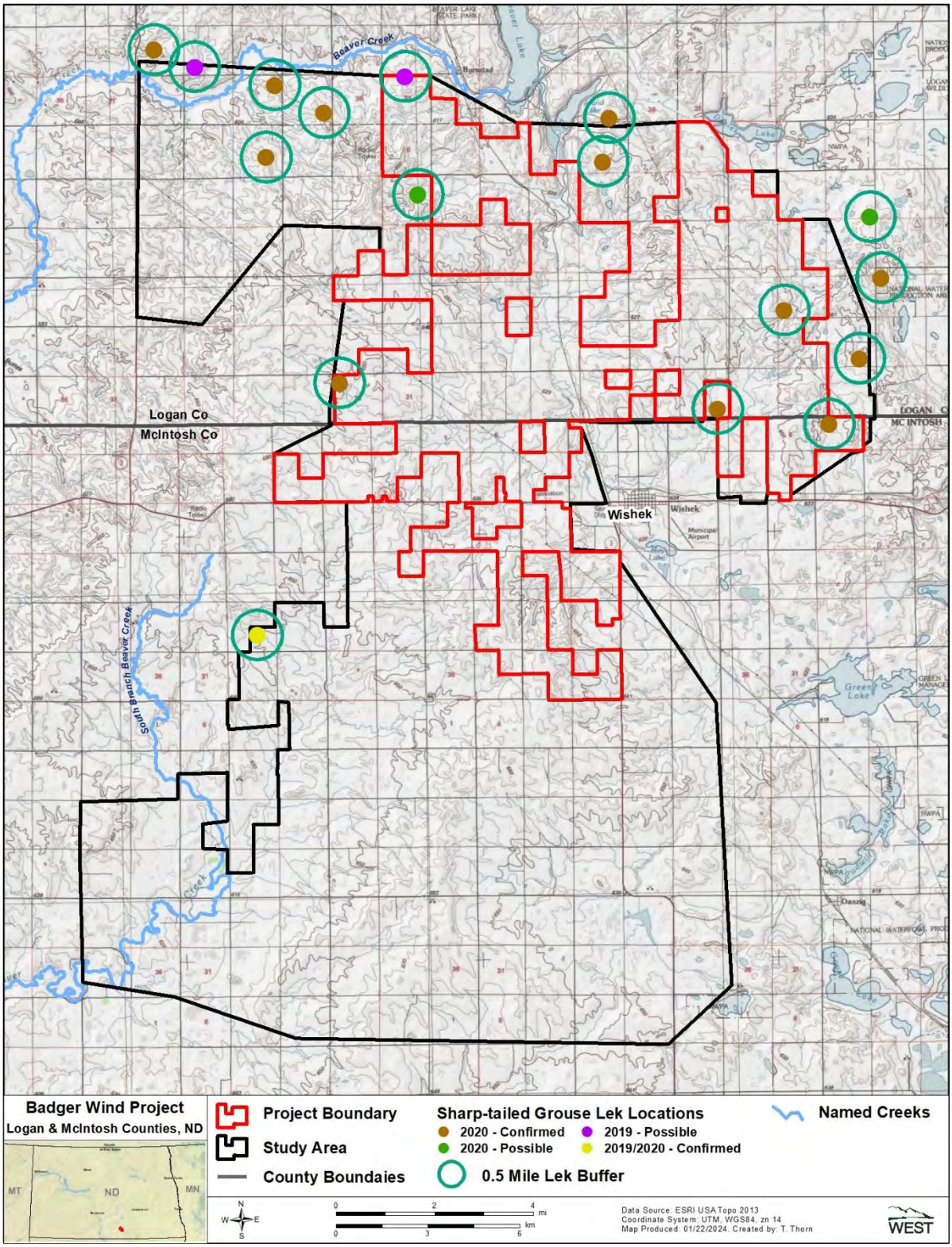


Figure 5.4. Sharp-tailed grouse lek locations surveyed in 2019 and 2020 at the Badger Wind Project in Logan and McIntosh counties, North Dakota.

2020 Sharp-tailed Grouse Lek Surveys

Atwell conducted sharp-tailed grouse lek surveys using both aerial and ground-based survey methods (2021c). Targeted portions of the Study Area were assessed via aerial transects on April 10, 2020. As described above (see Section 5.1.2), safety concerns limited flight time to one morning of aerial surveys that targeted specific areas within the Study Area and focused on portions of the Study Area that could not be reached or observed from publicly accessible roadside vantage points. Targeted aerial survey areas were believed to have a higher likelihood of harboring grouse leks based on the following:

- Results from 2019 aerial grouse lek surveys.
- Observations of grouse recorded incidentally during Year 1 and avian use surveys.
- Identification of potential sharp-tailed grouse breeding habitat through desktop review.

Three rounds of ground-based surveys were completed in additional parts of the Study Area from April 11 - May 15, 2020 (Atwell 2021c). Survey rounds were spaced 8 to 10 days apart. During each survey round, a biologist surveyed 77 publicly accessible roadside points spaced 0.5 miles (800 m) apart for two minutes, scanning visually and listening for sharp-tailed grouse vocalizations and other non-vocal sounds associated with lekking behavior. Twelve sharp-tailed grouse lek locations and two possible lek locations were recorded during surveys (Figure 5.4).

2021 Sharp-tailed Grouse Conservation Plan

To evaluate potential impacts to the local sharp-tailed grouse population at both the landscape and site-specific levels, various available resources and existing literature were reviewed and summarized in the sharp-tailed grouse conservation plan (see North Dakota Public Service Commission [PSC] Case PU-22-086, Exhibit 10; LeBeau et al. 2021). Based on this review, sharp-tailed grouse are most likely to occur in suitable habitat in the northern portion of the Project Boundary. To minimize impacts, wind turbines will be placed within previously fragmented areas, specifically avoiding areas in the northern portion of the Project Boundary and by siting turbines away from leks where the majority of seasonal habitat use by sharp-tailed grouse is expected to occur.

5.2 Bats

5.2.1 Bat Acoustic Surveys

Atwell, LLC (Atwell) conducted acoustic bat surveys between May – October 2019 and April – October 2020 (Atwell 2020b and Atwell 2021b; Appendix B). The objective of these surveys was to evaluate species composition and seasonal and spatial use of the Project Boundary by bats. Survey methods were developed in accordance with recommendations outlined in the WEG (USFWS 2012). Figure 5.5 provides an overview of the detector locations.

2019 Acoustic Bat Surveys

Acoustic bat monitoring occurred within the Study Area from May 23–October 16, 2019, at one meteorological evaluation tower (MET tower) and four ground-based locations representative of potential turbine locations within the Project Boundary and surrounding area (Figure 5.5). The raised MET tower location was paired with a ground-based location. Three of the four locations

are located within the Project Boundary, while the fourth ground unit was placed approximately two mi southwest of the Project Boundary (Figure 5.5). Song Meter full spectrum ultrasonic detectors (SM3 or SM4) were used throughout the duration of the study. The four ground-based units were deployed May 23, 2019 and remained in place over the course of the entire survey period (with the exception of one unit, which only recorded through October 9, 2019 due to technical issues). The one raised MET tower unit was deployed July 30, 2019, due to damaged MET tower components that delayed deployment until repairs were made. Calls were recorded from one half hour before sunset to one half hour after sunrise. Calls were then analyzed for species identification using Kaleidoscope Pro version 4.2.0 (Kaleidoscope; Wildlife Acoustics 2019). All calls underwent qualitative analysis by a biologist with sufficient bat acoustic call vetting experience through visual comparison of echolocation call metrics (i.e., call sequence activity and call duration, call slope, minimum frequency, and individual call characteristics representative of individual species; Atwell 2020b).

2020 Acoustic Bat Surveys

Acoustic bat monitoring occurred within the Study Area from April 14–October 15, 2020, at two MET towers and four ground-based locations representative of potential turbine locations within the Project (Figure 5.5). Raised MET tower locations were paired with ground-based locations. Song Meter full spectrum ultrasonic detectors (SM3 or SM4) were used throughout the duration of the study. The one raised MET tower was deployed on April 14, 2020, and the four ground-based units were deployed on April 15, 2020. All detectors remained in place over the course of the entire survey period. Calls were recorded from one half hour before sunset to one half hour after sunrise. Calls were analyzed for species identification using Kaleidoscope. All calls identified by the software as a potential *Myotis* species or unidentified species underwent qualitative analysis by a biologist with sufficient bat acoustic call vetting experience through visual comparison of echolocation call metrics (i.e., call sequence activity and call duration, call slope, minimum frequency, and individual call characteristics representative of individual species; Atwell 2021b).

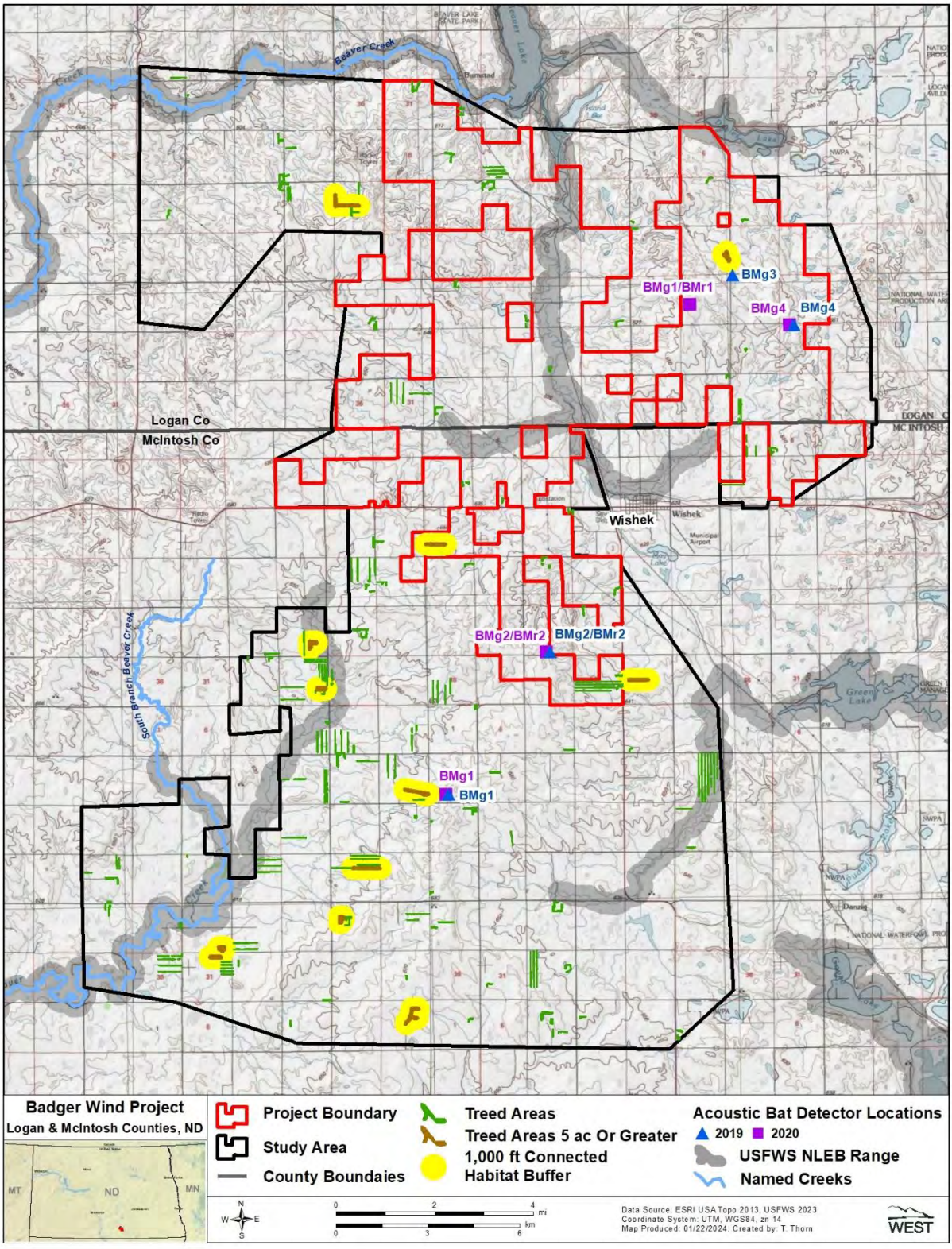


Figure 5.5. Bat resources within the Badger Wind Project in Logan and McIntosh counties, North Dakota.

5.3 Habitat Assessments and Wetland and Waterbody Assessments

5.3.1 2021 Grassland Habitat Assessment

A grassland habitat assessment was completed by WEST (Arellano and Piorkowski 2021) to identify areas of potential unbroken native grasslands (i.e., shows no evidence of soil disturbance) or previously broken grasslands (i.e., soil has been disturbed in some fashion) within the Project Area (2021 Grassland Survey Area; Figure 5.6) to inform proposed development areas. The grassland habitat assessment consisted of a desktop assessment and a field survey. The desktop assessment included a review of publicly available datasets (historical and recent aerial imagery and publicly available land cover databases) and NDGF Native Habitat Layer (NDGF 2016) using Esri software (ArcGIS 10.7). A digital data layer classifying polygons as unbroken or broken grasslands was created and used in the field assessment. During the field survey, a qualified biologist visually assessed the grassland parcels from public roads and on foot where access was permitted between September 29 – October 2, 2021. Areas that differed from the desktop review were delineated and sod types were identified as unbroken native prairie or previously broken grassland. Based on the desktop and field surveys, a total of 3,188.7 ac of grasslands classified as broken and 18,463.0 ac of unbroken grasslands within the 2021 Grassland Survey Area (Figure 5.6).

5.3.2 2023 Grassland Habitat Assessment

A grassland habitat assessment was completed to identify areas of potential unbroken native grasslands or previously broken grasslands within the 2023 Grassland Survey Area (Figure 5.6).. The 2023 Grassland Survey Area was defined by buffering leased lands by one mile that were located outside of the 2021 Grassland Survey Area. The grassland habitat assessment consisted of a desktop assessment and a field survey. The desktop assessment included a review of publicly available datasets (historical and recent aerial imagery and publicly available land cover databases) and the NDGF Native Habitat Layers (NDGF 2016 and 2022) using Esri software (ArcGIS 10.8.1). This resulted in a digital data layer of polygons delineating grassland cover. A qualified biologist completed both pedestrian and ocular surveys from publicly accessible roadsides from August 17 – 18, 2023. Grassland polygons created from the desktop review were confirmed as broken or unbroken, dominant grass and forb species were recorded as indicators of quality, and areas that differed from the desktop review were delineated. Based on the desktop and field surveys, a total of 2,265.8 ac of grasslands classified as broken and 5,804.6 ac classified as unbroken within the 2023 Grassland Survey Area (Figure 5.6).

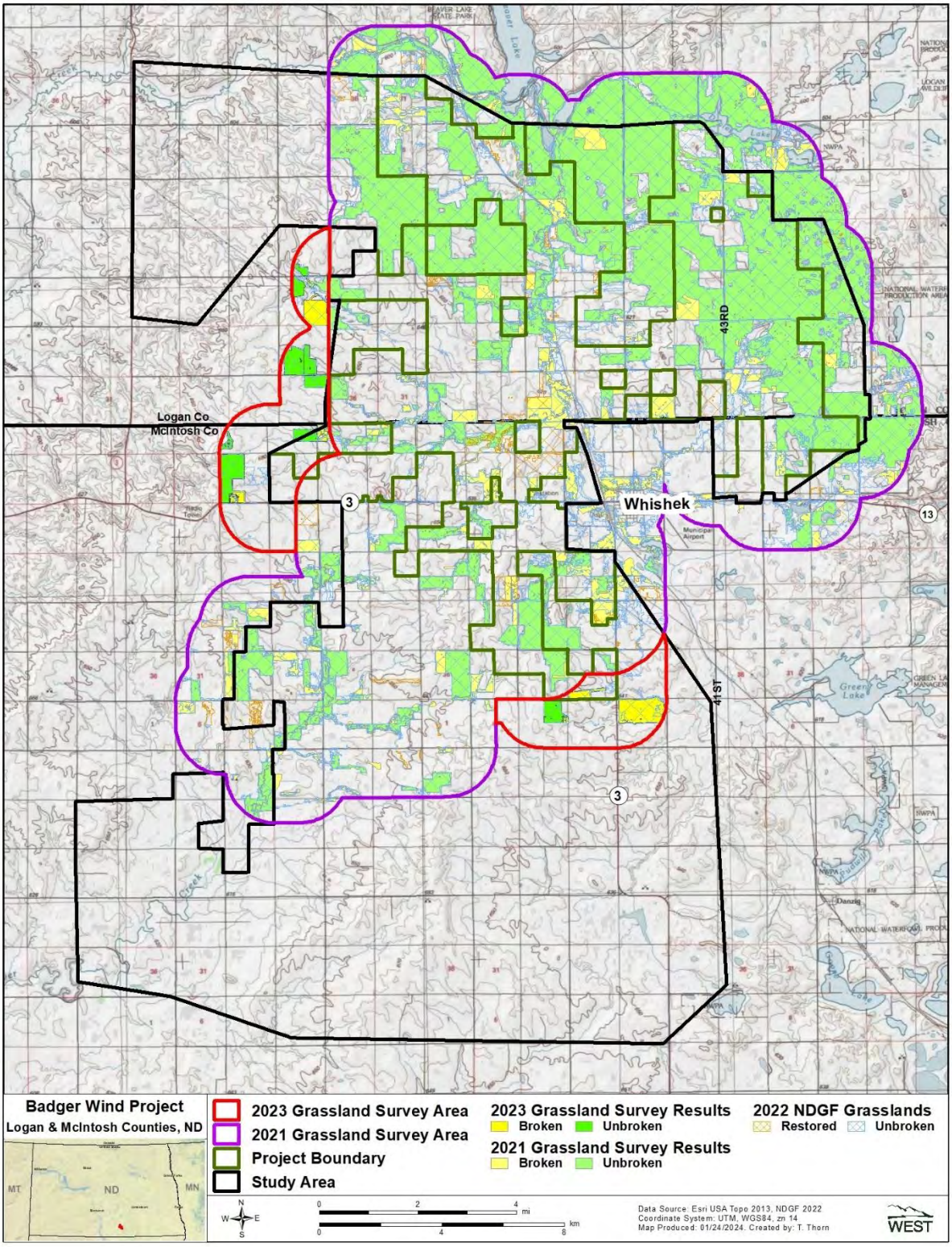


Figure 5.6. Results of the desktop review and field assessment of potential grassland habitat within the 2021 and 2023 Grassland Survey Areas of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021 and August 17 – 18, 2023.

5.3.3 Aquatic Resources Inventory 2020 and 2021

An aquatic resources inventory (AQI) was completed by Atwell and WEST to identify and delineate locations of wetlands and waterbodies within the Project Area (Atwell 2022). The AQI consisted of a desktop assessment and a field verification. The desktop assessment included a review of USGS topographic maps, soil survey information from the Natural Resource Conservation Service (NRCS), USFWS NWI maps, and the USGS NHD. Based on this review, all areas identified as potentially being wetlands or waters of the US (WOTUS) were targeted for field verification. The Survey Area consisted of Project infrastructure, including turbines, access road, crane walk paths, and collection lines that were buffered by 300-ft, 200-ft, 100-ft, and 150-ft, respectively. Qualified biologists completed the field verification in September and October 2020 and September and October 2021.

5.3.4 Aquatic Resources Inventory 2022

An AQI was completed to identify, describe, and document aquatic resource boundary determinations within a revised Project Area. The AQI consisted of a desktop assessment and a field verification. The desktop assessment included a review of USGS topographic maps, soil survey information from the county, USFWS NWI maps, and the USGS NHD, and Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMS). Based on this review, all areas identified as potentially being wetlands or WOTUS were targeted for field verification. The Survey Area consisted of Project infrastructure, including turbines, access roads, crane walk paths, and collection lines that were buffered by 300-ft, 200-ft, 100-ft, and 150-ft, respectively. Qualified biologists completed the field verification in May 2022

5.3.5 Wetlands and Waterboy Assessment 2023

A wetlands and waterbody assessment was completed to identify, delineate, and map locations of wetlands and waterbodies within the 2023 Wetland Survey Area (Figure 5.7). The 2023 Wetland Survey Area consisted of proposed Project infrastructure not previously delineated and infrastructure specific buffers. Buffers included a 250-ft radius centered around turbines, 300-ft wide corridor for turbine access roads, 100-ft wide corridor for underground collection lines, and 200-ft wide corridor for aircraft detection and lighting system tower, batch plant, crane walk paths, laydown yard, met towers, operations and maintenance facility, marshaling yard, substation, transmission line, and turning radii locations. The assessment consisted of a desktop assessment and a field assessment. The desktop assessment included a review of US Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP), USFWS NWI maps, USGS NHD, and past data collected in 2020, 2021, and 2022. Based on the desktop assessment, all areas identified as potentially being wetlands or WOTUS were targeted for the field assessment. Qualified biologists completed the field assessment in October and November 2023. Wetland delineations were conducted on October 24 – 25, 2023; while methods shifted to wetland mapping on October 31, November 1-2, and November 17 and 20, 2023 due to poor weather and late season conditions, which prevented the full wetland delineation protocol to be adequately performed.

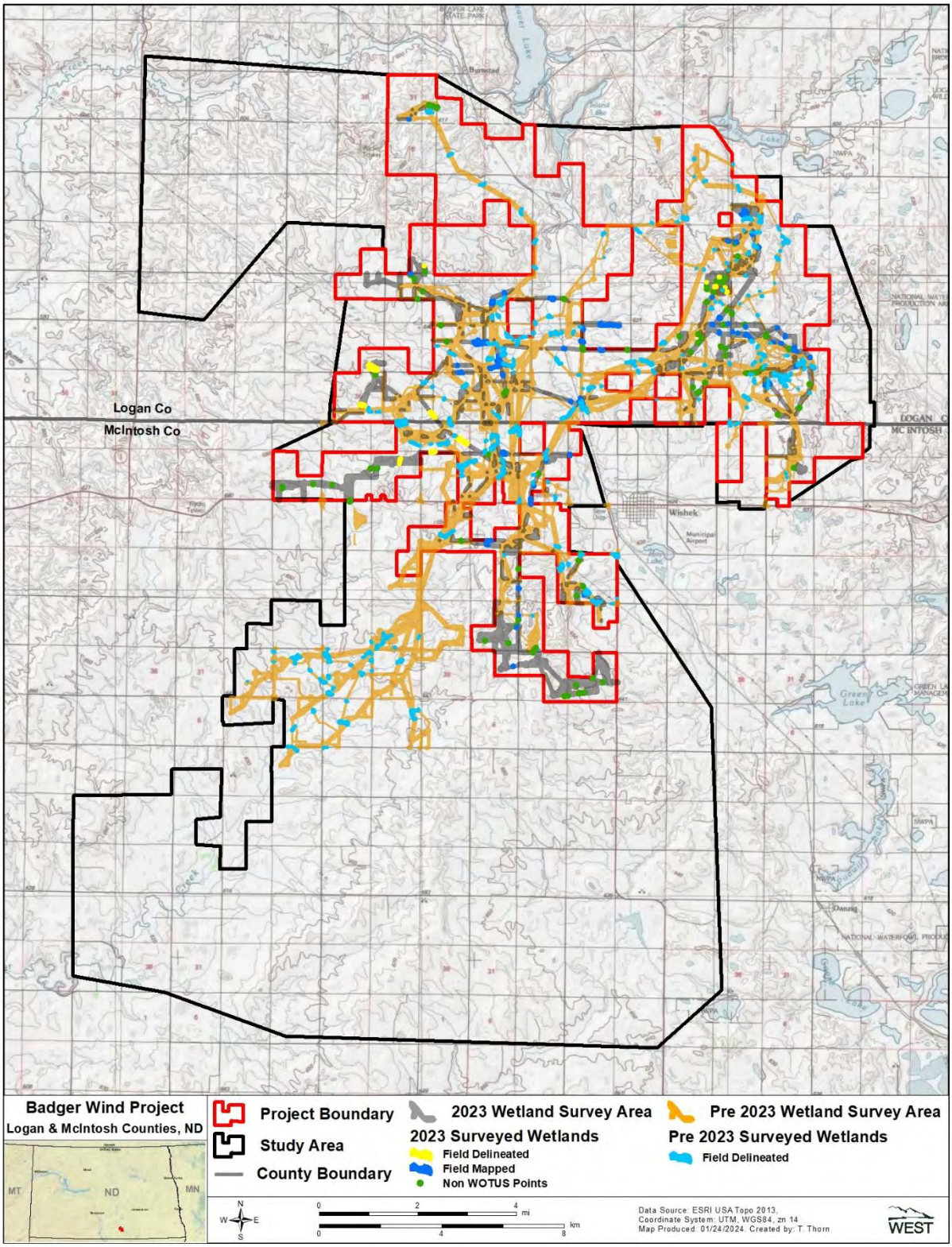


Figure 5.7. Aquatic Resources Inventory and Wetlands and Waterbody Assessment results for surveys completed in 2020, 2021, 2022, and 2023 at the Badger Wind Project in Logan and McIntosh counties, North Dakota.

Wetlands were delineated in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (US Army Corps of Engineers [USACE] 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains* (Version 2.0; USACE 2010). The 1987 manual outlines a three-parameter approach, which requires presence of hydrophytic plants (dominant vegetative cover), hydric soils, and wetland hydrology. All three parameters must be present and meet the wetland criteria of each parameter in order for an area to be considered a wetland. Wetland mapping used a two-parameter approach, which requires presence of hydrophytic plants and wetland hydrology. Both efforts evaluate the high water mark for field digitization.

The results of these studies are discussed in the following subsections.

5.4 Questions and Responses

1. Do field studies indicate that species of concern are present on or likely to use the proposed site?

In total, 37 SOC, including ESA-listed threatened or endangered species, eagle species listed under the BGEPA, and species listed as SCP per North Dakota's SWAP, were detected during Tier 3 field studies (Table 5.2). Whooping crane, listed as endangered under the ESA was detected within the Project Boundary during Tier 3 studies. One unknown *Myotis* bat species) was detected during bat acoustic studies but could not be identified to species as the calls contained characteristics of both little brown or NLEB.

One ESA-listed endangered bird species (whooping crane), two species protected under BGEPA (bald and golden eagle), 12 SHFC, and 35 North Dakota SCP (including whooping crane, bald eagle, and golden eagle) were detected incidentally and during avian use surveys (see Table 5.2).

Twenty-two SCP species in Table 5.2 are also listed by the USFWS as BCC species for the Prairie Pothole BCR and/or throughout its range in the continental United States and Alaska (USFWS 2024). Although protected under the MBTA, similar to SCP, these species are not afforded additional protection under federal or state regulations but have been identified as part of conservation planning efforts by the USFWS.

Bat acoustic surveys confirmed the presence of one bat SCP (little brown bat) and the likely presence of a second bat SCP (big brown bat; Table 5.2). Big brown and silver-haired bat calls were combined in the analysis due to similarities in call characteristics between the two species. This group was one of the more commonly detected species during acoustic surveys; however, while big brown bat is considered a North Dakota SCP, silver-haired bat is not currently listed as such. After excluding "noise", analysis of acoustic data with Kaleidoscope software identified 2,026 bat calls in 2019 and 1,134 calls in 2020. In 2019, this included 757 big brown bat/silver-haired bat calls and four little brown bat calls. In 2020, this included 485 big brown bat/silver-haired bat calls and three little brown bat calls. Two calls identified as an unknown *Myotis* species were also recorded but, as previously mentioned, were not identified to species as they contained

characteristics of both NLEB and little brown bat and there were not a sufficient number of passes to identify to species (Atwell 2020b; Atwell 2021b).

Additional discussions of species listed in Table 5.2 that could be a priority for agencies are discussed below. Additionally, taxa of interest (e.g., bats) to agencies are also discussed below.

Table 5.2. Seasonal occurrence of Species of Concern detected during Tier 3 field surveys (2019 – 2021).

Common Name[a] (*Scientific Name*)	Federal Status[b]	State Status[c]	Expected Seasonal Occurrence	Seasons Detected (Year 1)[d]	Seasons Detected (Year 2)[d]	References
Birds						
Whooping Crane* (*Grus americana*)	FE	SCP III	SP, FA	SP	Not Detected	Atwell 2020c
Bald Eagle (*Haliaeetus leucocephalus*)	BGEPA; BCC[e]	SCP II	SP, SU, FA, WI	SP, SU, FA, WI	SP, SU, FA, WI	Atwell 2020c; Atwell 2021c
Golden Eagle (*Aquila chrysaetos*)	BGEPA	SCP II	SP, FA, WI	SP, FA, WI	SP, FA, WI	Atwell 2020c; Atwell 2021c
American Avocet* (*Recurvirostra americana*)	N/A	SCP II	SP, FA, SU	SU, FA	FA	Atwell 2020c; Atwell 2021c
American Bittern (*Botaurus lentiginosus*)	BCC[e]	SCP I	SP, FA, SU	SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
American Kestrel (*Falco sparverius*)	N/A	SCP II	SP, FA, SU	SP, SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
American White Pelican (*Pelecanus erythrorhynchos*)	N/A	SCP II	SP, FA, SU	SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Baird's Sparrow* (*Centronyx bairdii*)	BCC, SHFC	SCP I	SP, FA, SU	SP	Not Detected	Atwell 2020c
Black Tern (*Chlidonias niger*)	BCC	SCP I	SP, FA, SU	SP, SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Bobolink (*Dolichonyx oryzivorus*)	BCC	SCP II	SP, FA, SU	SP, SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Burrowing Owl* (*Athene cunicularia*)	SHFC	SCP II	SP, FA, SU	FA	Not Detected	Atwell 2020c
Canvasback (*Aythya valisineria*)	N/A	SCP II	SP, FA, SU	SU	SP, SU	Atwell 2020c; Atwell 2021c
Chestnut-collared Longspur (*Calcarius ornatus*)	BCC, SHFC	SCP I	SP, FA, SU	SP, SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Dickcissel* (*Spiza americana*)	BCC[e]	SCP II	SP, FA, SU	SU	SU, FA	Atwell 2020c; Atwell 2021c

Common Name[a] (*Scientific Name*)	Federal Status[b]	State Status[c]	Expected Seasonal Occurrence	Seasons Detected (Year 1)[d]	Seasons Detected (Year 2)[d]	References
Ferruginous Hawk (*Buteo regalis*)	BCC[f]	SCP I	SP, FA, SU	SP, SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Franklin's Gull (*Leucophaeus pipixcan*)	BCC	SCP I	SP, FA, SU	SP, SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Grasshopper Sparrow (*Ammodramus savannarum*)	BCC, SHFC	SCP I	SP, FA, SU	SP, SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Horned Grebe (*Podiceps auritus*)	BCC[e]	SCP I	SP, FA, SU	SP, SU	SP, SU	Atwell 2020c; Atwell 2021c
LeConte's Sparrow* (*Ammospiza leconteii*)	BCC[f], SHFC	SCP II	SP, FA, SU	Not Detected	SU, FA	Atwell 2020c
Lesser Scaup (*Aythya affinis*)	N/A	SCP II	SP, FA, SU	SP, SU	SP, SU	Atwell 2020c; Atwell 2021c
Loggerhead Shrike* (*Lanius ludovicianus*)	N/A	SCP II	SP, FA, SU	Not Detected	SP, SU	Atwell 2020c
Marbled Godwit (*Limosa fedoa*)	BCC, SHFC	SCP I	SP, FA, SU	SP, SU	SP, SU	Atwell 2020c; Atwell 2021c
Nelson's Sparrow* (*Ammospiza nelson*)	BCC[e]	SCP I	SP, FA, SU	SU	SU, FA	Atwell 2020c; Atwell 2021c
Northern Harrier (*Circus hudsonius*)	BCC[f], SHFC	SCP II	SP, FA, SU	SP, SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Northern Pintail (*Anas acuta*)	N/A	SCP II	SP, FA, SU	SP, SU	SP, SU, FA	Atwell 2020c; Atwell 2021c
Peregrine Falcon (*Falco peregrinus*)	BCC[e]	SCP III	SP, FA	SP	SP	Atwell 2020c; Atwell 2021c
Prairie Falcon (*Falco mexicanus*)	BCC[f]	SCP II	SP, SU, FA, WI	FA	SU, FA, WI	Atwell 2020c; Atwell 2021c
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	BCC	SCP I	SP, FA, SU	SU, FA	SU, FA	Atwell 2020c; Atwell 2021c
Sharp-tailed Grouse (*Tympanuchus phasianellus*)	SHFC	SCP II	SP, SU, FA, WI	SP, SU, FA, WI	SP, SU, FA, WI	Atwell 2020c; Atwell 2021c

Common Name[a] (*Scientific Name*)	Federal Status[b]	State Status[c]	Expected Seasonal Occurrence	Seasons Detected (Year 1)[d]	Seasons Detected (Year 2)[d]	References
Sprague's Pipit (*Anthus spragueii*)	BCC, SHFC	SCP I	SP, FA, SU	SU, FA	SU, FA	Atwell 2020c; Atwell 2021c
Swainson's Hawk (*Buteo swainsoni*)	BCC[e]	SCP I	SP, FA, SU	SP, SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Upland Sandpiper (*Bartramia longicauda*)	BCC[e]	SCP II	SP, FA, SU	SP, SU	SP, SU, FA	Atwell 2020c; Atwell 2021c
Western Meadowlark (*Sturnella neglecta*)	SHFC	SCP II	SP, FA, SU	SP, SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Willet (*Tringa semipalmata*)	BCC, SHFC	SCP II	SP, FA, SU	SP, SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Wilson's Phalarope (*Phalaropus tricolor*)	SHFC	SCP I	SP, FA, SU	SP, SU	SP, SU	Atwell 2020c; Atwell 2021c
Bats						
Big Brown Bat/ Silver-haired Bat[g] (*Eptesicus fuscus/ Lasionycteris noctivagans*)	N/A	SCP I	SP, FA, SU	SU, FA	SP, SU, FA	Atwell 2020c; Atwell 2021c
Little Brown Bat (*Myotis lucifugus*)	N/A	SCP I	SP, FA, SU	SU, FA	SU, FA	Atwell 2020c; Atwell 2021c
Unknown *Myotis* Species[h] (*Myotis sp.*)	N/A	SCP I	SP, FA, SU	Not Detected	FA	Atwell 2020c

[a] Common names marked with an asterisk indicate that the species was as an incidental observation only during two years of avian surveys.
[b] BCC= Bird of Conservation Concern (USFWS 2008); SHFC = Species of Habitat Fragmentation (USFWS 2013b); BGEPA = Bald and Golden Eagle Protection Act; FE = ESA Endangered; N/A = No federal status.
[c] North Dakota State Wildlife Action Plan (SWAP; Dyke et al. 2015) Species of Conservation Priority (SCP) Level I, II, or III.
[d] For birds: SP = March–May; SU = June–July; FA = August–November; WI = December–February. Includes species detected incidentally within the Project Boundary. For bats: SP = April 1–May 15; SU = May 16–July 31; FA = August 1–October 16. Year 1 bat acoustic surveys did not conducted surveys in the spring.
[e] Previously considered BCC (USFWS 2008); USFWS has removed this species as a BCC for the Prairie Pothole BCR (USFWS 2021a)
[f] Previously this species was not considered BCC (USFWS 2008); however, the USFWS has since added this species to their list of BCC for the Prairie Pothole BCR (USFWS 2021a)
[g] Big brown and silver-haired bats were lumped during analysis due to similarities in call characteristics between the two species. Big brown bat is considered a North Dakota SCP, but silver-haired bat is not currently listed as such.
[h] Calls had characteristics of northern long-eared bat and little brown bat so a species-level classification could not be determined.

2. Do field studies indicate the potential for significant adverse impacts on affected populations of species of habitat fragmentation concern?

Based on Tier 3 studies, there is potential for impacts to grassland SHFC. Herbaceous/grassland makes up 47.4% of the Project Boundary (NLCD 2021), with relatively large tracts of grassland present, particularly within the northern and northeastern portions of the Project Boundary. In total, 12 birds listed as SHFC were recorded during Tier 3 surveys and are likely to breed within the Project Boundary (Table 5.2). Project infrastructure has been removed from within grasslands to the extent possible and impacts to SHFC are expected to be low.

Tier 1 and 2 desktop studies found that extensive forested habitat is not generally found within the Project Boundary and a high degree of woodland habitat fragmentation already exists (Atwell 2019; Atwell 2020a). Therefore, impacts to woodland SHFC are not likely to occur. Furthermore, results from Tier 3 bat surveys do not indicate that the Project will significantly and adversely impact threatened or endangered bat species by fragmenting roosting habitat.

3. What is the distribution, relative abundance, behavior, and site use of species of concern identified in Tiers 1 or 2, and to what extent do these factors expose these species to risk from the proposed wind energy site?

4. What are the potential risks of adverse impacts of the proposed wind energy site to individuals and local populations of species of concern and their habitats? (In the case of rare or endangered species, what are the possible impacts to such species and their habitats?)

SOC identified in Tiers 1 and 2 and documented within the Project Boundary as part of Tier 3 studies are summarized in Tables 4.1, 4.2, and 5.2. Whooping cranes have been observed in the Project during Tier 3 surveys and may migrate over the Project during the spring and fall migration periods; however, the likelihood of occurrence is moderate. Bald eagle and golden eagle use was low and risk to eagles due to Project development is expected to be low. Badger Wind has focused on minimizing direct and indirect impacts to SOC as well as grasslands and grassland dependent species by removing Project infrastructure from within grasslands and siting in cultivated cropland to the extent possible.

5.4.1 ESA-Listed Avian Species

Whooping crane (ESA-listed endangered): Whooping crane was the only bird species listed as threatened or endangered under the ESA that was observed during Tier 3 field studies. As previously mentioned, the Project Area is located within the 75th percentile of the migration corridor for this species. During Year 1 avian use studies, three adult whooping cranes were detected within the Project during surveys completed between April 15 - 17, 2020. The cranes were initially observed flying north at heights ranging from 2 to 7 m above the ground (i.e., below the rotor-swept zone [RSZ]) and later observed foraging in unharvested corn fields (Figure 4.3).

Some data indicate that cranes in general are at low risk of collision with wind turbines (Nagy et al. 2012). To date, no known whooping crane mortality event has occurred at an operational wind turbine (USFWS 2009; NGPC 2018). Currently, the USFWS (2009) accepts that whooping cranes actively avoid wind energy facility infrastructure out to at least 0.5 miles. Similarly, USFWS acknowledges that whooping cranes typically migrate above typical industry standard rotor-swept heights. However, data and expert biologist opinion indicate that daily forage-to-roosting flights do occur at risky flight heights, and these low flights can occur for distances up to 2 miles. If visibility conditions are poor, USFWS indicates that risky flights may occur up to 5 miles from migration stopover sites.

5.4.2 BGEPA Species

Bald eagle (BGEPA and SCP II): A total of 69 bald eagle detections were recorded during two years of surveys at the Project (Atwell 2020c; Atwell 2021c). Observations were recorded throughout each year; however, most detections occurred during the spring and fall migratory periods. A total of 81 bald eagle minutes were recorded during 636 hours of surveys in Year 1, of which 30.3 were risk minutes observed within 800 m from the survey point and at or below 200 m above ground level (i.e., the risk cylinder; Atwell 2020c). In Year 2, a total of 77 bald eagle minutes were recorded during 636 hours of survey, with 42.9 risk minutes (Atwell 2021c).

Bald eagle mean use rates were generally low. Across both survey years, Station 4 recorded13 of the 69 (19%) bald eagle observations. Stations 11, 18, and 12 also had increased number of bald eagle observations over the other stations (Atwell 202c; Atwell 2021c). Stations 11, 12, and 18 are proximate to one another, and all three points are within 2 mi of a creek that flows northward from Wishek to Beaver Lake. Increased use rates may be attributed to active migration along this watercourse (Atwell 2020c; 2021c).

One bald eagle nest, BAEA21_01 is located within the Project Boundary (Figure 5.3), 2.02 mi from the nearest Project turbine location. A nest verification check was completed in January 2024, nest location BAEA21_01 was present and undetermined occupancy and nest location BAEA19_01 was missing (Chodachek 2024). No other eagle nests have been found during surveys or incidentally from 2019 to 2024(Atwell 2020c; Atwell 2021c). Badger Wind has sited turbines at least 2 mi from nest BAEA21_01 to reduce the risk of collision with turbines.

Bald eagle collision mortality associated with wind farm operations within the United States has not been widely documented (Bay et al. 2016; USFWS 2018b). However, eagles migrating through the Project Boundary or using the Project Boundary for breeding or wintering are at risk of collision with turbines. Cumulatively, 157 total bald eagle flight minutes were recorded over two years of surveys, and bald eagles were often observed within the RSZ. Risk to bald eagles from construction and operations of the Project is moderate; tier 4 post-construction monitoring will provide more clarity regarding any impacts to bald eagles.

Golden eagle (BGEPA and SCP II): A total of 12 golden eagle detections were recorded during two years of survey at the Project, including six observations during both Year 1 and Year 2 surveys (Atwell 2020c; Atwell 2021c). During Year 1, observations occurred across the spring,

fall, and winter, whereas in Year 2, observations only occurred in fall and winter. A total of 21 golden eagle minutes were recorded during 636 hours of surveys in Year 1, of which 10.6 were risk minutes (Atwell 2020c). In Year 2, a total of 26 golden eagle minutes were recorded during 636 hours of survey, with 11.8 risk minutes (Atwell 2021c).

Cumulatively, 22.4 eagle risk minutes were recorded over 1,272 hours of surveys. While studies conducted in the western United States have shown golden eagles to be susceptible to collision mortality at wind farms (Smallwood and Thelander 2008), low observed mean use rates suggest that golden eagle use of the Project Boundary is minimal. Risk to golden eagles from construction and operations of the Project is low; tier 4 post-construction monitoring will provide more clarity regarding any impacts to golden eagles.

5.4.3 North Dakota Avian Species of Conservation Priority

Several non-raptor species that are listed as North Dakota SCP were detected during 10-minute diurnal avian activity point count surveys or incidentally (Atwell 2020c; Atwell 2021c). These species are summarized below:

Non-Passerines and Passerines

Baird's sparrow (SCP Level I): Baird's sparrow (*Centronyx bairdii*) was not observed during avian use surveys. During Year 1, two individuals were detected incidentally in May of 2019, in the northern and northeastern portions of the Project Boundary (Atwell 2020c; Atwell 2021c). This species prefers large, contiguous tracts of native prairie, though it will also use non-native grasslands and pastures (Dyke et al. 2015). Suitable nesting habitat may exist within the Project Boundary, particularly in the northern and northeastern portions, but the lack of observations over the course of two years of surveys indicates that breeding is unlikely and the observed individuals likely represented migrants. Therefore, this species is not likely to experience significant impacts as a result of Project construction and operations given the general lack of detections within the Project Boundary.

Bobolink (SCP Level II): Bobolink were commonly recorded during the spring and fall migration periods and summer breeding season during both years of surveys (Atwell 2020c; Atwell 2021c). Bobolink is a fairly common to abundant species that will use a variety of open habitats, including native grasslands, hayfields and pastures, old fields, and no-till cropland (Dyke et al. 2015). Given this species' level of use and presence of suitable habitat throughout much of the Project Boundary, development and operation of the Project may impact this species. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to bobolinks.

Chestnut-collared longspur (SCP Level I): Chestnut-collared longspur were a common observation during spring and fall migration periods and summer during the two years of survey (Atwell 2020c; Atwell 2021c). While observed throughout the Project Boundary, chestnut-collared longspurs were most frequently observed in the northern and northeastern portions of the Project that are higher in elevation and are dominated by herbaceous cover as shown in Figure 2.2. Given the level of use and the presence of suitable habitat throughout much of the Project Boundary, development and operation of the Project may impact this species. Badger Wind has voluntarily

sited all turbine locations in already disturbed habitats (i.e., agricultural fields) to minimize impacts, though collisions with turbines are still possible. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to chestnut-collared longspurs.

Dickcissel (SCP Level II): Although dickcissels (*Spiza americana*) were not observed during avian use surveys, this species was observed on multiple occasions throughout the Project Boundary Area during the summer season when surveys for small-bodied species did not take place. Dickcissel is a fairly common to uncommon species that will nest in a variety of grassland types, including hayfields and road ROW (Dyke et al. 2015). Given this species' level of use and presence of suitable habitat throughout much of the Project Boundary, development and operation of the Project may impact this species. Badger Wind has voluntarily sited all turbine locations in already disturbed habitats (i.e., agricultural fields) to minimize impacts, though collisions with turbines are still possible. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to Dickcissels.

Grasshopper sparrow (SCP Level I): Grasshopper sparrows were recorded during the spring and fall migration periods and summer during both years of surveys (Atwell 2020c; Atwell 2021c). Grasshopper sparrows were detected much more frequently during the summer survey period and likely breed within the Project Boundary. The majority of incidental observations occurred in June or July, which was outside of the spring and fall survey periods. Given this species' level of use and the presence of suitable habitat throughout much of the Project Boundary, development and operation of the Project may impact this species. Badger Wind has voluntarily sited all turbine locations in already disturbed habitats (i.e., agricultural fields) to minimize impacts, though collisions with turbines are still possible. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to grasshopper sparrows.

Sprague's pipit (SCP Level I): Two Sprague's pipit detections were recorded incidentally during the second year avian use surveys, during fall migration, after July 28, 2020 (Atwell 2021c). The majority (11 of 13 detections) of observations occurred in the northern half of the Project Boundary, within Logan County. Behaviors that would confirm local breeding (e.g., song displays, nesting material carries, food carries to dependent young, dependent fledglings) were not observed during the 13 detections. Observations occurred in wheat stubble and on grassy hilltops, habitat features found throughout the Project. While nesting is possible within the Project Boundary, it is not anticipated that this species will be a common breeder or would experience significant impacts, given the general lack of detections during surveys. Furthermore, Badger Wind has voluntarily sited all turbine locations in already disturbed habitats (i.e., agricultural fields) to minimize impacts, though collisions with turbines are still possible.

Western meadowlark (SCP Level II): Western meadowlark were a common observation during spring and fall migration periods and summer during the two years of survey (Atwell 2020c; Atwell 2021c). Western meadowlark is a common to uncommon species that prefers native grasslands but will also occur in hayfields, weedy fields, and within the grassy margins of croplands and roadsides (Davis and Lanyon 2008; Dyke et al. 2015). Given this species' level of use and presence of suitable habitat throughout much of the Project Boundary, development and

operation of the Project may impact this species. Badger Wind has voluntarily sited all turbine locations in already disturbed habitats (i.e., agricultural fields) to minimize impacts, though collisions with turbines are still possible. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to western meadowlarks.

Loggerhead shrike (SCP Level II): Limited observations of loggerhead shrike (*Lanius ludovicianus*) were recorded during surveys or incidentally within the Project Boundary (Atwell 2020c; Atwell 2021c). Loggerhead shrike was documented incidentally during Year 1 surveys, once during avian use surveys in Year 2, and incidentally in the summer while traveling between points during Year 1 surveys. These observations likely represent migrating individuals. While nesting is possible within the Project Boundary, it is not anticipated that this species will be a common breeder or experience significant impacts, given the general lack of detections within the Project Boundary.

Red-headed woodpecker (SCP Level I): One red-headed woodpecker (*Melanerpes erythrocephalus*) was observed over the course of two years of avian use surveys (Atwell 2020c; Atwell 2021c). This species was detected within the Study Area incidentally on several occasions, typically in the fall. Observations occurred exclusively in the southwestern portion of the Study Area. Red-headed woodpeckers prefer deciduous woodlots and may use shelterbelts within agricultural landscapes for breeding (Dyke et al. 2015). While nesting is possible within the Project, it is not anticipated that this species will be a common breeder or will experience significant impacts, given the presence of limited habitat and general lack of detections.

LeConte's sparrow (SCP Level II): LeConte's sparrow (*Ammospiza leconteii*) was not observed during avian use surveys; however, singing males were detected incidentally near riverine wetlands in the summer during Year 2 avian use surveys. While nesting is possible within the Project Boundary, it is not anticipated that this species will be a common breeder or experience significant impacts, given the general lack of detections during surveys.

Nelson's sparrow (SCP Level I): Limited observations of Nelson's sparrow were recorded during the two years of survey (Atwell 2020c; Atwell 2021c) This species prefers shallow marsh edges and wet meadows (Dyke et al. 2015) and may nest locally in appropriate habitats within the Project Boundary. While nesting is possible within the Project Boundary, it is not anticipated that this species will be a common breeder or experience significant impacts, given the general lack of detections during surveys. Furthermore, direct, and indirect impacts from construction and operations and maintenance of the Project should be minimized since Project infrastructure has been sited to avoid wetlands and waterbodies.

Shorebirds

Marbled godwit (SCP Level I): Marbled godwit, a Level I SCP, was recorded during the spring migration in Year 1 and Year 2 of avian use surveys (Atwell 2020c; Atwell 2021c). It is not anticipated that this species will experience significant impacts given the relatively low number of detections during avian use surveys. Furthermore, direct, and indirect impacts from construction and operations and maintenance of the Project should be minimized since Project infrastructure

has been sited to avoid wetlands and waterbodies. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to marbled godwits.

Wilson's phalarope (SCP Level I): Two detections of six Wilson's phalarope individuals were made during avian use surveys in Year 1, and three detections of four individuals were made in Year 2. Wilson's phalaropes were observed at the same two stations in both survey years, suggesting that they may locally breed at some wetlands within the Project Boundary. It is not anticipated that this species will experience significant impacts given the limited number of detections during avian use surveys; however, breeding is possible within the Project. Impacts to wetland habitat should be minimized since Project infrastructure has been sited to avoid wetlands and waterbodies.

American avocet (SCP Level II): American avocets (*Recurvirostra americana*) were only observed incidentally during Year 1 and Year 2 avian use surveys at scattered locations throughout the Project Boundary, typically during the fall. One summer observation of four birds flying occurred in the northeastern portion of the Project. This species generally prefers to nest in sparsely vegetated areas on exposed shorelines of wetlands or lakes (Dyke et al. 2015). Nesting habitat for American avocets is more prevalent outside of the Project to the northeast; however, wetlands in the northeastern portion of the Project may provide suitable habitat.

Willet (SCP Level I): One willet was observed during the spring migration over the course of two years of avian use surveys (Atwell 2020c; 2021c). This species was detected within the Project Boundary incidentally on multiple occasions throughout the spring, summer, and fall during both years of survey. Most observations occurred in the northern and northeastern portions of the Project, where the highest degree of suitable breeding habitat (i.e., large tracts of grassland habitat with adjacent shallow, wetland features with sparsely vegetated shoreline; Dyke et al. 2015) are located. Although, breeding habitat primarily occurs outside of the Project Boundary to the northeast, limited suitable breeding habitat within the Project Boundary may support nesting willets. It is not anticipated that this species will experience significant impacts given that breeding habitat appears limited within the Project and construction of Project infrastructure is not planned in the vicinity of prairie potholes where most detections of this species occurred.

Upland sandpiper (SCP Level II): During Year 1 avian use surveys, 9 detections of 11 individual upland sandpipers were observed in the spring only. During Year 2 avian use surveys, 26 detections of 34 individual upland sandpipers were observed in the spring and fall into mid-August of Year 2. Upland sandpipers were detected at 36% of point count stations in Year 2. Upland sandpipers likely nest in roadside habitats/ditches, grasslands, and cropland (particularly no-till) habitats throughout the Project Boundary. Given this species level of use of the Project and presence of suitable habitat throughout much of the Project Boundary, development and operation of the Project may impact this species. To minimize potential impacts, Badger Wind has voluntarily sited all turbine locations in already disturbed habitats (i.e., agricultural fields). Tier 4 post-construction monitoring will provide more clarity regarding any impacts to upland sandpipers.

Waders

American bittern (SCP Level I): American bittern nests in wetlands with tall emergent vegetation (Dyke et al. 2015). Incidental observations of American bitterns were recorded north and east of the Project Boundary during Year 1 surveys and one was recorded vocalizing at a wetland within the vicinity of previous observations east of the Project Boundary during Year 2 surveys. Bitterns were not observed at this location on subsequent surveys, but individuals are difficult to detect from roadsides when silent and may nonetheless nest at this location. It is not anticipated that this species will experience significant impacts given the overall low number of detections and the fact that breeding habitat appears limited within the Project Boundary. Construction of Project infrastructure is not anticipated in areas where this species was detected. Furthermore, Project infrastructure has been sited to avoid wetlands and waterbodies.

Waterbirds

Horned grebe (SCP Level I): Horned grebe (*Podiceps auratus*) was observed east of the Project Boundary during avian use surveys in the spring and summer in Year 1 (Atwell 2020c). and incidentally within the Project Boundary during the spring and summer in Year 2 (Atwell 2021c). Significant impacts to this species are not anticipated due to the limited habitat within the Project Boundary, as well Project infrastructure has been sited to avoid wetlands and waterbodies.

American white pelican (SCP Level II): American white pelican was recorded during spring and fall migrations and summer in both years of survey (Atwell 202c; Atwell 2021c). Nesting colonies were not observed and are not known to exist within the Project Boundary. While breeding is not likely within the Project Boundary, this species can migrate through the Project in large numbers and may be at risk of collision with operational turbines. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to American white pelicans.

Black tern (SCP Level I): Black terns were observed during spring and fall migration seasons and incidentally in summer during Year 1 and Year 2 of avian use surveys (Atwell 2020c; Atwell 2021c). Black terns were generally observed in low numbers in the northeastern portion of the Project Boundary in association with greater wetland density. Nesting colonies were not observed within the Project Boundary. Black terns may be at risk of collision with operational turbines during migration and foraging. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to the black tern.

Franklin's gull (SCP Level I): Franklin's gulls were observed flying through the Project Boundary more frequently in the fall than the spring over both the Year 1 and Year 2 study periods (Atwell 2020c; Atwell 2021c). There are no known Franklin's gull nesting colony sites within the Project Boundary, and fall detections appear to represent post-breeding movements from locations outside the Project. Reasons for diminished numbers observed during the fall period in Year 2 may be attributed to changing weather patterns, food source availability, etc. During Year 1 and Year 2, large flocks were found opportunistically foraging in agricultural habitats following harvesting and haying activities (Atwell 2020c; Atwell 2021c). Franklin's gull may be at risk of collision with operational turbines during spring and fall migration periods. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to Franklin's gulls.

Waterfowl

Northern Pintail (SCP Level II): Northern pintails were commonly observed during the spring and fall migration and summer periods during the Year 1 and Year 2 study periods. Northern pintails were usually observed in wetlands and cropland habitats throughout the Project Boundary. This species is relatively common and moves through the Project Boundary while migrating and foraging. Therefore, it may be at risk of collision with operational turbines. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to northern pintail.

Canvasback (SCP Level II): Four canvasback were observed during Year 1 surveys, and two canvasback were observed during Year 2 surveys. No evidence of breeding within the Project was observed. It is not anticipated that this species will experience significant impacts given the general lack of habitat in the Project Boundary, as well Project infrastructure has been sited to avoid wetlands and waterbodies.

Lesser Scaup (SCP Level I): Five lesser scaup were observed in May in the northeastern portion of the Project Boundary and incidentally in summer during Year 1 surveys. During Year 2 surveys, lesser scaup were only observed incidentally in the northeastern portion of the Project Boundary in spring and summer. Significant impacts are not anticipated for lesser scaup given the general lack of habitat in the Project Boundary, as well Project infrastructure has been sited to avoid wetlands and waterbodies.

Prairie Grouse (Sharp-tailed Grouse [SCP Level II])

One possible and three confirmed sharp-tailed grouse lek locations were recorded within the Project Boundary during Year 1 and Year 2 grouse lek surveys, respectively (Figure 5.4; Atwell 2020c, Atwell 2021c). Sharp-tailed grouse were also detected during spring and fall during Year 1 and Year 2 diurnal avian activity surveys (Atwell 2020c; Atwell 2021c). Given this species' level of use and presence of suitable habitat throughout much of the Project Boundary, development and operation of the Project may impact this species. Badger Wind has voluntarily sited all turbine locations in already disturbed habitats (i.e., agricultural fields) to minimize impacts, though collisions with turbines are still possible. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to sharp-tailed grouse.

Nesting Raptor Species

Aerial and ground-based raptor nest surveys were completed in May 2019 and April and May 2020. The following raptor species were recorded nesting in the Project Boundary: bald eagle, ferruginous hawk, great-horned owl, red-tailed hawk, Swainson's hawk, and unknown raptor (Figures 5.2 and 5.3). Recommended setbacks to raptor nests were used to assist with siting project infrastructure to minimize impacts to nesting raptors (USFWS 2020b; NDGF 2021).

Non-eagle raptor SOC observed within the Project Boundary during Tier 3 field studies included American kestrel (*Falco sparverius*; SCP Level II), burrowing owl (*Athene cunicularia*; SCP Level II), ferruginous hawk (SCP Level I), northern harrier (SCP Level II), peregrine falcon (*Falco peregrinus*; SCP Level III), prairie falcon (*Falco mexicanus;* SCP Level II), and Swainson's hawk (SCP Level I). Standardized observations of peregrine falcon and prairie falcon were relatively

infrequent, and burrowing owl was only detected once incidentally within the Project Boundary. These species are likely uncommon migrants through the Project Boundary, and significant impacts from project operation are not anticipated.

Raptor mean use recorded during avian use surveys was primarily driven by detections of red-tailed hawks, Swainson's hawks, and northern harriers. During Year 1, these species collectively accounted for approximately 68% of raptor detections in the spring season and 82% of detections in the fall season (Atwell 2020c). During Year 2, these species collectively accounted for approximately 66% of raptor detections in the spring season and about 65% of detections in the fall (Atwell 2021c). Red-tailed hawks, Swainson's hawks, and ferruginous hawks were commonly recorded within the RSZ, though northern harriers and American kestrels tended to fly below the RSZ (Atwell 2020c; Atwell 2021c). Red-tailed hawk, Swainson's hawk, and Ferruginous hawk may be at relatively higher risk because of their level of use of the Project; however, measures taken to avoid and minimize potential impacts of the Project to non-cultivated habitat along with proposed measures to avoid and minimize potential impacts, including establishing species-specific raptor nest buffers for wind turbines, are expected to reduce this risk.

5.4.4 ESA Listed Bat Species

Northern long-eared bat (Endangered): Acoustic monitoring was conducted in 2019 and 2020 at one MET tower location and ground-based monitoring was conducted in the vicinity of woodlot patches (Figure 5.5). NLEB were not detected during acoustic monitoring in 2019 and 2020 (Atwell 2020b; Atwell 2021b), though unknown *Myotis* species calls were detected. While the potential for these calls to be attributed to NLEB could not be ruled out, there was not a sufficient number of pulse calls to attribute these calls to species. Risk is anticipated to be low based on the limited and highly fragmented summer roosting habitat within the Project Boundary, and direct and indirect impacts to woodlots will generally be avoided as wind turbines were sited at least 1,000 ft, to the extent practicable, from smaller, fragmented woodlot patches.

5.4.5 North Dakota Bat Species of Conservation Priority

Big brown bat (SCP Level I): Due to similarities in call signatures between big brown bat (Level I SCP) and silver-haired bat (non-SCP), these two species were grouped during acoustic analysis. This group had the highest frequency of bat calls (485 calls; 42.8%) during Year 2 studies and the second highest frequency of bat calls during Year 1 studies (757 calls; 37.3%). Big brown bat/silver-haired bat activity was detected at all acoustic monitoring stations during Year 1 and Year 2 surveys. While peaks in activity during spring and fall are likely attributable to silver-haired bat activity, which are not year-round residents in the Project, summer activity is likely from big brown bats as they are year-round residents throughout North Dakota (Atwell 2020b; Atwell 2021b). Big brown bat mortality is possible as a result of project operation, particularly during migration or summer periods; however, it is expected to reflect the national trends of mortality for this species (Arnett and Baerwald 2013; Allison 2018; AWWI 2018), and no population-level effects are expected to occur as a result of project operation.

Risk may be reduced to big brown bats from the 1,000-foot buffer around suitable NLEB habitat. The number of turbines within this forest buffer will be reduced to the extent practicable, and tree

clearing of suitable bat habitat is expected to be minimal. Any proposed tree clearing will follow guidelines presented in Section 6.3. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to big brown bats.

Little brown bat (SCP Level I): Little brown bats were infrequently (0.2% of call in Year 1 and 0.3% of calls in Year 2) detected during Tier 3 acoustic monitoring studies. Calls were recorded at acoustic monitoring stations within the Project Boundary and south of the Project Boundary (Atwell 2020b; Atwell 2021b). Little brown bat mortality due to project operation is possible, particularly during migration or summer periods; however, it is expected to reflect the relatively low national trends of mortality for this species (Arnett and Baerwald 2013; Allison 2018; AWWI 2018), and no population-level effects are expected to occur as a result of project operation.

Risk may be reduced to little brown bats from the 1,000-foot buffer around suitable NLEB habitat. The number of turbines located near woodlots has been limited to the extent practicable, and tree clearing of suitable bat habitat and specifically removal of potential roost trees is expected to be minimal. Any proposed tree clearing will follow guidelines presented in Section 6.3. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to little brown bats.

5. How can developers mitigate identified significant adverse impacts?

Badger Wind is voluntarily adhering to guidance included in the WEG, ECPG, and 2016 Eagle Rule revision to minimize potential effects from the Project on birds and bats through development and implementation of this BBCS. Project design and construction best management practices (BMP) were developed based on the results of the Tier 3 studies and agency coordination. The Project was designed to avoid and minimize use of high-quality habitat and/or areas that may be suitable for TES and other sensitive SOC to the greatest extent practicable. Badger Wind has sited all turbines outside of unbroken grasslands, with most infrastructure in locations that are predominantly agricultural. Badger Wind is also coordinating with the North Dakota Department of Agriculture to determine potential voluntary offsets for indirect impacts to grassland species. The results of this analysis will help to guide additional conservation measures that can be implemented such as the preservation of existing grassland habitat or creation of new habitat that can support grassland bird species.

6. Are there studies that should be initiated at this stage that would be continued in post-construction?

Other than those studies conducted adhering to the WEG, no other Tier 3 studies are proposed at this time. While the Project is not likely to have significant impacts to SOC based on Tier 1, 2, and 3 analyses, the Project will conduct post-construction avian and bat mortality monitoring for at least one year following construction and adhering to the WEG. Post-construction surveys will serve to estimate mortality rates of birds and bats for the Project to further assess potential impacts and validate the efficacy of avoidance, minimization, and mitigation measures. Tier 4 monitoring methods are summarized in Section 7.

5.5 Tier 3 Decision Point

Tier 3 analyses indicate that the Project presents a low to moderate risk to TES and other sensitive SOC. Grassland bird species may be impacted if turbine infrastructure is placed within grassland habitat; however, Badger Wind proposes to minimize impacts to native grasslands to the extent practicable by siting infrastructure in cultivated cropland.

Badger Wind has decided to voluntarily proceed to Tier 4 surveys per WEG recommendations to further assess potential impacts to birds and bats and validate the efficacy of avoidance, minimization, and mitigation measures. Table 5.3 summarizes specific Tier 3 results and Badger Wind's decision to continue with further Tier 4 studies and analysis.

Table 5.3. Wind Energy Guidelines Tier 3 Decision Analysis per Ecological Constraint.

Species/ Resource	Resource Constraints within the Project Boundary	Status of Resource Constraint within the Project Boundary	Tier 3 Decision Point	Direct Impact Avoidance	Tier 4 Analysis Procedure
Avian Resources					
Grasslands	Presence of herbaceous grassland habitat through Tier 2 land-cover analysis (e.g., Figure 2.2).	Present as contiguous grassland parcels, particularly within the northern and northeastern portions of the Project Boundary.	Proceed to Tier 4b through assessment of resource impact to specific wildlife species. Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to grassland avian species.	Avoid operational infrastructure development within grassland habitat to greatest extent practicable; implement habitat mitigation protocols including voluntary offsets for impacts to native prairie.	Incorporate avoidance and minimization measures for herbaceous grassland into BBCS; Preliminary Post-Construction Fatality Monitoring; revision of BBCS, as needed.
Whooping Crane	Project is within 75% migration corridor for this species. Stopover habitat quantity and quality generally lower than reference areas.	Rare. One incidental detection of three whooping cranes.	Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to the species. Conduct post-construction mortality monitoring and build adaptive response.	Avoid operational infrastructure development near high-quality stopover habitat to greatest extent practicable; Adhere to APLIC guidelines.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed. Badger Wind will also develop a Whooping Crane Contingency Plan that outlines measures to be taken in the event that whooping cranes are observed in the project vicinity during operations.
Bald Eagle	Primarily spring and fall use of Project Boundary, with less summer and winter use. One known nest	Common . One in-use nest within Project Boundary.	Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to the species. Conduct post-construction	Situate Project to avoid construction of turbines within 1.5 miles of known eagle nest.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed. Badger Wind continues to coordinate with USFWS to avoid and

	within the Project Boundary.		mortality monitoring and build adaptive response.		minimize potential impacts to eagles to the extent practical.
Species/ Resource	**Resource Constraints within the Project Boundary**	**Status of Resource Constraint within the Project Boundary**	**Tier 3 Decision Point**	**Direct Impact Avoidance**	**Tier 4 Analysis Procedure**
Golden Eagle	Primarily fall and spring use of Project Boundary. Not likely to breed within Project Boundary.	Relatively rare within the Project Boundary, but occurrence in small numbers likely regular.	Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to the species. Conduct post-construction mortality monitoring and build adaptive response.	Situate project operational infrastructure to avoid potential foraging habitat.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed.
Other Nesting Raptors (including North Dakota SCP)	Known nesting raptors within Project Boundary, primarily red-tailed hawks, ferruginous hawks, Swainson's hawks and great horned owls.	Uncommon and sparsely distributed within isolated woodlots.	Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to the species. Conduct post-construction mortality monitoring and build adaptive response.	Site wind turbines away from known nests. Review on case-by-case basis if woodland habitat is proposed for removal. Site infrastructure outside of recommended nest setback buffers. Monitor nests for disturbance during construction when timeline overlaps with nesting season.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed.
North Dakota Avian Species of Conservation Priority	Thirty-seven avian SCP detected within the Project Boundary during Tier 3 surveys and incidentally (excluding species list above).	Rare to common within the Project Boundary, depending on species and time of year. Many are likely breeders, particularly in the	Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to the species. Conduct post-construction mortality monitoring and build adaptive response.	Avoid operational infrastructure development within grasslands and wetlands to greatest extent practicable.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed.

	Primarily grassland and wetland species.	northern and northeastern portions of the Project Boundary.			
Species/ Resource	**Resource Constraints within the Project Boundary**	**Status of Resource Constraint within the Project Boundary**	**Tier 3 Decision Point**	**Direct Impact Avoidance**	**Tier 4 Analysis Procedure**
Bat Resources					
Deciduous Woodland	Presence of some deciduous woodland (7.8% of total Project Boundary acreage).	Few isolated deciduous woodlots and shelterbelts scattered throughout Project Boundary; largest woodlots in southern portion of Project Boundary.	No need to proceed to Tier 4b through assessment of resource impact to specific wildlife species. Bat impacts already assessed in Tier 2.	Avoid forested habitat removal during June through July; avoid siting infrastructure in the vicinity of potential bat habitat. Avoid tree removal and specifically removal of potential roost trees to extent practicable.	Incorporate avoidance and minimization measures for deciduous woodland into BBCS. Revision of BBCS, as needed.
Northern long-eared bat	Potential migration through project airspace; summer roosting possible but not likely.	Not confirmed during Tier 3 field studies.	Proceed to Tier 4a to validate predictions of low impacts from operation of the Project and efficacy of avoidance and minimization measures.	Avoid forested habitat removal during June through July; avoid siting infrastructure in the vicinity of potential bat habitat. Avoid tree removal and specifically removal of potential roost trees to extent practicable.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed.
North Dakota bat Species of Conservation Priority	Potential use of project air space while foraging or migrating.	Little brown bat confirmed during Tier 3 acoustic studies. Big brown bat likely present but difficult to separate	Proceed to Tier 4a to validate predictions of low impacts from operation of the Project and efficacy of avoidance and minimization measures.	Avoid siting infrastructure in the vicinity of potential bat habitat. Avoid tree removal and specifically removal of potential	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed.

	calls from silver-haired bat (not SCP).	roost trees to extent practicable.

6.0 FACILITY DESIGN TO REDUCE WILDLIFE CONFLICT

6.1 Project Facilities Design and Consideration

6.1.1 Turbine Locations and Design

The project layout includes up to 103 WTG locations; 93 primary and 10 alternate WTG locations. Turbines are primarily sited within agricultural portions of the Project Boundary. The WTG site layout has been configured to avoid areas with higher documented use by raptors and other species of wildlife protected under the ESA, BGEPA, and MBTA, to the extent practicable. Habitat that was identified as potentially suitable for SOC was also avoided to the maximum extent practicable when siting the Project. Reducing turbine placement within a 1,000-ft buffer around forested areas greater than 5 ac and around connective woodlands to the greatest extent practicable may help to reduce impacts to bats during project operation. Minimizing turbine placement within the vicinity of this wetland-grassland complex to the greatest extent practicable may reduce direct impacts to avian species, such as collisions with turbines and habitat loss, as well as indirect impacts, such as displacement (Shaffer and Buhl 2016).

In addition, un-guyed tubular towers will be used for the Project wind turbines, which are documented to lower the potential for raptor and other bird collisions (Gehring et al. 2009). Bird flight diverters will be installed in the event that guyed MET towers are used for the Project.

6.1.2 Facilities

The Project's associated facilities will be sited and designed to avoid and reduce potential impacts to birds and bats, and the collection and communication system will be buried underground in accordance with industry standards. Impacts of these systems on birds and bats will be eliminated since they are underground. The Project Boundary and associated project infrastructure will be primarily located within cultivated agriculture areas, thereby minimizing project-related land disturbance of habitat for sensitive species. New land disturbance will be limited to the extent practicable. The existing road system will be utilized to the maximum extent practicable, thereby reducing additional land disturbance. Newly constructed access roads will be placed along section lines, within agricultural fields, and outside of wetlands and waterbodies to the extent practicable to reduce habitat fragmentation. The overhead transmission lines will be located primarily within agricultural upland habitat. Pole placement in wetlands will be avoided to the extent possible. The transmission line will parallel existing roadways and transmission lines for large portions of the route, thereby helping to reduce additional disturbance to bird and bat habitat. Furthermore, the transmission line will be designed to APLIC standards, including the use of avian flight diverters, to reduce the risk of electrocution and collision to birds.

Appropriately designed bird flight diverters (BFD) will be installed every 16.4-feet on the overhead ground wire (OHGW) and/or optical ground wire (OPGW) of the proposed overhead gen-tie line where it crosses a wetland (Figure 1.1) to reduce collision risk for whooping cranes. Increasing a line's profile and visibility is an accepted risk minimization approach with utility practices in the US and Canada and vetted by the USFWS (Heck 2007, APLIC 2012). Options for BFD include static

marking devices, dynamic marking devices, or hybrid (both dynamic and static) marking devices. The best available BFD will be selected for installation for the Project.

6.1.3 Lighting

Wind Turbines

The Project will comply with Federal Aviation Administration (FAA) guidelines. Gehring et al. (2009) reported that flashing red lights attract much lower numbers of nocturnal migrants compared to steady red lights and, in turn, should reduce avian and bat fatalities. The FAA recently amended its recommended lighting standards for wind facilities to follow this recommendation of utilizing flashing red lights in an effort to reduce the potential impacts to migratory species (FAA 2015), and the Project will comply with this standard. Furthermore, the Project will utilize an Aircraft Detection Lighting System (ADLS), subject to FFA approval, which will turn on lights for up to 93 turbine locations and up to 3 permanent meteorological tower locations when and aircraft is in proximity to the Project. As such, the amount of time lights are on will be reduced, thereby reducing the potential for lighting to attract birds.

Project Facilities

Lighting of ancillary structures (i.e., collector substation, and Operations and Maintenance building) will be minimized and downward-facing lights and/or motion-sensing lights will be installed, as practicable, to minimize attracting birds/bats. This approach to lighting should further minimize the attractiveness of the Project Boundary to nocturnal avian and bat migrants and thus reduce bird and bat mortalities (Gehring et al. 2009).

6.2 Measures to Offset and/or Compensate for Habitat-related Impacts

With respect to the Project site, a key concern identified by the agencies was potential impact to unbroken grasslands (i.e., native prairie grassland) and the potential displacement of grassland birds, as documented in Shaffer and Buhl (2016) at other wind project sites. Badger Wind is meeting with the Commissioner of the North Dakota Department of Agriculture to discuss voluntary mitigation options. In coordination with the North Dakota Department of Agriculture and North Dakota Department of Game and Fish, Badger Wind plans to offset its indirect impacts to grassland and wetland habitat by protecting and/or restoring 378.6 acres of grassland habitat and 74.0 acres of wetland habitat. Ongoing Project layouts have incorporated avoidance of the direct placement of primary and spare turbine locations on unbroken grasslands. Disturbance to unbroken grasslands has been and will continue to be avoided where possible.

6.3 Specific Avoidance Measures

Badger Wind has implemented the policy of avoidance, minimization, and mitigation as part of developing the Project. In past discussions regarding the Project, the USFWS and NDGF have outlined their preferences for avoidance and minimization of unbroken native prairie grasslands, where possible. Avoidance and minimization measures have included: relocating large portions of the Project away from more sensitive landscapes, placing roads along edges of section lines to minimize further fragmentation, moving turbines off of unbroken native prairie grasslands, and

implementation of voluntary offsets using best available science to mitigate any remaining potential displacement to grassland birds.

In addition, the following measures will be implemented to avoid and minimize potential impacts to birds and bats:

6.3.1 Electrocution

- APLIC best practices will be followed to reduce potential for electrocution and collision.
- Electrical collection lines will be buried.

6.3.2 Collision

- Tubular wind turbine towers will be used (not lattice towers) to minimize perching opportunities.
- All guy wires on MET towers (if applicable) and aboveground transmission lines will be marked with avian flight diverters.
- Wind turbine and MET tower lighting will comply with FAA requirements, including use of an FAA-approved ADLS, which will activate lights when an aircraft is detected in the vicinity of the Project. As such lighting that may attract birds will be reduced. Lighting of ancillary structures will be minimized and downward-facing lights and/or motion-sensing lights will be installed, as practicable, to minimize attracting birds/bats.

6.3.3 Habitat Loss

- Surface disturbance footprints will be limited to the extent practicable to minimize habitat disturbance.
- Existing roads will be used wherever possible.
- Badger Wind has voluntarily implemented the following avoidance and minimization measures for unbroken grasslands
    - Results of the grassland field verification studies were used to evaluate and inform project infrastructure siting decisions to avoid and minimize potential impacts to unbroken grassland habitat.
    - The Project Boundary was revised to avoid large areas of intact unbroken grasslands.
    - Focused leasing efforts on more actively managed agricultural lands.
    - Placed access roads along section lines and within agricultural fields, to the extent practicable, to minimize further fragmentation.
    - Sited wind turbines within already disturbed agricultural lands.
- Access roads have been sited outside of wetlands and waterbodies to the extent practicable. Where impacts are unavoidable, potential impacts to potential wildlife habitat, wetlands, and forested areas will be limited to the extent practicable.

- Impacts to jurisdictional wetlands and waters will be limited to the maximum extent practicable.
- The final site plan for the Project will exclude all WMAs, WPAs, PLOTs, and other protected federal and state lands.
- The final site plan for the Project will avoid permanent impacts to protected USFWS easements, including wetland and grassland easements.
- Badger Wind is coordinating with the North Dakota Department of Agriculture on potential offsets.
- A Stormwater Pollution Prevention Plan will be developed and implemented to limit potential for erosion-related impacts to wildlife or sensitive habitats.

6.3.4 Tree Removal

- Removal of trees will be avoided to the extent practicable.
- If tree removal is unavoidable, this removal will be completed in accordance with tree clearing restrictions or coordinated with the USFWS prior to tree clearing activities.
- As appropriate, wooded areas will be checked for potential bat roosts prior to disturbance.

6.3.5 Construction Measures

- As appropriate, areas will be checked for nests and potential bat roosts prior to disturbance and/or surface disturbance, and tree removal will be completed outside the avian nesting (April – July) and bat roosting (May – August) season.
    - The following measures will be implemented to avoid and minimize potential impacts to sharp-tailed grouse leks:
        - Badger Wind has voluntarily sited all wind turbines away from known sharp-tailed grouse leks and within previously fragmented areas in coordination with USFWS and NDGF.
        - The above-ground transmission line was not sited within one mile of sharp-tailed grouse leks, to the extent practicable.
        - The area disturbed for siting and construction activities will be minimized to the extent practicable.
        - Off-road travel will be minimized and on-site speed limits on roads will be implemented.
    - The following measures will be implemented to avoid and minimize potential impacts to nests:
        - Direct impacts to bird nests will be avoided to the extent practicable.
        - Roads and laydown areas will be located in previously disturbed areas, such as cultivated agricultural areas, to the extent practicable.

- Wind turbines were sited at least two miles from eagle nests and 0.25 mi from identified active, occupied raptor nests to the extent practical.
- Construction activities will be limited in the vicinity of raptor nests during the nesting season to the extent practical.
- Construction activities will be initiated prior to the raptor nesting season (February – June), to the extent practical.
- In cases where construction activity occurs in proximity to active nests, the nest activity will be monitored during the nesting season by a qualified biologist.
- Where turbines cannot be sited away from a raptor nest, Badger Wind will consult with USFWS and NDGF to determine appropriate mitigation measures, including potentially removing or relocating the nest outside of the nesting season.

o Badger Wind is consulting with USFWS on specific measures to avoid and minimize potential impacts to whooping cranes.

o Temporary disturbance areas will be reclaimed, fertilized, and reseeded according to NRCS recommendations, unless otherwise specified by the landowner and approved by the North Dakota PSC, as detailed in the Badger Wind Reclamation and Weed Management Plan.

6.3.6 Construction/Operational Measures

- All contractors and sub-contractors will be required to attend wildlife awareness training.
- Vehicles will be limited to roads or specific construction paths and will adhere to established on-site speed limits.
- Good housekeeping measures will be implemented during the construction period and over the operational life of the Project (e.g., collection and disposal of trash, debris, and limiting unharvested crops, as practicable).
- Wildlife carrion and/or roadkill identified by operations and maintenance (O&M) staff within the project footprint will be promptly removed and disposed of to avoid attracting scavenger wildlife or prey species.
- Noxious weeds will be managed in accordance with applicable regulations and the Badger Wind Reclamation and Noxious Weed Management Plan.
- Pesticide, herbicide, fertilizer, and other chemical treatments will be used in accordance with federal and state regulations and laws to minimize drift and other potential impacts on native habitat.
- A Spill Prevention, Control, and Countermeasure (SPCC) Plan will be developed to outline spill response/containment and clean up procedures.
- Post-Construction Mortality Monitoring (PCMM) will be conducted for at least one-year after construction. The PCMM program will include searches for bird and bat carcasses and will correct for potential searcher efficiency and carcass removal biases.

- An adaptive management program will be implemented in accordance with this BBCS.

This BBCS is considered a living document and will be updated over the operational life of the Project as deemed necessary.

6.4 Bird and Bat Conservation Strategy

As part of due diligence efforts and the adaptive management program Badger Wind is implementing for the Project, this BBCS has been developed to document the studies completed to help understand potential risk to avian and bat species from the Project and to describe the measures that will be implemented to avoid and minimize these potential impacts, including conservation strategies that will be implemented over the life of the Project. The BBCS outlines the progression of the Project from the preliminary due diligence phases of site assessment through the field studies and discusses minimization measures implemented by Badger Wind based on the results of the Tier 1 desktop analysis through Tier 3 field studies. Tier 4 studies (Section 7) will be used to evaluate the efficacy of avoidance and minimization measures designed to limit potential impacts to birds and bats. This document is considered a living document and will be updated as deemed necessary.

7.0 TIER 4 – POST-CONSTRUCTION STUDIES TO ESTIMATE IMPACTS

To substantiate the findings of the Tier 1 through Tier 3 assessment process, Badger Wind proposes to conduct PCMM studies, following completion of construction, to assess risk and estimate impacts to avian and bat species, including TES and other SOC. The Tier 4 PCMM study design will incorporate guidelines presented in the USFWS Land-based WEG (USFWS 2012).

7.1 Monitoring Methods

Once the Project is operational, PCMM studies will be conducted for one year, as follows:

- Searches for birds and bats will occur for one calendar year.
- Searches will occur on roads and pads at all Project turbines and square plot searches at a subset of Project turbines.
- Mortality rates will be calculated using GenEst (a generalized estimator of fatality; Dalthorp et al. 2018, Simonis et al. 2018) for both birds and bats on a per megawatt and per turbine basis, accounting for potential searcher efficiency and carcass removal biases.

Importantly, the complex task of determining fatality rate estimates will follow a rigorous approach to provide the best possible data for calculating these statistics. An annual report will be compiled upon completion of the mortality monitoring study. Items discussed will include:

- Standardized carcass searches of search plots at selected turbines.
- Combined searcher efficiency and carcass removal/persistence bias trials to estimate the probability that a carcass was available to be detected.

Estimates of project-related fatalities will be based on:

- Latest available estimator models (e.g., GenEst).
- Observed number of carcasses found during searches within the monitoring survey period for which the cause of death is either unknown or is probably project related.
- Measured rates of availability and detectability (by taxa size class).
- Area searched.

7.2 Reporting Mechanisms

The proposed avian and bat mortality monitoring studies will follow parameters set forth within a study plan completed prior to the start of monitoring. An annual report will be compiled detailing findings for the mortality study. The annual report will be shared with the USFWS and NDGF and Badger Wind will coordinate with these agencies to determine if adaptive management measures are warranted. Should operations staff or contractors confirm fatality of a species protected under the ESA or BGEPA, USFWS and NDGF will be notified within 24 hours. Key contacts for reporting avian and bat wildlife incidents, if applicable, are included in Appendix C.

7.3 Adaptive Management

This BBCS addresses the potential for "*significant adverse impacts*" (i.e., USFWS 2012) to SOC and their habitats. Potential significant adverse impacts to a broad spectrum of wildlife resources have not been identified as a possible outcome of developing and operating the Project, and this BBCS was created to provide an efficient means of navigating through project operations. If significant adverse impacts are found to have occurred, adaptive management measures will be discussed with the USFWS and NDGF and implemented accordingly to avoid, minimize, and mitigate these impacts and to monitor the efficacy of these measures. Federal and state wildlife agencies have not set potential impact threshold scenarios (e.g., species group per-megawatt collision mortality thresholds) that would qualify as significant adverse impacts in this region of North Dakota. However, certain scenarios, such as the discovery of a new eagle nest within the Project Boundary or the discovery of a fatality confirmed to be an ESA-listed TES or eagle species, will trigger agency coordination to assess whether adaptive management responses are warranted (Table 7.1).

Similarly, population-level bird and bat effects and significant avian-bat mortality events (e.g., "mass mortality events") at the Project are not expected based on the analysis of Tier 3 study data as presented within this BBCS. A certain level of avian-bat fatality is expected at any modern wind energy generation facility (Arnett et al. 2008; Loss et al. 2013), and residual fatality events do not necessarily equate to significant adverse impacts, as described by USFWS (2012). This BBCS has laid out a comprehensive pathway by which Badger Wind has taken a multi-tiered approach toward reducing potential direct and indirect impacts to both birds and bats.

Relatively speaking "mass mortality events" at operational wind energy facilities remain rare events (e.g., Loss et al. 2013). The occurrence of abnormally large mortality events often have been associated with inclement weather conditions and deviations from facility lighting BMP

(Johnson et al. 2000; Kerns and Kerlinger 2004; American Bird Conservancy 2011). In the unlikely event of a mass fatality, the wind site manager will determine the best course of action regarding communication to appropriate agency personnel. Recurring mortality of SOC or species susceptible to population-level impacts (see Beston et al. 2016) will also be considered when coordinating with appropriate agency personnel.

Table 7.1. Example triggers and responses in the Badger Wind Project Adaptive Management Strategy

Trigger	Response
A qualified biologist positively identifies a carcass of an Endangered Species Act-listed species with take prohibitions applicable to the Project	• Notification of the US Fish and Wildlife Service (USFWS) within one business day, or as soon as possible thereafter in the event of unique circumstances that would prevent such immediate contact. • Investigation of the circumstances under which the event occurred, the species affected, and whether population-level impacts may be occurring. • Coordination with the USFWS to determine next steps.
A qualified biologist positively identifies an eagle carcass	• Notification of the USFWS within one business day, or as soon as possible thereafter in the event of unique circumstances that would prevent such immediate contact. • Investigation of the circumstances under which the event occurred, the species affected, and whether population-level impacts are suspected. • Re-evaluation of the Project's risk to eagles, to be summarized in a memo provided to the Project owner. Information considered will include: o Incidental observations of eagles at the Project. o Badger Wind, LLC reports of new eagle nest locations near the Project. o Incidental Monitoring and Reporting System (or similar) data. • Coordination with the USFWS to determine avoidance measures or to apply for an eagle take permit.
Discovery of a cluster (at least 5 carcasses) of bird or bat fatalities in space (i.e., at one turbine or other component of Project infrastructure) or time (i.e., found or estimated to have occurred on the same day)	• Completion of a root cause analysis and implementation of appropriate measures, or consultation with the USFWS to determine next steps or further study.
A qualified biologist positively identifies an eagle nest within the Project	• Notification of the USFWS and North Dakota Game and Fish Department within one business day or as soon as possible thereafter in the event of unique circumstances that would prevent such immediate contact.

8.0 IMPLEMENTATION OF THE BADGER WIND PROJECT BBCS

8.1 Document Availability

This BBCS is subject to future revisions, as needed, and will be maintained by Badger Wind environmental staff. This BBCS will be kept on site throughout the operation of the Project.

8.2 Reporting

Any documented mortality of ESA-listed species or of either eagle species will be reported to the USFWS within 24 hours of discovery for the life of the Project. Badger Wind will communicate and coordinate with the USFWS and/or NDGF, as appropriate (Appendix C).

9.0 MITIGATION AND CONSERVATION DURING DECOMMISSING

At the end of the operational life of the Project, Bowman Wind will reclaim disturbed areas in accordance with lease requirements with landowners. Decommissioning may include removing any and all aboveground equipment, including towers, concrete pads, anchors, guy wires, fences, fixtures, materials, buildings, structures, improvements, and personal property installed by the Project or the Project's affiliates. In addition, foundations to a depth of 1.5 m (or as specified by applicable regulations or Bowman Wind approved Decommissioning Plan) and equipment on the surface shall be removed and Bowman Wind will cover up all pit holes, trenches, or other borings or excavations (but not roads selected by the landowner) and restore the Project area to a clean condition reasonably similar to its original condition and land use.

The following decommissioning BMPs, as outlined in the WEG, will be implemented during the decommissioning process:

- Decommissioning methods will minimize new site disturbance and removal of native vegetation, to the greatest extent practicable.
- Foundations will be removed to a minimum of 1.5 m below surrounding grade (or as otherwise required by state regulation and the approved decommissioning plan) so subsurface structures do not substantially disrupt ground water movements. This depth (1.5 m) is typically adequate for agricultural lands.
- If topsoil is removed during decommissioning, it will be stockpiled and reused when restoring plant communities. Once decommissioning activity is complete, topsoil will be restored to assist in establishing and maintaining pre-construction conditions to the extent possible, consistent with landowner objectives.
- Surface water flows will be restored to pre-disturbance conditions consistent with storm water management objectives and requirements. This will include removal of stream crossings, roads, and pads.
- Overhead power lines no longer needed will be removed.
- After decommissioning, erosion control measures will be installed in all areas of disturbance where potential for erosion exists, consistent with storm water management objectives and requirements.
- Fencing will be removed unless the landowner wishes to utilize the fence.

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Appendix A. 2019, 2022, 2023, and 2024 IPaC Analyses for the Badger Wind Project, Logan and McIntosh Counties, North Dakota

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IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

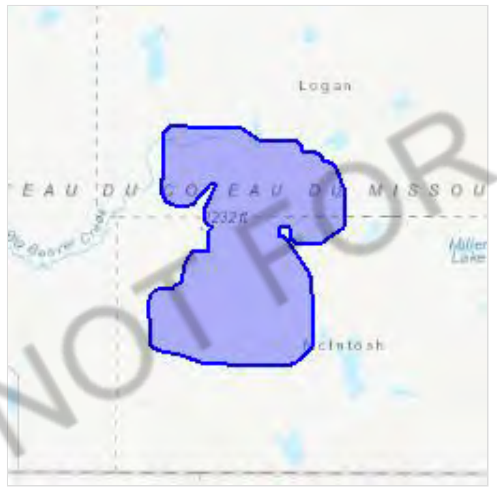
This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

Logan and McIntosh counties, North Dakota



Local office

North Dakota Ecological Services Field Office

(701) 250-4481
(701) 355-8513

3425 Miriam Avenue
Bismarck, ND 58501-7926

http://www.fws.gov/northdakotafieldoffice/endspecies/endangered_species.htm

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Piping Plover Charadrius melodus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot Calidris canutus rufa No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane Grus americana There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/758	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

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Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

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NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Bittern Botaurus lentiginosus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6582	Breeds Apr 1 to Aug 31
American Golden-plover Pluvialis dominica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

Black Tern Chlidonias niger — Breeds May 15 to Aug 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/3093

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chestnut-collared Longspur Calcarius ornatus — Breeds May 1 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Franklin's Gull Leucophaeus pipixcan — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Marbled Godwit Limosa fedoa — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Nelson's Sparrow Ammodramus nelsoni — Breeds May 15 to Sep 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

NOT FOR CONSULTATION

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be

used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

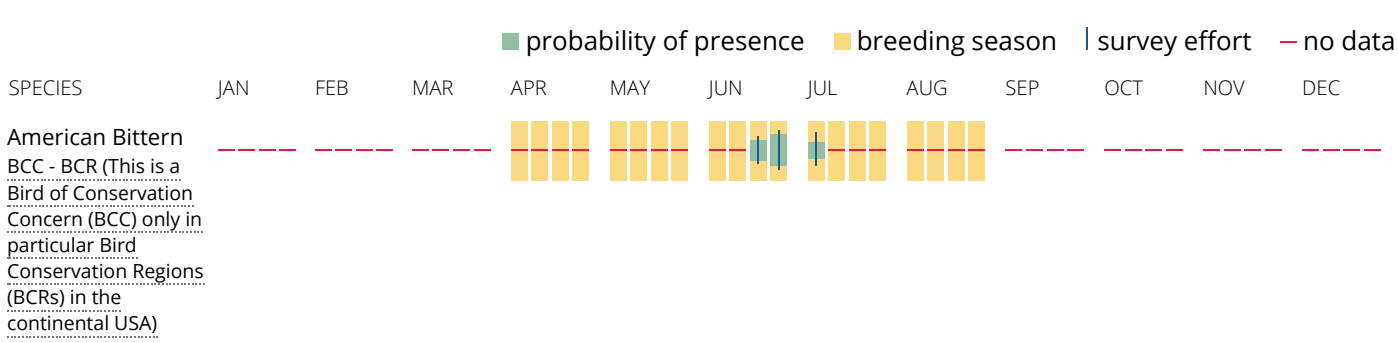
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

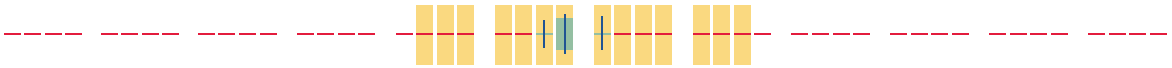


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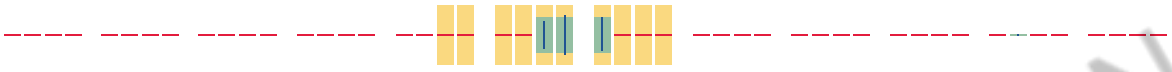
American Golden-plover
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



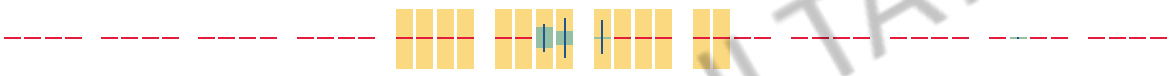
Black Tern
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



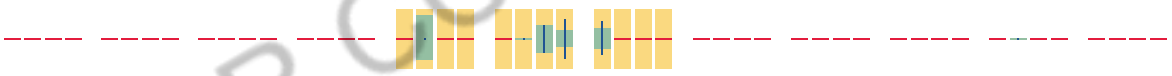
Bobolink
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Chestnut-collared Longspur
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



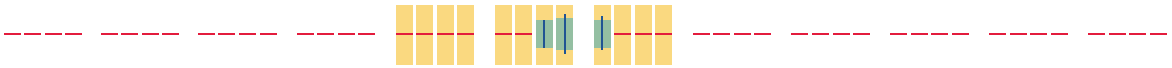
Franklin's Gull
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



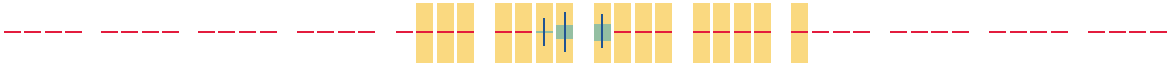
Lesser Yellowlegs
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Marbled Godwit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

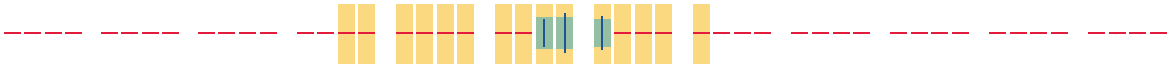


Nelson's Sparrow
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



NOT FOR CONSULTATION

Willet
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

NOT FOR CONSULTATION

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

This location overlaps the following National Wildlife Refuge lands:

LAND	ACRES
Kulm Wetland Management District	1,358.57 acres

(701) 647-2866
(701) 647-2221

MAILING ADDRESS
P.O. Box E
Kulm, ND 58456-0170

PHYSICAL ADDRESS
1 First Street Sw
Kulm, ND 58456-7112

https://www.fws.gov/refuges/profiles/index.cfm?id=62630

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Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

The area of this project is too large for IPaC to load all NWI wetlands in the area. The list below may be incomplete. Please contact the local U.S. Fish and Wildlife Service office or visit the NWI map for a full list.

FRESHWATER EMERGENT WETLAND

- PEM1A
- PEM1C
- PEM1Ax
- PEM1F
- PEM1Cx

FRESHWATER FORESTED/SHRUB WETLAND

- PFOA

FRESHWATER POND

- PABFh
- PABFx

RIVERINE

- R4SBC
- R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

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Location

Logan and McIntosh counties, North Dakota



Local office

North Dakota Ecological Services Field Office

(701) 250-4481
(701) 355-8513

3425 Miriam Avenue
Bismarck, ND 58501-7926

http://www.fws.gov/northdakotafieldoffice/endspecies/endangered_species.htm

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

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NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Piping Plover Charadrius melodus There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot Calidris canutus rufa Wherever found There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane Grus americana There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/758	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

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Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES

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	THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Golden-plover Pluvialis dominica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Black Tern Chlidonias niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3093	Breeds May 15 to Aug 20
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Chestnut-collared Longspur Calcarius ornatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 10
Franklin's Gull Leucophaeus pipixcan This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Golden-winged Warbler Vermivora chrysoptera This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Marbled Godwit Limosa fedoa This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds May 1 to Jul 31
Willet Tringa semipalmata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5

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Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

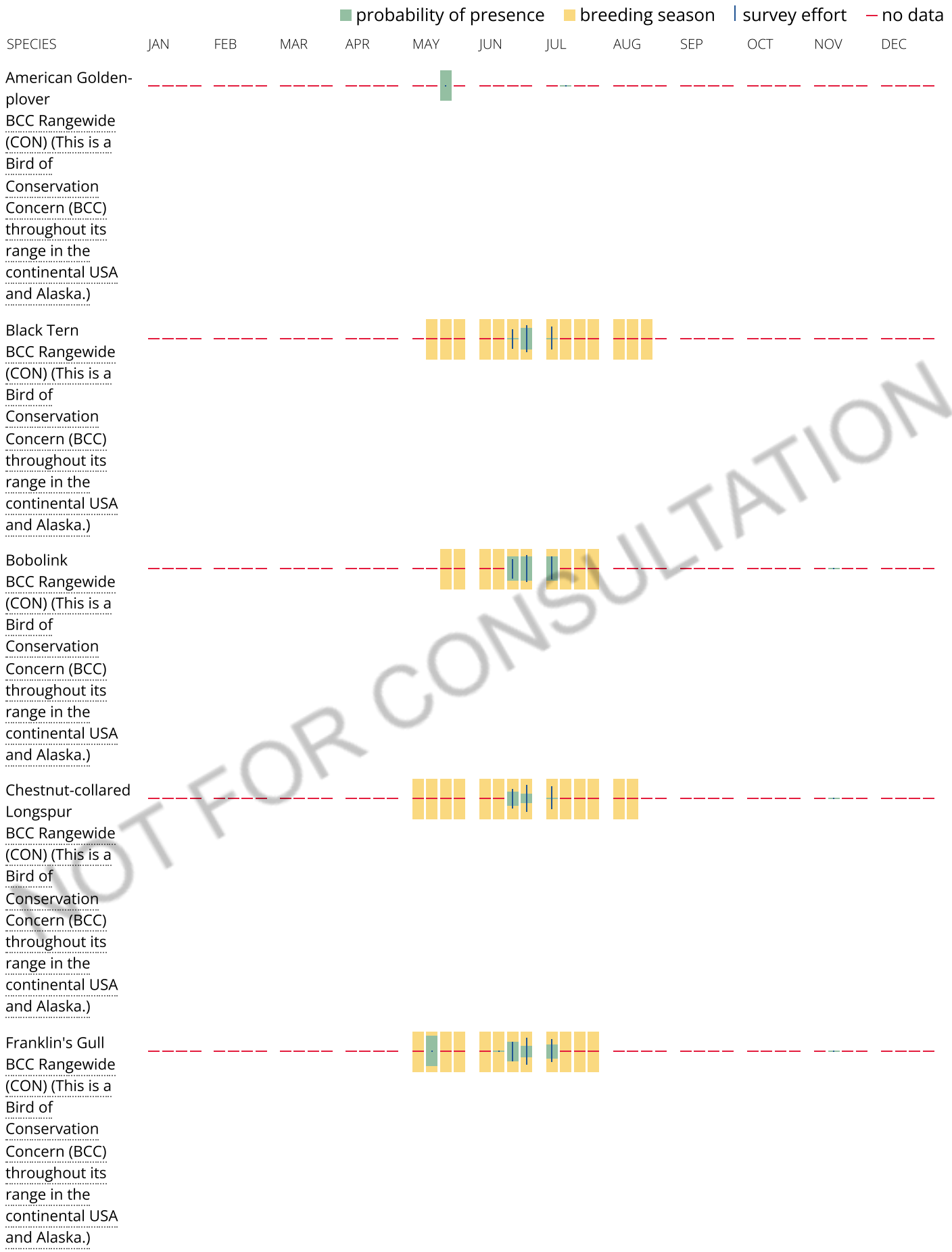
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

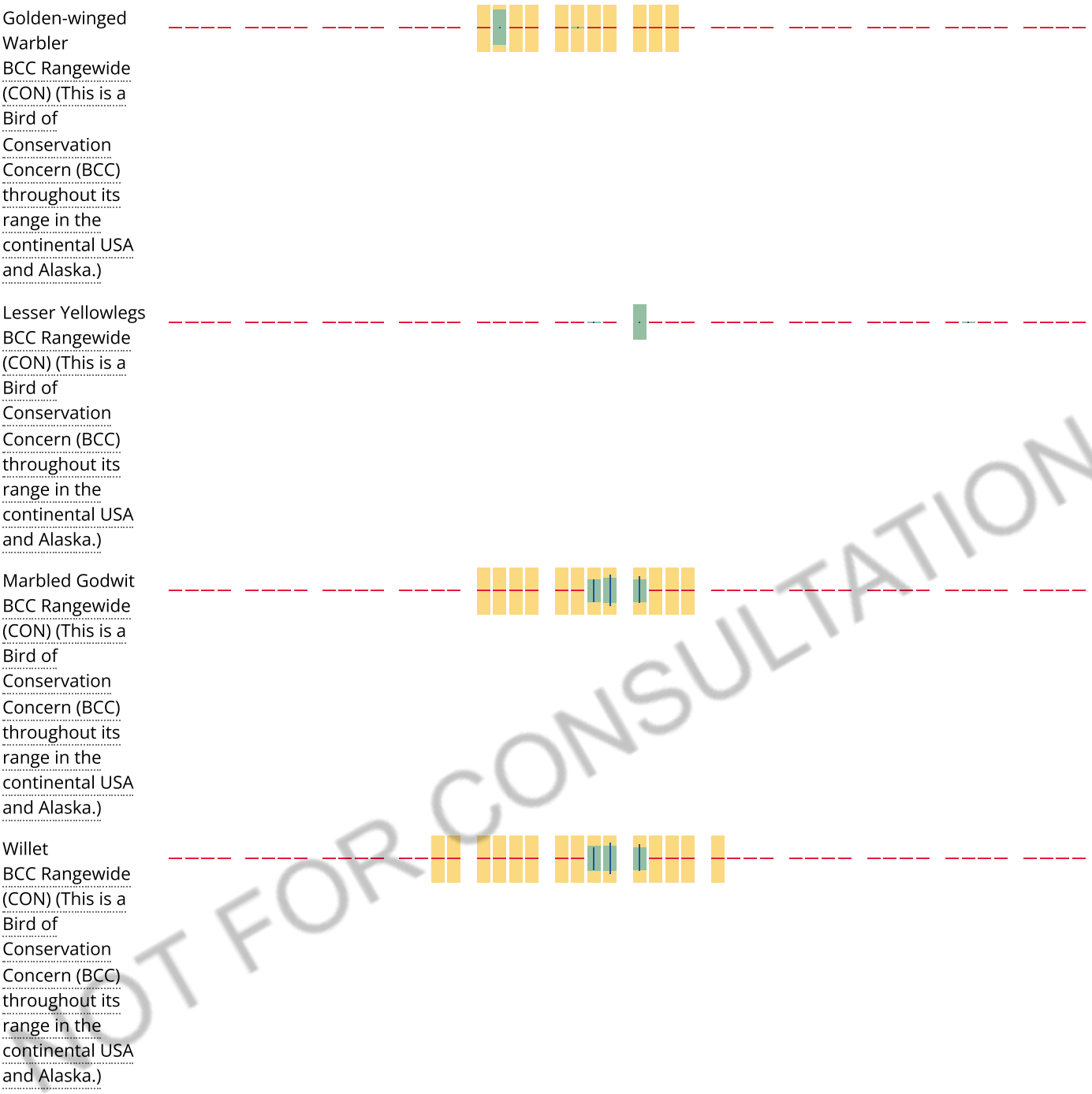
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review.

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Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

This location overlaps the following National Wildlife Refuge lands:

LAND	ACRES
LOGAN COUNTY WATERFOWL PRODUCTION AREA	1,358.57 acres

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

The area of this project is too large for IPaC to load all NWI wetlands in the area. The list below may be incomplete. Please contact the local U.S. Fish and Wildlife Service office or visit the NWI map for a full list.

FRESHWATER EMERGENT WETLAND

- PEM1A
- PEM1/ABF

FRESHWATER POND

- PAB/EM1F
- PABFh
- PABFx
- PABF

LAKE

- L1UBG
- L2ABG

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

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The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
North Dakota Ecological Services Field Office
3425 Miriam Avenue
Bismarck, ND 58501-7926
Phone: (701) 250-4481 Fax: (701) 355-8513

In Reply Refer To: August 16, 2023
Project Code: 2023-0117948
Project Name: Badger Wind Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Section 7 of the Endangered Species Act

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The Act requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service *if they determine their project and associated actions "may affect" listed species or critical habitat*. If Federal agencies or their non-federal representatives determine their project and associated actions will have "no effect" on listed species, their habitats, or designated critical habitat, consultation is not required. However, if a "no effect" is determined, we recommend that you maintain a written record in support of your conclusion.

Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act

Additionally, while not all are listed as threatened or endangered, eagles and migratory birds

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

Service Property Interests

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

Northwest ND WMD Complex: Kyle Flanery, (701) 768-2548
Eastern ND WMD Complex: Dave Azure, (701) 285-3341
Central ND WMD Complex (also covers south and west): Todd Luke, (701) 442-5474

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

North Dakota Ecological Services Field Office
3425 Miriam Avenue
Bismarck, ND 58501-7926
(701) 250-4481

PROJECT SUMMARY

Project Code: 2023-0117948
Project Name: Badger Wind Project
Project Type: Power Gen - Wind
Project Description: Wind energy project near Wishek, North Dakota comprised of up to 109 wind turbines
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@46.29386975,-99.5783625999317,14z



Counties: Logan and McIntosh counties, North Dakota

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

BIRDS

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

The following FWS National Wildlife Refuge Lands and Fish Hatcheries lie fully or partially within your project area:

FACILITY NAME	ACRES
LOGAN COUNTY WATERFOWL PRODUCTION AREA https://www.fws.gov/refuges/profiles/index.cfm?id=62630	0

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

Due to your project's size, the list below may be incomplete, or the acreages reported may be inaccurate. For a full list, please contact the local U.S. Fish and Wildlife office or visit https://www.fws.gov/wetlands/data/mapper.HTML

FRESHWATER EMERGENT WETLAND

- PEM1Ch
- PEM1B

- PEM1Cx
- PEM1Ad
- PEM1F
- PEM1Ah
- PEM1A
- PEM1Ax
- PEM1C

FRESHWATER POND
- PABF
- PABFh
- PABKx
- PUSA
- PABG
- PAB/EM1F
- PABFx

RIVERINE
- R4SBCx
- R4SBAx
- R4SBA
- R4SBC

LAKE
- L2ABGx
- L2ABG

OTHER
- Pf

IPAC USER CONTACT INFORMATION

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IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

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Project information

NAME

Logan-McIntosh

LOCATION

Logan and McIntosh counties, North Dakota



DESCRIPTION

None

Local office

North Dakota Ecological Services Field Office

(701) 250-4481
(701) 355-8513

3425 Miriam Avenue
Bismarck, ND 58501-7926

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Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of

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Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered

Birds

NAME	STATUS
Piping Plover Charadrius melodus There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/6039	Threatened
Rufa Red Knot Calidris canutus rufa Wherever found There is **proposed** critical habitat for this species. https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane Grus americana There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/758	Endangered

Insects

NAME	STATUS
Dakota Skipper Hesperia dacotae Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/1028	Threatened
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

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Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Piping Plover Charadrius melodus https://ecos.fws.gov/ecp/species/6039#crithab	Final

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON

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Bald Eagle Haliaeetus leucocephalus — Breeds Dec 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

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3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

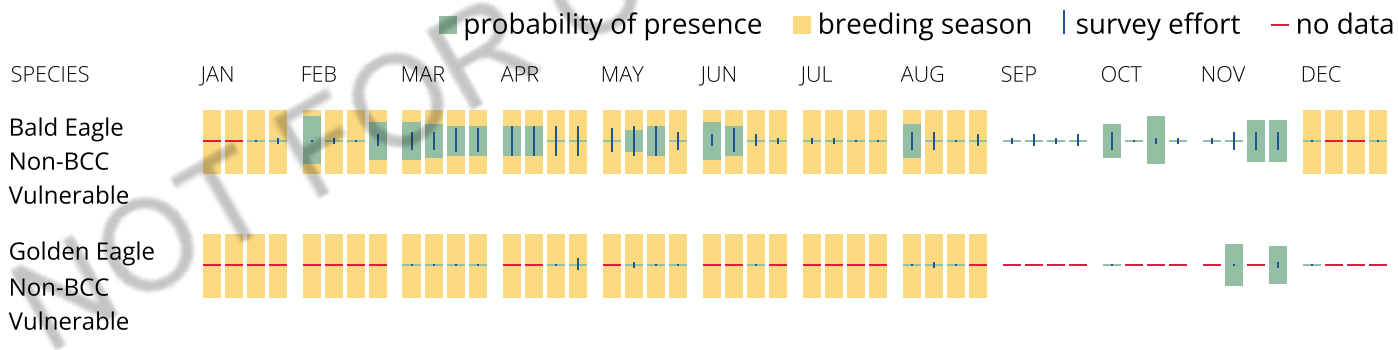
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

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Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

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NAME	BREEDING SEASON
American Golden-plover Pluvialis dominica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Baird's Sparrow Ammodramus bairdii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5113	Breeds May 20 to Aug 15
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31
Black Tern Chlidonias niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3093	Breeds May 15 to Aug 20
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31

California Gull Larus californicus — Breeds Mar 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chestnut-collared Longspur Calcarius ornatus — Breeds May 1 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Clark's Grebe Aechmophorus clarkii — Breeds Jun 1 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Ferruginous Hawk Buteo regalis — Breeds Mar 15 to Aug 15
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/6038

Franklin's Gull Leucophaeus pipixcan — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Golden-winged Warbler Vermivora chrysoptera — Breeds May 1 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8745

Henslow's Sparrow Ammodramus henslowii — Breeds May 1 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3941

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Hudsonian Godwit Limosa haemastica — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lark Bunting Calamospiza melanocorys — Breeds May 10 to Aug 15

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Marbled Godwit Limosa fedoa — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Pectoral Sandpiper Calidris melanotos — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prairie Falcon Falco mexicanus — Breeds Mar 1 to Jul 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/4736

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

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Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Sprague's Pipit Anthus spragueii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8964	Breeds May 10 to Aug 31
Western Grebe aechmophorus occidentalis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31
Willet Tringa semipalmata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

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2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

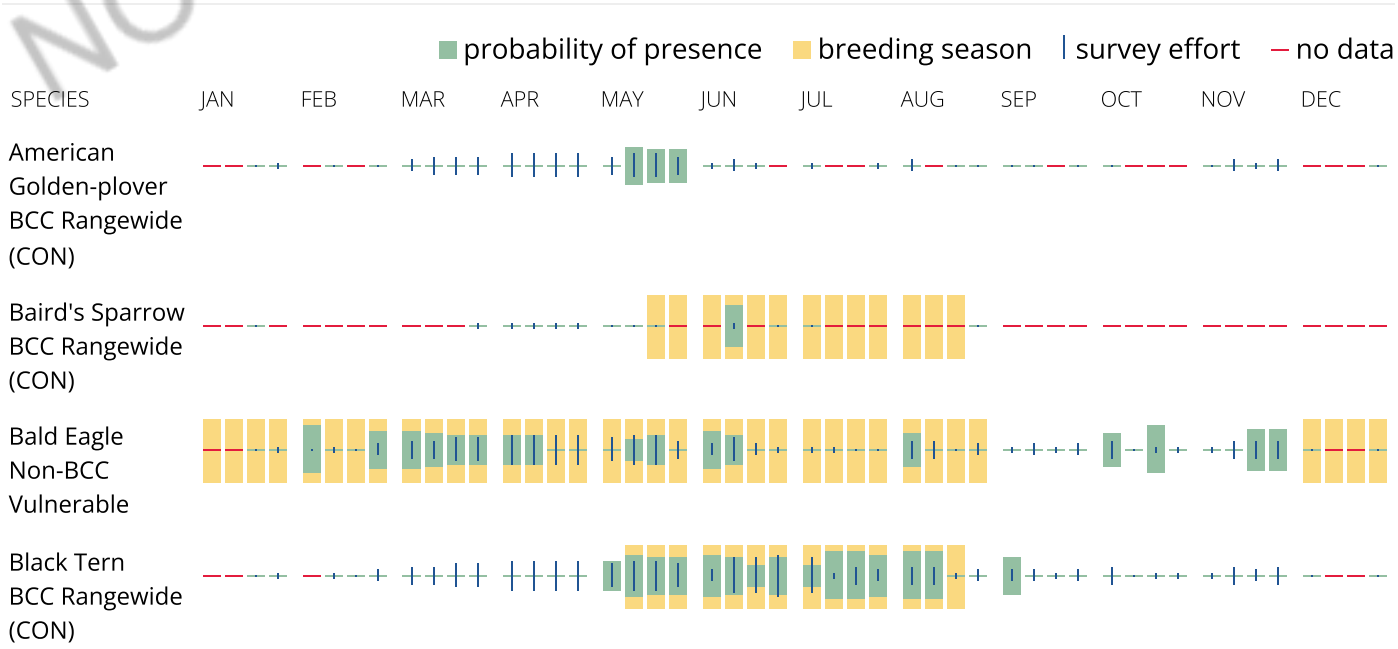
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

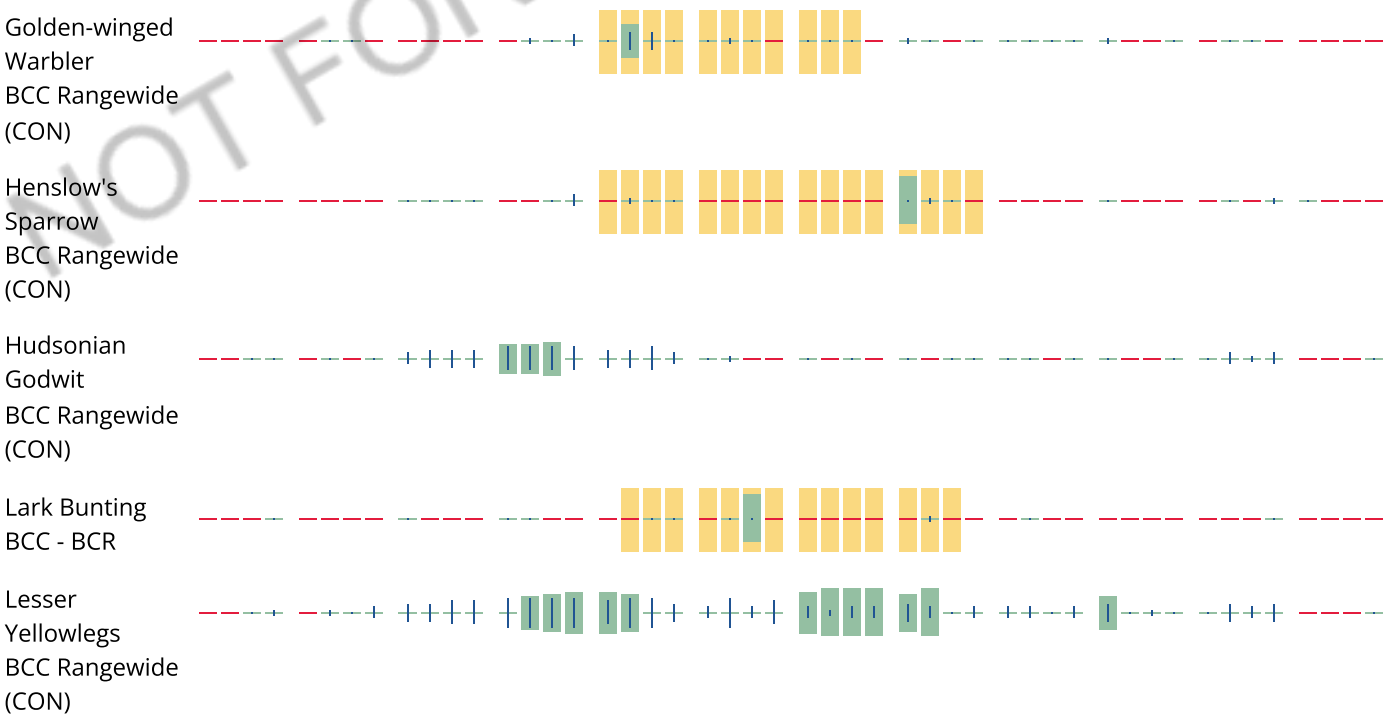
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

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Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

This location overlaps the following National Wildlife Refuge lands:

LAND	ACRES
DAKOTA GRASSLAND CONSERVATION AREA	0 acres
MCINTOSH COUNTY WATERFOWL PRODUCTION AREA	29,603.06 acres

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

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Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

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Location

Logan and McIntosh counties, North Dakota



Local office

North Dakota Ecological Services Field Office

(701) 250-4481
(701) 355-8513

3425 Miriam Avenue
Bismarck, ND 58501-7926

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Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

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2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered

Birds

NAME	STATUS
Piping Plover Charadrius melodus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6039	Threatened
Rufa Red Knot Calidris canutus rufa Wherever found There is **proposed** critical habitat for this species. https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane Grus americana There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/758	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

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Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON

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Bald Eagle Haliaeetus leucocephalus — Breeds Dec 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

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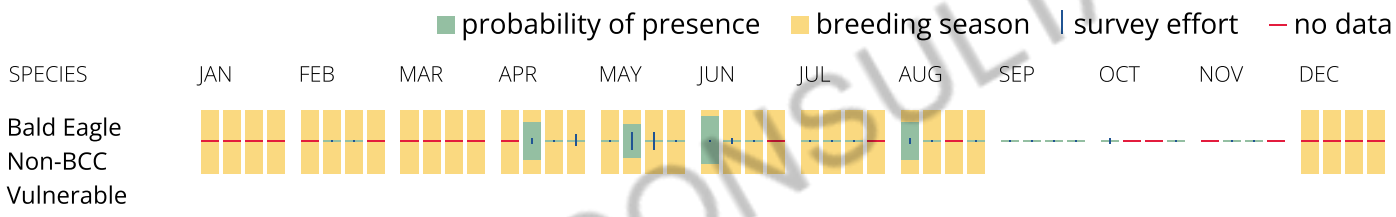
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your

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list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover *Pluvialis dominica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31
Black Tern *Chlidonias niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3093	Breeds May 15 to Aug 20
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
California Gull *Larus californicus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31
Chestnut-collared Longspur *Calcarius ornatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 10
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25

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Franklin's Gull Leucophaeus pipixcan This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Golden-winged Warbler Vermivora chrysoptera This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Marbled Godwit Limosa fedoa This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds May 1 to Jul 31
Pectoral Sandpiper Calidris melanotos This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Western Grebe aechmophorus occidentalis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31
Willet Tringa semipalmata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5

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Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

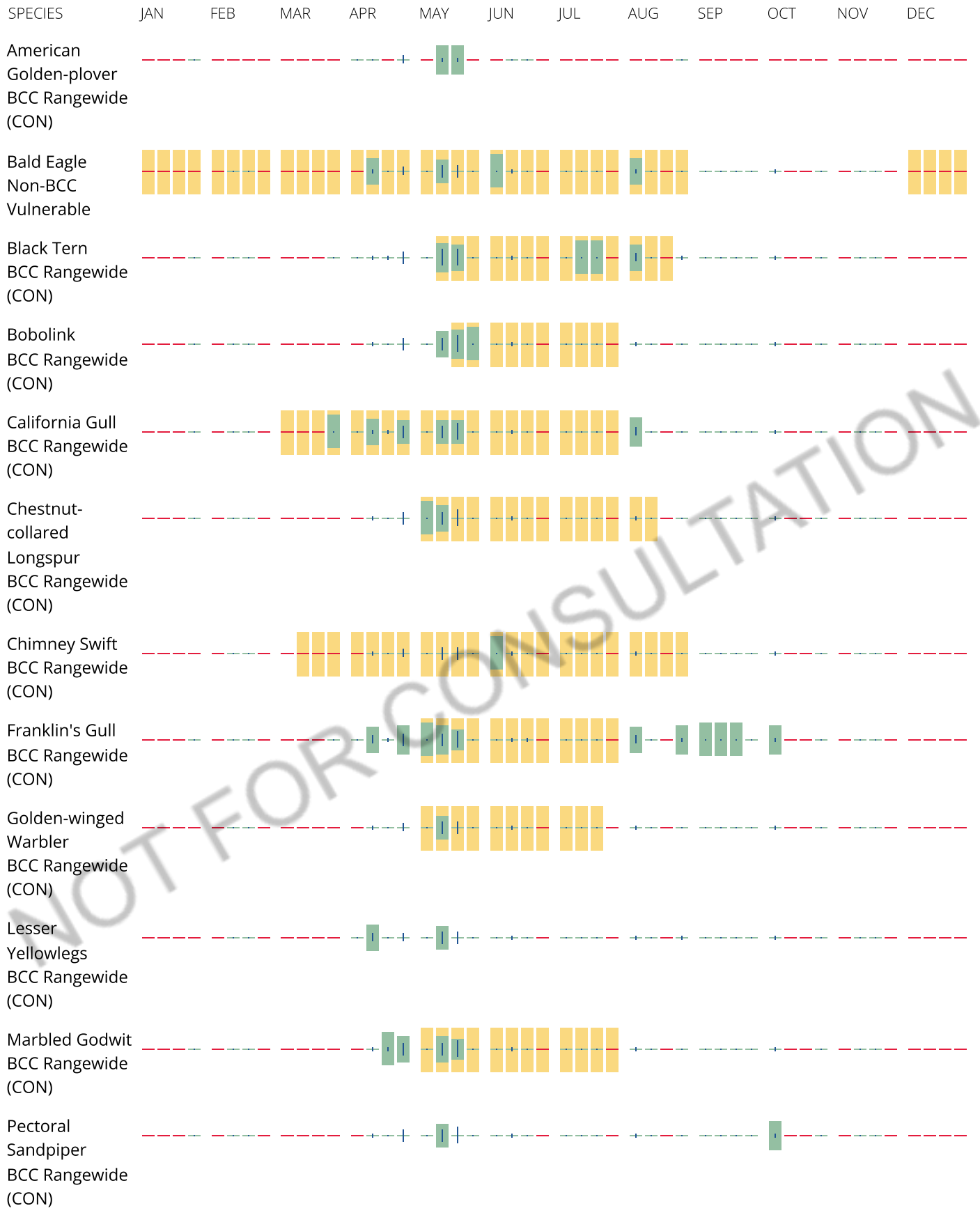
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

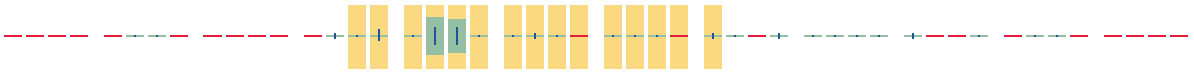
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird

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on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key

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component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

This location overlaps the following National Wildlife Refuge lands:

LAND	ACRES
DAKOTA GRASSLAND CONSERVATION AREA	0 acres

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Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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Appendix B. Selected Tier 2 and 3 Bird and Bat Study Reports for the Badger Wind Project, Logan and McIntosh Counties, North Dakota

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PRE-CONSTRUCTION AVIAN STUDIES
YEAR 1
MAY 2019 THROUGH APRIL 2020

BADGER WIND PROJECT
LOGAN AND MCINTOSH COUNTIES, NORTH DAKOTA

Prepared for

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EXECUTIVE SUMMARY

This report summarizes the results of pre-construction avian studies conducted by Atwell, LLC (Atwell) on behalf of Badger Wind, LLC (Badger Wind) for the proposed Badger Wind Project (the project) in Logan and McIntosh counties, North Dakota. Field studies were designed to document avian and raptor use, raptor nest activity, and Sharp-tailed Grouse (*Tympanuchus phasianellus*) lekking activity in the vicinity of the project.

Avian use studies were conducted in accordance with the United States Fish and Wildlife Service Land-Based Wind Energy Guidelines (USFWS WEG; USFWS 2012), the Eagle Conservation Plan Guidance: Module 1 - Land-based Wind Energy, Version 2 (ECPG; USFWS 2013), and the Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests (i.e., "final Eagle Rule"; USFWS 2016). The WEG recommend avian studies to document horizontal and vertical avian use, avian use by habitat type, raptor nest presence and activity, and species of concern presence and activity. The ECPG recommends studies to document eagle use, including occurrence, use during spring and fall migration seasons, and nest territory occupancy. The avian studies summarized in this report were designed to collect data in accordance with these guidelines.

Avian studies conducted during the first year of surveys included: nest surveys for Bald Eagles (*Haliaeetus leucocephalus*), Golden Eagles (*Aquila chrysaetos*), and other raptor species; lek surveys for Sharp-tailed Grouse; a full year of monthly eagle use surveys; and diurnal avian activity surveys during the spring and fall migration periods. The studies described in this report were conducted between May 2019 and April 2020.

Key results are summarized below.

Raptor Nests

- During aerial nest surveys, one in-use Bald Eagle nest was found within the project area and no nests were observed within the surrounding 10-mile buffer. This nest in the project area fledged young later in the season. No Golden Eagle nests were found within the project area or 10-mile buffer during the study period.
- Five in-use Ferruginous Hawk (*Buteo regalis*) nests, four Red-tailed Hawk (*Buteo jamaicensis*) nests, one Swainson's Hawk (*Buteo swainsoni*), and two Great Horned Owl nests (*Bubo virginianus*) were found within the project area and a surrounding two-mile buffer.

Sharp-tailed Grouse

- One confirmed Sharp-tailed Grouse lek was observed within the project boundary during aerial surveys in May 2019. In addition, two possible lek locations were detected during

May 2019 ground-based surveys within the project boundary. Cumulatively, six individual Sharp-tailed Grouse detections were recorded during lek surveys. Thirty-eight additional Sharp-tailed Grouse detections were recorded during diurnal avian use surveys in the spring and fall.

Bald Eagle and Golden Eagle Use of the Project Area

- Thirty-Four Bald Eagles were observed over the course of 636 hours of standardized eagle use surveys over the study period. An additional 46 Bald Eagles were detected incidental to standardized surveys. Incidental observations include sightings outside of the standardized sample plot and encounters outside of 60-minute eagle use survey periods.
- Six Golden Eagles were observed over the course of 636 hours of standardized eagle use surveys over the study period. Seven additional Golden Eagles were detected incidentally to standardized use surveys.
- Bald Eagle mean use rates were highest during the spring period, followed by the fall. Only one Bald Eagle was observed during standardized use surveys in the summer and only two were observed in the winter. Golden Eagle mean use rates were highest in the fall and winter.

Use of the Project Area by Species Listed under the Endangered Species Act

- Three Whooping Cranes (*Grus americana*) were observed within the project area from April 15 to 17, 2020. The cranes were first observed during eagle use surveys at a nearby point count station. Return visits found that the cranes foraged during daylight hours in unharvested corn and roosted in riverine wetlands nearby at night. This is the first known observation of Whooping Crane recorded within the project boundary.
- No other federally listed endangered or threatened species were observed within the project boundary during the study period.

General Avian Use of the Project Area

- Many of the most commonly observed species were generalists that are often observed in agricultural areas, including Mourning Doves (*Zenaida macroura*), Rock Pigeons (*Columba livia*), and American Crows (*Corvus brachyrhynchos*). Larger groups of birds were also observed, perhaps as part of seasonal migrations including Franklin's Gull (*Leucophaeus pipixcan*), Lapland Longspurs (*Calcarius lapponicus*), Red-winged Blackbird (*Agelaius phoeniceus*), and Sandhill Cranes (*Grus canadensis*).
    - Small-bodied passerines (particularly Lapland Longspurs) and waterfowl (particularly Snow Geese [*Chen caerulescens*]) together comprised the majority (98%) of avian detections during the spring.

  - Small-bodied passerines (particularly Red-winged Blackbirds), and waterbirds (particularly Franklin's Gull) together comprised the majority (83%) of avian detections during the fall.

- Avian species groups with mean flight heights within the pre-defined 35 – 150-meter rotor-swept zone included large-bodied corvids (e.g., crows and ravens), raptors, waterbirds (e.g., gulls, pelicans, cormorants), and waterfowl.
- Species of conservation priority observed more frequently in grassland habitats during diurnal avian use surveys included Chestnut-collared Longspur (*Calcarius ornatus*), Grasshopper Sparrow (*Ammodramus savannarum*), Bobolink (*Dolichonyx oryzivorus*), and Western Meadowlark (*Sturnella neglecta*).
- All raptor-species use rates were highest during the fall, driven by detections of Broad-winged Hawks (*Buteo platypterus*), Northern Harrier (*Circus hudsonius*), Red-tailed Hawk, and Swainson's Hawk.

TABLE OF CONTENTS

1 INTRODUCTION 1
2 METHODS 3
2.1 BALD EAGLE AND RAPTOR NEST SURVEY 3
2.2 SHARP-TAILED GROUSE LEK SURVEYS 4
2.3 EAGLE USE SURVEYS 5
2.4 DIURNAL AVIAN ACTIVITY POINT COUNT SURVEYS 8
2.5 INCIDENTAL DATA COLLECTION AND LISTED SPECIES 9
3 RESULTS 10
3.1 BALD EAGLE AND RAPTOR NEST SURVEY 10
3.1.1 Eagle Nests 10
3.1.2 Non-Eagle Raptor Nests 10
3.2 SHARP-TAILED GROUSE LEK SURVEYS 11
3.3 EAGLE USE SURVEYS 11
3.3.1 Eagle Use Survey Effort 11
3.3.2 Cumulative Detections of Bald Eagles and Golden Eagles 12
3.3.3 Seasonality 12
3.3.4 Spatial Distribution of Detections 13
3.3.5 Directional Movements 13
3.3.6 Flight Heights 14
3.3.7 Eagle-Minutes Summary 15
3.3.8 Use of the Project Area by Other Raptor Species 15
3.3.9 Federally Listed Threatened and Endangered Species 16
3.4 DIURNAL AVIAN ACTIVITY POINT COUNT SURVEYS 17
3.4.1 General Avian Use 17
3.4.2 Species Group Use of the Project Area during Spring and Fall Migration 17
3.4.3 Flight Heights by Species Group during Spring and Fall Migration 24
4 CONCLUSIONS 25
5 REFERENCES 26

TABLES

1 Survey Periods for Pre-Construction Avian Studies – Year 1
2 List of Alternate Winter Point Count Stations
3 Eagle Nests and Nests of Other Raptor Species
4 Total Standardized Survey Effort by Point Count Station
5 Eagle Use Surveys – Seasonal Mean Raptor Use
6 Eagle Use Surveys - Seasonal Bald Eagle Mean Use by Point Count Station
7 Eagle Use Surveys - Seasonal and Annual Raptor Mean Flight Heights
8 Eagle Minutes and Time within Rotor Swept Zone Summaries for Bald Eagles and Golden Eagles
9 Eagle Use Surveys - Seasonal Raptor Mean Use by Point Count Station
10 Diurnal Avian Use Surveys - Seasonal Mean Use by Species Group
11 Seasonal and Annual Mean Flight Heights for Species Groups Recorded during Diurnal Avian Use Surveys

FIGURES

1 Site Location
2 Land Cover Types within the Project Area
3 Eagle and Raptor Nests
4 Sharp-tailed Grouse Lek Survey
5 Avian and Eagle Use Point Count Stations
6 Bald Eagle and Golden Eagle Observations

APPENDICES

A Point Count Station Locations
B Seasonal Species Group Mean Use Statistics
B-1 Large-bodied Corvids, Large-bodied Non-Passerines, Upland Gamebirds
B-2 Small-bodied Non-Passerines, Passerines
B-3 Raptors
B-4 Shorebirds, Waders, and Waterbirds
B-5 Waterfowl
C Species Observed during Eagle Use and Diurnal Avian Use Surveys

ACRONYMS AND ABBREVIATIONS

AKN	Avian Knowledge Network
Atwell	Atwell, LLC
BGEPA	Bald and Golden Eagle Protection Act
ECPG	United States Fish and Wildlife Service Eagle Conservation Plan Guidance: Module 1 - Land-based Wind Energy Version 2
ESA	Endangered Species Act
km	kilometer(s)
m	meter(s)
MBTA	Migratory Bird Treaty Act
MCP	Minimum Convex Polygon
MW	Megawatt
NDGFD	North Dakota Game and Fish Department
ND SWAP	North Dakota State Wildlife Action Plan
NGPC	Nebraska Game and Parks Commission
NLCD	National Land Cover Database
QA/QC	Quality Assurance/Quality Control
project	Badger Wind Project
RSZ	rotor-swept zone
SCP	Species of Conservation Priority
SD	standard deviation
TES	Threatened and Endangered Species
USFWS	United States Fish and Wildlife Service
WEG	United States Fish and Wildlife Service 2012 Land-Based Wind Energy Guidelines
WTG	Wind Turbine Generator

1 INTRODUCTION

Atwell, LLC (Atwell) was contracted by Badger Wind, LLC (Badger Wind) to conduct avian studies for the proposed Badger Wind Project (the project) in Logan and McIntosh counties, North Dakota (Figure 1). The 250-megawatt (MW) project includes the development of 60 - 120 wind turbine generators (WTGs), associated collection lines, access roads, and a collector substation.

The current project boundary (April 2019) is depicted in Figure 1. The project area is an estimated 121,695 acres, with approximately 60% of its area (73,390 acres) in McIntosh County and approximately 40% (48,315 acres) in Logan County. The general topography is undulating and rises from the west to the east, with approximate elevations between 1,970 and 2,200 feet above mean sea level within the project boundary. The project is predominately within the Missouri Coteau Slope Level IV Ecoregion, with portions of the project area's eastern boundary extending upward into the Missouri Coteau Level IV Ecoregion (Bryce et al. 1996). The Missouri Coteau is an escarpment of glacial till containing numerous hills, small lakes, and poorly drained depressions that are referred to as "potholes" that receive most of their water from snow melt and precipitation (Bryce et al. 1996). The Missouri Coteau Slope descends westward toward the Missouri River from the Coteau and is characterized by a thinner glacial till layer and integrated drainages flowing toward the Missouri River (Clayton 1962).

According to the 2016 U.S. Geological Survey National Land Cover Database (NLCD; Yang et al. 2018), the project area is composed primarily of cultivated crops (56.0%) and herbaceous/grassland (35.1%; Figure 2). Wetlands and open water comprise 2.4% of the project area. Other land cover types found within the project area include developed areas (2.9% of the project area), pasture/hay (2.4%), shrub/scrub (1.1%), woodland forest (0.1%), and barren land (less than 0.1%; Figure 2).

The objectives of the studies summarized in this report were to document avian and raptor use, raptor nest activity, and grouse lekking activity in the vicinity of the project. Survey protocols described herein were designed to adhere to Tier 3 of the United States Fish and Wildlife Service (USFWS) 2012 Land-Based Wind Energy Guidelines (WEG) and Stage 2 assessments described in the USFWS Eagle Conservation Plan Guidance: Module 1 - Land-based Wind Energy Version 2 (ECPG; USFWS 2012; USFWS 2013). These two documents provide wind energy developers and operators guidance for adhering to the Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGEPA), respectively. Additionally, Atwell utilized industry standard approaches for avian use studies as promoted by the National Wind Wildlife Collaborative (Strickland et al. 2011). Table 1 includes a summary of avian studies conducted over the May 2019 to April 2020 study period and their respective survey extents, survey frequencies, and survey durations.

This report adheres to avian taxonomy outlined in the American Ornithological Society's Online Checklist of North & Middle American Birds: 61st Supplement (Chesser et al. 2020).

2 METHODS

2.1 BALD EAGLE AND RAPTOR NEST SURVEY

The eagle and raptor nest surveys were conducted from May 1 to 3, 2019. The eagle nest survey area, depicted with black outline in Figure 3, includes the project area and extends 10 miles from the project boundary, following recommendations in the ECPG and final Eagle Rule (USFWS 2013; USFWS 2016). The smaller non-eagle raptor nest survey area, depicted with purple outline in Figure 3, includes the project area and extends two miles from the project boundary, following recommendations in the WEG (USFWS 2012).

Aerial transect surveys were conducted in a fixed-wing Cessna Skyhawk 172M by an Atwell avian biologist. Transects were flown by North Dakota-based Bismarck Aero at speeds of approximately 70 to 120 knots at altitudes from approximately 400 to 1,000 feet, depending on landscape conditions. North-south survey transects were spaced one mile apart. The plane occasionally deviated from the transect to specifically circle potential nesting habitat patches when they were encountered. The plane then returned to resume the transect once the habitat patch was assessed.

An area extending to 0.5-mile on each side of each transect was scanned for eagle and other raptor nests. Surveys were flown prior to bud-break and leaf extension, resulting in minimal canopy obstruction of nests. Coniferous trees that may obscure nest locations were relatively scarce and were usually associated with homesteads.

In addition to the aerial nest survey, raptor nests that were located incidentally during ground-based eagle use and diurnal avian activity surveys were also recorded and added to the project nest database.

When a raptor nest was encountered, the following data were collected:

- Nesting species;
- Nest location (decimal degrees);
- Nest substrate (deciduous or coniferous);
- Nest status (in-use or alternate);
- Nest condition (good, fair, or poor); and
- Nest contents (number of eggs or young).

Following completion of the surveys, data were reviewed and uploaded into the project database as part of the quality assurance/quality control (QA/QC) program.

2.2 SHARP-TAILED GROUSE LEK SURVEYS

The Sharp-tailed Grouse (*Tympanuchus phasianellus*) lek survey was conducted between May 2 and May 10, 2019. The grouse lek survey area included the project area and extended one mile from the project boundary, following guidance described in the WEG, the North Dakota Game and Fish Department (NDGFD) North Dakota Wildlife Action Plan (ND SWAP; Dyke et al. 2015), and the Nebraska Game and Parks Commission (NGPC) Avian Assessment Guidance for Wind Energy Facilities in Nebraska version 3.5 (NGPC 2018; Figure 4).

Aerial transect surveys were conducted in a fixed-wing Cessna Skyhawk 172M by Atwell avian biologists. Transects were flown by North Dakota-based Bismarck Aero at speeds from approximately 50 to 135 knots at an approximate altitude of 400 feet, depending on landscape conditions and safety concerns. North-south survey transects were flown 0.5 miles apart, with surveyors scanning out to 0.25 mile on each side of the aircraft. Surveys began approximately ten minutes before sunrise and ended approximately two hours after sunrise.

When a potential grouse lek was encountered, the plane deviated from the transect and circled the area where grouse were observed to mark the coordinates of the location, document habitat features, and to count all grouse present. Once the lek was assessed, the aircraft then returned to continue the transect.

An Atwell biologist conducted an informal ground-based lek survey on May 2, 2019, after the morning's scheduled aerial survey was cancelled due to fog. The biologist drove 71st St SE from State Highway 3 to the Village of Burnstad. The biologist stopped every 0.5 mile to visually scan for grouse and to listen for grouse vocalizations over a five-minute survey period at each stop (Strickland et al. 2011; Newell 2016).

All grouse observed incidental to other project-related activities such as eagle nest surveys and eagle use point count surveys were recorded and added to the project's grouse data set.

When a Sharp-tailed Grouse lek was encountered, the following data were collected:

- Lek location (decimal degrees);
- Number of individuals present;
- Observed behaviors;
- Land use; and

Lek locations were additionally referenced with nearby landmarks (e.g., hilltops, potholes or wetlands, trees) to improve location precision and to help relocate the lek if assessed for ground-based lek counts at a later date.

Confirmed leks were defined as two or more birds together, with at least one male displaying. Possible leks were defined as auditory detections of multiple grouse that could not be verified visually after their initial detection on a ground-based survey.

Following completion of the surveys, data were reviewed and uploaded into the project database as part of the QA/QC program.

2.3 EAGLE USE SURVEYS

A long-duration, fixed-point protocol (Strickland et al. 2011) was used to document seasonal activity and behavior of eagles and other raptor species within the project. All eagle detections and other raptor detections within a three-dimensional cylindrical plot (the sample plot) were recorded, following a fixed-radius, point count survey approach (Hutto et al. 1986; Ralph et al. 1993) that is referenced in the ECPG (USFWS 2013). Though fixed-radius plots were used, the distance to each detection was estimated to allow for density estimation (Reynolds et al. 1980). Sample plots measured 2,625 feet (800 meters [m]) in radius by 656 feet (200 m) in height, as described in the final Eagle Rule (USFWS 2016).

Study Period

Eagle use surveys were conducted over one full year to encompass the wintering season, spring and fall migrations, and the breeding season (Strickland et al. 2011). Each sample plot was visited for one hour each month, as described in the final Eagle Rule (USFWS 2016). Seasonal periods were defined as spring (March through May), summer (June through July), fall (August through November), and winter (January through February). The study period began on May 1, 2019 and ended on April 30, 2020.

Survey Methodology

Consistent with the Eagle Rule, a one-hour survey duration was used throughout the study period for all visits (USFWS 2016). Surveys were conducted between dawn and dusk. Surveys were conducted in all weather conditions provided that conditions were safe for the observer and that horizontal visibility was at least 800 m and vertical visibility was at least 200 m. A starting point was randomly selected from the 53-monitoring stations before each of the 12 survey events across the year.

While broadly referred to here as point count surveys, the ECPG recognizes that eagle and raptor use surveys are more accurately described as a ‘point-based recording of activity duration (minutes of flight)’ within the sample plot (USFWS 2013).

The following information was recorded for each eagle or raptor individual that was observed:

- Species or parent taxa group (e.g., Accipiter species);
- Age (adult, immature, juvenile);
- Time of day at first and final observation within the sample plot;
- Behavior;
- Flight direction;
- Habitat;
- Horizontal distance to initial observation and to closest observation;
- Flight height within the sample plot (initial height, minimum height, maximum height);
- For eagles and species as endangered or threatened under the Endangered Species Act (ESA), flight path mapped through the sample plot;
- Duration of flight within the rotor-swept zone's (RSZ) portion of the sample plot (35 to 150 m in height), to the nearest 0.1 minute; and
- Duration of flight within the entire (0 to 200 m in height) sample plot for eagles only (i.e. eagle minutes described in the ECPG [USFWS 2013]).

At the completion of each survey, the observer confirmed that data sheets were complete and legible prior to proceeding to the next point count station. Following completion of the surveys, data were reviewed and uploaded into the project database as part of the QA/QC program.

Selection and Location of Point Count Stations

Fifty-three point count stations were established overall within the study area overall (Figure 5). Point count station coordinates are detailed in Appendix A. Consistent with guidelines in the final Eagle Rule (USFWS 2016) and the Appendix C of the ECPG (USFWS 2013), Atwell established 18 point count stations to achieve 30% spatial coverage of an approximately 28,269-acre minimum convex polygon (MCP). The MCP is depicted by the blue polygon in Figure 5 and was generated from a preliminary turbine array provided by Badger Wind. The MCP encompasses the potentially hazardous area around the turbines and their associated infrastructure.

An additional 35 point count stations were added to provide coverage of the project area given a potential for future expansion and/or modification of the project area. Three of these 35 stations were positioned to the east and outside of the project boundary, in an area that was also under consideration for development at the start of surveys.

The following criteria were used when selecting point count station locations:

- Stations should be located on low-traffic roadways for safety and to minimize noise disturbance during surveys.
- Stations should be located within or adjacent habitat types that are representative of the project area.
- Stations should be spaced so that sample plots do not overlap.
- Stations should provide a 360-degree view of the horizon to the extent feasible.
- Stations should be accessible year-round.

Atwell ground-truthed all 53 point count stations in May 2019. Stations with landowner conflicts, an inadequate viewshed, or anticipated poor observer access during heavy precipitation were adjusted as necessary.

Land cover types were reviewed during ground-truthing to confirm that the survey points were representative of habitats found within the project area. The point count stations were located within represented land cover types as follows: 53.6% cultivated crops, 38.1% herbaceous cover, 3.6% open-space developed areas, 1.9% hay/pastureland, 1.1% emergent herbaceous wetland, and 1.0% shrub scrub. The following land cover types each represented less than 1% of the area covered by survey point count stations: development (low, medium, and high intensities), open water, woody wetland, deciduous forest, and barren land.

Alternate Point Count Station Strategy for Winter Surveys

Point count stations were surveyed for eagle use during the winter (December through February) to the extent feasible. There are 12 point count stations with potential safety or access issues during winter storm events. Point count station 14, 21, 22, 30, 32, 35, 36, 40 and 48, are located on infrequently traveled roads with uncertain plowing frequency. These stations were potentially inaccessible during periods of high snow depths. Point count station 26, 39, and 50 are on frequently traveled roads with minimal roadside clearance. Roadside snowbanks that accumulated during plowing could further limit roadside clearance, rendering these points unsafe during surveys.

Nearby point count stations were pre-selected as to serve alternates for the above point count stations in the event that these stations could not be accessed in inclement weather (Table 2). Alternate points were proximate in location and were located within similar habitats when possible. This strategy allowed surveyors to safely meet standardized survey effort goals for the winter and early spring seasons while maintaining appropriate spatial coverage of the study area.

2.4 DIURNAL AVIAN ACTIVITY POINT COUNT SURVEYS

A short-duration, fixed-point protocol (Strickland et al. 2011) was used to characterize general avian use for all species within the study area, consistent with the WEG (USFWS 2012). Diurnal avian activity surveys were used to estimate mean use and species richness and to determine presence of species of concern and concentrations of avian use within the study area.

Detections of small-bodied birds and large-bodied birds were recorded within a three-dimensional cylindrical plot (the sample plot), following a fixed-radius plot point count survey approach described in Section 2.3. Small-bodied birds included hummingbirds, cuckoos, doves, swifts, woodpeckers, and most passerines. Sample plots for small-bodied birds measured 492 feet (150 m) in radius by 656 feet (200 m) in height. Large-bodied birds included upland game birds, waterfowl, waterbirds (wading birds, cormorants, pelicans, grebes), shorebirds, raptors, nightjars, pigeons, and large corvids (crows [*Corvus brachyrhynchos*] and Common Ravens [*Corvus corax*]). Sample plots for large-bodied birds measured 2,625 feet (800 m) in radius by 656 feet (200 m) in height.

Study Period and Study Area

Diurnal avian activity surveys were completed during the spring (May 2019, and March to April 2020) and fall (August to November 2019) seasons. The same 53 point count station locations established for eagle and raptor use surveys were also used for diurnal avian activity surveys (Figure 5).

Survey Methodology

Diurnal activity surveys followed point count methodology described in Ralph et al. (1993; 1995) and summarized in the WEG (USFWS 2012) and in standard industry recommendations (National Wind Coordinating Committee 1999; Strickland et al. 2011). Though a fixed-radius protocol was used (Hutto et al. 1986; Ralph et al. 1993), distance estimates to each detection were also recorded, allowing for calculation of density estimates (Reynolds et al. 1980).

Diurnal avian activity surveys were 10 minutes in duration. Surveys were conducted after the completion of the eagle and raptor use survey (Section 3.6), so birds had settled after initial disturbance created by the observer's arrival at the point count station.

All birds that were seen or heard during the survey were recorded, up to distances of 150 m for small-bodied birds and 800 m for large-bodied birds. Surveys were conducted throughout the day, their timing contingent on the completion of the preceding eagle and raptor use survey.

The following information was recorded for each auditory and visual detection:

- Species or parent taxa group (e.g., sparrow species);
- Age (adult, immature, and juvenile);
- Time of day at first detection;
- Behavior;
- Flight Direction;
- Habitat;
- Horizontal distance to initial observation and to closest observation;
- Flight height within the sample plot (initial height, minimum height, and maximum height); and
- Flight paths of federally listed threatened and endangered species mapped through the sample plot.

At the completion of each survey, the observer confirmed that data sheets were complete and legible prior to proceeding to the next point count station. Following completion of the surveys, data were reviewed and uploaded into the project database as part of the QA/QC program.

2.5 INCIDENTAL DATA COLLECTION AND LISTED SPECIES

Incidental detections of eagles, federally listed threatened or endangered (TES), and North Dakota species of conservation priority (SCP) as defined by the ND SWAP (Dyke et al. 2015) were recorded during survey activities. Incidental detections include observations recorded while en route to point count stations, non-raptor observations during eagle use surveys, raptor observations outside of the 800 m-radius survey plot, and observations that were recorded at point count stations but outside the survey period.

3 RESULTS

3.1 BALD EAGLE AND RAPTOR NEST SURVEY

3.1.1 Eagle Nests

Atwell detected one in-use Bald Eagle (*Haliaeetus leucocephalus*) nest within the eagle nest survey area during the May 2019 aerial surveys (Figure 3). This nest was located within the project area, in a small cluster of deciduous trees southwest of Beaver Lake in Logan County (46.3490°N, 99.6275°W). An adult Bald Eagle was observed incubating eggs at the time of observation. No other eagle nests were detected within the eagle nest survey area. One individual subadult Bald Eagle was observed soaring within the project area during aerial surveys (Figure 3). Golden Eagles (*Aquila chrysaetos*) were not observed during the aerial survey and no Golden Eagle nests were found during the study period.

3.1.2 Non-Eagle Raptor Nests

Atwell identified nine non-eagle raptor nests within the project area boundary and four non-eagle raptor nests within the surrounding two-mile raptor nest survey buffer. All 13 nests are depicted in Figure 3 and are summarized in Table 3. No federally listed raptor species were recorded as nesting during raptor nest surveys. Several of the 13 non-eagle raptor nests were found during ground-based eagle use and avian use surveys.

Five occupied Ferruginous Hawk (*Buteo regalis*) nests were found during the survey period, including three nests within the project area boundary and two nests within the 2-mile raptor nest survey buffer (Figure 3). All five nest structures were located in deciduous trees.

Four occupied Red-tailed Hawk (*Buteo jamaicensis*) nests were found during the survey period, including three nests within the project area and one nest within the two-mile raptor nest survey buffer. All four nest structures were constructed in deciduous trees.

The remaining four non-eagle raptor nests included: one Swainson's Hawk (*Buteo swainsoni*) nest observed during the nest building stage at an unusually late date inside of the project area boundary; one occupied Great Horned Owl (*Bubo virginianus*) nest within the project area and one occupied Great Horned Owl nest within the 2-mile raptor nest survey buffer; and one unoccupied raptor nest structure built by an unknown raptor species within the project area boundary. This structure was believed to be too small to be a Bald Eagle nest and of dimensions consistent with a hawk nest. The nest was found in poor condition.

3.2 SHARP-TAILED GROUSE LEK SURVEYS

One confirmed lek location, two possible lek locations, and six individual Sharp-tailed Grouse were observed within the grouse survey area during standardized grouse lek surveys (Figure 4). Confirmed and possible leks are shown with 0.5-mile buffers to represent likely nesting areas for females, following home range information provided in the ND SWAP (Dyke et al. 2015).

The confirmed lek was observed during the aerial survey on May 3, 2019, and it was observed again by aircraft on May 10, 2019. The lek was located approximately 7.75 miles southwest of Wishek and just inside of the project area boundary (Figure 4). On both visits, 16 to 18 individuals were observed at the lek. This lek location is managed as herbaceous habitat by the NDGFD (part of the CoverLocks program) according to signage posted on-site.

Of the two possible leks, both were discovered from auditory detections heard during ground-based surveys that were conducted on May 2, 2020 during inclement fog conditions that prevented visual confirmation of the leks on that date. In both cases, an unknown number of individuals were heard in the early morning hours from the biologist's roadside location. Neither potential lek could be confirmed in subsequent visits to the locations.

Of the six individual Sharp-tailed Grouse detected during the lekking season, one grouse was detected during aerial surveys within the project area and the other five grouse were detected incidentally during follow-up ground surveys between May 17 and May 20, 2019. Of these six birds, three were observed within the project area and three were observed outside of the project area but within the grouse survey area (Figure 4).

3.3 EAGLE USE SURVEYS

Eagle use survey results, along with discussion regarding annual and seasonal patterns, spatial distribution (where sample size allowed), directional movements, and flight heights are presented below.

3.3.1 Eagle Use Survey Effort

Table 4 summarizes survey effort by point during the survey period. Eagle use surveys occurred over 636 total hours of standardized survey effort during the study period. Total effort included 159 hours of spring surveys, 106 hours of summer surveys, 212 hours of fall surveys, and 159 hours of winter surveys.

Over the course of the study period, two point count stations (27 and 28) were shifted to new locations (54 and 55) to avoid landowner conflicts. Stations 14, 19, 22, 30, and 40 were not accessible during the winter and early spring so their paired replacement stations were surveyed instead following the alternative point strategy outlined in Section 2.4 above. Alternative points

were also used for stations 35 and 36 during the winter and spring due inaccessibility and to avoid potential landowner conflicts. Point count stations 35 and 36 will eventually be replaced with new point count stations during the second year of eagle use surveys.

3.3.2 Cumulative Detections of Bald Eagles and Golden Eagles

Overall, 34 Bald Eagles were detected over 636 hours across one year of standardized eagle use survey effort (Figure 6). This total only includes Bald Eagles observed during standardized use surveys within the point count stations' sample plots.

An additional 46 incidental detections of Bald Eagles were documented across the project area during the survey period. Incidental detections included eagles observed from point count stations but flying outside of the sample plot boundary or outside of the 60-minute eagle use survey window, including nine Bald Eagles observed only during 10-minute diurnal avian use surveys that were conducted immediately after the 60-minute eagle use surveys were completed. Eagles detected while traveling en route to point count stations were also included as incidental detections (Figure 6).

Six Golden Eagles were detected over 636 hours across one year of standardized eagle use survey effort (Figure 6). This total only included eagles observed during standardized use surveys that were detected within 800 m of the point count station. An additional seven incidental Golden Eagle detections were documented across the project area during the one-year survey period.

3.3.3 Seasonality

Bald Eagles were recorded as standardized detections throughout the year, though most detections occurred during the spring and fall migratory periods. Standardized mean use within the project area was:

- 0.11 Bald Eagle detections/60-minute survey/800 m plot (standard deviation [SD] = 0.37) during the spring survey period;
- 0.01 Bald Eagle detections/60-minute survey/800 m plot (SD = 0.10) during the summer period, 0.06 Bald Eagle detections/60-minute survey/800 m plot (SD = 0.28) during the fall period; and
- 0.01 Bald Eagle detections/60-minute survey/800 m plot (SD = 0.11) during the winter period, (Table 5).

Accounting for the total eagle use survey effort across the project area during the year, the equivalent of one Bald Eagle was detected for every 8.8 hours, 106.0 hours, 16.3 hours, and 79.5

hours of standardized eagle use survey effort during the spring, summer, fall, and winter survey periods, respectively.

Standardized Golden Eagle detections were spread across the spring, fall, and winter seasons, with most detections occurring during the fall season. Golden Eagles were not observed during standardized surveys in the summer. Standardized mean use within the project area was:

- 0.01 Golden Eagle detections/60-minute survey/800 m plot (SD=0.08) during the spring period;
- 0.01 Golden Eagle detections/60-minute survey/800 m plot (SD = 0.12) during the fall period; and
- 0.01 Golden Eagle detections/60-minute survey/800 m plot (SD = 0.11) during the winter period.

Accounting for the total eagle use survey effort across the project area during the year, the equivalent of one Golden Eagle was detected for every 159.0 hours 70.7 hours, and 79.5 hours during the spring, fall, and winter survey periods, respectively.

3.3.4 Spatial Distribution of Detections

Bald Eagle mean use rates were low across the project area (see Table 6 for a summary of use and Figure 5 for point count station locations). Point count stations with highest observed Bald Eagle use tended to be between Wishek and Beaver Lake in Logan County though this pattern was not well defined, and a second year of eagle use surveys will provide additional context on the persistence of this pattern. Point count station 4 was within 800 m of an in-use Bald Eagle nest (Section 3.1.1) and this point count station had the highest estimated Bald Eagle use of the sample set (Table 6). Point count stations 12 and 18 north of Wishek were the only other stations with more than two Bald Eagle detections over the one year of surveys.

There was no apparent spatial pattern to standardized Golden Eagle detections. Thirteen Golden Eagle sightings (six recorded during standardized surveys and seven recorded incidentally to surveys) were distributed across the project area, with six detections in Logan County and seven detections in McIntosh County.

3.3.5 Directional Movements

Bald Eagle movements tended to be toward the north in the spring and toward the south in the fall, suggesting that most of the Bald Eagles observed during these seasons were migrating through the project area.

Eighteen Bald Eagle detections occurred during the spring season, 10 of which were headed in a northerly direction (i.e., north, northeast, northwest, north-northeast, or north-northwest). Only three spring observations were moving in a southerly direction (i.e., south, southeast, southwest, south-southeast, or south-southwest). Five spring observations did not show any directional movement (i.e., either perched, circling, or mixed flight directions). One of the three southbound spring observations was associated with the known nest within the project area.

Thirteen Bald Eagle detections occurred during the fall season, seven of which were headed in a southerly direction. Only two fall observations were for eagles moving in a northerly direction, two eagle observations were seen flying westward, and another two eagle observations did not show any directional movement. Two Bald Eagles were detected flying south in early to mid-December, suggesting that Bald Eagle fall migrations may continue through late fall.

In contrast to Bald Eagles, Golden Eagles observed during standardized eagle use surveys did not generally follow expected seasonal directional movements (e.g., northbound in the spring and southbound in the fall). This pattern suggests that most of the Golden Eagles seen during the study period were not actively migrating at the time of observation, perhaps using the project area in postnatal dispersal movements or as migratory stopover habitat while observed from point count stations.

3.3.6 Flight Heights

Table 7 summarizes the mean distributions of minimum and maximum flight heights for raptor species detected during standardized eagle use surveys. Mean minimum and maximum flight heights within the project area were highest during the spring survey period for Bald Eagles, Golden Eagles, and the raptor group in general. Mean raptor flight heights steadily decreased through the seasons from the spring to the following winter. A time within RSZ summary for Bald and Golden Eagles is presented in Table 8.

Bald Eagle mean minimum and maximum flight heights were within the RSZ during the spring, and Bald Eagle mean maximum flight heights were within the RSZ during the fall and winter. Sample sizes were low during some seasons, with only one Bald Eagle observed during standardized surveys in the summer and only two Bald Eagles observed in the winter. Bald Eagles were observed within the RSZ for 30.3 minutes over 636 hours of standardized survey effort across the study period. Similar to a seasonal pattern of observation described in Section 3.3.3, rates of Bald Eagle time within the RSZ were highest in the spring (0.11 minutes/survey hour) and fall (0.05).

Golden Eagle sample size was also small, and three of the six Golden Eagles were observed during standardized surveys at heights within the RSZ. Golden Eagles were observed within the RSZ for 10.6 minutes over 636 hours of standardized survey effort across the study period. Golden Eagle

rates of observation within the RSZ were also highest in the spring (0.04 minutes/survey hour) and fall (0.02 minutes/survey hour).

3.3.7 Eagle-Minutes Summary

Eagle-minutes represent accrued minutes of eagle observations for flying eagles within the 800 m-radius by 200 m-high sample plot. Perched eagles or eagles observed outside of the sample plot are not assigned eagle-minutes (USFWS 2013). Eagle-minutes are summarized by season in Table 8.

Similar to patterns described in Sections 3.3.3 and 3.3.6 above, Bald Eagle seasonal eagle-minute rates were highest in the spring (0.26 Bald Eagle-minutes per hour of standardized eagle use observation) and fall (0.16 Bald Eagle-minutes per survey hour). Bald Eagle-minute rates were lowest in the winter (0.03 Bald Eagle-minutes per survey hour) and summer (0.01 Bald-Eagle minutes per survey hour). Cumulatively, 81 total Bald Eagle-minutes were recorded over 636 hours of standardized survey effort across the study period.

Observed Golden Eagle-minute rates were highest in the fall (0.056 Golden Eagle minutes per survey hour) and spring (0.04 Golden Eagle minutes per survey hour). Golden Eagle minute rates were lowest in the winter (0.02 Golden Eagle minutes per survey hour) and the summer, when they were not observed. Cumulatively, 21 Golden Eagle-minutes were recorded over 636 hours of standardized survey effort.

3.3.8 Use of the Project Area by Other Raptor Species

Overall, mean raptor use was highest during the fall survey period (3.37 raptors/60-minute survey/800 m plot; Table 5). Detections of Red-tailed Hawks, Swainson's Hawks, and Northern Harriers (*Circus hudsonius*) collectively accounted for 70.3% of raptor detections during the fall season. Broad-winged Hawks (*Buteo platypterus*) made up an additional 12.3% of raptor detections in the fall. All but one of the 88 Broad-winged Hawks that were reported in the fall were observed over the course of one September survey at point count station 25.

Mean use rates were similar during the summer and spring survey periods (summer: 2.39 raptors/60-minute survey/800 m plot; spring: 2.01 raptors/60-minute survey/800 m plot). Similar to the fall season, Red-tailed Hawks, Swainson's Hawks, and Northern Harriers comprised the bulk of raptor detections in both the summer (78.2%) and the spring (76.4%).

Winter mean use was very low compared to the other three seasons (0.069 raptors/60-minute survey/800 m plot). A total of 11 raptors representing five species were observed over 159 hours of standardized eagle use surveys over the full winter season. Three of the five species detected in the winter were not observed during standardized eagle use surveys during any other season,

including Northern Goshawk (*Accipiter gentilis*), Great Horned Owl, and Snowy Owl (*Bubo scandiacus*). Snowy Owls were the most common raptor detections (45.5%).

Fourteen raptor species were observed during standardized surveys in the fall, the highest raptor diversity noted in any season over the first year of surveys. Twelve raptor species were detected during the spring, seven species in the summer, and five in the winter.

A review of the entire raptor group across all point count stations shows that raptors generally did not exhibit strong inter-seasonal patterns of spatial use within the project area that might suggest local concentrations of use (Table 9 and Figure 5 for point count station locations). However, contrary to Bald Eagle observations described above, point count stations with the highest raptor use rates tended to be in the southern and central portions of the project area. Point count station 25, located west of Wishek in McIntosh County, had the highest mean use overall (8.92 raptors/60-minute survey/800 m plot). This result was driven by a large group of migrating Broad-winged Hawks detected at this station on September 19, 2019.

Mean minimum and maximum flight heights were within the RSZ during the spring for several raptor species (Table 7) including Ferruginous Hawk, Northern Harrier, Red-tailed Hawk, Rough-legged Hawk (*Buteo lagopus*), Swainson's Hawk, and Turkey Vulture (*Cathartes aura*). Summer and fall mean minimum and maximum flight heights were within or near the RSZ for Ferruginous Hawk, Red-tailed Hawk, Swainson's Hawk, and Turkey Vulture.

3.3.9 Federally Listed Threatened and Endangered Species

Three adult Whooping Cranes (*Grus americana*) were detected within the project area during standardized surveys on April 15, 2020. The cranes were initially observed at 46.304° N, 99.640° W, within 250 m of point count station 16, flying north at heights ranging from 2 to 7 m above the ground (i.e., below RSZ). This is the first known occurrence of this federally listed endangered species within the project area.

The Whooping Cranes were observed foraging in corn throughout the day, approximately four miles northwest of Wishek, North Dakota. Of note, due to poor harvesting conditions during the fall of 2019, the Whooping Cranes were foraging in unharvested stands of corn. The Atwell biologist noted in April 2020 that there were other areas of unharvested corn within the project area, perhaps dispersing Whooping Crane stopover use farther from the migration corridor's centerline than expected.

The nocturnal roosting location was not obtained on April 15. The Whooping Cranes were again present on April 16 and 17, 2020 and they roosted 0.7 miles (1.1 kilometer [km]) from their foraging location on those days. The roosting location is at the confluence of two riverine wetlands with seasonally flooded water regime classifications within the project area.

This was the only sighting of a federally listed threatened or endangered species within the project area during the study period.

3.4 DIURNAL AVIAN ACTIVITY POINT COUNT SURVEYS

The following sections summarize the results of the diurnal avian activity surveys, including mean use and mean flight height statistics.

3.4.1 General Avian Use

Standardized mean use data for all 110 species observed during 10-minute diurnal avian activity surveys in the spring and fall are presented in Appendix B. A list of all species observed within the project area over the course of eagle use and diurnal avian activity surveys (including incidentally observed species) is included in Appendix C.

Passerine, non-passerine, upland gamebird, raptor, wader, waterbird, and waterfowl statistics, discussed in more detail below, are summarized by species group in Table 10 and by individual species in Appendix B. Mean use statistics are summarized for all detections within the 800 m-radius by 200 m-high sample plot for large-bodied species and within the sample plot for small-bodied species as described in Section 2.5.

In addition, several large-bodied species of multiple species groups were frequently detected outside the sample plot at above 200 m in altitude. To provide additional information on use of the project area by these species, mean use statistics are also summarized for all detections within 800 m of the point regardless of flight height. In Table 10 and Appendix B, this is noted in a second line of data with an italicized “all” suffix after the species group or species name.

3.4.2 Species Group Use of the Project Area during Spring and Fall Migration

Large-bodied Corvids

Large-bodied corvids include crows and ravens and were recorded out to 800 m during diurnal avian activity surveys. Mean use rates within the project area were lower in the spring (0.05 detections/10-minute survey/800 m plot) than in the fall (0.11 detections/10-minute survey/800 m plot). This species group represented less than 0.1% of all spring detections and 0.4% of all fall detections in the project area during diurnal avian activity surveys. Nearly all large-bodied corvid detections (all spring detections and 96% of fall detections) were American Crows. One Common Raven was detected in the fall.

Large-bodied Non-Passerines

Large-bodied non-passerines include nightjars and Rock Pigeons (*Columba livia*) and were recorded out to 800 m during diurnal avian activity surveys. Large-bodied non-passerine mean use within the project area was slightly higher in the spring (0.56 detections/10-minute survey/800 m plot) than the fall (0.44 detections/10-minute survey/800 m plot). Large-bodied non-passerines represented 0.4% of spring detections and 2% of fall detections during diurnal avian activity surveys. Nearly all large non-passerine detections (all spring large-bodied non-passerines detections and 99% of fall large-bodied non-passerine detections) were Rock Pigeons. One Common Nighthawk (*Chordeiles minor*) was detected in the fall.

Non-Passerines (Small)

Small-bodied non-passerines include doves (excluding Rock Pigeon), cuckoos, swifts, hummingbirds, kingfishers, and woodpeckers were recorded out to 150 m during diurnal avian activity surveys. Small-bodied non-passerine mean use within the project area was three times higher in the fall (0.32 detections/10-minute survey/150 m plot) than in the spring (0.10 detections/10-minute survey/150 m plot). Much of this seasonal difference was attributable to higher numbers of Mourning Doves (*Zenaida macroura*) detected during the fall season.

Small-bodied non-passerines represented less than 0.1% of all spring detections and just over 1% of all fall detections during diurnal avian activity surveys. Mourning Doves were the most common small-bodied non-passerine detected and accounted for 81% of the observations of this species group in the spring and 94% of the observations of birds within this group in the fall.

Passerines (including Small-bodied Corvids)

Passerine species (perching birds) and small-bodied corvids (e.g., Blue Jay [*Cyanocitta cristata*]) were recorded out to 150 m and accounted for a large portion of all avian detections both in the spring (34% of all detections) and fall (44% of all detections). Passerine mean use of the project area was much higher in the spring, with mean use rates of 45.89 detections/10-minute survey/150 m plot in the spring and 11.77 detections/10-minute survey/150 m plot in the fall. Lapland Longspur (*Calcarius lapponicus*) accounted for much of the seasonal difference in passerine use; 6,245 Lapland Longspurs were detected during spring surveys, which equates to 86% of all spring passerine/small-bodied corvid detections. Only 498 Lapland Longspurs were detected during avian use surveys in the fall.

Fifty-one passerine and small-bodied corvid species were recorded during standardized diurnal avian activity surveys. Lapland Longspurs and Red-winged Blackbirds (*Agelaius phoeniceus*) were detected in large flocks on multiple occasions in cropland habitats, or in cropland/grassland margins. Red-winged Blackbirds are common breeders in cropland, grassland, and wetland

habitats within the project boundary and are abundant during migration in the spring and fall. Lapland Longspurs are also abundant in cropland habitats during spring and fall migration and may continue into the winter season contingent on seasonal weather conditions. Taken together, these two species represented 82% of 9,781 cumulative passerine detections recorded over the spring and fall seasons.

In the spring, migrating Lapland Longspurs accounted for the highest spring mean use rate any species (39.28 detections/10-minute survey/150 m plot) and made up 86% of all passerine detections. In the fall, flocks of staging and migrating Red-winged Blackbirds produced the highest fall mean use of any species (4.99 detections/10-minute survey/150 m plot) and made up 43% of all fall passerine detections. Migrating Lapland Longspurs were also numerous in the fall, accounting for an additional 20% of the fall passerine detections.

Counts of more than 500 Lapland Longspurs were recorded on two spring surveys (510 birds at point count station 32 on March 18, 2020 and 590 birds at point count station 17 on March 19, 2020) and counts between 300 and 500 Lapland Longspurs occurred at nine point count stations during the spring.

Encounters with large flocks of longspurs or blackbirds were not attributable to unique habitats and/or physiography present at stations with highest recorded mean use rates for these species, and the Atwell biologist noted that it was apparent that these longspur and blackbird flocks could have appeared at any location in the project area during migration. Spring Lapland Longspur counts within the project area generally peaked in early to mid-March, with a second, smaller peak in early to mid-April. This trend matches similar regional patterns reported for Logan and McIntosh counties (AKN 2020).

Several North Dakota SCP were detected during diurnal avian use surveys including:

- Chestnut-collared Longspur ([*Calcarius ornatus*], SCP Level I, 22 spring detections and 11 fall detections);
- Grasshopper Sparrow ([*Ammodramus savannarum*], SCP Level I, 4 spring detections and 1 fall detection);
- Bobolink ([*Dolichonyx oryzivorus*], SCP Level II, 19 spring detections and 4 fall detections); and
- Western Meadowlark ([*Sturnella neglecta*], SCP Level II, 66 spring detections and 22 fall detections).

Each of these species was found in generally low numbers with more detections during the spring season than in the fall season. This seasonal difference can likely be attributed to higher rates of detectability for vocalizing, territorial birds in the spring. Level I SCP (Chestnut-collared Longspur and Grasshopper Sparrow) detections tended to be in northern and eastern portions of the project area that are higher in elevation and are dominated by herbaceous, grassland cover. Highest Bobolink numbers were recorded southwest of Wishek, in fragmented grasslands near point count stations 32 and 34. Western Meadowlarks detections were more widespread across the project area but generally followed the spatial pattern observed for Chestnut-collared Longspurs.

Raptors

Raptors include eagles, falcons, harriers, hawks, owls, and vultures and were recorded out to 800 m during diurnal avian activity surveys. Additional raptor results recorded during eagle use surveys are summarized in Section 3.3.6. Mean raptor use recorded during diurnal avian use surveys was lower within the survey area during the spring survey period compared to the fall survey period. This pattern mirrored seasonal differences in raptor use found during eagle use surveys (Table 5).

Similar to results from eagle use surveys, raptor mean use recorded during diurnal avian use surveys was primarily driven by detections of Red-tailed Hawks, Swainson's Hawks, and Northern Harriers. In particular, Swainson's Hawks accounted for approximately 46% of all raptor detections during fall avian use surveys.

The ND SWAP lists several raptor species as SCP (Dyke et al. 2015) and several of these raptor species were observed during diurnal avian use surveys. Level I SCP observed during avian use surveys included: Ferruginous Hawk (3 spring detections and 1 fall detection) and Swainson's Hawk (8 spring detections and 62 fall detections). Level II SCP observed during avian use surveys included: American Kestrel (3 spring detections and 3 fall detections), Bald Eagle (7 spring detections and 4 fall detections), Golden Eagle (1 spring detection), and Northern Harrier (16 spring detections and 21 fall detections).

Shorebirds

Shorebirds include avocets, plovers, curlews, dowitchers, godwits, knots, phalaropes, sandpipers, snipes, stilts, turnstones, and woodcocks and were recorded out to 800 m during diurnal avian activity surveys. Shorebird mean use rates within the project area was similar in the spring (0.54 detections/10-minute survey/800 m plot) and fall (0.58 detections/10-minute survey/800 m plot). Shorebird detections represented 0.41% of all spring detections and 2.18% of all fall detections during diurnal avian activity surveys.

A large proportion of shorebirds observed in the fall were unidentifiable to species, belying higher shorebird species richness reported in the spring. A total of seven shorebird species were detected during the study period. Species that likely nest within the project area, including Killdeer and Upland Sandpiper (*Bartramia longicauda*), represented a majority of shorebird detections. Killdeer accounted for the greatest proportion of shorebirds in both seasons (65% in spring and 49% in fall).

Shorebirds were encountered in low numbers and frequencies throughout the project area and across several habitats. There was some indication that shorebirds may be found in higher densities in higher elevation grassland/pothole habitats along the project area's northeastern boundary, particularly near point count stations 22, 51, and 52. Killdeer accounted for the most significant proportion of higher shorebird concentrations in this portion of the study area.

The ND SWAP lists several shorebird species as SCP (Dyke et al. 2015). Several of these species were observed during diurnal avian use surveys, including:

- Marbled Godwit ([*Limosa fedoa*], SCP Level I, 5 spring detections);
- Wilson's Phalarope ([*Phalaropus tricolor*], SCP Level I, 6 spring detections); and
- Upland Sandpiper (SCP Level II, 11 spring detections).

Upland Gamebirds

Upland gamebirds include bobwhite, grouse, partridge, prairie-chickens, and turkey and were recorded out to 800 m during diurnal avian activity surveys. Upland gamebird mean use within the project area was higher in the spring (0.26 detections/10-minute survey/800 m plot) than the fall (0.10 detections/10-minute survey/800 m plot) during diurnal avian activity surveys.

Upland gamebirds represented 0.20% of all spring detections and 0.38% of all fall detections during diurnal avian activity surveys. Only two upland gamebird species were detected, Ring-necked Pheasant (*Phasianus colchicus*) and Sharp-tailed Grouse, a ND SWAP Level II SCP (Dyke et al. 2015). Ring-necked Pheasants were detected more frequently in the fall, with 15 fall detections and 10 spring detections. Sharp-tailed Grouse were detected more frequently in the spring, with 32 spring detections and six fall detections. These species are non-migratory and are present year-round within the project area; seasonal differences are attributable to seasonal differences in detectability stemming from grouse behavior and vocalization frequency.

Waders

Waders include cranes, bitterns, egrets and herons and were recorded out to 800 m during diurnal avian activity surveys. In addition to the previously mentioned Whooping Crane observations in the fall of 2019, only Sandhill Cranes (*Grus canadensis*) were observed in the spring and only Great Blue Herons (*Ardea herodias*) were observed in the fall.

A large proportion of Sandhill Cranes (including one group of 270 individuals) were observed flying over 200 m in altitude, above the sample plot and also above the RSZ. When observations greater than 200 m in height are excluded from analysis, wader spring mean use was 0.52 detections/10-minute survey/800 m plot and waders comprised 0.39% of all standardized spring avian observations. However, when Sandhill Cranes detected at heights over 200 m are included in analysis, spring mean increased to 2.42 detections/10-minute survey/800 m plot with waders comprising 1.77% of all standardized spring avian observations during diurnal avian activity surveys. Only three Great Blue Herons were detected during standardized avian use surveys in the fall.

Waterbirds

The waterbirds group includes cormorants, grebes, gulls, and loons. Waterbirds represented less than 1% of all spring detections and 38% of all fall detections during avian use surveys. Overall, waterbird mean use was 0.83 detections/10-minute survey/800 m plot in the spring and 10.13 detections/10-minute survey/800 m plot in the fall.

Most of this difference in observed seasonal use of the project area can be attributed to patterns in Franklin's Gull (*Leucophaeus pipixcan*) use. Only two Franklin's Gulls were observed during spring avian use surveys, a mean use rate of 0.01 detections/10-minute survey/800 m plot. In contrast, 2,023 Franklin's Gulls were observed during fall avian use surveys, a mean use rate of 9.54 detections/10-minute survey/800 m plot. Franklin's Gulls accounted for 94% of all fall waterbird detections during avian use surveys.

Nearly all Franklin's Gull detections were observed at just four surveys in the fall:

- August 27, 2019 - 500 individuals were seen at point count station 36 south of Wishek;
- September 6, 2019 - 300 individuals were seen at point count station 12 north of Wishek;
- August 28, 2020 - 200 individuals were seen at point count station 55 northwest of Wishek; and
- September 26, 2019 - 1,000 individuals were seen at point count station 2 near Beaver Lake.

Franklin's Gulls were generally observed in flight as they moved through the project area, and all gulls observed during the September 26, 2019 observation were in flight. On occasion, large flocks were found opportunistically foraging in agricultural habitats following harvesting and haying activities (e.g., the August 27, 2019 observation of 500 individuals), an expected observation for gulls moving in large numbers over agricultural cropland habitats. There are no known Franklin's Gull nesting colony sites within the project area and fall detections appear to represent post-breeding movements from locations beyond the project area.

The ND SWAP lists several waterbird species as SCP (Dyke et al. 2015). Waterbird SCP observed during diurnal avian use surveys included:

- Black Tern ([*Chlidonias niger*], SCP Level I, 1 fall detection); Franklin's Gull (SCP Level I, 2 spring detections and 2,023 fall detections);
- Horned Grebe ([*Podiceps auratus*], SCP Level I, 2 spring detections); and
- American White Pelican ([*Pelecanus erythrorhynchos*], SCP Level II, 21 fall detections).

Waterfowl

Waterfowl refers to the taxonomic order Anseriformes, including geese and ducks. Waterfowl mean use rates were significantly higher in the spring (84.18 detections/60-minute survey/800 m plot) than in the fall (2.31 detections/10-minute survey/800 m plot) and were the primary reason for higher overall avian use recorded in the spring than in the fall. There were 13,385 waterfowl detections during the spring season, 63% of all spring detections during avian use surveys. Only 489 waterfowl detections were recorded in the fall.

Migrating Snow Geese (*Chen caerulescens*), Greater White-fronted Geese (*Anser albifrons*), and Canada Geese (*Branta canadensis*) together accounted for 12,799 of 13,385 (96%) of spring waterfowl detections and 60% of all detections during avian use surveys. Groups of over 100 Snow Geese were regularly observed in flight and one flock of approximately 3,000 Snow Geese was observed flying northeastward on March 24, 2020 at point count station 40. This flock alone accounted for 14% of all of the spring detections combined. The spring mean use rates for the most commonly observed geese species included: 68.50 detections/60-minute survey/800 m plot for Snow Goose, 8.08 detections/10-minute survey/800 m plot for Canada Goose, and 3.91 detection/10-minute survey/800 m plot for Greater White-fronted Goose.

As noted for large observed flocks of passerines described above, there were no discernible habitat or physiographic characteristics that appeared to attract large groups of Snow Geese to these particular stations. Large flocks of geese were generally in flight when observed at point count stations across the project area.

Prairie pothole habitats are concentrated on the northeastern edge of the project area, particularly within the one-mile buffer surrounding the project area northeast of Wishek. Point count stations 51, 52, 53 within the one-mile buffer and point count station 22 within the project area boundary had waterfowl species richness values of 10 species or above.

The above statistics were calculated only from individuals observed within the sample plot. Waterfowl were frequently observed at altitudes over 200 m, and mean use statistics are also summarized for all detections regardless of flight height for Greater White-fronted Goose, Mallard (*Anas platyrhynchos*), Northern Pintail (*Anas acuta*), Ross's Goose (*Chen rossii*), and Snow Goose in Appendix B. Large proportions of detections of Greater White-fronted Geese, Mallards, and Snow Geese were observed above 200 m in altitude in the fall, and waterfowl mean use rates double in the fall to 5.77 detection/10-minute survey/800 m plot if detections over 200 m in altitude are included in mean use calculations.

3.4.3 Flight Heights by Species Group during Spring and Fall Migration

Table 11 details mean flight height statistics for species groups detected during diurnal avian use surveys in the spring and fall. Mean minimum and maximum flight heights are summarized for the spring survey period, the fall survey period, and for spring and fall observations combined. Flight heights are summarized by flock and not by individual; lone birds were counted as a flock of size of one.

Mean minimum and maximum flight heights were similar in the spring and fall for all birds combined, with mean minimum heights between 25 to 30 m and mean maximum heights around 35 m. The most notable seasonal differences were observed in waders and waterfowl. Mean flight heights were around 450 m for waders in the spring and under 20 m in the fall, attributable to high-flying migrating Sandhill Cranes observed only during the spring period and low-flying Great Blue Herons observed in the fall (see Waders subsection in Section 3.4.2 above). Waterfowl flight heights tended to be higher during the fall season (mean heights approximately 210 m) than in the spring (mean heights around 50 m).

Species groups with mean flight heights within or near the RSZ included raptors, shorebirds, waterbirds, and waterfowl.

4 CONCLUSIONS

During this pre-construction avian use study, a total of 62 species were recorded within the project area (Appendix C). Over the course of 2019 and 2020 standardized field studies, data were recorded for over 29,404 individual bird observations. Six hundred and thirty-six hours of standardized eagle use survey effort and 61.8 hours of standardized diurnal avian use surveys were completed for this avian use study.

One Bald Eagle nest was found within the project area during the aerial nest survey. No other Bald Eagle nests were found within 10 miles of the project boundary, and no Golden Eagle nests were found during the nest survey.

One confirmed Sharp-tailed Grouse lek was found within the project area during aerial lek surveys. Two possible lek locations were identified within the project area during ground-based surveys in fog. Lekking grouse were heard but not seen due to visibility conditions, and no grouse were observed at either location during follow-up visits.

Bald Eagle mean use rates were highest in the spring and fall, suggesting that most of the eagle use observed within the project area was comprised of migrating individuals heading northward in the spring and southward in the fall. Golden Eagles were rarely encountered during standardized use surveys, with highest mean use rates in the fall and winter.

Passerines and waterfowl together accounted for over 95% of bird detections recorded during spring diurnal avian use surveys. Large groups of Lapland Longspurs and Snow Geese in particular influenced this pattern. Passerines and waterbirds accounted for over 80% of bird detections during fall avian use surveys, driven by large groups of Red-winged Blackbirds and Franklin's Gulls. Significant numbers of Sandhill Cranes (spring) and waterfowl (fall) were observed flying at high altitudes well above the 200 m-high sample plot and the RSZ.

Three Whooping Cranes were observed within the project area over three-day span in April of 2020. Whooping Cranes are listed under the ESA as an endangered species. Though this is the first known observation within the project area boundary, the project area is within the Whooping Crane migration corridor and may be used by migrating cranes in the spring and fall (Pearse et al. 2018). The three individuals were observed foraging in unharvested corn during daylight hours and were observed flying to a roosting location in a nearby riverine wetland at dusk.

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FIGURES

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Badger Wind

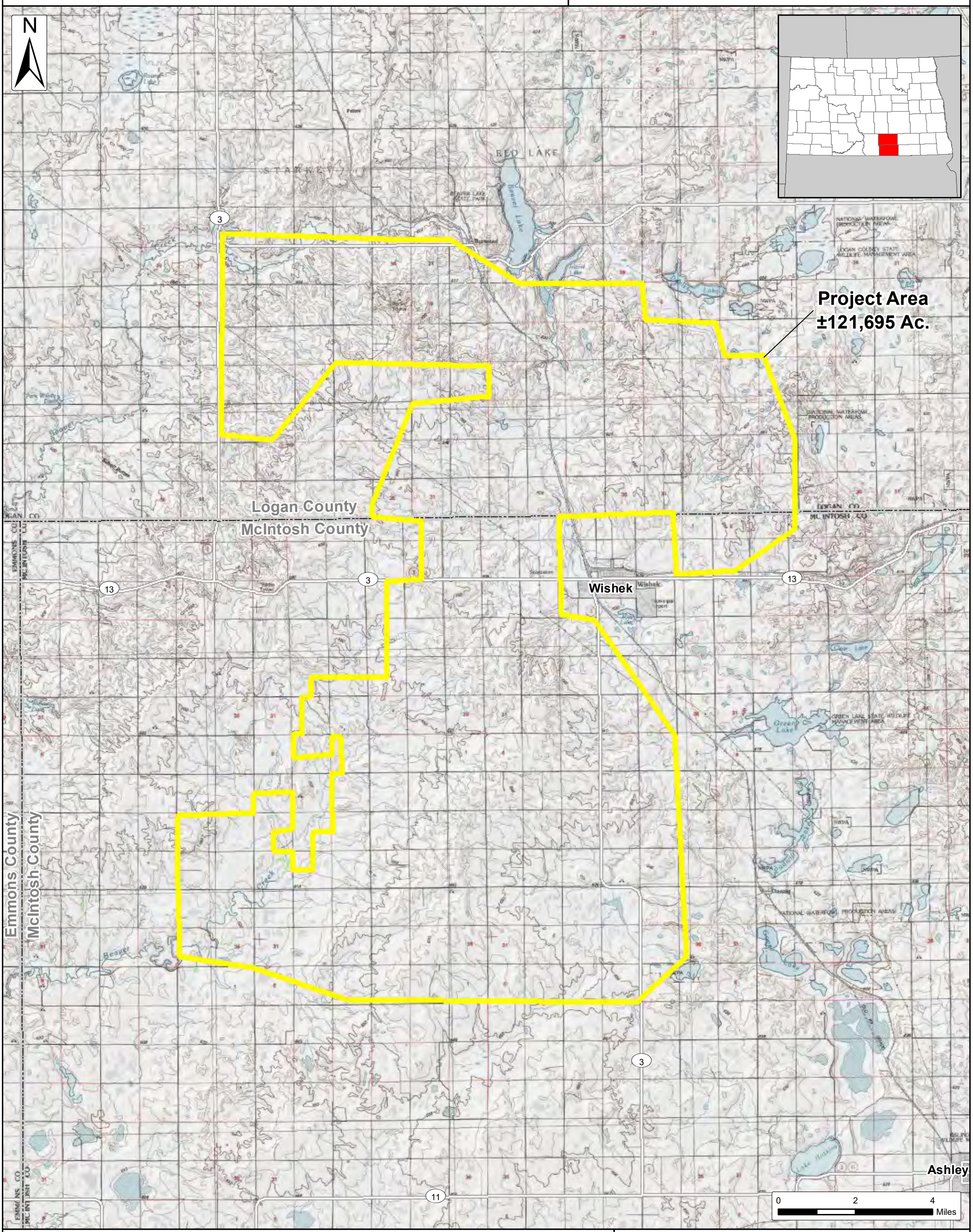
Figure 1. Site Location

Logan County & McIntosh County, North Dakota

Client:
Ørsted Onshore North America

Issue Date:
11/18/2020

Atwell, LLC Project:
19000785



Project Area
04/15/2019 (±121,695 Ac.)

City/Village

Counties

SOURCE: USGS TOPO QUADS

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Badger Wind

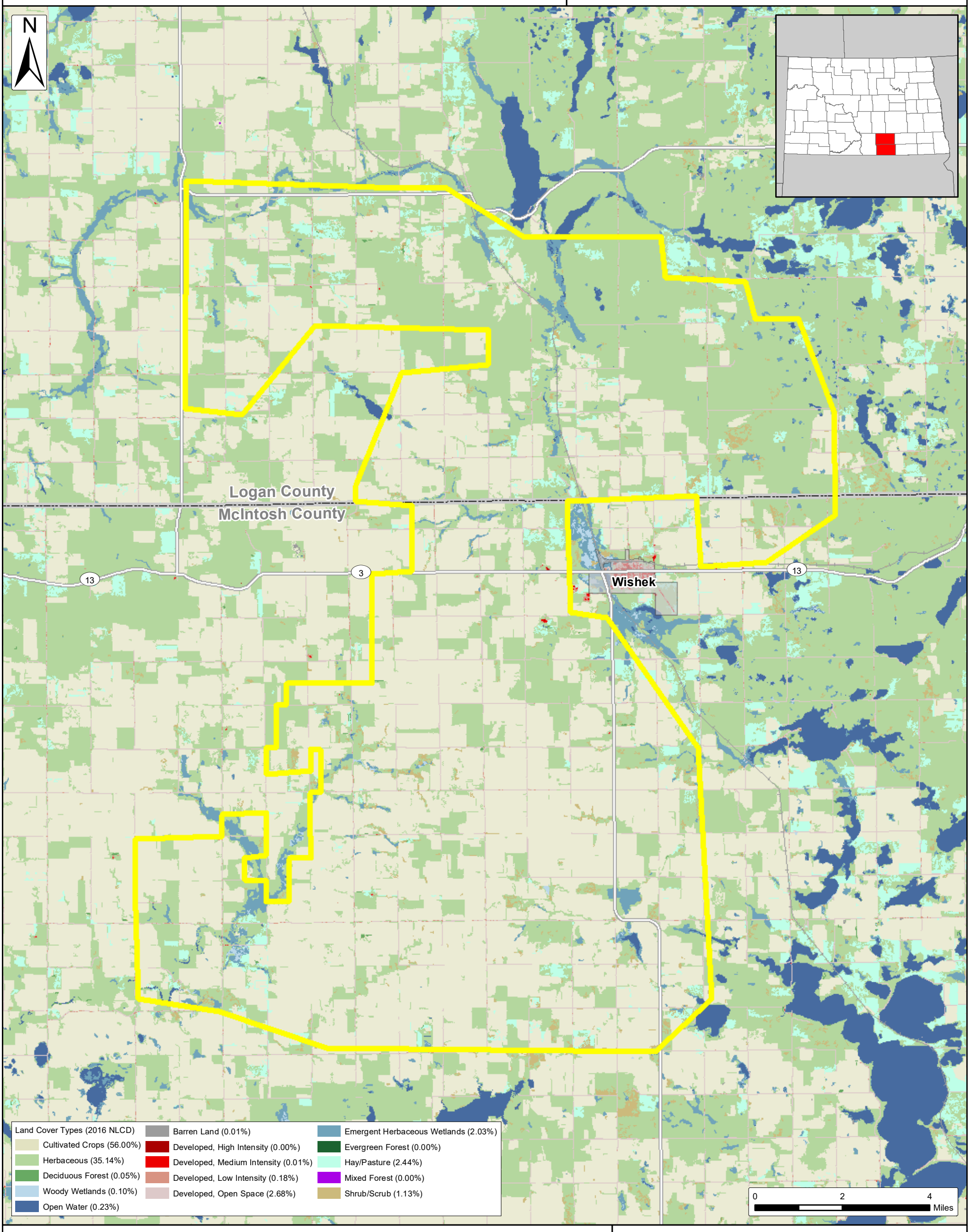
Figure 2. Land Cover Types within the Project Area

Logan County & McIntosh County, North Dakota

Client:
Ørsted Onshore North America

Issue Date:
11/18/2020

Atwell, LLC Project:
19000785



Project Area
04/15/2019 (±121,695 Ac.)

City/Village

Counties

SOURCE: NATIONAL LAND COVER DATABASE 2016 (USGS)

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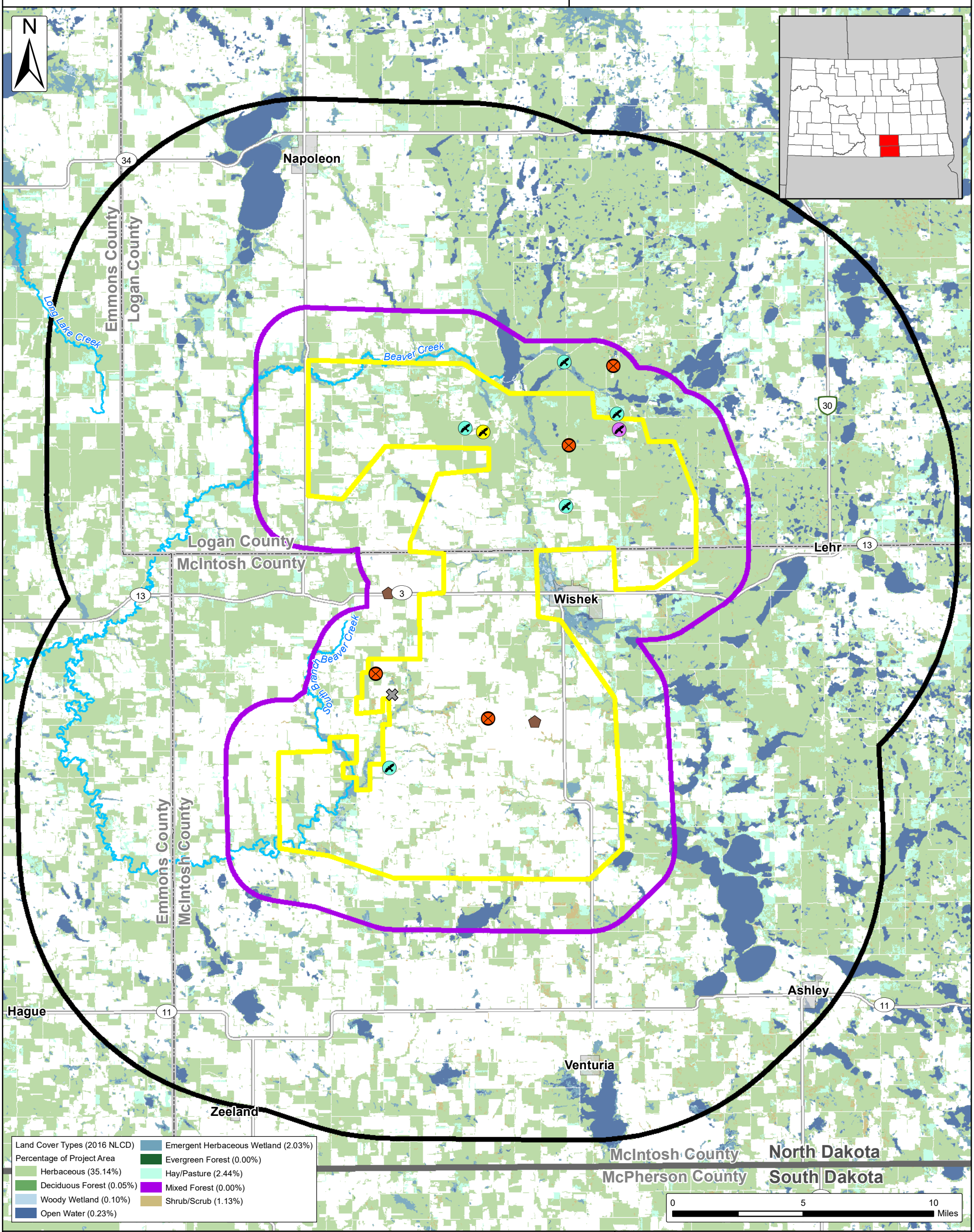
Figure 3. Eagle and Raptor Nests

Logan and McIntosh Counties, North Dakota

Client:
Ørsted Onshore North America

Issue Date:
8/17/2020

Atwell, LLC Project:
19000785



Raptor Nests Identified during 2020 Surveys
- Bald Eagle, In-Use
- Ferruginous Hawk, In-Use
- Great Horned Owl, In-Use
- Red-tailed Hawk, In-Use
- Swainson's Hawk, Nest Building
- Unknown, Not Occupied

- Major Watercourse (National Hydrography Dataset)
- Project Area 04/15/2019 (~121,695 acres)
- Raptor Nest Survey Area (2-Mile Buffer)
- Eagle Nest Survey Area (10-Mile Buffer)
- City/Village
- County
- State Boundary

SOURCE: USGS NATIONAL LAND COVER DATABASE (NLCD) 2016

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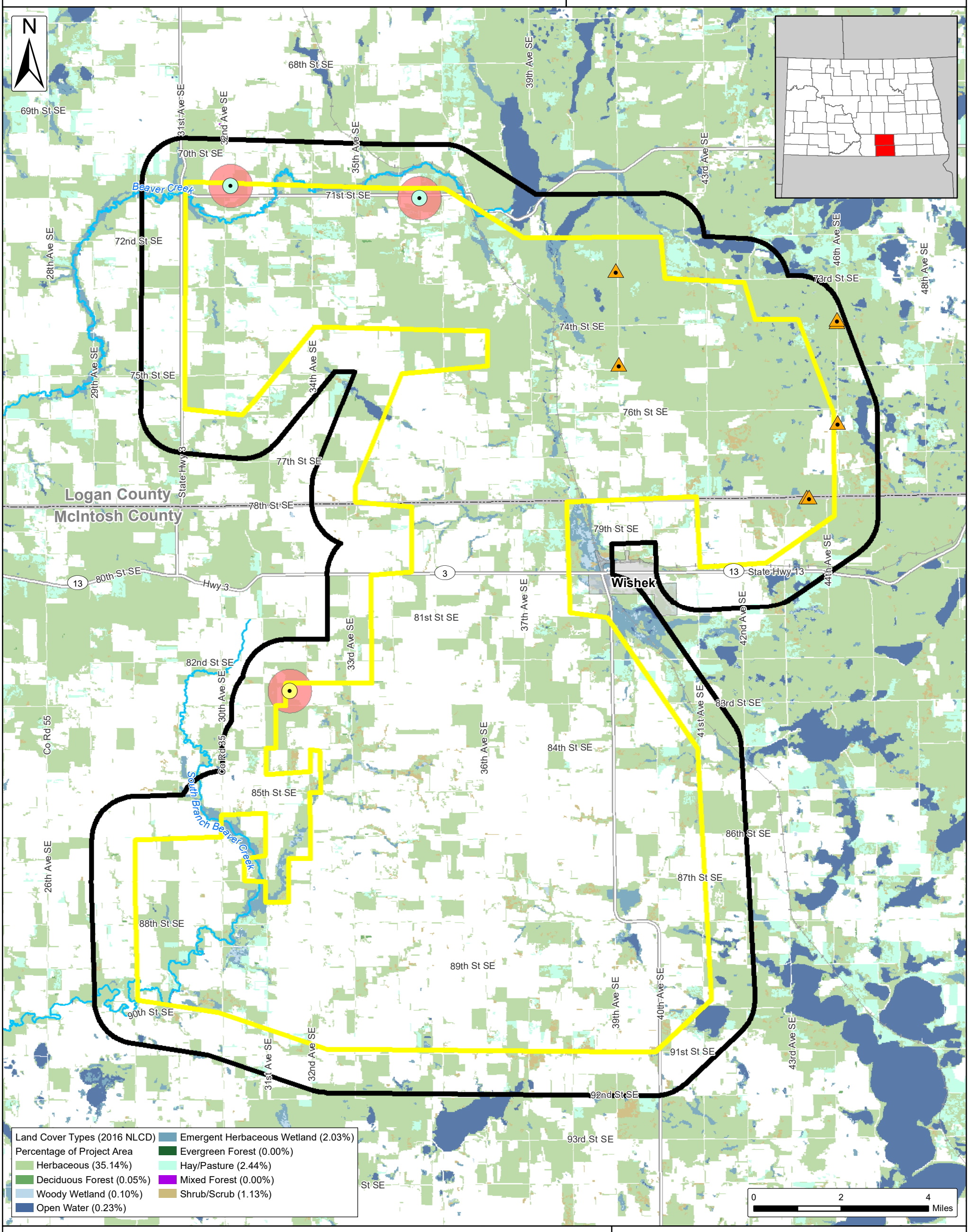
Figure 4. Sharp-Tailed Grouse Lek Survey

Logan and McIntosh Counties, North Dakota

Client:
Ørsted Onshore North America

Issue Date:
8/17/2020

Atwell, LLC Project:
19000785



Grouse and Leks Identified during 2019 Surveys
- Lone Individual
- Confirmed Lek
- Possible Lek

Grouse Lek Study Point 0.5-Mile Buffer

Project Area
04/15/2019 (~121,695 acres)

Grouse Survey Area (1-Mile Buffer)

Major Watercourse (National Hydrography Dataset)

City/Village

County

SOURCE: USGS NATIONAL LAND COVER DATABASE (NLCD) 2016

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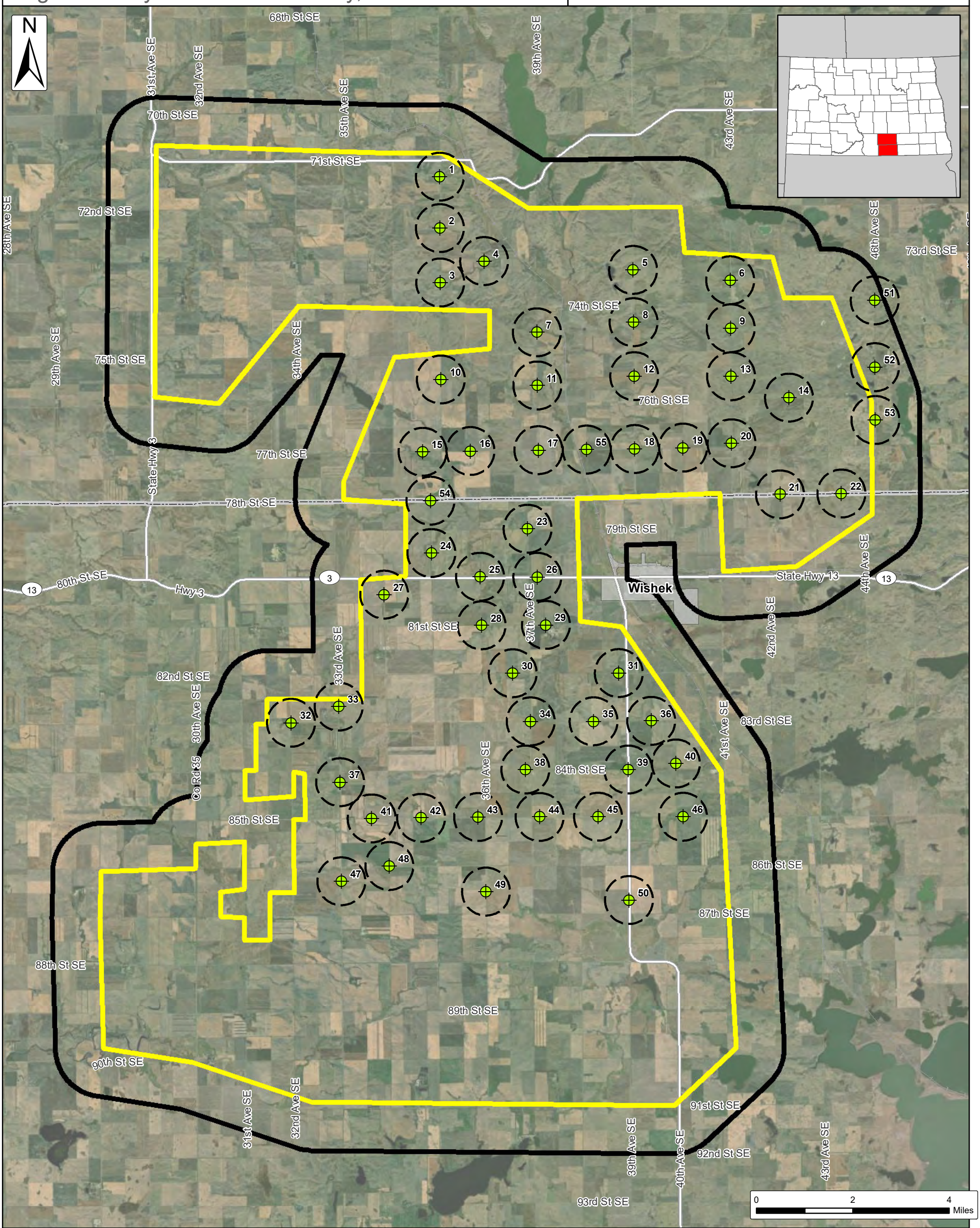
Figure 5. Avian and Eagle Use Point Count Stations

Logan County & McIntosh County, North Dakota

Client:
Ørsted Onshore North America

Issue Date:
8/18/2020

Atwell, LLC Project:
19000785



Point Count Station

800 m-radius Avian Sample Plot

Project Area
04/15/2019 (±121,695 Ac.)

1 Mile Buffer

City/Village

Counties

SOURCE: ESRI BASEMAPS

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Badger Wind

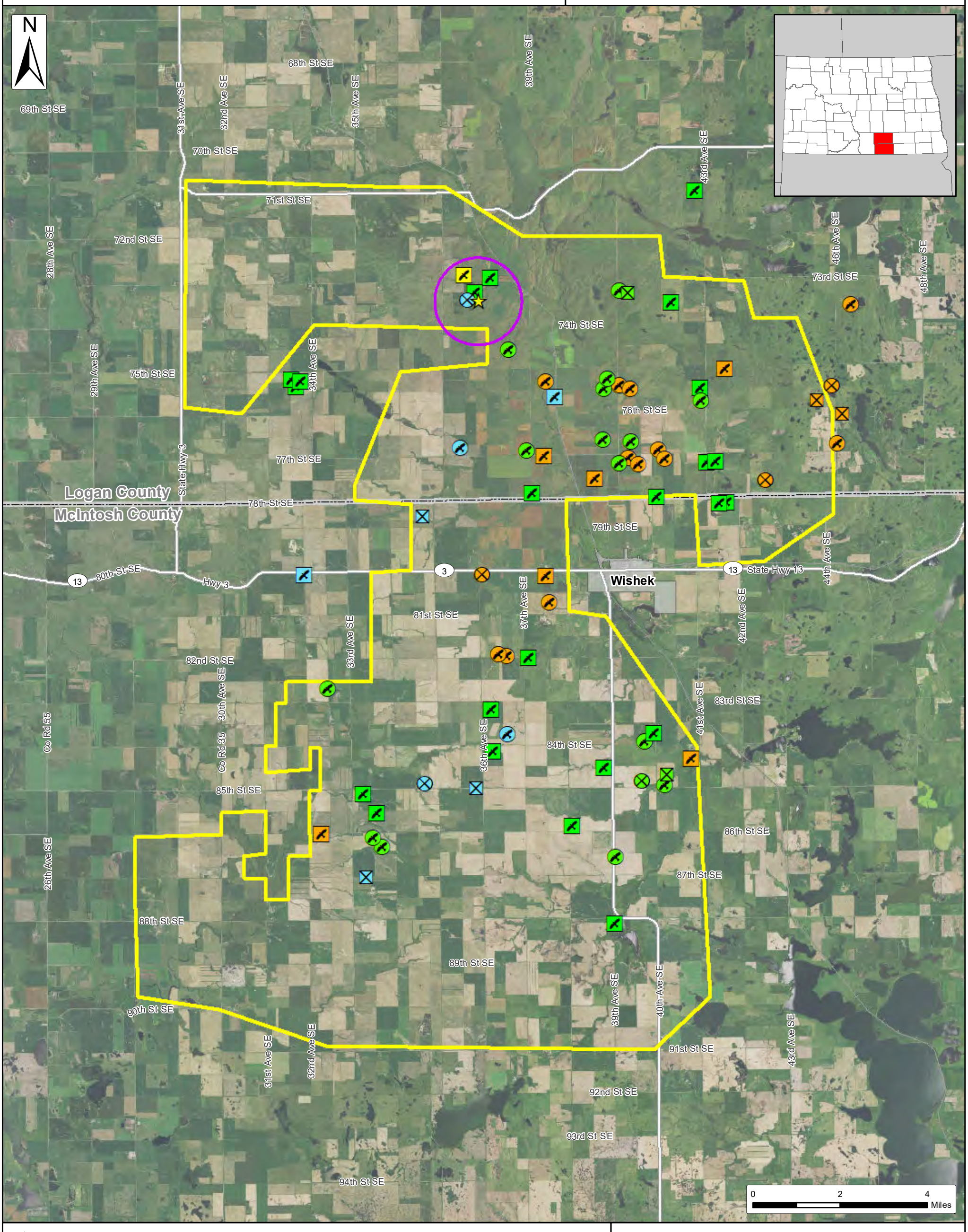
Figure 6. Bald Eagle and Golden Eagle Observations

Logan and McIntosh Counties, North Dakota

Client:
Ørsted Onshore North America

Issue Date:
11/18/2020

Atwell, LLC Project:
19000785



In-Use Bald Eagle Nest

Nest-Associated Observations (1-mile buffer)*

Species

- Bald Eagle - Standardized
- Bald Eagle - Incidental
- Golden Eagle - Standardized
- Golden Eagle - Incidental

Season

- Fall
- Spring
- Summer
- Winter

Project Area
04/15/2019 (~121,695 acres)

City/Village

County

*Six standardized and six incidental eagle observations associated with the in-use Bald Eagle nest were recorded within this buffer during spring, summer, and fall surveys.

Source: USDA NAIP 2019 Imagery

ATWELL

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TABLES

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Table 1. Survey Periods for Pre-Construction Avian Studies – Year 1

Survey	Frequency	May 2019	Jun 2019	Jul 2019	Aug 2019	Sep 2019	Oct 2019	Nov 2019	Dec 2019	Jan 2020	Feb 2020	Mar 2020	Apr 2020
Eagle and Raptor Nest Surveys	Single Survey Event	■											
Sharp-tailed Grouse Lek Surveys	Single Survey Event	■											
Eagle Use Surveys	Monthly	■	■	■	■	■	■	■	■	■	■	■	■
Diurnal Avian Activity Surveys	Monthly	■			■	■	■	■				■	■

Shaded boxes represent months in which the surveys occurred.

Table 2. List of Alternate Winter Point Count Stations

Original Point Count Station	Alternate Point Count Station
14	13
19	17
21	18
22	5
26	20
27[a]	23
30	11
32	33
35	49
36	37
39	46
40	47
48	42
50	44

[a] Point dropped in August 2019 due to landowner concerns, alternate point count station did not need to be used.

Table 3. Eagle Nests and Nests of Other Raptor Species

Survey Type	Date	Species	Status	Latitude	Longitude	Project Area of Nest Survey Buffer
Aerial	5/2/2019	Bald Eagle	In-Use	46.349	-99.628	Project Area
Aerial	5/2/2019	Ferruginous Hawk	In-Use	46.163	-99.706	Project Area
Ground	5/16/2019	Ferruginous Hawk	In-Use	46.351	-99.642	Project Area
Ground	5/19/2019	Ferruginous Hawk	In-Use	46.307	-99.562	Project Area
Ground	5/16/2019	Ferruginous Hawk	In-Use	46.387	-99.562	2-mile
Ground	5/19/2019	Ferruginous Hawk	In-Use	46.358	-99.520	2-mile
Ground	7/25/2019	Swainson's Hawk	Nest Building	46.349	-99.519	Project Area
Ground	5/19/2019	Red-tailed Hawk	In-Use	46.190	-99.626	Project Area
Ground	7/25/2019	Red-tailed Hawk	In-Use	46.341	-99.559	Project Area
Ground	7/29/2019	Red-tailed Hawk	In-Use	46.215	-99.716	Project Area
Ground	5/16/2019	Red-tailed Hawk	In-Use	46.385	-99.523	2-mile
Ground	5/21/2019	Great Horned Owl	In-Use	46.188	-99.589	Project Area
Aerial	5/2/2019	Great Horned Owl	In-Use	46.260	-99.705	2-mile
Aerial	5/2/2019	Unknown	Not Occupied	46.204	-99.703	Project Area

Table 4. Total Standardized Survey Effort by Point Count Station

	60 Minute Eagle Use Survey Standardized Effort (hours)[a]					10 Minute Diurnal Avian Activity Survey Standardized Effort (hours)[a]		
Point Count Station	Spring	Summer	Fall	Winter	Total Hours	Spring	Fall	Total Hours
1	3	2	4	3	12	0.50	0.67	1.17
2	3	2	4	3	12	0.50	0.67	1.17
3	3	2	4	3	12	0.50	0.67	1.17
4	3	2	4	3	12	0.50	0.67	1.17
5[a]	4	2	4	5	15	0.67	0.67	1.33
6	3	2	4	3	12	0.50	0.67	1.17
7	3	2	4	3	12	0.50	0.67	1.17
8	3	2	4	3	12	0.50	0.67	1.17
9	3	2	4	3	12	0.50	0.67	1.17
10	3	2	4	3	12	0.50	0.67	1.17
11[a]	3	2	4	5	14	0.50	0.67	1.17
12	3	2	4	3	12	0.50	0.67	1.17
13[a]	4	2	5	6	17	0.67	0.83	1.50
14[a]	2	2	3	0	7	0.33	0.50	0.83
15	3	2	4	3	12	0.50	0.67	1.17
16	3	2	4	3	12	0.50	0.67	1.17
17[a]	4	2	4	6	16	0.67	0.67	1.33
18	3	2	4	3	12	0.50	0.67	1.17
19[a]	2	2	4	0	8	0.33	0.67	1.00
20	3	2	4	3	12	0.50	0.67	1.17
21	3	2	4	3	12	0.50	0.67	1.17
22[a]	2	2	4	1	9	0.33	0.67	1.00
23	3	2	4	3	12	0.50	0.67	1.17
24	3	2	4	3	12	0.50	0.67	1.17

Table 4. Total Standardized Survey Effort by Point Count Station

	60 Minute Eagle Use Survey Standardized Effort (hours)[a]					10 Minute Diurnal Avian Activity Survey Standardized Effort (hours)[a]		
Point Count Station	Spring	Summer	Fall	Winter	Total Hours	Spring	Fall	Total Hours
25	3	2	4	3	12	0.50	0.67	1.17
26	3	2	4	3	12	0.50	0.67	1.17
27[b]	1	2	0	0	3	0.17	0.00	0.17
28[b]	1	2	0	0	3	0.17	0.00	0.17
29	3	2	4	3	12	0.50	0.67	1.17
30[a]	3	2	4	2	11	0.50	0.67	1.17
31	3	2	4	3	12	0.50	0.67	1.17
32	3	2	4	3	12	0.50	0.67	1.17
33	3	2	4	3	12	0.50	0.67	1.17
34	3	2	4	3	12	0.50	0.67	1.17
35[c]	1	2	4	1	8	0.17	0.67	0.83
36[c]	1	2	4	0	7	0.17	0.67	0.83
37[c]	5	2	4	6	17	0.83	0.67	1.50
38	3	2	4	3	12	0.50	0.67	1.17
39	3	2	4	3	12	0.50	0.67	1.17
40[a]	3	2	4	2	11	0.50	0.67	1.17
41	3	2	4	3	12	0.50	0.67	1.17
42	3	2	4	3	12	0.50	0.67	1.17
43	3	2	4	3	12	0.50	0.67	1.17
44	3	2	4	3	12	0.50	0.67	1.17
45	3	2	4	3	12	0.50	0.67	1.17
46	3	2	4	3	12	0.50	0.67	1.17
47[a]	3	2	4	4	13	0.50	0.67	1.17
48	3	2	4	3	12	0.50	0.67	1.17

Table 4. Total Standardized Survey Effort by Point Count Station

	60 Minute Eagle Use Survey Standardized Effort (hours)[a]					10 Minute Diurnal Avian Activity Survey Standardized Effort (hours)[a]		
Point Count Station	**Spring**	**Summer**	**Fall**	**Winter**	**Total Hours**	**Spring**	**Fall**	**Total Hours**
49[a]	5	2	4	4	15	0.83	0.67	1.50
50	3	2	4	3	12	0.50	0.67	1.17
51	3	2	4	3	12	0.50	0.67	1.17
52	3	2	4	3	12	0.50	0.67	1.17
53	3	2	4	3	12	0.50	0.67	1.17
54[d]	2	0	4	3	9	0.33	0.67	1.00
55[d]	2	0	4	3	9	0.33	0.67	1.00
Grand Total	**159**	**106**	**212**	**159**	**636**	**26.50**	**35.33**	**61.83**

[a] Due to the seasonal inaccessibility of some point count stations between November 2019 and March 2020, a winter alternate point count survey strategy was employed (see Section 2.4). Refer to Table 2 for a list point count stations with their paired alternate stations.

[b] Point count station dropped in August 2019 due to landowner concerns.

[c] Due to landowner concerns, the winter alternate point count station was surveyed in April 2020 (see Table 2).

[d] Point count station added in August 2019 as a replacement for dropped point count station.

Table 5. Eagle Use Surveys - Seasonal Raptor Mean Use

	Spring					Summer					Fall					Winter				
Common Name	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/60 min. survey)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/60 min. survey)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/60 min. survey)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/60 min. survey)[c]**	**SD[d]**	**Occur. Freq.[e]**
American Kestrel[II]	11	0.034	0.069	0.452	0.038	1	0.004	0.009	0.097	0.009	17	0.024	0.080	0.335	0.066	0	-	-	-	-
Bald Eagle[II]	18	0.056	0.113	0.373	0.094	1	0.004	0.009	0.097	0.009	13	0.018	0.061	0.277	0.052	2	0.182	0.013	0.112	0.013
Broad-winged Hawk	0	-	-	-	-	0	-	-	-	-	88	0.123	0.415	5.975	0.009	0	-	-	-	-
Cooper's Hawk	3	0.009	0.019	0.136	0.019	0	-	-	-	-	1	0.001	0.005	0.069	0.005	0	-	-	-	-
Ferruginous Hawk[I]	14	0.044	0.088	0.306	0.082	14	0.055	0.132	0.392	0.113	23	0.032	0.108	0.749	0.042	0	-	-	-	-
Golden Eagle[II]	1	0.003	0.006	0.079	0.006	0	-	-	-	-	3	0.004	0.014	0.118	0.014	2	0.182	0.013	0.112	0.013
Great Horned Owl	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	0.091	0.006	0.079	0.006
Merlin	3	0.009	0.019	0.136	0.019	0	-	-	-	-	4	0.006	0.019	0.168	0.014	0	-	-	-	-
Northern Goshawk	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	0.091	0.006	0.079	0.006
Northern Harrier[II]	85	0.266	0.535	1.048	0.321	42	0.166	0.396	0.973	0.236	141	0.197	0.665	1.330	0.325	0	-	-	-	-
Prairie Falcon[II]	0	-	-	-	-	0	-	-	-	-	5	0.007	0.024	0.152	0.024	0	-	-	-	-
Red-tailed Hawk	112	0.351	0.704	1.565	0.302	81	0.320	0.764	1.246	0.377	190	0.266	0.896	1.714	0.340	0	-	-	-	-
Rough-legged Hawk	8	0.025	0.050	0.219	0.050	0	-	-	-	-	4	0.006	0.019	0.168	0.014	0	-	-	-	-
Sharp-shinned Hawk	3	0.009	0.019	0.136	0.019	0	-	-	-	-	4	0.006	0.019	0.136	0.019	0	-	-	-	-
Snowy Owl	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	5	0.455	0.031	0.175	0.031
Swainson's Hawk[I]	47	0.147	0.296	1.077	0.132	75	0.296	0.708	1.387	0.311	172	0.241	0.811	2.227	0.217	0	-	-	-	-
Turkey Vulture	9	0.028	0.057	0.258	0.050	33	0.130	0.311	0.832	0.170	29	0.041	0.137	0.657	0.075	0	-	-	-	-
Unknown Accipiter	0	-	-	-	-	0	-	-	-	-	1	0.001	0.005	0.069	0.005	0	-	-	-	-
Unknown Buteo	4	0.013	0.025	0.157	0.025	5	0.020	0.047	0.254	0.038	13	0.018	0.061	0.352	0.038	0	-	-	-	-
Unknown Falcon	0	-	-	-	-	1	0.004	0.009	0.097	0.009	0	-	-	-	-	0	-	-	-	-
Unknown Raptor	1	0.003	0.006	0.079	0.006	0	-	-	-	-	7	0.010	0.033	0.204	0.028	0	-	-	-	-
Whooping Crane[FE, III]	3	1.000	0.019	0.238	0.006	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
ALL RAPTORS	**319**	**1.000**	**2.006**	**2.920**	**0.616**	**253**	**1.000**	**2.387**	**2.012**	**0.811**	**715**	**1.000**	**3.373**	**0.505**	**0.660**	**11**	**1.000**	**0.069**	**0.255**	**0.069**
ALL TES	**3**	**1.000**	**0.019**	**0.238**	**0.006**	**0**	**-**	**-**	**-**	**-**	**0**	**-**	**-**	**-**	**-**	**0**	**-**	**-**	**-**	**-**

[a] Total Std. Detections is the total number of standardized individuals detected within the 800 m–radius by 200 m-high survey cylinder during standardized use surveys

[b] % Comp. (i.e., percent composition) is the proportion of raptors or federally threatened and endangered species (TES) that a particular species comprises using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 60-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I, II, or III following the species name to indicate that it is Level 1, Level 2, or Level 3 SCP, respectively. Federally endangered species are denoted with a superscript FE.

Table 6. Eagle Use Surveys - Seasonal Bald Eagle Mean Use by Point Count Station

Point Count Station	Spring		Summer		Fall		Winter		Full Year	
	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]
1	0	-	0	-	0	-	0	-	0	-
2	0	-	0	-	0	-	0	-	0	-
3	0	-	0	-	0	-	0	-	0	-
4	4	1.333	1	0.500	1	0.250	0	-	6	0.500
5	1	0.200	0	-	0	-	0	-	1	0.067
6	0	-	0	-	0	-	0	-	0	-
7	1	0.333	0	-	0	-	0	-	1	0.083
8	0	-	0	-	0	-	0	-	0	-
9	0	-	0	-	0	-	0	-	0	-
10	0	-	0	-	0	-	0	-	0	-
11	0	-	0	-	1	0.250	0	-	1	0.071
12	2	0.667	0	-	2	0.500	0	-	4	0.333
13	1	0.250	0	-	0	-	0	-	1	0.059
14	0	-	0	-	0	-	0	-	0	-
15	0	-	0	-	0	-	0	-	0	-
16	0	-	0	-	0	-	1	0.333	1	0.083
17	1	0.250	0	-	0	-	0	-	1	0.063
18	3	1.000	0	-	2	0.500	0	-	5	0.417
19	0	-	0	-	2	0.500	0	-	2	0.250
20	0	-	0	-	0	-	0	-	0	-
21	0	-	0	-	0	-	0	-	0	-

Table 6. Eagle Use Surveys - Seasonal Bald Eagle Mean Use by Point Count Station

Point Count Station	Spring		Summer		Fall		Winter		Full Year	
	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]
22	0	-	0	-	0	-	0	-	0	-
23	0	-	0	-	0	-	0	-	0	-
24	0	-	0	-	0	-	0	-	0	-
25	0	-	0	-	0	-	0	-	0	-
26	0	-	0	-	0	-	0	-	0	-
27	0	-	0	-	0	-	0	-	0	-
28	0	-	0	-	0	-	0	-	0	-
29	0	-	0	-	1	0.250	0	-	1	0.083
30	0	-	0	-	2	0.500	0	-	2	0.182
31	0	-	0	-	0	-	0	-	0	-
32	0	-	0	-	0	-	0	-	0	-
33	1	0.333	0	-	0	-	0	-	1	0.083
34	0	-	0	-	0	-	0	-	0	-
35	0	-	0	-	0	-	0	-	0	-
36	0	-	0	-	0	-	0	-	0	-
37	0	-	0	-	0	-	0	-	0	-
38	0	-	0	-	0	-	1	0.333	1	0.083
39	0	-	0	-	0	-	0	-	0	-
40	1	0.333	0	-	0	-	0	-	1	0.091
41	0	-	0	-	0	-	0	-	0	-
42	0	-	0	-	0	-	0	-	0	-

Table 6. Eagle Use Surveys - Seasonal Bald Eagle Mean Use by Point Count Station

Point Count Station	Spring		Summer		Fall		Winter		Full Year	
	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]
43	0	-	0	-	0	-	0	-	0	-
44	0	-	0	-	0	-	0	-	0	-
45	0	-	0	-	0	-	0	-	0	-
46	1	0.333	0	-	0	-	0	-	1	0.083
47	0	-	0	-	0	-	0	-	0	-
48	1	0.333	0	-	0	-	0	-	1	0.083
49	0	-	0	-	0	-	0	-	0	-
50	1	0.333	0	-	0	-	0	-	1	0.083
51	0	-	0	-	1	0.250	0	-	1	0.083
52	0	-	0	-	0	-	0	-	0	-
53	0	-	0	-	1	0.250	0	-	1	0.083
54	0	-	0	-	0	-	0	-	0	-
55	0	-	0	-	0	-	0	-	0	-

[a] Total Std. Detections is the total number of standardized individuals detected within the 800 m–radius survey cylinder during standardized use surveys

[b] Mean Use is the total standardized detections divided by the total number of 60-minute point count surveys conducted within the season.

Table 7. Eagle Use Surveys - Seasonal and Annual Raptor Mean Flight Heights

Species	Flight Height[a]	Spring					Summer					Fall					Winter					Year				
		Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]
American Kestrel[II]	Min	11	7.91	11.26	15.48	0.34	1	1.00	N/A	N/A	N/A	13	12.38	13.53	20.56	4.21	-	-	-	-	-	25.00	9.96	12.36	15.06	4.86
American Kestrel[II]	Max	11	14.45	9.42	20.78	8.13	1	2.00	N/A	N/A	N/A	13	29.46	21.14	42.23	16.69	-	-	-	-	-	25.00	21.76	18.25	29.29	14.23
Bald Eagle[II]	Min	17	64.59	69.22	100.18	29.00	1	25.00	N/A	N/A	N/A	12	30.83	24.20	46.21	15.46	2	23.00	31.11	302.54	-256.54	32.00	48.09	55.08	67.95	28.23
Bald Eagle[II]	Max	17	99.41	77.88	139.45	59.37	1	30.00	N/A	N/A	N/A	12	56.25	48.53	87.08	25.42	2	37.50	31.82	323.39	-248.39	32.00	77.19	67.92	101.67	52.70
Broad-winged Hawk	Min	-	-	-	-	-	-	-	-	-	-	7	122.86	115.14	229.34	16.37	-	-	-	-	-	7	122.86	115.14	229.34	16.37
Broad-winged Hawk	Max	-	-	-	-	-	-	-	-	-	-	7	235.71	137.58	362.96	108.47	-	-	-	-	-	7	235.71	137.58	362.96	108.47
Cooper's Hawk	Min	3	25.33	21.22	78.05	-27.38	-	-	-	-	-	1	2.00	N/A	N/A	N/A	-	-	-	-	-	4	19.50	20.89	52.74	-13.74
Cooper's Hawk	Max	3	75.00	78.58	270.21	-120.21	-	-	-	-	-	1	3.00	N/A	N/A	N/A	-	-	-	-	-	4	57.00	73.57	174.07	-60.07
Ferruginous Hawk[I]	Min	14	95.14	90.52	147.41	42.88	13	27.54	30.17	45.77	9.31	20	36.05	32.52	51.27	20.83	-	-	-	-	-	47	51.30	61.93	69.48	33.11
Ferruginous Hawk[I]	Max	14	150.00	100.06	207.77	92.23	13	62.00	52.80	93.91	30.09	20	76.65	56.96	103.31	49.99	-	-	-	-	-	47	94.45	79.19	117.70	71.20
Golden Eagle[II]	Min	1	80.00	N/A	N/A	N/A	-	-	-	-	-	3	50.33	62.05	204.48	-103.81	2	13.50	9.19	96.09	-69.09	6	43.00	47.02	92.35	-6.35
Golden Eagle[II]	Max	1	150.00	N/A	N/A	N/A	-	-	-	-	-	3	71.67	70.06	245.70	-102.37	2	25.00	0.00	25.00	25.00	6	69.17	63.67	135.99	2.35
Merlin	Min	3	6.00	7.81	25.40	-13.40	-	-	-	-	-	3	13.67	10.97	40.92	-13.58	-	-	-	-	-	6	9.83	9.50	19.80	-0.13
Merlin	Max	3	8.67	9.81	33.05	-15.72	-	-	-	-	-	3	40.33	52.54	170.85	-90.18	-	-	-	-	-	6	24.50	37.99	64.37	-15.37
Northern Goshawk	Min	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	25.00	N/A	N/A	N/A	1	25.00	N/A	N/A	N/A
Northern Goshawk	Max	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	30.00	N/A	N/A	N/A	1	30.00	N/A	N/A	N/A
Northern Harrier[II]	Min	92	37.89	87.81	56.08	19.71	38	4.50	16.23	9.84	-0.84	140	4.69	14.45	7.11	2.28	-	-	-	-	-	270	15.98	54.79	22.54	9.41
Northern Harrier[II]	Max	29	49.32	89.56	67.86	30.77	38	11.76	23.05	19.34	4.19	140	12.71	33.40	18.30	7.13	-	-	-	-	-	270	25.05	60.57	32.31	17.79
Prairie Falcon[II]	Min	-	-	-	-	-	-	-	-	-	-	5	10.60	16.89	31.57	-10.37	-	-	-	-	-	5	10.60	16.89	31.57	-10.37
Prairie Falcon[II]	Max	-	-	-	-	-	-	-	-	-	-	5	20.80	22.55	48.80	-7.20	-	-	-	-	-	5	20.80	22.55	48.80	-7.20
Red-tailed Hawk	Min	119	73.18	105.97	92.41	53.94	66	35.85	42.83	46.38	25.32	161	22.72	32.64	27.80	17.64	-	-	-	-	-	346	42.58	72.08	50.20	34.96
Red-tailed Hawk	Max	119	100.23	111.23	120.42	80.04	66	86.71	79.28	106.20	67.22	161	45.36	49.01	52.99	37.73	-	-	-	-	-	346	72.12	84.72	81.08	63.16
Rough-legged Hawk	Min	9	83.56	108.68	167.09	0.02	-	-	-	-	-	4	25.00	11.55	43.37	6.63	-	-	-	-	-	13	65.54	93.27	121.90	9.18
Rough-legged Hawk	Max	9	114.44	117.57	204.81	24.08	-	-	-	-	-	4	51.25	17.50	79.10	23.40	-	-	-	-	-	13	95.00	101.06	156.07	33.93
Sharp-shinned Hawk	Min	3	17.00	17.09	59.45	-25.45	-	-	-	-	-	4	20.00	33.50	73.30	-33.30	-	-	-	-	-	7	18.71	25.71	42.49	-5.06
Sharp-shinned Hawk	Max	3	27.00	30.12	101.81	-47.81	-	-	-	-	-	4	23.50	32.15	74.66	-27.66	-	-	-	-	-	7	25.00	28.68	51.53	-1.53
Snowy Owl	Min	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	4.50	4.95	48.97	-39.97	2	4.50	4.95	48.97	-39.97
Snowy Owl	Max	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	11.00	1.41	23.71	-1.71	2	11.00	1.41	23.71	-1.71
Swainson's Hawk[I]	Min	42	59.43	54.68	76.47	42.39	75	47.89	71.27	64.29	31.50	140	41.57	56.92	51.08	32.06	-	-	-	-	-	257	46.33	61.22	53.85	38.81
Swainson's Hawk[I]	Max	42	107.74	81.91	133.26	82.21	75	120.64	113.32	146.71	94.57	140	94.43	85.87	108.78	80.08	-	-	-	-	-	257	104.25	94.47	115.86	92.65
Turkey Vulture	Min	9	93.11	158.80	215.17	-28.95	26	32.65	52.46	53.84	11.46	29	29.97	45.22	47.17	12.77	-	-	-	-	-	64	39.94	75.33	58.75	21.12
Turkey Vulture	Max	9	101.11	154.47	219.85	-17.63	26	81.35	78.63	113.11	49.59	29	52.21	49.00	70.85	33.57	-	-	-	-	-	64	70.92	82.99	91.65	50.19
Unknown Accipiter	Min	-	-	-	-	-	-	-	-	-	-	1	15.00	N/A	N/A	N/A	-	-	-	-	-	1	15.00	N/A	N/A	N/A
Unknown Accipiter	Max	-	-	-	-	-	-	-	-	-	-	1	20.00	N/A	N/A	N/A	-	-	-	-	-	1	20.00	N/A	N/A	N/A
Unknown Buteo	Min	1	20.00	N/A	N/A	N/A	3	38.33	29.30	111.11	-34.45	2	35.50	48.79	473.86	-402.86	-	-	-	-	-	6	34.33	29.51	65.30	3.37
Unknown Buteo	Max	1	30.00	N/A	N/A	N/A	3	38.33	29.30	111.11	-34.45	2	87.50	88.39	881.64	-706.64	-	-	-	-	-	6	53.33	51.15	107.02	-0.35

Table 7. Eagle Use Surveys - Seasonal and Annual Raptor Mean Flight Heights

Species	Flight Height[a]	Spring					Summer					Fall					Winter					Year				
		Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]
Unknown Falcon	Min	-	-	-	-	-	1	15.00	N/A	N/A	N/A	-	-	-	-	-	-	-	-	-	-	1	15.00	N/A	N/A	N/A
Unknown Falcon	Max	-	-	-	-	-	1	35.00	N/A	N/A	N/A	-	-	-	-	-	-	-	-	-	-	1	35.00	N/A	N/A	N/A
Unknown Raptor	Min	2	200.50	282.14	2735.39	-2334.39	-	-	-	-	-	4	5.75	6.40	15.93	-4.43	-	-	-	-	-	6	70.67	161.43	240.07	-98.74
Unknown Raptor	Max	2	201.00	281.43	2729.54	-2327.53	-	-	-	-	-	4	9.00	5.83	18.28	-0.28	-	-	-	-	-	6	73.00	160.28	241.21	-95.21
ALL RAPTORS	**Min**	**326**	**59.64**	**94.44**	**69.93**	**49.35**	**224**	**33.45**	**53.41**	**40.48**	**26.41**	**549**	**24.87**	**42.85**	**28.46**	**21.27**	**7**	**15.29**	**15.97**	**30.05**	**0.52**	**1106**	**36.79**	**65.88**	**40.68**	**32.91**
ALL RAPTORS	**Max**	**326**	**85.25**	**102.94**	**96.47**	**74.04**	**224**	**81.79**	**92.10**	**93.92**	**69.66**	**549**	**52.88**	**69.15**	**58.68**	**47.08**	**7**	**25.29**	**17.05**	**41.05**	**9.52**	**1106**	**68.10**	**86.33**	**73.20**	**63.01**

[a] This column indicates if a particular row is providing results for the minimum (Min) or maximum (Max) flight height statistic.

[b] Sample size refers to the number of flocks (i.e., not individuals) that were detected in flight within 800 m of the point count station during standardized eagle use (60-minute) surveys. Birds that were heard-only or perched-only were not included in the flight height analysis. All detections are included in flight height analyses, independent of whether the detection occurred above or below 200 m in height

[c] SD is the standard deviation of Mean Minimum or Maximum Flight Height. N/A indicates that standard deviation could not be calculated as the sample size is one.

[d] This column indicates either the upper or lower bound of the 95% confidence interval. N/A indicates that the confidence interval could not be calculated as the sample size is one.

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I, II, or III following the species name to indicate that it is Level 1, Level 2, or Level 3 SCP, respectively.

Table 8. Eagle-Minutes and Time within Rotor Swept Zone Summaries for Bald Eagles and Golden Eagles

	Spring	Summer	Fall	Winter	Annual Total
Survey Effort (hours)	159	106	212	159	636
	EAGLE-MINUTES SUMMARY				
BAEA Eagle-Minutes[a]	42	1	33	5	81
BAEA Eagle-Minutes per Survey Hour	0.264	0.009	0.156	0.031	0.127
GOEA Eagle-Minutes	6	0	12	3	21
GOEA Eagle-Minutes per Survey Hour	0.038	0.000	0.057	0.019	0.033
	MINUTES WITHIN ROTOR SWEPT ZONE (RSZ) SUMMARY				
BAEA minutes within RSZ[b]	17.8	0	10.5	2	30.3
BAEA minutes within RSZ per Survey Hour	0.112	0.000	0.050	0.013	0.048
GOEA time within RSZ	6	0	4.6	0	10.6
GOEA minutes within RSZ per Survey Hour	0.038	0.000	0.022	0.000	0.017

[a] Minutes within the standardized 800 m-radius by 200 m-high sample plot as described by the ECPG and final Eagle Rule. Each individual observation is rounded to the next highest integer; and eagle observed for 1.3 minutes in flight within the sample plot is assigned two eagle minutes. Perched eagles and eagles outside of the sample plot are not assigned eagle minutes.

[b] Minutes within the rotor swept zone (RSZ) is used as a metric of flight behavior that could expose a passing bird to collision with operating turbine blades. RSZ represents a predetermined range of above-ground heights within a hypothetical turbine blade sweep of 35 - 150 m within the 800 m-radius sample plot. Measured to the 0.1 minute.

- BAEA represents Bald Eagle and GOEA represents Golden Eagle

Table 9. Eagle Use Surveys - Seasonal Raptor Mean Use by Point Count Station

Point Count Station	Spring		Summer		Fall		Winter		Full Year	
	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]
1	1	0.333	7	3.500	6	1.500	0	-	14	1.167
2	5	1.667	12	6.000	2	0.500	0	-	19	1.583
3	2	0.667	5	2.500	1	0.250	0	-	8	0.667
4	6	2.000	6	3.000	17	4.250	1	0.333	30	2.500
5	4	1.000	1	0.500	29	7.250	0	-	34	2.267
6	5	1.667	0	-	16	4.000	0	-	21	1.750
7	7	2.333	6	3.000	14	3.500	1	0.333	28	2.333
8	0	-	9	4.500	12	3.000	0	-	21	1.750
9	6	2.000	4	2.000	9	2.250	0	-	19	1.583
10	3	1.000	0	-	4	1.000	0	-	7	0.583
11	7	2.333	2	1.000	9	2.250	0	-	18	1.286
12	6	2.000	2	1.000	10	2.500	0	-	18	1.500
13	2	0.500	1	0.500	9	1.800	1	0.167	13	0.765
14	8	4.000	12	6.000	5	1.667	0	-	25	3.571
15	5	1.667	4	2.000	7	1.750	0	-	16	1.333
16	2	0.667	1	0.500	6	1.500	1	0.333	10	0.833
17	5	1.250	6	3.000	9	2.250	0	-	20	1.250
18	7	2.333	8	4.000	21	5.250	0	-	36	3.000
19	2	1.000	5	2.500	9	2.250	0	-	16	2.000
20	9	3.000	9	4.500	12	3.000	0	-	30	2.500
21	3	1.000	4	2.000	6	1.500	0	-	13	1.083

Table 9. Eagle Use Surveys - Seasonal Raptor Mean Use by Point Count Station

Point Count Station	Spring		Summer		Fall		Winter		Full Year	
	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]
22	2	1.000	6	3.000	15	3.750	0	-	23	2.556
23	4	1.333	5	2.500	8	2.000	0	-	17	1.417
24	5	1.667	5	2.500	9	2.250	0	-	19	1.583
25	2	0.667	6	3.000	99	24.750	0	-	107	8.917
26	7	2.333	8	4.000	26	6.500	0	-	41	3.417
27	3	3.000	6	3.000	0	-	0	-	9	3.000
28	2	2.000	10	5.000	0	-	0	-	12	4.000
29	16	5.333	2	1.000	14	3.500	0	-	32	2.667
30	1	0.333	5	2.500	18	4.500	0	-	24	2.182
31	5	1.667	8	4.000	27	6.750	0	-	40	3.333
32	15	5.000	7	3.500	15	3.750	0	-	37	3.083
33	12	4.000	6	3.000	24	6.000	0	-	42	3.500
34	3	1.000	4	2.000	6	1.500	0	-	13	1.083
35	2	2.000	6	3.000	14	3.500	0	-	22	2.750
36	2	2.000	4	2.000	14	3.500	0	-	20	2.857
37	28	5.600	1	0.500	16	4.000	1	0.167	46	2.706
38	1	0.333	3	1.500	4	1.000	2	0.667	10	0.833
39	6	2.000	8	4.000	10	2.500	0	-	24	2.000
40	9	3.000	11	5.500	7	1.750	0	-	27	2.455
41	5	1.667	3	1.500	20	5.000	1	0.333	29	2.417
42	2	0.667	3	1.500	24	6.000	1	0.333	30	2.500

Table 9. Eagle Use Surveys - Seasonal Raptor Mean Use by Point Count Station

Point Count Station	Spring		Summer		Fall		Winter		Full Year	
	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]
43	1	0.333	5	2.500	8	2.000	1	0.333	15	1.250
44	2	0.667	7	3.500	3	0.750	0	-	12	1.000
45	1	0.333	1	0.500	7	1.750	0	-	9	0.750
46	16	5.333	4	2.000	16	4.000	0	-	36	3.000
47	6	2.000	1	0.500	1	0.250	0	-	8	0.615
48	22	7.333	5	2.500	13	3.250	0	-	40	3.333
49	7	1.400	3	1.500	3	0.750	0	-	13	0.867
50	18	6.000	1	0.500	8	2.000	0	-	27	2.250
51	10	3.333	1	0.500	14	3.500	0	-	25	2.083
52	1	0.333	0	-	10	2.500	0	-	11	0.917
53	1	0.333	4	2.000	14	3.500	1	0.333	20	1.667
54	1	0.500	0	-	15	3.750	0	-	16	1.778
55	6	3.000	0	-	20	5.000	0	-	26	2.889

[a] Total Std. Detections is the total number of standardized individuals detected within the 800 m–radius survey cylinder during standardized use surveys

[b] Mean Use is the total standardized detections divided by the total number of 60-minute point count surveys conducted within the season.

Table 10. Diurnal Avian Use Surveys - Seasonal Mean Use by Species Group

	Spring					Fall				
Species Group	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**
Large-bodied Corvids	8	0.038	0.050	0.433	0.019	23	0.412	0.108	1.512	0.009
Non-passerine (large)	89	0.420	0.560	2.401	0.075	94	1.682	0.443	2.604	0.047
Non-passerine (small)	16	0.075	0.101	0.424	0.063	68	1.217	0.321	1.140	0.146
Passerine	7296	34.418	45.887	98.798	0.918	2485	44.462	11.722	35.965	0.613
Raptor	66	0.311	0.415	0.705	0.314	136	2.433	0.642	1.668	0.349
Raptor_*all*	77	0.354	0.484	0.967	0.321	136	2.151	0.642	1.668	0.349
Shorebird	86	0.406	0.541	1.205	0.264	122	2.183	0.575	3.002	0.104
Unknown Species Group	2	0.009	0.013	0.159	0.006	0	-	-	-	-
Upland Gamebirds	42	0.198	0.264	1.225	0.082	21	0.376	0.099	0.664	0.038
Wader	83	0.392	0.522	3.174	0.031	3	0.054	0.014	0.153	0.009
Wader_*all*	385	1.768	2.421	22.674	0.038	3	0.047	0.014	0.153	0.009
Waterbird	125	0.590	0.786	1.564	0.296	2148	38.433	10.132	80.401	0.080
Waterbird_*all*	132	0.606	0.830	1.623	0.302	2148	33.966	10.132	80.401	0.080
Waterfowl	13385	63.143	84.182	472.342	0.478	489	8.749	2.307	14.195	0.108
Waterfowl_*all*	13646	62.657	85.824	472.602	0.484	1224	19.355	5.774	34.518	0.127
ALL BIRDS	**21198**	**100.000**	**133.321**	**483.877**	**0.975**	**5589**	**100.000**	**26.363**	**89.049**	**0.759**
ALL BIRDS_*all*	**21779**	**100.000**	**136.975**	**484.123**	**0.975**	**6324**	**100.000**	**29.830**	**93.995**	**0.769**

[a] Total Std. Detections is the total number of standardized individuals detected within the 200-m high sample plot during standardized use surveys. Survey cylinder radius extended out to 800 m for large-bodied species and 150 m for small-bodied species. Mean use also is summarized for all heights for species groups with detections over 200 m in altitude and out to the same radial distances for large and small-bodied species, noted with the suffix "_*all* " after the group name

[b] % Comp. (i.e., percent composition) is the percent of all birds that a particular species group comprises during the season

[c] Mean Use is the total standardized detections divided by the total number of 10-minute point count surveys conducted within the season

[d] SD is the standard deviation of Mean Use

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species group was detected during the season

Table 11. Diurnal Avian Use Surveys - Seasonal and Annual Mean Flight Heights

Species	Flight Height[a]	Spring					Fall					Year				
		Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Upper 95% CI Bound[d]	Lower 95% CI Bound[d]
Large-bodied Corvid	Min	3	35.00	27.84	104.16	-34.16	2	15.50	20.51	199.74	-168.74	5	27.20	24.63	57.78	-3.38
Large-bodied Corvid	Max	3	40.00	20.00	89.68	-9.68	2	36.00	48.08	468.01	-396.01	5	38.40	27.98	73.14	3.66
Non-passerine (large)	Min	16	8.25	6.81	11.88	4.62	15	11.73	10.68	17.65	5.82	31	9.94	8.92	13.21	6.66
Non-passerine (large)	Max	16	13.94	6.84	17.58	10.29	15	21.33	10.93	27.39	15.28	31	17.52	9.66	21.06	13.97
Non-passerine (small)	Min	10	4.80	3.46	7.27	2.33	36	6.00	6.94	8.35	3.65	46	5.74	6.33	7.62	3.86
Non-passerine (small)	Max	10	5.90	4.15	8.87	2.93	36	7.42	6.72	9.69	5.14	46	7.09	6.24	8.94	5.23
Passerine	Min	571	9.73	15.05	10.97	8.49	285	10.57	14.59	12.27	8.87	856	10.01	14.90	11.01	9.01
Passerine	Max	571	14.87	16.75	16.25	13.50	285	15.76	15.05	17.52	14.01	856	15.17	16.20	16.26	14.08
Raptor	Min	67	68.69	105.82	94.50	42.87	89	28.39	45.83	38.05	18.74	156	45.70	79.76	58.31	33.08
Raptor	Max	67	86.18	106.26	112.10	60.26	89	56.55	65.51	70.35	42.75	156	69.28	86.38	82.94	55.61
Shorebird	Min	32	22.38	33.20	34.34	10.41	15	6.20	6.59	9.85	2.55	47	17.21	28.53	25.59	8.84
Shorebird	Max	32	30.16	35.49	42.95	17.36	15	11.93	7.98	16.35	7.52	47	24.34	30.69	33.35	15.33
Upland Game	Min	3	10.67	16.74	52.26	-30.93	2	4.00	4.24	42.12	-34.12	5	8.00	12.57	23.61	-7.61
Upland Game	Max	3	12.00	15.59	50.72	-26.72	2	8.50	9.19	91.09	-74.09	5	10.60	12.10	25.62	-4.42
Wader	Min	10	453.50	555.74	851.05	55.95	2	8.50	9.19	91.09	-74.09	12	379.33	531.70	717.16	41.51
Wader	Max	10	456.00	553.60	852.02	59.98	2	15.00	0.00	15.00	15.00	12	382.50	529.35	718.84	46.16
Waterbird	Min	70	37.64	124.58	67.35	7.94	14	45.71	72.79	87.74	3.69	84	38.99	117.22	64.43	13.55
Waterbird	Max	70	43.87	123.62	73.35	14.39	14	81.86	66.11	120.03	43.69	84	50.20	116.59	75.50	24.90
Waterfowl	Min	212	45.55	51.87	52.57	38.53	28	210.71	347.67	345.53	75.90	240	64.82	137.31	82.28	47.36
Waterfowl	Max	212	58.59	73.90	68.60	48.59	28	217.14	344.21	350.61	83.67	240	77.09	144.25	95.43	58.75
Unknown Species Group	Min	1	1.00	N/A	N/A	N/A	-	-	-	-	-	1	1.00	N/A	N/A	N/A
Unknown Species Group	Max	1	1.00	N/A	N/A	N/A	-	-	-	-	-	1	1.00	N/A	N/A	N/A
ALL BIRDS	**Min**	**995**	**28.16**	**86.99**	**33.57**	**22.75**	**488**	**25.86**	**97.57**	**34.54**	**17.18**	**1483**	**27.40**	**90.58**	**32.02**	**22.79**
ALL BIRDS	**Max**	**995**	**35.90**	**91.01**	**41.57**	**30.24**	**488**	**36.14**	**99.80**	**45.02**	**27.26**	**1483**	**35.98**	**93.96**	**40.77**	**31.20**

[a] This column indicates if a particular row is providing results for the minimum (Min) or maximum (Max) flight height statistic

[b] Sample size refers to the number of flocks (i.e., not individuals) that were detected in flight within either the 800 m (large-bodied species) or 150 m (small-bodied species) of the point count station during standardized diurnal avian activity (10-minute) surveys. Birds that were heard-only or perched-only were not included in the flight height analysis. All observations are included in flight height analyses regardless of whether the flock was observed at above or below 200 m in height

[c] SD is the standard deviation of Mean Minimum or Maximum Flight Height. N/A indicates that standard deviation could not be calculated as the sample size is one

[d] This column indicates either the upper or lower bound of the 95% confidence interval. N/A indicates that the confidence interval could not be calculated as the sample size is one

APPENDICES

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APPENDIX A

POINT COUNT STATION LOCATIONS

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Appendix A. Point Count Station Locations

Point Count Station	Latitude	Longitude	Northing	Easting
1	46.380	-99.644	261305.231	2184491.587
2	46.365	-99.644	255663.371	2184500.034
3	46.348	-99.645	249700.860	2184534.672
4	46.354	-99.625	252051.518	2189349.957
5	46.351	-99.561	251087.624	2205682.309
6	46.348	-99.519	249948.627	2216331.143
7	46.333	-99.603	244239.141	2195133.639
8	46.336	-99.561	245351.453	2205738.269
9	46.333	-99.519	244690.246	2216389.261
10	46.319	-99.645	239070.552	2184604.957
11	46.317	-99.603	238411.779	2195187.563
12	46.319	-99.561	239433.078	2205806.507
13	46.319	-99.519	239420.642	2216424.772
14	46.312	-99.494	237079.382	2222780.975
15	46.297	-99.653	231138.422	2182598.229
16	46.297	-99.632	231228.571	2187850.204
17	46.297	-99.603	231323.198	2195298.857
18	46.297	-99.561	231450.248	2205856.453
19	46.298	-99.540	231601.896	2211160.716
20	46.299	-99.519	232076.075	2216478.600
21	46.283	-99.498	226475.597	2221795.379
22	46.283	-99.472	226566.186	2228522.830
23	46.274	-99.608	222702.669	2194112.594
24	46.267	-99.650	220043.702	2183565.178
25	46.260	-99.629	217443.492	2188900.519
26	46.259	-99.604	217433.926	2195181.774

Appendix A. Point Count Station Locations

Point Count Station	Latitude	Longitude	Northing	Easting
27	46.255	-99.670	215484.301	2178390.337
28	46.245	-99.628	212124.312	2189065.797
29	46.245	-99.600	212163.820	2196127.519
30	46.230	-99.615	206859.738	2192482.864
31	46.230	-99.569	206881.143	2204115.203
32	46.216	-99.711	201429.290	2168174.231
33	46.221	-99.691	203207.443	2173396.403
34	46.216	-99.607	201586.568	2194456.229
35	46.216	-99.580	201593.156	2201349.958
36	46.216	-99.555	201638.974	2207668.566
37	46.198	-99.690	194915.858	2173560.354
38	46.201	-99.610	196302.655	2193870.520
39	46.201	-99.565	196302.391	2205152.243
40	46.203	-99.545	196966.997	2210376.094
41	46.187	-99.677	190943.717	2177015.515
42	46.187	-99.655	191008.528	2182433.156
43	46.187	-99.631	191095.012	2188688.725
44	46.187	-99.604	191108.779	2195431.450
45	46.187	-99.579	191131.876	2201842.281
46	46.187	-99.542	191126.651	2211161.443
47	46.168	-99.690	184056.480	2173695.106
48	46.173	-99.669	185727.063	2178958.016
49	46.165	-99.628	182924.292	2189552.036
50	46.162	-99.566	181995.895	2205231.229
51	46.341	-99.456	247745.875	2232180.915
52	46.321	-99.456	240419.147	2232207.544

Appendix A. Point Count Station Locations

Point Count Station	Latitude	Longitude	Northing	Easting
53	46.305	-99.456	234631.774	2232254.113
54	46.283	-99.650		
55	46.297	-99.582		

APPENDIX B

SEASONAL SPECIES GROUP MEAN USE STATISTICS

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Appendix B-1. Seasonal Large-bodied Corvids, Large-bodied Non-Passerines, and Upland Gamebirds Use Statistics Recorded during Diurnal Avian Use Surveys

	Spring					Fall				
Common Name	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**
	LARGE-BODIED CORVIDS									
American Crow	8	100.000	0.050	0.433	0.019	22	95.652	0.104	1.511	0.005
Common Raven	0	-	-	-	-	1	4.348	0.005	0.069	0.005
	LARGE-BODIED NON-PASSERINES									
Common Nighthawk	0	-	-	-	-	1	1.064	0.005	0.069	0.005
Rock Pigeon	89	100.000	0.560	2.401	0.075	93	98.936	0.439	2.604	0.042
	UPLAND GAMEBIRDS									
Ring-necked Pheasant	10	23.810	0.063	0.291	0.050	15	71.429	0.071	0.567	0.028
Sharp-tailed Grouse[II]	32	76.190	0.201	1.084	0.044	6	28.571	0.028	0.350	0.009
ALL LARGE-BODIED CORVIDS	**8**	**100.000**	**0.050**	**0.433**	**0.019**	**23**	**100.000**	**0.108**	**1.512**	**0.009**
ALL LARGE-BODIED NON-PASSERINES	**89**	**100.000**	**0.560**	**2.401**	**0.075**	**94**	**100.000**	**0.443**	**2.604**	**0.047**
ALL UPLAND GAMEBIRDS	**42**	**100.000**	**0.264**	**1.225**	**0.082**	**21**	**100.000**	**0.099**	**0.664**	**0.038**

[a] Total Std. Detections is the total number of standardized individuals detected within the 800 m–radius survey cylinder during standardized use surveys

[b] % Comp. (i.e., percent composition) is the percent of a particular species group that a particular species comprises using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 60-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I or II following the species name to indicate that it is Level I or Level II SCP, respectively.

Appendix B-2. Seasonal Small-Bodied Non-Passerine and Passerine Use Statistics within the Project Area (Diurnal Avian Activity Surveys)

Common Name	Spring					Fall				
	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]
	SMALL NON-PASSERINES									
Hairy Woodpecker	0	-	-	-	-	1	1.471	0.005	0.069	0.005
Downy Woodpecker	1	6.250	0.006	0.079	0.006	0	-	-	-	-
Mourning Dove	13	81.250	0.082	0.389	0.050	64	94.118	0.302	1.107	0.137
Northern Flicker	2	12.500	0.013	0.112	0.013	3	4.412	0.014	0.153	0.009
	PASSERINES									
American Goldfinch	12	0.164	0.075	0.399	0.050	71	2.857	0.335	1.238	0.123
American Pipit	0	-	-	-	-	44	1.771	0.208	2.154	0.024
American Robin	24	0.329	0.151	1.313	0.038	19	0.765	0.090	0.539	0.028
American Tree Sparrow	11	0.151	0.069	0.586	0.025	0	-	-	-	-
Bank Swallow	1	0.014	0.006	0.079	0.006	13	0.523	0.061	0.703	0.014
Barn Swallow	12	0.164	0.075	0.382	0.050	90	3.622	0.425	1.976	0.090
Brown-headed Cowbird	93	1.275	0.585	1.532	0.233	6	0.241	0.028	0.237	0.019
Blue Jay	1	0.014	0.006	0.079	0.006	3	0.121	0.014	0.206	0.005
Bobolink[II]	19	0.260	0.119	0.520	0.069	4	0.161	0.019	0.136	0.019
Brewer's Blackbird	25	0.343	0.157	1.128	0.044	30	1.207	0.142	0.848	0.033
Brown Thrasher	0	-	-	-	-	3	0.121	0.014	0.206	0.005
Chestnut-collared Longspur[I]	22	0.302	0.138	0.497	0.088	11	0.443	0.052	0.326	0.033
Clay-colored Sparrow	12	0.164	0.075	0.365	0.050	11	0.443	0.052	0.326	0.038
Cedar Waxwing	0	-	-	-	-	6	0.241	0.028	0.412	0.005
Chipping Sparrow	0	-	-	-	-	1	0.040	0.005	0.069	0.005
Cliff Swallow	15	0.206	0.094	0.461	0.057	3	0.121	0.014	0.206	0.005
Common Grackle	96	1.316	0.604	2.447	0.170	34	1.368	0.160	1.072	0.047

Appendix B-2. Seasonal Small-Bodied Non-Passerine and Passerine Use Statistics within the Project Area (Diurnal Avian Activity Surveys)

	Spring					Fall				
Common Name	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]
Dark-eyed Junco	7	0.096	0.044	0.411	0.019	0	-	-	-	-
Eastern Bluebird	2	0.027	0.013	0.159	0.006	0	-	-	-	-
Eastern Kingbird	8	0.110	0.050	0.271	0.038	13	0.523	0.061	0.378	0.038
European Starling	33	0.452	0.208	1.080	0.057	166	6.680	0.783	7.072	0.038
Gray Catbird	2	0.027	0.013	0.159	0.006	1	0.040	0.005	0.069	0.005
Grasshopper Sparrow[l]	4	0.055	0.025	0.157	0.025	1	0.040	0.005	0.069	0.005
Harris's Sparrow	1	0.014	0.006	0.079	0.006	0	-	-	-	-
Horned Lark	206	2.823	1.296	1.989	0.516	123	4.950	0.580	2.014	0.160
House Sparrow	55	0.754	0.346	1.587	0.082	67	2.696	0.316	2.106	0.047
House Wren	1	0.014	0.006	0.079	0.006	2	0.080	0.009	0.097	0.009
Lapland Longspur	6245	85.595	39.277	99.106	0.346	498	20.040	2.349	12.525	0.108
Least Flycatcher	1	0.014	0.006	0.079	0.006	0	-	-	-	-
Lincoln's Sparrow	0	-	-	-	-	1	0.040	0.005	0.069	0.005
Marsh Wren	0	-	-	-	-	2	0.080	0.009	0.097	0.009
Northern Shrike	1	0.014	0.006	0.079	0.006	0	-	-	-	-
Orchard Oriole	3	0.041	0.019	0.136	0.019	3	0.121	0.014	0.206	0.005
Pine Siskin	0	-	-	-	-	20	0.805	0.094	0.608	0.033
Purple Martin	0	-	-	-	-	1	0.040	0.005	0.069	0.005
Red-winged Blackbird	225	3.084	1.415	4.414	0.277	1058	42.575	4.991	32.638	0.142
Say's Phoebe	2	0.027	0.013	0.112	0.013	0	-	-	-	-
Savannah Sparrow	9	0.123	0.057	0.258	0.050	18	0.724	0.085	0.416	0.047
Sedge Wren	0	-	-	-	-	6	0.241	0.028	0.166	0.028
Snow Bunting	4	0.055	0.025	0.250	0.013	3	0.121	0.014	0.206	0.005

Appendix B-2. Seasonal Small-Bodied Non-Passerine and Passerine Use Statistics within the Project Area (Diurnal Avian Activity Surveys)

	Spring					Fall				
Common Name	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**
Song Sparrow	6	0.082	0.038	0.222	0.031	9	0.362	0.042	0.245	0.033
Swainson's Thrush	7	0.096	0.044	0.555	0.006	0	-	-	-	-
Tree Swallow	2	0.027	0.013	0.112	0.013	0	-	-	-	-
Unknown Blackbird	5	0.069	0.031	0.397	0.006	1	0.040	0.005	0.069	0.005
Unknown Finch	0	-	-	-	-	3	0.121	0.014	0.206	0.005
Unknown Passerine	6	0.082	0.038	0.273	0.025	18	0.724	0.085	0.553	0.042
Unknown Sparrow	8	0.110	0.050	0.271	0.038	15	0.604	0.071	0.322	0.052
Unknwon Swallow	0	-	-	-	-	5	0.201	0.024	0.343	0.005
Unknown Warbler	3	0.041	0.019	0.238	0.006	1	0.040	0.005	0.069	0.005
Vesper Sparrow	11	0.151	0.069	0.278	0.063	12	0.483	0.057	0.287	0.042
White-crowned Sparrow	1	0.014	0.006	0.079	0.006	0	-	-	-	-
Western Kingbird	10	0.137	0.063	0.368	0.044	11	0.443	0.052	0.340	0.033
Western Meadowlark[II]	66	0.905	0.415	0.888	0.258	22	0.885	0.104	0.411	0.071
White-throated Sparrow	0	-	-	-	-	2	0.080	0.009	0.137	0.005
Yellow Warbler	2	0.027	0.013	0.112	0.013	6	0.241	0.028	0.256	0.014
Yellow-headed Blackbird	17	0.233	0.107	0.472	0.063	39	1.569	0.184	1.387	0.042
Yellow-rumped Warbler	0	-	-	-	-	9	0.362	0.042	0.428	0.019
ALL SMALL-BODIED NON-PASSERINES	**16**	**100.000**	**0.101**	**0.424**	**0.063**	**68**	**100.000**	**0.321**	**1.140**	**0.146**
ALL PASSERINES	**7296**	**100.000**	**45.887**	**98.798**	**0.918**	**2485**	**100.000**	**11.722**	**35.965**	**0.613**

[a] Total Std. Detections is the total number of standardized individuals detected within the 800 m–radius survey cylinder during standardized use surveys

[b] % Comp. (i.e., percent composition) is the percent of a particular species group that a particular species comprises using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 60-minute point count surveys conducted within the season.

Appendix B-2. Seasonal Small-Bodied Non-Passerine and Passerine Use Statistics within the Project Area (Diurnal Avian Activity Surveys)

	Spring					Fall				
Common Name	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]

[d] SD is the standard deviation of Mean Use

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I or II following the species name to indicate that it is Level I or Level II SCP, respectively.

Appendix B-3. Seasonal Raptor Use Statistics within the Project Area (Diurnal Avian Activity Surveys)

	Spring					Fall				
Common Name	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**
American Kestrel[II]	3	4.545	0.019	0.136	0.019	3	2.206	0.014	0.118	0.014
Bald Eagle[II]	7	10.606	0.044	0.283	0.025	4	2.941	0.019	0.136	0.019
Bald Eagle[II]_*all*[f]	8	10.390	0.050	0.293	0.031	4	2.941	0.019	0.136	0.019
Ferruginous Hawk[I]	3	4.545	0.019	0.136	0.019	1	0.735	0.005	0.069	0.005
Golden Eagle[II]	1	1.515	0.006	0.079	0.006	0	-	-	-	-
Great Horned Owl	1	1.515	0.006	0.079	0.006	0	-	-	-	-
Merlin	0	-	-	-	-	1	0.735	0.005	0.069	0.005
Northern Goshawk	0	-	-	-	-	1	0.735	0.005	0.069	0.005
Northern Harrier[II]	16	24.242	0.101	0.393	0.075	21	15.441	0.099	0.315	0.094
Northern Harrier[II]_*all*[f]	17	22.078	0.107	0.399	0.082	21	15.441	0.099	0.315	0.094
Red-tailed Hawk	21	31.818	0.132	0.375	0.119	28	20.588	0.132	0.426	0.104
Red-tailed Hawk_*all*[f]	26	33.766	0.164	0.476	0.126	28	20.588	0.132	0.426	0.104
Rough-legged Hawk	1	1.515	0.006	0.079	0.006	0	-	-	-	-
Sharp-shinned Hawk	1	1.515	0.006	0.079	0.006	1	0.735	0.005	0.069	0.005
Sharp-shinned Hawk_*all*[f]	3	3.896	0.019	0.136	0.019	1	0.735	0.005	0.069	0.005
Swainson's Hawk[I]	8	12.121	0.050	0.219	0.050	62	45.588	0.292	1.545	0.137
Swainson's Hawk[I]_*all*[f]	9	11.688	0.057	0.232	0.057	62	45.588	0.292	1.545	0.137
Turkey Vulture	1	1.515	0.006	0.079	0.006	6	4.412	0.028	0.166	0.028
Turkey Vulture_*all*[f]	2	2.597	0.013	0.112	0.013	6	4.412	0.028	0.166	0.028
Unknown Accipiter	0	-	-	-	-	1	0.735	0.005	0.069	0.005
Unknown Buteo	1	1.515	0.006	0.079	0.006	7	5.147	0.033	0.204	0.028
Unknown Raptor	2	3.030	0.013	0.112	0.013	0	-	-	-	-
ALL RAPTORS	**66**	**100.000**	**0.415**	**0.705**	**0.314**	136	100.000	0.642	1.668	0.349
ALL RAPTORS_*all heights*[f]	**77**	**100.000**	**0.484**	**0.967**	**0.321**	136	100.000	0.642	1.668	0.349

Appendix B-3. Seasonal Raptor Use Statistics within the Project Area (Diurnal Avian Activity Surveys)

	Spring					Fall				
Common Name	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]

[a] Total Std. Detections is the total number of standardized individuals detected within the 800 m–radius survey cylinder during standardized use surveys

[b] % Comp. (i.e., percent composition) is the percent of raptors that a particular species comprises using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 60-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season

[f] Species or group names followed by "*_all* " indicate that presented data includes individuals greater than 200 m in height.

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I or II following the species name to indicate that it is Level I or Level II SCP, respectively.

Appendix B-4. Seasonal Shorebirds, Waders, and Waterbirds Use Statistics within the Project Area (Diurnal Avian Activity Surveys)

	Spring					Fall				
Common Name	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]
	SHOREBIRDS									
Greater Yellowlegs	0	-	-	-	-	3	2.459	0.014	0.118	0.014
Killdeer	56	65.116	0.352	0.713	0.233	60	49.180	0.283	1.622	0.090
Marbled Godwit[I]	5	5.814	0.031	0.237	0.019	0	-	-	-	-
Red-necked Phalarope	3	3.488	0.019	0.238	0.006	0	-	-	-	-
Upland Sandpiper[II]	11	12.791	0.069	0.392	0.044	0	-	-	-	-
Wilson's Phalarope[I]	6	6.977	0.038	0.476	0.006	0	-	-	-	-
Wilson's Snipe	5	5.814	0.031	0.175	0.031	0	-	-	-	-
Unknown Shorebird	0	-	-	-	-	59	48.361	0.278	2.475	0.019
	WADERS									
Great Blue Heron	0	-	-	-	-	3	100.000	0.014	0.153	0.009
Sandhill Crane	83	100.000	0.522	3.174	0.031	0	-	-	-	-
Sandhill Crane_*all*[f]	385	100.000	2.421	22.674	0.038	0	-	-	-	-
	WATERBIRDS									
American Coot	5	4.000	0.031	0.326	0.013	16	0.745	0.075	0.500	0.033
American White Pelican[II]	0	-	-	-	-	21	0.978	0.099	1.442	0.005
American White Pelican[II]_*all*[f]	7	0.053	0.044	0.395	0.013	21	0.978	0.099	1.442	0.005
Black Tern[I]	0	-	-	-	-	1	0.047	0.005	0.069	0.005
California Gull	20	16.000	0.126	0.933	0.038	1	0.047	0.005	0.069	0.005
Double-crested Cormorant	0	-	-	-	-	81	3.771	0.382	4.592	0.009
Franklin's Gull[I]	2	1.600	0.013	0.159	0.006	2023	94.181	9.542	80.316	0.033
Horned Grebe[I]	2	1.600	0.013	0.159	0.006	0	-	-	-	-
Pied-billed Grebe	1	0.800	0.006	0.079	0.006	2	0.093	0.009	0.097	0.009
Ring-billed Gull	90	72.000	0.566	1.256	0.226	0	-	-	-	-

Appendix B-4. Seasonal Shorebirds, Waders, and Waterbirds Use Statistics within the Project Area (Diurnal Avian Activity Surveys)

	Spring					Fall				
Common Name	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**
Sora	1	0.800	0.006	0.079	0.006	3	0.140	0.014	0.118	0.014
Unknown Gull	2	1.600	0.013	0.159	0.006	0	-	-	-	-
Unknown Waterbird species	2	1.600	0.013	0.159	0.006	0	-	-	-	-
ALL SHOREBIRDS	**86**	**100.000**	**0.541**	**1.205**	**0.264**	**122**	**100.000**	**0.575**	**3.002**	**0.104**
ALL WADERS	**83**	**100.000**	**0.522**	**3.174**	**0.031**	**3**	**100.000**	**0.014**	**0.153**	**0.009**
ALL WADERS_*all heights*[f]	**385**	**100.000**	**2.421**	**22.674**	**0.038**	**3**	**100.000**	**0.014**	**0.153**	**0.009**
ALL WATERBIRDS	**125**	**100.000**	**0.786**	**1.564**	**0.296**	**2148**	**100.000**	**10.132**	**80.401**	**0.080**
ALL WATERBIRDS_*all heights*[f]	**132**	**100.000**	**0.830**	**1.623**	**0.302**	**2148**	**100.000**	**10.132**	**80.401**	**0.080**

[a] Total Std. Detections is the total number of standardized individuals detected within the 800 m–radius survey cylinder during standardized use surveys

[b] % Comp. (i.e., percent composition) is the percent of a particular species group that a particular species comprises using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 60-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season

[f] Species or group names followed by "_200" indicate that presented data includes individuals greater than 200 m in height.

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I or II following the species name to indicate that it is Level I or Level II SCP, respectively.

Appendix B-5. Seasonal Waterfowl Use Statistics within the Project Area (Diurnal Avian Activity Surveys)

	Spring					Fall				
Common Name	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]
American Wigeon	6	0.045	0.038	0.295	0.019	0	-	-	-	-
Blue-winged Teal	27	0.202	0.170	0.756	0.063	18	3.681	0.085	0.618	0.024
Cackling Goose	198	1.479	1.245	8.044	0.044	0	-	-	-	-
Canada Goose	1285	9.600	8.082	78.736	0.164	95	19.427	0.448	3.566	0.042
Canvasback[II]	4	0.030	0.025	0.317	0.006	0	-	-	-	-
Common Merganser	2	0.015	0.013	0.159	0.006	0	-	-	-	-
Gadwall	10	0.075	0.063	0.401	0.031	13	2.658	0.061	0.647	0.014
Greater White-fronted Goose	621	4.640	3.906	31.318	0.063	40	8.180	0.189	2.747	0.005
Greater White-fronted Goose_*all*[f]	671	4.917	4.220	31.529	0.069	150	12.255	0.708	8.027	0.009
Green-winged Teal	0	-	-	-	-	4	0.818	0.019	0.217	0.009
Lesser Scaup[II]	5	0.037	0.031	0.285	0.013	0	-	-	-	-
Mallard	147	1.098	0.925	3.275	0.239	77	15.746	0.363	4.815	0.019
Mallard_*all*[f]	154	1.129	0.969	3.310	0.245	117	9.559	0.552	5.531	0.024
Northern Pintail[II]	105	0.784	0.660	3.260	0.157	0	-	-	-	-
Northern Pintail[II]_*all*[f]	109	0.799	0.686	3.271	0.164	0	-	-	-	-
Northern Shoveler	12	0.090	0.075	0.485	0.031	4	0.818	0.019	0.217	0.009
Redhead	5	0.037	0.031	0.397	0.006	0	-	-	-	-
Ross's Goose	40	0.299	0.252	1.096	0.088	1	0.204	0.005	0.069	0.005
Ross's Goose_*all*[f]	40	0.293	0.252	1.096	0.088	6	0.490	0.028	0.350	0.009
Ruddy Duck	4	0.030	0.025	0.317	0.006	0	-	-	-	-
Snow Goose	10893	81.382	68.509	377.666	0.126	180	36.810	0.849	12.362	0.005
Snow Goose_*all*[f]	11093	81.291	69.767	378.071	0.126	760	62.092	3.585	32.776	0.014
Unknown Duck	21	0.157	0.132	0.772	0.050	57	11.656	0.269	2.336	0.019

Appendix B-5. Seasonal Waterfowl Use Statistics within the Project Area (Diurnal Avian Activity Surveys)

	Spring					Fall				
Common Name	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**
ALL WATERFOWL	**13385**	**100.000**	**84.182**	**472.342**	**0.478**	**489**	**100.000**	**2.307**	**14.195**	**0.108**
ALL WATERFOWL_*all heights*[f]	**13646**	**100.000**	**85.824**	**472.602**	**0.484**	**1224**	**100.000**	**5.774**	**34.518**	**0.127**

[a] Total Std. Detections is the total number of standardized individuals detected within the 800 m–radius survey cylinder during standardized use surveys

[b] % Comp. (i.e., percent composition) is the percent of waterfowl that a particular species comprises using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 60-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season

[f] Species or group names followed by "*_all* " indicate that presented data also includes individuals flying at greater than 200 m in height.

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I or II following the species name to indicate that it is Level I or Level II SCP, respectively.

APPENDIX C

SPECIES OBSERVED DURING EAGLE USE AND DIURNAL AVIAN USE SURVEYS

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Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Alder/Willow Flycatcher	*Empidonax alnorum/traillii*	-	Incidental	-	N/A	-	-
American Avocet	*Recurvirostra americana*	-	Incidental	Incidental	N/A	SCP II	-
American Bittern	*Botaurus lentiginosus*	-	Incidental	Incidental	N/A	SCP I	-
American Coot	*Fulica americana*	X	Incidental	X	N/A	-	-
American Crow	*Corvus brachyrhynchos*	X	N/A	X	N/A	-	-
American Goldfinch	*Spinus tristis*	X	Incidental	X	N/A	-	-
American Kestrel	*Falco sparverius*	X	X	X	-	SCP II	-
American Pipit	*Anthus rubescens*	Incidental	N/A	X	N/A	-	-
American Redstart	*Setophaga ruticilla*	Incidental	N/A	-	N/A	-	-
American Robin	*Turdus migratorius*	X	Incidental	X	N/A	-	-
American Tree Sparrow	*Spizelloides arborea*	X	N/A	-	N/A	-	-
American White Pelican	*Pelecanus erythrorhynchos*	-	Incidental	X	N/A	SCP II	-
American Wigeon	*Mareca americana*	X	Incidental	-	N/A	-	-
Baird's Sandpiper	*Calidris bairdii*	-	Incidental	-	N/A	-	-
Baird's Sparrow	*Centronyx bairdii*	Incidental	N/A	-	N/A	SCP I	-
Bald Eagle	*Haliaeetus leucocephalus*	X	X	X	X	SCP II	BGEPA
Baltimore Oriole	*Icterus galbula*	Incidental	Incidental	-	N/A	-	-
Bank Swallow	*Riparia riparia*	X	Incidental	X	N/A	-	-
Barn Swallow	*Hirundo rustica*	X	Incidental	X	N/A	-	-
Black Tern	*Chlidonias niger*	Incidental	Incidental	X	N/A	SCP I	-
Black-and-White Warbler	*Mniotilta varia*	Incidental	N/A	-	N/A	-	-
Black-bellied Plover	*Pluvialis squatarola*	Incidental	N/A	-	N/A	-	-
Black-crowned Night-Heron*	*Nycticorax nycticorax*	-	Incidental	-	N/A	-	-
Blackpoll Warbler	*Setophaga striata*	Incidental	N/A	-	N/A	-	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Blue Jay	*Cyanocitta cristata*	X	N/A	X	Incidental	-	-
Blue-winged Teal	*Spatula discors*	X	Incidental	X	N/A	-	-
Bobolink	*Dolichonyx oryzivorus*	X	Incidental	X	N/A	SCP II	-
Brewer's Blackbird	*Euphagus cyanocephalus*	X	Incidental	X	N/A	-	-
Broad-winged Hawk	*Buteo platypterus*	-	-	X	-	-	-
Brown Thrasher	*Toxostoma rufum*	-	Incidental	X	N/A	-	-
Brown-headed Cowbird	*Molothrus ater*	X	Incidental	X	N/A	-	-
Bufflehead	*Bucephala albeola*	Incidental	N/A	-	N/A	-	-
Burrowing Owl*	*Athene cunicularia*	-	N/A	Incidental	N/A	SCP II	-
Cackling Goose	*Branta hutchinsii*	X	N/A	-	N/A	-	-
California Gull	*Larus californicus*	X	Incidental	X	N/A	-	-
Canada Goose	*Branta canadensis*	X	Incidental	X	N/A	-	-
Canvasback	*Aythya valisineria*	-	Incidental	-	N/A	SCP II	-
Cattle Egret	*Bubulcus ibis*	Incidental	N/A	-	N/A	-	-
Cedar Waxwing	*Bombycilla cedrorum*	-	N/A	X	N/A	-	-
Chestnut-collared Longspur	*Calcarius ornatus*	X	Incidental	X	N/A	SCP I	-
Chipping Sparrow	*Spizella passerina*	-	Incidental	X	N/A	-	-
Clay-colored Sparrow	*Spizella pallida*	X	Incidental	X	N/A	-	-
Cliff Swallow	*Petrochelidon pyrrhonota*	X	Incidental	X	N/A	-	-
Common Goldeneye	*Bucephala clangula*	Incidental	N/A	-	N/A	-	-
Common Grackle	*Quiscalus quiscula*	X	Incidental	X	N/A	-	-
Common Merganser	*Mergus merganser*	Incidental	N/A	-	N/A	-	-
Common Nighthawk	*Chordeiles minor*	-	N/A	X	N/A	-	-
Common Raven	*Corvus corax*	-	N/A	X	N/A	-	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Common Yellowthroat	*Geothlypis trichas*	-	Incidental	-	N/A	-	-
Cooper's Hawk	*Accipiter cooperii*	-	-	X	-	-	-
Dark-eyed Junco	*Junco hyemalis*	X	N/A	-	N/A	-	-
Dickcissel	*Spiza americana*	-	Incidental	-	N/A	SCP II	-
Double-crested Cormorant	*Phalacrocorax auritus*	-	Incidental	X	N/A	-	-
Downy Woodpecker*	*Dryobates pubescens*	-	Incidental	-	N/A	-	-
Eastern Bluebird	*Sialia sialis*	X	Incidental	-	N/A	-	-
Eastern Kingbird	*Tyrannus tyrannus*	X	Incidental	X	N/A	-	-
Eurasian Collared-Dove*	*Streptopelia decaocto*	-	N/A	-	Incidental	-	
European Starling	*Sturnus vulgaris*	X	Incidental	X	N/A	-	-
Ferruginous Hawk	*Buteo regalis*	X	X	X	-	SCP I	-
Forster's Tern	*Sterna forsteri*	Incidental	Incidental	-	N/A	-	-
Franklin's Gull	*Leucophaeus pipixcan*	X	Incidental	X	N/A	SCP I	-
Gadwall	*Mareca strepera*	X	Incidental	X	N/A	-	-
Golden Eagle	*Aquila chrysaetos*	X	-	X	X	SCP II	BGEPA
Grasshopper Sparrow	*Ammodramus savannarum*	X	Incidental	X	N/A	SCP I	-
Gray Catbird	*Dumetella carolinensis*	X	N/A	X	N/A	-	-
Gray Partridge	*Perdix perdix*	Incidental	Incidental	Incidental	N/A	-	-
Gray-cheeked Thrush	*Catharus minimus*	Incidental	N/A	-	N/A	-	-
Great Blue Heron	*Ardea herodias*	-	N/A	X	N/A	-	-
Great Egret	*Ardea alba*	Incidental	Incidental	-	N/A	-	-
Great Horned Owl	*Bubo virginianus*	X	-	-	X	-	-
Greater White-fronted Goose	*Anser albifrons*	X	N/A	X	N/A	-	-
Greater Yellowlegs	*Tringa melanoleuca*	-	N/A	X	N/A	-	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Green-winged Teal	*Anas crecca*	-	Incidental	X	N/A	-	-
Hairy Woodpecker	*Dryobates villosus*	-	N/A	X	Incidental	-	-
Harris's Sparrow	*Zonotrichia querula*	X	N/A	-	N/A	-	-
Horned Grebe	*Podiceps auritus*	X	Incidental	-	N/A	SCP I	-
Horned Lark	*Eremophila alpestris*	X	Incidental	X	Incidental	-	-
House Finch	*Haemorhous mexicanus*	-	Incidental	-	N/A	-	-
House Sparrow	*Passer domesticus*	X	Incidental	X	N/A	-	-
House Wren	*Troglodytes aedon*	X	Incidental	X	N/A	-	-
Killdeer	*Charadrius vociferus*	X	Incidental	X	N/A	-	-
Lapland Longspur	*Calcarius lapponicus*	X	N/A	X	Incidental	-	-
Lark Sparrow	*Chondestes grammacus*	Incidental	N/A	-	N/A	-	-
Least Flycatcher	*Empidonax minimus*	X	Incidental	-	N/A	-	-
Least Sandpiper	*Calidris minutilla*	-	Incidental	-	N/A	-	-
Lesser Scaup	*Aythya affinis*	X	Incidental	-	N/A	SCP II	-
Lesser Yellowlegs	*Tringa flavipes*	Incidental	Incidental	-	N/A	-	-
Lincoln's Sparrow	*Melospiza lincolnii*	-	N/A	X	N/A	-	-
Mallard	*Anas platyrhynchos*	X	Incidental	X	N/A	-	-
Marbled Godwit	*Limosa fedoa*	X	Incidental	-	N/A	SCP I	-
Marsh Wren	*Cistothorus palustris*	-	Incidental	X	N/A	-	-
Merlin	*Falco columbarius*	X	-	X	-	-	-
Mourning Dove	*Zenaida macroura*	X	Incidental	X	N/A	-	-
Nelson's Sparrow	*Ammospiza nelsoni*	-	Incidental	-	N/A	SCP I	-
Northern Flicker	*Colaptes auratus*	X	Incidental	X	N/A	-	-
Northern Goshawk	*Accipiter gentilis*	-	-	X	X	-	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Northern Harrier	*Circus hudsonius*	X	X	X	-	SCP II	-
Northern Pintail	*Anas acuta*	X	Incidental	-	N/A	SCP II	-
Northern Shoveler	*Spatula clypeata*	X	Incidental	X	N/A	-	-
Northern Shrike	*Lanius borealis*	X	N/A	-	N/A	-	-
Northern Waterthrush	*Parkesia noveboracensis*	Incidental	N/A	-	N/A	-	-
Orchard Oriole	*Icterus spurius*	X	Incidental	X	N/A	-	-
Palm Warbler	*Setophaga palmarum*	-	N/A	Incidental	N/A	-	-
Pectoral Sandpiper*	*Calidris melanotos*	-	Incidental	-	N/A	-	-
Peregrine Falcon	*Falco peregrinus*	Incidental	-	-	-	SCP III	-
Pied-billed Grebe	*Podilymbus podiceps*	X	Incidental	X	N/A	-	-
Pine Siskin	*Spinus pinus*	-	N/A	X	N/A	-	-
Prairie Falcon	*Falco mexicanus*	-	-	X	-	SCP II	-
Purple Martin	*Progne subis*	-	N/A	X	N/A	-	-
Red Crossbill*	*Loxia curvirostra*	-	N/A	Incidental	N/A	-	-
Redhead	*Aythya americana*	X	N/A	-	N/A	-	-
Red-headed Woodpecker	*Melanerpes erythrocephalus*	-	Incidental	Incidental	N/A	SCP I	-
Red-necked Phalarope	*Phalaropus lobatus*	X	N/A	-	N/A	-	-
Red-tailed Hawk	*Buteo jamaicensis*	X	X	X	-	-	-
Red-winged Blackbird	*Agelaius phoeniceus*	X	Incidental	X	N/A	-	-
Ring-billed Gull	*Larus delawarensis*	X	N/A	-	N/A	-	-
Ring-necked Pheasant	*Phasianus colchicus*	X	Incidental	X	Incidental	-	-
Rock Pigeon	*Columba livia*	X	Incidental	X	Incidental	-	-
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Incidental	N/A	-	N/A	-	-
Ross's Goose	*Anser rossii*	X	N/A	X	N/A	-	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Rough-legged Hawk	*Buteo lagopus*	X	-	X	-	-	-
Ruddy Duck	*Oxyura jamaicensis*	X	N/A	-	N/A	-	-
Sandhill Crane	*Antigone canadensis*	Incidental	N/A	Incidental	N/A	-	-
Savannah Sparrow	*Passerculus sandwichensis*	X	Incidental	X	N/A	-	-
Say's Phoebe	*Sayornis saya*	X	N/A	-	N/A	-	-
Sedge Wren	*Cistothorus platensis*	-	Incidental	X	N/A	-	-
Semipalmated Sandpiper	*Calidris pusilla*	-	Incidental	-	N/A	-	-
Sharp-shinned Hawk	*Accipiter striatus*	-	-	X	-	-	-
Sharp-tailed Grouse	*Tympanuchus phasianellus*	X	Incidental	X	Incidental	SCP II	-
Snow Bunting	*Plectrophenax nivalis*	X	N/A	X	Incidental	-	-
Snow Goose	*Anser caerulescens*	X	N/A	X	N/A	-	-
Snowy Owl	*Bubo scandiacus*	-	-	-	X	-	-
Solitary Sandpiper	*Tringa solitaria*	-	Incidental	-	N/A	-	-
Song Sparrow	*Melospiza melodia*	X	Incidental	X	N/A	-	-
Sora	*Porzana carolina*	X	Incidental	X	N/A	-	-
Spotted Sandpiper*	*Actitis macularius*	-	Incidental	-	N/A	-	-
Sprague's Pipit	*Anthus spragueii*	-	Incidental	Incidental	N/A	SCP I	-
Swainson's Hawk	*Buteo swainsoni*	X	X	X	-	SCP I	-
Swainson's Thrush	*Catharus ustulatus*	X	N/A	-	N/A	-	-
Swamp Sparrow	*Melospiza georgiana*	-	Incidental	-	N/A	-	-
Tree Swallow	*Tachycineta bicolor*	X	Incidental	-	N/A	-	-
Tundra Swan	*Cygnus columbianus*	-	N/A	Incidental	N/A	-	-
Turkey Vulture	*Cathartes aura*	X	X	X	-	-	-
Upland Sandpiper	*Bartramia longicauda*	X	Incidental	-	N/A	SCP II	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Veery	*Catharus fuscescens*	Incidental	N/A	-	N/A	-	-
Vesper Sparrow	*Pooecetes gramineus*	X	Incidental	X	N/A	-	-
Warbling Vireo	*Vireo gilvus*	-	Incidental	-	N/A	-	-
Western Kingbird	*Tyrannus verticalis*	X	Incidental	X	N/A	-	-
Western Meadowlark	*Sturnella neglecta*	X	Incidental	X	N/A	SCP II	-
White-breasted Nuthatch*	*Sitta carolinensis*	-	N/A	Incidental	N/A	-	-
White-crowned Sparrow	*Zonotrichia leucophrys*	X	N/A	-	N/A	-	-
White-faced Ibis	*Plegadis chihi*	-	Incidental	-	N/A	-	-
White-throated Sparrow	*Zonotrichia albicollis*	-	N/A	X	N/A	-	-
Whooping Crane	*Grus americana*	X	N/A	-	N/A	SCP III	FE
Willet	*Tringa semipalmata*	Incidental	Incidental	Incidental	N/A	SCP II	-
Willow Flycatcher	*Empidonax traillii*	-	Incidental	-	N/A	-	-
Wilson's Phalarope	*Phalaropus tricolor*	X	Incidental	-	N/A	SCP I	-
Wilson's Snipe	*Gallinago delicata*	X	Incidental	-	N/A	-	-
Wood Duck*	*Aix sponsa*	-	Incidental	-	N/A	-	-
Yellow Warbler	*Setophaga petechia*	X	Incidental	X	N/A	-	-
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	X	Incidental	X	N/A	-	-
Yellow-rumped Warbler	*Setophaga coronata*	-	Incidental	X	N/A	-	-

[a] An "X" within a particular seasonal column indicates that species has been detected at least once within the project area over the course of standardized field studies. Non-raptor species generally receive an "N/A" in summer and winter as standardized surveys were only conducted for raptors during these seasons. However, species marked with "Incidental" indicate that the species was observed incidentally within the project area during the season.

[b] State conservation listing status indicates North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priority (SCP) Level I, II, or III. Species marked with an asterisk (*) indicate that it was detected within the project incidentally only.

c Federal Status Codes: FE = Federally Endangered; BGEPA = Bald and Golden Eagle Protection Act

YEAR 2
PRE-CONSTRUCTION AVIAN STUDIES

BADGER WIND PROJECT
LOGAN AND MCINTOSH COUNTIES, NORTH DAKOTA

Prepared for

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EXECUTIVE SUMMARY

This year-two (Y2) report summarizes the results of pre-construction avian studies conducted May 2020 through April 2021 by Atwell, LLC (Atwell) on behalf of Badger Wind, LLC (Badger Wind) for the proposed Badger Wind Project (the project) in Logan and McIntosh counties, North Dakota. Field studies were designed to document avian and raptor use, raptor nest activity, and Sharp-tailed Grouse (*Tympanuchus phasianellus*) lek activity in the vicinity of the project. A year-one (Y1) report summarizes the same results from May 2019 through April 2020 (Atwell 2020a). The project area was revised in December 2020, midway through the Y2 study period.

Avian use studies were conducted in accordance with the United States Fish and Wildlife Service Land-Based Wind Energy Guidelines (USFWS WEG) (USFWS 2012), the Eagle Conservation Plan Guidance: Module 1 - Land-based Wind Energy, Version 2 (ECPG) (USFWS 2013), and the Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests (i.e., "final Eagle Rule"; USFWS 2016).

Studies conducted during the Y2 surveys included nest surveys for Bald Eagles (*Haliaeetus leucocephalus*), Golden Eagles (*Aquila chrysaetos*), and other raptor species; lek surveys for Sharp-tailed Grouse; monthly eagle use surveys; and diurnal avian use surveys during the spring and fall migration periods. Results of Y2 avian use studies are summarized below.

Raptor Nests

- A single in-use Bald Eagle nest noted in 2019 and 2020 appeared to be missing in early 2021. The nesting pair initiated a new nesting location approximately two miles to the east of the original site in March 2021. This nest was found within the project area during aerial nest surveys in 2019 was confirmed occupied in 2020. The Bald Eagle pair fledged young from this nest in 2019 and 2020.
- No Golden Eagle nests were found within the project area or ten-mile buffer.
- Four occupied Ferruginous Hawk (*Buteo regalis*) nests, seven Red-tailed Hawk (*Buteo jamaicensis*) nests, four Swainson's Hawk nests (*Buteo swainsoni*), and four Great Horned Owl nests (*Bubo virginianus*) were found within the revised December 2020 project area boundary and a surrounding two-mile buffer during Y2.

Sharp-tailed Grouse

- Thirteen confirmed Sharp-tailed Grouse leks, and two possible leks, were found during Y2 lek surveys. Four of the confirmed leks were within the December 2020 project boundary and four confirmed leks and one possible lek were within a surrounding one-mile buffer.

Bald Eagle and Golden Eagle Use

- Overall Bald Eagle use of the project area was similar over the Y1 and Y2 study periods. Thirty-Four Bald Eagles were observed over the course of 636 hours of standardized eagle use surveys over the Y1 study period and 35 Bald Eagles were observed over the same amount of survey effort during Y2. An additional 46 Bald Eagles were detected incidental to standardized surveys in Y1 and 30 incidental Bald Eagle detections were recorded during Y2. Incidental observations include sightings outside of the standardized sample plot as well as encounters outside of 60-minute eagle use survey periods.
- Golden Eagle use of the project area was also similar over the Y1 and Y2 study periods. Six Golden Eagles were observed over a year of eagle use surveys in both Y1 and Y2. Seven Golden Eagles were detected incidentally to standardized use surveys during Y1 and 6 incidental Golden Eagle detections were recorded during Y2.

  Golden Eagles were sporadically encountered during the spring, fall, and winter periods. Detections appeared to represent both migrating and wintering individuals.

  Bald Eagle mean use rates were highest during the fall and spring over the Y2 study period. Several summer Bald Eagle observations were recorded in association with the in-use nest location. Bald Eagles were infrequently observed during the winter and were never observed in January or February during the Y1 and Y2 study periods.

Species Listed under the Endangered Species Act

- Three Whooping Cranes (*Grus americana*), listed as endangered by the Endangered Species Act (ESA), were observed within the project area from April 15 to 17, 2020. The cranes were first observed during eagle use surveys at a nearby point count station. Return visits found that the cranes foraged during daylight hours in unharvested corn and roosted in riverine wetlands nearby at night. No Whooping Cranes were observed in Y2.
- No other ESA- listed avian species were observed within the project boundary during the two years of avian use studies.

General Avian Use

- Many of the bird species that were commonly observed in the project area are habitat generalists that are regularly observed in agricultural areas, including several species of blackbirds and Lapland Longspurs (*Calcarius lapponicus*). Large groups of birds were observed moving through the project area during migration. These included Snow Geese (*Anser caerulescens*), Franklin's Gulls (*Leucophaeus pipixcan*), a North Dakota species of conservation priority (SCP), and Sandhill Cranes (*Grus canadensis*).

- Small-bodied passerines (particularly Icterids and Lapland Longspurs) and waterfowl (particularly Snow Geese) together comprised the majority (93 percent) of avian detections during the Y2 study period.
- Avian species groups with mean flight heights within the pre-defined 35 to 150-meter rotor-swept zone included large-bodied corvids (e.g., crows and ravens), raptors, waterbirds (e.g., gulls, pelicans, cormorants), and waterfowl.
- Several passerine species of conservation priority that are associated with grassland habitats were observed extensively throughout the project area during diurnal avian use surveys. These included Chestnut-collared Longspur (*Calcarius ornatus*), Grasshopper Sparrow (*Ammodramus savannarum*), Bobolink (*Dolichonyx oryzivorus*), and Western Meadowlark (*Sturnella neglecta*). Nelson's Sparrows (*Ammospiza nelsoni*) and LeConte's Sparrows (*Ammospiza leconteii*) were infrequently encountered at localized sites within the project area. Sprague's Pipits (*Anthus spragueii*) were observed on infrequent occasions during fall migration, but evidence of this species breeding within the project area was not noted.

TABLE OF CONTENTS

1 INTRODUCTION 1
2 METHODS 3
2.1 EAGLE AND RAPTOR NEST SURVEY 3
2.2 SHARP-TAILED GROUSE LEK SURVEYS 4
2.3 EAGLE USE SURVEYS 5
2.4 AVIAN ACTIVITY POINT COUNT SURVEYS 8
2.5 INCIDENTAL DATA COLLECTION AND LISTED SPECIES 10
3 RESULTS 11
3.1 EAGLE AND RAPTOR NEST SURVEY 11
3.1.1 Eagle Nests 11
3.1.1.1 New 2021 Bald Eagle Nest Location 11
3.1.2 Non-Eagle Raptor Nests 12
3.2 SHARP-TAILED GROUSE LEK SURVEYS 12
3.3 EAGLE USE SURVEYS 13
3.3.1 Eagle Use Survey Effort 13
3.3.2 Cumulative Detections of Bald Eagles and Golden Eagles 13
3.3.3 Seasonality 13
3.3.4 Spatial Distribution of Detections 14
3.3.5 Directional Movements 15
3.3.6 Flight Heights 16
3.3.7 Eagle-Minutes Summary 16
3.4 USE OF THE PROJECT AREA BY OTHER RAPTOR SPECIES 17
3.5 DIURNAL AVIAN ACTIVITY POINT COUNT SURVEYS 18
3.5.1 General Avian Use 18
3.5.2 Species Group Use of the Project Area during Spring and Fall Migration 18
3.5.3 Special Status Species 23
3.5.4 Flight Heights by Species Group during Spring and Fall Migration 27
4 CONCLUSIONS 28
5 REFERENCES 30

TABLES

1 Survey Periods for Pre-Construction Avian Studies
2 List of Alternate Winter Point Count Stations
3 Eagle Nests and Nests of Other Raptor Species
4 Sharp-tailed Grouse Lek Locations
5 Total Standardized Survey Effort by Point Count Station
6 Eagle Use Surveys – Seasonal Mean Raptor Use
7 Eagle Use Surveys - Seasonal Bald Eagle Mean Use by Point Count Station
8a Eagle Use Surveys - Seasonal and Annual Raptor Mean Flight Heights
8b Seasonal and Annual Mean Flight Heights of Other Large-bodied Species
9 Eagle Minutes and Time within Rotor Swept Zone Summaries for Bald Eagles and Golden Eagles
10 Seasonal Raptor Mean Use by Point Count Station
11 Diurnal Avian Use Surveys - Seasonal Mean Use by Species Group

FIGURES

1 Site Location
2 Land Cover Types within the Project Area
3 2020 Raptor Nest Survey Study Area
4 2020 Sharp-tailed Grouse Lek Survey Study Area
5 Avian Point Count Stations
6 2020 Eagle and Raptor Nest Survey Results
7 2020 Sharp-tailed Grouse Lek Survey Results
8 Bald Eagle and Golden Eagle Observations

APPENDICES

A Point Count Station Locations
B Seasonal Species Group Mean Use Statistics
B-1 Large-bodied Corvids, Large-bodied Non-Passerines, Upland Gamebirds
B-2 Small-bodied Non-Passerines, Passerines
B-3 Raptors
B-4 Shorebirds, Waders, and Waterbirds
B-5 Waterfowl
C Species Observed during Eagle Use and Diurnal Avian Use Surveys

ACRONYMS AND ABBREVIATIONS

AKN	Avian Knowledge Network
Atwell	Atwell, LLC
BGEPA	Bald and Golden Eagle Protection Act
ECPG	United States Fish and Wildlife Service Eagle Conservation Plan Guidance: Module 1 - Land-based Wind Energy Version 2
ESA	Endangered Species Act
Ft	feet
km	kilometer(s)
m	meter(s)
MBTA	Migratory Bird Treaty Act
MCP	Minimum Convex Polygon
MW	Megawatt(s)
NDGF	North Dakota Game and Fish Department
ND SWAP	North Dakota State Wildlife Action Plan
NLCD	National Land Cover Database
QA/QC	Quality Assurance/Quality Control
project	Badger Wind Project
RSZ	rotor-swept zone
SCP	Species of Conservation Priority
SD	standard deviation
T&E	Threatened and Endangered Species under ESA
USFWS	United States Fish and Wildlife Service
WEG	United States Fish and Wildlife Service 2012 Land-Based Wind Energy Guidelines
WTG	Wind Turbine Generator

1 INTRODUCTION

Atwell, LLC (Atwell) was contracted by Badger Wind, LLC (Badger Wind) to conduct avian studies for the proposed Badger Wind Project (the project) in Logan and McIntosh counties, North Dakota (Figure 1). The proposed 250-megawatt (MW) project would include the development of 60 to 120 wind turbine generators (WTGs), associated collection lines, access roads, and a collector substation.

The project boundary was modified in December 2020 and is now an estimated 57,097 acres (Figure 1). Approximately 46 percent of the project area (26,000 acres) is in McIntosh County and approximately 54 percent (31,098 acres) is in Logan County The general topography is undulating and rises from the west to the east, with approximate elevations between 1,960 and 2,230 feet above mean sea level within the project boundary. The project is predominately within the Missouri Coteau Slope Level IV Ecoregion, with portions of the project area's eastern boundary extending upward into the Missouri Coteau Level IV Ecoregion (Bryce et al. 1996). The Missouri Coteau is an escarpment of glacial till containing numerous hills, small lakes, and poorly drained depressions that are referred to as "potholes" that receive most of their water from snow melt and precipitation (Bryce et al. 1996). These potholes increase in density to the north and east of the project boundary. The Missouri Coteau Slope descends westward toward the Missouri River from the Coteau and is characterized by a thinner glacial till layer and integrated drainages flowing toward the Missouri River (Clayton 1962).

According to the 2016 U.S. Geological Survey National Land Cover Database (NLCD; MRLC 2019), the project area is composed primarily of cultivated crops (46.2 percent) and herbaceous/grassland (44.9 percent). Wetlands and open water comprise 2.5 percent of the project area. Other land cover types found within the project area include developed areas (3.1 percent), pasture/hay (2.2 percent), shrub/scrub (1.2 percent), woodland forest (less than 0.1 percent), and barren land (less than 0.1 percent) (Figure 2).

The objectives of the studies summarized in this report were to document avian and raptor use, raptor nest activity, and grouse lekking activity in the project area and its vicinity. Survey protocols described herein were designed to adhere to Tier 3 of the United States Fish and Wildlife Service (USFWS) 2012 Land-Based Wind Energy Guidelines (WEG); the USFWS Region 6 Recommended Protocol for Conducting Pre-construction Eagle Nest Surveys at Wind Energy Projects Version 3, and Stage 2 assessments described in the USFWS Eagle Conservation Plan Guidance: Module 1 - Land-based Wind Energy Version 2 (ECPG; (USFWS 2012; USFWS 2013; USFWS 2021). These two documents provide wind energy developers and operators guidance for adhering to the Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGEPA), respectively. Additionally, Atwell utilized industry standard approaches for avian use

studies as promoted by the National Wind Wildlife Collaborative (Strickland et al. 2011). This report summarizes the results of the second year of avian studies. Table 1 summarizes avian studies conducted over the two years and respective survey extents, frequencies, and durations.

This report adheres to avian taxonomy outlined in the American Ornithological Society's Online Checklist of North & Middle American Birds: 61st Supplement (Chesser et al. 2020).

2 METHODS

2.1 EAGLE AND RAPTOR NEST SURVEY

The Y2 eagle and raptor nest surveys were conducted during April and May of 2020. The project area established in April 2019 and its surrounding nest survey area were assessed through a combination of targeted aerial surveys conducted on April 10, 2020 and ground-based surveys that continued through May 15, 2020 (Figure 3). The aerial Y2 survey occurred shortly before updated USFWS eagle nest survey guidance was released that recommended a 2-mile nest survey buffer surrounding the project area (USFWS 2020). Therefore, the eagle nest survey buffer extended 10 miles from the project boundary as during the Y1 nest survey and described in the ECPG (USFWS 2013). All non-eagle raptor nests were recorded for the project area and a surrounding two-mile buffer as described in the WEG (USFWS 2012).

Flight time was restricted to one day of aerial surveys due to safety concerns regarding a) the COVID-19 coronavirus outbreak across the United States; and b) recent aircraft accidents associated with aerial wildlife surveys at other proposed wind facilities in the region. The plan for conducting restricted aerial surveys was communicated to the USFWS and North Dakota Game and Fish Department (NDGF) during a safety update meeting on April 3, 2020.

The Y2 survey's targeted aerial transect areas are depicted in purple-outlined polygons in Figure 3. Areas targeted for aerial surveys included:

- Roadless portions of the project area
- Habitat-based focal areas within the April 2019 project area and 10-mile eagle nest survey buffer
- Known eagle nests and nests of other raptor species that were found during the Y1 survey.

Habitat-based focal areas were identified using desktop analysis of the eagle nest survey area. Large bodies of water, riparian areas, and areas with large trees that could serve as potential eagle nesting sites were prioritized when identifying target areas.

Fixed-wing aerial transects were conducted by two Atwell biologists in a Cessna Skyhawk 172M on April 10, 2020. Transects were flown by locally based Bismarck Aero at speeds ranging from approximately 75-100 knots, and at an approximate altitude of 500 feet (ft). Altitude and speed varied to some degree based upon landscape conditions, safety concerns, and the need to investigate potential nests. Aerial survey transects were oriented north-south, and riparian-based transects were flown along the northern and southern edges of the Beaver Creek riparian corridor between Beaver Lake and the western edge of the eagle nest survey area (Figure 3).

In addition to aerial nest surveys, all raptor nests that were found during ground-based activities, including ground-based lek surveys, avian use surveys, and eagle use surveys were mapped, assessed for nesting status, and were added to the project nest database. Ground-based follow-up surveys were conducted to confirm species and status for nests that could not be attributed to species during the aerial survey.

When a raptor nest was encountered, the following data were collected (USFWS 2021):

- Nesting species
- Nest location (decimal degrees)
- Nest substrate (deciduous or coniferous)
- Nest status (in-use or alternate)
- Nest condition (good, fair, or poor)
- Nest contents (number of eggs or young)

Following completion of the surveys, data were reviewed and uploaded into the project database as part of the quality assurance/quality control (QA/QC) program.

Incidental observations of additional raptor nests were made during 2021 project micrositing efforts. These locations were noted by species and activity, when possible, and included in the project database.

2.2 SHARP-TAILED GROUSE LEK SURVEYS

The Y2 Sharp-tailed Grouse lek survey was also conducted using both aerial and ground-based survey methods. Targeted portions of the grouse survey area (specifically the April 2019 project area plus a one-mile buffer zone around the April 2019 project area) were assessed via aerial transects on April 10, 2020 and are depicted with black north-south transects in Figure 4.

As described above, safety concerns limited flight time to one morning of aerial surveys that targeted specific areas within the broader grouse survey area and focused on portions of the grouse survey area that could not be reached or observed from publicly accessible roadside vantage points. Targeted aerial survey areas were believed to have higher likelihood of harboring grouse leks (shaded green in Figure 4) based on 1) results from 2019 aerial grouse lek surveys, 2) observations of grouse recorded during Y1 eagle use and avian use surveys, and 3) identification of potential Sharp-tailed Grouse breeding habitat through desktop review.

Additional portions of the grouse survey area were sampled using 3 rounds of standardized ground-based surveys between April 11 and May 15, 2020. Standardized ground-based grouse survey locations are depicted with orange circles in Figure 4. Each round of surveys was spaced

approximately 8 to 10 days apart. During each survey round, an Atwell biologist surveyed 77 publicly accessible roadside points spaced 0.5 miles (800 m) apart for two minutes, scanning visually and listening for Sharp-tailed Grouse vocalizations and other non-vocal sounds associated with lekking behavior.

In addition to dedicated ground-based lek surveys, survey schedules for concurrently occurring eagle use and avian use surveys (see Sections 2.3 and 2.4 below) were modified to opportunistically increase the likelihood of incidental detections of lekking Sharp-tailed Grouse during the use surveys. Eagle use and avian use sample plots are depicted with dashed black circles in Figure 4. Survey schedules for eagle use surveys were adjusted so that plots within potential grouse habitat (shaded green in Figure 4) were surveyed earliest in the morning in the months of March, April, and May of 2020.

When a Sharp-tailed Grouse lek was encountered, the following data were collected:

- Lek location (decimal degrees)
- Number of individuals present
- Observed behaviors
- Land use

Lek locations were additionally referenced with nearby landmarks (e.g., hilltops, potholes or wetlands, trees) to improve location precision and to help relocate the lek if assessed for ground-based lek counts at a later date.

Confirmed leks were defined as two or more birds together, with at least one male displaying. Possible leks were defined as auditory detections of multiple grouse that could not be verified visually after their initial detection on a ground-based survey.

Following completion of the surveys, data were reviewed and uploaded into the project database.

2.3 EAGLE USE SURVEYS

A long-duration, fixed-point eagle use survey protocol (Strickland et al. 2011) was used to document seasonal activity and behavior of eagles and other raptor species within the project area. All eagle detections and other raptor detections within a three-dimensional cylindrical plot (the sample plot) were recorded following a fixed-radius, point count survey approach (Hutto et al. 1986; Ralph et al. 1993) that is referenced in the ECPG (USFWS 2013). Though fixed-radius plots were used, the distance to each detection was estimated to allow for density estimation (Reynolds et al. 1980). Sample plots measured 2,625 feet (800 meters [m]) in radius by 656 ft (200

m) in height, as described in the final Eagle Rule (USFWS 2016). These surveys are referred to as standardized eagle use surveys hereafter.

Study Period

Eagle use surveys were conducted over one full year to encompass spring migration and the breeding season, fall migration, and the wintering season (Strickland et al. 2011). Each sample plot was visited for one hour each month, as described in the final Eagle Rule (USFWS 2016). Seasonal periods were defined as spring (March through May), summer (June through July), fall (August through November), and winter (January through February). The Y2 study period began on May 1, 2020 and ended on April 30, 2021.

Survey Methodology

Consistent with the Eagle Rule, a one-hour survey duration was used throughout the study period for all visits (USFWS 2016). Surveys were conducted between dawn and dusk. Surveys were conducted in all weather conditions, provided that conditions were safe for the observer and that horizontal visibility was at least 800 m and vertical visibility was at least 200 m.

While broadly referred to here as point count surveys, the ECPG recognizes that eagle use surveys are more accurately described as a 'point-based recording of activity duration (minutes of flight) within the sample plot (USFWS 2013).

The following information was recorded for each individual that was observed:

- Time of day at first and final observation within the sample plot
- Species or parent taxa group if identification to species not possible (e.g., *Accipiter* species)
- Horizontal distance to initial observation and closest observation in meters
- Count
- Flight height altitude within the sample plot (initial height, minimum height, maximum height in meters)
- Flight direction
- Age (with dependent juveniles not included in mean use analyses)
- Behavior
- Duration of flight within a generic rotor-swept zone's (RSZ) portion of the sample plot (35 to 150 m in height), to the nearest 0.1 minute

- Duration of flight within the entire (0 to 200 m in height) sample plot for eagles only (i.e. eagle minutes described in the ECPG [USFWS 2013])
- Habitat
- For eagles and species as endangered or threatened under the Endangered Species Act (ESA), flight path mapped through the sample plot

A starting monitoring station was randomly selected from the 53-monitoring stations before each of the 12 survey events across the year.

At the completion of each survey, the observer confirmed that data sheets were complete and legible prior to proceeding to the next point count station. Following completion of the surveys, data were reviewed and uploaded into the project database as part of the QA/QC program.

Selection and Location of Point Count Stations

Fifty-three point count stations were established overall within a study area predicated on the previous April 2019 project boundary (Figure 5). Point count station coordinates are detailed in Appendix A. Consistent with guidelines in the final Eagle Rule (USFWS 2016) and the Appendix C of the ECPG (USFWS 2013), Atwell established 18 of the 53 point count stations within the minimum convex polygon (MCP) to achieve 30 percent spatial coverage of an approximately 28,269-acre MCP. The MCP is depicted by the blue polygon in Figure 5 and was generated from a preliminary turbine array provided by Badger Wind in April 2019. The MCP encompasses the project footprint, inclusive of the hazardous area around all turbine and associated infrastructure, including utility lines, out buildings, and roads.

An additional 35 point count stations were added to provide coverage of the project area given a potential for future expansion and/or modification of the project area. Three of these 35 stations were positioned to the east and outside of the project boundary, in an area that was also under consideration for development at the start of surveys.

The following criteria were used when selecting point count station locations:

- Stations were located on low-traffic roadways for safety and to minimize noise disturbance during surveys.
- Stations were located within or adjacent habitat types that are representative of the project area.
- Stations were spaced so that sample plots did not overlap.
- Stations provided a 360-degree view of the horizon to the extent feasible.

- Stations were located in areas accessible year-round to the extent feasible.

Atwell ground-truthed all 53 point count stations in May 2019. Stations with landowner conflicts, an inadequate viewshed, or anticipated poor observer access during heavy precipitation were adjusted as necessary.

Land cover types were reviewed during ground-truthing to confirm that the survey points were representative of habitats found within the project area. The point count stations were located within representative land cover types as follows: 53.6 percent cultivated crops, 38.1 percent herbaceous cover, 3.6 percent open-space developed areas, 1.9 percent hay/pastureland, 1.1 percent emergent herbaceous wetland, and 1.0 percent shrub scrub. The following land cover types each represented less than 1 percent of the area covered by survey point count stations: development (low, medium, and high intensities), open water, woody wetland, deciduous forest, and barren land.

Alternate Point Count Station Strategy for Winter Surveys

Point count stations were surveyed for eagle use during the winter (December through February) to the extent feasible. Twelve point count stations had safety or access issues during winter storm events. Point count station 14, 21, 22, 30, 32, 35, 36, 40 and 48 are located on infrequently traveled roads with uncertain plowing frequency. These stations were inaccessible during periods of high snow depths. Point count stations 26, 39, and 50 are located on frequently traveled roads with minimal roadside clearance. Roadside snowbanks that accumulated during plowing could further limit roadside clearance, rendering these points unsafe during surveys.

Nearby point count stations were pre-selected as to serve alternates for the above point count stations in the event that these stations could not be accessed in inclement weather (Table 2). Alternate nearby point count stations were proximate in location and were located within similar habitats when possible. This strategy allowed surveyors to safely meet standardized survey effort goals while maintaining appropriate spatial coverage of the study area.

2.4 AVIAN ACTIVITY POINT COUNT SURVEYS

Flight Height Data for Large-bodied Bird Species

Flight heights for all large-bodied bird species were recorded during the first 20 minutes of the 60-minute eagle use survey to obtain flight height data, including raptors, waterfowl, large gamebirds, grebes, nightjars, rails and cranes, shorebirds, gulls and terns, pelicans, and waders such as herons and egrets. Only eagles and other raptors were recorded during the final 40 minutes of the eagle use survey.

Short-duration Point Count Surveys

In addition, a short-duration, fixed-point protocol (Strickland et al. 2011) was used to characterize general avian use within the study area, consistent with the WEG (USFWS 2012). Diurnal avian activity surveys were used to estimate mean use and species richness, to determine presence of species of concern, and to determine areas of concentrated avian use within the study area. These surveys are referred to as standardized avian use surveys hereafter.

Detections of small-bodied birds and large-bodied birds were recorded within three-dimensional cylindrical plots (the sample plot areas varied for small-bodied and large-bodied birds), following a fixed-radius plot point count survey approach. Small-bodied birds included hummingbirds, cuckoos, doves, swifts, woodpeckers, and most passerines. Sample plots for small-bodied birds measured 492 ft (300 m) in radius. Large-bodied birds included upland game birds, waterfowl, waterbirds (wading birds, cormorants, pelicans, grebes), shorebirds, raptors, nightjars, pigeons, and large corvids (American Crows [*Corvus brachyrhynchos*] and Common Ravens [*Corvus corax*]). Sample plots for large-bodied birds measured 2,625 feet (800 meters) in radius.

Study Period and Study Area

Surveys were completed during the spring (May 2020, and March to April 2021) and fall (August to November 2020) seasons. The same 53 point count station locations established for eagle and raptor use surveys were also used for avian use surveys (Figure 5).

Survey Methodology

Short duration avian use surveys followed point count methodology as described in Ralph et al. (1993), Ralph et al. (1995), in the WEG (USFWS 2012), and in standard industry recommendations (National Wind Coordinating Committee 1999; Strickland et al. 2011). Though a fixed-radius protocol was used (Hutto et al. 1986; Ralph et al. 1993), distance estimates to each detection were also recorded, allowing for calculation of density estimates if desired (Reynolds et al. 1980).

Short duration point count surveys were 10 minutes in duration and were conducted after the completion of the 60-minute eagle use survey. All birds that were seen or heard during the survey were recorded. Surveys were conducted throughout the day, their timing contingent on the completion of the preceding eagle and raptor use survey.

The following information was recorded for each auditory and visual detection during the short-duration count:

- Species or parent taxa group (e.g., sparrow species)
- Detection type (song, visual, call, other)
- Distance to detection

- Count
- Age (with dependent fledglings not counted in mean use analyses)
- Flight height altitude at initial detection (coded as above RSZ, within RSZ, or below RSZ)
    - Numeric flight height estimate also recorded to accommodate analyses using a wider RSZ if desired
    - Whether the individual eventually entered the RSZ if not within RSZ at first detection
- Habitat
- Breeding observations (e.g., nesting material carry, food material carry, nest, copulation, etc.).

At the completion of each survey, the observer confirmed that data sheets were complete and legible prior to proceeding to the next point count station. Following completion of the surveys, data were reviewed and uploaded into the project database as part of the QA/QC program.

2.5 INCIDENTAL DATA COLLECTION AND LISTED SPECIES

Incidental detections of eagles, ESA-listed threatened or endangered species (T&E), and North Dakota species of conservation priority (SCP) as defined by the North Dakota State Wildlife Action Plan (ND SWAP) (Dyke et al. 2015) were recorded during survey activities. Level I SCP are species of high conservation priority that may be declining in North Dakota or which may occur regularly in North Dakota but are otherwise in decline range wide. Level II SCP are species with moderate conservation priority or with higher conservation priority and significant non-state wildlife grant funding available to provide for their conservation. Level III SCP have moderate conservation priority and North Dakota is ephemeral to their range (Dyke et al. 2015). Incidental detections include observations recorded while en route to point count stations, non-raptor observations during eagle use surveys, observations outside the survey plots, and observations that were recorded at point count stations but outside the survey period.

3 RESULTS

3.1 EAGLE AND RAPTOR NEST SURVEY

3.1.1 Eagle Nests

Atwell detected one in-use Bald Eagle nest within the project area during the April 2020 aerial survey (Figure 6). This nest was located in a small cluster of cottonwood (*Populus*) trees southwest of Beaver Lake, Logan County (approximate coordinates: 46.3493° N, 99.6274° W). This is the same grove of trees where a pair of Bald Eagles was observed to have successfully nested during Y1 (2019) studies (Atwell 2020a). Two adults were observed tending to the nest at the time of the aerial survey on April 10, 2020, and they continued to be seen during subsequent ground-based survey efforts into the summer, when fledged juveniles were observed near the nest. No other eagle nest structures were detected within the eagle nest survey area.

Golden Eagles were not observed during the aerial survey and no Golden Eagle nests were found during the study period.

3.1.1.1 New 2021 Bald Eagle Nest Location

Atwell located an in-use Bald Eagle nest within the project area on March 10, 2021 (approximate coordinates: 46.3474° N, 99.5856° W) (Figure 6) The nest was found incidentally during eagle-use surveys and is located in a small grove of cottonwoods immediately east of a tributary of Beaver Creek. The nest is located over a mile from a publicly accessible road and was visited on foot after permission was secured from a property owner on April 22, 2021. An adult was observed on the nest during this check, confirming its status as in-use and occupied

The 2021 nest was previously noted as unoccupied during the Y2 nest survey (Atwell 2020b). It was noted to be somewhat large but was not suspected to be an alternate to the 2019-2020 nest due to their distance apart. It was checked later in the spring of 2020 and found to still be unoccupied.

The 2019-2020 and 2021 nests are believed to belong to the same nesting territory. The 2021 Bald Eagle in-use nest is approximately 3.19 km (1.98 miles) east of the 2019-2020 nest. The 2019-2020 nest is now classified as an alternate nest site (USFWS 2013; USFWS 2016). The 2019-2020 nest was checked repeatedly after the March 10 discovery of the 2021 nest and it was found to be missing and perhaps fallen from its substrate. Bald Eagles were not observed at the old nest site during these subsequent checks.

3.1.2 Non-Eagle Raptor Nests

During the Y2 nesting raptor survey Atwell identified 20 non-eagle raptor nests within the December 2020 project area boundary and 14 non-eagle raptor nests within its surrounding 2-mile raptor nest survey buffer. All 36 nests are depicted in Figure 6 and summarized in Table 3. Several of the 34 non-eagle raptor nests were found during ground-based eagle use and avian use surveys.

Four occupied Ferruginous Hawk nests were found within the December 2020 project area and a surrounding two-mile raptor nest buffer. Two nests were found within the project area and two nests were found within the two-mile buffer (Figure 6). All 4 Ferruginous Hawk nests were initially discovered during Y1 surveys in 2019 (Atwell 2020a). A fifth occupied Ferruginous Hawk nest was found within the project area during micrositing activities in April of 2021.

Four occupied Swainson's Hawk nests were found within the December 2020 project area boundary and a surrounding 2-mile raptor nest buffer (Figure 6). One nest was found within the project area and 3 nests were found within the two-mile buffer. All Swainson's Hawk nests were found during ground-based efforts; Swainson's Hawks have later nesting phenology than other raptors found within the project area and were still scarce at the time of the aerial raptor nest survey on April 10, 2020.

Seven Red-tailed Hawk nests were found within the December 2020 project area and a surrounding two-mile raptor nest buffer (Figure 6). Five nests were found within the project area and 2 nests were found within the two-mile buffer. Two of the nests within the project area that were occupied during the Y1 survey were found unoccupied during the Y2 survey.

Five occupied Great Horned Owl nests were found within the December 2020 project area and a surrounding two-mile raptor nest buffer, 3 of them within the project boundary (Figure 6). One of the 3 nests within the project boundary was initially discovered during Y1 surveys in 2019.

Eleven likely raptor stick nests (unoccupied and not identified to species) were found within the revised December 2020 project area. Six of these were within the project area and five within the two-mile buffer (Figure 6). Ground-based follow-up surveys found the nests unoccupied and did not provide further information on the species identities for these unknown raptor nests.

3.2 SHARP-TAILED GROUSE LEK SURVEYS

Thirteen confirmed Sharp-tailed Grouse lek locations and two possible lek locations were found within the grouse survey area through a combination of aerial and ground-based efforts during the Y2 lek survey (Figure 7 and Table 4). The same area was surveyed in 2019 and 2020, which included the April 2019 project area and a surrounding one-mile survey buffer.

Four confirmed lek locations were observed within the December 2020 project area, 4 confirmed and one possible lek location were observed within the one-mile buffer, and 5 confirmed and one possible lek location were observed beyond the December 2020 project area's one-mile buffer.

Four confirmed leks were found during aerial surveys and the remaining 9 were found during ground-based surveys. Confirmed leks held 4 to 27 individuals. Confirmed and possible leks are depicted with 0.5-mile-radius buffers to represent likely nesting areas for females (Dyke et al. 2015).

3.3 EAGLE USE SURVEYS

Eagle use survey results, along with discussion regarding annual and seasonal patterns, spatial distribution of observations across the project area, individuals' directional movements at the time of observation, and flight heights are presented below.

3.3.1 Eagle Use Survey Effort

Table 5 summarizes the Y2 eagle use survey effort by point count station. Eagle use surveys occurred over 636 total hours of standardized survey effort during the study period. Total effort included 159 hours of spring surveys, 106 hours of summer surveys, 212 hours of fall surveys, and 159 hours of winter surveys. This matched seasonal and annual survey effort totals during Y1.

Over the course of the Y2 study period station 14 was not accessible during the winter and early spring, and its paired replacement (station 13) was surveyed as an alternative, as described in Section 2.3 above.

3.3.2 Cumulative Detections of Bald Eagles and Golden Eagles

Overall, 35 Bald Eagles were detected over 636 hours across one year of standardized eagle use survey effort in Y2 (Figure 8). These results were similar to the 34 detections recorded over the same amount of survey effort during Y1. An additional 30 incidental detections of Bald Eagles were documented across the project area during the Y2 survey period (Figure 8).

Six Golden Eagles were detected over 636 hours across one year of standardized eagle use survey effort in Y2, matching the number of standardized Golden Eagle detections recorded over 636 hours of standardized effort during Y1 (Figure 8). An additional 6 incidental Golden Eagle detections were documented across the project area during Y2.

3.3.3 Seasonality

During Y2 surveys Bald Eagles were recorded throughout most of the year, with most detections occurring during the fall migratory period. Bald Eagles were not detected during standardized eagle use surveys in January and February in both Y1 and Y2.

Mean use rates during the spring, summer, and winter periods were similar. Seasonal standardized mean use within the project area follows, as summarized in Table 6:

- 0.04 Bald Eagle detections/60-minute survey/800 m plot (standard deviation [SD] = 0.22) during the winter and spring periods
- 0.05 Bald Eagle detections/60-minute survey/800 m plot (SD = 0.35) during the summer period
- 0.09 Bald Eagle detections/60-minute survey/800 m plot (SD = 0.41) during the fall survey period.

Accounting for the total eagle use survey effort across the project area during the year, the equivalent of one Bald Eagle was detected for every 26.5 hours, 21.2 hours, 11.2 hours, and 26.5 hours of standardized eagle use survey effort during the spring, summer, fall, and winter survey periods, respectively.

The observed decrease in standardized spring Bald Eagle detections between Y1 and Y2 was partly attributable to the establishment of a new nesting location in 2021 that was farther away from the nearest point count station than the 2019-2020 nest. Unlike the 2019-2020 nesting location, the new 2021 nest site was beyond 800 meters from the closest point count station. Spring 2021 detections of the nesting adults were therefore outside of the sample plot, necessitating their categorization as incidental detections. All standardized summer detections were associated with the nest that was in-use in 2020.

Golden Eagle detections were noted during the fall and winter periods. Standardized mean use within the project area was:

- 0.01 Golden Eagle detections/60-minute survey/800 m plot (SD = 0.10) during the fall period
- 0.03 Golden Eagle detections/60-minute survey/800 m plot (SD = 0.16) during the winter period

Accounting for the total eagle use survey effort across the project area during the year, the equivalent of one Golden Eagle was detected for every 106 hours of survey effort during the fall period and every 39.8 hours of during the winter period.

3.3.4 Spatial Distribution of Detections

Bald Eagle mean use rates were generally low across the project area (see Table 7 for a summary of use and Figure 5 for point count station locations). Thirteen of the 69 (19 percent) Bald Eagle

observations across study area in Y1 and Y2 were recorded at station 4 and were of individuals associated with the in-use nest that was occupied in 2019 and 2020.

Among the other 52 stations, stations 11 and 18 each recorded 6 standardized Bald Eagle detections within the sample plot over the Y1 and Y2 surveys cumulatively. Station 12 recorded 5 standardized detections over the 2-year period. Observations of small migrating groups of 2 to 3 Bald Eagles, which were infrequent events during the Y1 and Y2 surveys, contributed to higher numbers recorded at these 3 stations. The remaining 39 standardized Bald Eagle detections were recorded at 26 other point count stations.

Stations 11, 12, and 18 are in proximity and all three points are within 2 miles of a creek that flows northward from Wishek to Beaver Lake (Figure 5). All of the eagles observed at these 3 stations appeared to be in active migration. It is possible that migrating eagles may loosely follow this watercourse while moving through the area, slightly increasing use rates in this portion of the project area.

There was no apparent spatial pattern to Golden Eagle detections during Y2 surveys. The 6 Golden Eagle sightings were distributed across the project area. Golden Eagle detections were also similarly spread across the project area during Y1.

3.3.5 Directional Movements

Bald Eagle movements tended northward in the spring and southward in the fall during Y2 surveys, suggesting that most of the Bald Eagles observed during these seasons were actively migrating through the project area. This pattern resembled similar movement patterns observed during Y1.

Three of 5 Bald Eagle standardized detections that occurred during the spring season showed directional movement, with one individual moving to the north-northeast, one moving northeastward, and one moving eastward. Of 19 Bald Eagles observed in the fall, 4 were moving southward, 3 to the south-southeast, 7 southeastward, and 2 eastwards.

Similar to Y1 surveys, 4 Bald Eagles were observed flying southward or southeastward in early to mid-December, suggesting that Bald Eagle fall migration continues through the project into mid-late December.

Golden Eagles were infrequently observed during Y2 surveys, and only 3 of the Golden Eagles observed showed directional movement. One individual observed on November 22, 2020 was flying southward and may have been actively migrating through the project area. Individuals observed flying northward in December and eastward in February may have been overwintering within or near the project area.

3.3.6 Flight Heights

Table 8a summarizes the mean distributions of minimum and maximum flight heights for eagles and other raptor species detected during standardized eagle use surveys. Y1 data and Y2 data have been pooled for more robust seasonal sample sizes.

Over the full 2-year study period, Bald Eagle mean minimum and maximum flight heights were within the RSZ during the spring and fall, and Bald Eagle mean maximum flight heights were within the RSZ during the winter. Sample sizes were low during some seasons, with only one Bald Eagle observed during standardized surveys in the summer and only 8 Bald Eagles observed in the winter.

Golden Eagle seasonal results were similar, with spring and fall mean flight heights within the RSZ. Winter heights were lower and only the mean maximum flight height was within the RSZ during the winter.

A summary of accrued time within RSZ for Bald and Golden Eagles for the Y2 study period is presented in Table 9. The table also pools Y1 and Y2 data for more robust seasonal sample size.

Bald Eagle rates of flying within the RSZ were highest in the fall (0.11 minutes within RSZ/ hour of standardized observation) and spring (0.06 minutes within RSZ/hour of standardized observation) over the Y1 and Y2 study periods combined. Bald Eagles were more infrequently observed within the RSZ during the winter and never observed to fly within the RSZ during the summer period over two years of observation (Table 9).

Golden Eagle rates of flying within the RSZ were similar during the spring, fall, and winter over the Y1 and Y2 study periods (Table 9). Golden Eagles were not observed to fly within the RSZ during the summer period over Y1 and Y2 surveys.

3.3.7 Eagle-Minutes Summary

Eagle-minutes represent accrued minutes of eagle observations for flying eagles within the sample plot associated with each point count station. Perched eagles or eagles observed outside of the sample plot are not assigned eagle-minutes (USFWS 2013). Eagle-minutes are summarized by season for the Y2 study period and also for Y1 and Y2 combined in Table 9. Seasonal survey effort is summarized in Section 3.3.1.

The Y2 cumulative total of 76 eagle minutes was similar to the Y1 annual total of 81 minutes over 636 hours of standardized surveys each year. Bald Eagle seasonal eagle minute rates were highest in the fall (0.23 Bald Eagle minutes per hour of standardized eagle use observation) and winter (0.12 Bald Eagle minutes per survey hour), and lower in the spring (0.05 Bald Eagle minutes per

survey hour). All Y2 summer detections were of perched Bald Eagles associated with the in-use nest location.

Cumulatively, 157 total Bald Eagle minutes were recorded over 1,272 hours over two years, a rate of 0.12 eagle minutes / hour of standardized surveys.

Cumulatively, 47 total Golden Eagle minutes were recorded over 1,272 hours over two years, a rate of 0.04 eagle minutes / hour of standardized surveys. Observed Golden Eagle-minute rates were at their relative highest in the winter (0.09 Golden Eagle minutes per survey hour) and lower in the fall (0.05 Golden Eagle minutes per survey hour) across the Y2 study period. Golden Eagle minutes were not recorded during the spring or summer during Y2 surveys.

3.4 USE OF THE PROJECT AREA BY OTHER RAPTOR SPECIES

Raptors include eagles, falcons, harriers, hawks, owls, and vultures. Raptor mean use recorded during avian use surveys was primarily driven by detections of Red-tailed Hawks, Swainson's Hawks, and Northern Harriers. In particular, Red-tailed Hawks and Northern Harriers together accounted for 61 percent of all spring raptor detections during surveys. Red-tailed Hawks and Swainson's Hawks accounted for 42 percent of all fall detections during avian use surveys

Seasonal raptor mean use rates were relatively highest during the fall in both Y1 and Y2. Raptor mean use was notably higher during the fall in Y1 (3.37 raptors/60-minute survey/800 m plot) than in Y2 (2.46 raptors/60 minute survey/800 m plot; Table 6), suggesting that regional raptor productivity was higher during the 2019 breeding season that preceded the following fall migration.

This difference may have been influenced by interannual differences in precipitation, with the region experiencing much wetter conditions in 2019. Regional precipitation in 2019 was approximately 150 percent of the average annual precipitation while 2020 was approximately 75 percent of average annual precipitation (NOAA 2021). Specifically, above average precipitation across the northern Great Plains during the winter months in early 2019 could have provided more persistent and deeper snow cover conditions that have been correlated with temporal increases in raptor prey abundance (Heisler et al. 2014). Mean use rates were higher during the fall of Y1 for the most frequently observed raptor species, including Red-tailed Hawks, Swainson's Hawks, Northern Harriers (*Circus hudsonius*), and Broad-winged Hawks (*Buteo platypterus*).

Y1 and Y2 raptor mean use rates were similar during the summer and spring survey periods (summer: 2.47 raptors/60-minute survey/800 m plot; spring: 1.94 raptors/60-minute survey/800 m plot). Red-tailed Hawks, Swainson's Hawks, and Northern Harriers together comprised the majority of raptor detections in both the summer (79 percent) and the spring (73 percent) as well.

Y2 winter raptor mean use was very low compared to the other three seasons (0.15 raptors/60-minute survey/800 m plot). A total of 24 raptors representing seven species were observed over 159 hours of standardized eagle use surveys over the full winter season.

A review of the entire raptor group across all point count stations shows that raptors generally did not exhibit strong inter-seasonal patterns of spatial use within the project area that might suggest local concentrations of use (Table 10 and Figure 5 for point count station locations).

Mean minimum and maximum raptor flight heights were highest during the spring and summer survey periods, respectively. Mean minimum and maximum raptor flight heights were slightly lower during the fall and substantially lower during the winter (Table 8a).

Approximately 41 percent (199 out of 486 total detections) of all raptors observed in flight during the summer flew within the RSZ at some point during observation. The fall (39 percent; 415 out of 1,073 total observations of flying individuals) and spring (37 percent; 236 out of 643 total observations) periods held similar proportions of raptors flying within the RSZ. Consistent with low observed mean heights in the winter, only 29 percent (6 of 21 observations) of winter observations entered the RSZ.

3.5 DIURNAL AVIAN ACTIVITY POINT COUNT SURVEYS

The following sections summarize the results of the avian use surveys.

3.5.1 General Avian Use

Mean use data for all 97 species observed during Y2 avian use surveys are presented in Appendix B. A list of species observed within the project area over the full Y1 and Y2 study periods (including incidentally observed species) is included in Appendix C.

Passerine, non-passerine, upland gamebird, wader, waterbird, and waterfowl mean use statistics, discussed in more detail below, are summarized by species group in Table 11 and by individual species in Appendix B.

3.5.2 Species Group Use of the Project Area during Spring and Fall Migration

Avian use surveys occurred over 26.50 spring hours and 35.33 fall hours at 53 point count stations (Table 5). This was the same effort completed for the Y1 avian use surveys. Interannual comparisons therefore are drawn from the same amount of survey effort in each year of study and are reported in number of standardized detections (rather than mean use rate values in units of detections/survey duration/plot radius) for readability.

Large-bodied Corvids

Large-bodied corvids include crows and ravens. Y2 results for this species group were similar to Y1,with small numbers of American Crows detected each year: Thirty-three American Crows were detected on standardized avian use surveys during Y2; and 30 American Crows were detected over the same amount of effort during Y1 (Appendix B-1). Approximately three-quarters of American Crow detections occurred in the fall in both years. One Common Raven was detected during the fall in each year of surveys.

Passerines (including Small-bodied Corvids)

This species group was analyzed out to 150 m during Y1 surveys and the plot radius was adjusted out to 300 m for the Y2 study period. This adjustment in sample plot radius better captured the effective detection radius for these and other easily-detected species in open habitats found in the project area during the spring and fall periods (Thomas et al. 2010).

As observed during Y1, passerines accounted for a large portion of all avian detections during Y2, both in the spring (76 percent of all detections) and fall (96 percent of all detections). Seasonal passerine mean use patterns were reversed from Y1, however. During Y1, passerine mean use of the project area was much higher in the spring than in the fall (45.89 detections/10-minute survey/150 m plot in the spring and 11.77 detections/10-minute survey/150 m plot in the fall). During Y2, passerine mean use was 64.23 detections/10-minute survey/300 m plot in the fall and 29.72 detections/10-minute survey/300 m plot in the spring (Appendix B-2).

The Y1 pattern of lower passerine fall mean use relative to spring mean use was unexpected and can in part be ascribed to the 150 m plot radius used during Y1 surveys. Specifically, large flocks of blackbirds were detected at distances between 150 and 300 m from the point during Y2 fall surveys. Detections of fall blackbirds at this distance were beyond 150 m and therefore regarded as incidental detections during Y1. Brewer's Blackbird (686 fall detections and 18 spring detections), Red-winged Blackbird (5,906 fall detections and 1,011 spring detections), and Common Grackle (3,968 fall detections and 317 spring detections) all contributed to this seasonal pattern during Y2.

Large flocks of several hundred to 2,000 blackbirds of various species were observed at stations 2, 3, and 4 in the northwestern portion of the project area, apparently drawn to planted sunflower crops and to adjacent woodlots and shelterbelts that provided cover and roosting opportunities in close proximity to sunflowers. In addition, large flocks were associated with a livestock feedlot at station 39 in the southern portion of the project area.

Lapland Longspurs (*Calcarius lapponicus*) contributed to higher relative spring use found during Y1 and Y2. Seasonal differences in Lapland Longspur detections were not as pronounced in Y2 as in Y1 (6,245 spring detections and 498 fall detections during Y1; 2,294 spring and 1,238 fall

detections during Y2). The observed decrease in Lapland Longspur detections between Y1 and Y2 may be due to changes in productivity on the species' breeding grounds, as longspurs were observed throughout the project area in cultivated cropland, and habitat and food availability did not appear to change for this species over the two years of study.

Encounters with large flocks of longspurs or blackbirds were not clearly attributable to unique habitats and/or physiography present at stations with highest recorded mean use rates for these species (blackbirds congregating at a feedlot near station 39 were a notable exception to this pattern), and the Atwell biologist noted that it was apparent that these longspur and blackbird flocks could have appeared at any location in the project area during migration given the condition and crops of nearby agricultural fields.

Large-bodied Non-Passerines

Large-bodied non-passerines include nightjars and Rock Pigeons (*Columba livia*). Large-bodied non-passerines were detected with less frequency during Y2 surveys (120 total detections) than during Y1 (183 total detections; Appendix B-1).

As observed during Y1, Rock Pigeons represented nearly all large-bodied non-passerine detections. Rock Pigeon were often detected near farms and home throughout the project area, and large flocks of 20 – 30 individuals were observed at a feedlot near station 39 during the Y1 study period. Large flocks of this size were not observed during Y2 surveys.

Small-bodied Non-Passerines

Small-bodied non-passerine mean use within the project area was higher in the fall (0.40 detections/10-minute survey/300 m plot) than in the spring (0.22 detections/10-minute survey/300 m plot; Appendix B-2). Mourning Doves (*Zenaida macroura*) were the most common small-bodied non-passerine detected and accounted for 86 percent of the observations of this species group in the spring and 92 percent of the observations of birds within this group in the fall. Much of the seasonal difference in mean use rate for this species group was attributable to higher numbers of Mourning Doves detected during the fall season.

Shorebirds

Shorebirds include avocets, plovers, curlews, dowitchers, godwits, knots, phalaropes, sandpipers, snipes, stilts, turnstones, and woodcocks. Interannual shorebird mean use rates within the project area were similar; 208 shorebirds were detected during standardized avian use surveys in Y1, and 206 shorebirds were detected during Y2 (Appendix B-4).

Shorebirds were encountered in low numbers and frequencies throughout the project area and across several habitats. Over both Y1 and Y2 study periods the stations with highest shorebird

detection rates were in higher elevation grassland/pothole habitats along the project area's northeastern boundary, particularly near point count stations 22, 51, and 52. Stations 51 and 52 are beyond the December 2020 project boundary. Killdeer accounted for nearly two-thirds of all shorebird detections during the Y2 study period.

Upland Gamebirds

Upland gamebirds include bobwhite, grouse, partridge, prairie-chickens, and turkey. Upland gamebird mean use within the project area was higher in the spring (0.27 detections/10-minute survey/800 m plot) than the fall (0.09 detections/10-minute survey/800 m plot) (Appendix B-1). These species are non-migratory and are present year-round within the project area. Seasonal differences are potentially attributable to seasonal differences in detectability stemming from behavior and vocalization frequency during the spring (Giudice and Ratti 2020; Connelly et al. 1998).

As a group, upland gamebird seasonal and overall mean use rates were nearly identical between Y1 (42 spring and 21 fall detections) and Y2 (43 spring and 20 fall detections). However, Sharp-tailed Grouse detections decreased between Y1 (38 detections) and Y2 (18 detections). Habitat availability appeared unchanged between Y1 and Y2. Of note, the project area experienced drier conditions during the late winter and early spring lekking period in Y2 than during the lekking period in Y1 (NOAA 2021).

All but one Sharp-tailed Grouse detection during the Y2 study period occurred within the green-shaded "Sharp-tailed Grouse Priority Areas" (Figure 7) that were used to target Y2 lek surveys (Section 2.2), suggesting that this habitat designation is a good indicator of Sharp-tailed Grouse occurrence.

Waders

Waders include cranes, bitterns, egrets, and herons. Nearly all (97 percent) Y2 detections of waders were Sandhill Cranes, and over 80 percent of Sandhill Crane detections occurred during the spring. Whooping Cranes were not observed during Y2 surveys.

Wader mean use rates were higher during the Y2 study period (526 total detections during standardized avian use surveys when considering individuals observed at all flight heights) than Y1 (388 total detections during avian use surveys at all heights). A large proportion of Sandhill Crane detections (35 percent) were noted at heights of over 200 m.

More standardized detections of waders of all species were recorded during the Y2 study period than during Y1, including Great Egret (*Ardea alba*) and American Bittern (*Botaurus lentiginosus*), two species that were only observed incidentally during the Y1 study period. The project area

experienced drier conditions during the Y2 study period than during Y1, potentially limiting the extent of foraging habitat available to wading species during the Y2 study period.

Waterbirds

Waterbirds include cormorants, grebes, gulls, and loons. Overall waterbird mean use was 2.59 detections/10-minute survey/800 m plot in the spring and 1.96 detections/10-minute survey/800 m plot in the fall during the Y2 study period.

Waterbird detection rates were seasonally similar in Y2 (412 spring detections and 416 fall detections). There were notably more fall detections in Y1 (132 spring detections and 2,148 fall detections.

Most of the observed difference in seasonal and interannual use patterns can be attributed to patterns in Franklin's Gull (*Leucophaeus pipixcan*) use, an SCP Level I species. Franklin's Gulls were observed flying through the project area more frequently in the fall over both the Y1 and Y2 study periods (Y1: 2 spring detections and 2,023 fall detections; Y2: 199 spring detections and 342 fall detections; Appendix B-4).

There are no known Franklin's Gull nesting colony sites within the project area, and fall detections appear to represent post-breeding movements from locations beyond the project area. Reasons for diminished numbers observed during the fall period in Y2 are unclear. During Y1, large flocks were found opportunistically foraging in agricultural habitats following harvesting and haying activities (e.g., the August 27, 2019 observation of 500 individuals). This is an expected observation for gulls moving in large numbers over agricultural cropland habitats, yet one not observed during standardized surveys during the fall period in Y2. As found with Snow Geese above, the observed decrease in fall Franklin's Gull detections may have been due to chance. A large group of approximately 1,000 individuals was detected incidentally beyond 800 m during standardized eagle use surveys on September 22, 2020 at station 23, demonstrating the presence of Franklin's Gull flocks during Y2 surveys.

The waterbird species that were most frequently observed at flight heights within the RSZ included Franklin's Gull, Ring-billed Gull (*Larus delawarensis*), California Gull (*Larus californicus*), American White Pelican (*Pelecanus erythrorhynchos*), and Double-crested Cormorant (*Phalacrocorax auritus*). These species tended to be observed in the northeastern third of the project area, in Logan County.

Waterfowl

The waterfowl species group refers to the taxonomic order Anseriformes and includes geese and ducks. Waterfowl mean use rates were significantly higher in the spring in both years of study, a pattern influenced by spring geese migration through the project area (Y1 spring and fall

waterfowl mean use: 84.18 and 2.31 detections/10-minute survey/800 m plot, respectively; Y2 spring and fall waterfowl mean use: 38.97 and 6.74 detections/10-minute survey/800 m plot, respectively).

Several thousand fewer Snow Geese (*Anser caerulescens*) were detected during the Y2 spring study period (5,224 detections) than during the Y1 spring study period (11,093 detections). This interannual variation may have been due to chance encounters of large flocks. Large flocks were not encountered as frequently during the short duration counts in Y2, but large numbers of Snow Geese were observed in the vicinity of the project area yet were not observed during surveys. Regionally, peak Snow Goose migration occurred during the week of March 22 during both years of study (eBird 2021). Large numbers of Snow Geese were contemporaneously reported near the project area during peak migration in Y2, including a report of 10,000 Snow Geese at nearby Beaver Lake, within a mile of the project area (eBird 2021). In addition, several large groups of Snow Geese were observed incidentally during the second half of March (e.g., over 6,000 Snow Geese were observed at station 48 on March 18, 2021).

Migrating geese species accounted for the majority of overall waterfowl use in both years and in similar relative proportions in both years. Snow Geese, Ross's Geese (*Anser rossii*), Greater White-fronted Geese (*Anser albifrons*), Cackling Geese (*Branta hutchinsii*) and Canada Geese (*Branta canadensis*) together accounted for 5,926 of 6,196 (96 percent) of spring waterfowl detections during Y2. The Y2 spring mean use rates for the most commonly observed geese species included: 32.86 detections/10-minute survey/800 m plot for Snow Geese, and 2.17 detections/10-minute survey/800 m plot for Greater White-fronted Geese (Appendix B-5).

Prairie pothole habitats in the vicinity of the project primarily occur to the northeast of the project area. Point count stations 22, 51, 52, and 53 had highest annual waterfowl species richness values during both Y1 and Y2. Stations 51, 52, and 53 are located beyond December 2020 project boundary.

3.5.3 Special Status Species

ESA-listed Species

No ESA-listed avian species were observed over the Y2 study period.

Species of Conservation Priority

Several species that are listed as North Dakota SCP were detected during standardized avian use surveys, summarized by group in the following sections.

Passerines

Sprague's Pipit: SCP Level I; zero spring detections and 2 fall detections during standardized avian use surveys; incidental detections during eagle use surveys at 10 of 53 (19 percent) point count stations. All observations occurred during fall migration, after July 28. Eleven of the 13 total Y2 observations of individuals or groups occurred in the northern half of the project area, within Logan County. It was not apparent why more observations were recorded over the Y2 study period than during Y1, when Sprague's Pipits were observed on only two occasions (also in the fall). Atwell did not note behaviors that would confirm local breeding (e.g., song displays, nesting material carries, food carries to dependent young, dependent fledglings) during the 13 detections. Observations occurred in wheat stubble and on grassy hilltops, habitat features found throughout the project area.

Grasshopper Sparrow: SCP Level I; 4 spring detections and zero fall detections during standardized avian use surveys. Atwell notes that Grasshopper Sparrows were also incidentally observed at approximately 50 percent of point count stations, were observed throughout the project area, and were often associated with grassland habitats. Grasshopper Sparrows were detected much more frequently during the summer survey period and likely breed within the project area. Atwell notes that the majority of incidental observations occurred during eagle use surveys in June or July, which was outside of the spring and fall survey periods.

Nelson's Sparrow: SCP Level I; Nelson's Sparrow was not observed during standardized avian use surveys. One individual was detected incidentally at station 37. Prefers shallow marsh edges and wet meadows (Dyke et al. 2015) and may nest locally in appropriate habitats within the project area. Station 37 is near riverine wetland associated with a tributary of the south branch of Beaver Creek flowing through the southwestern portion of the project area. Riparian areas north and west of Wishek may also support riverine wetlands that are favorable to this species.

Chestnut-collared Longspur: SCP Level I; 55 spring detections and 92 fall detections during avian use surveys. Atwell notes that Chestnut-collared Longspur was also incidentally observed at 70 percent of point count stations. Over the Y2 study period, Chestnut-collared Longspur mean use rates were 0.35 detections/10-minute survey/300 m plot during the spring and 0.43 detections/10-minute survey/300 m plot during the fall. Males were frequently seen singing, and this species likely breeds within the project area. While observed throughout the project area, Chestnut-collared Longspurs were most frequently observed in the northern and eastern portions of the project area that are higher in elevation and are dominated by herbaceous cover as shown in Figure 2 (e.g., stations 12, 13, 17, and 21).

LeConte's Sparrow: SCP Level II; LeConte's Sparrow was not observed during avian use surveys; however, singing males were detected incidentally in July at stations 37 and 57. Stations 37 and

57 are near riverine wetlands associated with tributaries of Beaver Creek. The wet/riparian areas associated with station 57 are west and outside of the December 2020 project area boundary. Similar to Nelson's Sparrow, LeConte's Sparrows may nest locally in and near similar riverine habitats within the project area.

Bobolink: SCP Level II; Bobolink was detected 22 times in the fall and 30 times in spring. Atwell notes that Bobolink were incidentally observed at 98 percent of point count stations in June and July. Dependent fledglings were observed in early August at station 32, confirming breeding. Bobolink mean use rates were 0.14 detections/10-minute survey/300 m plot during both the spring and fall.

Western Meadowlark: SCP Level II; 171 spring detections and 114 fall detections of Western Meadowlark were recorded during standardized avian use surveys. Atwell also notes that Western Meadowlark were incidentally observed at all incidental detections at all point count stations in June and July. Western Meadowlark mean use rates were 1.08 detections/10-minute survey/300 m plot during the spring and 0.54 detections/10-minute survey/300 m plot during the fall.

Shorebirds

Marbled Godwit (*Limosa fedoa*): SCP Level I; There were 7 spring detections of 9 individuals and zero fall detections of Marbled Godwit. Atwell also incidentally observed Marbled Godwit at 19 percent of point count stations. Marbled Godwits may nest within the project area in low numbers, but specific favored locations were not apparent during Y1 and Y2 surveys. During the Y1 study period, agitated behavior was recorded at station 16 on June 10, 2019, suggesting that a nest or brood was nearby. Breeding behaviors were not observed during Y2 surveys, and godwits were not observed at station 16 during the Y2 study period.

Wilson's Phalarope (*Phalaropus tricolor*): SCP Level I; 3 detections of 4 individuals and zero fall detections of Wilson's Phalarope in Y2 compared to 2 detections of 6 individuals during standardized avian use surveys in Y1. Wilson's Phalaropes were observed at stations 15 and 22 in both Y1 and Y2, suggesting that they may locally breed at some wetlands within the project area.

Upland Sandpiper (*Bartramia longicauda*): SCP Level II; 26 detections of 34 individual Upland Sandpipers were observed in the spring and fall into mid-August of Y2. Atwell notes that Upland Sandpipers were detected at 36 percent of point count stations. Upland Sandpipers likely nest in roadside habitats/ditches, grasslands, and cropland (particularly no-till) habitats throughout the project area.

Waders

American Bittern

American Bittern is a Level I SCP that nests in wetlands with tall emergent vegetation (Dyke et al. 2015) and was vocalizing at a wetland near station 53 on May 15, 2020. Bitterns were not observed at this location on subsequent surveys, but individuals are difficult to detect from roadsides when silent and may nonetheless nest at this location. Station 53 is outside of the project area's new December 2020 boundary, but this species may nest in similar habitats within the project area.

Waterbirds

Horned Grebe (*Podiceps auratus*): SCP Level I; only observed during the spring and summer in Y1 at station 52. Station 52 is near several prairie potholes and is not within the December 2020 project area.

American White Pelican: SCP Level II; 3 spring detections of 62 individuals and one fall detection of 2 individuals were recorded during surveys. American White Pelican were also incidentally observed in the spring, summer, and fall. Nesting colonies were not observed and are not known to exist within the project area. Flocks of up to 60 individuals were encountered at 20 of 53 point count stations (38 percent) throughout the project area.

Black Tern (*Chlidonias niger*): SCP Level 1; 5 spring detections and one fall detection in Y2. Black Tern were generally observed in low numbers in the northeastern portion of the project area in association with greater wetland density. Nesting colonies were not observed within the project area.

Waterfowl

Northern Pintail (*Anas acuta*): SCP Level II; 31 spring detections and 5 fall detections of Northern Pintail were documented during Y2 surveys. Atwell notes that Northern Pintail were also observed at 66 percent of point count stations during the Y2 study period. Thirty-six detections of Northern Pintail during Y2, less than 109 detections recorded in Y1. Pintails were usually observed singly or in small groups of less than five individuals in wetlands cropland habitats throughout the project area. Pintail fledglings were not noted during Y2 surveys, but this species may nest near wetland complexes in associated prairie habitats.

Canvasback (*Aythya valisineria*): SCP Level II; Two Canvasback were observed during Y2 surveys. Both observations occurred at the northeastern portion of the study area at stations 5 and 53 in May. Atwell did not observe evidence of breeding within the project area.

3.5.4 Flight Heights by Species Group during Spring and Fall Migration

Table 8b summarizes seasonal mean flight height statistics for species and species groups detected during the first 20 minutes of long-duration point counts for large-bodied birds observed during Y2 surveys. Flight heights are summarized for each flock and not by individual. Lone birds were counted as a flock of size of one.

For large bodied birds, mean flight heights were highest during the spring and fall, while many birds are actively migrating over the project area. Species groups with mean flight heights within the RSZ included large-bodied corvids, waterbirds (gulls, terns, and cormorants), and waterfowl. Mean flight heights for the waders group were over 200 m in altitude due to mean Sandhill Crane flight heights outside of the RSZ. Species with sample sizes of at least five flocks and mean flight heights within the RSZ included American White Pelican, Black Tern, Double-crested Cormorant, Franklin's Gull, Ring-billed Gull, Greater White-fronted Goose, Northern Shoveler (*Anas clypeata*), Ross's Goose, and Snow Goose (Table 8b).

For small-bodied birds, 42 of 1136 (4 percent) spring flocks and 58 of 958 (6 percent) fall flocks entered the RSZ during observation. When considering counts of individual small-bodied birds instead of flocks, 925 of 4,760 (19 percent) spring detections and 868 of 13,702 (6 percent) fall detections were observed within the RSZ. Large spring flocks of Lapland Longspurs and Red-winged Blackbirds contributed to the disproportionately high percentage of individual spring detections within the RSZ.

4 CONCLUSIONS

A total of 156 species were recorded over two years of pre-construction avian studies within the project area and its vicinity (Appendix C). Two full years of eagle use surveys have been completed, totaling 1,272 hours of observation standardized survey effort. Approximately 62 hours of surveys have been conducted over two spring and fall migratory periods. Standardized nesting raptor and grouse lek surveys were conducted in 2019 and 2020.

One active Bald Eagle nest was observed within the project area in Y2. The pair nested south of Beaver Lake in 2019, returned to the same location to nest in 2020, then apparently moved two miles to the east to a new nesting site in 2021. No other Bald Eagle nests were found within 10 miles of the project boundary, and no Golden Eagle nests were found during the nest surveys.

Thirteen confirmed Sharp-tailed Grouse leks and two possible leks were found within during the Y2 study period. Y2 surveys were conducted across a study area that included the April 2019 project area and a surrounding one-mile buffer. The project boundary was modified to cover a smaller area in December 2020, and four of the 13 confirmed lek locations are within the December 2020 boundary. Four additional confirmed leks and one of the possible lek locations are within the new boundary's one-mile buffer.

Bald Eagle mean use rates and mean flight heights were highest in the spring and fall, suggesting that most of the Bald Eagle use observed within the project area was comprised of migrating individuals heading northward in the spring and southward in the fall. Consistent with these patterns, Bald Eagles observations within the RSZ were also highest in the spring and fall.

Summer Bald Eagle use within the project area was entirely associated with the nesting pair near Beaver Lake, and Bald Eagles were not observed during January or February over both Y1 and Y2. Aside from the nesting pair, no areas of concentrated Bald Eagle use were identified in the project area, which suggests that the project area lacks physiographic features that might attract or concentrate Bald Eagle use during migration. Golden Eagles were rarely encountered during standardized eagle use surveys, with relative highest mean use rates in the fall and winter.

Passerines and waterfowl together accounted for over 93 percent of bird detections recorded during surveys in the spring and fall of the Y2 study period. Large groups of species that are typically abundant in agricultural habitats in the northern Great Plains, including blackbirds, Lapland Longspurs, and Snow Geese influenced this pattern. Sandhill Cranes were observed flying at high altitudes well above the 200 m-high sample plot and the RSZ.

Grassland-associated passerine species that are listed by the NDGF as SCP (Dyke et al. 2015), including Sprague's Pipit, Grasshopper Sparrow, Nelson's Sparrow, LeConte's Sparrow, Chestnut-Collared Longspur, Bobolink, and Western Meadowlark were detected during surveys during the

spring and fall and were also noted as incidental detections during eagle use surveys in the summer. Sprague's Pipits were only observed in the late summer and fall, but the remaining other grassland SCP listed above were observed singing on territory and likely nest within the project area. Grasshopper Sparrows, Bobolinks, and Western Meadowlarks were observed throughout the project area, Chestnut-collared Longspurs were most frequently found in grasslands near the northeastern and eastern portions of the project area, and LeConte's and Nelson's Sparrows were found on localized, single occasions in their favored habitats.

Most waterfowl detections consisted of geese flocks migrating through the project area. Locations reporting highest waterfowl species richness were found in the northeastern portion of the study area, at stations 22, 51, 52, and 53. Stations 51, 52, and 53 are beyond the December 2020 project area boundary.

Whooping Cranes are listed as endangered under the ESA. Three Whooping Cranes were observed within the project area over three-day span in April 2020 during the Y1 study period. This is the first recorded observation of Whooping Cranes within the vicinity of the project area. No Whooping Cranes were observed in Y2.

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FIGURES

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Badger Wind

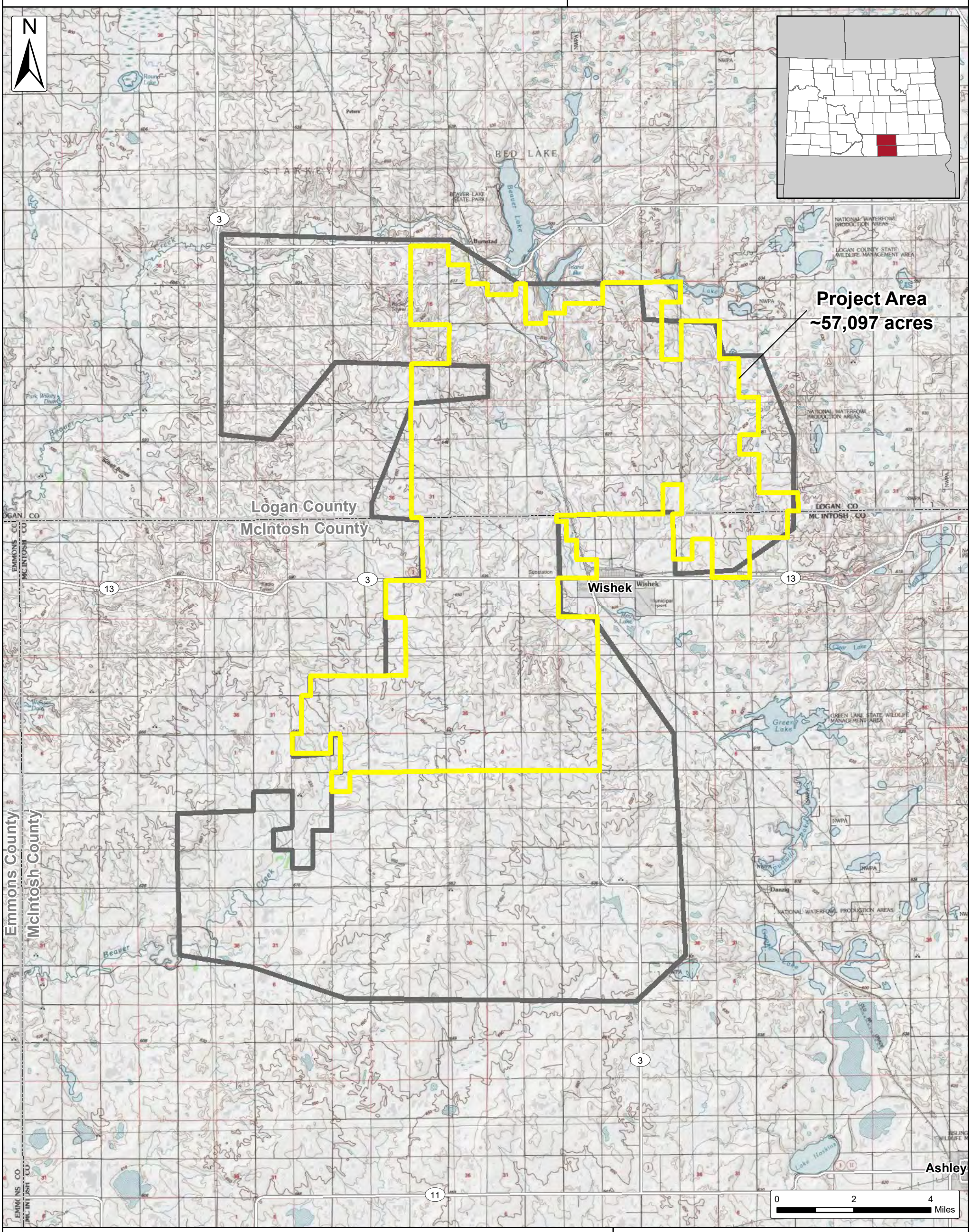
Figure 1. Site Location

Logan and McIntosh Counties, North Dakota

Client:
Badger Wind, LLC

Issue Date:
7/12/2021

Atwell, LLC Project:
19000785



Project Area
12/04/2020 (~57,097 acres)

Project Area
04/15/2019 (~121,695 acres)

City/Village

Counties

Source: USGS Topographic Quadrangle

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Badger Wind

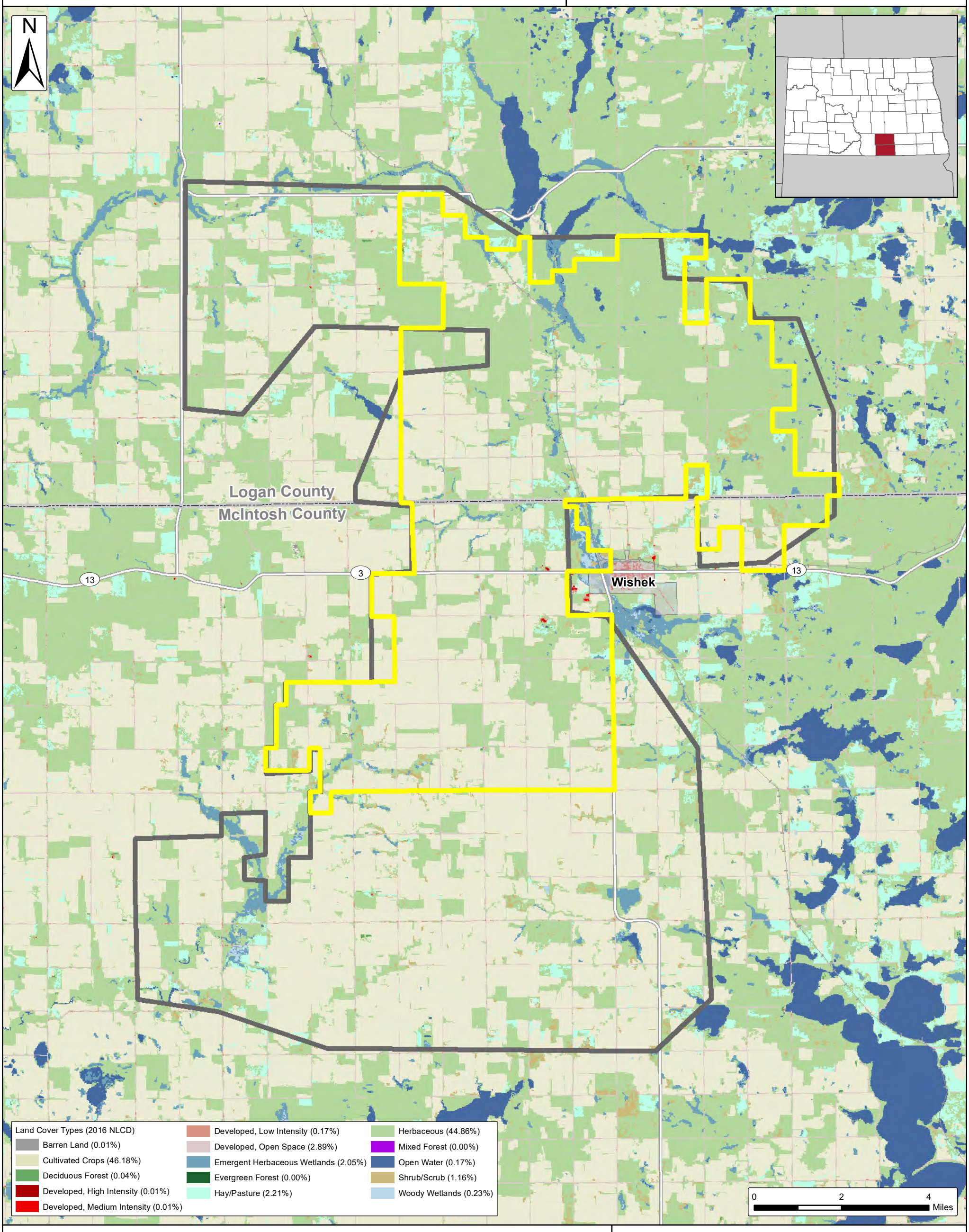
Figure 2. Land Cover Types within the Project Area

Logan and McIntosh Counties, North Dakota

Client:
Badger Wind, LLC

Issue Date:
7/12/2021

Atwell, LLC Project:
19000785



Project Area
12/04/2020 (~57,097 acres)

Project Area
04/15/2019 (~121,695 acres)

City/Village

Counties

Source: National Land Cover Database (USGS, 2016)

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Badger Wind

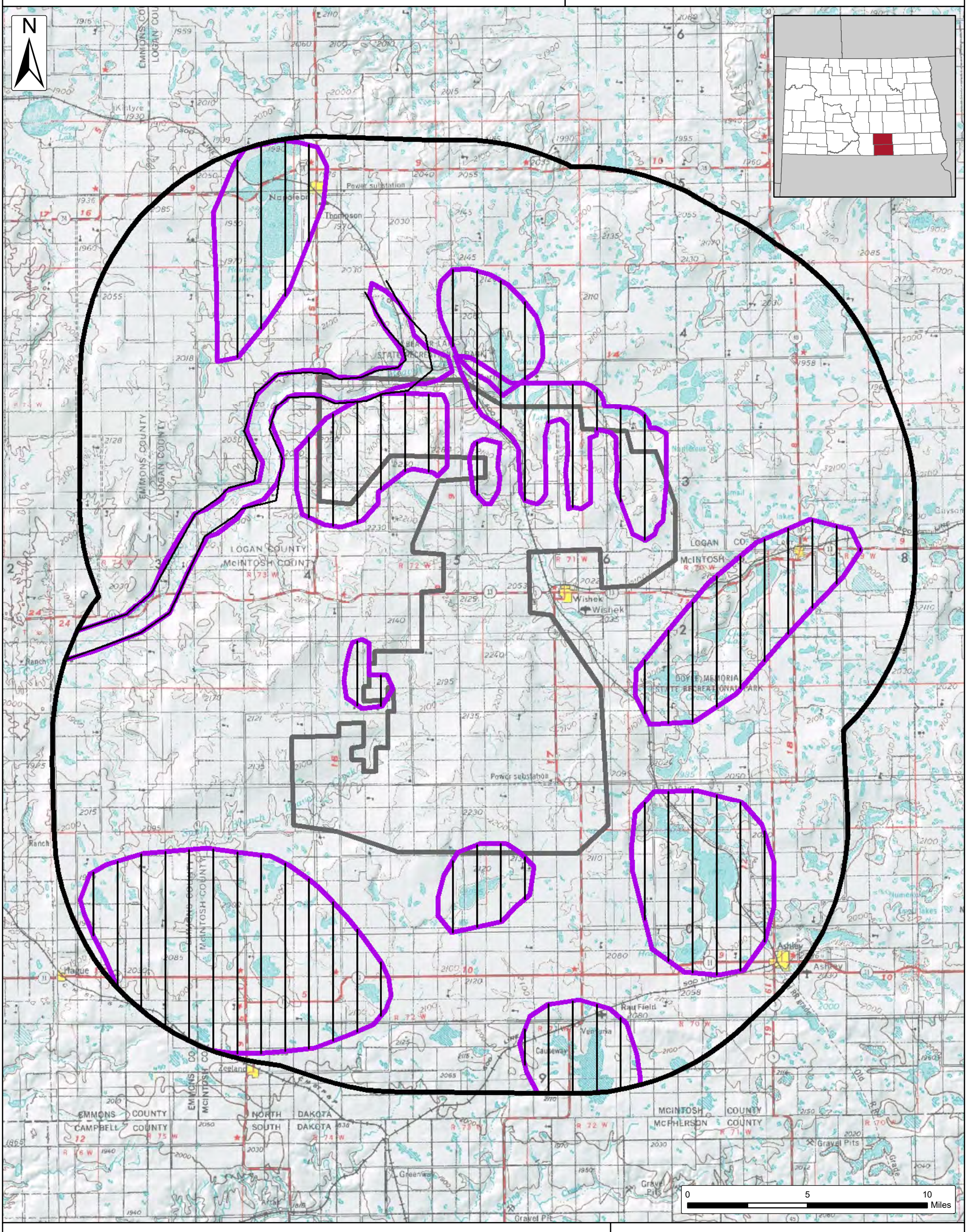
Figure 3. 2020 Raptor Nest Survey Study Plan

Logan and McIntosh Counties, North Dakota

Client:
Badger Wind, LLC

Issue Date:
7/12/2021

Atwell, LLC Project:
19000785



1-Mile Aerial Transects

Project Area
04/15/2019 (~121,695 acres)

Raptor Nest Survey Area (2-Mile Buffer)

Targeted Raptor Nest Survey Area

Eagle Nest Survey Area (10-Mile Buffer)

Source: USGS Topographic Quadrangle

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Badger Wind

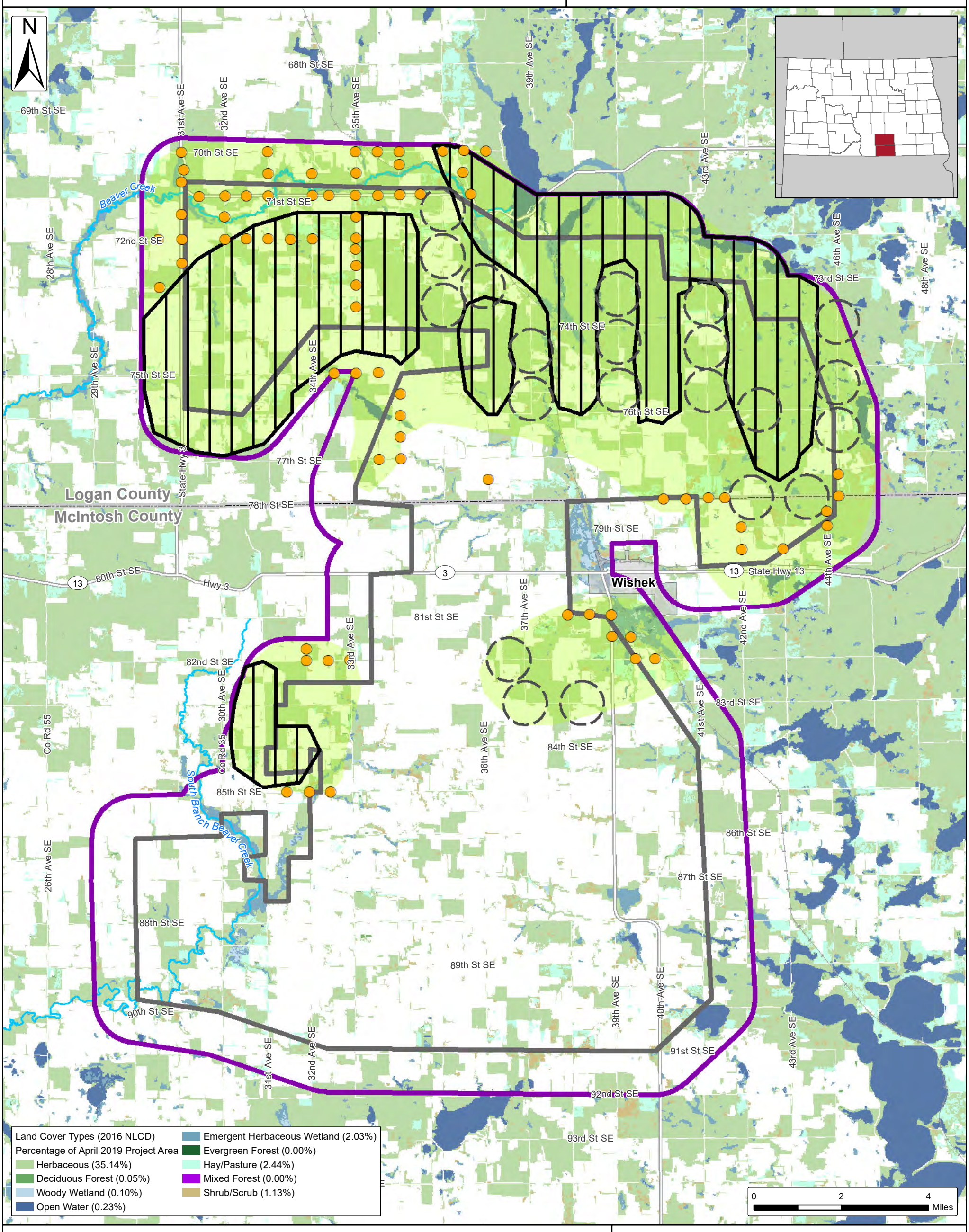
Figure 4. 2020 Sharp-tailed Grouse Lek Survey Study Plan

Logan and McIntosh Counties, North Dakota

Client:
Badger Wind, LLC

Issue Date:
7/12/2021

Atwell, LLC Project:
19000785



Standardized Ground-based Lek Survey Points
Opportunistic Ground-based Lek Survey Points
Standardized Aerial Survey Transects
2020 Aerial Lek Survey Area
Sharp-tailed Grouse Priority Areas
Major Watercourse (National Hydrography Dataset)

Project Area 04/15/2019 (~121,695 acres)
Grouse Survey Area (1-Mile Buffer)
City/Village
County

Source: National Land Cover Database (USGS, 2016)

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Badger Wind

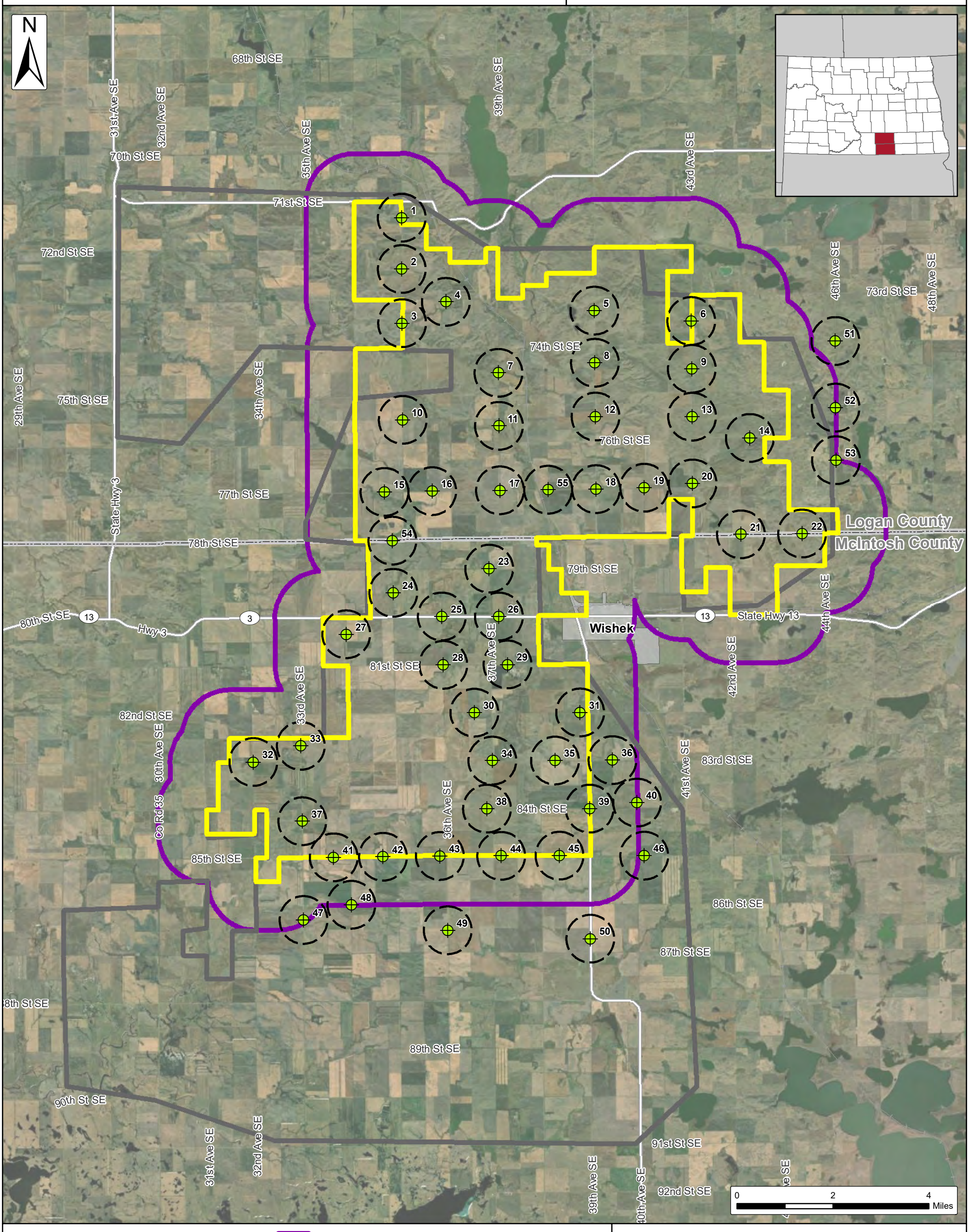
Figure 5. Avian Point Count Stations

Logan and McIntosh Counties, North Dakota

Client:
Badger Wind, LLC

Issue Date:
7/12/2021

Atwell, LLC Project:
19000785



- Avian Study Point
- 800 m-radius Avian Sample Plot
- Project Area 12/04/2020 (~57,097 acres)
- Project Area 04/15/2019 (~121,695 acres)
- 1-mile Buffer
- City/Village
- Counties

Source: Esri World Imagery

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Badger Wind

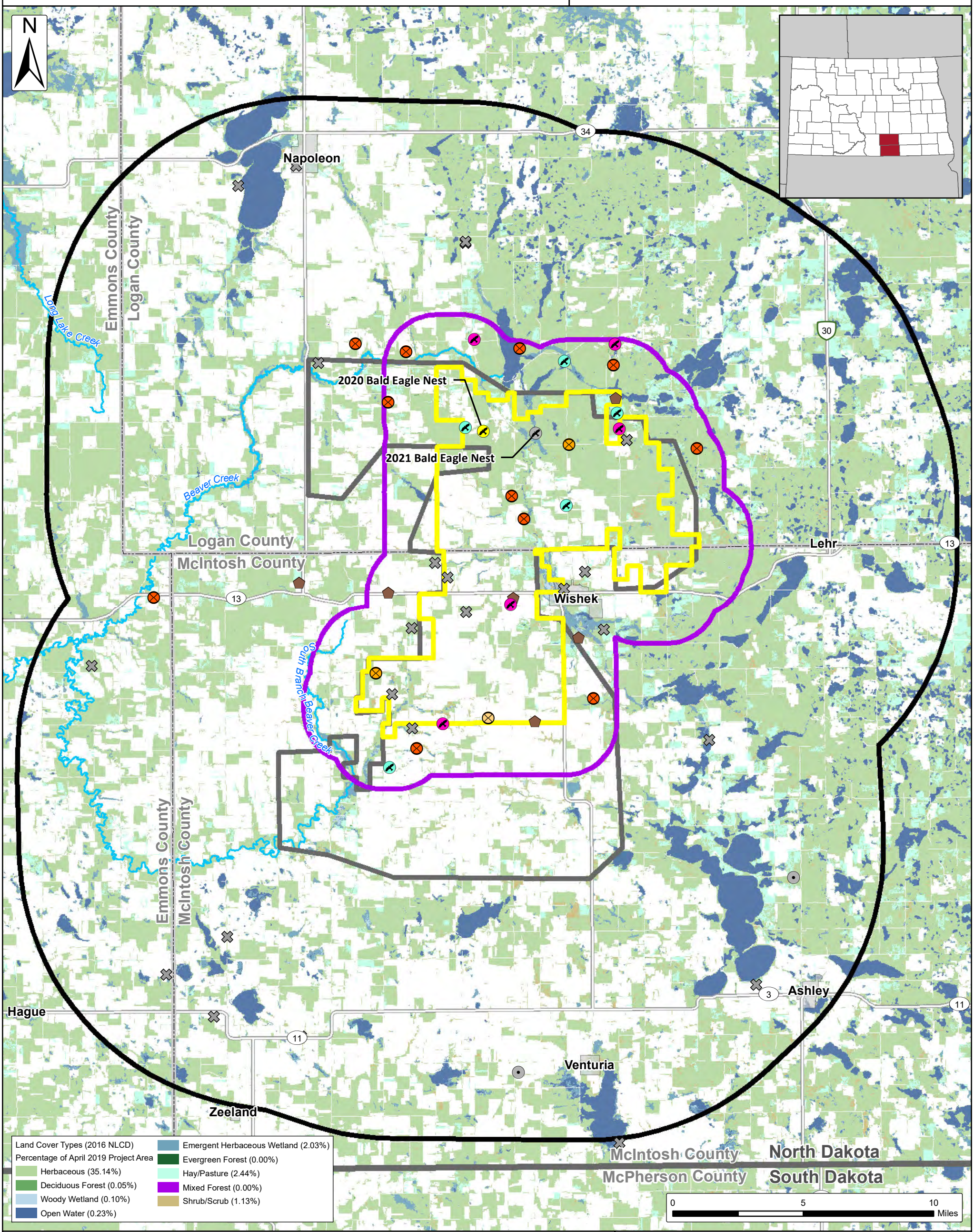
Figure 6. Eagle and Raptor Nest Survey Results

Logan and McIntosh Counties, North Dakota

Client:
Badger Wind, LLC

Issue Date:
7/12/2021

Atwell, LLC Project:
19000785



Raptor Nests Identified during 2020 Surveys
- Bald Eagle, In-Use
- Bald Eagle, Unoccupied
- Ferruginous Hawk, In-Use
- Great Horned Owl, In-Use
- Red-tailed Hawk, Missing
- Red-tailed Hawk, In-Use
- Red-tailed Hawk, Status Unknown
- Swainson's Hawk, In-Use
- Unknown raptor, In-Use
- Unknown raptor, Status Unknown
- Major Watercourse (NHD)
- Project Area 12/04/2020 (~57,097 acres)
- Project Area 04/15/2019 (~121,695 acres)
- 2-mile Buffer (12/04/2020)
- Eagle Nest Survey Area (4/15/2019 10-mile Buffer)
- City/Village
- County
- State Boundary

Source: National Land Cover Database (USGS, 2016)

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Badger Wind

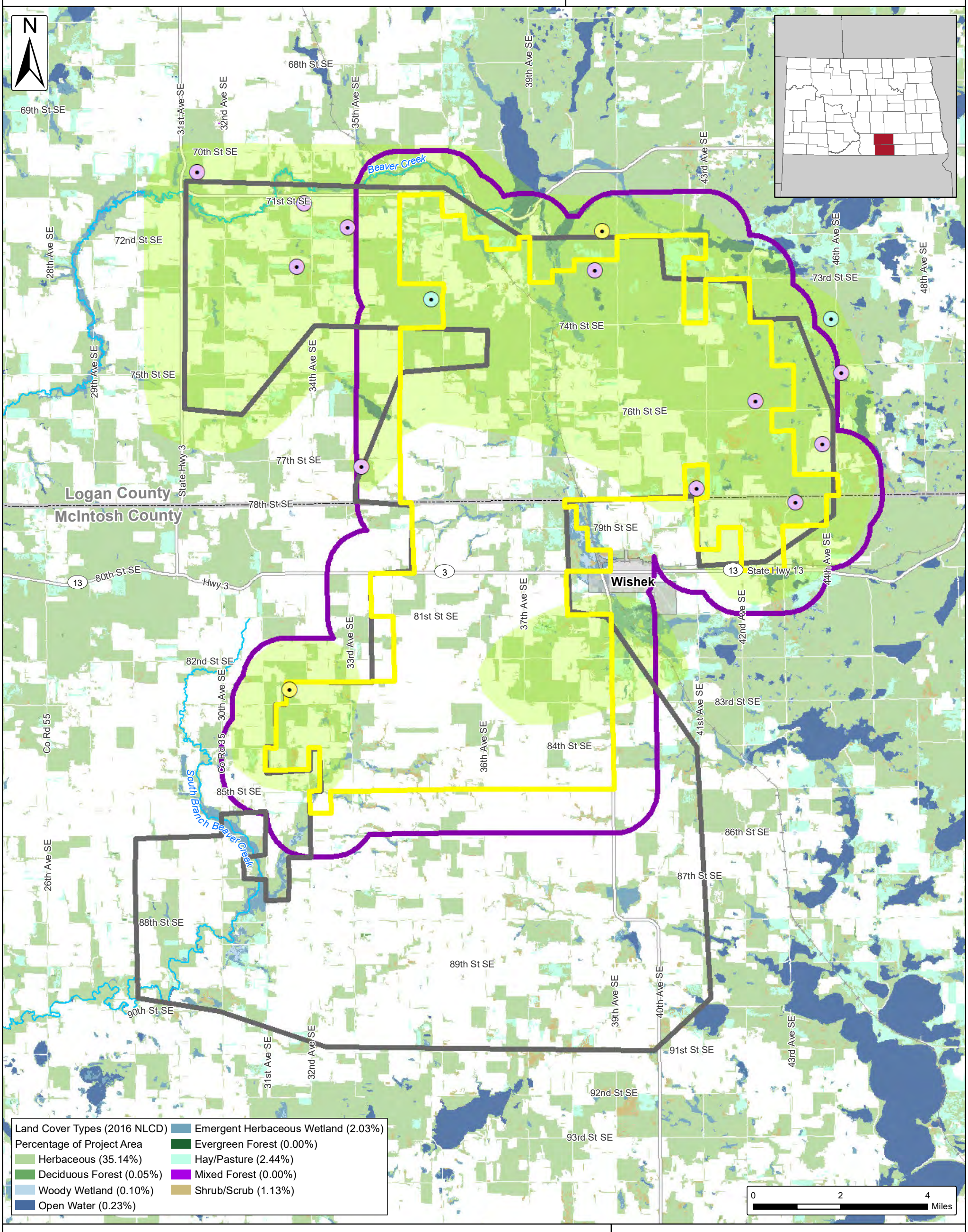
Figure 7. 2020 Sharp-tailed Grouse Lek Survey Results

Logan and McIntosh Counties, North Dakota

Client:
Badger Wind, LLC

Issue Date:
7/12/2021

Atwell, LLC Project:
19000785



Grouse Leks
- Confirmed, Aerial
- Confirmed, Ground
- Possible, Ground

Major Watercourse (NHD)

Project Area 12/04/2020 (~57,097 acres)

Project Area 04/15/2019 (~121,695 acres)

Sharp-tailed Grouse Priority Areas

Grouse Survey Area (1-Mile Buffer)

City/Village

County

Source: National Land Cover Database (USGS, 2016)

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Badger Wind

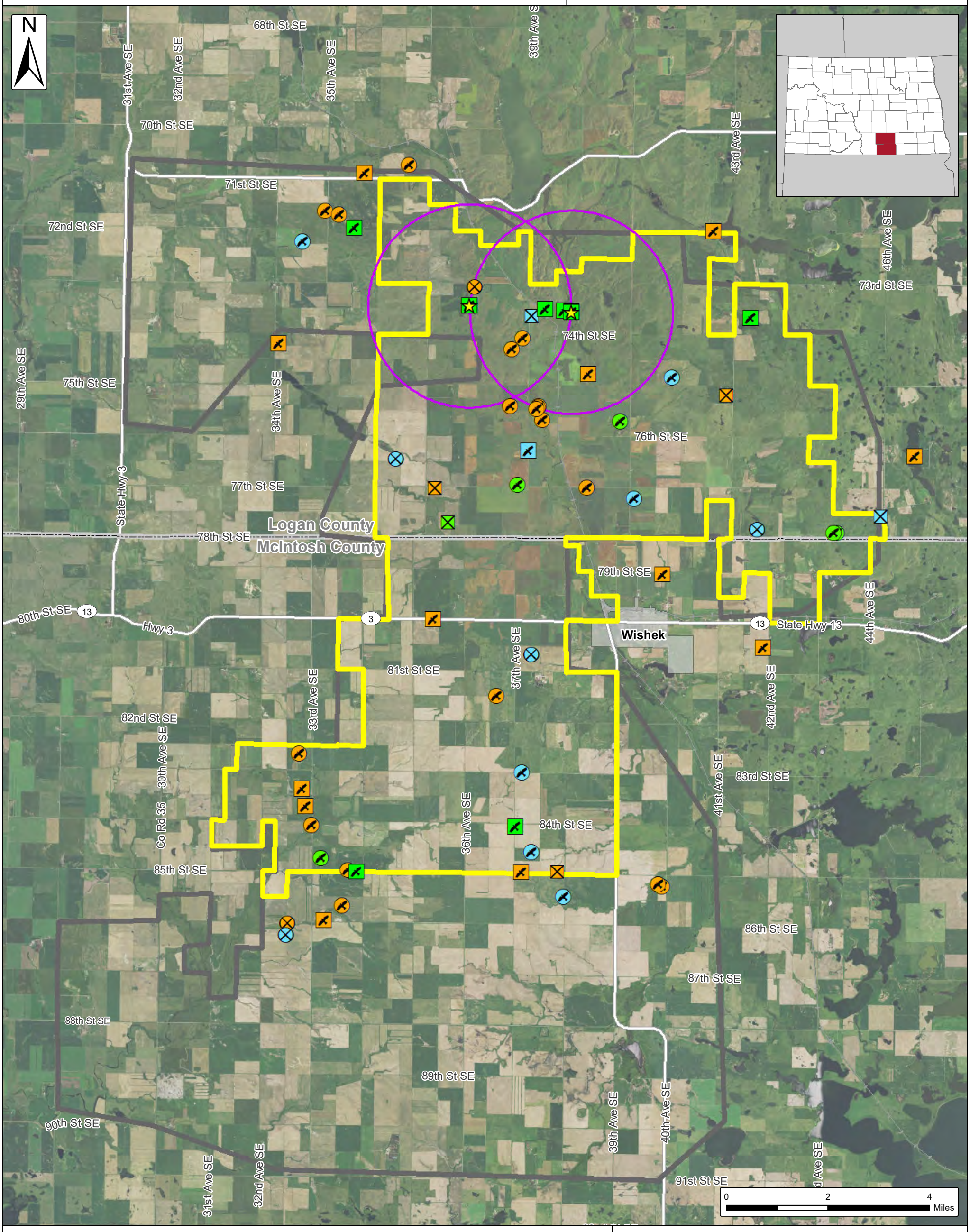
Figure 8. Bald Eagle and Golden Eagle Observations

Logan and McIntosh Counties, North Dakota

Client:
Badger Wind, LLC

Issue Date:
7/12/2021

Atwell, LLC Project:
19000785



In-Use Bald Eagle Nest

Nest-Associated Observations (2-mile buffer)*

Species

- Bald Eagle - Standardized
- Bald Eagle - Incidental
- Golden Eagle - Standardized
- Golden Eagle - Incidental

Season

- Fall
- Spring
- Summer
- Winter

- Project Area 12/04/2020 (~57,097 acres)
- Project Area 04/15/2019 (~121,695 acres)
- City/Village
- County

*Six standardized and six incidental eagle observations associated with the in-use Bald Eagle nest were recorded within this buffer during spring, summer, and fall surveys.

Source: USDA NAIP 2019 Imagery

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TABLES

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Table 1. Survey Periods for Pre-Construction Avian Studies – Year Two

Survey	Frequency	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021
Eagle and Raptor Nest Surveys	Single Survey Event	■	■											
Sharp-tailed Grouse Lek Surveys	Single Survey Event	■												
Eagle Use Surveys	Monthly		■	■	■	■	■	■	■	■	■	■	■	■
Diurnal Avian Activity Surveys	Monthly		■			■	■	■	■				■	■

Shaded boxes represent months in which the surveys occurred.

Table 2. List of Alternate Winter Point Count Stations

Original Point Count Station	Alternate Point Count Station
14	13
19	17
21	18
22	5
26	20
30	11
32	33
35	49
36	37
39	46
40	47
48	42
50	44

Table 3. Eagle Nests and Nests of Other Raptor Species

Territory Number[a]	Nest ID	Species	Date Found	Latitude	Longitude	Survey Type	2019 Nesting Season Status[b]	2020 Nesting Season Status[b]	2021 Nesting Season Status[c]	December 2020 Boundary Survey Buffer[d]
1	BAEA19_01	Bald Eagle	5/2/2019	46.3490	-99.6275	Aerial	In-Use, Active	In-Use, Active	Alternate, Unoccupied	Project Area
1	BAEA21_01	Bald Eagle	3/10/2021	46.3474	-99.5856	Ground	--	Alternate, Unoccupied	In-Use, Active	Project Area
--	FEHA19_03	Ferruginous Hawk	5/16/2019	46.3512	-99.6420	Ground	Occupied	Occupied	Not Checked	Project Area
--	FEHA19_04	Ferruginous Hawk	5/16/2019	46.3873	-99.5620	Ground	Occupied	Occupied	Not Checked	2-mile
--	FEHA19_05	Ferruginous Hawk	5/19/2019	46.3071	-99.5618	Ground	Occupied	Occupied	Not Checked	Project Area
--	FEHA19_06	Ferruginous Hawk	5/19/2019	46.3580	-99.5203	Ground	Occupied	Occupied	Not Checked	2-mile
--	FEHA21_07	Ferruginous Hawk	5/13/2021	46.2339	-99.6154	Micrositing	--	--	Nestlings	Project Area
--	SWHA19_01	Swainson's Hawk	7/25/2019	46.3494	-99.5188	Ground	Occupied	Occupied	Not Checked	2-mile
--	SWHA20_01	Swainson's Hawk	4/23/2020	46.3963	-99.5214	Ground	--	Occupied	Not Checked	2-mile
--	SWHA20_03	Swainson's Hawk	5/8/2020	46.2525	-99.6075	Ground	--	Occupied	To Be Determined	Project Area
--	SWHA20_04	Swainson's Hawk	5/14/2020	46.1869	-99.6626	Ground	--	Occupied	Not Checked	2-mile
--	RTHA19_03	Red-tailed Hawk	5/19/2019	46.1898	-99.6262	Ground	Occupied	Missing	Not Checked	Project Area
--	RTHA19_04	Red-tailed Hawk	7/25/2019	46.3410	-99.5591	Ground	Occupied	Unknown	Not Checked	Project Area
--	RTHA19_05	Red-tailed Hawk	7/29/2019	46.2153	-99.7157	Ground	Occupied	Unknown	Not Checked	Project Area
--	RTHA20_02	Red-tailed Hawk	4/17/2020	46.1999	-99.5420	Ground	--	Occupied	Not Checked	2-mile
--	RTHA20_05	Red-tailed Hawk	4/23/2020	46.3935	-99.6891	Ground	--	Occupied	Not Checked	2-mile
--	RTHA20_06	Red-tailed Hawk	4/15/2020	46.3002	-99.5959	Ground	--	Occupied	Not Checked	Project Area
--	RTHA20_08	Red-tailed Hawk	5/15/2020	46.3127	-99.6056	Ground	--	Occupied	Not Checked	Project Area
--	RTHA20_10	Red-tailed Hawk	4/22/2020	46.1734	-99.6837	Ground	--	Occupied	Not Checked	2-mile
--	GHOW19_01	Great Horned Owl	5/2/2019	46.2600	-99.7051	Aerial	Occupied	Occupied	Not Checked	2-mile
--	GHOW19_02	Great Horned Owl	5/21/2019	46.1879	-99.5891	Ground	Occupied	Occupied	Not Checked	Project Area
--	GHOW20_01	Great Horned Owl	5/8/2020	46.2340	-99.5535	Ground	--	Occupied	Not Checked	2-mile
--	GHOW20_02	Great Horned Owl	4/23/2020	46.3665	-99.5214	Ground	--	Occupied	Not Checked	Project Area
--	GHOW20_04	Great Horned Owl	4/17/2020	46.2564	-99.6051	Ground	--	Occupied	Not Checked	Project Area
--	UKRA19_05	Unknown Raptor	5/2/2019	46.2036	-99.7030	Aerial	Unknown	Unknown	Not Checked	Project Area
--	UKRA20_14	Unknown Raptor	4/10/2020	46.2488	-99.6432	Aerial	--	Unknown	Not Checked	Project Area
--	UKRA20_16	Unknown Raptor	4/17/2020	46.2704	-99.5476	Ground	--	Unknown	Not Checked	2-mile
--	UKRA20_17	Unknown Raptor	4/17/2020	46.3432	-99.5130	Ground	--	Unknown	Not Checked	Project Area
--	UKRA20_19	Unknown Raptor	4/17/2020	46.2762	-99.6676	Ground	--	Unknown	Not Checked	2-mile
--	UKRA20_21	Unknown Raptor	4/22/2020	46.2680	-99.6578	Ground	--	Unknown	Not Checked	Project Area
--	UKRA20_22	Unknown Raptor	4/22/2020	46.1845	-99.6872	Ground	--	Unknown	Not Checked	2-mile
--	UKRA20_25	Unknown Raptor	4/16/2020	46.3479	-99.5854	Ground	--	Unknown	Not Checked	Project Area
--	UKRA20_26	Unknown Raptor	4/10/2020	46.2382	-99.5333	Ground	--	Unknown	Not Checked	2-mile
--	UKRA20_27	Unknown Raptor	5/13/2020	46.2401	-99.6868	Ground	--	Unknown	Not Checked	2-mile
--	UKRA20_29	Unknown Raptor	5/6/2020	46.3877	-99.7595	Ground	--	Unknown	Not Checked	Project Area

[a] Territory number is used for Bald Eagles to label distinct territories that may contain both in-use and alternate nests. A territory may only have one in-use nest (USFWS 2016).

[b] 2019 and 2020 nesting season status fields classify Bald Eagle nests following USFWS (2016).

Table 3. Eagle Nests and Nests of Other Raptor Species

Territory Number[a]	Nest ID	Species	Date Found	Latitude	Longitude	Survey Type	2019 Nesting Season Status[b]	2020 Nesting Season Status[b]	2021 Nesting Season Status [c]	December 2020 Boundary Survey Buffer [d]

[c] 2020 Survey buffer describes whether the observation occurred within the project area, the 2-mile raptor nest survey buffer, or the 10-mile eagle nest survey buffer. Buffers drawn around the December 2020 boundary. Some nests found in 2020 were within the previous project area boundary's 10-mile buffer but are beyond 10-miles from the edge of the current project area boundary.

[d] Standardized surveys were not scheduled in 2021 and most of the 2020 nests were not checked in 2021. BAEA 21_01 was found during standardized eagle use surveys.

- Surveys were conducted from the ground in 2020 and nest contents could not be seen. All nests holding a sitting adult were assumed to be incubating, though it is possible that adults were brooding young chicks. All nests were built in deciduous trees.

- Nest ID numbers may not be consecutive as only raptor nests within two miles of the December 2020 project area are included.

Table 4. Sharp-tailed Grouse Lek Locations

Lek Number	Latitude	Longitude	Status	April 2019 Boundary Buffer	December 2020 Boundary Buffer	Distance to December 2020 Project Area (miles)	Maximim Count	Maximum Number of Males	Maximum Number of Females
1	46.341966	-99.458353	Possible Lek	1-mile	Beyond 1-mile	1.39	3	1	3
2	46.359088	-99.571498	Confirmed Lek	Project Area	Project Area	0.00	10 (estimate)	heard only	heard only
3	46.286172	-99.524005	Confirmed Lek	Project Area	1-mile	0.21	15 (estimate)	7	8 (estimate)
4	46.300468	-99.463506	Confirmed Lek	Project Area	1-mile	0.65	10 (estimate)	heard only	heard only
5	46.281264	-99.476778	Confirmed Lek	Project Area	Project Area	0.00	14	10	4
6	46.324065	-99.453897	Confirmed Lek	1-mile	Beyond 1-mile	1.10	10 (estimate)	heard only	heard only
7	46.22101	-99.71988	Confirmed Lek	Project Area	Project Area	0.00	4	at least 1	n/a
8	46.382441	-99.710489	Confirmed Lek	Project Area	Beyond 1-mile	2.17	5	n/a	n/a
9	46.314892	-99.495277	Confirmed Lek	Project Area	Project Area	0.00	15	at least 4	n/a
10	46.294829	-99.684162	Confirmed Lek	1-mile	1-mile	0.89	27	n/a	n/a
11	46.361242	-99.714363	Confirmed Lek	Project Area	Beyond 1-mile	2.32	6	at least 2	n/a
12	46.374129	-99.689697	Confirmed Lek	1-mile	Beyond 1-mile	1.20	10 (estimate)	heard only	heard only
13	46.349941	-99.65008	Possible Lek	Project Area	1-mile	0.25	1	may have heard more	may have heard more
14	46.394152	-99.767987	Confirmed Lek	1-mile	Beyond 1-mile	4.95	5 (estimate)	n/a	n/a
15	46.37213	-99.56779	Confirmed Lek	1-mile	1-mile	0.36	3	n/a	n/a

Table 5. Total Standardized Survey Effort by Point Count Station

Point Count Station	60 Minute Eagle Use Survey Standardized Effort (hours)[a]					10 Minute Avian Activity Survey Standardized Effort- Small-Bodied Species (hours)[a]		
	Spring	Summer	Fall	Winter	Total Hours	Spring	Fall	Total Hours
1	3	2	4	3	12	0.50	0.67	1.17
2	3	2	4	3	12	0.50	0.67	1.17
3	3	2	4	3	12	0.50	0.67	1.17
4	3	2	4	3	12	0.50	0.67	1.17
5	3	2	4	3	12	0.50	0.67	1.17
6	3	2	4	3	12	0.50	0.67	1.17
7	3	2	4	3	12	0.50	0.67	1.17
8	3	2	4	3	12	0.50	0.67	1.17
9	3	2	4	3	12	0.50	0.67	1.17
10	3	2	4	3	12	0.50	0.67	1.17
11	3	2	4	3	12	0.50	0.67	1.17
12	3	2	4	3	12	0.50	0.67	1.17
13[a]	4	2	4	6	16	0.67	0.67	1.33
14[a]	2	2	4	0	8	0.33	0.67	1.00
15	3	2	4	3	12	0.50	0.67	1.17
16	3	2	4	3	12	0.50	0.67	1.17
17	3	2	4	3	12	0.50	0.67	1.17
18	3	2	4	3	12	0.50	0.67	1.17
19	3	2	4	3	12	0.50	0.67	1.17
20	3	2	4	3	12	0.50	0.67	1.17
21	3	2	4	3	12	0.50	0.67	1.17
22	3	2	4	3	12	0.50	0.67	1.17

Table 5. Total Standardized Survey Effort by Point Count Station

Point Count Station	60 Minute Eagle Use Survey Standardized Effort (hours)[a]					10 Minute Avian Activity Survey Standardized Effort- Small-Bodied Species (hours)[a]		
	Spring	Summer	Fall	Winter	Total Hours	Spring	Fall	Total Hours
23	3	2	4	3	12	0.50	0.67	1.17
24	3	2	4	3	12	0.50	0.67	1.17
25	3	2	4	3	12	0.50	0.67	1.17
26	3	2	4	3	12	0.50	0.67	1.17
27[b]	0	0	0	0	0	0.00	0.00	0.00
28[b]	0	0	0	0	0	0.00	0.00	0.00
29	3	2	4	3	12	0.50	0.67	1.17
30	3	2	4	3	12	0.50	0.67	1.17
31	3	2	4	3	12	0.50	0.67	1.17
32	3	2	4	3	12	0.50	0.67	1.17
33	3	2	4	3	12	0.50	0.67	1.17
34	3	2	4	3	12	0.50	0.67	1.17
35[c]	0	0	0	0	0	0.00	0.00	0.00
36[c]	0	0	0	0	0	0.00	0.00	0.00
37	3	2	4	3	12	0.50	0.67	1.17
38	3	2	4	3	12	0.50	0.67	1.17
39	3	2	4	3	12	0.50	0.67	1.17
40	3	2	4	3	12	0.50	0.67	1.17
41	3	2	4	3	12	0.50	0.67	1.17
42	3	2	4	3	12	0.50	0.67	1.17
43	3	2	4	3	12	0.50	0.67	1.17
44	3	2	4	3	12	0.50	0.67	1.17
45	3	2	4	3	12	0.50	0.67	1.17

Table 5. Total Standardized Survey Effort by Point Count Station

Point Count Station	60 Minute Eagle Use Survey Standardized Effort (hours)[a]					10 Minute Avian Activity Survey Standardized Effort- Small-Bodied Species (hours)[a]		
	Spring	Summer	Fall	Winter	Total Hours	Spring	Fall	Total Hours
46	3	2	4	3	12	0.50	0.67	1.17
47	3	2	4	3	12	0.50	0.67	1.17
48	3	2	4	3	12	0.50	0.67	1.17
49	3	2	4	3	12	0.50	0.67	1.17
50	3	2	4	3	12	0.50	0.67	1.17
51	3	2	4	3	12	0.50	0.67	1.17
52	3	2	4	3	12	0.50	0.67	1.17
53	3	2	4	3	12	0.50	0.67	1.17
54[d]	3	2	4	3	12	0.50	0.67	1.17
55[d]	3	2	4	3	12	0.50	0.67	1.17
56[d]	3	2	4	3	12	0.50	0.67	1.17
57[d]	3	2	4	3	12	0.50	0.67	1.17
Grand Total	**159**	**106**	**212**	**159**	**636**	**26.50**	**35.33**	**61.83**

[a] Due to the seasonal inaccessibility of some point count stations between November 2019 and March 2020, a winter alternate point count survey strategy was employed (see Section 2.3). Refer to Table 2 for a list point

[˜] Point count station dropped in August 2019 (Year 1) due to landowner concerns

[c] Point count station dropped in April 2020 (Year 1) due to landowner concerns

[d] Point count station added in August 2019 (Year 1) as a replacement for dropped point count station

Table 6. Eagle Use Surveys - Seasonal Raptor Mean Use

Common Name	Spring					Summer					Fall					Winter				
	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/60 min. survey)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/60 min. survey)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/60 min. survey)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/60 min. survey)[c]	SD[d]	Occur. Freq.[e]
American Kestrel[II]	5	1.64%	0.031	0.237	0.019	1	0.39%	0.009	0.097	0.009	8	1.54%	0.038	0.255	0.028	0	-	-	-	-
Bald Eagle[II]	5	1.64%	0.031	0.175	0.031	5	1.95%	0.047	0.349	0.019	19	3.65%	0.090	0.409	0.061	6	25.00%	0.038	0.222	0.031
Bald Eagle[II] - *all heights*[f]	6	1.94%	0.038	0.222	0.031	5	1.91%	0.047	0.349	0.019	19	3.61%	0.090	0.409	0.061	6	25.00%	0.038	0.222	0.031
Ferruginous Hawk[I]	17	5.59%	0.107	0.458	0.069	24	9.38%	0.226	0.574	0.160	5	0.96%	0.024	0.227	0.014	0	-	-	-	-
Golden Eagle[II]	0	-	-	-	-	0	-	-	-	-	2	0.38%	0.009	0.097	0.009	4	16.67%	0.025	0.157	0.025
Great Horned Owl	1	0.33%	0.006	0.079	0.006	1	0.39%	0.009	0.097	0.009	0	-	-	-	-	1	4.17%	0.006	0.079	0.006
Merlin	3	0.99%	0.019	0.136	0.019	0	-	-	-	-	1	0.19%	0.005	0.069	0.005	4	16.67%	0.025	0.157	0.025
Northern Harrier[II]	78	25.66%	0.491	0.770	0.352	61	23.83%	0.575	1.014	0.330	119	22.84%	0.561	1.127	0.297	0	-	-	-	-
Peregrine Falcon[III]	2	0.66%	0.013	0.112	0.013	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Peregrine Falcon[III] - *all heights*[f]	3	0.97%	0.019	0.136	0.019	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Prairie Falcon[II]	0	-	-	-	-	1	0.39%	0.009	0.097	0.009	2	0.38%	0.009	0.097	0.009	5	20.83%	0.031	0.208	0.025
Red-tailed Hawk	102	33.55%	0.642	1.224	0.308	49	19.14%	0.462	0.978	0.264	168	32.25%	0.792	1.848	0.288	0	-	-	-	-
Red-tailed Hawk - *all heights*[f]	104	33.66%	0.654	1.232	0.314	49	18.70%	0.462	0.978	0.264	171	32.45%	0.807	1.864	0.288	0	-	-	-	-
Rough-legged Hawk	18	5.92%	0.113	0.477	0.075	0	-	-	-	-	28	5.37%	0.132	0.601	0.066	2	8.33%	0.013	0.112	0.013
Sharp-shinned Hawk	1	0.33%	0.006	0.079	0.006	0	-	-	-	-	5	0.96%	0.024	0.227	0.014	0	-	-	-	-
Snowy Owl	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	4.17%	0.006	0.079	0.006
Swainson's Hawk[I]	46	15.13%	0.289	0.837	0.151	92	35.94%	0.868	1.525	0.377	127	24.38%	0.599	1.783	0.217	0	-	-	-	-
Swainson's Hawk[I] - *all heights*[f]	46	14.89%	0.289	0.837	0.151	97	37.02%	0.915	1.574	0.387	128	24.29%	0.604	1.786	0.217	0	-	-	-	-
Turkey Vulture	8	2.63%	0.050	0.418	0.025	11	4.30%	0.104	0.496	0.057	15	2.88%	0.071	0.351	0.047	0	-	-	-	-
Unknown Accipiter	0	-	-	-	-	1	0.39%	0.009	0.097	0.009	0	-	-	-	-	0	-	-	-	-
Unknown Buteo	14	4.61%	0.088	0.363	0.069	3	1.17%	0.028	0.216	0.019	11	2.11%	0.052	0.279	0.038	1	4.17%	0.006	0.079	0.006
Unknown Buteo - *all heights*[f]	14	4.53%	0.088	0.363	0.069	3	1.15%	0.028	0.216	0.019	12	2.28%	0.057	0.287	0.042	1	4.17%	0.006	0.079	0.006
Unknown Falcon	0	-	-	-	-	0	-	-	-	-	1	0.19%	0.005	0.069	0.005	0	-	-	-	-
Unknown Raptor	4	1.32%	0.025	0.157	0.025	7	2.73%	0.066	0.250	0.066	10	1.92%	0.047	0.271	0.033	0	-	-	-	-
Unknown Raptor - *all heights*[f]	5	1.62%	0.031	0.175	0.031	8	3.05%	0.075	0.299	0.066	11	2.09%	0.052	0.279	0.038	0	-	-	-	-
ALL RAPTORS	**304**	100.00%	**1.912**	**2.082**	**0.692**	**256**	100.00%	**2.415**	**2.464**	**0.764**	**521**	100.00%	**2.458**	**3.054**	**0.670**	**24**	100.00%	**0.151**	**0.466**	**0.113**
ALL RAPTORS - *all heights*[f]	**309**	100.00%	**1.943**	**2.094**	**0.692**	**262**	100.00%	**2.472**	**2.523**	**0.764**	**527**	100.00%	**2.486**	**3.084**	**0.670**	**24**	100.00%	**0.151**	**0.466**	**0.113**

[a] Total Std. Detections is the total number of standardized individuals detected within the 800 m–radius by 200 m-high survey cylinder during standardized use surveys

[b] % Comp. (i.e., percent composition) is the proportion of raptors that a particular species comprises during the season using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 60-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use.

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season

[f] Species or group names followed by "- *all heights* " indicate that presented data includes individuals greater than 200 m in height.

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I, II, or III following the species name to indicate that it is Level 1, Level 2, or Level 3 SCP, respectively.

Table 7. Eagle Use Surveys - Seasonal Bald Eagle Mean Use by Point Count Station

Point Count Station	Spring			Summer			Fall			Winter			Full Year		
	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Standard Deviation
1	0	-	-	0	-	-	1	0.250	0.500	0	-	-	1	0.083	0.289
2	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
3	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
4	1	0.333	0.577	5	2.500	0.707	1	0.250	0.500	0	-	-	7	0.583	0.996
5	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
6	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
7	0	-	-	0	-	-	2	0.500	1.000	0	-	-	2	0.167	0.577
8	0	-	-	0	-	-	0	-	-	1	0.333	0.577	1	0.083	0.289
9	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
10	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
11	0	-	-	0	-	-	5	1.250	1.893	0	-	-	5	0.417	1.165
12	1	0.333	0.577	0	-	-	0	-	-	0	-	-	1	0.083	0.289
13	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
14[c]	0	-	-	0	-	-	0	-	-	N/A	N/A	N/A	0	-	-
15	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
16	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
17	1	0.333	0.577	0	-	-	0	-	-	0	-	-	1	0.083	0.289
18	0	-	-	0	-	-	0	-	-	1	0.333	0.577	1	0.083	0.289
19	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
20	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
21	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
22	1	0.333	0.577	0	-	-	0	-	-	0	-	-	1	0.083	0.289
23	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
24	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
25	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
26	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
29	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
30	0	-	-	0	-	-	1	0.250	0.500	0	-	-	1	0.083	0.289
31	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
32	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
33	0	-	-	0	-	-	1	0.250	0.500	0	-	-	1	0.083	0.289
34	0	-	-	0	-	-	0	-	-	1	0.333	0.577	1	0.083	0.289
37	1	0.333	0.577	0	-	-	1	0.250	0.500	0	-	-	2	0.167	0.389
38	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-

Table 7. Eagle Use Surveys - Seasonal Bald Eagle Mean Use by Point Count Station

Point Count Station	Spring			Summer			Fall			Winter			Full Year		
	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (eagles/60 min. survey/800-m survey plot)[b]	Standard Deviation
39	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
40	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
41	0	-	-	0	-	-	1	0.250	0.500	0	-	-	1	0.083	0.289
42	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
43	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
44	0	-	-	0	-	-	0	-	-	2	0.667	1.155	2	0.167	0.577
45	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
46	0	-	-	0	-	-	2	0.500	1.000	0	-	-	2	0.167	0.577
47	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
48	0	-	-	0	-	-	1	0.250	0.500	0	-	-	1	0.083	0.289
49	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
50	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
51	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
52	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
53	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
54	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
55	0	-	-	0	-	-	1	0.250	0.500	0	-	-	1	0.083	0.289
56	0	-	-	0	-	-	2	0.500	1.000	0	-	-	2	0.167	0.577
57	0	-	-	0	-	-	0	-	-	1	0.333	0.577	1	0.083	0.289

[a] Total Std. Detections is the total number of standardized individuals detected within the 800 m–radius survey cylinder during standardized use surveys

[b] Mean Use is the total standardized detections divided by the total number of 60-minute point count surveys conducted within the season.

[c] Total Std. Detections and Mean Use are not applicable (N/A) at point 14 in the winter as this point was not accessible for surveys.

- This table only includes Bald Eagles within the ample plot at some point during the survey. One Bald Eagle was only observed above 200 m in altitude at station 22 in the spring and is excluded.

Table 8a. Eagle Use Surveys - Seasonal and Annual Raptor Mean Flight Heights

Species	Flight Height[a]	Spring					Summer					Fall					Winter					Year-Round				
		Sample Size[b]	Mean Flight Height (m)	SD[c]	Low 95% CI [d]	High 95% CI [d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Low 95% CI [d]	High 95% CI [d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Low 95% CI [d]	High 95% CI [d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Low 95% CI [d]	High 95% CI [d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Low 95% CI [d]	High 95% CI [d]
American Kestrel[II]	Min	16	8.5	11.1	2.6	14.4	2	6.0	7.1	-57.5	69.5	18	15.3	20.7	5.0	25.6	-	-	-	-	-	36	11.8	16.6	6.2	17.4
American Kestrel[II]	Max	16	15.3	10.5	9.7	20.9	2	18.5	23.3	-191.2	228.2	18	32.5	28.8	18.2	46.8	-	-	-	-	-	36	24.1	23.2	16.2	31.9
Bald Eagle[II]	Min	22	87.6	114.7	36.8	138.5	1	25.0	N/A	N/A	N/A	29	40.5	38.3	26.0	55.1	8	22.0	17.3	7.5	36.5	60	55.1	77.9	34.9	75.2
Bald Eagle[II]	Max	22	130.9	148.7	65.0	196.8	1	30.0	N/A	N/A	N/A	29	67.0	54.6	46.2	87.7	8	45.0	27.3	22.2	67.8	60	86.9	102.9	60.3	113.4
Broad-winged Hawk	Min	-	-	-	-	-	-	-	-	-	-	7	122.9	115.1	16.4	229.3	-	-	-	-	-	7	122.9	115.1	16.4	229.3
Broad-winged Hawk	Max	-	-	-	-	-	-	-	-	-	-	7	235.7	137.6	108.5	363.0	-	-	-	-	-	7	235.7	137.6	108.5	363.0
Cooper's Hawk	Min	3	25.3	21.2	-27.4	78.0	-	-	-	-	-	1	2.0	N/A	N/A	N/A	-	-	-	-	-	4	19.5	20.9	-13.7	52.7
Cooper's Hawk	Max	3	75.0	78.6	-120.2	270.2	-	-	-	-	-	1	3.0	N/A	N/A	N/A	-	-	-	-	-	4	57.0	73.6	-60.1	174.1
Ferruginous Hawk[I]	Min	31	55.9	70.8	30.0	81.9	34	21.4	24.7	12.8	30.0	25	35.3	31.6	22.2	48.3	-	-	-	-	-	90	37.2	49.0	26.9	47.4
Ferruginous Hawk[I]	Max	31	93.4	86.7	61.6	125.2	34	74.9	70.4	50.3	99.5	25	70.2	54.8	47.6	92.8	-	-	-	-	-	90	79.9	72.7	64.7	95.2
Golden Eagle[II]	Min	1	80.0	N/A	N/A	N/A	-	-	-	-	-	5	40.2	46.2	-17.1	97.5	6	18.0	21.5	-4.5	40.5	12	32.4	36.5	9.2	55.6
Golden Eagle[II]	Max	1	150.0	N/A	N/A	N/A	-	-	-	-	-	5	59.0	52.6	-6.3	124.3	6	42.5	20.2	21.3	63.7	12	58.3	45.7	29.3	87.4
Great Horned Owl	Min	1	1.0	N/A	N/A	N/A	1	1.0	N/A	N/A	N/A	-	-	-	-	-	-	-	-	-	-	2	1.0	0.0	1.0	1.0
Great Horned Owl	Max	1	2.0	N/A	N/A	N/A	1	2.0	N/A	N/A	N/A	-	-	-	-	-	-	-	-	-	-	2	2.0	0.0	2.0	2.0
Merlin	Min	6	3.5	5.6	-2.4	9.4	-	-	-	-	-	4	12.8	9.1	-1.8	27.3	4	2.3	1.9	-0.8	5.3	14	5.8	7.3	1.6	10.0
Merlin	Max	6	7.7	7.8	-0.5	15.8	-	-	-	-	-	4	36.5	43.6	-32.8	105.8	4	9.0	11.1	-8.7	26.7	14	16.3	25.8	1.4	31.2
Northern Goshawk	Min	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	25.0	N/A	N/A	N/A	1	25.0	N/A	N/A	N/A
Northern Goshawk	Max	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	30.0	N/A	N/A	N/A	1	30.0	N/A	N/A	N/A
Northern Harrier[II]	Min	170	23.3	67.7	13.1	33.6	99	4.1	11.5	1.8	6.4	259	5.3	16.4	3.3	7.3	-	-	-	-	-	528	10.9	41.2	7.4	14.4
Northern Harrier[II]	Max	170	34.5	71.8	23.6	45.4	99	12.7	23.8	7.9	17.4	259	12.3	29.3	8.7	15.9	-	-	-	-	-	528	19.5	47.8	15.4	23.6
Peregrine Falcon[III]	Min	3	84.0	143.8	-273.1	441.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	84.0	143.8	-273.1	441.1
Peregrine Falcon[III]	Max	3	93.3	136.0	-244.6	431.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	93.3	136.0	-244.6	431.3
Prairie Falcon[II]	Min	-	-	-	-	-	1	1.0	N/A	N/A	N/A	7	14.7	17.7	-1.7	31.1	4	13.0	16.1	-12.6	38.6	12	13.0	16.0	2.8	23.2
Prairie Falcon[II]	Max	-	-	-	-	-	1	100.0	N/A	N/A	N/A	7	46.3	55.4	-4.9	97.5	4	25.0	20.4	-7.5	57.5	12	43.7	47.0	13.8	73.5
Red-tailed Hawk	Min	216	56.3	90.3	44.2	68.4	105	32.6	37.6	25.3	39.9	302	28.5	45.3	23.4	33.6	-	-	-	-	-	623	38.8	64.9	33.7	44.0
Red-tailed Hawk	Max	216	84.4	96.6	71.4	97.3	105	84.3	84.5	67.9	100.6	302	53.4	64.3	46.2	60.7	-	-	-	-	-	623	69.4	81.6	62.9	75.8
Rough-legged Hawk	Min	27	40.9	70.6	13.0	68.9	-	-	-	-	-	32	24.9	34.5	12.5	37.4	2	25.0	7.1	-38.5	88.5	61	32.0	53.3	18.4	45.7
Rough-legged Hawk	Max	27	65.1	76.8	34.7	95.5	-	-	-	-	-	32	44.0	39.5	29.8	58.3	2	27.5	10.6	-67.8	122.8	61	52.8	59.1	37.7	67.9
Sharp-shinned Hawk	Min	4	15.8	14.2	-6.8	38.3	-	-	-	-	-	9	24.2	31.5	0.0	48.4	-	-	-	-	-	13	21.6	27.0	5.3	37.9
Sharp-shinned Hawk	Max	4	26.5	24.6	-12.7	65.7	-	-	-	-	-	9	39.8	44.0	6.0	73.6	-	-	-	-	-	13	35.7	38.5	12.4	59.0
Snowy Owl	Min	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	4.5	4.9	-40.0	49.0	2	4.5	4.9	-40.0	49.0
Snowy Owl	Max	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	11.0	1.4	-1.7	23.7	2	11.0	1.4	-1.7	23.7
Swainson's Hawk[I]	Min	86	44.5	49.5	33.9	55.1	159	46.7	75.3	35.0	58.5	250	42.0	50.0	35.7	48.2	-	-	-	-	-	495	43.9	59.1	38.7	49.2
Swainson's Hawk[I]	Max	86	104.4	118.7	78.9	129.8	159	113.4	114.5	95.4	131.3	250	89.2	75.8	79.7	98.6	-	-	-	-	-	495	99.6	98.1	90.9	108.3
Turkey Vulture	Min	17	50.8	121.5	-11.7	113.2	36	30.0	45.2	14.7	45.3	44	39.6	46.5	25.4	53.7	-	-	-	-	-	97	38.0	65.0	24.9	51.1
Turkey Vulture	Max	17	59.9	118.4	-1.0	120.8	36	73.9	72.8	49.2	98.5	44	70.1	59.0	52.2	88.0	-	-	-	-	-	97	69.7	76.5	54.3	85.1

Table 8a. Eagle Use Surveys - Seasonal and Annual Raptor Mean Flight Heights

Species	Flight Height[a]	Spring					Summer					Fall					Winter					Year-Round				
		Sample Size[b]	Mean Flight Height (m)	SD[c]	Low 95% CI [d]	High 95% CI [d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Low 95% CI [d]	High 95% CI [d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Low 95% CI [d]	High 95% CI [d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Low 95% CI [d]	High 95% CI [d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Low 95% CI [d]	High 95% CI [d]
Unknown Accipiter	Min	-	-	-	-	-	1	25.0	N/A	N/A	N/A	1	15.0	N/A	N/A	N/A	-	-	-	-	-	2	20.0	7.1	-43.5	83.5
Unknown Accipiter	Max	-	-	-	-	-	1	40.0	N/A	N/A	N/A	1	20.0	N/A	N/A	N/A	-	-	-	-	-	2	30.0	14.1	-97.1	157.1
Unknown Buteo	Min	10	14.3	11.1	6.4	22.2	4	32.5	26.6	-9.8	74.8	10	74.1	71.7	22.8	125.4	1	5.0	N/A	N/A	N/A	25	40.8	53.7	18.6	62.9
Unknown Buteo	Max	10	21.2	14.1	11.1	31.3	4	32.5	26.6	-9.8	74.8	10	100.5	78.6	44.3	156.7	1	20.0	N/A	N/A	N/A	25	54.7	62.9	28.7	80.6
Unknown Falcon	Min	-	-	-	-	-	1	15.0	N/A	N/A	N/A	1	1.0	N/A	N/A	N/A	-	-	-	-	-	2	8.0	9.9	-80.9	96.9
Unknown Falcon	Max	-	-	-	-	-	1	35.0	N/A	N/A	N/A	1	20.0	N/A	N/A	N/A	-	-	-	-	-	2	27.5	10.6	-67.8	122.8
Unknown Raptor	Min	6	112.3	171.5	-67.6	292.3	6	106.3	242.1	-147.7	360.4	10	78.4	185.6	-54.4	211.2	-	-	-	-	-	22	95.3	189.7	11.2	179.4
Unknown Raptor	Max	6	112.5	171.4	-67.3	292.3	6	108.0	241.5	-145.5	361.5	10	79.7	185.0	-52.7	212.1	-	-	-	-	-	22	96.4	189.2	12.5	180.3
ALL RAPTORS	**Min**	**619**	**43.7**	**80.0**	**37.4**	**50.0**	**450**	**30.9**	**59.6**	**25.4**	**36.4**	**1014**	**27.9**	**47.4**	**25.0**	**30.9**	**28**	**15.5**	**16.1**	**9.3**	**21.7**	**2111**	**33.0**	**61.3**	**30.4**	**35.6**
ALL RAPTORS	**Max**	**619**	**70.4**	**98.0**	**62.6**	**78.1**	**450**	**76.3**	**96.4**	**67.4**	**85.3**	**1014**	**54.3**	**69.2**	**50.0**	**58.5**	**28**	**31.4**	**23.1**	**22.4**	**40.3**	**2111**	**63.4**	**84.8**	**59.8**	**67.0**

[a] This column indicates if a particular row is providing results for the minimum (Min) or maximum (Max) flight height statistic.

[b] Sample size refers to the number of flocks (i.e., not individuals) that were detected in flight within 800 m of the point count station during standardized eagle use (60-minute) surveys. Raptor data from Year 1 and Year 2 have been combined to provide more robust sample sizes. Birds that were heard-only or perched-only were not included in the flight height analysis. All detections are included in flight height analyses, independent of whether the detection occurred above or below 200 m in height.

[c] SD is the standard deviation of Mean Minimum or Maximum Flight Height. N/A indicates that standard deviation could not be calculated as the sample size is one.

[d] This column indicates either the upper or lower bound of the 95% confidence interval. N/A indicates that the confidence interval could not be calculated as the sample size is one.

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I, II, or III following the species name to indicate that it is Level 1, Level 2, or Level 3 SCP, respectively.

Table 8b. Seasonal and Annual Mean Flight Heights of Other Large-bodied Species

Species	Flight Height[a]	Spring					Summer					Fall					Winter					Year-Round				
		Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]
		LARGE-BODIED CORVIDS																								
American Crow	Min	7	36.4	37.2	2.1	70.8	-	-	-	-	-	9	222.8	81.7	160.0	285.6	-	-	-	-	-	16	141.3	115.0	80.0	202.5
American Crow	Max	7	47.9	30.0	20.1	75.6	-	-	-	-	-	9	225.6	73.3	169.2	281.9	-	-	-	-	-	16	147.8	107.3	90.6	205.0
All Large-bodied Corvids	**Min**	**7**	**36.4**	**37.2**	**2.1**	**70.8**	**-**	**-**	**-**	**-**	**-**	**9**	**222.8**	**81.7**	**160.0**	**285.6**	**-**	**-**	**-**	**-**	**-**	**16**	**141.3**	**115.0**	**80.0**	**202.5**
All Large-bodied Corvids	**Max**	**7**	**47.9**	**30.0**	**20.1**	**75.6**	**-**	**-**	**-**	**-**	**-**	**9**	**225.6**	**73.3**	**169.2**	**281.9**	**-**	**-**	**-**	**-**	**-**	**16**	**147.8**	**107.3**	**90.6**	**205.0**
		LARGE-BODIED NON-PASSERINES																								
Eurasian Collared Dove	Min	1	12.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	12.0	NA	NA	NA
Eurasian Collared Dove	Max	1	12.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	12.0	NA	NA	NA
Rock Pigeon	Min	25	10.1	8.7	6.5	13.7	20	10.8	12.9	4.8	16.8	37	10.8	8.9	7.8	13.8	10	10.7	8.7	4.5	16.9	92	10.6	9.7	8.6	12.6
Rock Pigeon	Max	25	20.3	10.9	15.8	24.8	20	18.5	15.1	11.4	25.5	37	20.1	9.6	16.9	23.2	10	18.4	9.8	11.4	25.4	92	19.6	11.2	17.3	21.9
All Large-bodied Non-Passerines	**Min**	**26**	**10.2**	**8.5**	**6.7**	**13.6**	**20**	**10.8**	**12.9**	**4.8**	**16.8**	**37**	**10.8**	**8.9**	**7.8**	**13.8**	**10**	**10.7**	**8.7**	**4.5**	**16.9**	**93**	**10.6**	**9.6**	**8.6**	**12.6**
All Large-bodied Non-Passerines	**Max**	**26**	**20.0**	**10.8**	**15.6**	**24.3**	**20**	**18.5**	**15.1**	**11.4**	**25.5**	**37**	**20.1**	**9.6**	**16.9**	**23.2**	**10**	**18.4**	**9.8**	**11.4**	**25.4**	**93**	**19.5**	**11.2**	**17.2**	**21.8**
		UPLAND GAMEBIRDS																								
Gray Partridge	Min	1	1.0	NA	NA	NA	1	1.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	2	1.0	0.0	1.0	1.0
Gray Partridge	Max	1	1.0	NA	NA	NA	1	1.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	2	1.0	0.0	1.0	1.0
Ring-necked Pheasant	Min	-	-	-	-	-	-	-	-	-	-	3	1.0	0.0	1.0	1.0	-	-	-	-	-	3	1.0	0.0	1.0	1.0
Ring-necked Pheasant	Max	-	-	-	-	-	-	-	-	-	-	3	1.0	0.0	1.0	1.0	-	-	-	-	-	3	1.0	0.0	1.0	1.0
Sharp-tailed Grouse[II]	Min	12	1.3	1.2	0.6	2.1	1	1.0	NA	NA	NA	2	13.5	9.2	-69.1	96.1	10	1.0	0.0	1.0	1.0	25	2.2	4.0	0.5	3.8
Sharp-tailed Grouse[II]	Max	12	3.0	2.6	1.4	4.6	1	1.0	NA	NA	NA	2	17.5	3.5	-14.3	49.3	10	4.2	4.2	1.2	7.2	25	4.6	5.1	2.5	6.7
All Upland Gamebirds	**Min**	**13**	**1.3**	**1.1**	**0.6**	**2.0**	**2**	**1.0**	**0.0**	**1.0**	**1.0**	**5**	**6.0**	**8.2**	**-4.2**	**16.2**	**10**	**1.0**	**0.0**	**1.0**	**1.0**	**30**	**2.0**	**3.6**	**0.6**	**3.3**
All Upland Gamebirds	**Max**	**13**	**2.8**	**2.5**	**1.3**	**4.4**	**2**	**1.0**	**0.0**	**1.0**	**1.0**	**5**	**7.6**	**9.2**	**-3.8**	**19.0**	**10**	**4.2**	**4.2**	**1.2**	**7.2**	**30**	**4.0**	**4.8**	**2.2**	**5.8**
		SHOREBIRDS																								
American Avocet[II]	Min	-	-	-	-	-	-	-	-	-	-	1	5.0	NA	NA	NA	-	-	-	-	-	1	5.0	NA	NA	NA
American Avocet[II]	Max	-	-	-	-	-	-	-	-	-	-	1	30.0	NA	NA	NA	-	-	-	-	-	1	30.0	NA	NA	NA
Greater Yellowlegs	Min	2	12.5	3.5	-19.3	44.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	12.5	3.5	-19.3	44.3
Greater Yellowlegs	Max	2	17.5	10.6	-77.8	112.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	17.5	10.6	-77.8	112.8
Killdeer	Min	32	8.0	9.5	4.6	11.4	37	2.9	4.8	1.3	4.5	23	12.6	10.1	8.2	16.9	-	-	-	-	-	92	7.1	8.9	5.3	8.9
Killdeer	Max	32	14.0	12.1	9.6	18.3	37	9.7	8.1	7.0	12.4	23	16.7	9.4	12.6	20.7	-	-	-	-	-	92	12.9	10.2	10.8	15.1
Least Sandpiper	Min	-	-	-	-	-	1	1.0	NA	NA	NA	2	11.0	5.7	-39.8	61.8	-	-	-	-	-	3	7.7	7.0	-9.8	25.1
Least Sandpiper	Max	-	-	-	-	-	1	3.0	NA	NA	NA	2	15.0	0.0	15.0	15.0	-	-	-	-	-	3	11.0	6.9	-6.2	28.2
Lesser Yellowlegs	Min	1	10.0	NA	NA	NA	6	2.2	2.4	-0.4	4.7	2	1.5	0.7	-4.9	7.9	-	-	-	-	-	9	2.9	3.3	0.4	5.4
Lesser Yellowlegs	Max	1	12.0	NA	NA	NA	6	4.2	4.0	0.0	8.3	2	6.5	4.9	-38.0	51.0	-	-	-	-	-	9	5.6	4.4	2.1	9.0
Marbled Godwit[I]	Min	14	18.1	13.2	10.4	25.7	3	11.0	9.5	-12.7	34.7	-	-	-	-	-	-	-	-	-	-	17	16.8	12.7	10.3	23.4
Marbled Godwit[I]	Max	14	27.7	14.9	19.1	36.3	3	25.0	8.7	3.5	46.5	-	-	-	-	-	-	-	-	-	-	17	27.2	13.8	20.1	34.3
Pectoral Sandpiper	Min	-	-	-	-	-	3	11.0	12.5	-20.0	42.0	1	1.0	NA	NA	NA	-	-	-	-	-	4	8.5	11.4	-9.6	26.6
Pectoral Sandpiper	Max	-	-	-	-	-	3	16.7	7.6	-2.3	35.6	1	1.0	NA	NA	NA	-	-	-	-	-	4	12.8	10.0	-3.2	28.7

Table 8b. Seasonal and Annual Mean Flight Heights of Other Large-bodied Species

Species	Flight Height[a]	Spring					Summer					Fall					Winter					Year-Round				
		Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]
Solitary Sandpiper	Min	-	-	-	-	-	1	2.0	NA	NA	NA	4	10.3	6.6	-0.3	20.8	-	-	-	-	-	5	8.6	6.8	0.2	17.0
Solitary Sandpiper	Max	-	-	-	-	-	1	2.0	NA	NA	NA	4	14.3	4.3	7.3	21.2	-	-	-	-	-	5	11.8	6.6	3.5	20.1
Spotted Sandpiper	Min	1	1.0	NA	NA	NA	1	1.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	2	1.0	0.0	1.0	1.0
Spotted Sandpiper	Max	1	1.0	NA	NA	NA	1	5.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	2	3.0	2.8	-22.4	28.4
Unknown Shorebird	Min	-	-	-	-	-	3	15.3	14.5	-20.7	51.4	3	2.7	2.1	-2.5	7.8	-	-	-	-	-	6	9.0	11.6	-3.1	21.1
Unknown Shorebird	Max	-	-	-	-	-	3	15.3	14.5	-20.7	51.4	3	8.0	3.5	-0.6	16.6	-	-	-	-	-	6	11.7	10.3	0.9	22.4
Upland Sandpiper[II]	Min	14	9.7	11.0	3.3	16.1	11	18.2	20.5	4.4	32.0	7	6.0	6.6	-0.1	12.1	-	-	-	-	-	32	11.8	14.8	6.5	17.2
Upland Sandpiper[II]	Max	14	20.8	18.3	10.2	31.3	11	28.2	21.4	13.8	42.6	7	14.7	11.4	4.2	25.3	-	-	-	-	-	32	22.0	18.4	15.4	28.6
Willet[II]	Min	1	15.0	NA	NA	NA	2	1.0	0.0	1.0	1.0	-	-	-	-	-	-	-	-	-	-	3	5.7	8.1	-14.4	25.7
Willet[II]	Max	1	50.0	NA	NA	NA	2	8.0	9.9	-80.9	96.9	-	-	-	-	-	-	-	-	-	-	3	22.0	25.2	-40.7	84.7
Wilson's Phalarope[I]	Min	9	5.0	5.2	1.0	9.0	8	5.1	3.7	2.0	8.2	-	-	-	-	-	-	-	-	-	-	17	5.1	4.4	2.8	7.3
Wilson's Phalarope[I]	Max	9	8.4	8.9	1.6	15.3	8	8.8	4.7	4.8	12.7	-	-	-	-	-	-	-	-	-	-	17	8.6	7.0	5.0	12.2
Wilson's Snipe	Min	5	23.2	16.8	2.3	44.1	3	3.0	3.5	-5.6	11.6	2	57.5	60.1	-482.5	597.5	-	-	-	-	-	10	24.0	30.4	2.2	45.8
Wilson's Snipe	Max	5	36.2	26.7	3.1	69.3	3	28.3	16.1	-11.6	68.3	2	65.0	49.5	-379.7	509.7	-	-	-	-	-	10	39.6	29.0	18.9	60.3
All Shorebirds	**Min**	**79**	**10.8**	**11.4**	**8.3**	**13.4**	**79**	**6.2**	**10.6**	**3.8**	**8.6**	**45**	**11.7**	**16.1**	**6.9**	**16.5**	**-**	**-**	**-**	**-**	**-**	**203**	**9.2**	**12.5**	**7.5**	**10.9**
All Shorebirds	**Max**	**79**	**18.7**	**16.4**	**15.1**	**22.4**	**79**	**13.3**	**13.2**	**10.3**	**16.2**	**45**	**17.1**	**15.7**	**12.4**	**21.9**	**-**	**-**	**-**	**-**	**-**	**203**	**16.3**	**15.2**	**14.1**	**18.4**
		WADERS																								
Great Blue Heron	Min	-	-	-	-	-	-	-	-	-	-	6	10.8	15.2	-5.1	26.8	-	-	-	-	-	6	10.8	15.2	-5.1	26.8
Great Blue Heron	Max	-	-	-	-	-	-	-	-	-	-	6	23.3	19.9	2.4	44.2	-	-	-	-	-	6	23.3	19.9	2.4	44.2
Great Egret	Min	1	25.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	25.0	NA	NA	NA
Great Egret	Max	1	35.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	35.0	NA	NA	NA
Sandhill Crane	Min	21	186.0	146.1	119.4	252.5	-	-	-	-	-	7	557.1	222.5	351.3	763.0	-	-	-	-	-	28	278.8	231.6	189.0	368.5
Sandhill Crane	Max	21	227.1	146.8	160.3	294.0	-	-	-	-	-	7	557.1	222.5	351.3	763.0	-	-	-	-	-	28	309.6	219.4	224.6	394.7
White-faced Ibis	Min	-	-	-	-	-	1	3.0	NA	NA	NA	3	7.0	0.0	7.0	7.0	-	-	-	-	-	4	6.0	2.0	2.8	9.2
White-faced Ibis	Max	-	-	-	-	-	1	3.0	NA	NA	NA	3	35.0	0.0	35.0	35.0	-	-	-	-	-	4	27.0	16.0	1.5	52.5
All Waders	**Min**	**22**	**178.6**	**146.7**	**113.6**	**243.7**	**1**	**3.0**	**NA**	**NA**	**NA**	**16**	**249.1**	**314.0**	**81.8**	**416.4**	**-**	**-**	**-**	**-**	**-**	**39**	**203.1**	**230.4**	**128.3**	**277.8**
All Waders	**Max**	**22**	**218.4**	**149.0**	**152.4**	**284.5**	**1**	**3.0**	**NA**	**NA**	**NA**	**16**	**259.1**	**306.1**	**96.0**	**422.2**	**-**	**-**	**-**	**-**	**-**	**39**	**229.6**	**225.9**	**156.3**	**302.8**
		WATERBIRDS																								
American White Pelican[II]	Min	9	63.3	86.1	-2.9	129.5	12	58.7	52.6	25.2	92.1	7	121.4	75.9	51.3	191.6	-	-	-	-	-	28	75.9	73.0	47.6	104.2
American White Pelican[II]	Max	9	86.1	83.0	22.3	149.9	12	110.8	140.5	21.5	200.1	7	128.6	75.1	59.1	198.0	-	-	-	-	-	28	107.3	107.8	65.5	149.1
Black Tern[I]	Min	7	44.6	50.1	-1.7	90.9	24	4.8	7.4	1.7	8.0	3	16.7	20.2	-33.6	66.9	-	-	-	-	-	34	14.1	27.9	4.3	23.8
Black Tern[I]	Max	7	63.3	66.7	1.6	125.0	24	9.6	8.5	6.0	13.2	3	21.7	15.9	-17.8	61.1	-	-	-	-	-	34	21.7	36.7	8.9	34.5
Bonaparte's Gull	Min	3	1.0	0.0	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1.0	0.0	1.0	1.0
Bonaparte's Gull	Max	3	10.0	0.0	10.0	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	10.0	0.0	10.0	10.0
California Gull	Min	2	1.0	0.0	1.0	1.0	15	5.6	5.2	2.7	8.5	-	-	-	-	-	-	-	-	-	-	17	5.1	5.1	2.4	7.7
California Gull	Max	2	6.5	4.9	-38.0	51.0	15	12.8	7.0	8.9	16.7	-	-	-	-	-	-	-	-	-	-	17	12.1	7.0	8.5	15.7

Table 8b. Seasonal and Annual Mean Flight Heights of Other Large-bodied Species

Species	Flight Height[a]	Spring					Summer					Fall					Winter					Year-Round				
		Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]
Double-crested Cormorant	Min	6	28.7	18.2	9.5	47.8	7	24.3	11.3	13.8	34.8	7	51.4	21.9	31.1	71.7	-	-	-	-	-	20	35.1	20.8	25.3	44.9
Double-crested Cormorant	Max	6	40.8	13.9	26.2	55.5	7	34.3	20.1	15.7	52.9	7	68.6	44.5	27.4	109.7	-	-	-	-	-	20	48.3	32.3	33.1	63.4
Forster's Tern	Min	3	4.7	4.7	-7.1	16.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4.7	4.7	-7.1	16.4
Forster's Tern	Max	3	20.7	21.1	-31.8	73.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	20.7	21.1	-31.8	73.1
Franklin's Gull[I]	Min	29	49.9	59.4	27.3	72.5	13	43.8	52.3	12.2	75.5	60	28.6	48.6	16.0	41.1	-	-	-	-	-	102	36.6	52.7	26.2	46.9
Franklin's Gull[I]	Max	29	61.7	59.0	39.2	84.1	13	59.6	56.5	25.4	93.8	60	87.5	60.4	71.9	103.1	-	-	-	-	-	102	76.6	60.4	64.7	88.5
Ring-billed Gull	Min	61	30.7	55.8	16.4	45.0	18	9.9	9.5	5.2	14.7	2	1.5	0.7	-4.9	7.9	-	-	-	-	-	81	25.4	49.4	14.5	36.3
Ring-billed Gull	Max	61	39.4	77.0	19.7	59.1	18	16.8	10.6	11.5	22.0	2	2.0	0.0	2.0	2.0	-	-	-	-	-	81	33.5	67.7	18.5	48.4
Unknown Gull	Min	9	11.6	10.3	3.6	19.5	28	12.0	33.4	-1.0	25.0	-	-	-	-	-	-	-	-	-	-	37	11.9	29.3	2.1	21.7
Unknown Gull	Max	9	17.0	8.4	10.6	23.4	28	16.3	33.2	3.4	29.2	-	-	-	-	-	-	-	-	-	-	37	16.5	29.0	6.8	26.2
All Waterbirds	**Min**	**129**	**34.9**	**55.3**	**25.2**	**44.5**	**117**	**18.5**	**34.1**	**12.2**	**24.7**	**79**	**37.7**	**55.1**	**25.3**	**50.0**	**-**	**-**	**-**	**-**	**-**	**325**	**29.6**	**49.3**	**24.3**	**35.0**
All Waterbirds	**Max**	**129**	**45.9**	**67.3**	**34.1**	**57.6**	**117**	**30.1**	**59.1**	**19.3**	**41.0**	**79**	**84.8**	**62.3**	**70.8**	**98.8**	**-**	**-**	**-**	**-**	**-**	**325**	**49.7**	**66.5**	**42.4**	**56.9**
		WATERFOWL																								
American Wigeon	Min	4	5.5	6.6	-5.0	16.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5.5	6.6	-5.0	16.0
American Wigeon	Max	4	8.3	8.2	-4.8	21.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	8.3	8.2	-4.8	21.3
Blue-winged Teal	Min	8	1.0	0.0	1.0	1.0	5	1.0	0.0	1.0	1.0	1	1.0	NA	NA	NA	-	-	-	-	-	14	1.0	0.0	1.0	1.0
Blue-winged Teal	Max	8	3.5	2.9	1.1	5.9	5	4.0	2.0	1.5	6.5	1	1.0	NA	NA	NA	-	-	-	-	-	14	3.5	2.5	2.0	5.0
Cackling Goose	Min	10	58.5	28.5	38.1	78.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	58.5	28.5	38.1	78.9
Cackling Goose	Max	10	63.0	23.0	46.5	79.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	63.0	23.0	46.5	79.5
Canada Goose	Min	40	29.0	30.5	19.2	38.8	2	6.0	5.7	-44.8	56.8	22	19.3	13.0	13.6	25.1	-	-	-	-	-	64	25.0	25.8	18.5	31.4
Canada Goose	Max	40	34.1	29.6	24.6	43.6	2	10.0	7.1	-53.5	73.5	22	25.2	13.7	19.1	31.3	-	-	-	-	-	64	30.3	25.2	24.0	36.6
Common Goldeneye	Min	1	70.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	70.0	NA	NA	NA
Common Goldeneye	Max	1	70.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	70.0	NA	NA	NA
Common Merganser	Min	1	25.0	NA	NA	NA	-	-	-	-	-	1	35.0	NA	NA	NA	-	-	-	-	-	2	30.0	7.1	-33.5	93.5
Common Merganser	Max	1	25.0	NA	NA	NA	-	-	-	-	-	1	35.0	NA	NA	NA	-	-	-	-	-	2	30.0	7.1	-33.5	93.5
Gadwall	Min	14	7.7	9.3	2.4	13.1	8	7.5	9.9	-0.8	15.8	1	3.0	NA	NA	NA	-	-	-	-	-	23	7.4	9.1	3.5	11.4
Gadwall	Max	14	18.5	15.0	9.9	27.1	8	18.1	16.3	4.5	31.7	1	20.0	NA	NA	NA	-	-	-	-	-	23	18.4	14.7	12.1	24.8
Greater White-fronted Goose	Min	16	37.2	13.9	29.8	44.6	-	-	-	-	-	6	308.3	111.4	191.4	425.3	-	-	-	-	-	22	111.1	135.5	51.0	171.2
Greater White-fronted Goose	Max	16	59.4	13.4	52.2	66.5	-	-	-	-	-	6	308.3	111.4	191.4	425.3	-	-	-	-	-	22	127.3	126.3	71.3	183.3
Green-winged Teal	Min	3	1.0	0.0	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1.0	0.0	1.0	1.0
Green-winged Teal	Max	3	18.7	27.2	-48.9	86.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	18.7	27.2	-48.9	86.3
Lesser Scaup[II]	Min	-	-	-	-	-	1	4.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	1	4.0	NA	NA	NA
Lesser Scaup[II]	Max	-	-	-	-	-	1	12.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	1	12.0	NA	NA	NA
Mallard	Min	66	18.1	28.4	11.1	25.1	25	9.3	10.8	4.9	13.8	7	23.4	16.1	8.6	38.3	-	-	-	-	-	98	16.2	24.6	11.3	21.2
Mallard	Max	66	25.2	28.0	18.3	32.1	25	16.1	11.1	11.5	20.7	7	31.0	10.7	21.1	40.9	-	-	-	-	-	98	23.3	24.2	18.4	28.1
Northern Pintail[II]	Min	25	21.6	44.9	3.1	40.1	5	2.2	2.7	-1.1	5.5	-	-	-	-	-	-	-	-	-	-	30	18.4	41.5	2.9	33.9

Table 8b. Seasonal and Annual Mean Flight Heights of Other Large-bodied Species

Species	Flight Height[a]	Spring					Summer					Fall					Winter					Year-Round				
		Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]	Sample Size[b]	Mean Flight Height (m)	SD[c]	Lower 95% CI Bound[d]	Upper 95% CI Bound[d]
Northern Pintail[II]	Max	25	29.7	44.1	11.5	47.9	5	2.6	2.5	-0.5	5.7	-	-	-	-	-	-	-	-	-	-	30	25.2	41.4	9.7	40.6
Northern Shoveler	Min	6	51.2	121.9	-76.8	179.1	6	1.0	0.0	1.0	1.0	2	15.0	0.0	15.0	15.0	-	-	-	-	-	14	24.5	79.5	-21.4	70.4
Northern Shoveler	Max	6	59.2	118.0	-64.7	183.0	6	5.0	5.1	-0.3	10.3	2	22.5	3.5	-9.3	54.3	-	-	-	-	-	14	30.7	77.8	-14.2	75.6
Redhead	Min	1	1.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.0	NA	NA	NA
Redhead	Max	1	7.0	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	7.0	NA	NA	NA
Ross's Goose	Min	9	166.7	66.0	116.0	217.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	166.7	66.0	116.0	217.4
Ross's Goose	Max	9	166.7	66.0	116.0	217.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	166.7	66.0	116.0	217.4
Snow Goose	Min	72	142.5	104.9	117.8	167.2	-	-	-	-	-	8	111.3	64.2	57.5	165.0	-	-	-	-	-	80	139.4	101.7	116.7	162.0
Snow Goose	Max	72	150.1	99.6	126.7	173.5	-	-	-	-	-	8	126.3	59.0	76.9	175.6	-	-	-	-	-	80	147.8	96.3	126.3	169.2
Unknown Duck	Min	21	24.0	37.2	7.1	41.0	8	16.5	17.2	2.1	30.9	4	27.8	18.4	-1.6	57.1	-	-	-	-	-	33	22.7	31.2	11.6	33.7
Unknown Duck	Max	21	28.7	37.1	11.8	45.6	8	24.1	19.3	8.0	40.2	4	27.8	18.4	-1.6	57.1	-	-	-	-	-	33	27.5	31.3	16.4	38.6
Unknown Goose	Min	5	46.0	15.2	27.2	64.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	46.0	15.2	27.2	64.8
Unknown Goose	Max	5	61.0	19.5	36.8	85.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	61.0	19.5	36.8	85.2
All Waterfowl	**Min**	**302**	**56.7**	**81.1**	**47.5**	**65.8**	**60**	**7.7**	**10.9**	**4.9**	**10.5**	**52**	**67.5**	**103.5**	**38.7**	**96.3**	**-**	**-**	**-**	**-**	**-**	**414**	**50.9**	**80.4**	**43.2**	**58.7**
All Waterfowl	**Max**	**302**	**64.2**	**79.1**	**55.3**	**73.2**	**60**	**13.9**	**13.3**	**10.5**	**17.3**	**52**	**73.9**	**102.2**	**45.5**	**102.4**	**-**	**-**	**-**	**-**	**-**	**414**	**58.2**	**78.9**	**50.5**	**65.8**

[a] This column indicates if a particular row is providing results for the minimum (Min) or maximum (Max) flight height statistic.

[b] Sample size refers to the number of flocks (i.e., not individuals) that were detected in flight within 800 m of the point count station during standardized eagle use (60-minute) surveys. Birds that were heard-only or perched-only were not included in the flight height analysis. All detections are included in flight height analyses, independent of whether the detection occurred above or below 200 m in height.

[c] SD is the standard deviation of Mean Minimum or Maximum Flight Height. N/A indicates that standard deviation could not be calculated as the sample size is one.

[d] This column indicates either the upper or lower bound of the 95% confidence interval. N/A indicates that the confidence interval could not be calculated as the sample size is one.

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priority (SCP) are denoted with a superscript I, II, or III following the species name to indicate that it is Level 1, Level 2, or Level 3 SCP, respectively.

Table 9. Eagle-Minutes and Time within Rotor Swept Zone Summaries for Bald Eagles and Golden Eagles

	Spring	Summer	Fall	Winter	Annual Total
Annual Survey Effort (hours)	159	106	212	159	636
	Y2 EAGLE-MINUTES SUMMARY				
BAEA Eagle-Minutes[a]	8	0	49	19	76
BAEA Eagle-Minutes per Survey Hour	0.050	0.000	0.231	0.119	0.119
GOEA Eagle-Minutes	0	0	11	15	26
GOEA Eagle-Minutes per Survey Hour	0.000	0.000	0.052	0.094	0.041
	Y1 and Y2 EAGLE MINUTES COMBINED				
BAEA Eagle-Minutes[a]	50	1	82	24	157
BAEA Eagle-Minutes per Survey Hour	0.157	0.005	0.193	0.075	0.123
GOEA Eagle-Minutes	6	0	23	18	47
GOEA Eagle-Minutes per Survey Hour	0.019	0.000	0.054	0.057	0.037
	Y2 MINUTES WITHIN ROTOR SWEPT ZONE (RSZ) SUMMARY				
BAEA minutes within RSZ[b]	2.4	0	34.5	6	42.9
BAEA minutes within RSZ per Survey Hour	0.015	0.000	0.163	0.038	0.067
GOEA time within RSZ	0	0	5.6	6.2	11.8
GOEA minutes within RSZ per Survey Hour	0.000	0.000	0.026	0.039	0.019
	Y-1 and Y2 MINUTES WITHIN ROTOR SWEPT ZONE (RSZ) COMBINED				
BAEA minutes within RSZ[b]	20.2	0	45	8	73.2
BAEA minutes within RSZ per Survey Hour	0.064	0.000	0.106	0.025	0.058
GOEA time within RSZ	6	0	10.2	6.2	22.4
GOEA minutes within RSZ per Survey Hour	0.019	0.000	0.024	0.019	0.018

[a] Minutes within the standardized 800 m-radius by 200 m-high sample plot as described by the ECPG and final Eagle Rule. Each individual observation is rounded to the next highest integer. For example, and eagle observed for 1.3 minutes in flight within the sample plot is assigned two eagle minutes. Perched eagles and eagles outside of the sample plot are not assigned eagle minutes.

[b] Minutes within the rotor swept zone (RSZ) is used as a metric of flight behavior that could expose a passing bird to collision with operating turbine blades. RSZ represents a predetermined range of above-ground heights within a hypothetical turbine blade sweep of 35 - 150 m within the 800 m-radius sample plot. Measured to the 0.1 minute.

Table 10. Seasonal Raptor Mean Use by Point Count Station

Point Count Station	Spring			Summer			Fall			Winter			Full Year		
	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Standard Deviation
1	3	1.000	1.732	2	1.000	1.414	8	2.000	0.816	1	0.333	0.577	14	1.167	1.193
2	10	3.333	2.517	6	3.000	1.414	19	4.750	4.031	0	-	-	35	2.917	3.059
3	7	2.333	2.517	8	4.000	1.414	3	0.750	0.957	0	-	-	18	1.500	1.931
4	9	3.000	1.732	9	4.500	2.121	16	4.000	3.559	0	-	-	34	2.833	2.758
5	1	0.333	0.577	1	0.500	0.707	6	1.500	1.000	0	-	-	8	0.667	0.888
6	6	2.000	3.464	4	2.000	1.414	17	4.250	3.686	0	-	-	27	2.250	2.989
7	0	-	-	3	1.500	2.121	7	1.750	1.708	0	-	-	10	0.833	1.403
8	6	2.000	1.732	9	4.500	3.536	0	-	-	1	0.333	0.577	16	1.333	2.146
9	4	1.333	2.309	1	0.500	0.707	3	0.750	1.500	0	-	-	8	0.667	1.371
10	7	2.333	2.309	4	2.000	1.414	1	0.250	0.500	0	-	-	12	1.000	1.537
11	10	3.333	0.577	8	4.000	4.243	19	4.750	1.708	0	-	-	37	3.083	2.503
12	5	1.667	2.082	7	3.500	2.121	2	0.500	1.000	1	0.333	0.577	15	1.250	1.712
13	3	0.750	0.957	1	0.500	0.707	8	2.000	2.160	0	-	-	12	0.750	1.342
14[c]	0	-	-	4	2.000	0.000	1	0.250	0.500	N/A	N/A	N/A	5	0.625	0.916
15	2	0.667	0.577	9	4.500	6.364	15	3.750	4.349	1	0.333	0.577	27	2.250	3.519
16	4	1.333	1.528	1	0.500	0.707	6	1.500	1.291	1	0.333	0.577	12	1.000	1.128
17	8	2.667	2.309	2	1.000	0.000	12	3.000	1.414	0	-	-	22	1.833	1.801
18	2	0.667	0.577	4	2.000	2.828	5	1.250	1.500	1	0.333	0.577	12	1.000	1.348
19	5	1.667	1.528	3	1.500	2.121	11	2.750	2.217	0	-	-	19	1.583	1.832
20	2	0.667	1.155	2	1.000	0.000	2	0.500	0.577	2	0.667	1.155	8	0.667	0.778
21	10	3.333	4.163	10	5.000	0.000	9	2.250	1.708	4	1.333	1.155	33	2.750	2.417
22	5	1.667	1.155	3	1.500	2.121	11	2.750	4.193	0	-	-	19	1.583	2.575
23	8	2.667	1.528	5	2.500	2.121	2	0.500	1.000	0	-	-	15	1.250	1.603
24	2	0.667	0.577	4	2.000	1.414	2	0.500	1.000	0	-	-	8	0.667	0.985
25	9	3.000	4.359	7	3.500	4.950	6	1.500	1.291	0	-	-	22	1.833	2.823
26	12	4.000	3.000	10	5.000	5.657	22	5.500	3.109	0	-	-	44	3.667	3.525
29	10	3.333	3.055	8	4.000	0.000	4	1.000	1.155	1	0.333	0.577	23	1.917	2.109
30	8	2.667	0.577	6	3.000	1.414	5	1.250	1.500	0	-	-	19	1.583	1.505
31	5	1.667	2.082	5	2.500	3.536	3	0.750	0.957	0	-	-	13	1.083	1.730
32	4	1.333	1.528	10	5.000	4.243	20	5.000	5.598	0	-	-	34	2.833	3.996
33	4	1.333	0.577	2	1.000	1.414	10	2.500	2.380	2	0.667	1.155	18	1.500	1.624
34	0	-	-	3	1.500	2.121	17	4.250	1.893	1	0.333	0.577	21	1.750	2.261
37	9	3.000	1.000	10	5.000	4.243	14	3.500	2.380	1	0.333	0.577	34	2.833	2.480
38	2	0.667	0.577	2	1.000	1.414	7	1.750	1.258	0	-	-	11	0.917	1.084

Table 10. Seasonal Raptor Mean Use by Point Count Station

Point Count Station	Spring			Summer			Fall			Winter			Full Year		
	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Standard Deviation	Total Std. Detections[a]	Mean Use (raptors/60 min. survey/800-m survey plot)[b]	Standard Deviation
39	8	2.667	2.082	11	5.500	7.778	12	3.000	3.559	1	0.333	0.577	32	2.667	3.576
40	6	2.000	0.000	2	1.000	0.000	17	4.250	3.775	0	-	-	25	2.083	2.644
41	6	2.000	2.000	3	1.500	2.121	13	3.250	2.754	0	-	-	22	1.833	2.209
42	9	3.000	2.646	4	2.000	0.000	10	2.500	3.697	0	-	-	23	1.917	2.539
43	1	0.333	0.577	5	2.500	2.121	5	1.250	1.500	0	-	-	11	0.917	1.379
44	4	1.333	2.309	2	1.000	1.414	10	2.500	1.000	3	1.000	1.732	19	1.583	1.564
45	5	1.667	2.082	1	0.500	0.707	3	0.750	1.500	0	-	-	9	0.750	1.357
46	7	2.333	1.528	3	1.500	2.121	14	3.500	2.646	0	-	-	24	2.000	2.174
47	3	1.000	1.732	0	-	-	3	0.750	0.500	1	0.333	0.577	7	0.583	0.900
48	7	2.333	2.082	4	2.000	2.828	23	5.750	7.089	0	-	-	34	2.833	4.549
49	3	1.000	0.000	5	2.500	2.121	7	1.750	3.500	0	-	-	15	1.250	2.137
50	3	1.000	0.000	8	4.000	2.828	20	5.000	8.124	0	-	-	31	2.583	4.870
51	11	3.667	4.726	9	4.500	6.364	11	2.750	3.594	0	-	-	31	2.583	3.753
52	5	1.667	2.082	1	0.500	0.707	22	5.500	7.853	0	-	-	28	2.333	4.849
53	4	1.333	0.577	2	1.000	0.000	12	3.000	4.761	0	-	-	18	1.500	2.780
54	9	3.000	1.732	4	2.000	0.000	9	2.250	2.500	0	-	-	22	1.833	1.899
55	12	4.000	6.083	5	2.500	2.121	8	2.000	1.414	1	0.333	0.577	26	2.167	3.099
56	8	2.667	2.082	8	4.000	4.243	15	3.750	2.363	0	-	-	31	2.583	2.575
57	11	3.667	3.512	6	3.000	1.414	14	3.500	2.517	1	0.333	0.577	32	2.667	2.498

[a] Total Std. Detections is the total number of standardized individuals detected within the 800 m–radius survey cylinder during standardized use surveys

[b] Mean Use is the total standardized detections divided by the total number of 60-minute point count surveys conducted within the season.

[c] Total Std. Detections and Mean Use are not applicable (N/A) at point 14 in the winter as this point was not accessible for surveys.

Table 11. Standardized Avian Use Surveys - Seasonal Mean Use by Species Group

	Spring					Fall				
Species Group	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**
Large-bodied Corvid	6	0.05%	0.038	0.476	0.006	28	0.17%	0.132	1.720	0.019
Non-passerine (large)	46	0.38%	0.289	1.544	0.069	74	0.46%	0.349	1.742	0.075
Non-passerine (small)	35	0.29%	0.220	0.801	0.107	85	0.53%	0.401	1.108	0.189
Passerine	4725	39.21%	29.717	59.438	0.943	13617	85.02%	64.231	438.807	0.849
Raptor	41	0.34%	0.258	0.565	0.208	110	0.69%	0.519	1.009	0.311
Shorebird	113	0.94%	0.711	1.420	0.352	93	0.58%	0.439	1.467	0.179
Unknown Species Group	12	0.10%	0.075	0.485	0.031	39	0.24%	0.184	1.105	0.080
Upland Gamebird	43	0.36%	0.270	0.744	0.176	20	0.12%	0.094	0.576	0.047
Wader	420	3.49%	2.642	14.194	0.075	106	0.66%	0.500	3.562	0.061
Waterbird	412	3.42%	2.591	10.219	0.226	416	2.60%	1.962	9.091	0.108
Waterfowl	6196	51.42%	38.969	250.351	0.346	1429	8.92%	6.741	32.012	0.118
ALL BIRDS	**12049**	100.00%	**75.780**	**254.263**	**0.969**	**16017**	100.00%	**75.552**	**439.179**	**0.915**

[a] Total Std. Detections is the total number of standardized individuals detected within a 300-m radius (small-bodied species) or 800-m radius (large-bodied species) of the point count station during standardized use surveys. Because small-bodied birds species are the primary focus of diurnal avian use surveys, birds detected at all flight heights were recorded, analyzed, and presented in this table.

[b] % Comp. (i.e., percent composition) is the proportion of all birds that a particular species group comprises during the season using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 10-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use.

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species group was detected during the season.

APPENDICES

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APPENDIX A

POINT COUNT STATION LOCATIONS

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Appendix A. Point Count Station Locations

Point Count Station[a]	Latitude	Longitude
1	46.380	-99.644
2	46.365	-99.644
3	46.348	-99.645
4	46.354	-99.625
5	46.351	-99.561
6	46.348	-99.519
7	46.333	-99.603
8	46.336	-99.561
9	46.333	-99.519
10	46.319	-99.645
11	46.317	-99.603
12	46.319	-99.561
13	46.319	-99.519
14	46.312	-99.494
15	46.297	-99.653
16	46.297	-99.632
17	46.297	-99.603
18	46.297	-99.561
19	46.298	-99.540
20	46.299	-99.519
21	46.283	-99.498
22	46.283	-99.472
23	46.274	-99.608
24	46.267	-99.650
25	46.260	-99.629
26	46.259	-99.604

Point Count Station[a]	Latitude	Longitude
30	46.230	-99.615
31	46.230	-99.569
32	46.216	-99.711
33	46.221	-99.691
34	46.216	-99.607
37	46.198	-99.690
38	46.201	-99.610
39	46.201	-99.565
40	46.203	-99.545
41	46.187	-99.677
42	46.187	-99.655
43	46.187	-99.631
44	46.187	-99.604
45	46.187	-99.579
46	46.187	-99.542
47	46.168	-99.690
48	46.173	-99.669
49	46.165	-99.628
50	46.162	-99.566
51	46.341	-99.456
52	46.321	-99.456
53	46.305	-99.456
54	46.283	-99.650
55	46.297	-99.582
56	46.370	-99.686
57	46.371	-99.707

[a] Point count stations 27, 28, 35, and 36 were dropped for year 2 avian surveys due to land owner concerns and are therefore excluded from this list. Point count stations 54 and 55 were added as replacements for 27 and 28 during year 1 avian surveys, whereas point count stations 56 and 57 were added as replacements for 35 and 36 prior to the start of year 2 surveys.

APPENDIX B

SEASONAL SPECIES GROUP MEAN USE STATISTICS

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Appendix B-1. Seasonal Large-bodied Corvids, Large-bodied Non-Passerines, and Upland Gamebirds Use Statistics within the Project Area (Diurnal Avian Use Surveys)

	Spring					Fall				
Common Name	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**
	LARGE-BODIED CORVIDS									
American Crow	6	1.000	0.038	0.476	0.006	27	0.964	0.127	1.719	0.014
Common Raven	0	-	-	-	-	1	0.036	0.005	0.069	0.005
ALL LARGE-BODIED CORVIDS	**6**	**1.000**	**0.038**	**0.476**	**0.006**	**28**	1.000	**0.132**	**1.720**	**0.019**
	LARGE-BODIED NON-PASSERINES									
Eurasian Collared Dove	4	0.087	0.025	0.193	0.019	5	0.068	0.024	0.343	0.005
Rock Pigeon	42	0.913	0.264	1.473	0.057	69	0.932	0.325	1.712	0.071
ALL LARGE-BODIED NON-PASSERINES	**46**	1.000	**0.289**	**1.544**	**0.069**	**74**	1.000	**0.349**	**1.742**	**0.075**
	UPLAND GAMEBIRDS									
Gray Partridge	1	0.023	0.006	0.079	0.006	2	0.100	0.009	0.137	0.005
Ring-necked Pheasant	33	0.767	0.208	0.529	0.164	9	0.450	0.042	0.281	0.028
Sharp-tailed Grouse[II]	9	0.209	0.057	0.467	0.019	9	0.450	0.042	0.490	0.014
ALL UPLAND GAMEBIRDS	**43**	**1.000**	**0.270**	**0.744**	**0.176**	**20**	**1.000**	**0.094**	**0.576**	**0.047**

[a] Total Std. Detections is the total number of standardized individuals detected within a 800-m radius of the point count station during standardized use surveys. Because

[b] % Comp. is the proportion of a particular species group that a particular species comprises during the season using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 10-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use.

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season.

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I or II following the species name to indicate that it is Level I or Level II SCP, respectively.

Appendix B-2. Seasonal Small-Bodied Non-Passerine, and Passerine, and Unknown Species Group Use Statistics within the Project Area (Diurnal Avian Use Surveys)

Common Name	Spring					Fall				
	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]
	SMALL-BODIED NON-PASSERINES									
Downy Woodpecker	2	0.057	0.013	0.112	0.013	1	0.012	0.005	0.069	0.005
Hairy Woodpecker	1	0.029	0.006	0.079	0.006	2	0.024	0.009	0.097	0.009
Mourning Dove	30	0.857	0.189	0.773	0.088	78	0.918	0.368	1.087	0.165
Northern Flicker	2	0.057	0.013	0.159	0.006	3	0.035	0.014	0.118	0.014
Red-headed Woodpecker[I]	0	-	-	-	-	1	0.012	0.005	0.069	0.005
ALL SMALL-BODIED NON-PASSERINES	**35**	**1.000**	**0.220**	**0.801**	**0.107**	**85**	**1.000**	**0.401**	**1.108**	**0.189**
	PASSERINES									
Alder Flycatcher	1	0.000	0.006	0.079	0.006	0	-	-	-	-
American Goldfinch	12	0.003	0.075	0.414	0.044	113	0.008	0.533	1.322	0.231
American Pipit	0	-	-	-	-	17	0.001	0.080	0.714	0.033
American Robin	19	0.004	0.119	0.650	0.063	49	0.004	0.231	1.492	0.052
American Tree Sparrow	7	0.001	0.044	0.482	0.013	3	0.000	0.014	0.153	0.009
Bank Swallow	13	0.003	0.082	0.886	0.013	3	0.000	0.014	0.153	0.009
Barn Swallow	13	0.003	0.082	0.405	0.050	274	0.020	1.292	6.697	0.222
Black-billed Magpie	0	-	-	-	-	1	0.000	0.005	0.069	0.005
Blue Jay	0	-	-	-	-	6	0.000	0.028	0.256	0.014
Bobolink[II]	22	0.005	0.138	0.521	0.075	30	0.002	0.142	0.607	0.075
Brewer's Blackbird	18	0.004	0.113	0.779	0.031	686	0.050	3.236	41.262	0.066
Brown Thrasher	4	0.001	0.025	0.193	0.019	1	0.000	0.005	0.069	0.005
Brown-headed Cowbird	141	0.030	0.887	2.264	0.214	16	0.001	0.075	0.656	0.024
Cedar Waxwing	0	-	-	-	-	2	0.000	0.009	0.097	0.009
Chestnut-collared Longspur[I]	55	0.012	0.346	1.079	0.151	92	0.007	0.434	1.777	0.108
Chipping Sparrow	2	0.000	0.013	0.112	0.013	9	0.001	0.042	0.368	0.024

Appendix B-2. Seasonal Small-Bodied Non-Passerine, and Passerine, and Unknown Species Group Use Statistics within the Project Area (Diurnal Avian Use Surveys)

	Spring					Fall				
Common Name	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]
Clay-colored Sparrow	19	0.004	0.119	0.441	0.094	13	0.001	0.061	0.294	0.047
Cliff Swallow	9	0.002	0.057	0.377	0.031	13	0.001	0.061	0.458	0.028
Common Grackle	317	0.067	1.994	6.963	0.277	3968	0.291	18.717	212.562	0.071
Common Redpoll	25	0.005	0.157	1.315	0.031	9	0.001	0.042	0.263	0.028
Common Yellowthroat	0	-	-	-	-	1	0.000	0.005	0.069	0.005
Dark-eyed Junco	0	-	-	-	-	20	0.001	0.094	1.374	0.005
Eastern Bluebird	0	-	-	-	-	2	0.000	0.009	0.137	0.005
Eastern Kingbird	6	0.001	0.038	0.249	0.025	47	0.003	0.222	0.697	0.118
European Starling	49	0.010	0.308	1.587	0.094	79	0.006	0.373	2.364	0.061
Grasshopper Sparrow[l]	4	0.001	0.025	0.157	0.025	0	-	-	-	-
Harris's Sparrow	0	-	-	-	-	12	0.001	0.057	0.824	0.005
Horned Lark	258	0.055	1.623	2.757	0.579	218	0.016	1.028	2.168	0.335
House Sparrow	69	0.015	0.434	1.632	0.082	133	0.010	0.627	2.137	0.142
House Wren	1	0.000	0.006	0.079	0.006	1	0.000	0.005	0.069	0.005
Lapland Longspur	2294	0.486	14.428	51.960	0.346	1238	0.091	5.840	29.771	0.184
Least Flycatcher	1	0.000	0.006	0.079	0.006	1	0.000	0.005	0.069	0.005
Lincoln's Sparrow	0	-	-	-	-	1	0.000	0.005	0.069	0.005
Marsh Wren	0	-	-	-	-	1	0.000	0.005	0.069	0.005
Orchard Oriole	3	0.001	0.019	0.177	0.013	14	0.001	0.066	0.580	0.028
Palm Warbler	0	-	-	-	-	3	0.000	0.014	0.153	0.009
Pine Siskin	10	0.002	0.063	0.385	0.031	90	0.007	0.425	2.798	0.071
Purple Martin	1	0.000	0.006	0.079	0.006	0	-	-	-	-
Red-breasted Nuthatch	0	-	-	-	-	1	0.000	0.005	0.069	0.005
Red-winged Blackbird	1011	0.214	6.358	27.801	0.384	5906	0.434	27.858	238.760	0.203
Savannah Sparrow	14	0.003	0.088	0.380	0.063	17	0.001	0.080	0.362	0.057

Appendix B-2. Seasonal Small-Bodied Non-Passerine, and Passerine, and Unknown Species Group Use Statistics within the Project Area (Diurnal Avian Use Surveys)

	Spring					Fall				
Common Name	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]
Say's Phoebe	1	0.000	0.006	0.079	0.006	0	-	-	-	-
Sedge Wren	11	0.002	0.069	0.517	0.025	9	0.001	0.042	0.313	0.019
Snow Bunting	0	-	-	-	-	16	0.001	0.075	0.684	0.019
Song Sparrow	10	0.002	0.063	0.268	0.057	22	0.002	0.104	0.400	0.075
Sprague's Pipit[I]	0	-	-	-	-	2	0.000	0.009	0.097	0.009
Tree Swallow	7	0.001	0.044	0.235	0.038	7	0.001	0.033	0.343	0.009
Unknown Blackbird	13	0.003	0.082	0.477	0.044	24	0.002	0.113	0.812	0.038
Unknown Finch	1	0.000	0.006	0.079	0.006	42	0.003	0.198	2.113	0.019
Unknown Passerine	34	0.007	0.214	0.749	0.119	132	0.010	0.623	2.072	0.189
Unknown Sparrow	6	0.001	0.038	0.273	0.025	33	0.002	0.156	0.645	0.080
Unknown Swallow	5	0.001	0.031	0.237	0.019	11	0.001	0.052	0.340	0.028
Unknown Warbler	0	-	-	-	-	3	0.000	0.014	0.153	0.009
Vesper Sparrow	33	0.007	0.208	0.540	0.145	17	0.001	0.080	0.387	0.052
Warbling Vireo	2	0.000	0.013	0.112	0.013	1	0.000	0.005	0.069	0.005
Western Kingbird	10	0.002	0.063	0.368	0.038	27	0.002	0.127	0.531	0.071
Western Meadowlark[II]	171	0.036	1.075	1.394	0.497	114	0.008	0.538	1.282	0.241
White-crowned Sparrow	0	-	-	-	-	1	0.000	0.005	0.069	0.005
White-throated Sparrow	0	-	-	-	-	3	0.000	0.014	0.206	0.005
Yellow Warbler	4	0.001	0.025	0.193	0.019	2	0.000	0.009	0.137	0.005
Yellow-headed Blackbird	19	0.004	0.119	0.741	0.044	39	0.003	0.184	1.614	0.033
Yellow-rumped Warbler	0	-	-	-	-	22	0.002	0.104	0.637	0.033
ALL PASSERINES	**4725**	**1.000**	**29.717**	**59.438**	**0.943**	**13617**	**1.000**	**64.231**	**438.807**	**0.849**
	UNKNOWN SPECIES GROUP									
Unknown Species	6	0.001	0.038	0.354	0.013	6	0.000	0.028	0.216	0.019

Appendix B-2. Seasonal Small-Bodied Non-Passerine, and Passerine, and Unknown Species Group Use Statistics within the Project Area (Diurnal Avian Use Surveys)

	Spring					Fall				
Common Name	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]
ALL UNKNOWN SPECIES GROUP	**6**	**0.001**	**0.038**	**0.354**	**0.013**	**6**	**0.000**	**0.028**	**0.216**	**0.019**

[a] Total Std. Detections is the total number of standardized individuals detected within a 300-m radius of the point count station during standardized use surveys. Because small-bodied birds species are the primary focus of diurnal avian use surveys, birds detected at all flight heights were recorded, analyzed, and presented in this table.

[b] % Comp. (i.e., percent composition) is the proportion of a particular species group that a particular species comprises during the season using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 10-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use.

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season.

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I or II following the species name to indicate that it is Level I or Level II SCP, respectively.

Appendix B-3. Seasonal Raptor Use Statistics within the Project Area (Diurnal Avian Use Surveys)

	Spring					Fall				
Common Name	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**
American Kestrel[II]	3	0.073	0.019	0.136	0.019	6	0.055	0.028	0.193	0.024
Bald Eagle[II]	4	0.098	0.025	0.157	0.025	3	0.027	0.014	0.118	0.014
Cooper's Hawk	0	-	-	-	-	1	0.009	0.005	0.069	0.005
Ferruginous Hawk[I]	2	0.049	0.013	0.112	0.013	0	-	-	-	-
Great Horned Owl	0	-	-	-	-	4	0.036	0.019	0.194	0.009
Merlin	0	-	-	-	-	1	0.009	0.005	0.069	0.005
Northern Harrier[II]	8	0.195	0.050	0.219	0.050	15	0.136	0.071	0.275	0.066
Red-tailed Hawk	17	0.415	0.107	0.348	0.094	30	0.273	0.142	0.423	0.118
Rough-legged Hawk	0	-	-	-	-	7	0.064	0.033	0.226	0.024
Swainson's Hawk[I]	2	0.049	0.013	0.112	0.013	27	0.245	0.127	0.531	0.075
Turkey Vulture	3	0.073	0.019	0.136	0.019	7	0.064	0.033	0.417	0.009
Unknown Buteo	2	0.049	0.013	0.112	0.013	5	0.045	0.024	0.181	0.019
Unknown Raptor	0	-	-	-	-	4	0.036	0.019	0.136	0.019
ALL RAPTORS	**41**	**1.000**	**0.258**	**0.565**	**0.208**	**110**	**1.000**	**0.519**	**1.009**	**0.311**

[a] Total Std. Detections is the total number of standardized individuals detected within a 800-m radius of the point count station during standardized use surveys. Because small-bodied birds species are the primary focus of diurnal avian use surveys, birds detected at all flight heights were recorded, analyzed, and presented in this table.

[b] % Comp. (i.e., percent composition) is the proportion of a particular species group that a particular species comprises during the season using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 10-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use.

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season.

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I or II following the species name to indicate that it is Level I or Level II SCP, respectively.

Appendix B-4. Seasonal Shorebirds, Waders, and Waterbirds Use Statistics within the Project Area (Diurnal Avian Use Surveys)

Common Name	Spring					Fall				
	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]
	SHOREBIRDS									
American Golden-Plover	0	-	-	-	-	1	0.011	0.005	0.069	0.005
Killdeer	58	0.513	0.365	0.733	0.245	72	0.774	0.340	1.207	0.170
Lesser Yellowlegs	2	0.018	0.013	0.159	0.006	2	0.022	0.009	0.137	0.005
Marbled Godwit[I]	9	0.080	0.057	0.281	0.044	0	-	-	-	-
Solitary Sandpiper	0	-	-	-	-	1	0.011	0.005	0.069	0.005
Spotted Sandpiper	1	0.009	0.006	0.079	0.006	0	-	-	-	-
Upland Sandpiper	20	0.177	0.126	0.682	0.082	14	0.151	0.066	0.538	0.024
Willet[II]	1	0.009	0.006	0.079	0.006	0	-	-	-	-
Wilson's Phalarope[I]	4	0.035	0.025	0.193	0.019	0	-	-	-	-
Wilson's Snipe	18	0.159	0.113	0.421	0.082	0	-	-	-	-
Unknown Shorebird	0	-	-	-	-	3	0.032	0.014	0.153	0.009
ALL SHOREBIRDS	**113**	**1.000**	**0.711**	**1.420**	**0.352**	**93**	**1.000**	**0.439**	**1.467**	**0.179**
	WADERS									
American Bittern[I]	1	0.002	0.006	0.079	0.006	0	-	-	-	-
Great Blue Heron	2	0.005	0.013	0.159	0.006	11	0.104	0.052	0.392	0.028
Great Egret	0	0.000	0.000	0.000	0.000	2	0.019	0.009	0.137	0.005
Sandhill Crane	417	0.993	2.623	14.196	0.063	93	0.877	0.439	3.545	0.028
ALL WADERS	**420**	**1.000**	**2.642**	**14.194**	**0.075**	**106**	**1.000**	**0.500**	**3.562**	**0.061**
	WATERBIRDS									
American Coot	10	0.024	0.063	0.368	0.031	59	0.142	0.278	1.783	0.038
American White Pelican[II]	62	0.150	0.390	4.022	0.019	2	0.005	0.009	0.137	0.005
Black Tern[I]	5	0.012	0.031	0.208	0.025	1	0.002	0.005	0.069	0.005
California Gull	8	0.019	0.050	0.488	0.019	0	-	-	-	-
Double-crested Cormorant	29	0.070	0.182	1.349	0.019	2	0.005	0.009	0.097	0.009

Appendix B-4. Seasonal Shorebirds, Waders, and Waterbirds Use Statistics within the Project Area (Diurnal Avian Use Surveys)

	Spring					Fall				
Common Name	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**	**Total Std. Detections[a]**	**% Comp.[b]**	**Mean Use (birds/10 min. survey/survey plot)[c]**	**SD[d]**	**Occur. Freq.[e]**
Franklin's Gull[I]	199	0.483	1.252	8.866	0.063	342	0.822	1.613	8.800	0.071
Pied-billed Grebe	2	0.005	0.013	0.112	0.013	7	0.017	0.033	0.356	0.014
Ring-billed Gull	45	0.109	0.283	1.137	0.113	2	0.005	0.009	0.097	0.009
Unknown Gull	52	0.126	0.327	2.356	0.050	1	0.002	0.005	0.069	0.005
ALL WATERBIRDS	**412**	**1.000**	**2.591**	**10.219**	**0.226**	**416**	**1.000**	**1.962**	**9.091**	**0.108**

[a] Total Std. Detections is the total number of standardized individuals detected within a 800-m radius of the point count station during standardized use surveys. Because small-bodied birds species are the primary focus of diurnal avian use surveys, birds detected at all flight heights were recorded, analyzed, and presented in this table.

[b] % Comp. (i.e., percent composition) is the proportion of a particular species group that a particular species comprises during the season using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 10-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use.

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season.

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Appendix B-5. Seasonal Waterfowl Use Statistics within the Project Area (Diurnal Avian Use Surveys)

	Spring					Fall				
Common Name	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]
American Wigeon	3	0.000	0.019	0.177	0.013	1	0.001	0.005	0.069	0.005
Blue-winged Teal	29	0.005	0.182	0.980	0.050	16	0.011	0.075	0.500	0.028
Cackling Goose	157	0.025	0.987	8.654	0.019	0	-	-	-	-
Canada Goose	195	0.031	1.226	6.900	0.170	267	0.187	1.259	7.627	0.047
Canvasback[II]	2	0.000	0.013	0.112	0.013	0	-	-	-	-
Common Merganser	8	0.001	0.050	0.501	0.013	0	-	-	-	-
Gadwall	36	0.006	0.226	1.079	0.069	19	0.013	0.090	0.932	0.009
Greater White-fronted Goose	345	0.056	2.170	21.403	0.013	205	0.143	0.967	14.079	0.005
Green-winged Teal	5	0.001	0.031	0.237	0.019	1	0.001	0.005	0.069	0.005
Mallard	57	0.009	0.358	1.711	0.113	223	0.156	1.052	10.200	0.019
Northern Pintail[II]	31	0.005	0.195	0.924	0.082	5	0.003	0.024	0.343	0.005
Northern Shoveler	13	0.002	0.082	0.435	0.044	12	0.008	0.057	0.373	0.024
Redhead	6	0.001	0.038	0.354	0.013	0	-	-	-	-
Ring-necked Duck	2	0.000	0.013	0.159	0.006	0	-	-	-	-
Ross's Goose	5	0.001	0.031	0.237	0.019	9	0.006	0.042	0.553	0.009
Snow Goose	5224	0.843	32.855	243.694	0.057	653	0.457	3.080	25.804	0.019
Tundra Swan	0	-	-	-	-	13	0.009	0.061	0.893	0.005
Unknown Duck	78	0.013	0.491	4.055	0.075	5	0.003	0.024	0.343	0.005
ALL WATERFOWL	**6196**	**1.000**	**38.969**	**250.351**	**0.346**	**1429**	**1.000**	**6.741**	**32.012**	**0.118**

[a] Total Std. Detections is the total number of standardized individuals detected within a 800-m radius of the point count station during standardized use surveys. Because small-bodied birds species are the primary focus of diurnal avian use surveys, birds detected at all flight heights were recorded, analyzed, and presented in this table.

[b] % Comp. (i.e., percent composition) is the proportion of a particular species group that a particular species comprises during the season using total standardized detections.

[c] Mean Use is the total standardized detections divided by the total number of 10-minute point count surveys conducted within the season.

[d] SD is the standard deviation of Mean Use.

Appendix B-5. Seasonal Waterfowl Use Statistics within the Project Area (Diurnal Avian Use Surveys)

	Spring					Fall				
Common Name	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]	Total Std. Detections[a]	% Comp.[b]	Mean Use (birds/10 min. survey/survey plot)[c]	SD[d]	Occur. Freq.[e]

[e] Occur. Freq. (i.e., Occurrence Frequency) is the proportion of point count surveys at which a particular species was detected during the season.

- North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priortiy (SCP) are denoted with a superscript I or II following the species name to indicate that it is Level I or Level II SCP, respectively.

APPENDIX C

SPECIES OBSERVED DURING EAGLE USE AND DIURNAL AVIAN USE SURVEYS

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Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Alder Flycatcher	*Empidonax alnorum*	X	N/A	-	N/A	-	-
American Avocet	*Recurvirostra americana*	-	-	X	-	SCP II	-
American Bittern	*Botaurus lentiginosus*	X	Incidental	Incidental	-	SCP I	-
American Coot	*Fulica americana*	X	X	X	-	-	-
American Crow	*Corvus brachyrhynchos*	X	-	X	-	-	-
American Golden-Plover	*Pluvialis dominica*	Incidental	-	X	-	-	-
American Goldfinch	*Spinus tristis*	X	Incidental	X	N/A	-	-
American Kestrel	*Falco sparverius*	X	X	X	-	SCP II	-
American Pipit	*Anthus rubescens*	Incidental	N/A	X	N/A	-	-
American Robin	*Turdus migratorius*	X	Incidental	X	N/A	-	-
American Tree Sparrow	*Spizelloides arborea*	X	N/A	X	N/A	-	-
American White Pelican	*Pelecanus erythrorhynchos*	X	X	X	-	SCP II	-
American Wigeon	*Mareca americana*	X	Incidental	X	-	-	-
Baird's Sandpiper	*Calidris bairdii*	-	Incidental	Incidental	-	-	-
Bald Eagle	*Haliaeetus leucocephalus*	X	X	X	X	SCP II	BGEPA
Baltimore Oriole	*Icterus galbula*	-	N/A	Incidental	N/A	-	-
Bank Swallow	*Riparia riparia*	X	Incidental	X	N/A	-	-
Barn Swallow	*Hirundo rustica*	X	Incidental	X	N/A	-	-
Black Tern	*Chlidonias niger*	X	X	X	-	SCP I	-
Black-billed Magpie	*Pica hudsonia*	Incidental	N/A	X	N/A	-	-
Black-crowned Night-Heron	*Nycticorax nycticorax*	-	-	Incidental	-	-	-
Blue Jay	*Cyanocitta cristata*	X	N/A	X	Incidental	-	-
Blue-winged Teal	*Spatula discors*	X	X	X	-	-	-
Bobolink	*Dolichonyx oryzivorus*	X	Incidental	X	N/A	SCP II	-
Bonaparte's Gull	*Chroicocephalus philadelphia*	X	-	-	-	-	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Brewer's Blackbird	*Euphagus cyanocephalus*	X	Incidental	X	N/A	-	-
Brown Thrasher	*Toxostoma rufum*	X	Incidental	X	N/A	-	-
Brown-headed Cowbird	*Molothrus ater*	X	Incidental	X	N/A	-	-
Bufflehead	*Bucephala albeola*	X	-	-	-	-	-
Cackling Goose	*Branta hutchinsii*	X	-	-	-	-	-
California Gull	*Larus californicus*	X	X	-	-	-	-
Canada Goose	*Branta canadensis*	X	X	X	-	-	-
Canvasback	*Aythya valisineria*	X	X	-	-	SCP II	-
Cattle Egret	*Bubulcus ibis*	Incidental	Incidental	-	-	-	-
Cedar Waxwing	*Bombycilla cedrorum*	-	Incidental	X	N/A	-	-
Chestnut-collared Longspur	*Calcarius ornatus*	X	Incidental	X	N/A	SCP I	-
Chipping Sparrow	*Spizella passerina*	X	Incidental	X	N/A	-	-
Clay-colored Sparrow	*Spizella pallida*	X	Incidental	X	N/A	-	-
Cliff Swallow	*Petrochelidon pyrrhonota*	X	Incidental	X	N/A	-	-
Common Goldeneye	*Bucephala clangula*	X	-	-	-	-	-
Common Grackle	*Quiscalus quiscula*	X	N/A	X	N/A	-	-
Common Merganser	*Mergus merganser*	X	-	X	-	-	-
Common Raven	*Corvus corax*	-	-	X	-	-	-
Common Redpoll	*Acanthis flammea*	X	N/A	X	Incidental	-	-
Common Yellowthroat	*Geothlypis trichas*	X	Incidental	X	N/A	-	-
Cooper's Hawk	*Accipiter cooperii*	Incidental	-	X	-	-	-
Dark-eyed Junco	*Junco hyemalis*	Incidental	N/A	X	N/A	-	-
Dickcissel	*Spiza americana*	-	Incidental	Incidental	N/A	SCP II	-
Double-crested Cormorant	*Phalacrocorax auritus*	X	X	X	-	-	-
Downy Woodpecker	*Dryobates pubescens*	X	N/A	X	Incidental	-	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Eastern Bluebird	*Sialia sialis*	Incidental	Incidental	X	N/A	-	-
Eastern Kingbird	*Tyrannus tyrannus*	X	Incidental	X	N/A	-	-
Eurasian Collared Dove	*Streptopelia decaocto*	X	Incidental	X	X	-	-
European Starling	*Sturnus vulgaris*	X	N/A	X	Incidental	-	-
Ferruginous Hawk	*Buteo regalis*	X	X	X	-	SCP I	-
Forster's Tern	*Sterna forsteri*	X	-	-	-	-	-
Franklin's Gull	*Leucophaeus pipixcan*	X	X	X	-	SCP I	-
Gadwall	*Mareca strepera*	X	X	X	-	-	-
Golden Eagle	*Aquila chrysaetos*	Incidental	-	X	X	SCP II	BGEPA
Grasshopper Sparrow	*Ammodramus savannarum*	X	Incidental	Incidental	N/A	SCP I	-
Gray Partridge	*Perdix perdix*	X	X	X	-	-	-
Great Blue Heron	*Ardea herodias*	X	Incidental	X	-	-	-
Great Egret	*Ardea alba*	X	-	X	-	-	-
Great Horned Owl	*Bubo virginianus*	X	X	X	X	-	-
Greater White-fronted Goose	*Anser albifrons*	X	-	X	-	-	-
Greater Yellowlegs	*Tringa melanoleuca*	X	X	Incidental	-	-	-
Green-winged Teal	*Anas crecca*	X	X	X	-	-	-
Hairy Woodpecker	*Dryobates villosus*	X	N/A	X	Incidental	-	-
Harris's Sparrow	*Zonotrichia querula*	Incidental	N/A	X	N/A	-	-
Hooded Merganser	*Lophodytes cucullatus*	X	-	-	-	-	-
Horned Grebe	*Podiceps auritus*	Incidental	Incidental	-	-	SCP I	-
Horned Lark	*Eremophila alpestris*	X	Incidental	X	N/A	-	-
House Sparrow	*Passer domesticus*	X	Incidental	X	N/A	-	-
House Wren	*Troglodytes aedon*	X	Incidental	X	N/A	-	-
Killdeer	*Charadrius vociferus*	X	X	X	-	-	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Lapland Longspur	*Calcarius lapponicus*	X	N/A	X	Incidental	-	-
Lark Sparrow	*Chondestes grammacus*	Incidental	N/A	-	N/A	-	-
LeConte's Sparrow	*Ammospiza leconteii*	-	Incidental	Incidental	N/A	SCP II	-
Least Flycatcher	*Empidonax minimus*	X	Incidental	X	N/A	-	-
Least Sandpiper	*Calidris minutilla*	-	X	X	-	-	-
Lesser Scaup	*Aythya affinis*	X	X	-	-	SCP II	-
Lesser Yellowlegs	*Tringa flavipes*	X	X	X	-	-	-
Lincoln's Sparrow	*Melospiza lincolnii*	Incidental	N/A	X	N/A	-	-
Loggerhead Shrike	*Lanius ludovicianus*	Incidental	Incidental	-	N/A	SCP II	-
Long-billed Dowitcher	*Limnodromus scolopaceus*	-	Incidental	-	-	-	-
Mallard	*Anas platyrhynchos*	X	X	X	Incidental	-	-
Marbled Godwit	*Limosa fedoa*	X	X	-	-	SCP I	-
Marsh Wren	*Cistothorus palustris*	-	N/A	X	N/A	-	-
Merlin	*Falco columbarius*	X	-	X	X	-	-
Mourning Dove	*Zenaida macroura*	X	Incidental	X	N/A	-	-
Nelson's Sparrow	*Ammospiza nelsoni*	-	Incidental	-	N/A	SCP I	-
Northern Flicker	*Colaptes auratus*	X	Incidental	X	N/A	-	-
Northern Harrier	*Circus hudsonius*	X	X	X	-	SCP II	-
Northern Pintail	*Anas acuta*	X	X	X	-	SCP II	-
Northern Shoveler	*Spatula clypeata*	X	X	X	-	-	-
Orange-crowned Warbler	*Oreothlypis celata*	Incidental	N/A	-	N/A	-	-
Orchard Oriole	*Icterus spurius*	X	Incidental	X	N/A	-	-
Osprey	*Pandion haliaetus*	-	-	Incidental	-	-	-
Palm Warbler	*Setophaga palmarum*	Incidental	N/A	X	N/A	-	-
Pectoral Sandpiper	*Calidris melanotos*	-	X	X	-	-	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Peregrine Falcon	*Falco peregrinus*	X	-	-	-	SCP III	-
Pied-billed Grebe	*Podilymbus podiceps*	X	X	X	-	-	-
Pine Siskin	*Setophaga palmarum*	X	N/A	X	N/A	-	-
Prairie Falcon	*Falco mexicanus*	-	X	X	X	SCP II	-
Purple Martin	*Falco peregrinus*	X	Incidental	-	N/A	-	-
Red-breasted Nuthatch	*Sitta canadensis*	-	N/A	X	N/A	-	-
Redhead	*Aythya americana*	X	X	-	-	-	-
Red-headed Woodpecker	*Melanerpes erythrocephalus*	-	Incidental	X	N/A	SCP I	-
Red-tailed Hawk	*Buteo jamaicensis*	X	X	X	-	-	-
Red-winged Blackbird	*Agelaius phoeniceus*	X	Incidental	X	N/A	-	-
Ring-billed Gull	*Larus delawarensis*	X	X	X	-	-	-
Ring-necked Duck	*Aythya collaris*	X	-	-	-	-	-
Ring-necked Pheasant	*Phasianus colchicus*	X	X	X	X	-	-
Rock Pigeon	*Columba livia*	X	X	X	X	-	-
Ross's Goose	*Anser rossii*	X	-	X	-	-	-
Rough-legged Hawk	*Buteo lagopus*	X	-	X	X	-	-
Ruddy Duck	*Oxyura jamaicensis*	Incidental	X	-	-	-	-
Sandhill Crane	*Antigone canadensis*	X	-	X	-	-	-
Savannah Sparrow	*Passerculus sandwichensis*	X	Incidental	X	N/A	-	-
Say's Phoebe	*Sayornis saya*	X	N/A	Incidental	N/A	-	-
Sedge Wren	*Cistothorus platensis*	X	Incidental	X	N/A	-	-
Semipalmated Plover	*Charadrius semipalmatus*	-	-	X	-	-	-
Semipalmated Sandpiper	*Calidris pusilla*	-	-	Incidental	-	-	-
Sharp-shinned Hawk	*Accipiter striatus*	X	-	X	-	-	-
Sharp-tailed Grouse	*Tympanuchus phasianellus*	X	X	X	X	SCP II	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Smith's Longspur	*Calcarius pictus*	Incidental	N/A	Incidental	N/A	-	-
Snow Bunting	*Plectrophenax nivalis*	-	N/A	X	Incidental	-	-
Snow Goose	*Anser caerulescens*	X	-	X	-	-	-
Snowy Owl	*Bubo scandiacus*	-	-	-	X	-	-
Solitary Sandpiper	*Tringa solitaria*	-	X	X	-	-	-
Song Sparrow	*Melospiza melodia*	X	Incidental	X	N/A	-	-
Sora	*Porzana carolina*	X	X	X	-	-	-
Spotted Sandpiper	*Actitis macularius*	X	X	X	-	-	-
Sprague's Pipit	*Anthus spragueii*	-	Incidental	X	N/A	SCP I	-
Swainson's Hawk	*Buteo swainsoni*	X	X	X	-	SCP I	-
Swainson's Thrush	*Catharus ustulatus*	Incidental	N/A	-	N/A	-	-
Swamp Sparrow	*Melospiza georgiana*	Incidental	N/A	-	N/A	-	-
Tree Swallow	*Tachycineta bicolor*	X	Incidental	X	N/A	-	-
Tundra Swan	*Cygnus columbianus*	-	-	X	-	-	-
Turkey Vulture	*Cathartes aura*	X	X	X	-	-	-
Upland Sandpiper	*Bartramia longicauda*	X	X	X	-	SCP II	-
Vesper Sparrow	*Pooecetes gramineus*	X	Incidental	X	N/A	-	-
Warbling Vireo	*Vireo gilvus*	X	Incidental	X	N/A	-	-
Western Kingbird	*Tyrannus verticalis*	X	Incidental	X	N/A	-	-
Western Meadowlark	*Sturnella neglecta*	X	Incidental	X	N/A	SCP II	-
White-crowned Sparrow	*Zonotrichia leucophrys*	Incidental	N/A	X	N/A	-	-
White-faced Ibis	*Plegadis chihi*	Incidental	X	X	-	-	-
White-throated Sparrow	*Zonotrichia albicollis*	-	N/A	X	N/A	-	-
Willet	*Tringa semipalmata*	X	X	Incidental	-	SCP II	-
Willow Flycatcher	*Empidonax traillii*	-	Incidental	-	N/A	-	-

Appendix C. Species Observed during Eagle Use and Diurnal Avian Use Surveys

Common Name	Scientific Name	Season[a]				Conservation Listing Status	
		Spring	Summer	Fall	Winter	State Status[b]	Federal Status[c]
Wilson's Phalarope	*Phalaropus tricolor*	X	X	-	-	SCP I	-
Wilson's Snipe	*Gallinago delicata*	X	X	X	-	-	-
Wood Duck	*Aix sponsa*	Incidental	-	Incidental	-	-	-
Yellow Warbler	*Setophaga petechia*	X	N/A	X	N/A	-	-
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	X	Incidental	X	N/A	-	-
Yellow-rumped Warbler	*Setophaga coronata*	Incidental	N/A	X	N/A	-	-

[a] An "X" within a particular seasonal column indicates that species has been detected at least once within the project area over the course of standardized field studies (i.e., eagle use or diurnal avian use surveys). While diurnal avian use survey data were truncated at a distance of 300 m and 800 m for small and large bird analysis, respectively, all birds were recorded as standardized during these surveys and are therefore given an "X" if detected at any distance during spring or fall. As a result, some species may receive an "X" in the table above and be excluded from tables in Appendix B since the species was only detected beyond the 300 m or 800 m cut-offs. Small-bodied bird species generally receive an "N/A" in summer and winter as standardized surveys were only conducted for large-bodied birds during these seasons. However, species marked with "Incidental" indicate that the species was observed incidentally within the project area during the season.

[b] State conservation listing status indicates North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priority (SCP) Level I, II, or III.

[c] Federal Status Codes: BGEPA = Bald and Golden Eagle Protection Act; No federally threatened or endangered species were detected within the project area over the course of Year 2 avian studies.

TECHNICAL MEMORANDUM

Date: January 17, 2024

To: Andrew Krieger and Christopher Farmer; Badger Wind, LLC

From: Western EcoSystems Technology, Inc.

Subject: Badger Wind Project – 2024 Bald Eagle Nest Verification Survey

INTRODUCTION

Badger Wind, LLC (Badger Wind) is proposing the development of the Badger Wind Project (Project) in Logan and McIntosh counties, North Dakota (Figure 1). Badger Wind contracted Western EcoSystems Technology, Inc. (WEST) to complete a ground-based nest verification survey to determine if two previous bald eagle nests **(**nest IDs BAEA 19-01 and BAEA 21-01; Figure 1) located within two miles (mi; 3.2 kilometers [km]) of proposed turbine locations were present. Nest ID BAEA 19-01 was previously discovered in spring 2019 and was occupied, active in 2019 and 2020; however, in the spring of 2021, the nest was classified as missing. Nest ID BAEA 21-01 was discovered in March 2021 and was occupied, active for the breeding season.

METHODS

The ground-based nest verification survey did not follow US Fish and Wildlife (USFWS) Region 6 Guidance (USFWS 2021). An experienced WEST biologist completed the ground-based nest verification from accessible public roads within a maximum distance of 0.8 mi (1.3 km) from each nest location allowing for a thorough visual inspection of the habitat. The biologist spent a maximum of 30 minutes at each nest location scanning the area with binoculars and a high-powered scope. The ground survey was conducted between 0800 and 1200 hours.

RESULTS

One ground-based nest verification survey was conducted at both nest locations on January 5, 2024. BAEA 21-01 was identified in 2024 and is located in a deciduous tree (Figure 2). The nest was classified as being in good condition and inactive during the survey. No new nesting material was observed in the nest and no adult eagle was observed at the nest during the brief survey. BAEA 19-01 was missing during 2024 surveys and no other large stick nests were recorded in the vicinity of this location.

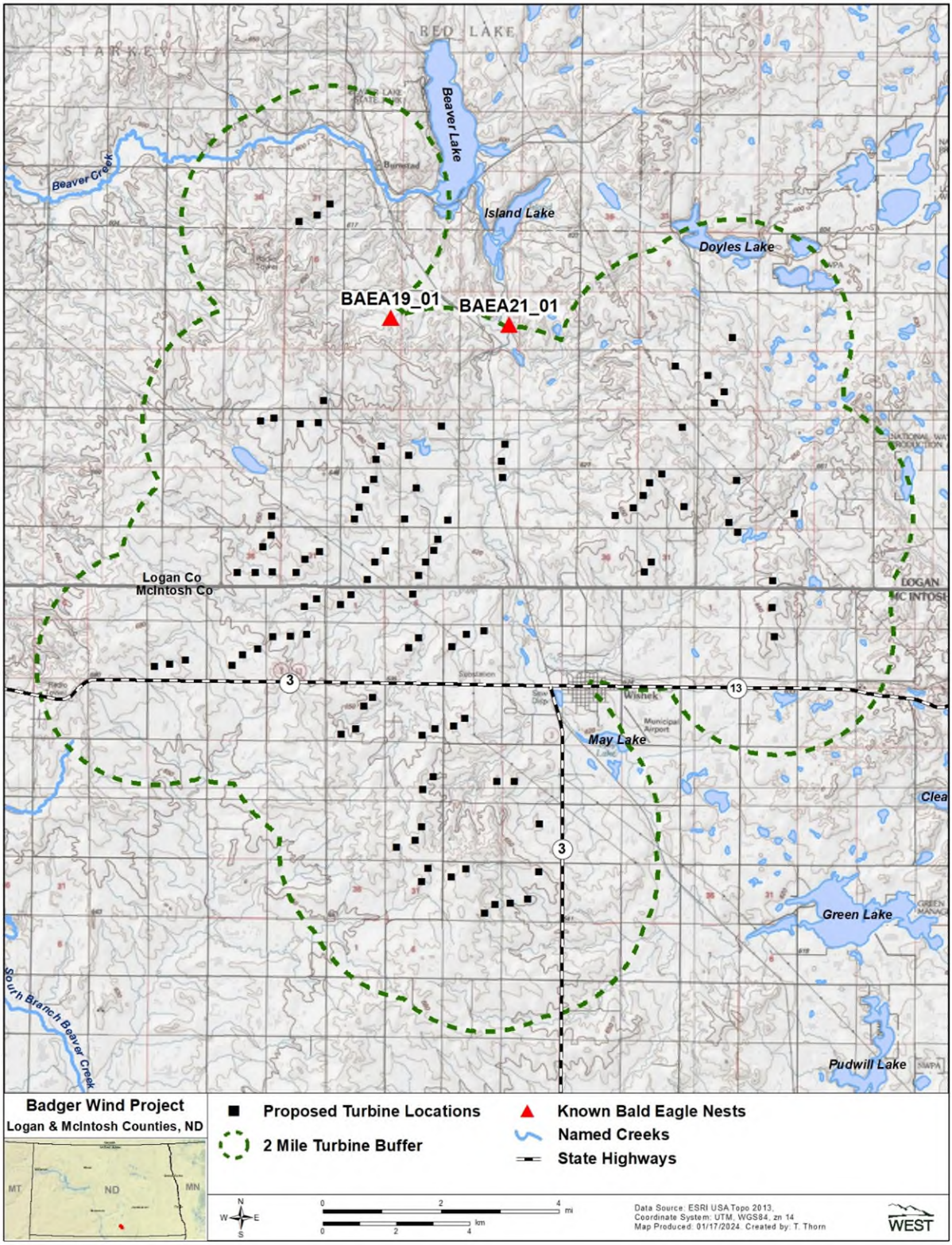


Figure 1. Bald eagle nest locations at the Badger Wind Energy Project in Logan and McIntosh counties, North Dakota.



Figure 2. Photos of BAEA21-01 nest identified at the Badger Wind Energy Project in Logan and McIntosh counties, North Dakota, January 5, 2024.

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YEAR 1 MIGRATION ACOUSTIC MONITORING

BADGER WIND PROJECT

Prepared for

Ørsted Onshore North America
401 N. Michigan Ave
Suite 501
Chicago, IL 60611

Atwell Project No. 19000785

DRAFT

Submitted by Atwell, LLC

April 18, 2020

TABLE OF CONTENTS

TABLE OF CONTENTS **2**

APPENDICES **2**

1 INTRODUCTION **3**

1.1 STUDY AREA 3

1.2 NORTH DAKOTA STATE WILDLIFE ACTION PLAN 3

1.3 BATS OF NORTH DAKOTA 4

2 METHODS **5**

2.1 BAT MIGRATION ACOUSTIC MONITORING 5

2.2 STATION INSTALLMENT 5

2.3 DETECTOR DEPLOYMENT 6

2.4 CALL ANALYSIS 6

2.5 DATA ANALYSIS 6

3 RESULTS **7**

3.1 SURVEY EFFECTIVENESS 7

3.2 MEAN USE 7

3.3 SPECIES PERCENTAGES AND SPATIAL DISTRIBUTION 8

3.4 TEMPORAL SPECIES DISTRIBUTION 8

4 DISCUSSION AND CONCLUSIONS **9**

REFERENCES **11**

APPENDICES

Appendix A **Figure 1. Land cover in the project area (NLCD 2016)**
Figure 2. Acoustic monitoring locations
Figure 3. Nightly mean use
Figure 4. Hourly mean use
Figure 5. Species by detector
Figure 6. Call files by species and station
Figure 7. Species by week

Appendix B **Table 1. Nightly mean bat use per detector location**
Table 2. Hourly mean bat use per detector location
Table 3. Frequency of recorded bat calls at each detector (noise excluded).
Table 4. Frequency of all recordings at each detector (noise included).

Appendix C **Photo log**

1 INTRODUCTION

Ørsted Onshore North America (Ørsted) retained Atwell, LLC (Atwell) to conduct migration acoustic monitoring in accordance with the North Dakota Native Wildlife Resources: Guidelines for Reducing Impacts from Wind Energy Development for the Badger Wind Project (the project), an approximate 121,695-acre potential wind energy development site located in Logan and McIntosh counties, North Dakota (the project area) (Figure 1). The purpose of this monitoring is to conduct preconstruction surveys to evaluate bat activity at meteorological (MET) tower locations and ground stations representative of turbine locations.

1.1 STUDY AREA

Ørsted is currently in the early stages of developing a wind energy project in rural south-central North Dakota. The approximate center of the project area is near 46.239702N, -99.626697E. The project area, situated in Logan and McIntosh counties, is approximately 36 miles east of the Missouri River, 55 miles southeast of Bismarck, 54 miles southwest of Jamestown, and 11 miles north of the South Dakota border (Figure 1).

Approximately 60% (73,380 acres) of the 121,695-acre project area is in McIntosh County and approximately 40% (48,315 acres) is in Logan County. A network of paved and unpaved roads provides access throughout the project area. Farmsteads and associated buildings are scattered throughout the project area.

Based on topographic maps, satellite imagery, and review of the land-cover data, the project area consists predominantly of agricultural land and herbaceous land cover. Overall, the project area is dominated by agricultural land use and supports a mix of cultivated cropland, hayfields, pasturelands, and grasslands. A network of streams with herbaceous riparian buffers and scattered freshwater ponds, emergent wetlands, and livestock ponds are present. Emergent wetlands in this area are primarily classified as prairie potholes and are associated with a formerly glaciated landscape; however, the prairie pothole region primarily occurs to the north and east of the project area. Forested habitat is limited and highly fragmented, consisting primarily of planted shelterbelts. The general topography of the region and the project area can be described as undulating, with approximate elevations between 1,970 and 2,200 ft above mean sea level (amsl) within the project area.

1.2 NORTH DAKOTA STATE WILDLIFE ACTION PLAN

North Dakota Game and Fish Department (NDGFD) does not maintain a list of state-level threatened and endangered species (TES), but rather defaults to those species listed federally as those it recognizes with a threatened or endangered status (NDGFD 2015). The USFWS has primary oversight of TES in North Dakota.

The North Dakota State Wildlife Action Plan (SWAP) is the principle guiding document for safeguarding rare and declining species of fish and wildlife within the state. The plan places an emphasis on the protection of diverse native habitats to maximize the preservation of native wildlife diversity. The SWAP includes a list of 115 species of greatest conservation priority, and each has been given a priority designation based on conservation need (SCP Levels I, II, and III). SCP Level I are species that have declining populations in North Dakota or across their range, or are species that are at risk, range-wide, and have a high rate of occurrence in North Dakota constituting the core of the species breeding range. SCP Level I receives the most funding from the state wildlife grant. SCP Level II are species of moderate conservation priority, or species with a high level of conservation priority that receive a substantial level of monetary support from non-state wildlife grant funding. SCP Level III are species of moderate conservation priority but are peripheral or non-breeding in North Dakota (NDGFD 2016d). The SWAP has no regulatory authority over industrial development on private land (NDGFD 2016 pers. comm.). Should project development impact state-listed species of conservation concern on public lands, the SWAP could assist in providing steps to reduce or minimize these impacts.

1.3 BATS OF NORTH DAKOTA

Twelve species of bats are known to occur in North Dakota: Townsend's big-eared bat (*Corynorhinus townsendii*), big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), western red bat (*Lasiurus blossevillii*), hoary bat (*Aeorestes cinereus*), western small-footed bat (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), little brown bat (*Myotis lucifugus*), fringed myotis (*Myotis thysanodes*), long-legged myotis (*Myotis volans*), and northern long-eared bat (*Myotis septentronalis;* MYSE) (Nelson, Barnhart, and Gillam 2015). The MYSE is the only listed species and is federally threatened. NDGFD has classified Townsend's big-eared bat, big brown bat, little brown bat, and MYSE as SCP Level I, and western small-footed bat, long-eared myotis, and long-legged myotis as SCP Level III (Dyke, Johnson, and Isakson 2015).

According to Bat Conservation International species profiles, the ranges of Townsend's big-eared bat, western small-footed bat, long-eared myotis, and long-legged myotis include small portions of western North Dakota (BCI 2019). These four SCP are unlikely to occur within the project area and will not be discussed further.

Species that may occur, with varying likelihood, within the project area include (NDGFD 2016a; 2016b; 2016c; BCI 2019):

- eastern red bat (LABO)
- hoary bat (AECI)
- silver-haired bat (LANO)
- big brown bat (EPFU; SCP Level I)
- little brown bat (MYLU; SCP Level I)
- northern long-eared bat (MYSE; SCP Level I; Federally Threatened)

Additional information regarding these species and habitat within the project area can be found within the *Bat Habitat Assessment* dated January 23, 2020.

2 METHODS

2.1 Bat Migration Acoustic Monitoring

Acoustic surveys were completed during the summer (May 23 – July 14), and fall (July 15 – October 16) seasons in 2019. Five (5) Song Meter full spectrum ultrasonic detectors (SM3 or SM4; Wildlife Acoustics, Inc; www.wildlifeacoustics.com) were deployed at representative turbine locations utilizing available MET tower locations and ground locations within the project area.

2.2 Station Installment

Four ground-based stations (BMg1, BMg2, BMg3, BMg4) and one raised MET tower station (BMr2) were deployed using SM3 or SM4 detectors for the study (Figure 2). Detectors were positioned to record bat activity at approximately ground level and record activity within the rotary sweep zone (RSZ), in accordance with the North Dakota Native Wildlife Resources: Guidelines for Reducing Impacts from Wind Energy Development.

Each ground-based detector was secured to poly-vinyl chloride (PVC) tube encasing the microphone cable. Atop the PVC tubing was a 90-degree PVC elbow to secure the SMM-U1 external ultrasonic microphone. Allowing the microphone to sit parallel to the ground recording at an approximate height of 3m.

At BMr2, the microphone and microphone cable were raised using a K-bat pulley system installed on the MET tower. The SMM-U1 external ultrasonic microphone recorded at an approximate height of 50m, representative of the RSZ.

A photo log of all stations can be found in **Appendix C**.

2.3 Detector Deployment

All ground-based units were deployed on May 23, 2019 (BMg1, BMg2, BMg3, BMg4). The raised MET tower unit was deployed on July 30, 2019 (BMr2). Two MET towers were originally intended to be utilized at locations BM1 and BM2; however, damaged components prevented a raised deployment at BM1 and delayed deployment at BMr2 until MET tower repairs were made. BMg1 and BMr2 were initially deployed with SM3 units and switched to SM4 units on June 12, 2019, and September 4, 2019 respectively. All stations except BMg4 recorded activity through October 16, 2019. BMg4 had technical issues and recorded through October 9, 2019. Detectors monitored from approximately 30 minutes before sunset to 30 minutes after sunrise each night. Detectors were visited routinely to ensure units worked properly, to collect data, and to change data cards and batteries.

2.4 Call Analysis

Bat calls were identified using USFWS- approved Kaleidoscope Pro software (Wildlife Acoustics, Inc. v. 4.2.0) automated ID software. The following parameters were applied to the software (approved for use by USFWS):

- Classifier: NA 4.1.0
- "0" Sensitivity
- Approved for both Indiana bat and northern long-eared bat calls
- Analysis was set to include all species with ranges overlapping with project area

All bat calls underwent qualitative analysis by a biologist with sufficient bat acoustic call vetting experience through visual comparison of echolocation call metrics (i.e., call sequence activity and call duration, call slope, minimum frequency, and individual call characteristics representative of individual species). Species categories for analysis consisted of AECI (hoary bat), EPFU/LANO (big brown bat and silver-haired bat), LABO (eastern-red bat), little brown bat (MYLU), high frequency call (HF), and low frequency call (LF). Big brown bats and silver-haired bats were paired due to similar call characteristics. High frequency calls were distinguished as bat calls that exhibited call characteristics above 30khz (i.e., LABO, MYLU, MYSE, but either had degraded call sequence quality, limited amount of quality call pulses, or did not provide a quality search phase call to accurately apply a species identification. Similarly, the low frequency category included calls under 30khz that couldn't be classified to species. Recorded calls that did not exhibit any bat call pulses were categorized as "noise" and censored from species specific analysis.

2.5 Data Analysis

Data were organized and analyzed with Microsoft Excel, Program R, and Program RStudio (R Core Team 2018), RStudio TEAM 2018). The following statistics/data appearing in this report include:

- Detector Recording Effectiveness

- Site species richness
- High frequency and low frequency mean use
    - Nightly mean use
    - Hourly mean use
- Species Proportions
- Location Distribution of Species

Acoustic call data were standardized across time. Mean use statistics were calculated for each call frequency group (e.g., high frequency, low frequency, and all bats) per detector station per deployment period (e.g., detector nights or detector hours).

A detector night is equivalent to one detector properly operating for one entire night. Detector hours are defined as the number of hours a detector was properly operating for each detector night. It is important to note that mean use does not reflect absolute density of a particular call frequency group, and the number of a individuals present cannot be determined by number of calls identified. Standard errors (SE) are reported alongside of total bat calls per station mean use values. A bat pass was defined as a sequence of at least two echolocation calls (pulses) produced by an individual bat with no pause between calls.

Frequency of bat calls is the percentage that a particular species was recorded on completed detector nights per site and for completed detector nights per project area.

3 RESULTS

3.1 Survey Effectiveness

SM3 and SM4 units collected data for 602 detector nights, an overall 90.25% effectiveness for the study period. Survey effectiveness per detector unit ranged from 76.9% (BMg4) to 100% (BMg2). Stations BMr2, BMg3, and BMg1 accounted for 94.9%, 94.6%, and 87.1% effectiveness, respectfully. BMg4 detector malfunctioned late in the season, which hindered the detector's overall survey effectiveness.

3.2 Mean Use

Mean use by site and detector nights are displayed in Table 1 and Figure 3. Ground stations had a mean of 3.18 ± 0.31 SE bat passes per detector night and the MET tower station had a mean of 4.65 ± 1.60 SE bat passes per detector night.

All detectors were operational for 8,428 hours for the 602 detector nights. Ground stations and the MET station operated for 7,378 hours and 1,050 hours respectively. Mean use by hour and detector site are displayed in Table 2 and Figure 4. Ground stations had a mean of 0.21 ± 0.01 SE bat passes per hour and the MET tower station had a mean use of 0.31 ± 0.08 SE bat passes per hour.

Overall, bat mean use by night and by hour for each site is relatively low.

3.3 Species Percentages and Spatial Distribution

Throughout the survey period, 26,850 total files were recorded. Of these, 24,824 files (92.45%) were categorized as "Noise" and filtered out during automated and manual call analysis, leaving 2,026 total bat calls (Table 4).

Approximately 89% of all recorded bat activity came from low frequency species (AECI, EPFU, LANO, LF calls; Table 3). The remaining 11% of calls included LABO, MYLU, and HF calls. No federally threatened or endangered bat species were identified in analysis through either Kaleidoscope software or manual vetting of calls.

AECI had the highest frequency of calls across all stations (937 calls; 3.49% of call files; 46.3% of bat calls) followed by EPFU/LANO (757 calls; 2.82% of call files; 37.3% of bat calls), LABO (202 calls; 0.75% of call files; 9.97%), and MYLU (4 calls; .01% of call files; 0.20% of bat calls) (Table 3). HF and LF categorized bat calls made up 5.13% and 1.09% of bat calls, respectfully.

BMg4 (39.09%), BMg2 (18.36%), and BMr2 (17.23) had the highest percentage of bat calls across the project area. It is important to note that BMr2 was not deployed until late July, so there were fewer detector nights than any other station despite having a high percentage of overall bat call recordings.

AECI and EPFU/LANO had the highest percentage of bat calls per station (46.25% and 47.36%, respectfully). However, AECI made up a relatively low amount of total bat recordings at the raised (BMr2) station. EPFU/LANO had the highest percent of bat calls at BMg1, BMg2, BMr2. AECI had the highest percent of bat calls at BMg3 and BMg4 (Table 3; Figure 5). Additionally, a majority of all bat calls identified at location BMr2 were EPFU/LANO (7.90%) and LABO (6.81%). Approximately 68% of all LABO calls were collected at BMr2.

Only four *Myotis spp.* (all identified as MYLU; 0.2% of bat recordings) were recorded during the study. MYLU calls were dispersed across ground stations and were not concentrated at any detector location.

3.4 Temporal Species Distribution

All call files identified as bat calls are displayed by species categories and detector site across date and time in Figure 6. AECI exhibited peaks in activity in the evening, shortly after sunset, and also again just prior to sunrise throughout the season. EPFU/LANO activity was more distributed throughout the night, but had more concentrated activity in June, September and October. Activity was substantially lower for these species in July and August months. LABO species had distributions of activity throughout the survey period but were most notable in September. In addition, this peak in LABO activity occurred mostly at the raised station, BMr2 (Table 3).

Seasonal distribution of species is grouped by week in Figure 4. Overall bat passes recorded across the project area peaked in late-May and also again in late August/early September (Figure 7). Recorded bat passes across all species rapidly declined by late September.

Throughout most of the survey season, AECI was the dominant species detected across all stations and accounted for 46.25% of all bat recordings (Table 3). AECI exhibited the greatest frequency of bat passes during completed nights in the summer season (May 23 – July 14) while EPFU/LANO species had peak activity in the fall season (July 15 – October 16) (Figure 4). EPFU/LANO species accounted for 37.36% of all bat recordings and accounted for the second most recorded category. LABO accounted for the third highest percentage of all recorded bat calls (9.97%) and had the greatest total bat passes the week of September 2nd. Total bat calls were driven by AECI in May and June with EPFU/LANO species dominating most of the bat species activity in mid-August and September. No temporal distribution was evident of MYLU due to low total recorded calls.

4 DISCUSSION AND CONCLUSIONS

No federally threatened or endangered bat species were detected throughout the acoustic migration monitoring study.

Overall bat activity for throughout the project was low. Bat activity between ground-based stations and the MET tower station were similar (3.18 bat passes per detector nights, and 4.65 respectively). However, the MET tower station, BMr2, had significantly fewer detector nights and a shorter survey period than the ground-based units, making the sample size smaller and incurring a higher standard error (SE) than the ground-based bat passes per night (0.31 SE and 1.60 SE respectively). Thus, evaluating operational mortality risk during normal operations based on the MET tower station with year one data may not adequately depict comparable bat data between the RSZ and ground units within the project area.

The MET tower station recorded more HF bats compared to the ground-based stations, primarily due to increased LABO activity in the fall season. BMg4 had the highest bat activity compared to all stations, and this margin was largely driven by AECI (91 .9% of bat calls). BMg4 has very limited suitable habitat and/or shelterbelts within the vicinity of the station. However, the station is located on the northeast side of the project adjacent to the prairie pothole region described in the *Study Area* section of this report. AECI are large bats and accustomed to foraging in open areas, which may have yielded the increase in activity by this species. BMg3 had the lowest bat activity compared to all stations, with only 0.69% of all recording files were categorized as bat calls at BMg3. BMg3 is in a very open area of the project area and, comparative to other station locations, has the least amount of attractive bat habitat features within the surrounding area.

The majority of bat passes over the monitoring period were made by LF bats and a seasonal bimodal distribution was largely driven by LF bats in mid-May through mid-June (AECI activity dominating) and mid-August through mid-September (dominated by EPFU/LANO) (Figure 7). AECI also exhibited a nightly bimodal distribution (eavening and morning peaks), particulalry in June and July months, but AECI bat activity becomes less concentrated and more distributed across the night in the fall season (Figure 6).

EPFU and LANO species can exhibit similar call characteristics and can be difficult to adequately distinguish between. However, it is likely that EPFU/LANO peaks were driven by LANO migration, with May influxes being triggered by by the end of migration, and this migration may be more indicative of activity being more evenly distributed throughout the night rather than exhibiting a bimodal distribution. In September and October, this distribution is very likely driven by LANO migrations as well. Migratory tree bat species (AECI, LABO, LANO) are commonly recorded bat fatalities at wind facilities and are expected to be the most common fatalities at the project (AWWI 2018; Arnett et al. 2013). EPFU are common bat species and are also likely to occur within the project area as well.

Unlike low frequency species, high frequency species, such as MYLU and LABO, did not reflect these strong bimodal distributions in nightly activity. LABO did exhibit increased activity in late the fall season. Due to the relative absence of activity earlier in the study, it is likely that these influxes were more related to seasonal migration. MYLU call data is limitted (only four total calls), and no distinctive trends in activity are evident. Additionally, no MYSE (federally threatened) calls were detected. Suitable habitat within the project is limited for each of these species. MYSE is dependent on forest habitat for foraging and roosting during the summer season. There is minimal suitable habitat for MYSE within the project area as discussed in the *Bat Habitat Assessment Memorandum* submitted by Atwell. Migration monitoring is not intended to replace summer presence/absence studies for federally threatened and endangered species. Protocols for addressing threatened and endangered bat species presence/absence surveys at the project should be discussed with USFWS.

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APPENDIX A

FIGURES

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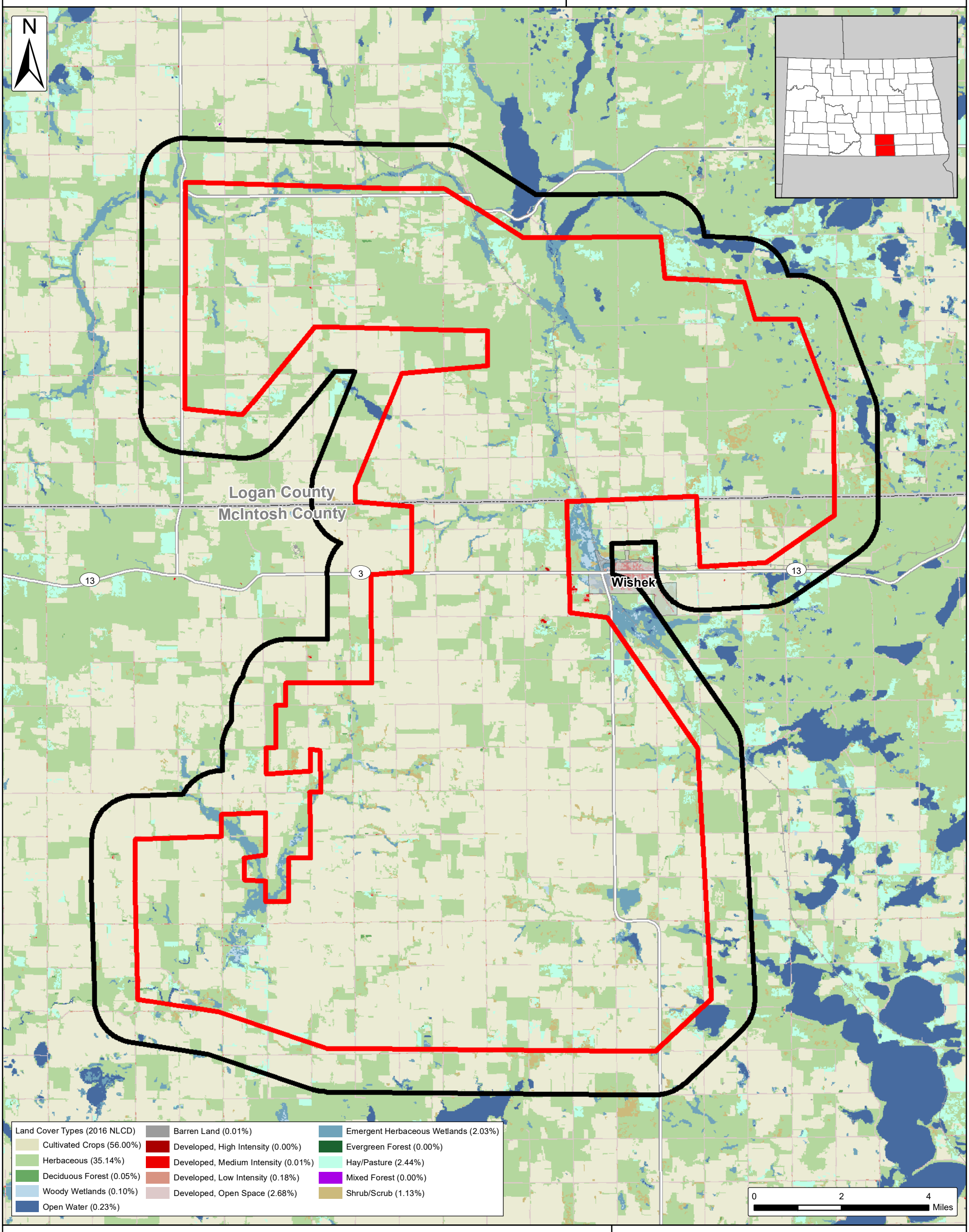
Figure 1.

Land Cover in the Project Area (NLCD 2016) Logan County & McIntosh County, North Dakota

Client:
Ørsted Onshore North America

Issue Date:
5/22/2019

Atwell, LLC Project:
19000785



Project Area
04/15/2019 (±121,695 Ac.)

1 Mile Buffer

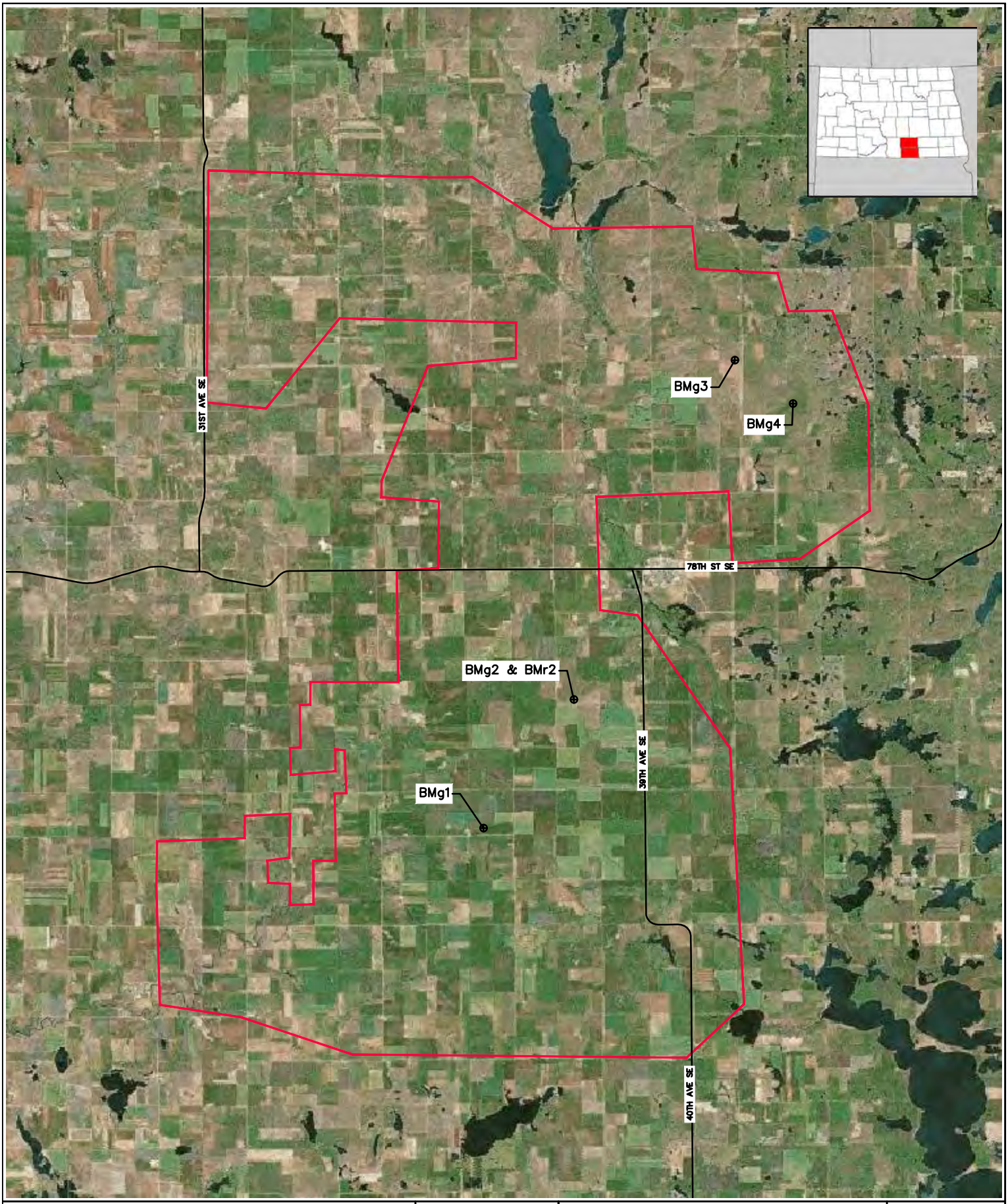
City/Village

Counties

SOURCE: NATIONAL LAND COVER DATABASE 2016 (USGS)

ATWELL

The information contained on this map is proprietary and confidential. The use or disclosure of this information by you to third parties is prohibited by law and may give rise to civil or criminal liability.



BADGER WIND PROJECT

Figure 2:

Acoustic Monitoring Locations

DRAWN BY: BS

DATE: 12-30-2019

0 7500 15000

SCALE: 1"=15000'

ATWELL

866.850.4200 www.atwell-group.com

CAD FILE: S:\19000785\DWG\ECOLOGICAL\ACOUSTIC REPORT DWG\19000785ACOUSTICS

Figure 3: Nightly Mean Use

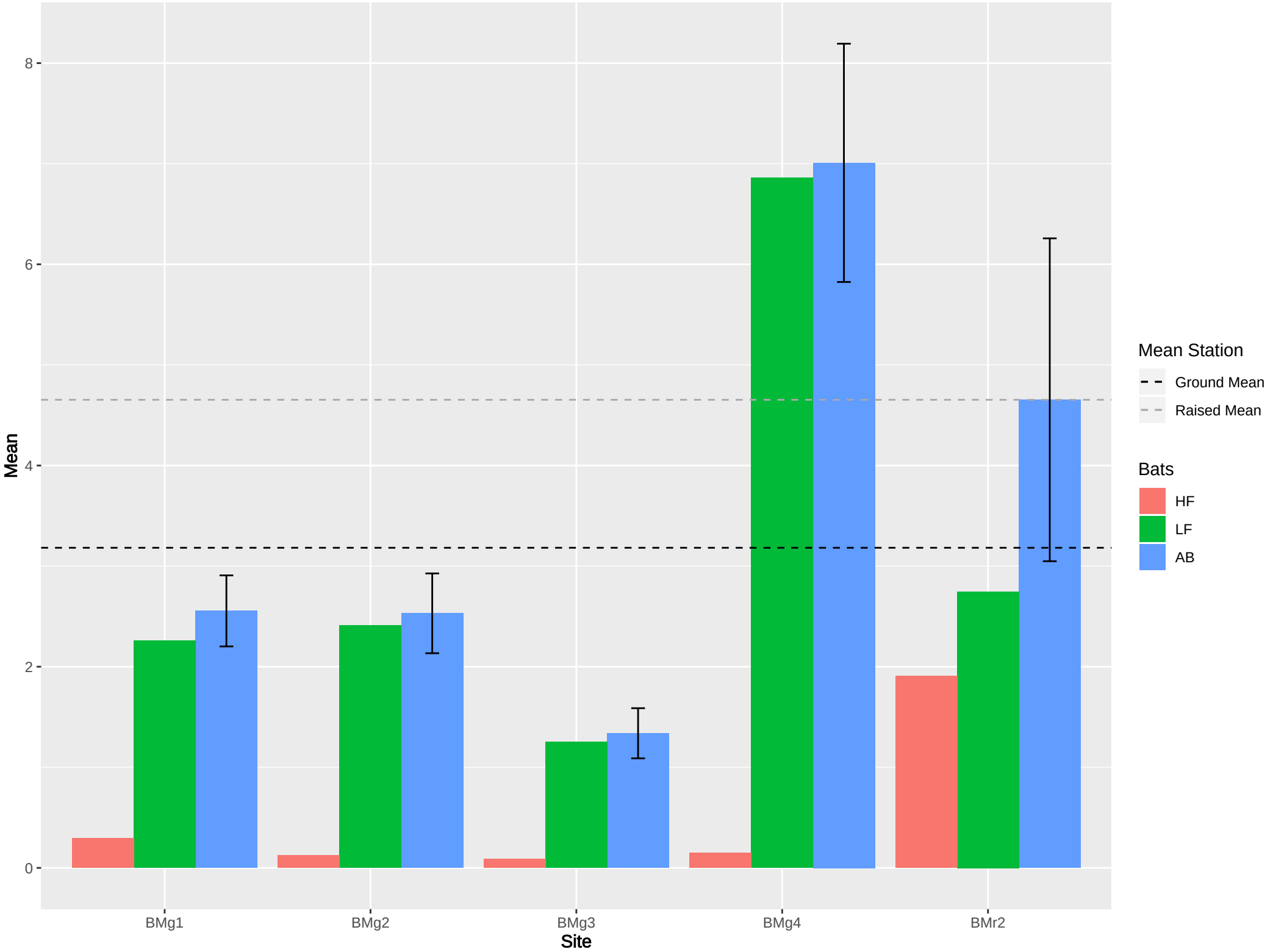


Figure 4: Hourly Mean Use

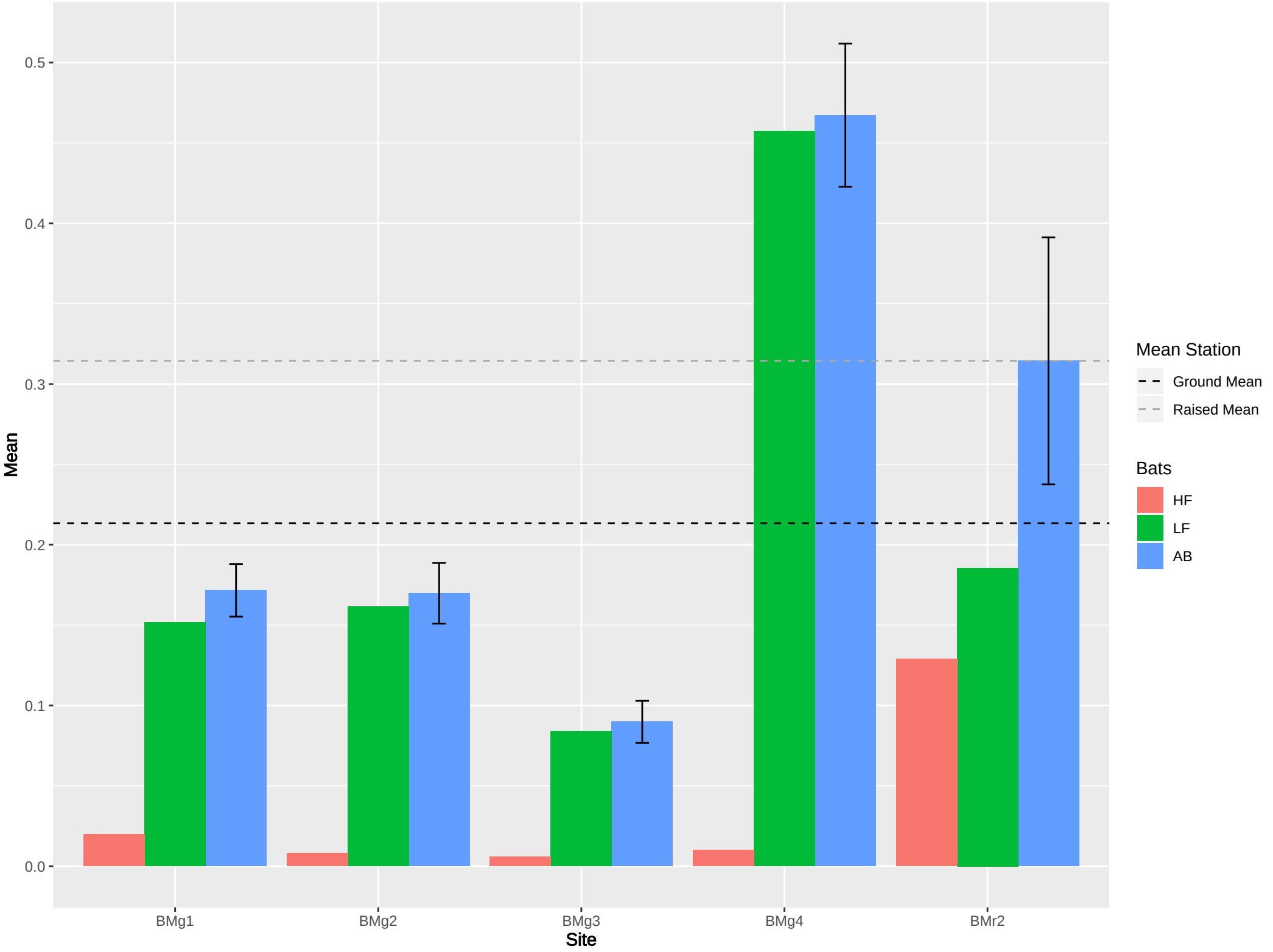


Figure 5: Species by Detector

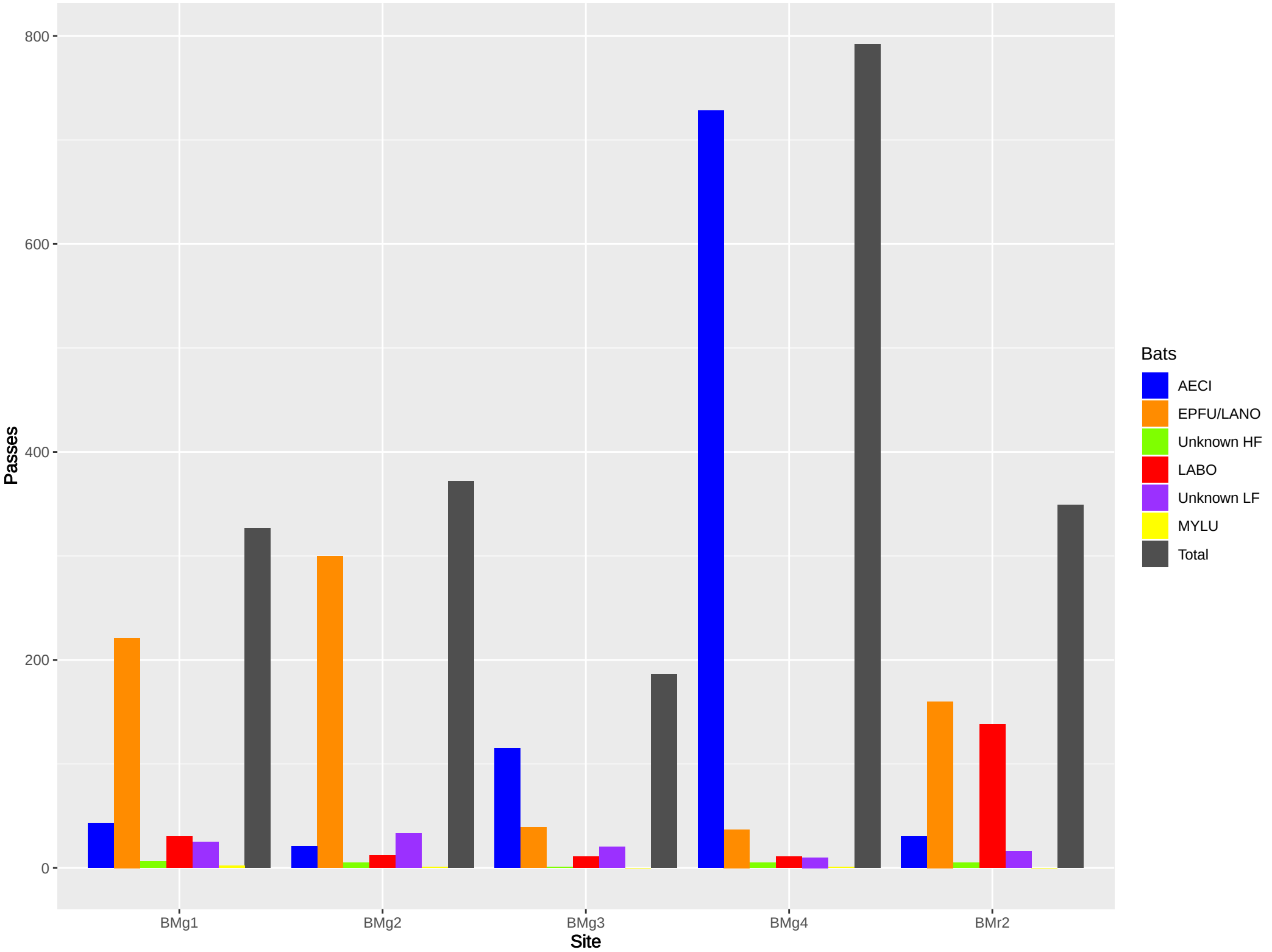


Figure 6: Call Files by Species and Site

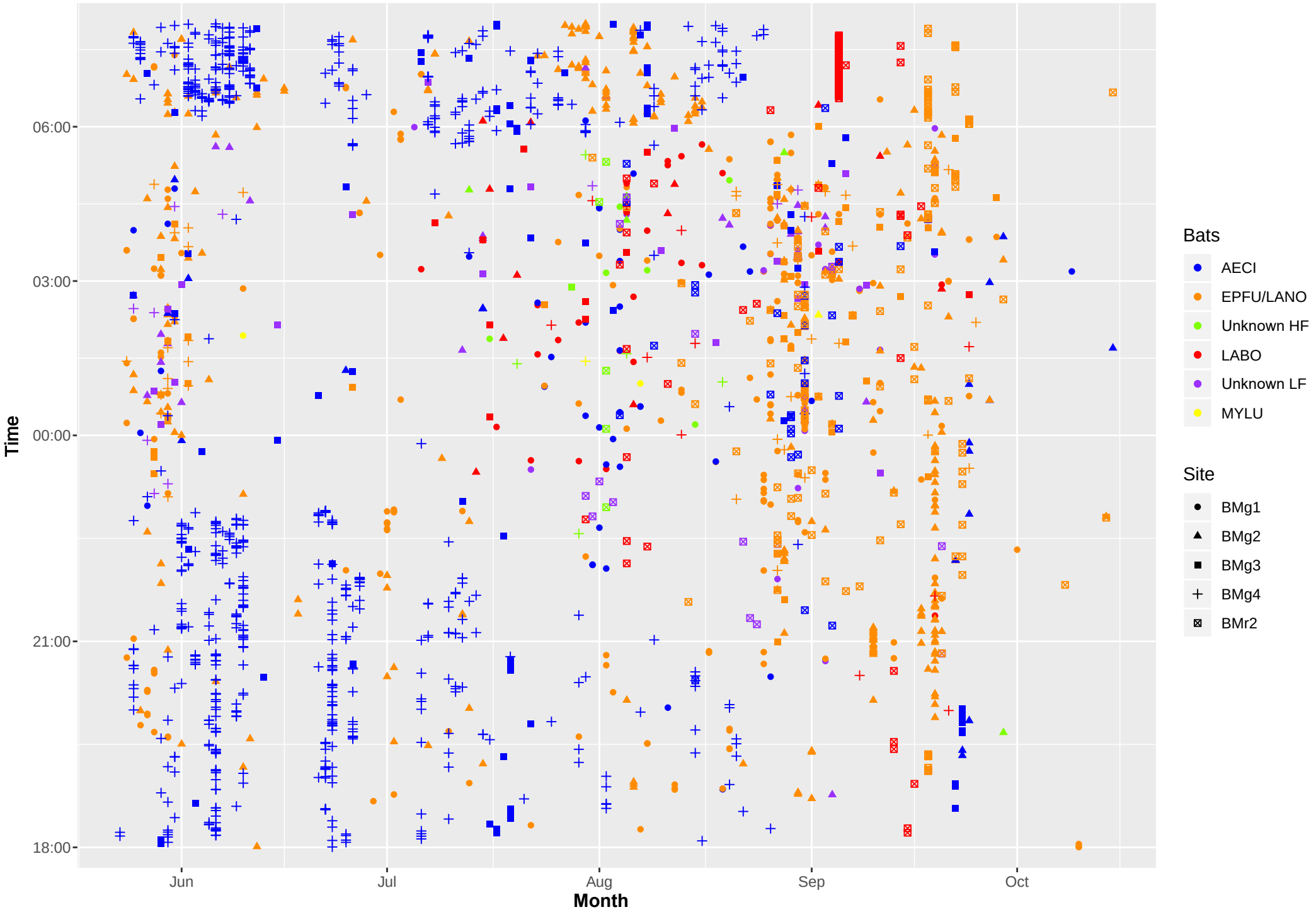
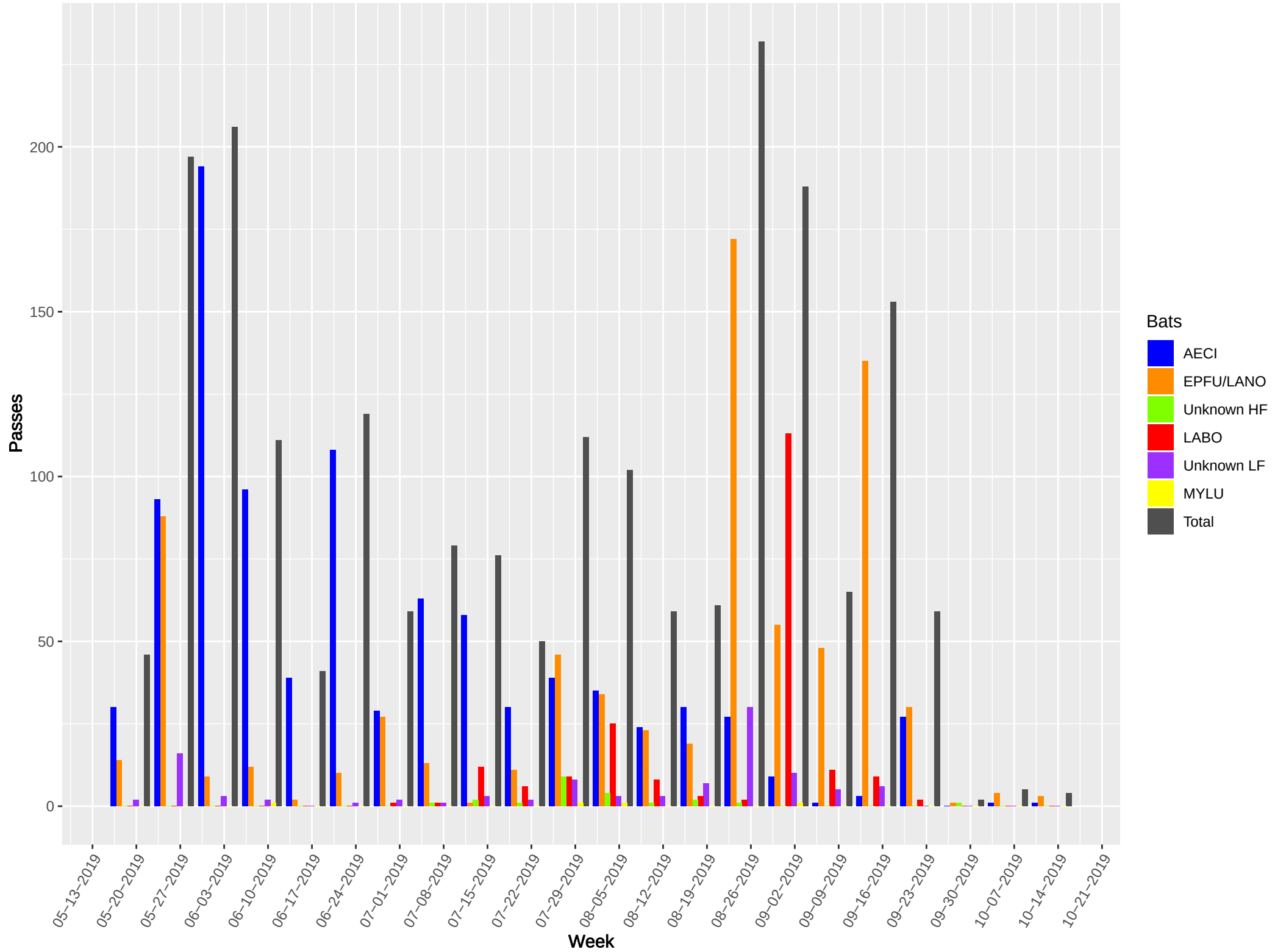


Figure 7: Species by Week



APPENDIX B

TABLES

DRAFT

Table 1. Nightly mean bat use per detector location.

Station	Type	Bat Calls			Detector Nights	Mean Nightly Bat Passes (± SE)
		High Frequency	Low Frequency	Total		
BMg1	Ground	38	289	327	128	2.55 ± 0.35
BMg2	Ground	18	354	372	147	2.53 ± 0.40
BMg3	Ground	12	174	186	139	1.34 ± 0.25
BMg4	Ground	17	775	792	113	7.01 ± 1.18
BMr2	Raised	143	206	349	75	4.65 ± 1.60
Total Ground	Ground	85	1592	1677	527	3.18 ± 0.31
Total Raised	Raised	143	206	349	75	4.65 ± 1.60
Total	--	228	1798	2026	602	--

Table 2: Hourly mean bat use per detector location.

Station	Type	Bat Calls			Detector Hours	Mean Hourly Bat Passes (± SE)
		High Frequency	Low Frequency	Total		
BMg1	Ground	38	289	327	1792	0.17 ± 0.02
BMg2	Ground	18	354	372	2058	0.17 ± 0.02
BMg3	Ground	12	174	186	1946	0.09 ± 0.01
BMg4	Ground	17	775	792	1582	0.47 ± 0.04
BMr2	Raised	143	206	349	1050	0.31 ± 0.08
Total Ground	Ground	85	1592	1677	7378	0.21 ± 0.01
Total Raised	Raised	143	206	349	1050	0.31 ± 0.08
Total	--	228	1798	2026	8428	--

Table 3: Frequency of recorded bat calls at each detector (noise excluded).

Site	Call Analysis ID	Passes	Site Percentage	Project Percentage
BMg1	AECI	43	13.15%	2.12%
	EPFU/LANO	221	67.58%	10.91%
	HF	6	1.83%	0.30%
	LABO	30	9.17%	1.48%
	LF	25	7.65%	1.23%
	MYLU	2	0.61%	0.10%
	Station Total	*327*	-	*16.14%*
BMg2	AECI	21	5.65%	1.04%
	EPFU/LANO	300	80.65%	14.81%
	HF	5	1.34%	0.25%
	LABO	12	3.23%	0.59%
	LF	33	8.87%	1.63%
	MYLU	1	0.27%	0.05%
	Station Total	*372*	-	*18.36%*
BMg3	AECI	115	61.83%	5.68%
	EPFU/LANO	39	20.97%	1.92%
	HF	1	0.54%	0.05%
	LABO	11	5.91%	0.54%
	LF	20	10.75%	0.99%
	Station Total	*186*	-	*9.18%*
BMg4	AECI	728	91.92%	35.93%
	EPFU/LANO	37	4.67%	1.83%
	HF	5	0.63%	0.25%
	LABO	11	1.39%	0.54%
	LF	10	1.26%	0.49%
	MYLU	1	0.13%	0.05%
	Station Total	*792*	-	*39.09%*
BMr2	AECI	30	8.60%	1.48%
	EPFU/LANO	160	45.85%	7.90%
	HF	5	1.43%	0.25%
	LABO	138	39.54%	6.81%
	LF	16	4.58%	0.79%
	Station Total	*349*	-	*17.23%*
Totals	AECI	937	-	46.25%
	EPFU/LANO	757	-	37.36%
	HF	22	-	1.09%
	LABO	202	-	9.97%
	LF	104	-	5.13%
	MYLU	4	-	0.20%
Total Bat Calls		*2026*		100.00%

Table 4. Frequency of all recordings at each detector (includes noise).

Site	Call Analysis ID	Passes	Site Percentage	Project Percentage
BMg1	AECI	43	0.99%	0.16%
	EPFU/LANO	221	5.07%	0.82%
	HF	6	0.14%	0.02%
	LABO	30	0.69%	0.11%
	LF	25	0.57%	0.09%
	MYLU	2	0.05%	0.01%
	Noise	4028	92.49%	15.00%
BMg2	AECI	21	0.19%	0.08%
	EPFU/LANO	300	2.69%	1.12%
	HF	5	0.04%	0.02%
	LABO	12	0.11%	0.04%
	LF	33	0.30%	0.12%
	MYLU	1	0.01%	0.00%
	Noise	10762	96.66%	40.08%
BMg3	AECI	115	3.45%	0.43%
	EPFU/LANO	39	1.17%	0.15%
	HF	1	0.03%	0.00%
	LABO	11	0.33%	0.04%
	LF	20	0.60%	0.07%
	Noise	3147	94.42%	11.72%
BMg4	AECI	728	32.59%	2.71%
	EPFU/LANO	37	1.66%	0.14%
	HF	5	0.22%	0.02%
	LABO	11	0.49%	0.04%
	LF	10	0.45%	0.04%
	MYLU	1	0.04%	0.00%
	Noise	1442	64.55%	5.37%
BMr2	AECI	30	0.52%	0.11%
	EPFU/LANO	160	2.76%	0.60%
	HF	5	0.09%	0.02%
	LABO	138	2.38%	0.51%
	LF	16	0.28%	0.06%
	Noise	5445	93.98%	20.28%
Totals	AECI	937	--	3.49%
	EPFU/LANO	757	--	2.82%
	HF	22	--	0.08%
	LABO	202	--	0.75%
	LF	104	--	0.39%
	MYLU	4	--	0.01%
	Noise	24824		92.45%
Total Recordings		*26850*	24824	--

APPENDIX C

PHOTO LOG

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PHOTO LOG

Badger Wind Project

Logan and McIntosh Counties, North Dakota, May 23-October 16, 2019



Photo 1. A view of pastureland on site. Agricultural and grazing are common practices throughout the site.



Photo 2. Initial deployment of BMg1, with an SM3 unit, at ground level.



Photo 3. Initial deployment of BMg2, with an SM4 unit, at ground level.



Photo 4. Initial deployment of BMg3, with an SM4, at ground level.



Photo 5. Initial deployment of BMg4, with an SM4, at ground level.



Photo 6. Installing the microphone at BMr2. Initially deployed with an SM3. In background you can see BMg2.

YEAR 2 ACOUSTIC BAT MONITORING

BADGER WIND PROJECT

Prepared for

Badger Wind, LLC
401 N. Michigan Ave
Suite 501
Chicago, IL 60611

Atwell Project No. 19000785

Submitted by Atwell, LLC

March 5, 2021

TABLE OF CONTENTS

TABLE OF CONTENTS **2**

APPENDICES **2**

ACRONYMS AND ABBREVIATIONS **3**

1 INTRODUCTION **4**

1.1 STUDY AREA 4

1.2 NORTH DAKOTA STATE WILDLIFE ACTION PLAN 4

1.3 BATS OF NORTH DAKOTA 5

2 METHODS **7**

2.1 BAT ACOUSTIC MONITORING 7

2.2 STATION INSTALLMENT 7

2.3 DETECTOR DEPLOYMENT 7

2.4 ACOUSTIC FILES ANALYSIS 8

2.5 DATA ANALYSIS 9

3 RESULTS **10**

3.1 SURVEY EFFECTIVENESS 10

3.2 MEAN USE 10

3.3 SPECIES PERCENTAGES AND SPATIAL DISTRIBUTION 10

3.4 TEMPORAL SPECIES DISTRIBUTION 11

4 DISCUSSION AND CONCLUSIONS **12**

REFERENCES **14**

APPENDICES

Appendix A Figure 1. Land cover in the project area (NLCD 2016)
Figure 2. Acoustic monitoring locations
Figure 3. Nightly Mean Use
Figure 4. Hourly Mean Use
Figure 5. Species by Station
Figure 6. Call files by Species and Station
Figure 7. Species by Week

Appendix B Table 1. Nightly Mean Use per Station
Table 2. Hourly Mean Use per Station
Table 3. Frequency of Recorded Bat Passes (noise excluded).
Table 4. Frequency of All Files Recorded (noise included).

Appendix C Photo log

ACRONYMS AND ABBREVIATIONS

AECI	*Aeorestes cinereus* (hoary bat)
amsl	above mean sea level
BCI	Bat Conservation International
EPFU	*Eptesicus fuscus* (big brown bat)
ESA	Endangered Species Act
ft	feet
HF	High Frequency
kHz	kilohertz
LABO	*Lasiurus borealis* (eastern red bat)
LANO	*Lasionycteris noctivagans* (silver-haired bat)
LF	Low Frequency
MET	Meteorological Evaluation Tower
MRLC	Multi-Resolution Land Characteristics
MYLU	*Myotis lucifugus* (little brown bat)
MYSE	*Myotis septentrionalis* (northern long-eared bat)
MYSP	*Myotis* species
NDWWC	North Dakota Wind and Wildlife Collaboration
NLCD	National Land Cover Database
NDGFD	North Dakota Game and Fish Department
noID	No identification to species
PVC	Poly-vinyl Chloride
RSZ	Rotor Sweep Zone
SCP	Species of Conservation Priority
SE	Standard Error
SWAP	State Wildlife Action Plan
TES	Threatened and Endangered Species
USFWS	United States Fish and Wildlife Service

1 INTRODUCTION

Badger Wind, LLC (Badger Wind) a wholly owned subsidiary of Ørsted Onshore North America retained Atwell, LLC (Atwell) to conduct migration acoustic monitoring for the Badger Wind Project (the project), an approximately 121,695-acre potential wind energy development site located in Logan and McIntosh counties, North Dakota (the project area; Figure 1). Acoustic monitoring was conducted in accordance with North Dakota Native Wildlife Resources: Guidelines for Reducing Impacts from Wind Energy Development (NDWWC 2018). The purpose of this monitoring is to conduct pre-construction surveys to document bat activity at meteorological evaluation tower (MET) stations and ground stations at locations representative of turbine locations within the study area.

1.1 STUDY AREA

Badger Wind is currently in the early stages of developing a wind energy project in rural south-central North Dakota. The approximate centroid of the project area is near 46.239702°N, 99.626697°W. The project area, situated in Logan and McIntosh counties, is approximately 36 miles east of the Missouri River, 55 miles southeast of Bismarck, North Dakota, 54 miles southwest of Jamestown, North Dakota, and 11 miles north of the South Dakota border. Approximately 60% (73,380 acres) of the 121,695-acre project area is in McIntosh County and approximately 40% (48,315 acres) is in Logan County (Figure 1).

The project area is located within a largely rural landscape containing agricultural fields, herbaceous lands including pastures, and some dispersed single-family rural residences. A network of paved and unpaved roads provides access throughout the project area. According to the 2016 National Land Cover Database (NLCD), the major land use types within the project area include: cultivated crops (approximately 56% of the project area), and herbaceous land (approximately 35% of the project area; MRLC 2016). Overall, the project area is dominated by agricultural land use and supports a mix of cultivated cropland, hayfields, pasturelands, and grasslands. A network of streams with herbaceous riparian buffers and scattered freshwater ponds, emergent wetlands, and livestock ponds are present. Forested habitat is limited and highly fragmented, consisting primarily of planted shelterbelts. The general topography of the region and the project area can be described as undulating, with approximate elevations between 1,970 and 2,200 feet (ft) above mean sea level (amsl) within the project area.

1.2 NORTH DAKOTA STATE WILDLIFE ACTION PLAN

North Dakota Game and Fish Department (NDGFD) does not maintain a list of state-level threatened and endangered species (TES), but rather defaults to those species federally protected under the Endangered Species Act (ESA) as those it recognizes with a threatened or

endangered status (NDGFD 2015). The U.S. Fish and Wildlife Service (USFWS) has primary oversight of TES in North Dakota.

The North Dakota State Wildlife Action Plan (SWAP) is the principle guiding document for safeguarding rare and declining species of fish and wildlife within the state. The plan places an emphasis on the protection of diverse native habitats to maximize the preservation of native wildlife diversity. The SWAP includes a list of 115 species of greatest conservation priority, and each has been given a priority designation based on conservation need (Species of Conservation Priority [SCP] Levels I, II, and III). SCP Level I are species that have declining populations in North Dakota or across their range, or are species that are at risk, range-wide, and have a high rate of occurrence in North Dakota constituting the core of the species' breeding range. SCP Level I receive the most funding from the state wildlife grant. SCP Level II are species of moderate conservation priority, or species with a high level of conservation priority that receive a substantial level of monetary support from non-state wildlife grant funding. SCP Level III are species of moderate conservation priority but are peripheral or non-breeding in North Dakota (NDGFD 2016d). The SWAP has no regulatory authority over industrial development on private land (NDGFD 2016 pers. comm.). Should a project development impact state-listed species of conservation concern on public lands, the NDGFD and SWAP can assist in providing steps to reduce or minimize these impacts.

1.3 BATS OF NORTH DAKOTA

Eleven species of bats are known to occur in North Dakota: Townsend's big-eared bat (*Corynorhinus townsendii*), big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), , hoary bat (*Aeorestes cinereus*), western small-footed bat (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), little brown bat (*Myotis lucifugus*), fringed myotis (*Myotis thysanodes*), long-legged myotis (*Myotis volans*), and northern long-eared bat (*Myotis septentronalis;* MYSE) (Nelson, Barnhart, and Gillam 2015). The MYSE is the only listed species and is federally threatened. NDGFD has classified Townsend's big-eared bat, big brown bat, little brown bat, and MYSE as SCP Level I and western small-footed bat, long-eared myotis, and long-legged myotis as SCP Level III (Dyke, Johnson, and Isakson 2015).

According to Bat Conservation International (BCI) species profiles and previous studies in North Dakota, the ranges of Townsend's big-eared bat, western small-footed bat, long-eared myotis, fringed myotis, and long-legged myotis include small portions of western North Dakota (BCI 2019; Nelson, Barnhart, and Gillam 2015). These five SCP were only documented in the Badlands (Nelson, Barnhart, and Gillam 2015); thus, they are unlikely to occur within the project area and will not be discussed further.

Species that may occur, with varying likelihood, within the project area include (NDGFD 2016a; 2016b; 2016c; BCI 2019):

- eastern red bat (LABO)
- hoary bat (AECI)
- silver-haired bat (LANO)
- big brown bat (EPFU; SCP Level I)
- little brown bat (MYLU; SCP Level I)
- northern long-eared bat (MYSE; SCP Level I; federally threatened)

Additional information regarding these species and habitat within the project area can be found within the Bat Habitat Assessment dated January 23, 2020 (Atwell 2020).

2 METHODS

2.1 Bat Acoustic Monitoring

Acoustic surveys were completed during the spring (April 14 – May 15), summer (May 15 – August 15), and fall (August 16 – October 15) seasons in 2020. Six (6) Song Meter full spectrum ultrasonic detectors (SM3 or SM4; Wildlife Acoustics, Inc; www.wildlifeacoustics.com) were deployed at representative turbine locations utilizing available MET stations and ground stations within the project area. Refer to Figure 2 for monitoring station locations.

2.2 Station Installment

Four ground-based stations (BMg1, BMg2, BMg3, BMg4) and two raised MET stations (BMr1, BMr2) were deployed using SM3 or SM4 detectors for the study (Figure 2). Detectors installed on MET towers were positioned to record bat activity at approximately ground level and to record bat activity within the rotor sweep zone (RSZ), in accordance with the North Dakota Native Wildlife Resources: Guidelines for Reducing Impacts from Wind Energy Development (NDWWC 2018).

Each ground-based station included one detector that was secured to a poly-vinyl chloride (PVC) tube encasing the microphone cable. Atop the PVC tubing was a 90-degree PVC elbow to secure the SMM-U1 external ultrasonic microphone. Allowing the microphone to sit parallel to the ground recording at an approximate height of 3 meters (m).

MET stations (BMr1 and BMr2) were paired with a ground-based station (BMg1 and BMg2, respectively). Each MET station included one detector that was secured to fencing around the MET. Each microphone and microphone cable were raised using a K-bat pulley system installed on the MET. The SMM-U1 external ultrasonic microphones recorded acoustic data at an approximate height of 50 m, representative of the RSZ.

A photo log of all stations is included in Appendix C.

2.3 Detector Deployment

All ground-based detectors were deployed on April 15, 2020 (BMg1, BMg2, BMg3, BMg4). The raised MET detectors were deployed on April 14, 2020 (BMr1, BMr2). BMg2 was deployed with an SM3 detector, while all other stations were deployed with SM4 detectors. Detectors recorded from approximately 30 minutes before sunset to 30 minutes after sunrise each night during the monitoring period. Detectors were visited routinely to ensure units worked properly, to collect data, and to change data cards and batteries.

A detector night was equivalent to one detector properly operating for one entire night (30 minutes before sunset to 30 minutes after sunrise). Detector hours were defined as the number of hours a detector was properly operating for each detector night.

2.4 Acoustic Files Analysis

Acoustic files (files) were assessed using USFWS-approved Kaleidoscope Pro automated ID software (Wildlife Acoustics, Inc. v. 4.2.0) sand were identified to species when appropriate and where feasible. The following parameters were applied to the software (approved for use by USFWS; USFWS 2020):

- Classifier: NA 4.1.0
- "0" Sensitivity
- Approved for both Indiana bat and northern long-eared bat calls
- Analysis was set to include all species with ranges overlapping with project area

A bat pass was defined as a sequence of at least two echolocation calls (pulses) produced by an individual bat. Bat passes classified by the software as MYLU (little brown bat), MYSE (northern long-eared bat), or noID (indicating that a bat pass was identified but could not be categorized to species) underwent qualitative analysis by a biologist with sufficient bat acoustic call vetting experience through visual comparison of echolocation call metrics (i.e., call sequence activity and call duration, call slope, minimum frequency, and individual call characteristics representative of individual species). These files were manually vetted using the viewer in SonoBat acoustic software (v4.2.2 North America). Files were initially differentiated into two classes: high frequency calls (those with a low frequency above 30 kilohertz, kHz) and low frequency calls (those with a low frequency below 30 kHz). From here, files were identified to species/species group when possible or remained in the coarse high frequency call (HF) or low frequency call (LF) classification. Species categories evaluated for as part of the analysis consisted of AECI (hoary bat), EPFU/LANO (big brown bat and silver-haired bat), LABO (eastern-red bat), MYLU (little brown bat), MYSE (northern long-eared bat), and MYSP (unidentified myotis species). Additionally, any file that did not include obvious bat calls were classified as "noise" and removed from further analysis.

Low frequency bats included EPFU, LANO, and AECI. EPFU and LANO were paired due to similar call characteristics. The passes for EPFU and LANO were differentiated from AECI based on the low frequency of the calls in the sequence. EPFU and LANO calls are consistently above 25 kHz, while AECI calls are consistently below 25 kHz, with some calls below 20 kHz. If a mix of calls was found in the sequence or the recording was determined to be a bat but possessed too few calls for conclusive identification, they were classified as LF.

High frequency bats included LABO, MYLU, MYSE, and MYSP. Of the high frequency bats, LABO were differentiated from *Myotis* species by having long, sweeping calls with variable frequencies. *Myotis* calls possessed an obvious "tail" at the end of the call that is indicative of the genus in the state. Some calls of LABO, most notably feeding buzzes (a short duration call used when approaching prey items), can be confused as *Myotis* species. If enough of the LABO call sequence is recorded, the calls leading to the feeding buzz possess the typical characteristics of LABO and thus can be classified as such. MYSE and MYLU were differentiated by the shape and duration of the call as MYSE has a steeper, shorter duration call than MYLU (Humboldt State University Bat Lab 2011). Files were only classified as MYSE if all calls in the sequence possessed the steeper, shorter duration indicative of the species. If calls indicative of both MYSE and MYLU were present in the sequence, the pass was classified as MYSP. For files classified as MYSP, identification to the species level is inaccurate and inconclusive based on the bat passes recorded; therefore, the course identification to the *Myotis* genus is utilized for file classification. Similar to LF files, files classified as HF were inconclusive and could not be classified beyond the coarse identification.

2.5 Data Analysis

Data were organized and analyzed with Microsoft Excel, Program R, and Program RStudio (R Core Team 2019; R StudioTeam 2018). Statistics/data analysis in this report includes:

- Detector recording effectiveness
- Site species richness
- High frequency and low frequency mean use
    - Nightly mean use
    - Hourly mean use
- Species Proportions
- Location distribution of species

Acoustic data were standardized across time. Mean use statistics were calculated for each call frequency group (e.g., high frequency [HF], low frequency [LF], and all bats [Total]) per station per deployment period (e.g., detector nights or detector hours). It is important to note that mean use does not reflect absolute density of a particular call frequency group, and the number of individuals present cannot be determined by number of passes identified.

Standard errors (SE) are reported alongside total bat passes per station mean use values. To calculate the SE, bat passes were theoretically resampled 1,000 times using bootstrapping.

Frequency of bat passes is the percentage that a particular species was recorded on completed detector nights per station and for completed detector nights per project area.

3 RESULTS

3.1 Survey Effectiveness

SM3 and SM4 detectors collected data for 1,097 detector nights, an overall 99.73% effectiveness for the study period. Survey effectiveness per detector unit ranged from 98.36% (BMg2) to 100% (BMg1, BMg3, BMg4, BMr1, BMr2).

3.2 Mean Use

All detectors were operational for 15,358 hours over 1,097 detector nights. Mean use by station and detector nights are displayed in Table 1 and Figure 3. Across all six stations, the average number of bat passes per night was 1.03 ± 0.07 and an hourly mean of 0.07 ± 0.00. Ground stations had a mean of 1.01 ± 0.09 SE bat passes per detector night and the MET stations had a mean of 1.06 ± 0.11 SE bat passes per detector night. Ground stations and MET stations operated for 10,206 hours and 5,152 hours, respectively. Mean use by station and detector hours are displayed in Table 2 and Figure 4. Ground stations had a mean of 0.07 ± 0.00 SE bat passes per hour and MET stations had a mean use of 0.07 ± 0.00 SE bat passes per hour.

Overall, bat mean use by night and by hour for all detector locations was relatively low. BMg1 saw the highest mean use by night and by hour, 2.01 ± 0.30 SE and 0.13 ± 0.01 SE, respectively.

3.3 Species Percentages and Spatial Distribution

Throughout the survey period, 63,417 total files were recorded. Of these, 62,283 files (98.21%) were categorized as “Noise” and were consequently filtered out during automated identification and manual vetting, leaving 1,134 total bat passes for analysis (Table 4).

Approximately 81.66% of all recorded bat activity came from LF species (AECI, EPFU/LANO, LF passes). The remaining 18.34% of passes included HF species (LABO, MYLU, MYSP and HF passes). Following analysis using the automated Kaleidoscope software, nine files were classified as MYSE; however, following manual vetting, all nine files were debunked as noise files that were misidentified by the automated software. Of the remaining files analyzed, only two were manually classified as *Myotis* species as there were calls characteristic of MYSE and MYLU (one was classified by the automated software as noID and the other was classified as MYLU). It should be noted that MYSP is a course identification for *Myotis* spp. and identification to the species level was therefore not obtained. However, with only two files classified, MYSP only made up approximately 0.18% of all recorded bat passes. For a breakdown of recorded bat passes refer to Table 3.

EPFU/LANO had the highest frequency of passes across all stations (485 passes; 42.77% of bat passes) followed by AECI (418 passes; 36.86% of bat passes), LABO (202 passes; 17.81% of bat passes), MYLU (3 passes; 0.26% of bat passes), and MYSP (2 passes, 0.18% of bat passes; Table 3). HF and LF categorized bat passes made up 0.09% and 2.03% of bat passes, respectfully.

BMg1 possessed the highest number of bat passes among the six detector locations (370 passes; 32.63% of the bat passes) followed by BMr1 (204 passes; 17.99%), BMr2 (190 passes; 16.75%), BMg3 (161 passes; 14.20%), and BMg4 (102 passes; 8.99%). In comparisons of the MET locations with two simultaneously recording detectors, BM1 had more activity (574 passes) than BM2 (298 passes). Ground based units also recorded more activity (478 passes) than raised units (394 passes), but the sample size for these two comparisons was too small to test for statistical significance.

EPFU/LANO and AECI had the highest percentage of bat passes per station (42.77% and 36.86%, respectfully). However, AECI activity represented a minimal percentage of total bat passes at BMr2 (3.79%). EPFU/LANO had the highest percent of bat passes at BMg2, BMg3, BMg4, and BMr2. AECI had the highest percent of bat passes at BMg1 and BMr1 (Table 3; Figure 5). At MET locations where both detectors were recording, EPFU/LANO and AECI were more commonly detected at ground locations (180 and 234, respectively) than at raised locations (166 and 135, respectively). LABO was highest at BMg2 and BMr1 (24.26% and 22.77%, respectively). LABO was the only species more commonly detected at raised sites (91 passes) compared to ground sites (56 passes) at MET locations where two detectors were recording. Only five *Myotis* spp. files (three passes identified as MYLU; 0.26% of recorded bat activity, and two passes identified as MYSP, 0.18% of recorded bat activity) were recorded during the study, all of which occurred on ground-based detector locations.

3.4 Temporal Species Distribution

All files identified as bat passes are displayed by their identification through Kaleidoscope software and/or manual vetting (i.e., species and/or call frequency group) and station across date and time in Figure 6. AECI exhibited activity distributed throughout the night, including shortly after sunset and prior to sunrise, throughout the entire monitoring season. EPFU/LANO activity was also distributed throughout the night, but had more concentrated activity in May, June, September and October. Activity was substantially lower for these species from mid-June to mid-July. LABO had distributions of activity throughout the survey period but were most notable in August. In addition, this peak in LABO activity occurred mostly at the raised stations, BMr1 and BMr2 (Table 3).

Seasonal distribution of species is grouped by week in Figure 7. Overall bat passes recorded across the project area had a slight peak in late-April and early-May and had a large peak in

mid- and late-August (Figure 7). Recorded bat passes across all species rapidly declined by late-September.

Throughout most of the survey season, EPFU/LANO was the dominant species detected across all stations and accounted for 42.77% of all bat passes (Table 3). EPFU/LANO species had peak activity in the spring (April 14 – May 18) and fall (August 24 – September 28) seasons (Figure 7). AECI exhibited the greatest frequency of bat passes during nights in the summer season (May 18 – July 13) AECI accounted for 36.86% of all bat passes and accounted for the second most recorded identification category. LABO accounted for the third highest percentage of all recorded bat passes (17.81%) and had the greatest total bat passes in the late summer, early fall (July 27 – Aug 3), and at the end of the survey period in October. Total bat passes were driven by AECI in May, June, and July with EPFU/LANO species dominating most of the bat species activity in spring and fall. Four *Myotis* spp. (MYLU and MYSP) passes were detected in late July and a MYLU bat pass was also detected at the end of August.

4 DISCUSSION AND CONCLUSIONS

Overall bat activity throughout the project was low with an average of one bat pass per night. Due to the lack of suitable bat habitat in the project area (i.e., waterways and forested areas), this observation was expected as bats would have to commute longer distances from roost locations to forage in these areas. A preconstruction survey in similar habitat in South Dakota (approximately 200 km SE) yielded fewer than two passes per night (Pickle, Bishop-Boros, and Solick 2017). Bat activity between ground-based stations and MET stations were similar (1.01 ± 0.09 SE bat passes per detector night, and 1.06 ± 0.11 SE bat passes per detector night, respectively). However, MET stations had fewer detector nights than the ground-based stations, making the sample size smaller and incurring a slightly higher standard error (SE) than the ground-based mean.

BMg1 had the highest bat activity compared to all stations, and this higher activity was largely driven by AECI (58.92% of bat passes at BMg1). However, BMg1 has very limited suitable habitat and/or shelterbelts within the vicinity of the station. There is a livestock pond approximately 0.34 miles east of the station. AECI are large bats and accustomed to foraging in open areas, which may have contributed to the activity observed for this species (Norberg and Rayner 1987).

BMg4 had the lowest bat activity compared to all stations, with only 0.16% of all files throughout the project area categorized as bat passes. BMg4 is in a very open area of the project, with limited suitable habitat in the immediate vicinity. In contrast with 2020 results, BMg4 saw the highest level of bat activity during the Year 1 Migration Bat Activity Monitoring in 2019.

Over two years of monitoring, the relatively highest level of bat activity was observed in association with ground-based acoustic stations located in the northeastern portion of the project area and during fall migration. Much of this activity can be attributed to activity peaks related to AECI migration. A peak in AECI activity was observed at BMg4 in the spring of 2019 and a peak in AECI activity was observed at BMg1 in the fall of 2020. It therefore appears that there are short periods of AECI activity that occur seasonally during spring and fall migration. However, large peaks in AECI activity was not observed across all migration seasons.

Additionally, during acoustic file analysis it was noted that BMr1 possessed a disproportionately high number of passes classified to species compared to the other five stations. Upon manual review, these files contained pulsing noises that were being classified to species. In many cases, the low frequency noises resembled those of low frequency bats (AECI, EPFU, LANO) and would have normally been classified as such. However, the manual vetting process found little to no evidence of bat activity throughout the night and the consistency with which these noise files were found indicated that they were misidentified noise files by the software program. As a result, the manual vetting of files classified by the automated software as noID or as any bat species recorded on BMr1 allowed for the proper identification and removal of false positives.

The majority of bat passes over the monitoring period were made by LF bats and a seasonal bimodal distribution was largely driven by LF bats in spring, mid-April through mid-May (dominated by EPFU/LANO) and fall, mid-August through mid-September (dominated by AECI and/or EPFU/LANO) (Figure 7). AECI also exhibited a nightly bimodal distribution (evening and morning peaks), particularly in June and July, but AECI activity becomes less concentrated and more evenly distributed across the night in the early spring and fall seasons (Figure 6). These observed trends in activity can be attributed to migratory behaviors in AECI and LANO which travel north to breeding grounds in the spring before traveling south in the fall to overwinter (Cryan 2003). These species are likely not year-round residents in the project area. Occurrences of EPFU/LANO through the summer stems from the grouping of these species as the two possess similar call characteristics and can be diffficult to distinguish. EPFU are year-round residents in North Dakota; thus, the recordings through the summer are most likely this species and not LANO.

Unlike low frequency species, high frequency species, such as MYLU, MYSP, and LABO, did not reflect these strong bimodal distributions in nightly activity. LABO did exhibit increased activity in the fall season. Due to the relative absence of activity earlier in the study, it is likely that these influxes were more related to seasonal migration. MYLU call data is limited (only three total calls), and no distinctive trends in activity can be discerned from this small sample size.

Despite the identification of the federally threatened MYSE in the Kaleidoscope automated analysis, evaluation of these nine files through manual vetting concluded that these were noise

files. While no MYSE passes were confirmed during the 2020 survey, two files were classified as MYSP indicating that the calls in the sequence possessed characteristics of MYLU and MYSE, but a conclusive identification could not be made. MYSE not being identified in the acoustic analysis could be attributed to a lack of suitable habitat within the project area, as discussed in the Bat Habitat Assessment Memorandum submitted by Atwell (Atwell 2020). MYSE are typically associated with forested habitat for foraging and roosting and do not normally venture into open agricultural landscapes in the midwest (White, Freeman, and Lemen 2017). Additionally, although previous bat survey work in North Dakota is limited, the eastern-most confirmed locations for MYSE in the state occur along the Missouri River, approximately 36 miles west of the study area (Nelson et al. 2015; Shank et al. 2015). Due to the lack of suitable habitat, the distance to the nearest known documentation of the species in the state, and the results of the acoustic monitoring study in 2020, we can conclude that MYSE are rare in the project area if they do occur, and are unlikely to be encountered. Note that migration monitoring is not intended to replace summer presence/absence studies for federally threatened and endangered species.

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APPENDIX A

FIGURES

Badger Wind

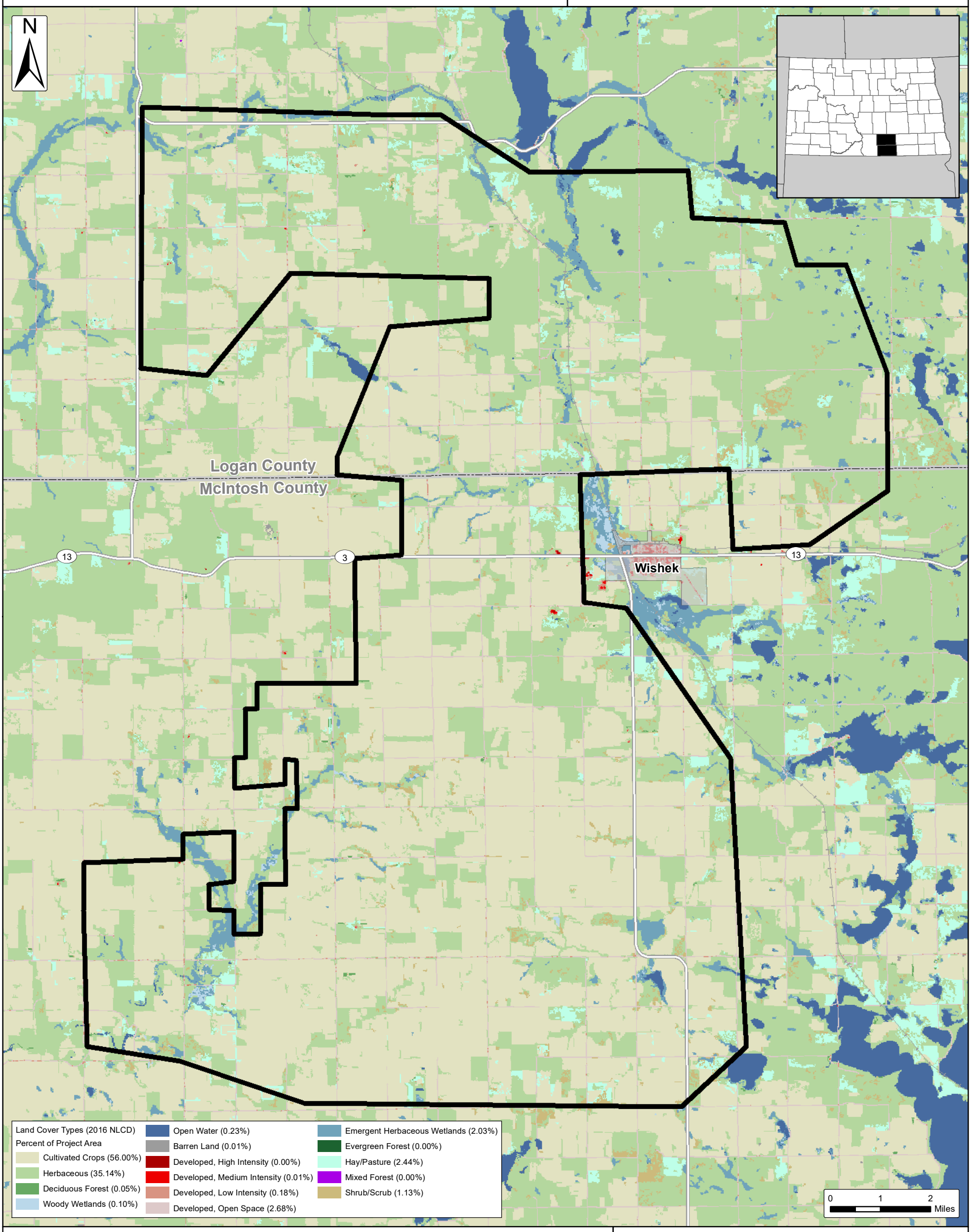
Figure 1. Land Cover

Logan County & McIntosh County, North Dakota

Client:
Badger Wind, LLC

Issue Date:
12/15/2020

Atwell, LLC Project:
19000785



Project Area
04/15/2019 (±121,695 Ac.)

City/Village

Counties

SOURCE: NATIONAL LAND COVER DATABASE 2016 (USGS)

ATWELL

The information contained on this map is proprietary and confidential. The use or disclosure of this information by you to third parties is prohibited by law and may give rise to civil or criminal liability.

Badger Wind

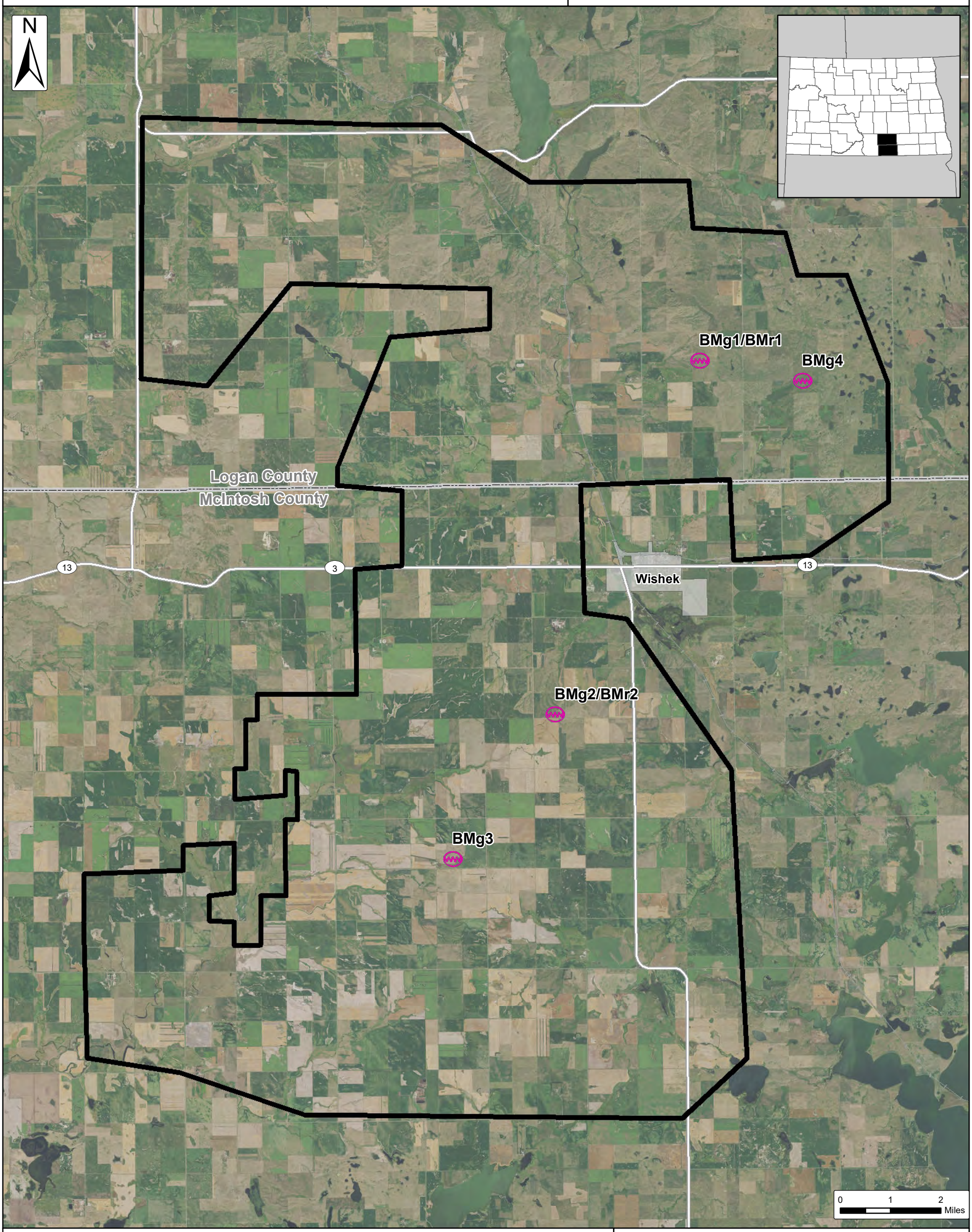
Figure 2. Bat Acoustic Monitoring

Logan County & McIntosh County, North Dakota

Client: Badger Wind, LLC

Issue Date: 2/4/2021

Atwell, LLC Project: 19000785



Acoustic Monitoring Site

Project Area
04/15/2019 (±121,695 Ac.)

City/Village

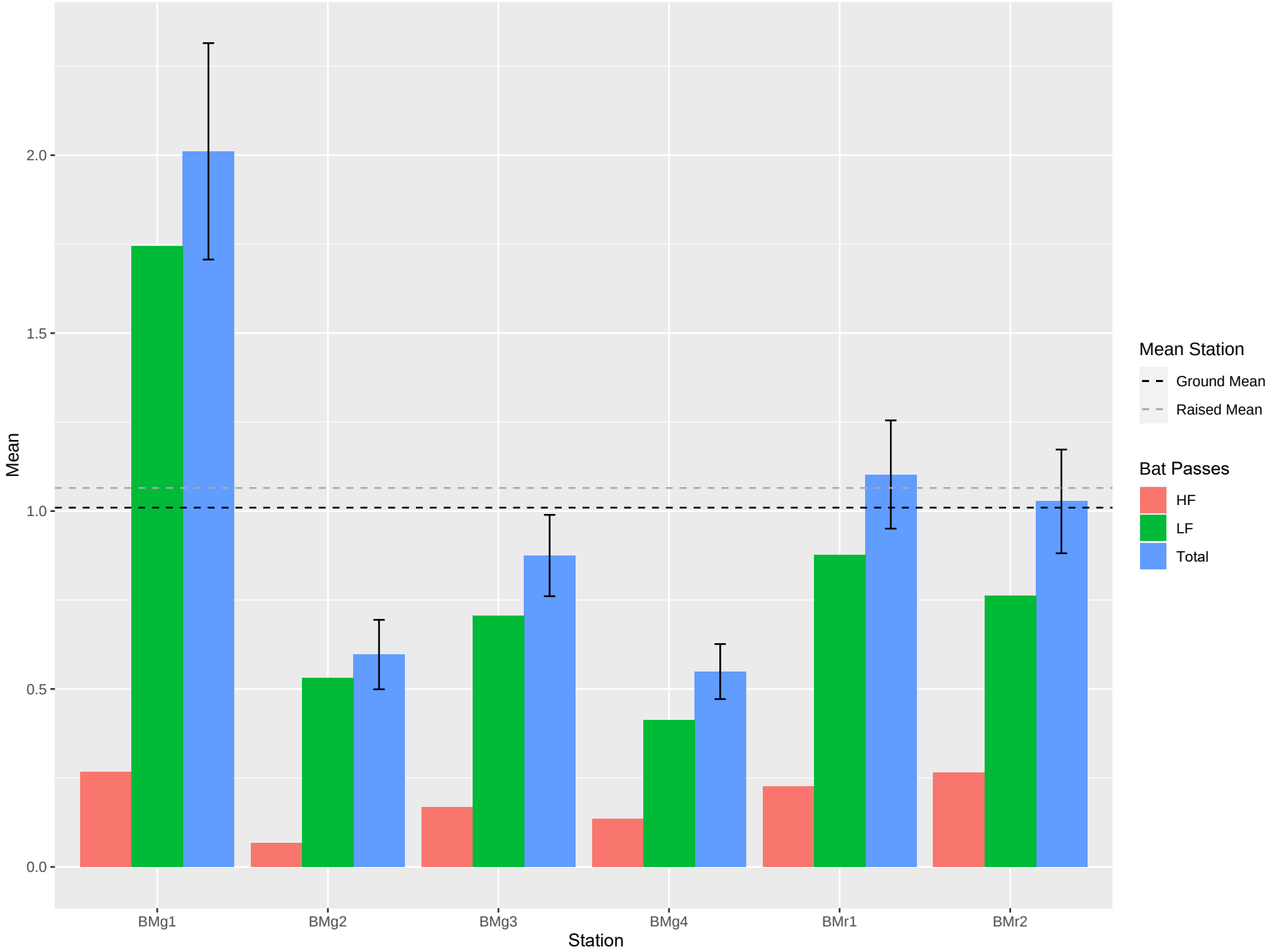
Counties

SOURCE: NATIONAL LAND COVER DATABASE 2016 (USGS)

ATWELL

The information contained on this map is proprietary and confidential. The use or disclosure of this information by you to third parties is prohibited by law and may give rise to civil or criminal liability.

Figure 3: Nightly Mean Use



Fgiure 4: Hourly Mean Use

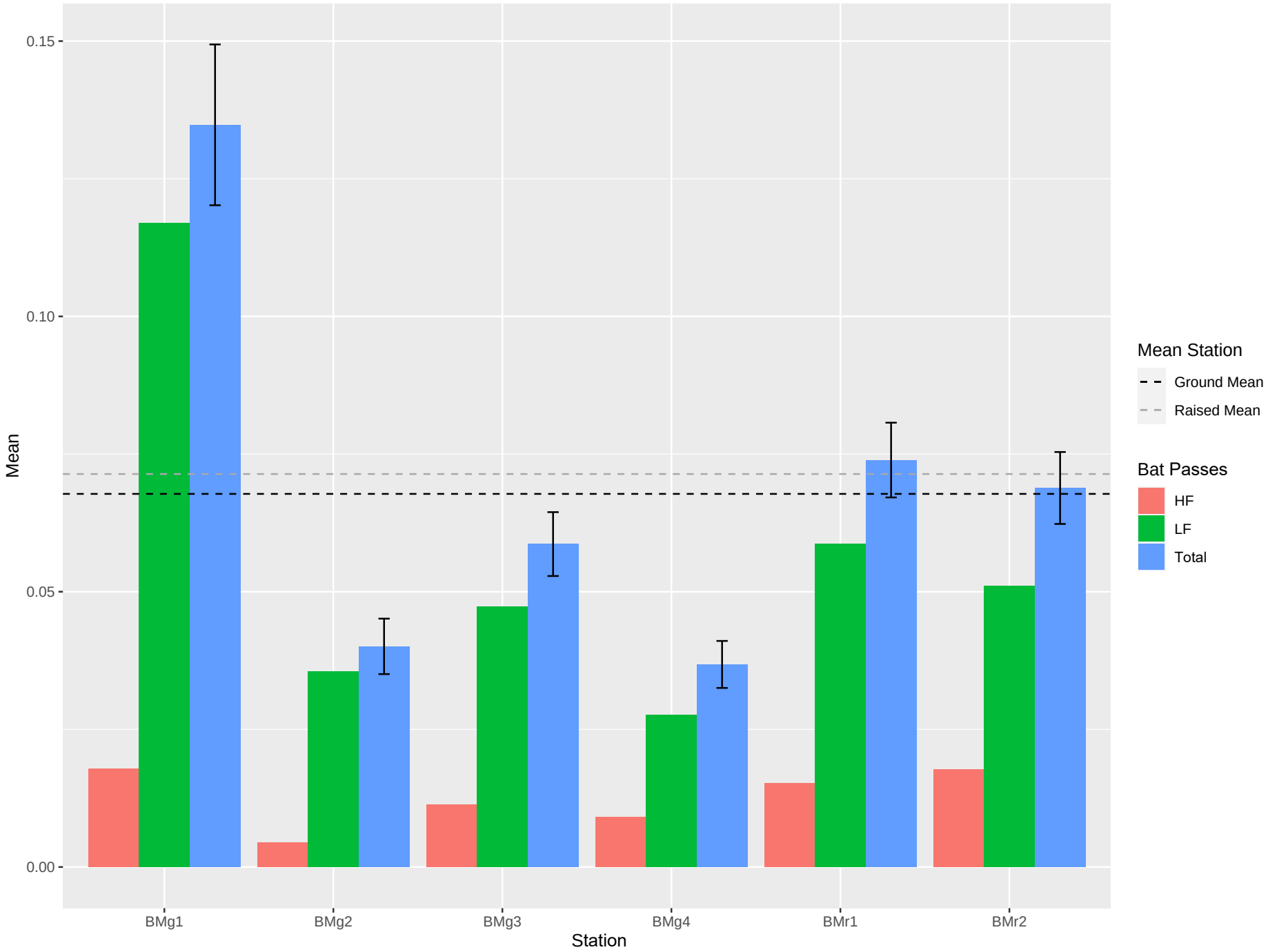


Figure 5: Species by Station

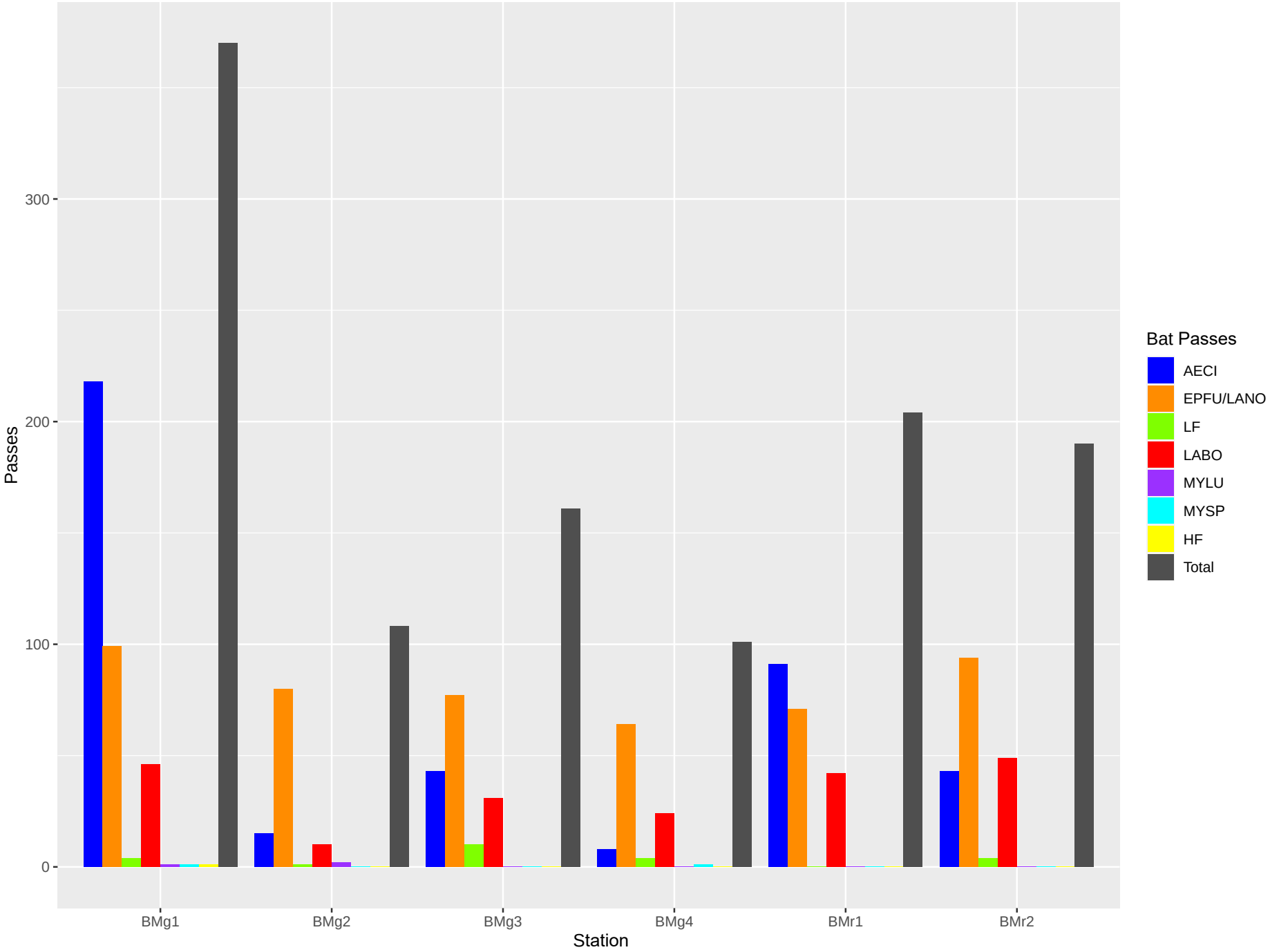


Figure 6: Call Files by Species and Station

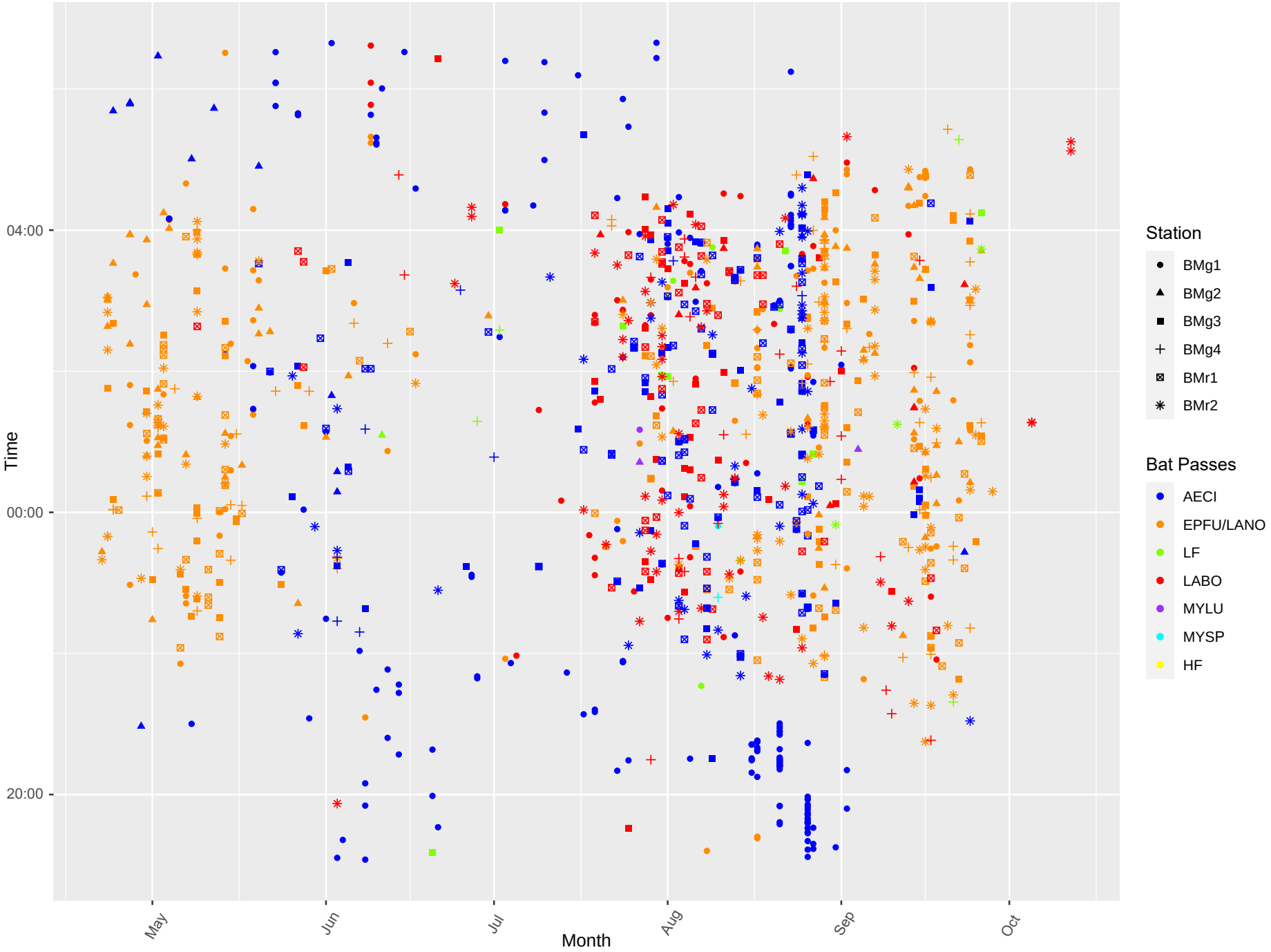
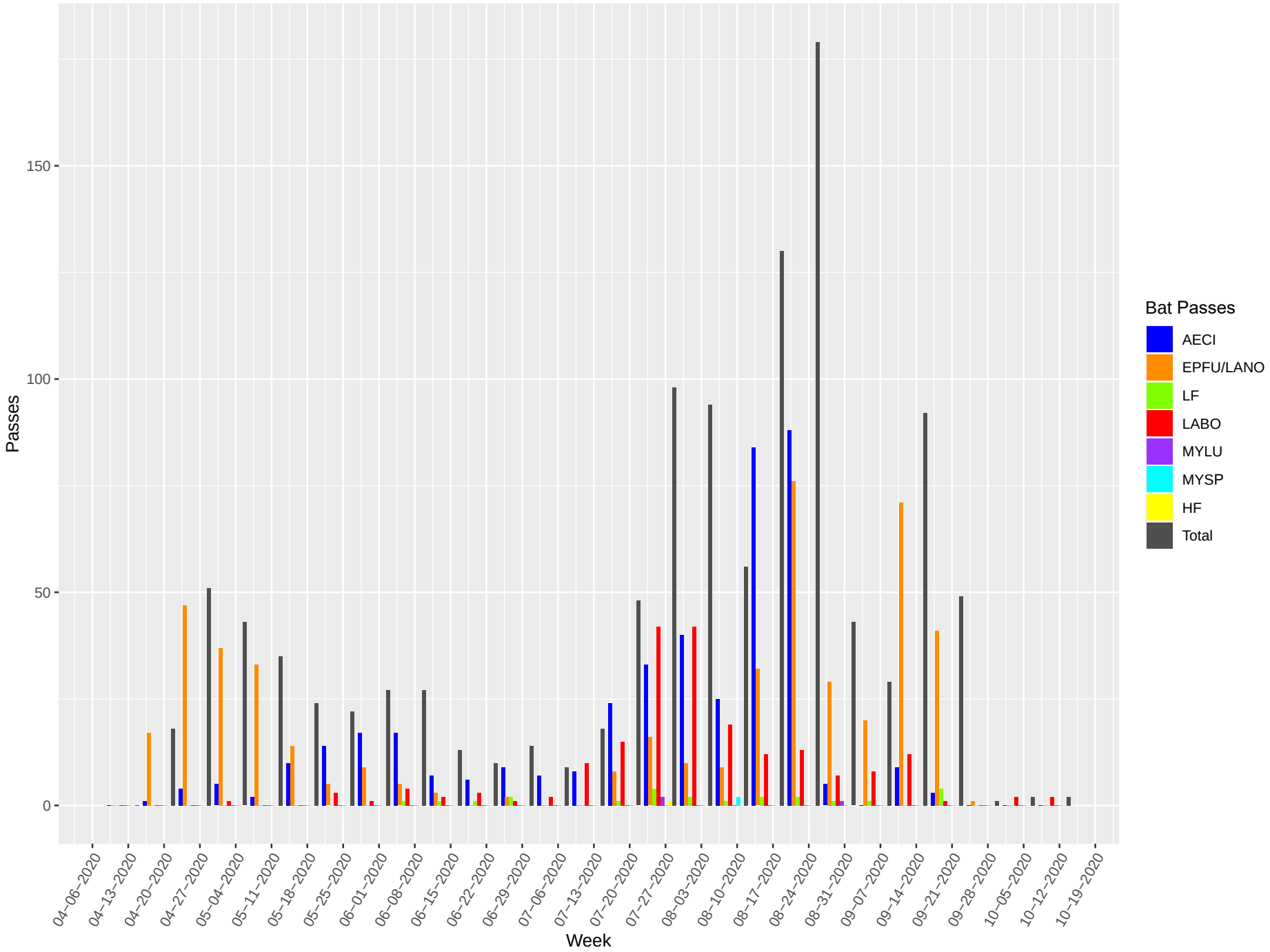


Figure 7: Species by Week



APPENDIX B

TABLES

Table 1. Nightly Mean Bat Use per Station

Station	Type	Bat Passes			Detector Nights	Mean Nightly Bat Passes (± SE)[c]
		High Frequency[a]	Low Frequency[b]	Total		
BMg1	Ground	49	321	370	183	2.01 ± 0.30
BMg2	Ground	12	96	108	180	0.60 ± 0.10
BMg3	Ground	31	130	161	183	0.88 ± 0.11
BMg4	Ground	25	76	101	183	0.55 ± 0.08
BMr1	Raised	42	162	204	184	1.10 ± 0.15
BMr2	Raised	49	141	190	184	1.03 ± 0.15
Total Ground	Ground	117	623	740	729	1.01 ± 0.09
Total Raised	Raised	91	303	394	368	1.06 ± 0.11
Total	--	208	926	1134	1097	--

[a] High Frequency includes: LABO, MYLU, MYSP, and HF
[b] Low Frequency includes AECI, EPFU/LANO, and LF
[c] Rounding has occurred

Table 2: Hourly Mean Bat Use per Station

Station	Type	Bat Passes			Detector Hours	Mean Hourly Bat Passes (± SE)[c]
		High Frequency[a]	Low Frequency[b]	Total		
BMg1	Ground	49	321	370	2562	0.13 ± 0.01
BMg2	Ground	12	96	108	2520	0.04 ± 0.01
BMg3	Ground	31	130	161	2562	0.06 ± 0.01
BMg4	Ground	25	76	101	2562	0.04 ± 0.00
BMr1	Raised	42	162	204	2576	0.07 ± 0.01
BMr2	Raised	49	141	190	2576	0.07 ± 0.01
Total Ground	Ground	117	623	740	10206	0.07 ± 0.00
Total Raised	Raised	91	303	394	5152	0.07 ± 0.00
Total	--	208	926	1134	15358	--

[a] High Frequency includes: LABO, MYLU, MYSP, and HF
[b] Low Frequency includes AECI, EPFU/LANO, and LF
[c] Rounding has occurred

Table 3: Frequency of Recorded Bat Passes (noise excluded)

Station	Call Analysis ID	Passes	Site Percentage[a]	Project Percentage[a]
BMg1	AECI	218	58.92%	19.22%
	EPFU/LANO	99	26.76%	8.73%
	LF	4	1.08%	0.35%
	LABO	46	12.43%	4.06%
	MYLU	1	0.27%	0.09%
	MYSP	1	0.27%	0.09%
	HF	1	0.27%	0.09%
	Station Total	370	100.00%	32.63%
BMg2	AECI	15	13.89%	1.32%
	EPFU/LANO	80	74.07%	7.05%
	LF	1	0.93%	0.09%
	LABO	10	9.26%	0.88%
	MYLU	2	1.85%	0.18%
	MYSP	--	--	--
	HF	--	--	--
	Station Total	108	100.00%	9.52%
BMg3	AECI	43	26.71%	3.79%
	EPFU/LANO	77	47.83%	6.79%
	LF	10	6.21%	0.88%
	LABO	31	19.25%	2.73%
	MYLU	--	--	--
	MYSP	--	--	--
	HF	--	--	--
	Station Total	161	100.00%	14.20%
BMg4	AECI	8	7.92%	0.71%
	EPFU/LANO	64	63.37%	5.64%
	LF	4	3.96%	0.35%
	LABO	24	23.76%	2.12%
	MYLU	--	--	--
	MYSP	1	0.99%	0.09%
	HF	--	--	--
	Station Total	101	100.00%	8.91%
BMr1	AECI	91	44.61%	8.02%
	EPFU/LANO	71	34.80%	6.26%
	LF	--	--	--

Station	Call Analysis ID	Passes	Site Percentage[a]	Project Percentage[a]
BMr1	LABO	42	20.59%	3.70%
	MYLU	--	--	--
	MYSP	--	--	--
	HF	--	--	--
	Station Total	204	100.00%	17.99%
BMr2	AECI	43	22.63%	3.79%
	EPFU/LANO	94	49.47%	8.29%
	LF	4	2.11%	0.35%
	LABO	49	25.79%	4.32%
	MYLU	--	--	--
	MYSP	--	--	--
	HF	--	--	--
	Station Total	190	100.00%	16.75%
Totals	AECI	418	--	36.86%
	EPFU/LANO	485	--	42.77%
	LF	23	--	2.03%
	LABO	202	--	17.81%
	MYLU	3	--	0.26%
	MYSP	2	--	0.18%
	HF	1	--	0.09%
Total Bat Passes		1134	--	100.00%

[a] Rounding has occurred

Table 4. Frequency of All Files Recorded (includes noise)

Station	Call Analysis ID	Passes	Site Percentage[a]	Project Percentage[a]
BMg1	AECI	218	9.78%	0.34%
	EPFU/LANO	99	4.44%	0.16%
	LF	4	0.18%	0.01%
	LABO	46	2.06%	0.07%
	MYLU	1	0.04%	0.00%
	MYSP	1	0.04%	0.00%
	HF	1	0.04%	0.00%
	Noise	1858	83.39%	2.93%
	Station Total	2228	100.00%	3.51%
BMg2	AECI	15	0.22%	0.02%
	EPFU/LANO	80	1.17%	0.13%
	LF	1	0.01%	0.00%
	LABO	10	0.15%	0.02%
	MYLU	2	0.03%	0.00%
	MYSP	--	--	--
	HF	--	--	--
	Noise	6702	98.41%	10.57%
	Station Total	6810	100.00%	10.74%
BMg3	AECI	43	0.86%	0.07%
	EPFU/LANO	77	1.53%	0.12%
	LF	10	0.20%	0.02%
	LABO	31	0.62%	0.05%
	MYLU	--	--	--
	MYSP	--	--	--
	HF	--	--	--
	Noise	4860	96.79%	7.66%
	Station Total	5021	100.00%	7.92%
BMg4	AECI	8	0.45%	0.01%
	EPFU/LANO	64	3.60%	0.10%
	LF	4	0.22%	0.01%
	LABO	24	1.35%	0.04%
	MYLU	--	--	--
	MYSP	1	0.06%	0.00%
	HF	--	--	--
	Noise	1679	94.33%	2.65%
	Station Total	1780	100.00%	2.81%
BMr1	AECI	91	0.23%	0.14%
	EPFU/LANO	71	0.18%	0.11%
	LF	--	--	--
	LABO	42	0.11%	0.07%

Station	Call Analysis ID	Passes	Site Percentage[a]	Project Percentage[a]
BMr1	MYLU	--	--	--
	MYSP	--	--	--
	HF	--	--	--
	Noise	38994	99.48%	61.49%
	Station Total	39198	100.00%	61.81%
BMr2	AECI	43	0.51%	0.07%
	EPFU/LANO	94	1.12%	0.15%
	LF	4	0.05%	0.01%
	LABO	49	0.58%	0.08%
	MYLU	--	--	--
	MYSP	--	--	--
	HF	--	--	--
	Noise	8190	97.73%	12.91%
	Station Total	8380	100.00%	13.21%
Totals	AECI	418	--	0.66%
	EPFU/LANO	485	--	0.76%
	LF	23	--	0.04%
	LABO	202	--	0.32%
	MYLU	3	--	0.00%
	MYSP	2	--	0.00%
	HF	1	--	0.00%
	Noise	62283	--	98.21%
Total Recordings		63417	--	100.00%

[a] Rounding has occurred

APPENDIX C

PHOTO LOG

PHOTO LOG

Badger Wind Project

Logan and McIntosh Counties, North Dakota, April 14-October 15, 2020



Photo 1. A view of pastureland within the project area. Agricultural and grazing are common practices throughout the project area.



Photo 2. Initial deployment of BMg1, with an SM4 unit, at ground level.



Photo 3. Initial deployment of BMg2, with an SM3 unit, at ground level.



Photo 4. Initial deployment of BMg3, with an SM4, at ground level.

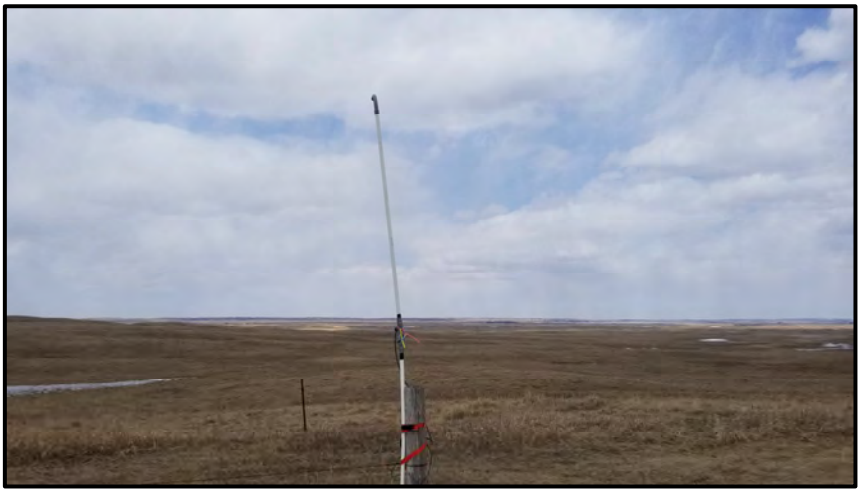


Photo 5. Initial deployment of BMg4, with an SM4, at ground level.



Photo 6. A west facing view of BMr1. This is a representative view of the landscape surrounding the MET tower where BMr1 is located.



Photo 7. A west facing view of BMr2. This is a representative view of the landscape surrounding the MET tower where BMr2 is located.

BAT HABITAT ASSESSMENT MEMORANDUM

BADGER WIND PROJECT

Prepared for

Ørsted Onshore North America
401 N. Michigan Ave
Suite 501
Chicago, IL 60611

Atwell Project No. 19000785

DRAFT

Submitted by Atwell, LLC

January 21, 2020

TABLE OF CONTENTS

1 INTRODUCTION 2
1.1 STUDY AREA 2
1.2 BATS OF NORTH DAKOTA 2
1.3 NORTHERN LONG-EARED BAT ECOLOGY 4
2 METHODS 5
3 RESULTS 5
3.1 DESKTOP HABITAT ASSESSMENT 5
3.2 LITERATURE REVIEW 6
4 DISCUSSION 6
5 CONCLUSION 7
6 REFERENCES 8

APPENDICES

Appendix A Figure 1. Land Cover in the Project Area (NLCD 2016)
Figure 2. Potential Bat Habitat in the Project Area
Figure 3. Known NLEB Presence in North Dakota

1 INTRODUCTION

Ørsted Onshore North America (Ørsted) is proposing to develop the Badger Wind Project (the project) in Logan and McIntosh counties, North Dakota. Atwell, LLC (Atwell) conducted a desktop bat habitat assessment for the federally threatened northern long-eared bat (NLEB; *Myotis septentrionalis*) within the project area in accordance with the United States Fish and Wildlife Service (USFWS) Range-Wide Indiana Bat Survey Guidelines (the USFWS Guidelines; (USFWS 2019a). These guidelines are used to identify suitable habitat for the NLEB as well as the federally listed Indiana bat (*Myotis sodalist)*; however, the range of the latter does not extend into North Dakota and is not discussed further in this assessment.

The objectives of the bat habitat assessment were to identify potential summer habitat for NLEB and to assess the habitat quality of forested areas within the project area.

1.1 STUDY AREA

The project area consists of approximately 121,695 acres in northwestern McIntosh County and southwestern Logan County, North Dakota. The town of Wishek, North Dakota is approximately 1 mile from the project boundary.

According to the 2016 National Land Cover Database (NLCD), a large proportion of the project area is dedicated to agriculture. Figure 1 summarizes land cover data for the project area. Approximately 56% of the land is classified as cultivated crops (approximately 68,149 acres) and 35% of the land is classified as herbaceous, including pastures (approximately 42,593 acres).

According to the Environmental Protection Agency (EPA) Ecoregion mapping data, the project is located mostly within the Missouri Coteau Slope (U.S. EPA 2013). A few eastern sections of the project area are located in the Missouri Coteau Level IV Ecoregions. The Level IV Ecoregions are located within the Northwestern Glaciated Plains Level III Ecoregion. Soils in the ecoregion consist of mollisols and some entisols. The region was once dominated by prairie grasses (spear, grama, and wheat grasses) and shrubs. Forested area consisting of scrubby aspen, box elder, cottonwood, and willow is limited to shaded slopes in the valleys and river terraces. The ecoregion mainly consists of rangeland used for cattle grazing, and some cropland.

1.2 BATS OF NORTH DAKOTA

Twelve species of bats are known to occur in North Dakota: Townsend's big-eared bat (*Corynorhinus townsendii*), big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), western red bat (*Lasiurus blossevillii*), hoary bat (*Aeorestes cinereus*), western small-footed bat (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), little brown bat (*Myotis lucifugus*), fringed myotis (*Myotis thysanodes*), long-legged myotis

(*Myotis volans*), and NLEB (Nelson et al. 2015). The NLEB is the only listed species and is federally threatened.

North Dakota does not maintain a state endangered or threatened species list (NDGFD 2015). However, the North Dakota Game and Fish Department (NDGFD) tracks species of conservation priority (SCP). Species of conservation priority are categorized into three levels. SCP Level I are species that have declining populations in North Dakota or across their range, or are species that are at risk, range-wide, and have a high rate of occurrence in North Dakota constituting the core of the species breeding range. SCP Level I receives the most funding from the state wildlife grant. SCP Level II are species of moderate conservation priority, or species with a high level of conservation priority that receive a substantial level of monetary support from non-state wildlife grant funding. SCP Level III are species of moderate conservation priority but are peripheral or non-breeding in North Dakota. NDGFD has classified Townsend's big-eared bat, big brown bat, little brown bat, and NLEB as SCP Level I, and western small-footed bat, long-eared myotis, and long-legged myotis as SCP Level III (Dyke et al. 2015).

According to Bat Conservation International species profiles, the ranges of Townsend's big-eared bat, western small-footed bat, long-eared myotis, and long-legged myotis include small portions of western North Dakota (BCI 2019). These four SCP are unlikely to occur within the project area and will not be discussed further in this assessment.

Species that may occur, with varying likelihood, within the project area include (NDGFD 2016a; NDGFD 2016b; BCI 2019):

- eastern red bat
- hoary bat
- silver-haired bat
- big brown bat (SCP Level I)
- little brown bat (SCP Level I)
- NLEB (SCP Level I; Federally Threatened)

The little brown bat is known for forming maternity colonies in man-made structures and foraging over water (BCI 2019). The little brown bat was heavily impacted by white-nose syndrome (WNS) in the eastern part of its range and is currently under review for being listed (USFWS 2019c). WNS is a disease that results from the fungus, *Pseudogymnoascus destructans,* which affects hibernating bats (White-Nose Syndrome.org 2018). The big brown bat is a generalist species showing no preference for foraging habitat (BCI 2019). The NLEB is the only federally listed bat species (threatened) within North Dakota and occurrence of NLEB is unlikely within the project area.

The project area is within the NLEB WNS zone per the USFWS WNS Zone Final 4(d) Rule (05/31/2019). The final ruling prohibits all incidental take within a known hibernaculum or incidental take caused by tree removal if (a) tree removal occurs within 0.25 miles of a known hibernaculum at any time of year, and (b) tree removal cuts or destroys a known occupied

maternity roost tree or any other trees within a 150 ft radius of the maternity roost tree during the pup season (June 1 through July 31). There are no known maternity roost trees or hibernacula in North Dakota (USFWS 2019b). However, correspondence with the USFWS (North Dakota Ecological Services Field Office [NDESFO], Bismarck, ND) and NDGFD is recommended for additional confirmation that no known NLEB roosts or hibernacula are within the project area.

Under the USFWS 4(d) rule, incidental take that results from operating wind turbines or from permanent conversion of forested lands to other uses (i.e., rights-of-way creation or expansion, urban development) may be allowed within the project area. However, surveys for northern long-eared bat maternity roosts are recommended by NDGFD, e.g., *North Dakota Native Wildlife Resources: Guidelines for Reducing Impacts from Wind Energy Development (DRAFT)* (NDWWC 2018) if tree removal is necessary for the construction of the wind farm.

1.3 NORTHERN LONG-EARED BAT ECOLOGY

Suitable summer habitat for NLEB consists of a wide variety of forested/wooded habitats for foraging, roosting, and commuting routes as well as interspersed non-forested habitats (i.e., emergent wetlands, shelterbelts adjacent to agriculture fields, and pastures). Foster and Kurta found that NLEB prefer mature forest as foraging habitat but can also use younger riparian forests, open forest corridors, wooded ponds, emergent wetlands, adjacent agriculture fields, and wooded shelterbelts (Foster and Kurta 1999). Linear features, such as fencerows, riparian forests, and other wooded corridors can serve as suitable habitat for NLEB.

NLEB are roost generalists and utilize a broad array of roost characteristics, including roost types (e.g., cavities, crevices, exfoliating bark) and tree species (Carter and Feldhamer 2005; Timpone et al. 2010). NLEB roost species can vary by geographic location and site characteristics (Whalen and Krusac 2014).

The USFWS Guidelines define suitable NLEB habitat as forests and woodlots containing potential roost trees; however, buildings, barns, bridges, and bat houses may also be considered potential summer habitat for NLEB. Trees with a diameter at breast height greater than or equal to 3.0 inches (7.6 centimeters [cm]) and which have exfoliating bark and/or cavities are defined as potential roosts. NLEB roost trees may include individual trees when they exhibit characteristics of a potential roost and are within 1,000 feet (ft; 305 meters [m]) of other forested/wooded habitat (USFWS 2019a).

Documented information on bat ecology in North Dakota is limited. Nelson et al. conducted the first detailed survey of occurrence and distribution of bats in North Dakota, and captured NLEB at sites in McKenzie County, and Oliver County, North Dakota (Nelson et al. 2015). NLEB maternity roost trees or hibernacula have not been reported in North Dakota (USFWS 2019b). However,

correspondence with UWFWS NDESFO (Bismarck, ND) and NDGFD is recommended for additional confirmation that no known NLEB roosts or hibernacula are within the project area.

2 METHODS

Atwell conducted a desktop bat habitat assessment using available satellite imagery and Geographic Information System (GIS) data. NLCD data were reviewed to identify potential bat habitat within the project area. Forested areas and associated wooded shelterbelts or tree lines were delineated manually using satellite imagery. A site visit was conducted by a technician from Atwell, from June 12 – June 13, 2019 to identify dominant tree species within the project area.

Potential habitat was categorized using the following criteria:

- Size of forested areas and associated shelterbelts
- Preferred roost tree species presence
- Preferred roost characteristics.

In addition to the desktop Habitat Assessment, Atwell conducted a literature review of North Dakota bats to determine any known NLEB presence in the vicinity of the project. Publicly available information on locations of confirmed NLEB presence were compiled and digitized in order to establish the distance(s) of documented NLEB presence to the project area.

3 RESULTS

3.1 DESKTOP HABITAT ASSESSMENT

There is a high degree of habitat fragmentation within the project area, which consists predominantly of cropland and herbaceous land (91% of total acreage) (MRLC 2016). Delineation of forested parcels and wooded shelterbelts resulted in 426.93 acres (approximately 0.35% of the project area) of potential suitable habitat from 248 forested areas and wooded shelterbelts. The median forested area of potential suitable habitat was 1.41 acres. The size of woodlots range from 0.09 to 8.65 acres. Figure 2 (Appendix A) shows potential suitable habitat within the project area.

Data collected during the site visit identified green ash (*Fraxinus pennsylvanica*) and Siberian elm (*Ulmus pumila*) as the dominant tree species within the project area. Additional tree species include American elm (*Ulmus americana*) and Russian olive (*Elaeagnus angustifolia*).

Other tree species potentially present within the project area include Tatarian honeysuckle (*Lonicera tatarica*), common lilac (*Syringa vulgaris*), American plum (*Prunus americana*), chokecherry (*Prunus virginiana*), rocky mountain juniper (*Juniperus scopulorum*), eastern red cedar (*Juniperus virginiana*), ponderosa pine (*Pinus ponderosa*), black hills white spruce (*Picea*

glauca var. densata), Colorado spruce (*Picea pungens*), and willow species (*Salix spp.*) These tree species were recommended for planting shelterbelts in North Dakota, and could provide characteristics suitable (as defined by the Indiana Bat Range-Wide Survey Guidelines) for NLEB roosting (Herman and Chaput 2003).

3.2 LITERATURE REVIEW

In 2010, NLEB were not listed as occurring within the vicinity of the project (Bicknell and Gillam 2013). However, the NLEB range was more recently updated by USFWS to include all of North Dakota (Nelson et al. 2015).

There is confirmed NLEB presence in North Dakota within the Missouri River Valley, the Badlands of North Dakota, and the Moreau Prairie (Nelson et al. 2015; Christopher Shank et al. 2015 Fall). The distances of known NLEB locations ranged from 53.5 miles to 187.3 miles from the project area. Figure 3 shows documented NLEB presence in North Dakota and the project boundary.

A brief summary of NLEB presence from publicly available documents on North Dakota bats is provided below.

- Twenty-three NLEB were captured via mist net in McKenzie and Oliver Counties, North Dakota, ranging from 80-190 miles northwest of the project area (Nelson et al. 2015).
- NLEB were documented during acoustic surveys at Standing Rock Indian Reservation in the Moreau Prairie in Sioux County, North Dakota, approximately 50 miles west of the project area (Christopher Shank et al. 2015 Fall).

4 DISCUSSION

The project area has a minimal amount of potential suitable summer roosting habitat based on a review of satellite imagery, NLCD data, and on-site reconnaissance. None of the forested area or wooded shelterbelts exceed 8.65 acres. The fragmented forested areas and wooded shelterbelts within the project area offer limited connectivity to more suitable roosting and foraging habitat. NLEB are roost generalists, and roost tree species exhibiting preferential roost characteristics do occur within the project area.

Known NLEB presence in North Dakota was documented in two publicly available papers. The closest known NLEB presence was approximately 50 miles away and was confirmed during acoustic surveys. According to Whalen and Krusac, the home range of suitable habitat for NLEB is typically within three miles of a capture or positive acoustic identification, or within 1.5 miles of a roost tree (Rhea Whalen and Dennis Krusac 2014). None of the documented NLEB were within this distance of the project area.

The terrain and habitat characteristics in areas of known NLEB presence within North Dakota differ significantly from the landscape characteristics within the project area. The Badlands of North Dakota has rugged terrain with exposed rock and stands of Juniper (*Juiperus scopulorum*). The Missouri River Valley has riparian vegetation including cottonwood forests and grasslands (Nelson et al. 2015). The Moreau Prairie terrain includes buttes, badlands, grasslands, and saltpans (Christopher Shank et al. 2015 Fall). None of the known sites of NLEB presence include the high percentage of croplands and herbaceous lands present within the project area.

5 CONCLUSION

Information confirming NLEB presence in North Dakota is limited. Based on literature review, known NLEB presence is confirmed west of the Missouri River, in landscapes that differ from the project area. There are no known maternity roost trees nor hibernacula in North Dakota (USFWS 2019b). However, correspondence with the USFWS (North Dakota Ecological Services Field Office [NDESFO], Bismarck, ND) and NDGFD is recommended for additional confirmation that no known NLEB roosts or hibernacula are within the project vicinity.

Based on NLCD data, satellite imagery review, and site reconnaissance, potential suitable habitat for NLEB within the project area is limited. Forested areas along the southern and eastern boundaries of the project area have better potential to support NLEB, based on their proximity to open water, but even these are small woodlots with limited resources. There is high forest fragmentation and low connectivity of wooded shelterbelts throughout the agriculturally dominated landscape. Most riparian areas throughout the project area do not have adjacent forested areas.

Despite these findings, as with many operational wind facilities in the region, the project may represent a risk to bats during the spring/fall migration. Migratory tree-roosting bats, such as the hoary bat, eastern red bat, and the silver-haired bat, are at a greater risk to operational wind facilities. Summer foraging/roosting activities for bats, particularly NLEB, are expected to be limited due to low amounts of suitable habitat. Overall, risk to NLEB from an operational wind facility within the project area is expected to be low

Bat activity acoustic monitoring was conducted (based on *North Dakota Native Wildlife Resources: Guidelines for Reducing Impacts from Wind Energy Development (DRAFT)*) in 2019 and is expected to continue in 2020. Survey results will be available in a separate report. Correspondence with USFWS and NDGFD is recommended to determine if additional bat surveys are needed.

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APPENDIX A

FIGURES

DRAFT

Figure 1.

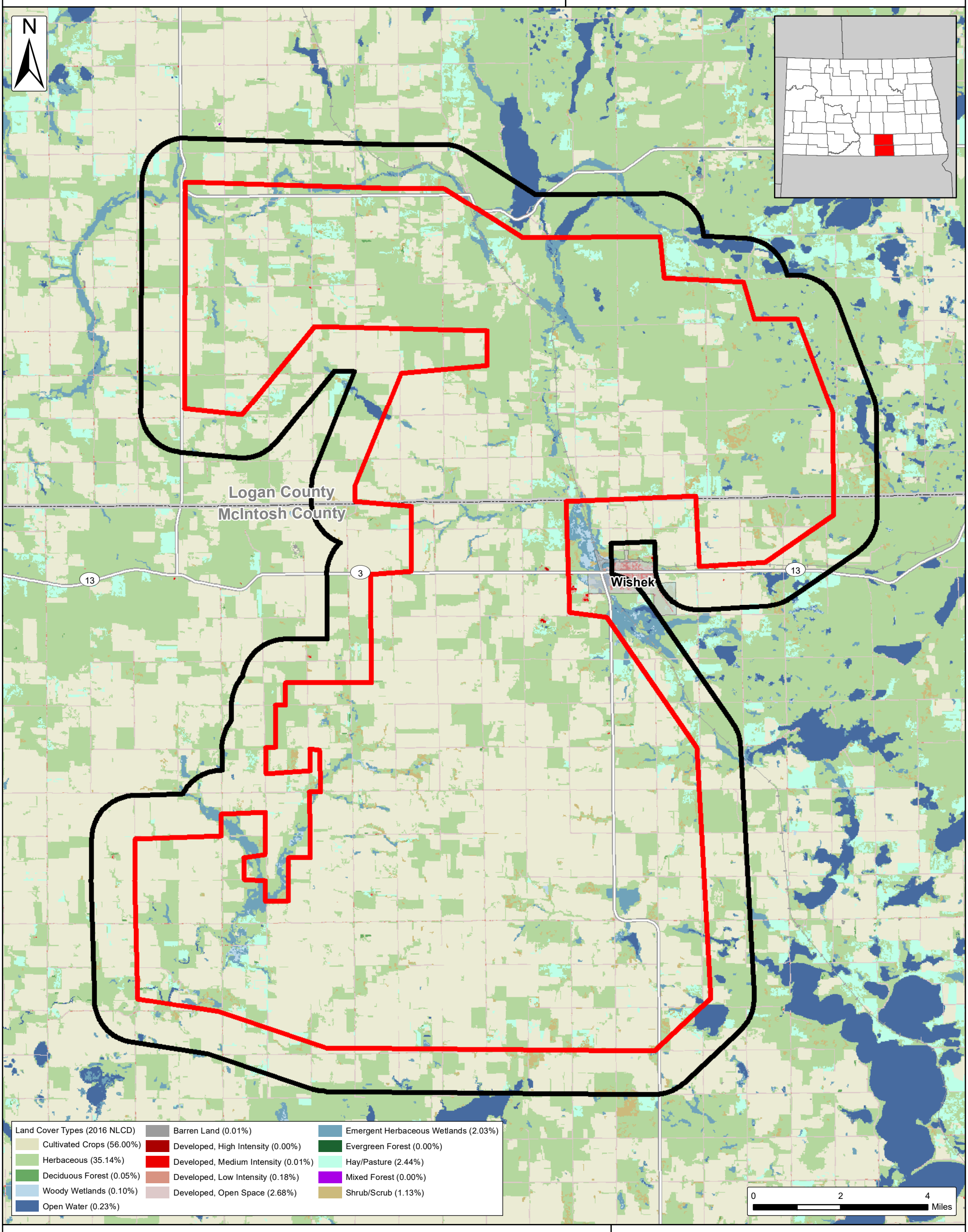
Land Cover in the Project Area (NLCD 2016)

Logan County & McIntosh County, North Dakota

Client:
Ørsted Onshore North America

Issue Date:
5/22/2019

Atwell, LLC Project:
19000785



Project Area
04/15/2019 (±121,695 Ac.)

1 Mile Buffer

City/Village

Counties

SOURCE: NATIONAL LAND COVER DATABASE 2016 (USGS)

ATWELL

The information contained on this map is proprietary and confidential. The use or disclosure of this information by you to third parties is prohibited by law and may give rise to civil or criminal liability.

Figure 2.

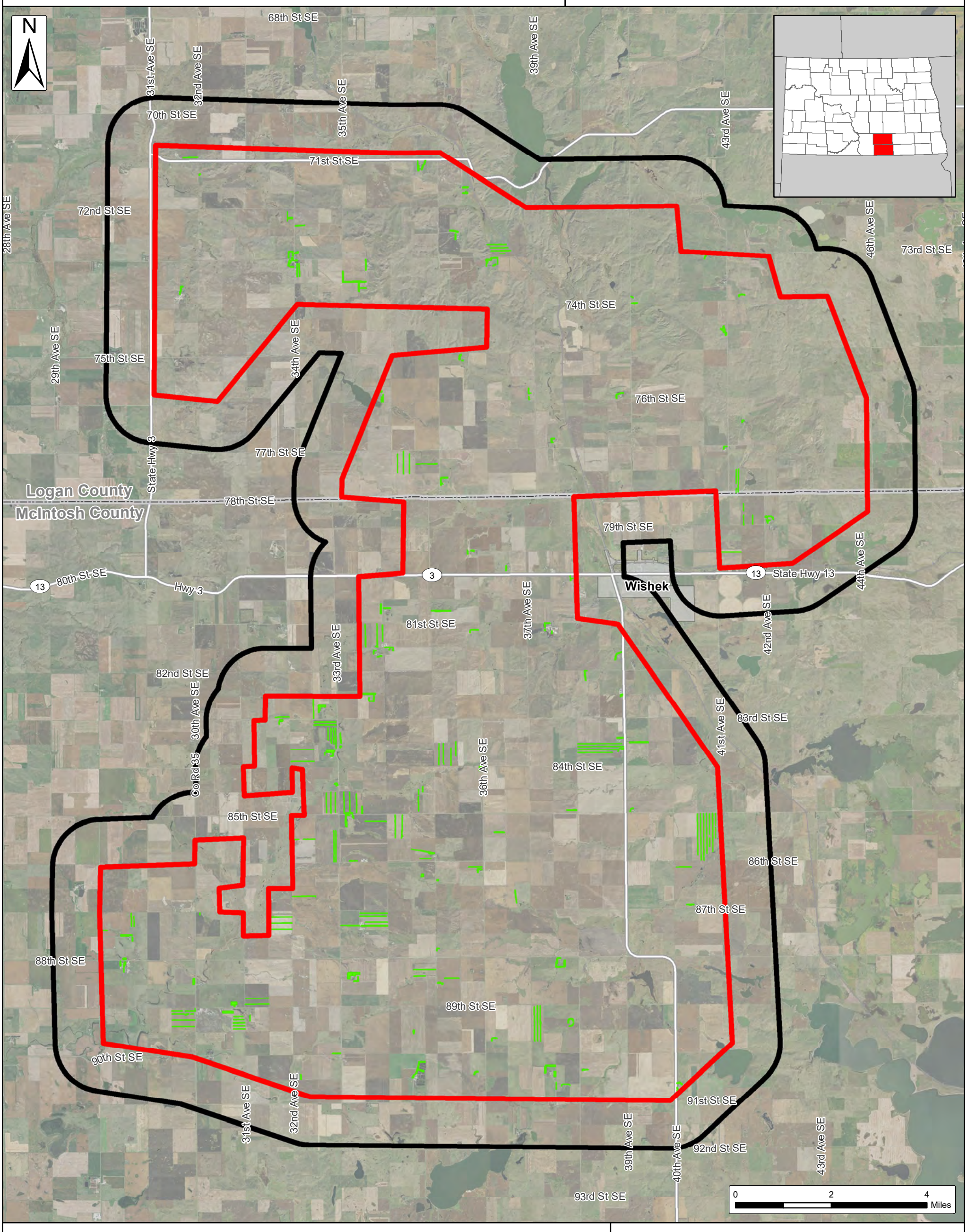
Potential Bat Habitat in the Project Area

Logan County & McIntosh County, North Dakota

Client:
Ørsted Onshore North America

Issue Date:
6/18/2019

Atwell, LLC Project:
19000785



Woodlots with Potential Suitable Bat Habitat (Atwell Aerial Interpretation)

Project Area
04/15/2019 (±121,695 Ac.)

1 Mile Buffer

City/Village

Counties

SOURCE: USDA NAIP 2018 IMAGERY

ATWELL

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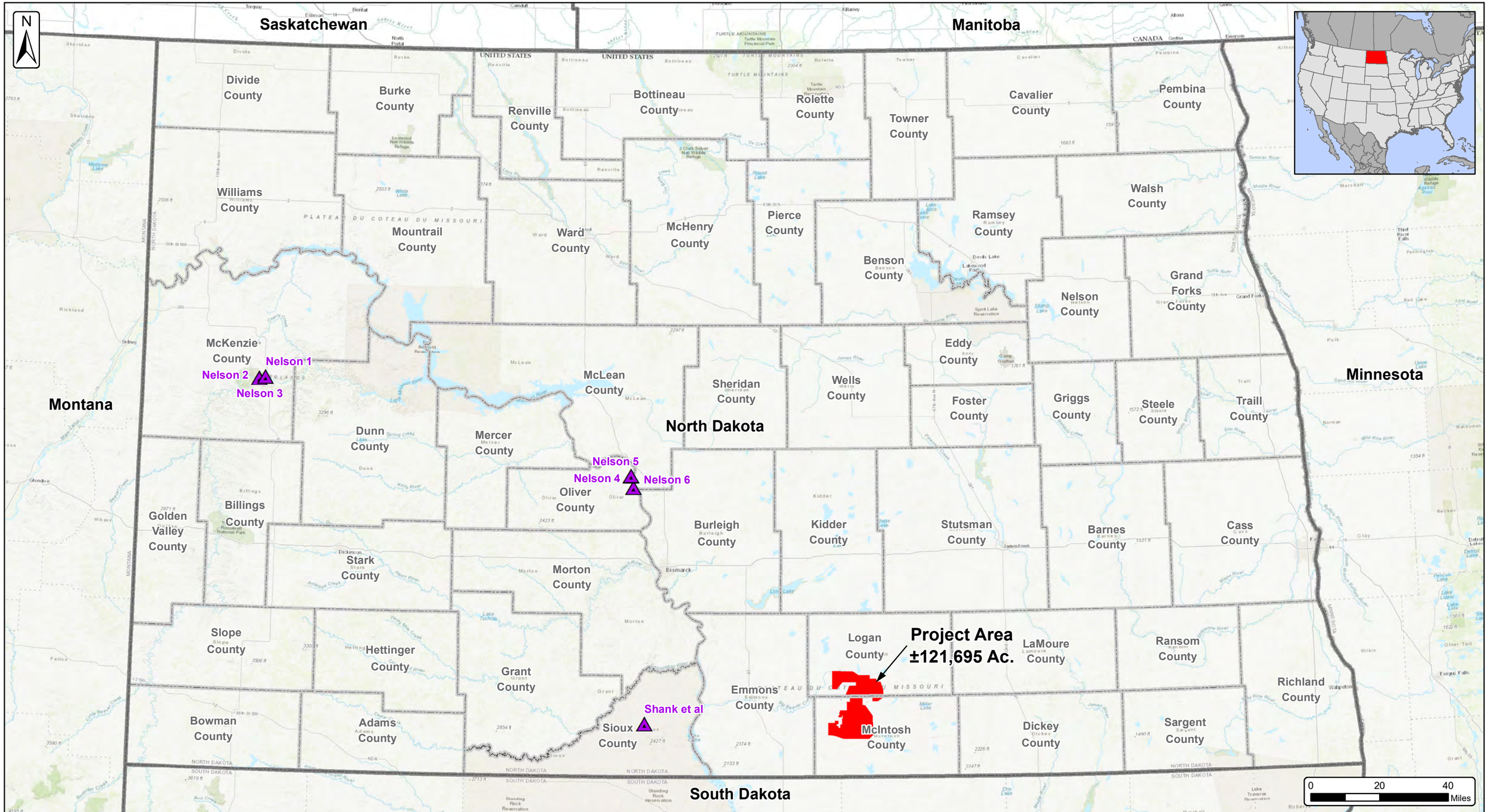


Figure 3.
Known NLEB Presence in North Dakota
North Dakota
Date: 6/18/2019

Client:
Ørsted Onshore North America

Atwell, LLC Project: 19000785

Northern Long-Eared Bat Presence (Nelson et al., Shank et al.)
Project Area 04/15/2019 (±121,695 Ac.)
County Boundaries
State Boundaries

SOURCE: ESRI WORLD TOPOGRAPHIC BASEMAP

ATWELL

The information contained on this map is proprietary and confidential. The use or disclosure of this information by you to third parties is prohibited by law and may give rise to civil or criminal liability.

WHOOPING CRANE STOPOVER HABITAT ASSESSMENT

BADGER WIND PROJECT
LOGAN AND MCINTOSH COUNTIES, NORTH DAKOTA
REVISED

Prepared for

Badger Wind, LLC
401 N. Michigan Avenue
Suite 501
Chicago, IL 60611

Atwell Project No. 19000785

Submitted by Atwell, LLC

September 2021

TABLE OF CONTENTS

1 INTRODUCTION 3
2 PROJECT AREA 4
3 METHODS 6
3.1 HABITAT MAPPING 6
3.2 POTENTIAL STOPOVER ROOSTING SITE ASSESSMENT 7
3.3 STOPOVER USE INTENSITY 7
3.4 PROBABILITY OF HABITAT USE 7
4 RESULTS 9
4.1 HABITAT MAPPING 9
4.2 POTENTIAL STOPOVER ROOSTING SITE ASSESSMENT 9
4.3 STOPOVER USE INTENSITY 11
4.4 PROBABILITY OF HABITAT USE 11
5 DISCUSSION 11
6 REFERENCES 14

FIGURES

1 Project Area and Reference Areas
2 NLCD Land Cover Classification
3 NWI Wetlands
4 Whooping Crane Stopover Use Intensity
5 Whooping Crane Probability of Landscape-level Habitat Use

TABLES

1 NLCD Land Cover Classification
2 NWI Wetland Assessment
3a Wetland Scoring Assessment: All Scored Wetlands
3b Wetland Scoring Assessment: Potential Roosting Habitat Wetlands
4a Whooping Crane Stopover Use Intensity Acreage
4b Whooping Crane Stopover Use Intensity Percent Coverage
5a Whooping Crane Probability of Habitat Use: Decile Acreage
5b Whooping Crane Probability of Habitat Use: Decile Percent Coverage

ACRONYMS AND ABBREVIATIONS

Atwell	Atwell, LLC
AWP	Aransas-Wood Buffalo Whooping Crane Subpopulation
amsl	above mean sea levelBadger Wind Badger Wind, LLC
GIS	geographic information system
HAPET	Habitat and Population Evaluation Team
km	kilometer(s)
m	meter(s)
NDGF	North Dakota Game and Fish Department
NLCD	National Land Cover Database
NWI	National Wetland Inventory
Ørsted	Ørsted Onshore North America, LLC
PUDL	Potential Undisturbed Layer
QA/QC	Quality Assurance / Quality Control
TWI	The Watershed Institute
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1 INTRODUCTION

Atwell, LLC (Atwell) was retained by Badger Wind, LLC (Badger Wind), a wholly-owned subsidiary of Ørsted Onshore North America, LLC (Ørsted), to conduct a desktop assessment evaluating the potential for Whooping Crane (*Grus americana*) to use the Badger Wind Project Area (the project area) as stopover habitat during seasonal spring and fall migrations. The project area is located in Logan and McIntosh counties, North Dakota (Figure 1).

Whooping Cranes use a variety of stopover habitats during migration. Stopover roost habitats include palustrine, lacustrine, and riverine wetlands. Stopover foraging habitats include grasslands and croplands, and foraging sites are often within 1.6 kilometers (km, or approximately one mile) of roost habitat (The Watershed Institute; TWI 2013; Austin and Richert 2005). The objectives of the assessment are to determine whether potentially suitable Whooping Crane stopover habitat is present within the project area and to compare this habitat to four reference areas adjacent to the project area.

The Whooping Crane is listed federally as an endangered species (U.S. Fish and Wildlife Service [USFWS] 2016). The Aransas/Wood Buffalo subpopulation (AWP) is the only self-sustaining population in existence (Urbanek and Lewis 2015) and was estimated at 505 individuals in 2017 (Devokaitis 2018). Whooping Cranes that constitute the AWP winter at locations in the Texas Gulf Coast, including the Aransas National Wildlife Refuge. In the spring, the subpopulation migrates northward to its nesting grounds at Wood Buffalo National Park in Alberta and the Northwest Territories of Canada, passing through North Dakota en route. Cranes return to Texas in the fall, following approximately the same pathway on both their northern and southern migrations. Whooping Cranes occur in North Dakota in the spring from April into May and in the fall from October into November.

Researchers have defined Whooping Crane migration corridors using accrued sightings reported by the public from 1942 to the present, including locations from telemetered birds between 2010 to 2016. The migration corridor has been delineated with 50%, 75%, and 95% core areas. The 95% core area (i.e., the area containing 95% of all recorded observations) averages 294 km (183 miles) in width (Pearse et al. 2018). The project area is located within the 75% migration corridor (Figure 1).

2 PROJECT AREA

The current project area boundary (December 2020) is depicted in Figure 1. The project area is approximately 57,097 acres, with approximately 46% of the area (26,000 acres) in McIntosh County and approximately 54% (31,098 acres) in Logan County. The general topography is undulating and rises from the west to the east, with elevations between 1,940 and 2,180 feet above mean sea level (amsl). The project area is predominately within the Missouri Coteau Slope Level IV Ecoregion, with portions of the eastern boundary extending upward into the Missouri Coteau Level IV Ecoregion (Bryce et al. 1996). The Missouri Coteau is an escarpment of glacial till containing numerous hills, small lakes, and poorly drained depressions that are referred to as "potholes" that receive most of their water from snow melt and precipitation (Bryce et al. 1996). The Missouri Coteau Slope descends westward toward the Missouri River from the Coteau and is characterized by a thinner glacial till layer and integrated drainages that flow toward the Missouri River (Clayton 1962).

According to the 2016 U.S. Geological Survey National Land Cover Database (National Land Cover Database [NLCD]; Yang et al. 2018), the project area is composed primarily of cultivated crops (46.2%) and herbaceous/grassland (44.9%) (Figure 2). Wetlands and open water cover 2.5% of the project area. Other land cover types found within the project area include developed areas (3.1% of the project area), pasture/hay (2.2%), shrub/scrub (1.2%), woodland forest (less than 0.1%), and barren land (less than 0.1%). It is noted that percentage totals exceed 100% due to rounding.

2.1 Reference Areas

As discussed in more detail in the Methods section (Section 3), , four reference areas of equal shape and dimension as the project area were established in each of the four cardinal directions, at equal distances from the project's centroid (referred to as the North, East, South, and West reference areas and as depicted on Figure 1). The reference areas were spaced to be adjacent to, but without overlapping, the project area. Due to the project boundary configuration and to avoid overlap, the West and East reference areas are slightly farther from the project boundary than the North and South reference areas (Figure 1). All of the reference areas are within the Missouri Coteau Slope and Missouri Coteau Level IV Ecoregions described above. Elevations and topography of the reference areas are similar to elevations and topography of the project area described above. Notable differences include a relatively greater amount of topographic relief in the West reference area due to the intrusion of dissected river break physiography associated with the Missouri River and a relatively lower amount of topographic relief due to the lower elevation outwash plain present in the East reference area. The East reference area is also within the Collapsed Glacial Outwash Level IV Ecoregion. The Collapsed Glacial Outwash Ecoregion is characterized by large, shallow, alkaline lakes. The West reference area is also within the River Breaks Level IV Ecoregion. The River Breaks ecoregion is characterized by broken terraces and

uplands surrounding the floodplains of the Missouri River and its major tributaries (Bryce et al. 1996).

3 METHODS

The Whooping Crane stopover habitat assessment was conducted using data sources and publicly available reports recommended by the USFWS and North Dakota Game and Fish Department (NDGF) during a January 28, 2020 agency meeting. The assessment follows a reference area-analysis approach and is consistent with the methodology used in other publicly available reports produced for wind energy facilities in North Dakota (Derby and Thorn 2018; WEST 2018; Chodachek 2019). The stopover habitat assessment was conducted in four steps:

1) Habitat Mapping - habitat mapping was completed to compare land cover between the project area and each of the four reference areas;

2) Potential Stopover Roosting Site Assessment - stopover wetland habitat was scored to compare availability of stopover habitat between the project area and each reference area using previously published wetland assessment methodology developed by TWI (TWI 2013);

3) Stopover Use Intensity - stopover site use intensity analysis was conducted using modeling outputs (Pearse et al. 2015) produced by the U.S Geological Survey (USGS) to compare stopover use intensity between the project area and each reference area; and

4) Probability of Habitat Use - probability of stopover habitat use in North and South Dakota modeled by the USFWS Habitat and Population Evaluation Team (HAPET) was used to compare each reference area using modeling outputs produced by Niemuth et al. (2018). The USFWS also furnished Atwell an unpublished, annually updated data set of opportunistically collected Whooping Crane sightings dating back to 1942. USFWS sightings data are not intended for public distribution but can be used to provide additional context for regional habitat and Whooping Crane use patterns.

3.1 HABITAT MAPPING

Desktop analysis was used to assess terrestrial and wetland habitat parameters within the project boundary and within surrounding reference areas using ArcMap 10.8.1 (ESRI 2020); land cover information from the NLCD (Yang et al. 2018) (Figure 2); wetland data from the USFWS National Wetland Inventory (USFWS 2019) (Figure 3); agricultural aerial imagery provided by the National Agriculture Imagery Program (U.S Department of Agriculture [USDA] 2018); and cropland coverage data from the potentially undisturbed lands (PUDL) assessment recently completed by the Prairie Pothole Joint Venture (Fields and Barnes 2019).

A site visit was not conducted to ground-truth the desktop analysis. However, Atwell has conducted ground-based avian use surveys at 53 fixed point count stations throughout the project area since May 2019, as well as aerial nesting raptor and grouse lek surveys throughout

the project area and surrounding biological survey buffer areas extending to ten miles (as part of surveys conducted between May 2019 through April 2020). Through these efforts, Atwell confirmed that desktop habitats are generally consistent with on-the-ground conditions observed as part of field studies.

3.2 POTENTIAL STOPOVER ROOSTING SITE ASSESSMENT

The stopover roosting wetland assessment methodology used for this report was developed by TWI (TWI 2013) and consists of: 1) elimination of unsuitable wetlands (wetlands considered not suitable as Whooping Crane stopover habitat) from consideration after screening all wetlands for conditions including size, proximity to human disturbance, and proximity to visual obstructions; 2) a score-based assessment of screened suitable wetlands that considers water regime, distance to food, wetland size, whether the wetland is natural or manmade, and wetland density (TWI 2013); and, 3) comparison of stopover wetland density, acreage, and favorability as Whooping Crane stopover roosting sites between the project area and reference areas.

3.3 STOPOVER USE INTENSITY

To map stopover use intensity, Pearse et al. (2015) used five years of migration stopover data provided by radio-tagged Whooping Cranes to categorize 20 km^2 (7.72 $miles^2$) grid cells throughout the migration pathway by number of stopover sites and duration of time spent at stopover locations.

Grid cells were classified from low to high stopover intensity as unoccupied, low intensity, core intensity, and extended-use core intensity (Pearse et al. 2015). Unoccupied grid cells have no evidence of Whooping Crane use. Low intensity grid cells have at least one stopover site, with low duration of time spent at the site(s). Core intensity cells have a density of stopover sites below calculated stopover volume, which is a measure of duration of use. Core intensity cells also have a lower density of crane days, an additional metric of stopover intensity, than extended-use core intensity cells. Extended-use core intensity cells have density of stopover sites below calculated stopover volume and have the highest volume of crane days.

The project area and reference areas were overlaid atop grid classifications. Coverage values were calculated for each stopover use intensity class for the project area and for each reference area.

3.4 PROBABILITY OF HABITAT USE

Niemuth et al. (2018) created a predictive model and map showing relative probability of Whooping Crane habitat use during migration through North and South Dakota. In this model, Whooping Crane stopover habitat selection is influenced by land cover and by wetland

characteristics including water regime, size, water depth, and proximity to food resources and other wetland habitats nearby (TWI 2013; Niemuth et al. 2018).

The predictive model was generated using historic Whooping Crane stopover data for the Whooping Crane migration corridor and was combined with high resolution landscape data. Model outputs were used to produce a relative probability of habitat use map for North and South Dakota. Researchers then divided this map into deciles of ten equal-area bins, or classes, to rank probability of use across the two states. Areas with decile values of 1 have the lowest probability of use while areas with decile values of 10 have the highest probability of Whooping Crane use. The project area and reference areas were overlaid atop decile values and coverage values were calculated for each decile class for the project area and for the four reference areas.

4 RESULTS

4.1 HABITAT MAPPING

The project area contains more cultivated cropland and less grassland/herbaceous cover than surrounding reference areas (Table 1). Cover values for other terrestrial land cover classifications were similar between the project area and the reference areas.

Cultivated Cropland

The project area has a comparable amount of cultivated cropland (26,362.1 acres, or 46.2% of the project area) to each of the four reference areas. Cultivated cropland within reference areas ranged from 16,573.2, or 33.9% for the North reference area to 35,070.5 acres, or 52.1% for the South reference area.

Grassland/Herbaceous

The project area has a comparable amount of grassland and herbaceous cover (25,622.6 acres, or 44.9% of the project area) to each of the four reference areas. Grassland and herbaceous cover within reference areas ranged from 15,194.5 acres or 38.0% for the South reference area to 31,292.7 acres or 49% for the North reference area.

Wetlands/Waters

The project area had less wetlands/waters compared to the four reference areas, with less than 2.36% or 2,872.7 acres within the project area comprised of wetlands/waters. Wetlands/waters within the reference areas ranged from 3,006.7 acres or 2.47% for the West reference area to 18,283.2 acres or 15.0% for the East reference area. The East and North reference areas had the highest wetlands / waters habitat.

4.2 POTENTIAL STOPOVER ROOSTING SITE ASSESSMENT

Wetland density within the project area increases moving from west to east and from the south to north in Logan and McIntosh counties as the topography rises from the Missouri Coteau Slope eastward into the Missouri Coteau (Figure 3). The project area and West reference area are located predominately within the Missouri Coteau Slope, and they have similar low percentages of wetland coverage. The North, East, and South reference areas extend further into the Missouri Coteau and the wetland compositions of these three reference areas are higher than that of the project area. The project area and the West reference area have less wetland acreage (2,297.9 acres and 1,943.6 acres respectively) than the North (7,324.0 acres), East (7,724.5 acres) and South (3,831.7 acres) reference areas, respectively (Table 2).

Riverine wetlands associated with the integrated drainages of the Missouri Coteau Slope were more numerous within the project area and West reference area (394.3 acres and 377.1 acres respectively) than in the North, East, and South reference areas (83.81 – 95.7 acres, Table 2), indicting that wetlands in these areas are more commonly associated with linear water features (such as streams). Conversely, freshwater emergent wetlands covered more acreage in the North, East, and South reference areas (3,652.5 – 6,398.0 acres) than in the project area (1,824.2 acres) and West reference area (1,477.6 acres, Table 2), indicating that wetlands in these areas are more commonly associated with other topographic features, including pothole areas.

Potential Roosting Habitat Scoring Assessment

The project area includes 370 wetland basins that passed initial wetland screening to be subsequently processed using the TWI score-based assessment to evaluate their potential as stopover roosting habitat. Wetlands that passed the wetland screening are hereafter referred to as "screened wetlands". These screened wetlands cover approximately 955.0 acres of the project area (Table 3a). The project holds fewer screened wetland basins with less acreage than each of the reference areas. The total number of screened wetlands in reference areas ranged from 460 in the West reference area to 1,603 in the East reference area (Table 3a). Screened wetland habitat acreage in the reference areas ranged from 1,406.1 acres in the West reference area to 5,587.2 acres in the East reference area. Mean screened wetland size in the project area was 2.6 acres. This is also smaller than mean screened wetland sizes for the four reference areas (which had mean scored wetland sizes ranging from 3.0 acres in the North reference area to 3.5 acres in the East reference area).

As noted earlier, the wetland scoring system developed by TWI scores potential roosting habitat based on criteria such as water regime, distance to food, wetland size, whether the wetland is natural or manmade, and wetland density (TWI 2013). Mean wetland assessment scores for the project area and surrounding reference areas for screened wetlands ranged from 10.7 – 12.8 out of a total possible score of 20 (Table 3a). Mean assessment scores were highest in the East and North reference areas, which extend into the Missouri Coteau. Screened wetlands within the project area held a mean score of 10.7.

Stopover roosting habitat scores derived from this methodology have been truthed with roosting Whooping Crane observations at Quivira National Wildlife Refuge in Kansas. TWI researchers used stopover roosting data gathered from Whooping Cranes sightings to determine that wetlands with cumulative scores of at least 12 qualified as potentially suitable stopover roosting habitat (TWI 2013). Project area and reference area wetlands with cumulative assessment scores of at least 12 are summarized in Table 3b.

The project area holds 114 wetlands that are potential stopover roosting habitat with assessment scores of at least 12. The project area has a lower number of potential roosting habitat wetlands

than each of the four reference areas (Table 3b). Surrounding reference areas contain a range of 177 potential roosting habitat wetlands within the West reference area to 1,240 potential roosting habitat wetlands within the East reference area. Potential roosting habitat wetlands also cover a smaller portion of the project area (744.3 acres) than each of the reference areas (1,116.3 in the West reference area to 5,306.7 acres in the East reference area).

4.3 STOPOVER USE INTENSITY

Whooping Crane stopover use intensity generally increases moving westward from the project area toward the migration corridor's centerline (Figure 4). In the case of the project area, even though relatively higher quality stopover habitat exists to the north and east of the project area, these reference areas are also to the east of the portion of the Whooping Crane migration corridor that encompasses a higher density of recorded historic stopovers.

The project area and reference areas do not contain any lands classified as extended use core intensity, which is the classification representing highest use (Figure 4). The project area and surrounding reference areas are located in an area generally classified as low intensity use (Tables 4a and 4b). The low intensity classification is described in Pearse et al. (2015) as a classification containing grid cells with Whooping Crane stopovers, but whose ratio of total Whooping Crane observation days to total stopovers was not as high as ratios found in core intensity cells.

4.4 PROBABILITY OF HABITAT USE

The USFWS HAPET found that the best supported model indicated that Whooping Crane occurrence was positively associated with wetland area, wetland variety, cropland area, and road density (reflecting the opportunistic nature of Whooping Crane sightings). Whooping Crane occurrence was negatively associated with distance to the migration corridor's centerline, number of wetlands, and terrain roughness. Areas included with the highest decile rankings best fit these parameters and have the highest probability of use.

As with stopover use intensity (Section 4.3), probability of Whooping Crane habitat use modeled by the USFWS HAPET (Niemuth et al. 2018) also increases moving westward from the project area toward the migration corridor's centerline (Figure 5). On an east to west axis, the decile ranking with highest probability of use (depicted in red in Figure 5) covers approximately 3.5% of the East reference area, increases to cover 4.4% of the project area, then further increases to cover 13.5% of the West reference area (Tables 5a and 5b).

5 DISCUSSION

This desktop analysis assesses the likelihood that Whooping Cranes will use the project area for stopover habitat by using methodologies that consider both stopover roosting and foraging

requirements of Whooping Cranes. The results of this analysis generally confirm that on a regional basis, and in comparison to four reference areas adjacent to the project area, the project area has been sited in an area that has relatively lower quality and quantity Whooping Crane stopover habitat. The Project Area is primarily comprised of croplands, has the relatively lowest portion of wetland and water habitat, and is located in the 75th percentile of the Whooping Crane migration corridor. Areas to the west (which is located in the 50th percentile migration corridor) and to the north and east (which have a relatively higher percentage of wetlands and waters) have relatively more potentially suitable Whooping Crane stopover habitat.

Considering land cover alone, the project area has equal or more cropland than the surrounding reference areas. Cropland habitat is present throughout the project area but is found in highest density in the project area and to the south and west, on the Missouri Coteau Slope. The project area has a similar amount of herbaceous grassland cover as the reference areas. Grassland cover is more prevalent north of the project area and less prevalent south of the project area. Wetlands are present throughout the project area but are found in highest densities on the Missouri Coteau to the east, north, and south of the project area.

USFWS HAPET analyzed probability of habitat use and found that Whooping Crane occurrence was positively associated with wetland area, wetland variety, cropland area, and road density. Whooping Crane occurrence was negatively associated with distance to the migration corridor centerline, wetland density, distance to areas of increased survey effort, and terrain roughness (Niemuth et al. 2018). Importantly, the best-supported habitat use model also was positively influenced by interactions of wetland area and wetland density; and by interactions of wetland area, cropland area, and distance to the centerline of the migration corridor. Red-shaded areas in Figure 5 encompass the highest modeled probability of Whooping Crane habitat use that best captures relationships between the parameters that are listed above.

The project area appears to have a greater probability of use than much of the East reference area, which lies farther from the migration corridor's center line but within the 95% migration corridor band. The project area is modeled to generally have a lower probability of use than the South and West reference areas. The project area also includes a lower number of potentially suitable stopover roosting sites with an assessment score of at least 12 out of 20 (Table 3b) than each of the four reference areas, and that the North and East reference areas on the Missouri Coteau hold notably more wetlands with assessment scores of at least 12 than the project area. Stopover wetland habitat scoring suggests that the project area has a lower potential to host roosting Whooping Cranes during stopovers than the surrounding reference areas because it holds a smaller number of high-scoring wetland basins as well as less acreage of high-scoring wetland basins than the surrounding reference areas.

The project area and reference areas tended to contain low intensity use areas or areas left unclassified by this system due to a lack of evidence of use, and only the South reference area contained any areas that were classified as core use (Pearse et al. 2015). The South reference area had the highest modeled stopover use intensity, the North and West reference areas were comparable in stopover use intensity to the project area, and the East reference area had the lowest modeled stopover use intensity. The closest areas with the highest stopover use intensity classification were approximately 30 miles (48 km) to the northwest of the project area, near the Missouri River and Lake Oahe. The closest core use cell (the second highest use intensity classification), was approximately 22 miles (35 km) south of the project area, near the town of Ventura (Figure 4).

Whooping Crane Observations

An unpublished Whooping Crane sighting data set curated by the USFWS contains only one record for the study area (specifically within the West reference area).

On April 15, 2020, an Atwell biologist incidentally observed three adult Whooping Cranes within the project area. This observation is the first known occurrence of Whooping Cranes within the project area. The Whooping Cranes were observed foraging in agricultural areas (corn fields) throughout the day, approximately four miles northwest of Wishek, North Dakota. Of note, due to poor harvesting conditions during the fall of 2019, the Whooping Cranes were foraging in unharvested stands of corn. The Atwell biologist noted at the time of observation that there are many other areas of unharvested corn within the project area, perhaps dispersing Whooping Crane stopover use farther from the migration corridor's centerline than expected.

Their stopover roosting location was not obtained on April 15. The Whooping Cranes were again present on April 16 and 17, and they were observed heading to roost near dusk approximately 0.7 miles (1,120 meters [m]) from their foraging location on the April 16 and 17. The roosting location is at the confluence of two riverine wetlands with seasonally flooded water regime classifications within the project area. The location is depicted by the yellow icon on Figure 5. Wetland density is not high at this location, with two NWI-delineated wetlands present within the one-mile section block. The roost is within a low stopover use intensity grid cell. It is within the second-highest probability of habitat use decile. The Whooping Cranes may have been attracted to the area of unharvested corn where they foraged and then to a roost site near this foraging area. During future operations, Whooping Cranes would be expected to generally avoid wind turbines. However, a potential consideration would be to limit areas within the project area with unharvested crops to avoid attracting Whooping Cranes into the project area to forage.

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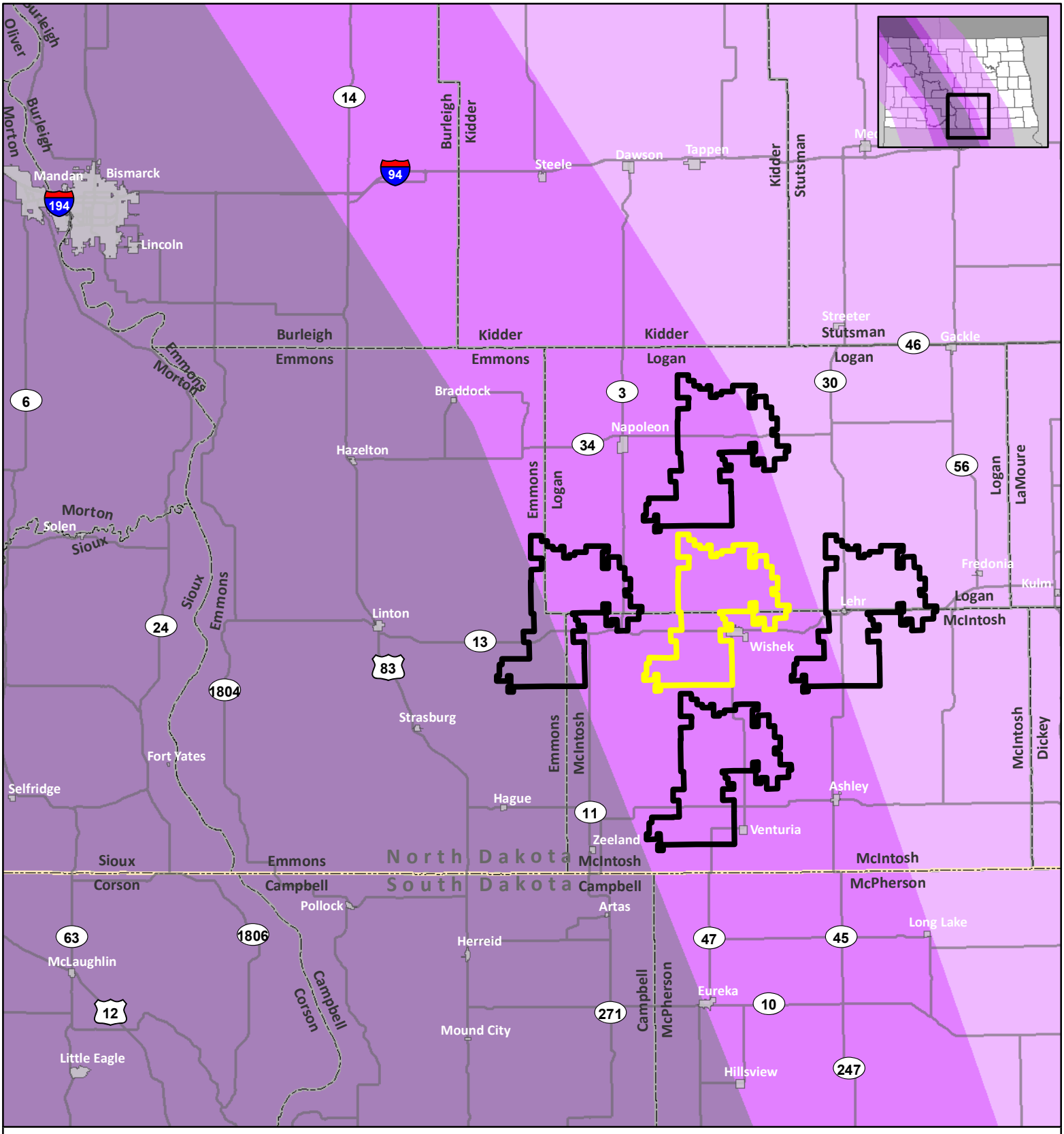
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FIGURES



Whooping Crane Migration Corridor (USFWS)
- 50%
- 75%
- 95%

Project Area (12/4/2020, ~57,097 acres)
Reference Areas

Road
Town/Village
County
State

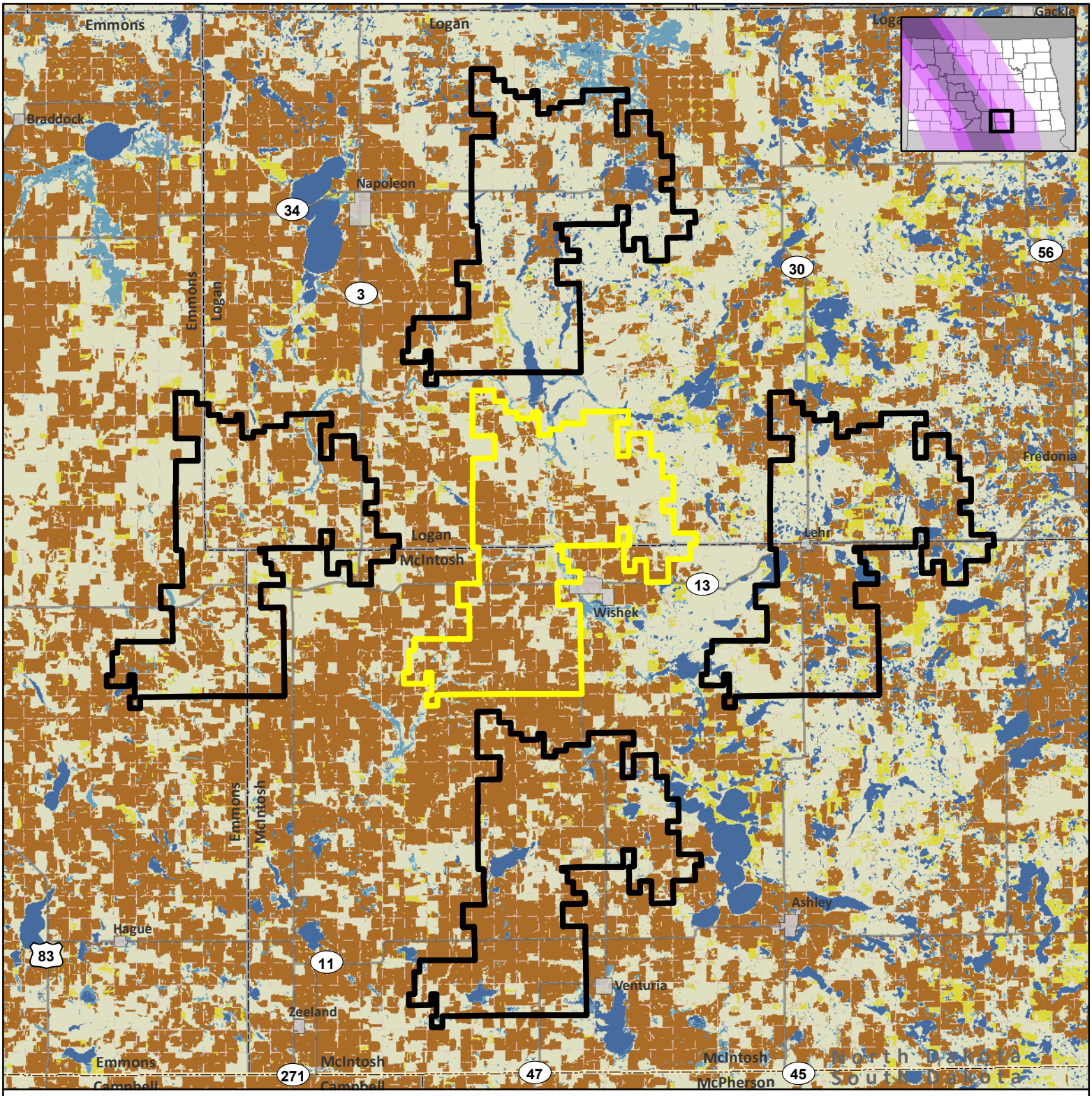
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ATWELL

Whooping Crane Habitat Assessment
Badger Wind
19000785
March 09, 2021

Figure 1
Project Area and Reference Areas
North Dakota

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Open Water
Developed, Open Space
Developed
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Herbaceous
Hay/Pasture
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
Project Area (12/4/2020, ~57,097 acres)
Reference Areas
Whooping Crane Migration Corridor (USFWS)
50%
75%
95%
Road
County
State

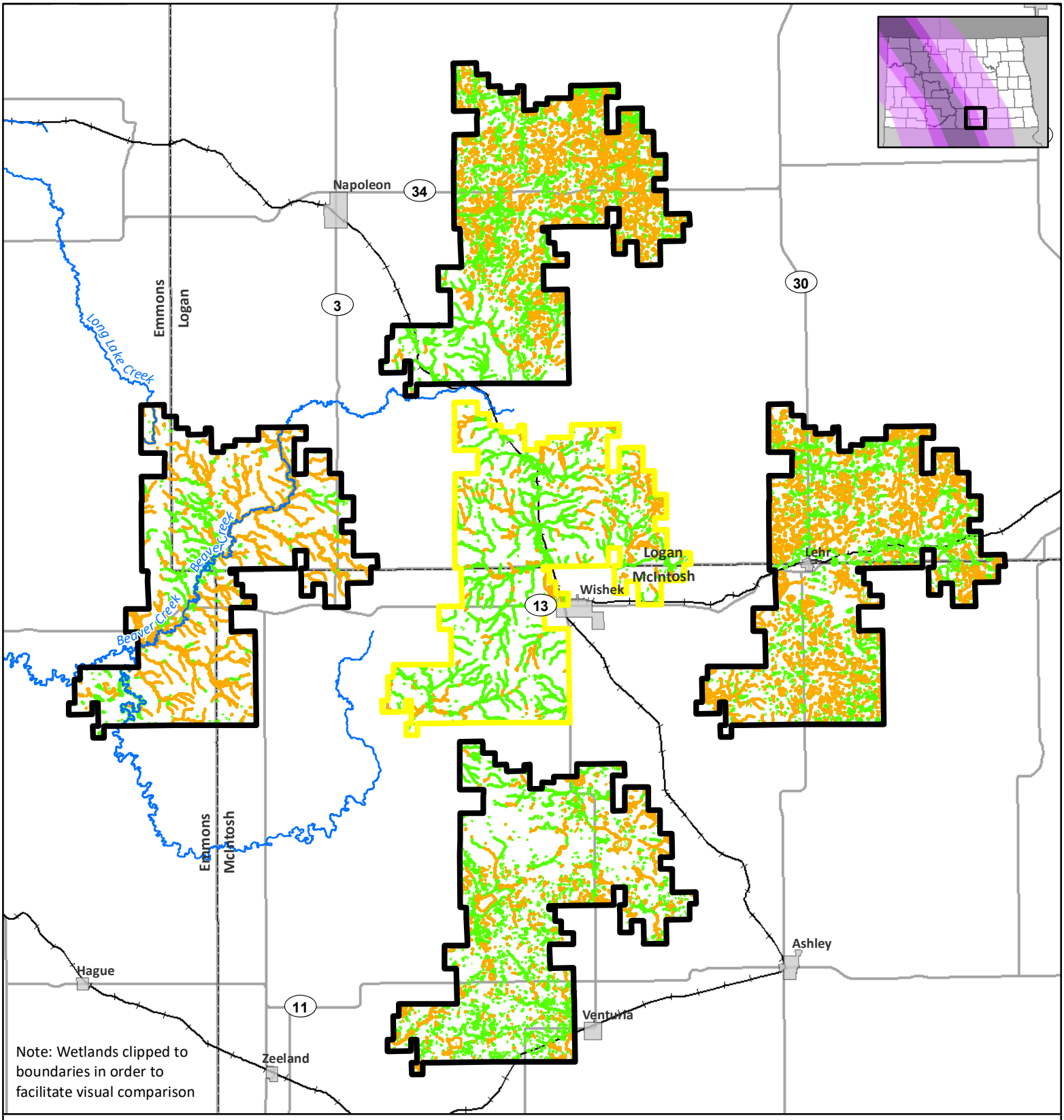
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ATWELL

Whooping Crane Habitat Assessment
Badger Wind
19000785
March 09, 2021

Figure 2
NLCD Land Cover Classification
North Dakota

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Major Watercourse (NHD)
Wetland (Screened)
Wetland (NWI)

Whooping Crane Migration Corridor (USFWS)
50%
75%
95%

Project Area (12/4/2020, ~57,097 acres)
Reference Areas

Road
Railroad
County

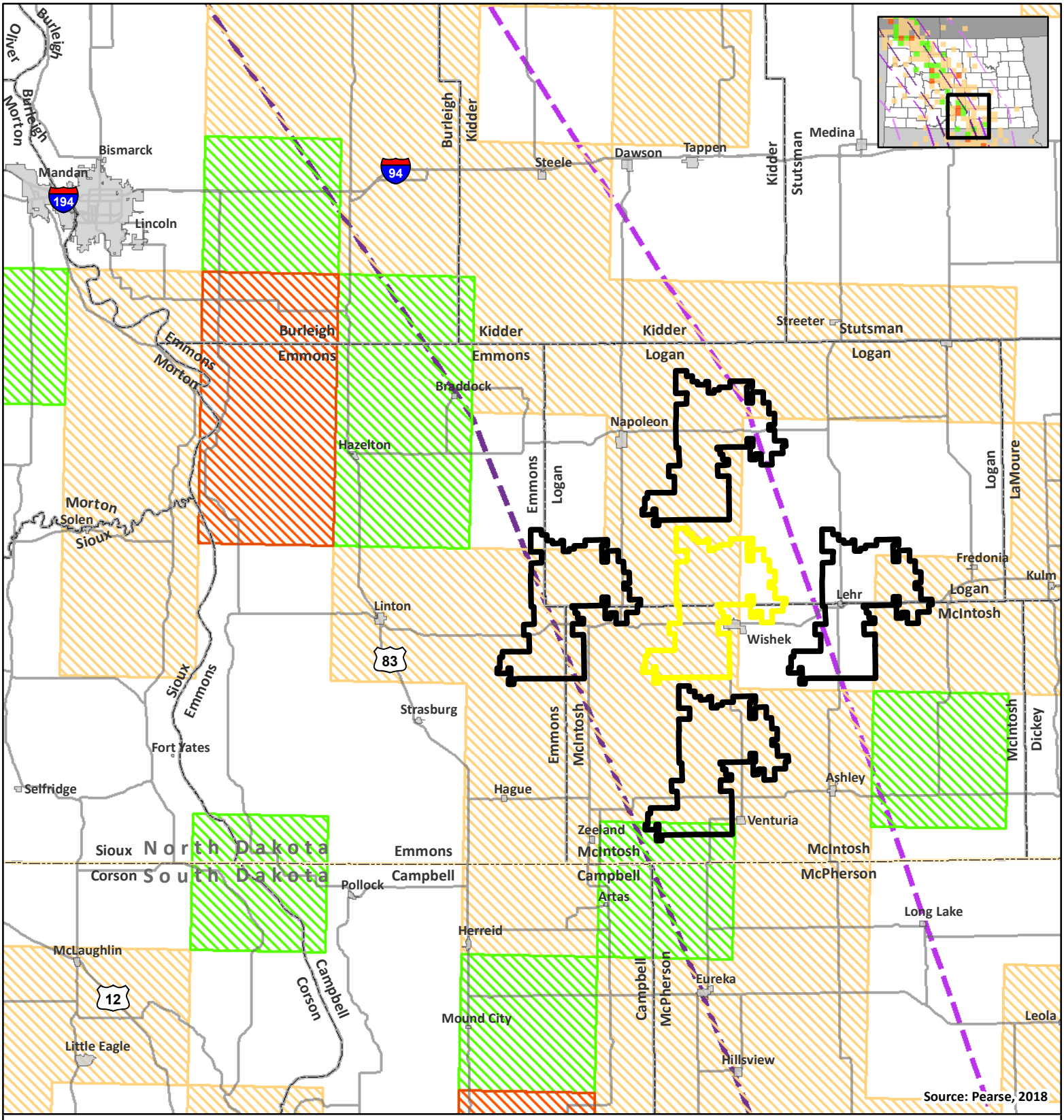
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ATWELL

Whooping Crane Habitat Assessment
Badger Wind
19000785
March 10, 2021

Figure 3
NWI Wetlands
North Dakota

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Whooping Crane Stop Over Intensity
- Extended Use Core
- Core
- Low
- Unoccupied

Whooping Crane Migration Corridor (USFWS)
- 50%
- 75%
- 95%

- Project Area (12/4/2020, ~57,097 acres)
- Reference Areas

- Road
- Town/Village
- County
- State

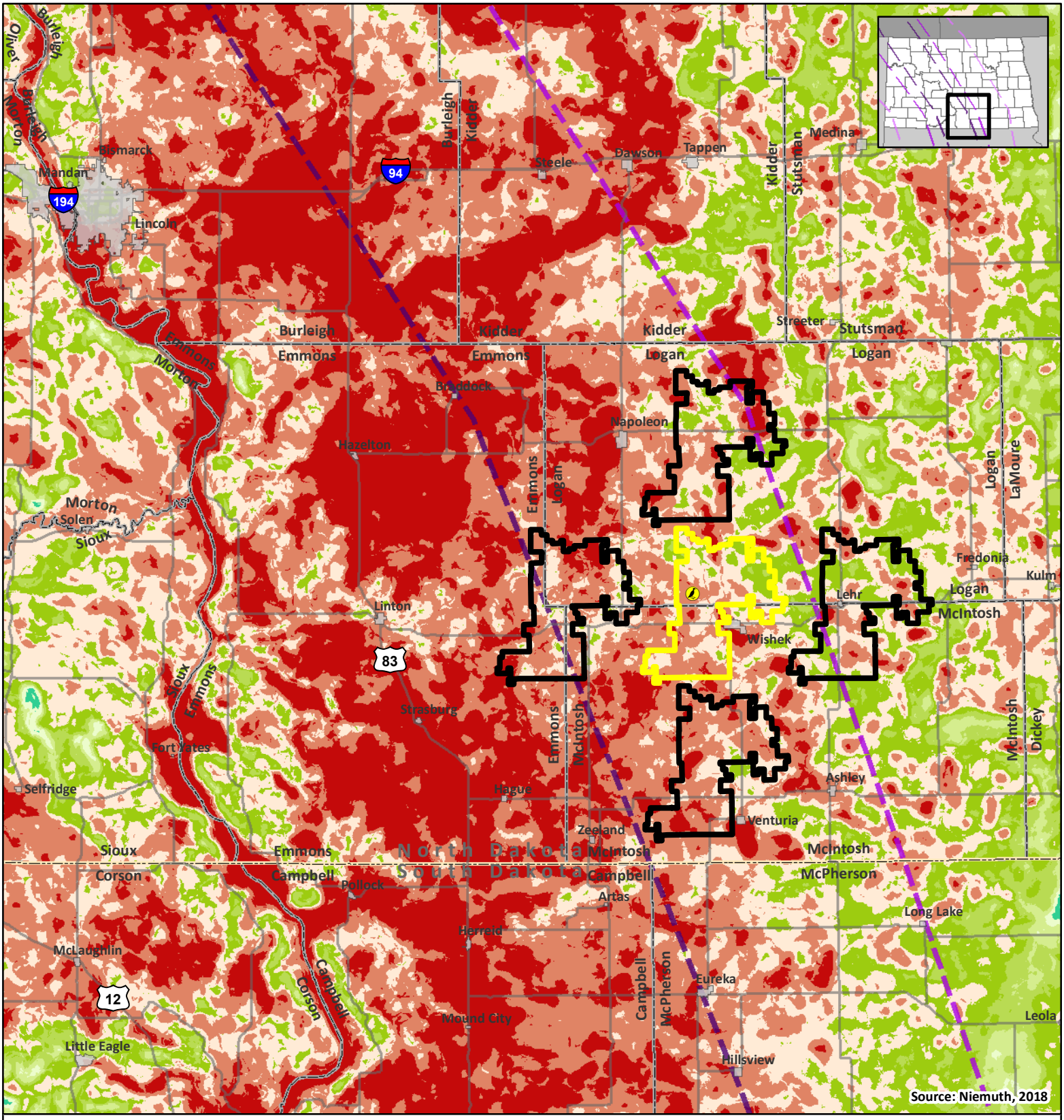
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ATWELL

Whooping Crane Habitat Assessment
Badger Wind
19000785
March 09, 2021

Figure 4
Whooping Crane Stopover Use Intensity
North Dakota

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Whooping Crane Probability of Use
- High (10)
- High (9)
- High (8)
- Medium (7)
- Medium (6)
- Medium (5)
- Medium (4)
- Low (3)
- Low (2)

Whooping Crane Migration Corridor (USFWS)
- 50%
- 75%
- 95%

Whooping Crane Sighting (April 2020)

Project Area (12/4/2020, ~57,097 acres)

Reference Areas

Road

Town/Village

County

State

0 10
Miles

ATWELL

Whooping Crane Habitat Assessment
Badger Wind
19000785
March 09, 2021

Figure 5
Whooping Crane Probability of Landscape-level Habitat Use
North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Avian\WHCR\T19000785_Fig5_WHCR_ProbabilityOfUse_20210309.mxd 3/9/2021

TABLES

Table 1. NLCD Land Cover Classification

	Project		East		North		South		West	
Land Use/Cover	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Cultivated Crops	26362.1	46.17%	16988.0	29.75%	16573.2	29.03%	35070.5	61.42%	26633.1	46.65%
Wetlands/Water	1402.8	2.46%	8279.7	14.50%	6774.6	11.87%	3097.0	5.42%	1105.6	1.94%
Grassland/Herbaceous	25622.6	44.88%	25098.9	43.96%	31292.7	54.81%	15194.5	26.61%	25451.2	44.58%
Pasture/Hay	1260.5	2.21%	4273.5	7.48%	976.7	1.71%	816.0	1.43%	2042.0	3.58%
Developed	1756.8	3.08%	1823.3	3.19%	1369.4	2.40%	1905.6	3.34%	1827.4	3.20%
Woodland/Forest	24.0	0.04%	13.6	0.02%	22.2	0.04%	11.3	0.02%	10.2	0.02%
Shrub/Scrub	664.7	1.16%	573.6	1.00%	70.5	0.12%	983.5	1.72%	22.9	0.04%
Barren Land	3.6	0.01%	46.5	0.08%	17.6	0.03%	18.5	0.03%	4.4	0.01%

National Land Cover Database (NLCD) classification values provided for the Badger Wind project area and four surrounding references areas in North Dakota. Project area and each reference area is approximately 57,097.0 acres in area.

Source: Yang et al. 2018

Table 2. NWI Wetland Assessment

	Project		East		North		South		West	
Land Use/Cover	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Freshwater Emergent Wetland	1824.2	79.4%	6398.0	82.8%	5724.9	78.2%	3652.5	95.3%	1477.6	76.0%
Freshwater Forested/Shrub Wetland	1.9	0.1%	1.3	0.0%	4.9	0.1%	2.9	0.1%	0.0	0.0%
Freshwater Pond	57.0	2.5%	166.4	2.2%	127.4	1.7%	42.8	1.1%	89.0	4.6%
Lake	20.4	0.9%	1075.0	13.9%	1371.2	18.7%	39.3	1.0%	0.0	0.0%
Riverine	394.3	17.2%	83.8	1.1%	95.7	1.3%	94.2	2.5%	377.1	19.4%
Total	**2297.9**	**100.0%**	**7724.5**	**100.0%**	**7324.0**	**100.0%**	**3831.7**	**100.0%**	**1943.6**	**100.0%**

National Wetlands Inventory (NWI) classification values provided for the Badger Wind project area and four surrounding references areas in North Dakota. Project area and each reference area is approximately 57,097.0 acres in area.

Source: USFWS 2019

Table 3a. Wetland Scoring Assessment: All Scored Wetlands

Area	Number of Basins	Total Wetland Acres	Mean Basin Size in Acres	Basin Size Range in Acres	Mean Score	Score Range
Project	370	955.0	2.6	0.3 - 292.3	10.7	7 - 18
East	1603	5587.2	3.5	0.3 - 305.2	12.7	7 - 19
North	1393	4215.9	3.0	0.3 - 381.3	12.8	6 - 19
South	634	1945.5	3.1	0.3 - 206.4	11.0	7 - 17
West	460	1406.1	3.1	0.3 - 80.8	11.0	7 - 17

Number of wetland basins that passed wetland assessment screening, total acreage, mean acreage, acreage range, mean score, and score range of screened basins. Basin summary data are provided for the Badger Wind project area and four surrounding reference areas in North Dakota. Project area and each reference area is appoximately 57,097.0 acres. Screening and scoring methodology from The Watershed Institute (2013).

Table 3b. Wetland Scoring Assessment: Potential Roosting Habitat Wetlands

Area	Number of Basins	Total Wetland Acres	Mean Basin Size in Acres	Basin Size Range in Acres	Mean Score	Score Range
Project	114	744.3	6.5	0.3 - 146.4	13.2	12 - 18
East	1240	5306.7	4.3	0.3 - 192.4	13.5	12 - 19
North	1116	4021.0	3.6	0.3 - 108.6	13.4	12 - 18
South	273	1628.2	6.0	0.3 - 206.4	13.0	12 - 17
West	177	1116.3	6.3	0.3 - 353.0	13.5	12 - 18

Screened wetlands with assessment scores ≥ 12, signifying status as potential Whooping Crane stopover roosting habitat (Watershed Institute, Inc. 2013).
Number of potential stopover roosting habitat basins, total acreage, mean acreage, acreage range, mean score, and score range are provided for the Badger Wind project area and four surrounding reference areas in North Dakota. Project area and each reference area is approximately 57,097.0 acres.

Table 4a. Whooping Crane Stopover Use Intensity Acreage

Area	Extended Use Core Intensity	Core Intensity	Low Intensity	Unclassified
Project	0	0	45,374	11,723
East	0	0	13,901	43,196
North	0	0	49,997	7,100
South	0	5,367	51,731	0
West	0	0	53,806	3,291
Grand Total	**0**	**5,367**	**214,809**	**65,310**

Source: Pearse, A.T., M. Rabbe, L.M. Juliusson, M.T. Bidwell, L. Craig-Moore, D.A. Brandt, and W. Harrell. 2018.

Table 4b. Whooping Crane Stopover Use Intensity Percent Coverage

Area	Extended Use Core Intensity	Core Intensity	Low Intensity	Unclassified
Project	0.0%	0.0%	79.5%	20.5%
East	0.0%	0.0%	24.3%	75.7%
North	0.0%	0.0%	87.6%	12.4%
South	0.0%	9.4%	90.6%	0.0%
West	0.0%	0.0%	94.2%	5.8%
Average	**0.0%**	**1.9%**	**75.2%**	**22.9%**

Source: Pearse, A.T., M. Rabbe, L.M. Juliusson, M.T. Bidwell, L. Craig-Moore, D.A. Brandt, and W. Harrell. 2018.

Table 5a. Whooping Crane Probability of Habitat Use: Decile Acreage

Habitat Quality	Value	Project Area	East	North	South	West
High	**10**	2,518	2,001	7,081	7,330	7,692
	9	21,993	14,349	22,536	34,315	30,209
	8	23,741	22,780	18,684	14,785	17,653
High Total		**48,252**	**39,130**	**48,301**	**56,430**	**55,554**
Medium	**7**	8,253	16,062	8,116	667	1,543
	6	591	1,901	650	0	0
	5	0	3	30	0	0
Medium Total		**8,844**	**17,966**	**8,796**	**667**	**1,543**

Source: Niemuth, N. D., A. J. Ryba, A. T. Pearse, S. M. Kvas, D. A. Brandt, B. Wangler, J. E. Austin, and M. J. Carlisle. 2018

Table 5b. Whooping Crane Probability of Habitat Use: Percent Coverage

Habitat Quality	Decile	Project Area	East	North	South	West
High	**10**	4.4%	3.5%	12.4%	12.8%	13.5%
	9	38.5%	25.1%	39.5%	60.1%	52.9%
	8	41.6%	39.9%	32.7%	25.9%	30.9%
High Total		**84.5%**	**68.5%**	**84.6%**	**98.8%**	**97.3%**
Medium	**7**	14.5%	28.1%	14.2%	1.2%	2.7%
	6	1.0%	3.3%	1.1%	0.0%	0.0%
	5	0.0%	0.0%	0.1%	0.0%	0.0%
Medium Total		**15.5%**	**31.4%**	**15.4%**	**1.2%**	**2.7%**

Source: Niemuth, N. D., A. J. Ryba, A. T. Pearse, S. M. Kvas, D. A. Brandt, B. Wangler, J. E. Austin, and M. J. Carlisle. 2018

Grassland Habitat Assessment

Badger Wind Project

Logan and McIntosh Counties, North Dakota



Prepared for:

Badger Wind, LLC

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Prepared by:

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January 19, 2024

WEST

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REPORT REFERENCE

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TABLE OF CONTENTS

INTRODUCTION 1

PROJECT AND SURVEY AREAS 1

METHODS 3

Desktop Review 3

Field Survey 3

Data Management 4

RESULTS 4

REFERENCES 6

LIST OF FIGURES

Figure 1. Location of the 2021 and 2023 Grassland Survey Areas and the Badger Wind Project in Logan and McIntosh counties, North Dakota. 2

Figure 2. Results of the desktop review and field assessment of potential grassland habitat within the 2021 and 2023 Grassland Survey Areas of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021 and August 17 – 18, 2023. 5

LIST OF APPENDICES

Appendix A. Representative Photographs of Grassland Habitats within the 2021 and 2023 Grassland Survey Areas of the Badger Wind Project in Logan and McIntosh Counties, North Dakota, from September 29 – October 2, 2021 and August 17 – 18, 2023.

Appendix B. Results of the desktop review and field assessment of potential grassland habitat within the Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021 and August 17 – 18, 2023.

INTRODUCTION

Badger Wind, LLC (Badger Wind) is proposing the Badger Wind Project (Project) in Logan and McIntosh counties, North Dakota. Badger Wind contracted Western EcoSystems Technology, Inc. (WEST) to complete a grassland habitat assessment, including characterization of grassland sod types as broken/unbroken, to inform development of the Project. Unbroken grasslands, defined in the North Dakota Game and Fish Department's (NDGFD) *Wind Energy Development in North Dakota, Best Management Practices* (NDGFD 2021) as "grasslands that have not been tilled or otherwise broken," are considered key habitat for the "health and long-term survival of many of North Dakota's native wildlife."

The objective of this study was to identify grassland parcels within the Project and categorize the sod type of each parcel as either broken or unbroken grasslands. This report presents the combined results of grassland assessments conducted for the Project during 2021 (Arellano and Piorkowski 2021) and during 2023 to cover changes/updates to the Project since2021, which include the expanded project boundary and design modifications. Results from this assessment can help inform siting of facilities and guide decisions regarding future survey needs within the area.

PROJECT AND SURVEY AREAS

The Project Area encompasses approximately 34,867 acres (ac; 14,110 hectares [ha]) in Logan and McIntosh counties, North Dakota (Figure 1). The primary land cover within the Project is predominantly herbaceous (47.4%) and cultivated crops (42.4%; National Land Cover Database [NLCD] 2019). The Project Area lies within the Northwestern Glaciated Plains Level III Ecoregion, an ecoregion dominated by mixed-grass prairie (US Environmental Protection Agency 2013). Topography within the Project Area ranges from relatively flat to rolling hills and elevations range from 1,963 to 2,200 feet (598 to 610 meters).

The 2021 Grassland Survey Area was not buffered and encompassed 52,305 ac (21,657 ha) within Logan and McIntosh counties, North Dakota (Figure 1). The 2023 Grassland Survey Area included recently leased lands buffered by one mile (1.6 kilometers) that were located outside of the 2021 Grassland Survey Area (Figure 1). The 2023 Survey Area encompassed 7704.5ac (3,117.9 ha).

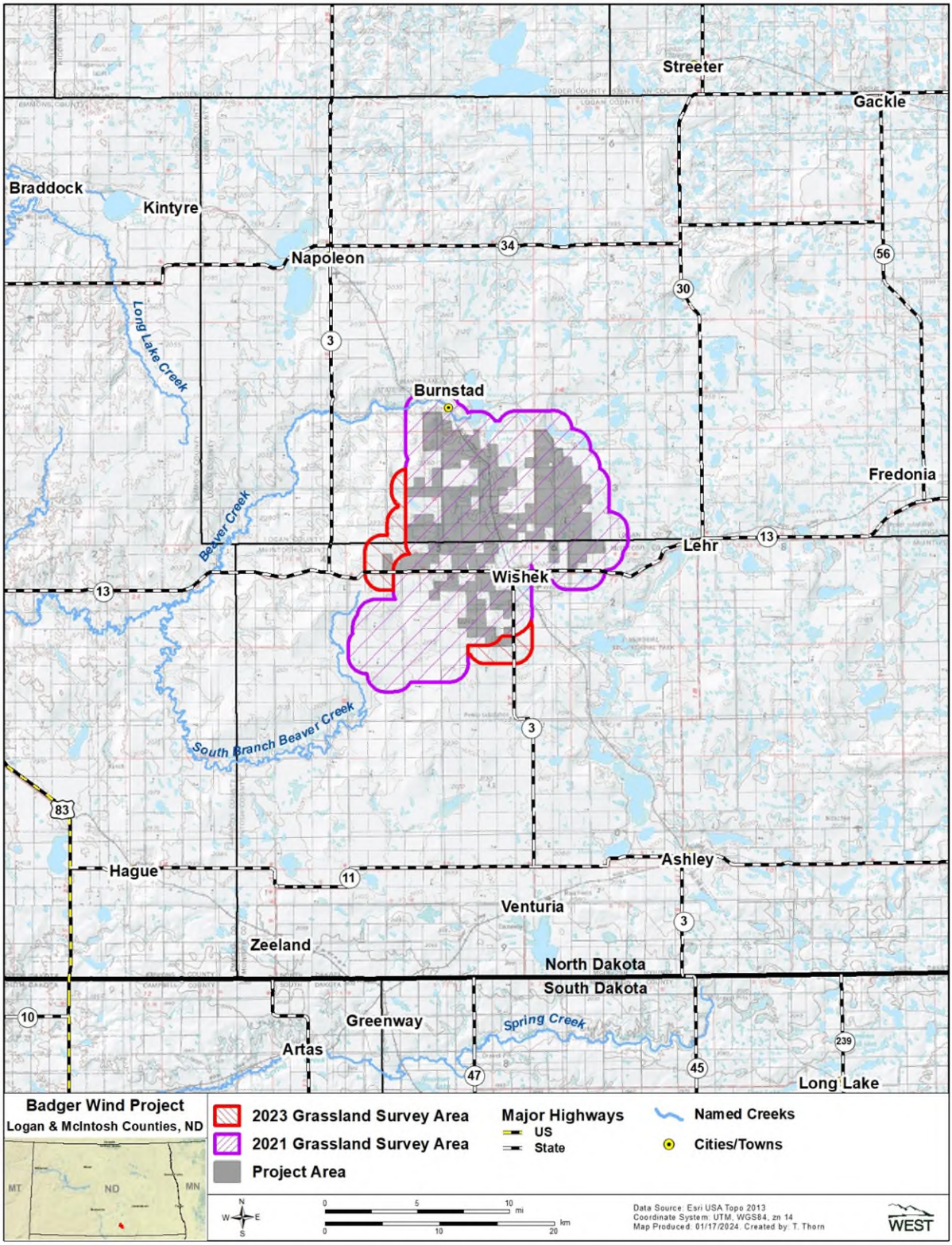


Figure 1. Location of the 2021 and 2023 Grassland Survey Areas and the Badger Wind Project in Logan and McIntosh counties, North Dakota.

METHODS

Desktop Review

Prior to field surveys, WEST completed a desktop review of existing land cover features within the 2021 and 2023 Survey Areas using current aerial photography (US Department of Agriculture [USDA] National Agriculture Imagery Program [NAIP] 2019, 2020, 2021, and 2022), ESRI imagery (larger scale/higher resolution; ESRI 2021), existing land cover (NLCD 2016 and 2019), 2021 Project grasslands data layer (Arellano and Piorkowski 2021), and the NDGFD Native Habitat layer (NDGFD 2014). This review, conducted using Esri software (ArcGIS 10.8.1), resulted in a digital data layer of polygons delineating grassland cover.

Delineated grassland polygons were further examined using a series of historical USDA NAIP aerial photography and USDA North Dakota statewide historical imagery from 1957–1962 (USDA 2017) to establish a preliminary classification of grassland type (broken or unbroken). Broken grassland was identified based on features such as rock piles indicating extensive mechanized rock clearing; presence and number of trees and shrubs; field edge changes; absence of scattered rocks; straight line features indicating plowing, discing, harvesting, or planting; or any other features indicating human disturbance. Unbroken grassland was identified based on the lack of these disturbance features.

The desktop analysis resulted in creation of a digital data layer of polygons classified as "grassland" or "other" (i.e., non-grass areas such as cultivated cropland, roads, barren areas, development, wetlands, forests, and shrub/scrub). Each grassland polygon was defined by visual changes in the landscape (e.g., grassland to cropland or forest edges) and was further categorized as broken or unbroken and given a unique identifier (Grassland ID) used on maps and datasheets. The geographical information system specialist provided maps showing all grassland polygons, Grassland ID, roads, cities, and land access information for the field survey effort.

In November 2023, WEST received a revised NDGFD Native Habitat layer (NDGFD 2022). All areas classified as grasslands in this spatial file were previously reviewed during the desktop review and evaluated during field surveys. This layer is included in the results for reference.

Field Survey

Field surveys were completed from September 29 – October 2, 2021 and August 17 – 18, 2023 to verify the results of the desktop review. A qualified WEST biologist experienced with grassland plant identification and habitat assessments completed both pedestrian surveys and ocular surveys from publicly accessible roadsides for these efforts. Grassland polygons created from the desktop review were confirmed as broken or unbroken, and dominant grass and forb species were recorded as indicators of quality. Photographs were taken to document the condition of the grassland polygons (Appendix A).

Data Management

WEST implemented quality assurance and quality control (QA/QC) measures at all stages of the grassland habitat assessment, including during the desktop review, in the field, during data entry, and during report writing. Data were reviewed by the WEST field biologist before the field data were submitted for data entry; WEST data entry staff were trained on proper data entry procedures, which included an independent review of the field data. If any errors, omissions, or problems were identified, follow-up QA/QC measures were implemented including discussions and review of field data with field staff and/or Project Manager. Upon completion of field surveys, the digital data layer created during the desktop review was updated, as needed.

RESULTS

The combined desktop and field survey resulted in 3,188.7 ac (1,290.4 ha) of grasslands classified as broken and 18,463.0 ac (7,471.7 ha) of unbroken grasslands within the 2021 Grassland Survey Area (Table 1; Figure 2; Appendix B1). The 2023 Grassland Survey Area resulted in 2,265.8 ac (916.92 ha) of grasslands classified as broken and 5,804.6 ac (2,349.05 ha) classified as unbroken within the 2023 Grassland Survey Area (Table 1; Figure 2; Appendix B2).

Table 1. Results of the grassland habitat survey conducted within the 2021 and 2023 Grassland Survey Areas of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021 and August 17 – 18, 2023.

	2021 Grassland Survey Area		2023 Grassland Survey Area	
Grassland Sod Type	**Acres**	**Percentage of Total**	**Acres**	**Percentage of Total**
Broken	3,188.7	14.7	2,265.8	28.1
Unbroken	18,463.0	85.3	5,804.6	71.9
Total	**21,651.7**	**100**	**8,070.4**	**100**

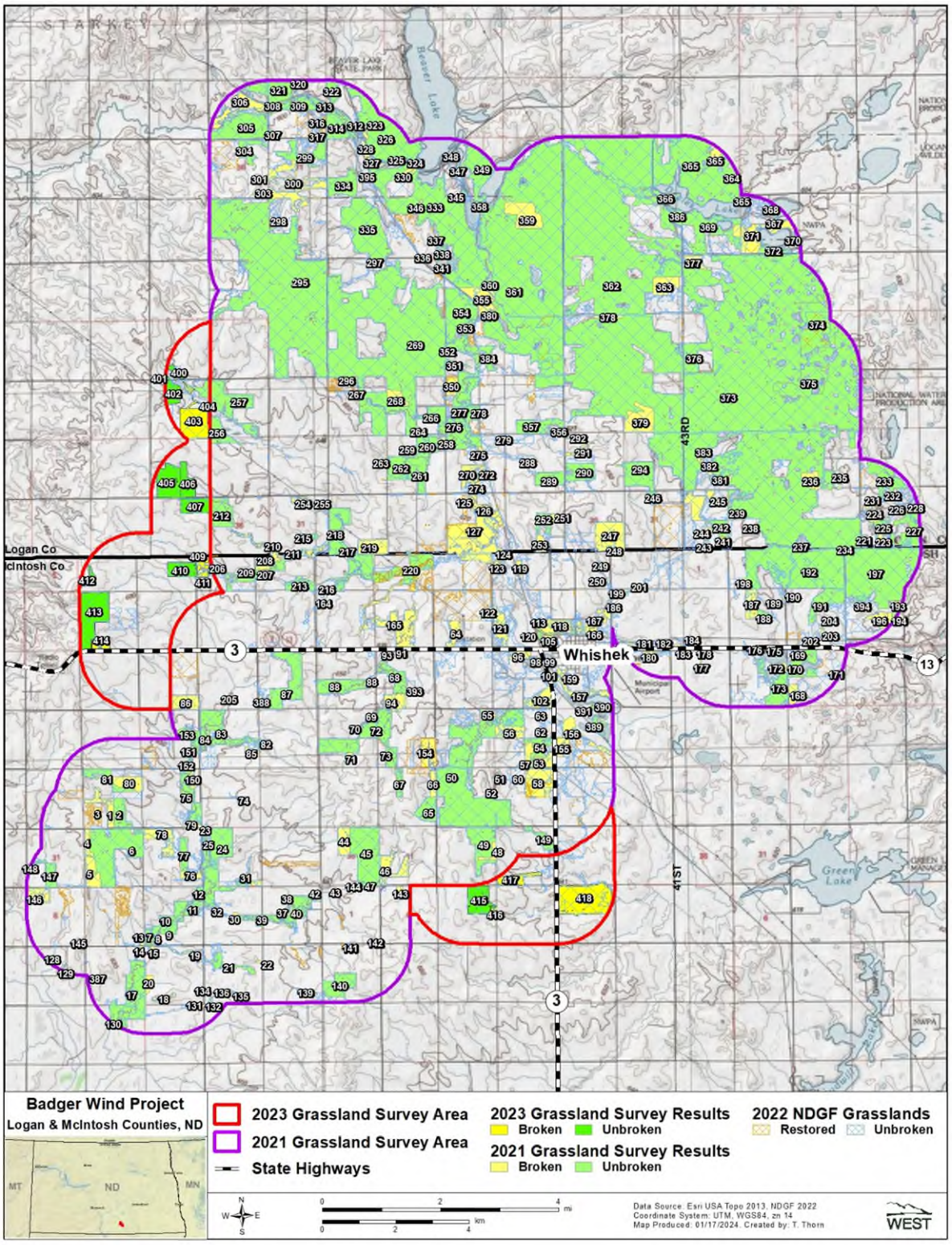


Figure 2. Results of the desktop review and field assessment of potential grassland habitat within the 2021 and 2023 Grassland Survey Areas of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021 and August 17 – 18, 2023.

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Appendix A. Representative Photographs of Grassland Habitats within the 2021 and 2023 Grassland Survey Areas of the Badger Wind Project in Logan and McIntosh Counties, North Dakota, from September 29 – October 2, 2021 and August 17 – 18, 2023.



Appendix A1. Representative photo of broken grasslands within the 2021 Grassland Survey Area of the Badger Wind Farm, Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.



Appendix A2. Representative photo of broken grasslands within the 2021 Grassland Survey Area of the Badger Wind Farm, Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.



Appendix A3. Representative photo of unbroken grasslands within the 2021 Grassland Survey Area of the Badger Wind Farm, Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.



Appendix A4. Representative photo of unbroken grasslands within the 2021 Grassland Survey Area of the Badger Wind Farm, Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.



Appendix A5. Representative photo of broken grassland within the 2023 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from August 17 – 18, 2023.



Appendix A6. Representative photo of broken grasslands within the 2023 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from August 17 – 18, 2023.



Appendix A7. Representative photo of unbroken grassland within the 2023 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from August 17 – 18, 2023.



Appendix A8. Representative photo of unbroken grassland within the 2023 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from August 17 – 18, 2023.

Appendix B. Results of the desktop review and field assessment of potential grassland habitat within the Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021 and August 17 – 18, 2023.

Appendix B1. Results of the desktop review and field assessment of potential grassland habitat within the 2021 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.

Grassland ID	Classification
1	Broken
2	Unbroken
3	Broken
4	Broken
5	Broken
6	Unbroken
7	Unbroken
8	Broken
9	Unbroken
10	Unbroken
11	Unbroken
12	Unbroken
13	Broken
14	Broken
15	Broken
16	Broken
17	Unbroken
18	Broken
19	Broken
20	Broken
21	Unbroken
22	Broken
23	Unbroken
24	Unbroken
25	Unbroken
26	Unbroken
27	Unbroken
28	Unbroken
29	Unbroken
30	Unbroken
31	Broken
32	Broken
33	Broken
34	Unbroken
35	Unbroken
36	Unbroken
37	Broken
38	Broken
39	Unbroken
40	Unbroken
41	Broken
42	Broken
43	Broken
44	Broken
45	Unbroken
46	Broken
47	Unbroken
48	Broken
49	Unbroken

Appendix B1. Results of the desktop review and field assessment of potential grassland habitat within the 2021 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.

Grassland ID	Classification
50	Unbroken
51	Unbroken
52	Unbroken
53	Broken
54	Unbroken
55	Broken
56	Broken
57	Broken
58	Broken
59	Unbroken
60	Unbroken
61	Unbroken
62	Unbroken
63	Unbroken
64	Broken
65	Unbroken
66	Broken
67	Unbroken
68	Unbroken
69	Broken
70	Broken
71	Broken
72	Unbroken
73	Broken
74	Broken
75	Unbroken
76	Broken
77	Unbroken
78	Broken
79	Broken
80	Broken
81	Unbroken
82	Broken
83	Unbroken
84	Unbroken
85	Broken
86	Broken
87	Unbroken
88	Unbroken
88	Broken
89	Broken
90	Broken
91	Broken
92	Broken
93	Broken
94	Broken
96	Broken
97	Broken
98	Broken
99	Broken

Appendix B1. Results of the desktop review and field assessment of potential grassland habitat within the 2021 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.

Grassland ID	Classification
100	Broken
101	Broken
102	Broken
104	Broken
105	Broken
106	Broken
107	Broken
108	Unbroken
109	Broken
110	Broken
111	Unbroken
112	Unbroken
113	Unbroken
114	Unbroken
115	Unbroken
116	Unbroken
118	Broken
119	Broken
120	Unbroken
121	Broken
122	Broken
123	Broken
124	Broken
125	Broken
126	Broken
127	Broken
128	Broken
129	Broken
130	Unbroken
131	Broken
132	Broken
133	Broken
134	Broken
135	Broken
136	Broken
137	Broken
138	Broken
139	Unbroken
140	Unbroken
141	Broken
142	Broken
143	Broken
144	Broken
145	Broken
146	Broken
147	Unbroken
148	Broken
149	Unbroken
150	Broken
151	Unbroken

Appendix B1. Results of the desktop review and field assessment of potential grassland habitat within the 2021 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.

Grassland ID	Classification
152	Unbroken
153	Unbroken
154	Broken
155	Broken
156	Broken
157	Broken
158	Broken
159	Broken
164	Broken
165	Broken
166	Broken
167	Broken
168	Broken
169	Broken
170	Unbroken
171	Broken
172	Broken
173	Unbroken
174	Broken
175	Broken
176	Broken
177	Broken
178	Broken
179	Broken
180	Broken
181	Broken
182	Broken
183	Broken
184	Broken
185	Broken
186	Broken
187	Broken
188	Unbroken
189	Unbroken
190	Broken
191	Broken
192	Unbroken
193	Broken
194	Broken
195	Unbroken
196	Broken
197	Unbroken
198	Broken
199	Broken
200	Broken
201	Broken
202	Broken
203	Broken
204	Unbroken
205	Broken

Appendix B1. Results of the desktop review and field assessment of potential grassland habitat within the 2021 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.

Grassland ID	Classification
206	Unbroken
207	Unbroken
208	Broken
209	Unbroken
210	Broken
211	Broken
212	Unbroken
213	Unbroken
214	Unbroken
215	Broken
216	Broken
217	Unbroken
218	Broken
219	Broken
220	Unbroken
221	Broken
222	Unbroken
223	Broken
224	Broken
225	Unbroken
226	Broken
227	Unbroken
228	Broken
229	Broken
230	Unbroken
231	Broken
232	Unbroken
233	Unbroken
234	Broken
235	Broken
236	Broken
237	Unbroken
238	Broken
239	Broken
240	Broken
241	Broken
242	Unbroken
243	Broken
244	Broken
245	Broken
246	Unbroken
247	Broken
248	Broken
249	Broken
250	Broken
251	Broken
252	Unbroken
253	Broken
254	Broken
255	Broken

Appendix B1. Results of the desktop review and field assessment of potential grassland habitat within the 2021 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.

Grassland ID	Classification
256	Unbroken
257	Unbroken
258	Broken
259	Broken
260	Unbroken
261	Unbroken
262	Unbroken
263	Broken
264	Broken
265	Broken
266	Unbroken
267	Broken
268	Broken
269	Unbroken
270	Broken
272	Broken
273	Broken
274	Broken
275	Broken
276	Broken
277	Unbroken
278	Unbroken
279	Broken
280	Broken
288	Broken
289	Unbroken
290	Unbroken
291	Broken
292	Broken
293	Broken
294	Unbroken
295	Unbroken
296	Broken
297	Broken
298	Unbroken
299	Unbroken
300	Broken
301	Unbroken
302	Unbroken
303	Unbroken
304	Unbroken
305	Unbroken
306	Broken
307	Unbroken
308	Unbroken
309	Unbroken
310	Unbroken
311	Unbroken
312	Unbroken
313	Unbroken

Appendix B1. Results of the desktop review and field assessment of potential grassland habitat within the 2021 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.

Grassland ID	Classification
314	Unbroken
315	Broken
316	Broken
317	Broken
318	Unbroken
319	Unbroken
320	Broken
321	Unbroken
322	Unbroken
323	Broken
324	Broken
325	Broken
326	Unbroken
327	Broken
328	Broken
329	Broken
330	Broken
331	Unbroken
332	Unbroken
333	Unbroken
334	Unbroken
335	Unbroken
335	Broken
336	Unbroken
337	Unbroken
338	Unbroken
339	Unbroken
340	Unbroken
341	Unbroken
342	Unbroken
343	Unbroken
345	Unbroken
346	Broken
347	Unbroken
348	Broken
349	Unbroken
350	Broken
351	Unbroken
352	Broken
353	Unbroken
354	Unbroken
355	Broken
356	Broken
357	Unbroken
358	Unbroken
359	Broken
360	Broken
361	Unbroken
362	Unbroken
363	Broken

Appendix B1. Results of the desktop review and field assessment of potential grassland habitat within the 2021 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from September 29 – October 2, 2021.

Grassland ID	Classification
364	Broken
365	Unbroken
365	Broken
365	Broken
366	Unbroken
367	Unbroken
368	Unbroken
369	Unbroken
370	Unbroken
371	Broken
372	Unbroken
373	Unbroken
374	Unbroken
375	Unbroken
376	Unbroken
377	Broken
378	Broken
379	Broken
380	Unbroken
381	Broken
382	Broken
383	Broken
384	Unbroken
384	Broken
385	Unbroken
386	Unbroken
387	Broken
388	Broken
389	Unbroken
390	Unbroken
391	Unbroken
392	Unbroken
393	Unbroken
394	Broken
395	Broken

Appendix B2. Results of the desktop review and field assessment of potential grassland habitat within the 2023 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from August 17 – 18, 2023.

Grassland ID	Classification	Vegetation	Comments
400	Unbroken	*Bouteloua gracilis, Bromus inermis, Poa pratensis, Grindelia squarrosa, Artemisia ludoviciana, Artemisia absinthium,* and *Rumex spp.*	
401	Unbroken	*Bouteloua gracilis, Bromus inermis, Poa pratensis, Grindelia squarrosa, Artemisia ludoviciana, Artemisia absinthium,* and *Rumex spp.*	
402	Unbroken	*Bouteloua gracilis, Bromus inermis,* and *Poa pratensis*	Heavy grazing
403	Broken	*Bouteloua gracilis, Bromus inermis, Poa pratensis,* and *Artemisia ludoviciana*	
404	Broken	*Bouteloua gracilis, Bromus inermis, Poa pratensis,* and *Artemisia ludoviciana*	
405	Unbroken	*Bouteloua gracilis, Bromus inermis, Grindelia squarrosa, Liatris ligulistylis, Taraxacum officinale, artemisia ludoviciana, Rumex spp.,* and *Symphoricaros occidentalis*	
406	Unbroken	*Bromus inermis, Poa pratensis, Grindelia squarrosa, Artemisia ludoviciana, Symphoricarpos occident,* and *Melilotus officinalis*	
407	Unbroken	*Bromus inermis, Poa pratensis, Grindelia squarrosa, Artemisia ludoviciana, Symphoricarpos occident,* and *Melilotus officinalis*	
409	Broken	*Bromus inermis, Poa pratensis, Medicago sativa, Artemisia ludoviciana,* and *Melilotus officinalis*	Planted, straight line features
410	Broken	*Bouteloua gracilis, Spartina pectinate, Bromus inermis, Poa pratensis, Taraxacum officinale,* and *Symphoricarpos occident*	Cattle grazing
411	Broken	*Bromus inermis, Poa pratensis, Medicago sativa, Artemisia ludoviciana,* and *Melilotus officinalis*	Planted, straight line features
412	Unbroken	*Bromus inermis, Grindelia squarrosa, Artemisia ludoviciana, Sonchus spp., Pediomelum argophyllum,* and *Symphoricarpos occident*	Cattle grazing
413	Unbroken	*Bromus inermis, Grindelia squarrosa, Artemisia ludoviciana, Sonchus spp., Pediomelum argophyllum,* and *Symphoricarpos occident*	Cattle grazing
414	Broken	*Bromus inermis, Poa pratensis, Grindelia squarrosa, Artemisia ludoviciana, Sonchus spp., Taraxacum*	Extensive rock clearing, straight line features, farm equipment

Appendix B2. Results of the desktop review and field assessment of potential grassland habitat within the 2023 Grassland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, from August 17 – 18, 2023.

Grassland ID	Classification	Vegetation	Comments
		officinale, and *Symphoricarpos occident*	
415	Unbroken	*Bouteloua gracilis, Bromus inermis, Poa pratensis, Agropyron cristatum, Grindelia squarrosa, Solidago spp., Artemisia absinthium,* and *Symphoricarpos occident*	Cattle grazing
416	Broken	*Bromus inermis, Agropyron cristatum, Rosa spp., Echninacea, Medicago sativa, Grindelia squarrosa,* and *Fraxinus*	Extensive rock clearing, Abandoned farmyard
417	Broken	*Bromus inermis, Poa pratensis, Liatris ligulistylis, Artemisia absinthium, Bassia scoparia,* and *Melilotus officinalis*	Extensive rock clearing
418	Broken	*Artemisia absinthium, Sonchus spp.,* and *Symphoricarpos occident*	Extensive rock clearing

AQUATIC RESOURCES DELINEATION REPORT

BADGER WIND
LOGAN AND MCINTOSH COUNTIES, NORTH DAKOTA

Prepared for

Badger Wind, LLC
401 N. Michigan Avenue
Suite 501
Chicago, IL 60611

Atwell Project No. 19000785

Submitted by Atwell, LLC

June 7, 2022

EXECUTIVE SUMMARY

Atwell, LLC (Atwell) was retained by Badger Wind, LLC (Badger Wind) to delineate aquatic resources, including wetlands, watercourses, and waterbodies, for portions of the Badger Wind Project (Project) in North Dakota. In 2020 and 2021, Atwell conducted delineations for the portion of the Project in Logan County, North Dakota, with Western EcoSystems Technology, Inc. (WEST) conducting delineations for the portion of the Project in McIntosh County, North Dakota in 2021. In 2022, Atwell completed additional delineations for areas of Project adjustment in both Logan and McIntosh Counties.

The purpose of this report is to identify, describe, and document aquatic resource boundary determinations for review by regulatory authorities, including potential Waters of the U.S. (WOTUS). Aquatic resources that exhibit a hydrological connection to, or are adjacent to, navigable waters are regulated by the U.S. Army Corps of Engineers (USACE). The Badger Wind Project Area is located in Logan and McIntosh Counties, North Dakota, and comprises approximately 31,514 acres (49 square miles) centered at 46.287179, - 99.600842 (**Figure 1**).

The aquatic resources delineations were performed in accordance with the 1987 USACE Wetland Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (USACE 2010). Delineations were performed with a focus on proposed Badger Wind development areas. Atwell and WEST were provided the following assessment areas: a 250-foot (ft) radius around proposed turbines; a 100-ft-wide corridor around proposed collection lines; a 300-ft-wide corridor around access roads; a 200-ft-wide corridor for crane walks; a 200-ft-wide disturbance area around the proposed Project transmission line, and the areas comprising a proposed electric substation, Operations and Maintenance (O&M) facility, meteorological towers (MET) towers, the Aircraft Detection Lighting System (ADLS) tower, laydown yard, batch plant, marshaling yard (approximately 38.5 acres total), and turning radii locations. Collectively, Atwell and WEST assessed a 6,056-acre survey area.

Field aquatic resources delineations were conducted by Atwell within the defined survey area in 2020. In early 2021, Badger Wind shifted the Project to the south, which resulted in additional survey areas. WEST was retained by Badger Wind to conduct the aquatic resources delineation surveys for the remaining McIntosh County portion of the survey area, while Atwell continued to perform aquatic resources delineation surveys for the Logan County portion of the survey area. This was done with the understanding that two aquatic resources delineation reports would be produced to summarize 2021 delineation results.

Adjustments to the proposed project layout resulted in the need for additional aquatic resources delineation surveys in 2022. These surveys were conducted in full by Atwell. This report details

the results of all aquatic resources delineation field efforts led by Atwell. Several wetland boundaries that were originally delineated by WEST were updated or extended during the 2022 aquatic resources delineation effort due to changes in survey area boundaries and/or variations in seasonal climatic conditions on-site. These updated features are provided in this report following the original WEST nomenclature.

Atwell conducted aquatic resources delineations within the survey area during the months of September 2020, October 2020, September 2021, October 2021, and May 2022. Atwell ecologists delineated 158 wetland features comprising a cumulative total of 272.62 acres of wetlands within the survey area. Three waterbodies were identified within the survey area for a total of 0.84 acres. Six watercourses were identified within the survey area for a total of 6.44 acres and 7,468 linear feet.

Project activities that impact WOTUS must be authorized by the USACE prior to those activities taking place.

TABLE OF CONTENTS

1 INTRODUCTION 4
2 LOCATION 7
3 METHODS 7
3.1 PRELIMINARY DESKTOP ANALYSIS 8
3.2 AQUATIC RESOURCES DELINEATION METHODS 9
4 EXISTING CONDITIONS 10
4.1 LANDSCAPE SETTING (DESKTOP ANALYSIS RESULTS) 10
4.1.1.1 Aerial Imagery Results 10
4.1.1.2 USGS Topographic Map Results 10
4.1.1.3 Soils Survey of Logan and McIntosh County Results 11
4.1.1.4 NWI Map Results 11
4.1.1.5 NHD Map Results 11
4.1.1.6 Precipitation Data Results 11
4.2 AQUATIC RESOURCES RESULTS 11
4.2.1 Overview 11
4.2.2 On-Site Conditions 12
4.2.3 Aquatic Resource Features 12
4.2.3.1 Vegetation 13
4.2.3.2 Soils 13
4.2.3.3 Hydrology 14
4.2.4 Waterbodies 14
4.2.5 Watercourses 15
5 CONCLUSIONS & RECOMMENDATIONS 16
6 REFERENCES 18
7 COMMON AQUATIC RESOURCE DEFINITIONS 20

FIGURES

1. Wind Farm Site Location Map
2. Wind Farm Desktop Review Mapbook
3. Wind Farm Delineated Features Mapbook

APPENDICES

A NRCS SSURGO Soil Map Unit Table
B Results of Antecedent Precipitation Tool
C Photographic Log
D Wetland Determination Forms
E Aquatic Resources Tables

ACRONYMS

ADLS	Aircraft Detection Lighting System
APT	Antecedent Precipitation Tool
Atwell	Atwell, LLC
Badger Wind	Badger Wind, LLC
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HUC	Hydrologic Unit Code
MET	Meteorological Towers
NDGF	North Dakota Game and Fish
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary High-Water Mark
O&M	Operations and Maintenance
PEM	Palustrine Emergent
SSURGO	Soil Survey Geographic Database
TNW	Traditional Navigable Waters
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOTUS	Waters of the United States, including wetlands

1 INTRODUCTION

Atwell, LLC (Atwell) was retained by Badger Wind, LLC (Badger Wind) to delineate aquatic resources for the Badger Wind Project (Project) in North Dakota. These include wetlands, watercourses, and waterbodies, including potential waters of the United Stated, including wetlands (WOTUS). In 2020 and 2021, Atwell conducted delineations for the portion of the Project in Logan County, North Dakota, with Western EcoSystems Technology, Inc. (WEST) conducting delineations for the portion of the Project in McIntosh County, North Dakota in 2021. In 2022, Atwell completed additional delineations for areas of Project adjustment in both Logan and McIntosh Counties.

The purpose of this report is to identify, describe, and document aquatic resource boundary determinations for review by regulatory authorities, including potential Waters of the U.S. (WOTUS). Aquatic resources that exhibit a hydrological connection to, or are adjacent to, navigable waters are regulated by the U.S. Army Corps of Engineers (USACE). The Badger Wind Project Area is located in Logan and McIntosh Counties, North Dakota, and comprises approximately 31,514 acres (49 square miles) centered at 46.287179, - 99.600842 (**Figure 1**).

The proposed Project will have a nameplate capacity of up to 251.6 megawatts and consist of an array of wind turbines, each with an associated transformer. Proposed Project facilities include the following components:

- Up to 74 wind turbines;
- All-weather access roads to each turbine site;
- One collection substation (approximately 2 acres);
- Underground electrical collection lines and fiber optic cables from each turbine to the collection substation;
- An operations and maintenance (O&M) facility (approximately 2 acres);
- A temporary concrete batch plant location (up to 3 acres);
- A temporary marshaling yard (up to 10 acres);
- A temporary laydown yard (up to 15 acres);
- Temporary turning radii;
- An Aircraft Detection Lighting System (ADLS) tower;
- Up to 3 permanent meteorological towers (MET); and

- One generation transmission line that would not exceed 0.75 miles in length.

The Project will have one point of interconnection at Montana-Dakota Utilities' (MDU) 230 kV Wishek substation.

A Study Area of approximately 121,695 acres (190 square miles) was studied, analyzed, and refined to create a 55,745-acre Project Area that would avoid or minimize impacts to natural and human resources. Further refinement in 2022 resulted in a smaller Project Area footprint, which is approximately 31,514 acres (49 square miles). This Project Area was submitted as part of the *Application for a Certificate of Site Compatibility* submitted to the North Dakota Public Service Commission in February 2022.

The aquatic resources delineation conducted within the Project Area is limited to the sections of the Project where the proposed development is associated with the facilities detailed above. Atwell and WEST were provided the following assessment areas: a 250-foot (ft) radius around proposed turbines; a 100-ft-wide corridor around proposed collection lines; a 300-ft-wide corridor around access roads; a 200-ft-wide corridor for crane walks; a 200-ft-wide disturbance area around the proposed Project transmission line, and the areas comprising a proposed electric substation, Operations and Maintenance (O&M) facility, meteorological towers (MET) towers, the Aircraft Detection Lighting System (ADLS) tower, laydown yard, batch plant, marshaling yard (approximately 38.5 acres total), and turning radii locations.

The proposed Project layout was analyzed and revised several times over the course of field surveys, resulting in Atwell analyzing a cumulative survey area of approximately 6,056 acres within the Project Area.

Field delineations were conducted by Atwell within the defined survey area in 2020. In early 2021, Badger Wind shifted the Project to the south, which resulted in additional survey areas. Western EcoSystems Technology, Inc. (WEST) was retained by Badger Wind to conduct the delineation surveys for the remaining McIntosh County portion of the survey area, while Atwell continued to perform delineation surveys for the Logan County portion of the survey area. This was done with the understanding that two aquatic resources delineation reports would be produced to summarize 2021 delineation results. Adjustments to the proposed project layout resulted in the need for additional delineation surveys in 2022. These surveys were conducted in full by Atwell.

This report details the results of all aquatic resources delineation field efforts within the survey area conducted by Atwell. The results of WEST's aquatic resources delineation efforts in McIntosh County in 2021 are provided under separate cover. Several aquatic resources boundaries that were originally delineated by WEST were updated or extended during the 2022 aquatic resources delineation effort due to changes in survey area boundaries and/or variations in

seasonal climatic conditions on-site. These updated features are provided in this report following the original WEST nomenclature.

2 LOCATION

The Project Area is located in Logan and McIntosh Counties, North Dakota, and consists of approximately 31,514 acres (49 square miles) centered at 46.287179, - 99.600842 (**Figure 1**). The approximately 6,056-acre aquatic resources delineation survey area contains all portions of the site where permanent or temporary disturbances might occur as a result of Project construction. The survey area is located within the Beaver (Hydrologic Unit Code [HUC] 10130104) watershed.

The Project is located directly adjacent to the City of Wishek, North Dakota in the following townships, ranges, and sections:

Red Lake

134N 71W 31-32

Unorganized Territory
132N 70W 5-7
132N 71W 1, 4-8, 12, 17-21, 28-30
132N 72W 1-2, 12-14, 23
133N 70W 6-8, 16-21, 28-33
133N 71W 3-6, 8-10, 12, 14-15, 18-23, 25-29, 31-36
133N 72W 36

North Dakota Highway 13 intersects the Project Area just west of Wishek in McIntosh County. A number of roads traverse the Project Area in a grid-like arrangement. The northernmost road is 71st St SE, the southernmost is 83rd St SE, the westernmost is 37th Avenue SE, and the easternmost is 44th Avenue SE.

3 METHODS

Atwell completed a preliminary desktop review of existing background information for the Project prior to field surveys. The review considered current and historical background documentation, including aerial photographs, and publicly-available data as detailed in Section 3.1, including U.S. Geological Survey (USGS) Topographic Maps (ESRI 2019), National Wetland Inventory (NWI) Maps (USFWS 2019), USGS National Hydrography Dataset (NHD) (USGS 2018), County Soil Survey Maps (USDA 2019), and Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) (FEMA 2017). This information was previously utilized during desktop review to direct micro-siting efforts within the Project Area to avoid and/or minimize impacts to aquatic resources and other natural features. The survey area for this report was developed, in part, as a result of these efforts.

Due to the continuous refinement of the Project Area, and therefore the aquatic resources survey area, some portions of the survey area may appear outside of the current Project Area as shown on **Figures 1-3**. At the time of field surveys, a larger Project Area was in effect and preliminary desktop analyses were performed on that larger area as described below.

After this preliminary desktop data review, Atwell conducted field surveys within the entire survey area in late August and early September 2020; in September and October 2021 for the Logan County portions of the survey area; and again, in May 2022 for the entire survey area. WEST conducted field surveys for portions of the survey area in McIntosh County in 2021. Atwell analyzed precipitation data prior to field mobilizations to determine the status of climatic conditions. Section 7 includes definitions of common terms us throughout this report.

3.1 PRELIMINARY DESKTOP ANALYSIS

The following information was reviewed as part of the preliminary desktop evaluation:

1.1.1 Aerial Imagery

Atwell utilized National Agriculture Imagery Program aerial imagery and Google Earth historical imagery ranging from 1992 to 2018 to guide field efforts and outline land cover characteristics within the Project Area (USDA 2018).

1.1.2 USGS Topographic Map

The USGS 7.5-minute series topographic quadrangles for Wishek, Wishek SW, Lehr SW, May Lake, May Lake NW, and Burnstad (1982) were reviewed for overall topography, natural features, and additional characteristics of the Project Area.

1.1.3 Soil Survey of Logan and McIntosh Counties

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey geographic database (SSURGO) for Logan and McIntosh counties were reviewed to obtain the soil types likely to be observed within the Project Area (USDA 2019).

1.1.4 National Wetlands Inventory Map

A review of the NWI maps for Logan and McIntosh counties was conducted to determine the likely presence, location, size, and type of wetlands that may be located within the Project Area (USFWS 2018). The United States Fish and Wildlife Service (USFWS) produces NWI maps through aerial photographic interpretation.

1.1.5 National Hydrography Dataset Map

A review of the NHD (USGS 2018) for the Project was conducted to identify NHD watercourses and waterbodies within the Project Area.

1.1.6 FEMA National Flood Hazard Layer Map

FEMA FIRMs are maps that show floodplain and floodway areas along watercourses and their tributaries. The maps provide the following data, when available for any given area: 100-year floodplains (one percent chance of annual flooding) and 500-year floodplains (< one percent annual chance of flooding), the regulatory floodway (the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height), the base flood elevation, and the risk to premium areas developed across a floodplain (FEMA 2018). There is no available FEMA mapping for Logan and McIntosh Counties. Therefore, a review of the existence, location, and zone of any 100-year floodplain that may be located within the Project Area could not be conducted.

1.1.7 Precipitation Data

Precipitation data provided by the U.S. Army Corps of Engineers (USACE) Antecedent Precipitation Tool (APT) were reviewed for sections within the Project Area for the three months prior to each of the survey efforts to determine whether climatic conditions were below average, normal, or above average when compared to monthly historical data.

3.2 AQUATIC RESOURCES DELINEATION METHODS

All on-site aquatic resources delineations were performed in accordance with the 1987 USACE Wetland Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (USACE 2010). The determination of a wetland depends on three basic parameters: (1) presence of hydrophytic vegetation, (2) presence of hydric soils, and (3) presence of wetland hydrology.

Atwell identified likely-jurisdictional waters (watercourses) by utilizing existing mapping of known watercourses, including the NHD, NWI databases, and blue line streams on 7.5-minute USGS topographic quads, in combination with field observations of watercourse channel characteristics, such as indicators of an Ordinary High-Water Mark (OHWM).

Plant species were identified using several regional references and following the nomenclature of the National Wetlands Plant List (USACE 2018). The boundaries of all identified features were recorded using a submeter-capable handheld GPS unit, and representative photographs were taken of each feature.

4 EXISTING CONDITIONS

4.1 LANDSCAPE SETTING (DESKTOP ANALYSIS RESULTS)

The Project Area is located in both the Missouri Coteau Slope and the Missouri Coteau Level IV Ecoregions within the Northwestern Great Plains Level III Ecoregion of North Dakota (Bryce et al. 1996). The Missouri Coteau is characterized by rolling hummocks that contain numerous wetland potholes. The Missouri Coteau Slope ecoregion is characterized by rolling to hilly plains with more watercourses and fewer prairie potholes. Pre-human development, mixed-grass prairie was the most common grassland in these regions, with very little upland deciduous forest or woodlands. Land use in these regions is a mixture of agriculture and cattle grazing, which has resulted in conversion of much of the mixed-grass prairie. The transition between these ecoregions across the Project Area is highly visible in the expression of surface hydrology, as noted during the delineation field effort, discussed further in the **Section 4.2** of this report.

The primary source of surface hydrology in both regions is precipitation, including snowmelt (Eisenlohr Jr. and Sloan 1968). Water drains to the southwest and to the north into South Branch Beaver Creek and Beaver Creek, respectively. These streams are tributaries to the Missouri River. A seasonal surficial connection between delineated wetlands may exist in these regions despite the lack of a defined watercourse channel or presence of connecting wetland features surveyed in the field.

4.1.1.1 Aerial Imagery Results

The Project Area does not intersect large urban areas. A review of present and historic aerial photographs indicate agricultural fields, pasture/rangeland, grasslands, residential areas, a railroad, streams, rivers, wetlands, and waterbodies (ponds, lakes, or reservoirs) within the Project Area. In general, the western and southern portions of the Project Area appeared flat and dominated by cultivated crops whereas the northeastern portion of the Project Area appeared to support more pastures and disturbed grasslands, comparatively. Preliminary identification of potential aquatic resource signatures and locations, as assessed through the aerial imagery desktop review, was provided to Badger Wind to aid in initial micro-siting efforts intended to avoid and minimize potential impacts to aquatic resources and other ecologically sensitive areas. As a result, the survey area only contained a subset of aquatic resources identified by aerial imagery within the entire Project Area.

4.1.1.2 USGS Topographic Map Results

The USGS 7.5-minute topographic quadrangles indicated that elevations within the Project Area range between approximately 1,963 and 2,264 feet above sea level (ASL). The overall topography of the Project Area was mapped as flat to undulating with the presence of knolls, ridges,

drainages, wetlands, and roads throughout. While very few wetlands were mapped on the USGS 7.5-minute topographic quadrangles, numerous unnamed watercourses were mapped within the Project Area. Beaver Creek was the only named watercourse within the Project Area and flows along the northern boundary.

4.1.1.3 Soils Survey of Logan and McIntosh County Results

NRCS soil survey data indicated that 96 soil types underlie the Project Area, 11 of which are considered to be hydric or partially hydric (USDA 2019). Hydric soils comprise approximately 1,693 acres or five percent of the Project Area. A detailed list of each soil map unit, its hydric status, and total area within the Project Area is provided in **Appendix A**. The locations of soil map units within the survey area are provided in **Figure 2**.

4.1.1.4 NWI Map Results

NWI mapping was provided to Badger Wind to aid in initial micro-siting efforts intended to avoid and minimize potential impacts to aquatic resources and other ecologically sensitive areas. As a result, only a small subset of NWI-mapped features were contained within the survey area. These features appeared to be mostly drainages or depressional. Refer to **Figure 2** to see the location of NWI-mapped features within the survey area.

4.1.1.5 NHD Map Results

NHD mapping was also provided to Badger Wind to aid in initial micro-siting efforts. **Figure 2** provides the locations of NHD-mapped features within the survey area. Watercourses and freshwater ponds are mapped within the survey area.

4.1.1.6 Precipitation Data Results

Atwell reviewed the results of the USACE APT for the days on which aquatic resources field delineations occurred using the centroid of the Project Area. The results of the APT indicated that field delineations were performed during the dry season and under normal conditions during the 2020 and 2021 field mobilization efforts. Field delineations performed in May 2022 were performed under wetter than normal conditions.

4.2 AQUATIC RESOURCES RESULTS

4.2.1 Overview

Atwell conducted aquatic resources delineations within the survey area during the months of September 2020, October 2020, September 2021, October 2021, and May 2022. Photographs

depicting features and conditions during the site reconnaissance are provided in the Photographic Log within **Appendix C**.

Atwell ecologists delineated 158 wetland features within the survey area, comprising 272.62 acres. Wetland determination forms for these delineated features and adjacent uplands are provided in **Appendix D**. Three waterbodies were identified within the survey area for a total of 0.84 acres. Six watercourses were identified within the survey area for a total of 6.44 acres and 7,468 linear feet. Summary tables for all features identified during Atwell's aquatic resources delineation field efforts are provided in **Appendix E**. **Figure 3** depicts the locations of all delineated features within the survey area.

4.2.2 On-Site Conditions

Atwell ecologists noted that the survey area was dominated by cultivated cropland, pasture, and fallow fields. Homesteads, wetland systems, drainage swales, grasslands, shelterbelts, and road systems were also present within the survey area to a lesser degree. Other structures within the survey area included existing transmission lines, railroads, and distribution lines. No interstate or foreign commerce associated with aquatic resources were observed on-site.

4.2.3 Aquatic Resource Features

Atwell ecologists delineated 158 aquatic resource features within the survey area, comprising 272.62 acres. Many of the delineated features existed as naturally depressional, vegetated swales that were seasonally saturated or flooded and support emergent vegetative communities. Additional common wetland systems observed included emergent fringe wetland systems associated with watercourses, depressional wetland pockets that appeared isolated from surficial hydrological connection, atypical heavily disturbed wetland drainage swales, and smaller temporarily saturated headwater drainage swales that contributed hydrology to larger drainage systems.

Some atypical wetland systems were observed as heavily disturbed depressional areas associated with agricultural farming activities. Farmers apparently cleared emergent wetland vegetation via mechanical mowing or tilling for planting crops. In some locations, cattle grazing within pastures prevented identification of some vegetation types. The wetland boundaries of these areas were delineated using a combination of topographical changes, wetland hydrology indicators, and the presence of hydric soils.

While the majority of wetlands did not appear to have a direct connection to navigable waters, a combination of field data and desktop analysis anticipated that during spring snowmelt, a

seasonal surficial connection between delineated wetlands may exist despite the lack of a defined watercourse channel or presence of connecting wetland features surveyed in the field.

Of the 158 delineated aquatic features identified within the survey area, 38 appeared to be hydrologically isolated. These wetland areas lacked an apparent drainage outlet, as noted during the field assessment, and no clear overland flow paths were observed during the desktop analysis. These isolated wetland areas existed almost solely within the northeastern portion of the survey area, where the landscape comprises depressional areas geologically formed by the collapse of superglacial sediment. In these areas, water became trapped for extended periods of time after snowmelt and other precipitation events. The results of Atwell's field and desktop connectivity analyses are summarized in **Appendix E**.

4.2.3.1 Vegetation

All wetlands within the survey area were classified as palustrine emergent (PEM). Common dominant herbaceous species within delineated PEM wetlands included reed canary grass (*Phalaris arundinacea,* FACW), cattail (*Typha latifolia, T. angustifolia, or T.* x *glauca,* OBL), freshwater cordgrass (*Spartina pectinata,* FACW), rice cutgrass (*Leersia oryzoides,* OBL), curly dock (*Rumex crispus*, FAC), and water smartweed (*Persicaria amphibia,* OBL). Other common but less prevalent species included common spikerush (*Eleocharis palustris*, OBL), large barnyard grass (*Echinochloa crus-galli,* FAC), foxtail barley (*Hordeum jubatum,* FACW), and upright sedge (*Carex stricta*, OBL).

Uplands were generally comprised of cropland or pastureland. Croplands were dominated by species such as corn (*Zea mays*, NI) and soybean (*Glycine max,* NI). Pastures were dominated by grasses such as smooth brome (*Bromus inermis,* UPL), foxtail barley, and little bluestem (*Schizachyrium scoparium,* FACU). Forbs such as clovers (*Trifolium repens* and *T. pratense,* FACU), goldenrods (*Solidago* spp.), common yarrow (*Achillea millefolium,* FACU), Canadian horseweed (*Erigeron canadensis*, FACU), and alfalfa (*Medicago sativa,* UPL) were intermixed throughout.

Two species found on North Dakota Department of Agriculture's Noxious Weeds List, absinth wormwood (*Artemisia absinthium*, NI) and Canada thistle (*Cirsium arvense,* FACU), were locally uncommon in both wetlands and uplands throughout the survey area.

4.2.3.2 Soils

Soil samples within wetlands were generally noted to display dark, silt loam horizons on top of darker, silt loam to clay loam horizons that exhibited redoximorphic features. Wetland depressions that tended to hold water for longer periods of time sometimes exhibited a gleyed matrix underneath a dark, loam horizon. The majority of delineated wetland features contained soils that met the redox dark surface hydric soil indicator. Less frequent hydric soil indicators

included loamy gleyed matrix, hydrogen sulfide, depleted matrix, and redox depressions. Soils within the uplands generally displayed dark horizons, but they included slightly brighter values and chroma colors compared to soils within the wetlands. Upland soils did not contain any visually-notable redoximorphic features.

4.2.3.3 Hydrology

Delineated wetlands exhibited both primary and secondary hydrology indicators, including saturation, geomorphic position, and the FAC-Neutral test. Delineated wetland drainage features also contained drift deposits and drainage patterns, while depressional features typically exhibited surface water and a high water table.

As discussed above in **Section 4.2.3**, the majority of wetlands appeared to possess a seasonal surficial connection to navigable water. USGS 7.5-minute topographic quads (**Figure 1**) and the NHD dataset (**Figure 2**) indicated that these wetlands generally aligned with mapped, blue-line streams. Some depressional features that appeared hydrologically isolated were present in the northeastern portion of the survey area. These wetlands were noted to lack an apparent drainage outlet, and no clear overland flow paths could be observed during the desktop analysis. These features did not align with blue-line streams as shown in **Figure 2**. Uplands on-site typically did not contain any primary or secondary wetland hydrology indicators.

4.2.4 Waterbodies

Three waterbodies were observed within the survey area, totaling 0.84 acres.

Waterbody B1

Waterbody B1 comprises 0.35 acres and is associated with Wetlands B3 and C1. The OHWM was characterized by an absence of vegetation as well as a sudden a break in elevation (i.e. scouring). Water levels were low at the time of delineation and the unconsolidated mud substrate was apparent in the transition area between the OHWM and the open water. Water depths reached two feet in the deepest portions of the waterbody.

Waterbody F1

Waterbody F1 comprised 0.29 acres and is associated with Wetland F10. Waterbody F1 was noted as a farm pond with signs of trampling from cattle in the shallow portions of the pond. The OHWM was characterized by an absence of vegetation as well as a sudden a break in elevation (i.e. scouring). Water levels were low at the time of delineation and the unconsolidated mud substrate was apparent in the transition area between the OHWM and the open water. Water depths reached two feet in the deepest portions of the waterbody.

Waterbody G1

Waterbody G1 comprises 0.20 acres and appeared to be a completely enclosed basin isolated from other surface water features. The OHWM was characterized by the absence of vegetation as well as a sudden a break in elevation (i.e. scouring). Water levels were low at the time of delineation and the unconsolidated mud substrate was apparent in the transition area between the OHWM and the open water. Water depths reached three inches in the deepest portions of the waterbody.

4.2.5 Watercourses

Six watercourses were identified within the survey area for a total of 7,468 linear feet and 6.44 acres.

Watercourse D1 (2020)

Watercourse D1 (2020) was identified as a perennial stream that meandered through Wetland D5 (2020) within a pasture. Stream width was highly variable; at the survey area crossing, the OHWM width was 17 feet. OHWM was characterized primarily by an abrupt transition between vegetated wetlands and unvegetated stream channel. Water was visibly murky and approximately one foot deep. The stream bed substrate was comprised of primarily muck with a small amount of gravel intermixed, and no aquatic life was observed. Watercourse D1 (2020) flowed north to Beaver Lake.

Watercourse E1 (2020)

Watercourse E1 (2020) was identified as a perennial stream that flowed south through an agriculture field. The OHWM width was 30 feet, which was characterized by an abrupt transition between vegetated uplands and unvegetated stream channel. Water was clear and approximately five to seven feet deep. The stream bed substrate was primarily silt and, no aquatic life was observed.

Watercourse H1 (2020)

Watercourse H1 (2020) was identified as an intermittent stream crossing through pasture. The stream was culverted underneath an existing road and flowed eastward, ultimately to Beaver Lake. The OHWM was 25 feet at the time of survey. The OHWM was characterized by scouring and the absence of vegetation. Water was tannic and approximately one foot deep, and the stream bed substrate was silty. No aquatic life was observed.

Watercourse H2 (2020)

Watercourse H2 (2020) was identified as a perennial stream crossing through pasture within Wetland H8 (2020). This stream was part of the same tributary as Watercourse D1 (2020) and exhibited similar characteristics. The OHWM width was 25 feet within the survey area, and the OHWM was characterized by an abrupt transition between vegetated wetlands and unvegetated stream channel. The water was clear and approximately three feet deep. The stream bed substrate contained a mixture of silt, sand, and gravel, and no aquatic life was observed. Watercourse H2 (2020) flows north to Beaver Lake.

Watercourse D1

Watercourse D1 was noted as a meandering, perennial stream flowing through pastureland, within Wetland D6. Watercourse D1 was part of the same tributary as Watercourses H2 (2020). Watercourse D1 was located upstream of Watercourse H2 (2020). The OHWM was characterized by an abrupt transition between vegetated wetlands and unvegetated stream channel. The OHWM width was 80 feet. The stream bed substrate was mucky, and no aquatic life was observed. Watercourse D1 flowed north to Beaver Lake.

Watercourse G1

Watercourse G1 was noted as a perennial stream that flowed through cropland, within Wetland G13. Watercourse G1 was located upstream of Watercourses D1 (2020) and H2 (2020), and these all were part of the same tributary. The OHWM was characterized by an abrupt transition between vegetated wetlands and unvegetated stream channel. The OHWM width was 25 feet. The stream bed substrate was mucky, and no aquatic life was observed. Watercourse G1 flows north to Beaver Lake.

5 CONCLUSIONS & RECOMMENDATIONS

Atwell ecologists delineated a total of 158 aquatic resource features comprising a cumulative total of 272.62 acres within the survey area. There were six watercourses comprising a cumulative total of 7,468 linear feet and 6.44 acres, and three waterbodies comprising a cumulative total of 0.84 acres were delineated within the survey area. Project activities that impact WOTUS must be authorized by the USACE prior to those activities taking place.

In late August 2021, the EPA and USACE received a court order vacating and remanding the Navigable Waters Protection Rule. At present, the EPA and USACE are interpreting WOTUS consistent with the pre-2015 regulatory regime until further notice. While Atwell believes that some wetland features on-site are hydrologically isolated and, therefore, may not be subject to

federal regulation, the USACE and the EPA ultimately determine the final jurisdictional status of all wetlands and aquatic resources presented within this report.

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7 COMMON AQUATIC RESOURCE DEFINITIONS

Emergent Wetland: Vegetative classification of a wetland system based on the dominant vegetation consisting of rooted herbaceous plant species that have parts extending above a water surface.

Aquatic Resources: Wetland waters (i.e. vegetated swales, freshwater marshes, vernal pools, other seasonal wetlands, etc.) and nonwetland waters (i.e. ponds, lakes, streams, rivers, drainages, ditches, etc.) - Definition of aquatic resources as used by the USACE and EPA for regulatory purposes.

Hydric Soil: Soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (1991 National Technical Committee on Hydric Soils definition).

Hydrophytic Vegetation: Plant species that grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content; plants typically found in wet habitats.

Typical Situation: That which normally, usually, or commonly occurs.

Wetland: "…areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." - Definition of wetlands as used by the USACE and EPA for regulatory purposes.

Wetland Hydrology: Hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season.

Wetland Indicator Status:

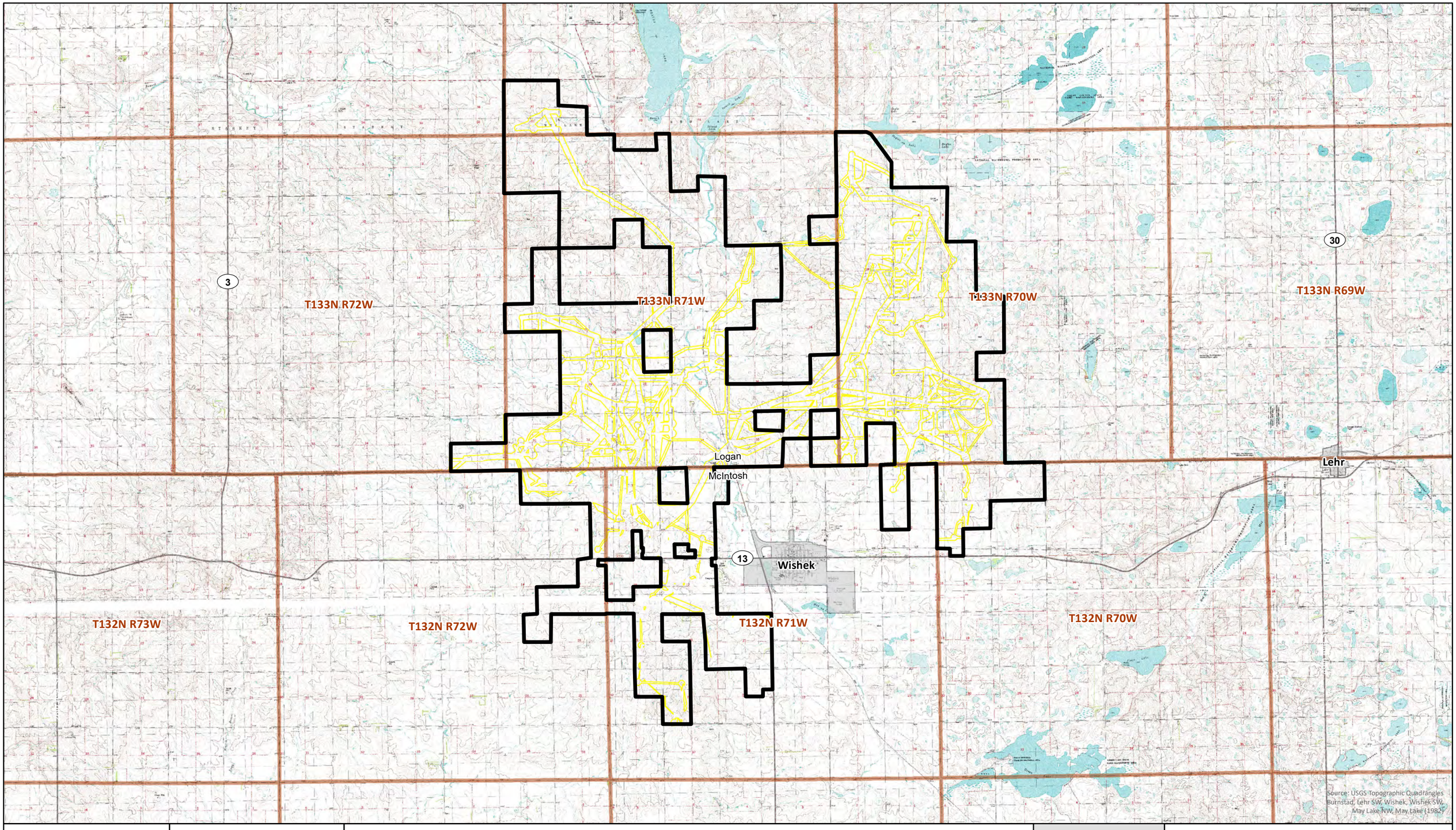
OBL: Obligate wetland plant that occurs almost always, 99% of the time, in wetlands under natural conditions, but which rarely occur in non-wetlands.

FACW: Facultative wetland plant that occurs usually, 67% to 99% of the time, in wetlands, but also occurs 1% to 33% of the time in non-wetlands.

FAC: Facultative plant that occurs in both wetlands and non-wetlands 33% to 67% of the time.

FACU: Plant that occurs sometimes, 1% to 33% of the time, in wetlands but occurs more often, 67% to 99% of the time, in non-wetlands.

FIGURES



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 1 2
Miles

Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Town/Village
Township (PLSS)
County

Figure 1
Wind Farm Site Location
Logan and McIntosh Counties, North Dakota

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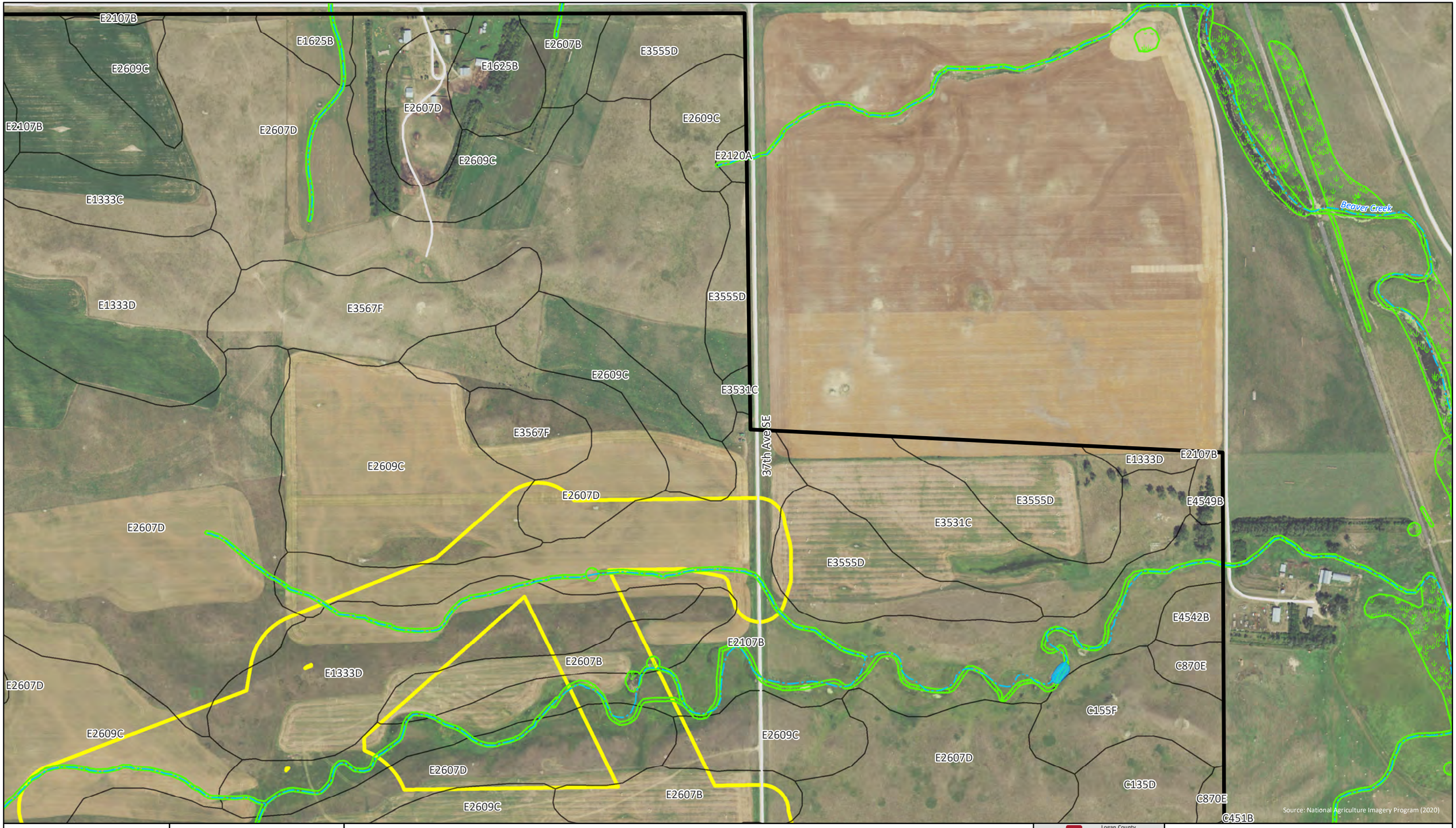
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Miles

Map Index
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

Figure 2
Index Map
Wind Farm Desktop Review Mapbook
Logan and McIntosh Counties, North Dakota

Source: National Agriculture Imagery Program (2020)

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

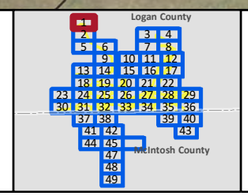
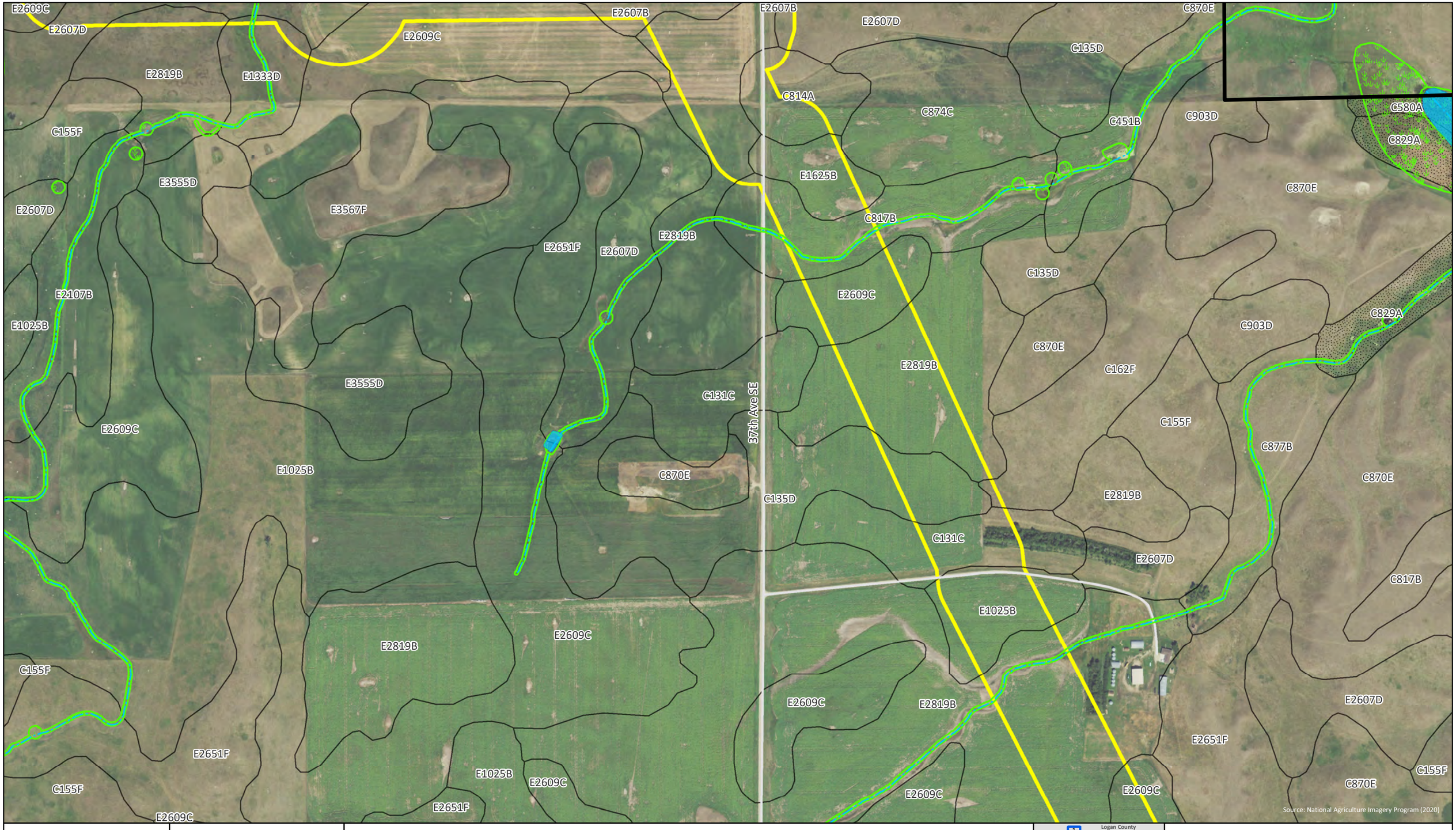


Figure 2
Map 1 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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19000785
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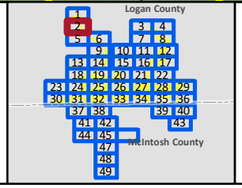
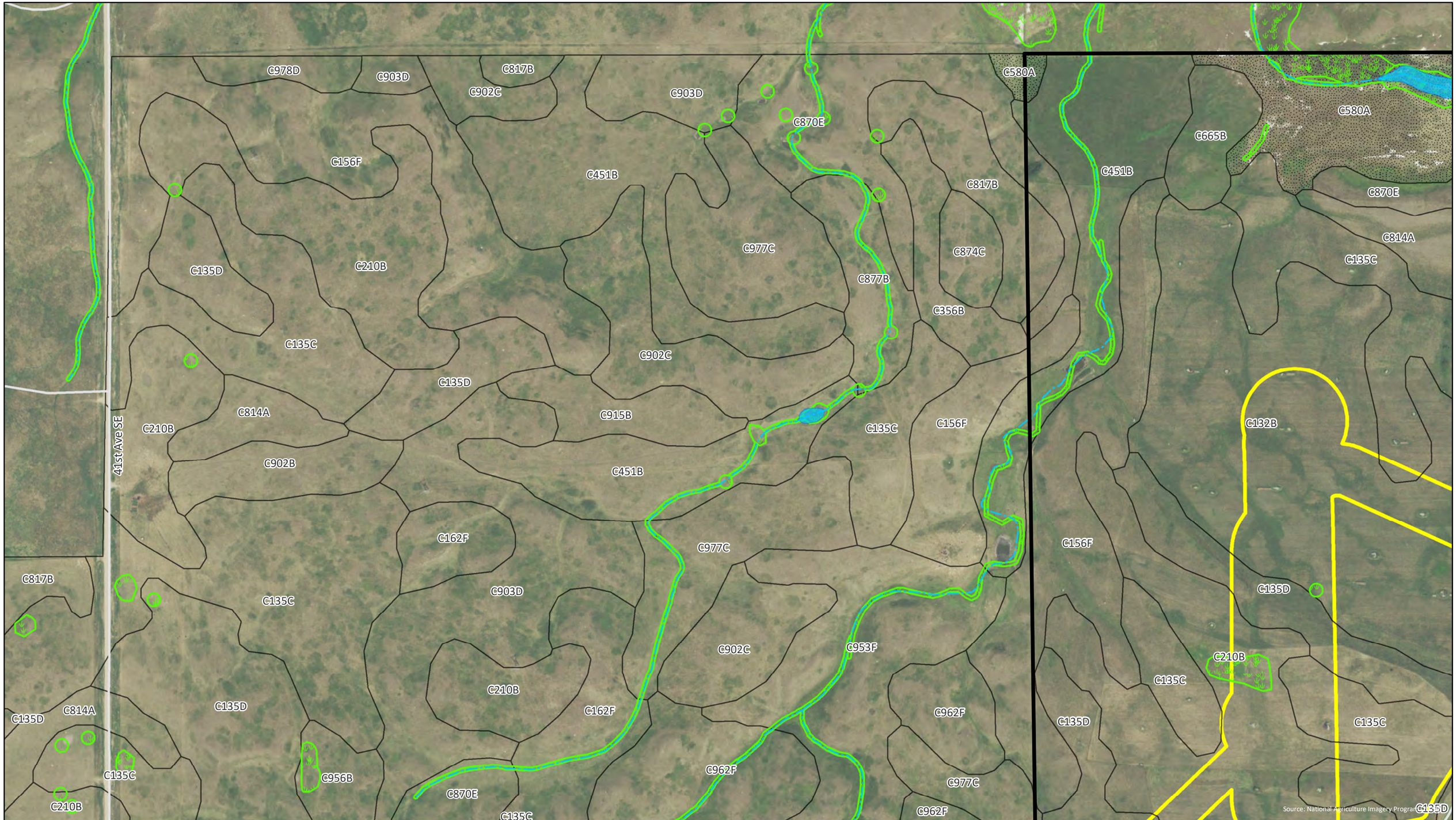


Figure 2
Map 2 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
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Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

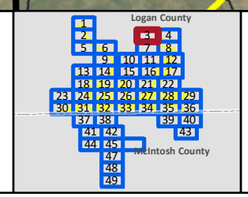
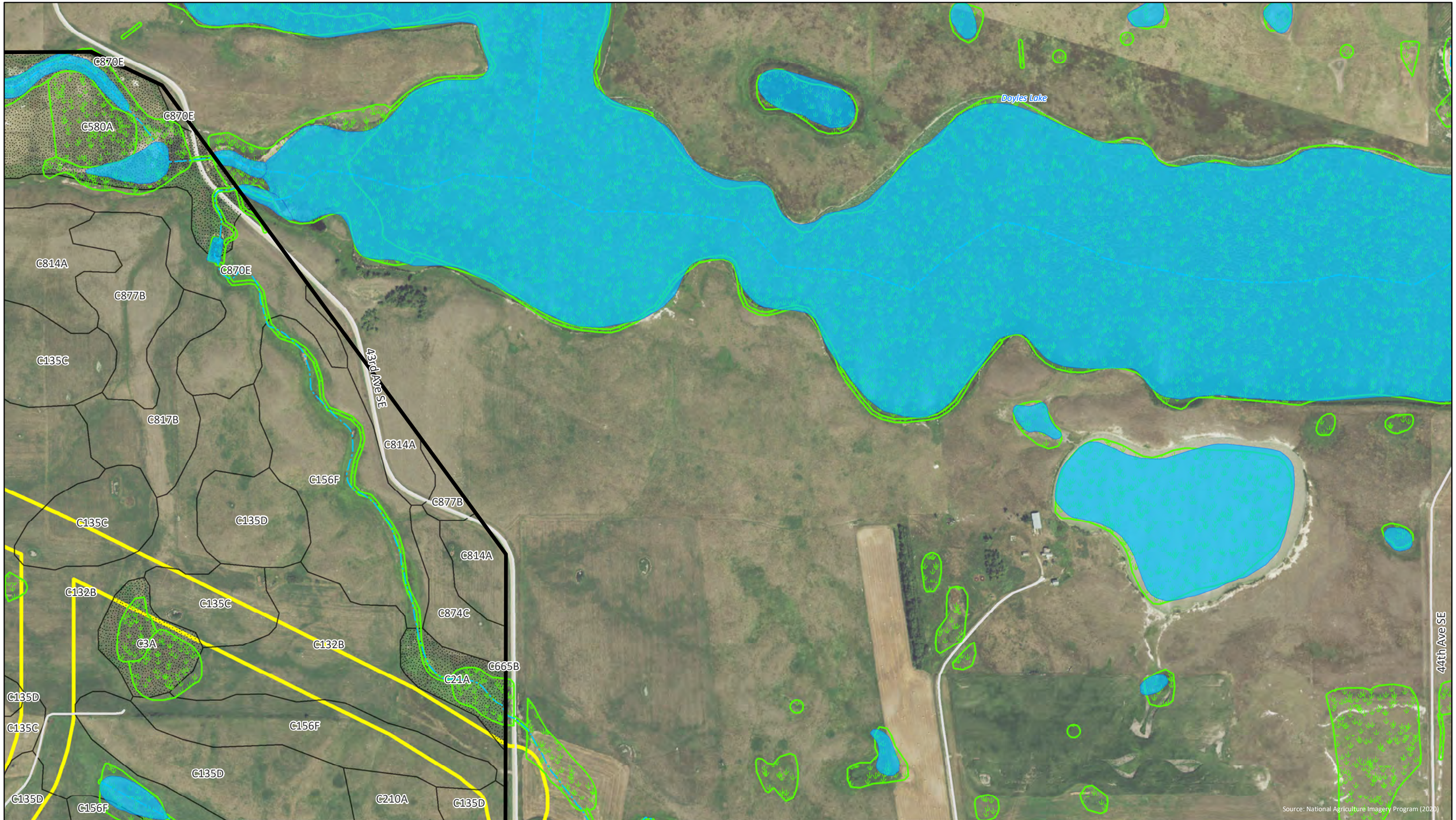


Figure 2
Map 3 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
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19000785
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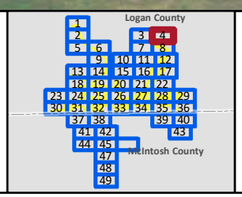
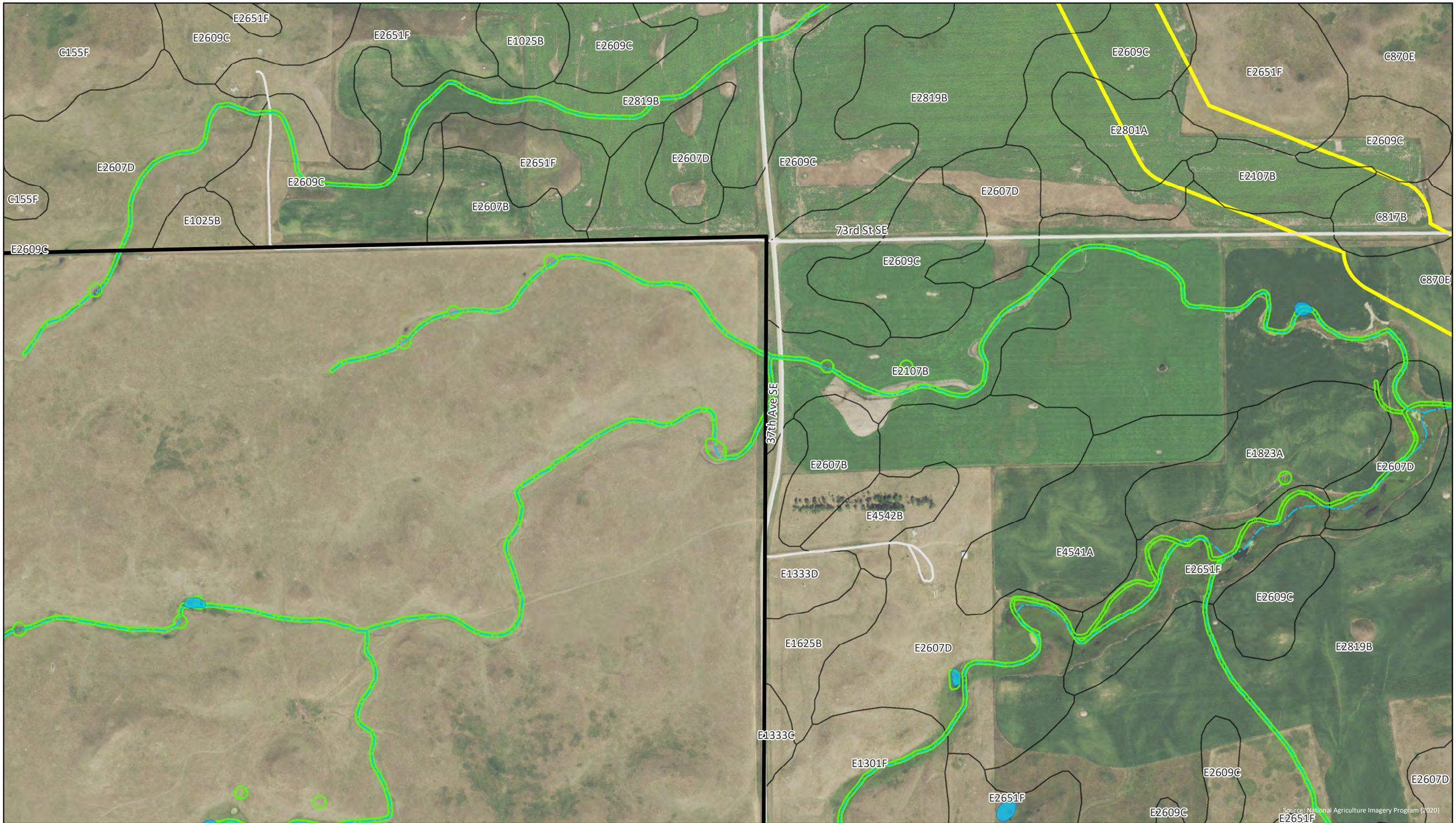


Figure 2
Map 4 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
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19000785
May 16, 2022

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Feet

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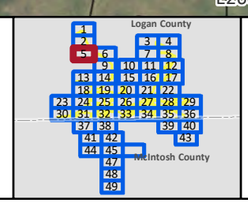
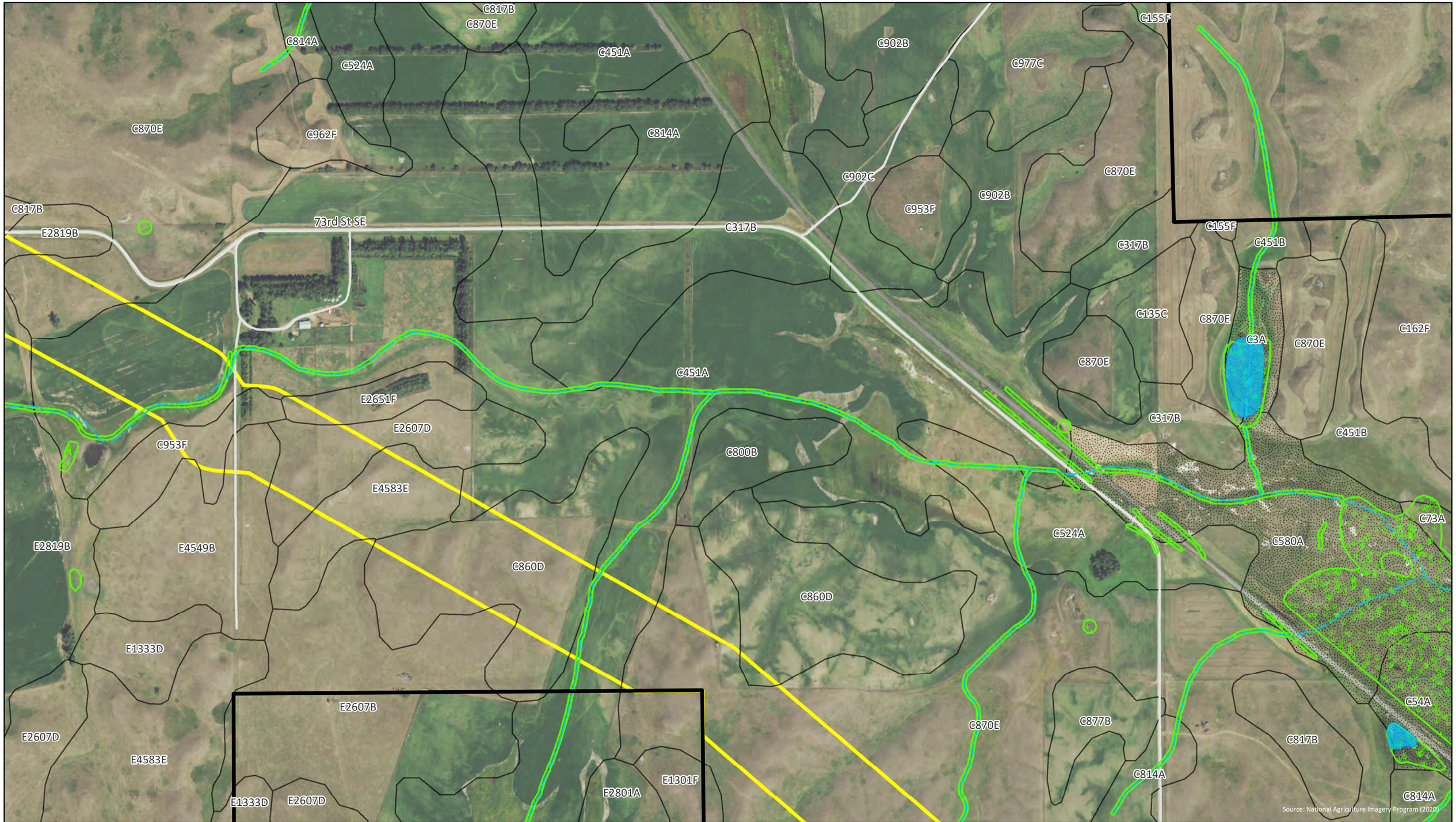


Figure 2
Map 5 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

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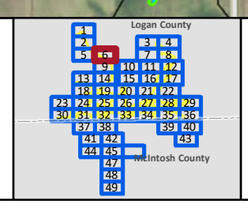
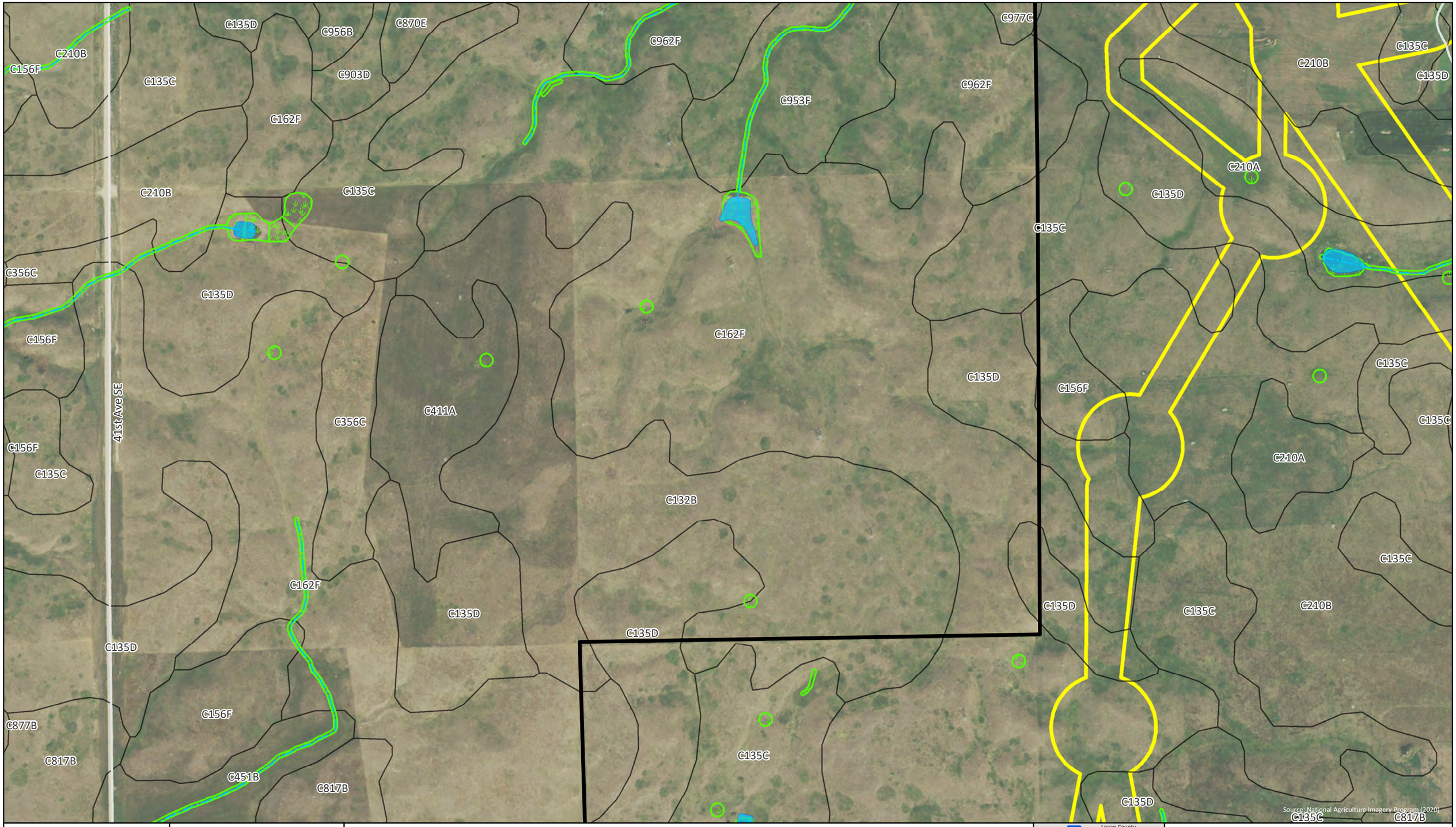


Figure 2
Map 6 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

- Watercourse (NHD)
- Waterbody (NHD)
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- Hydric Soils (gSSURGO)
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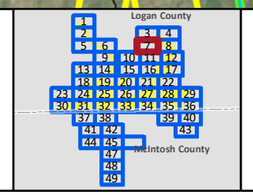
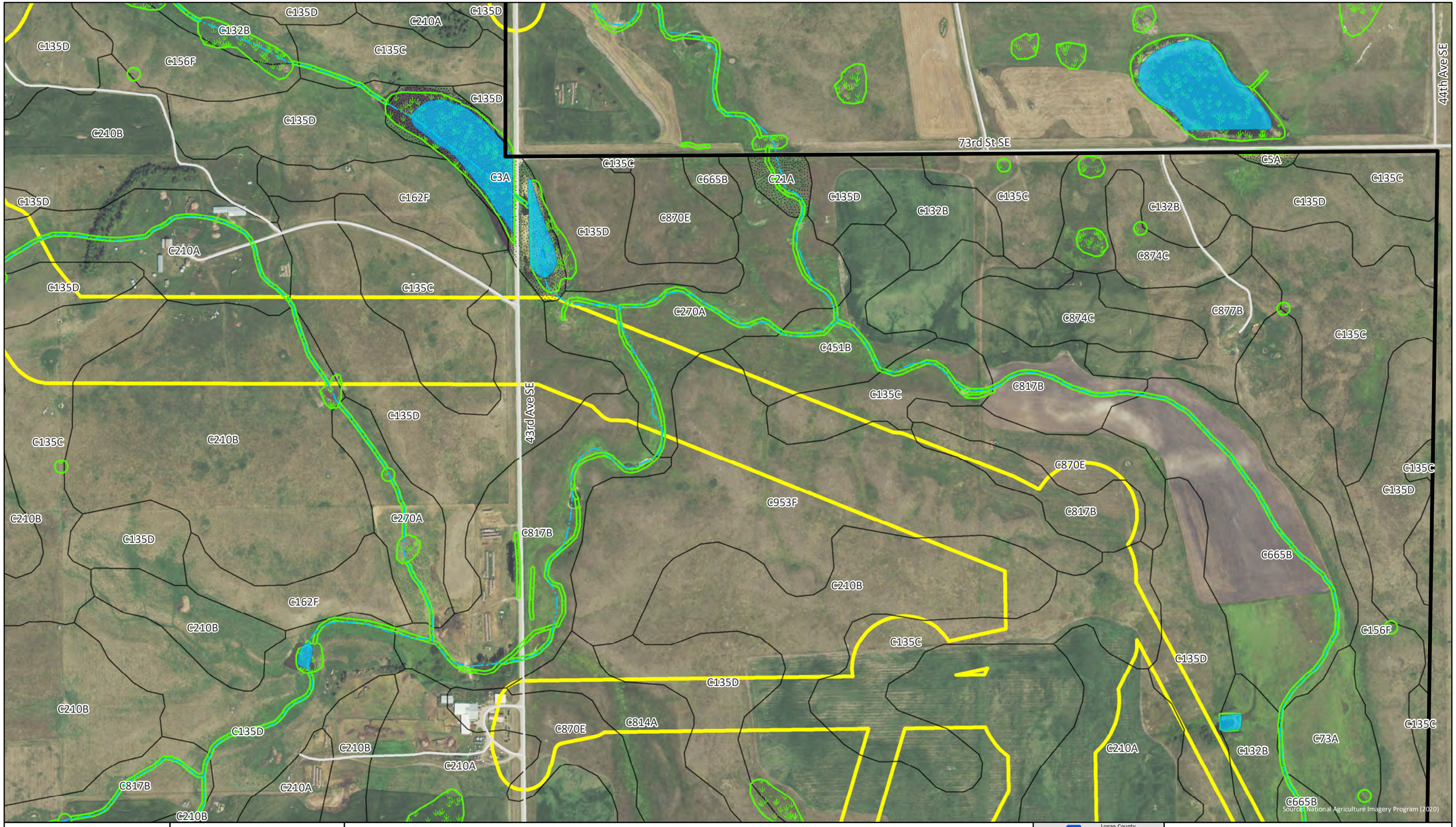


Figure 2
Map 7 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Source: National Agriculture Imagery Program (2020)

ATWELL

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0 500
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Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

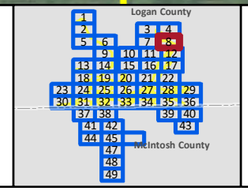
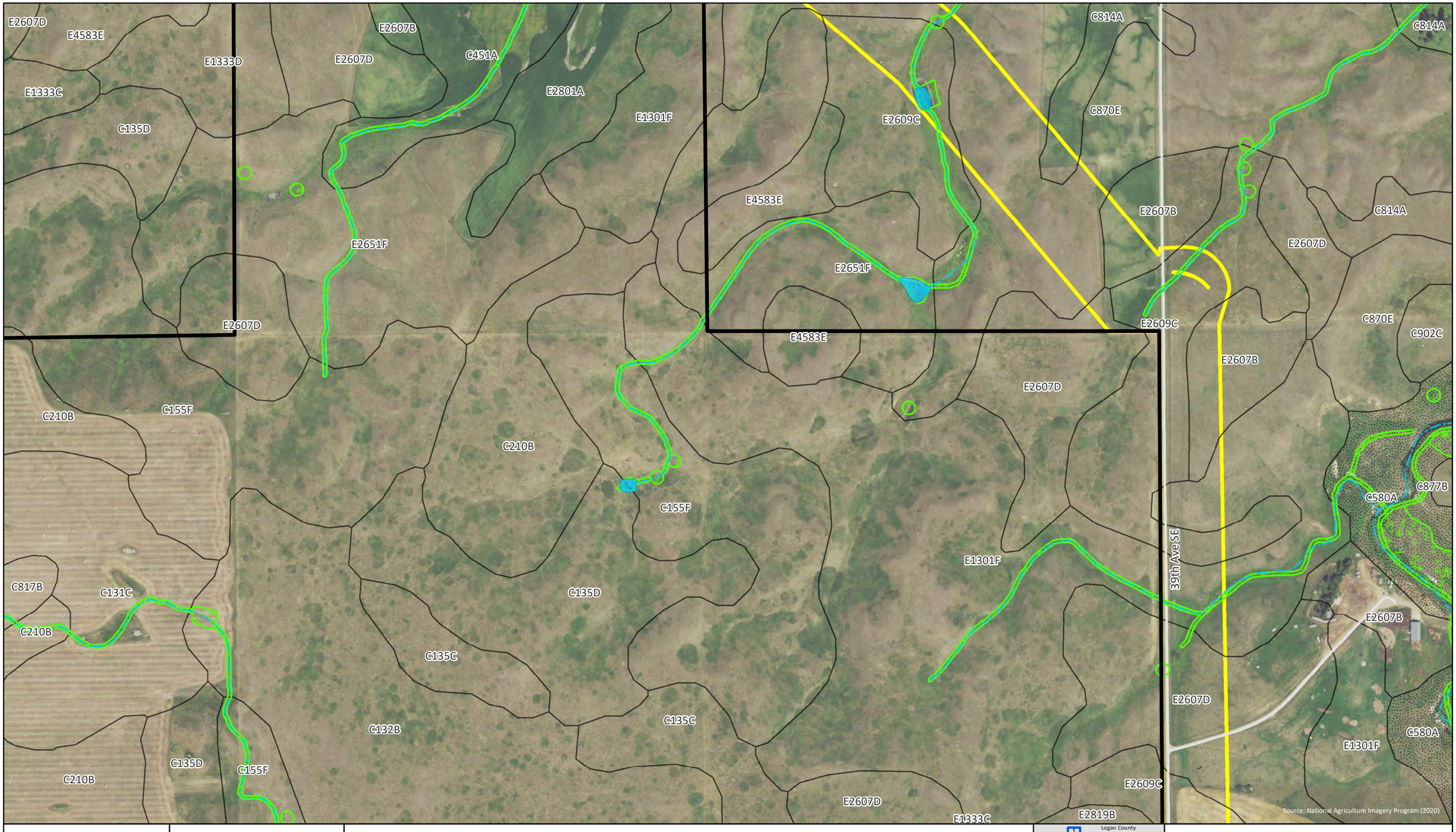


Figure 2
Map 8 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

- Watercourse (NHD)
- Waterbody (NHD)
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- Survey Area (~6,056 acres)
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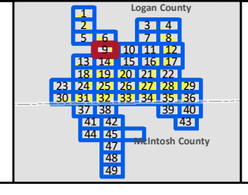
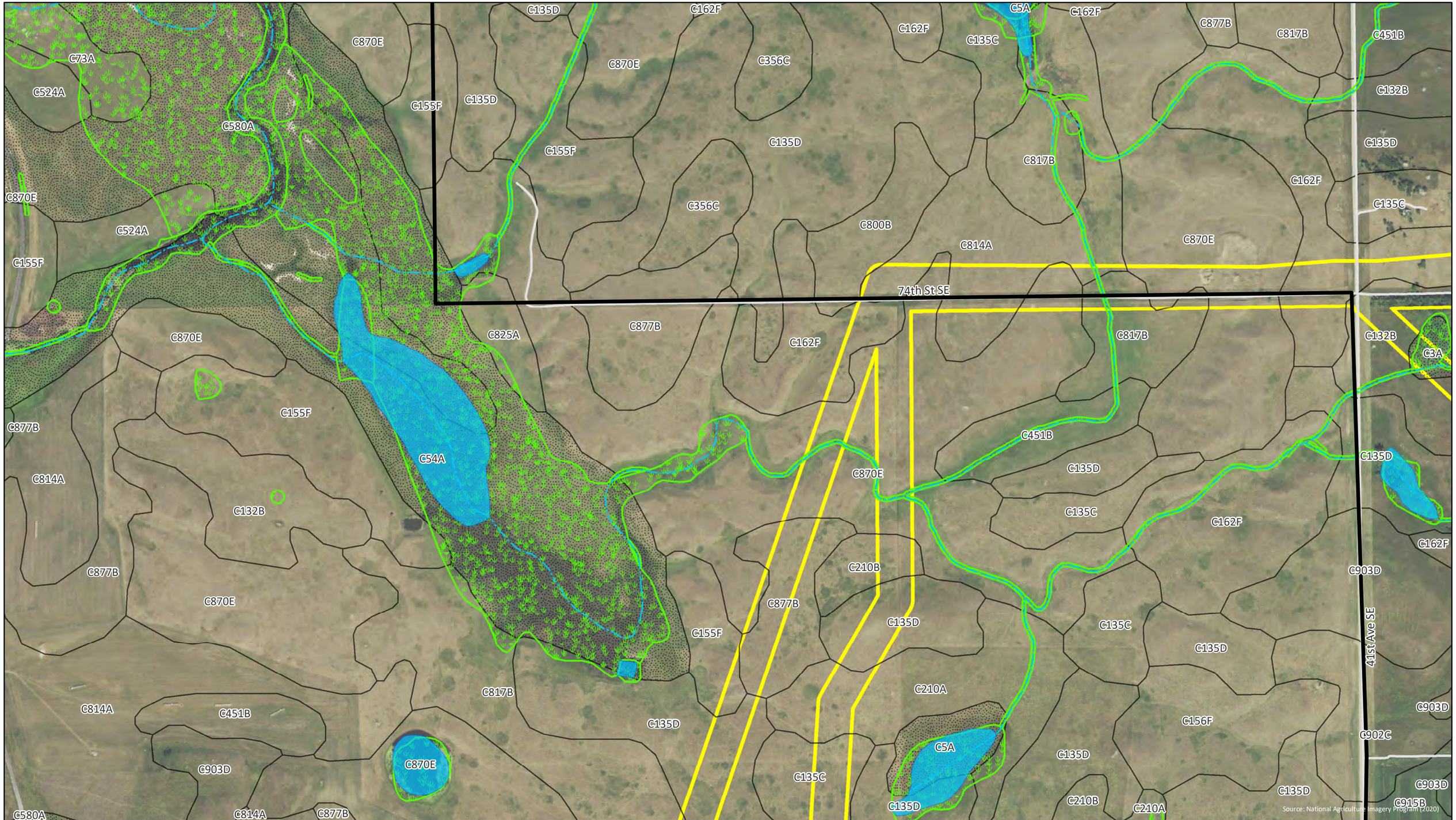


Figure 2
Map 9 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
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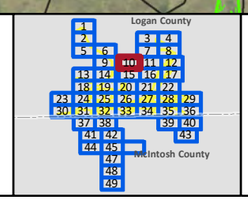
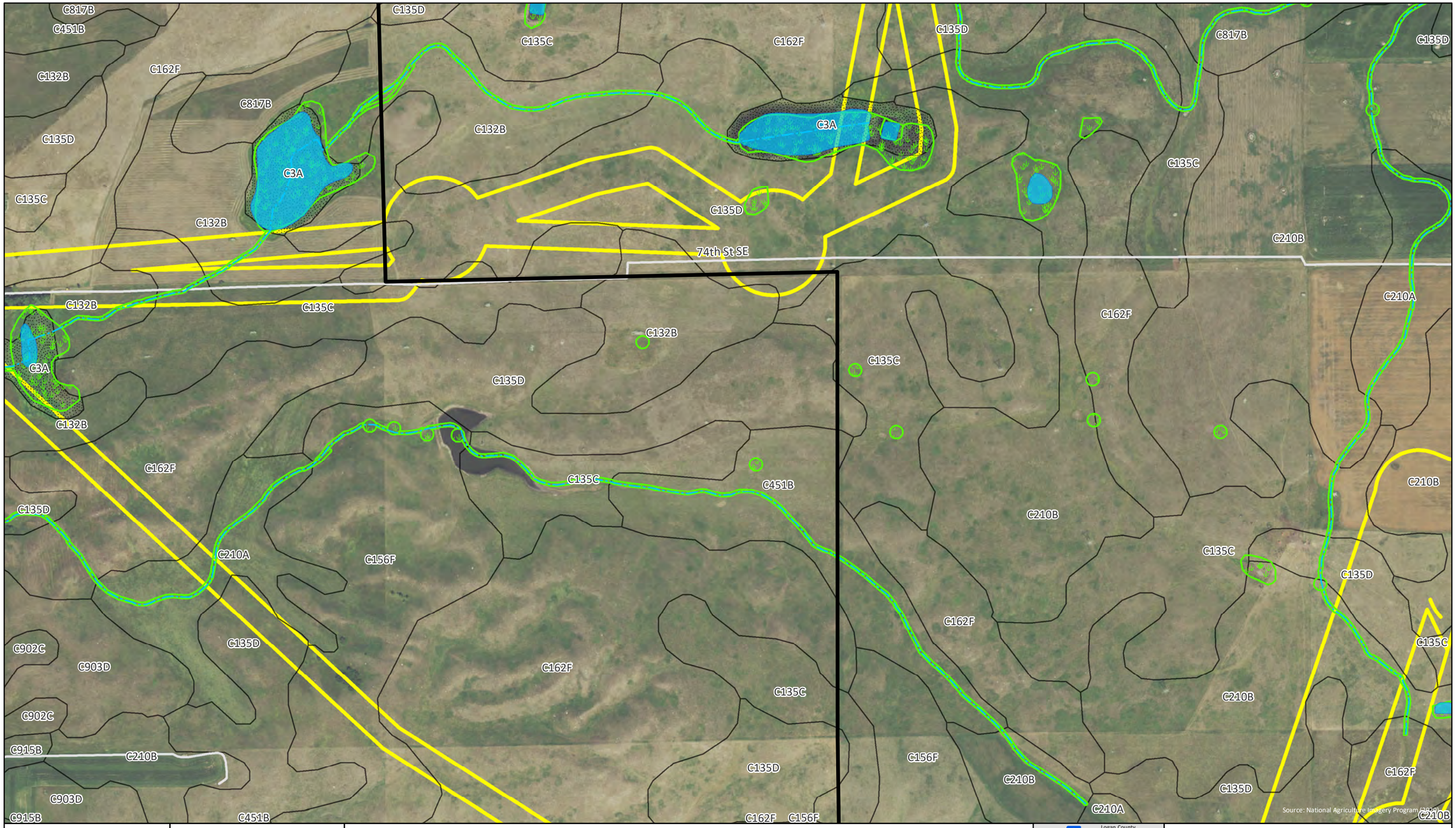


Figure 2
Map 10 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

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Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
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Road
County

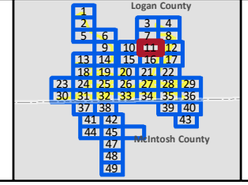
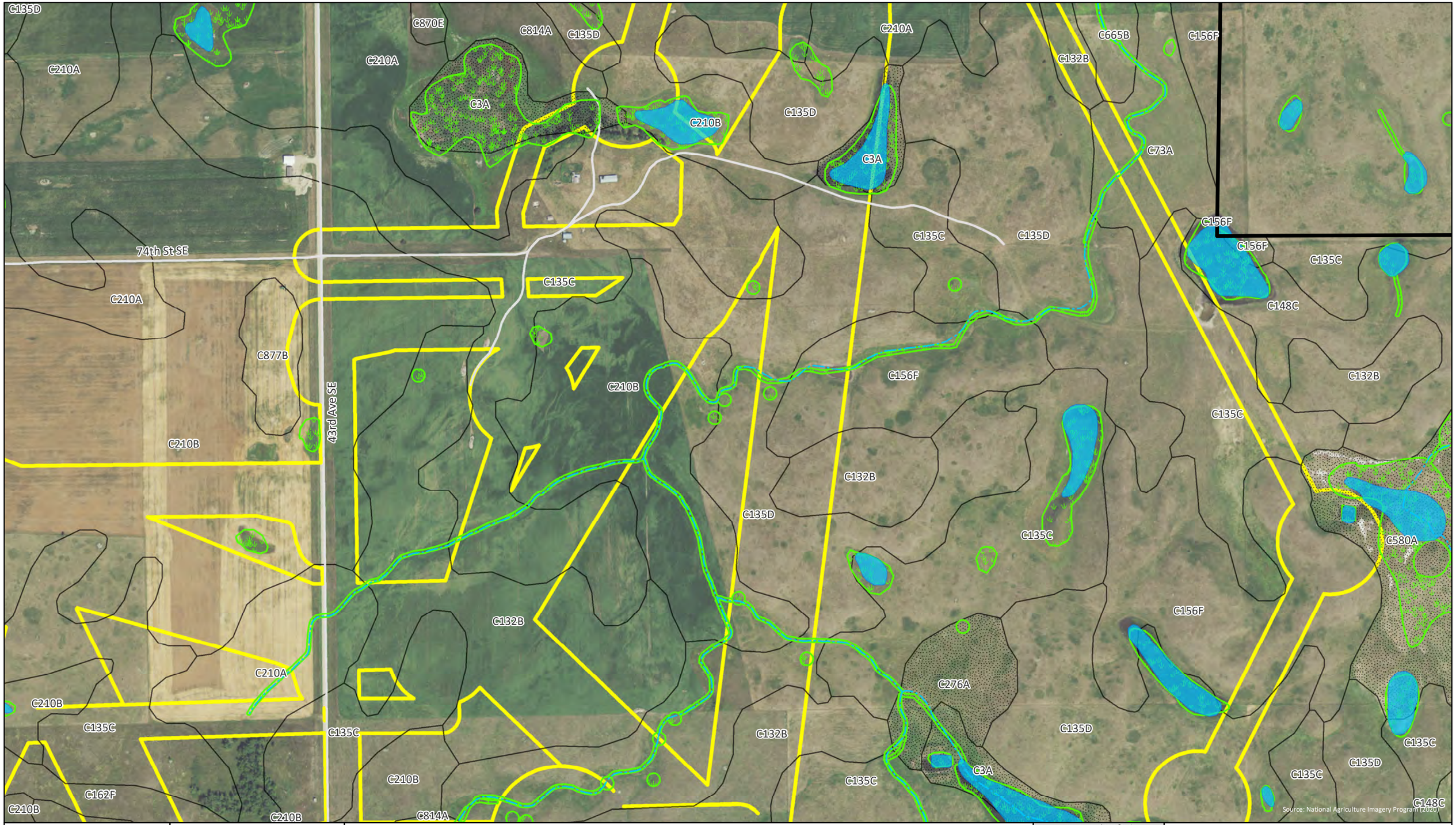


Figure 2
Map 11 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
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0 500
Feet

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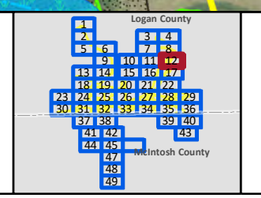
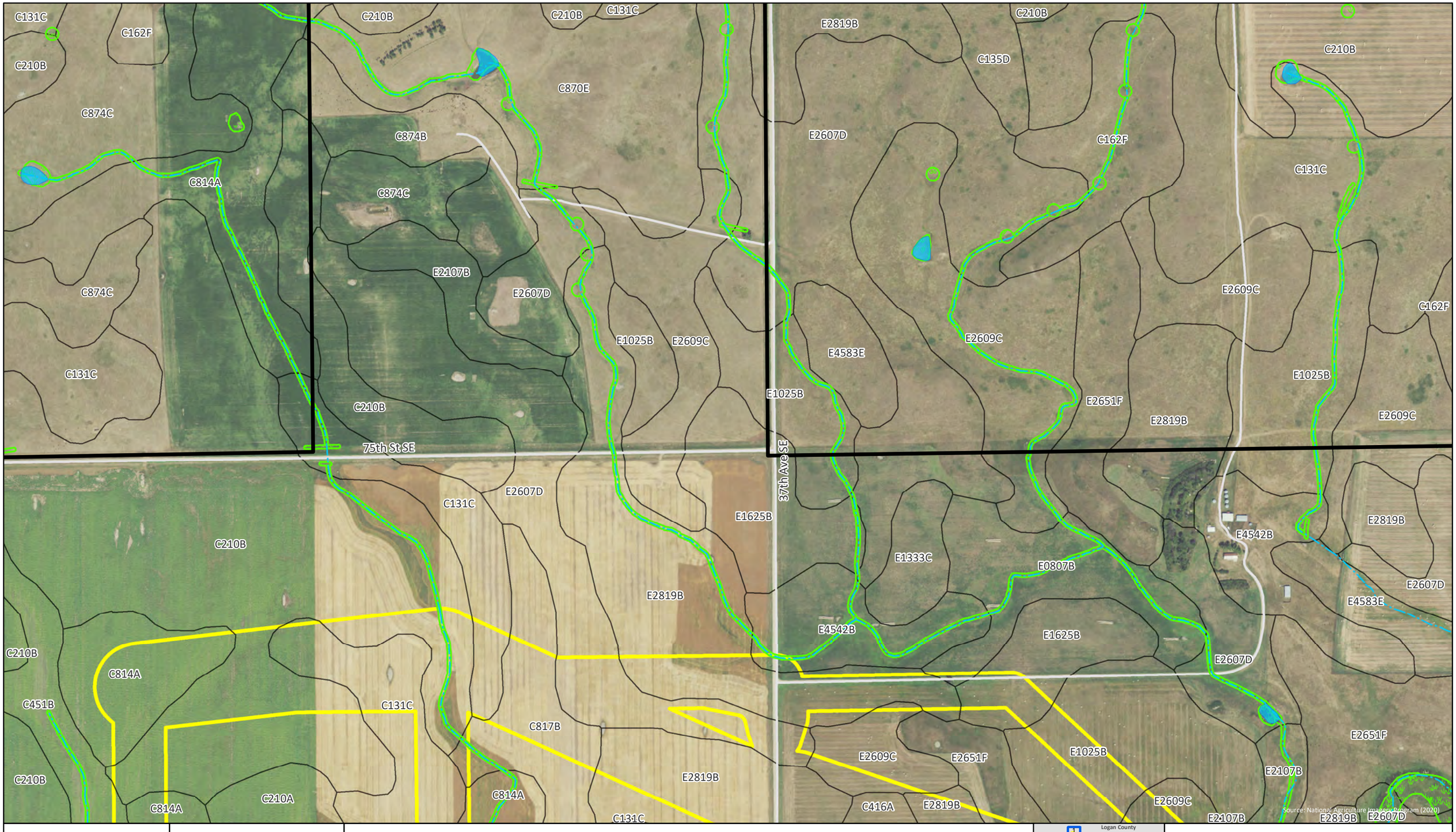


Figure 2
Map 12 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
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Road
County

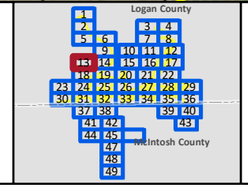
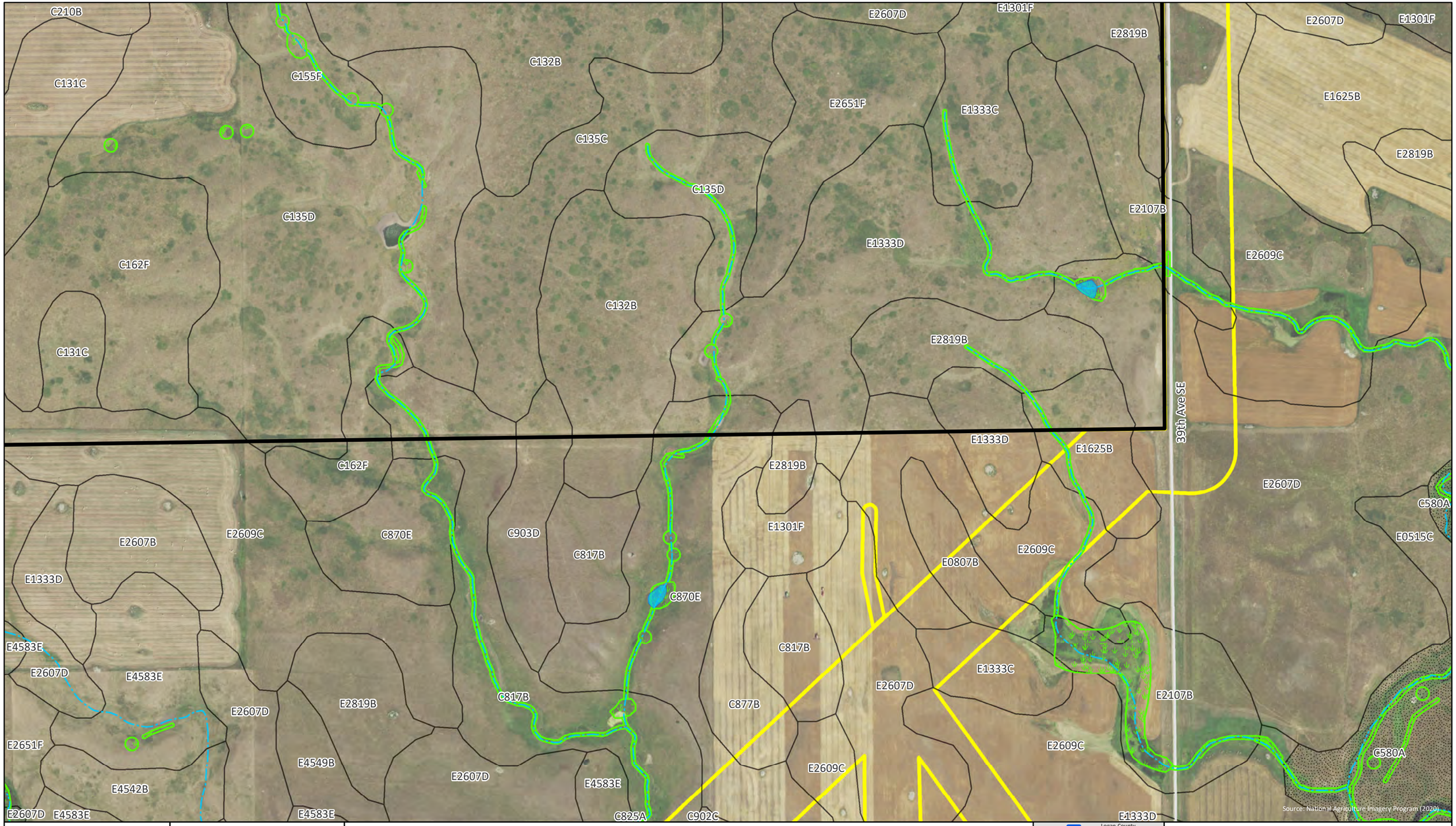


Figure 2
Map 13 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Badger Wind, LLC
19000785
May 16, 2022

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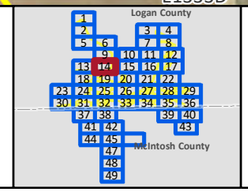
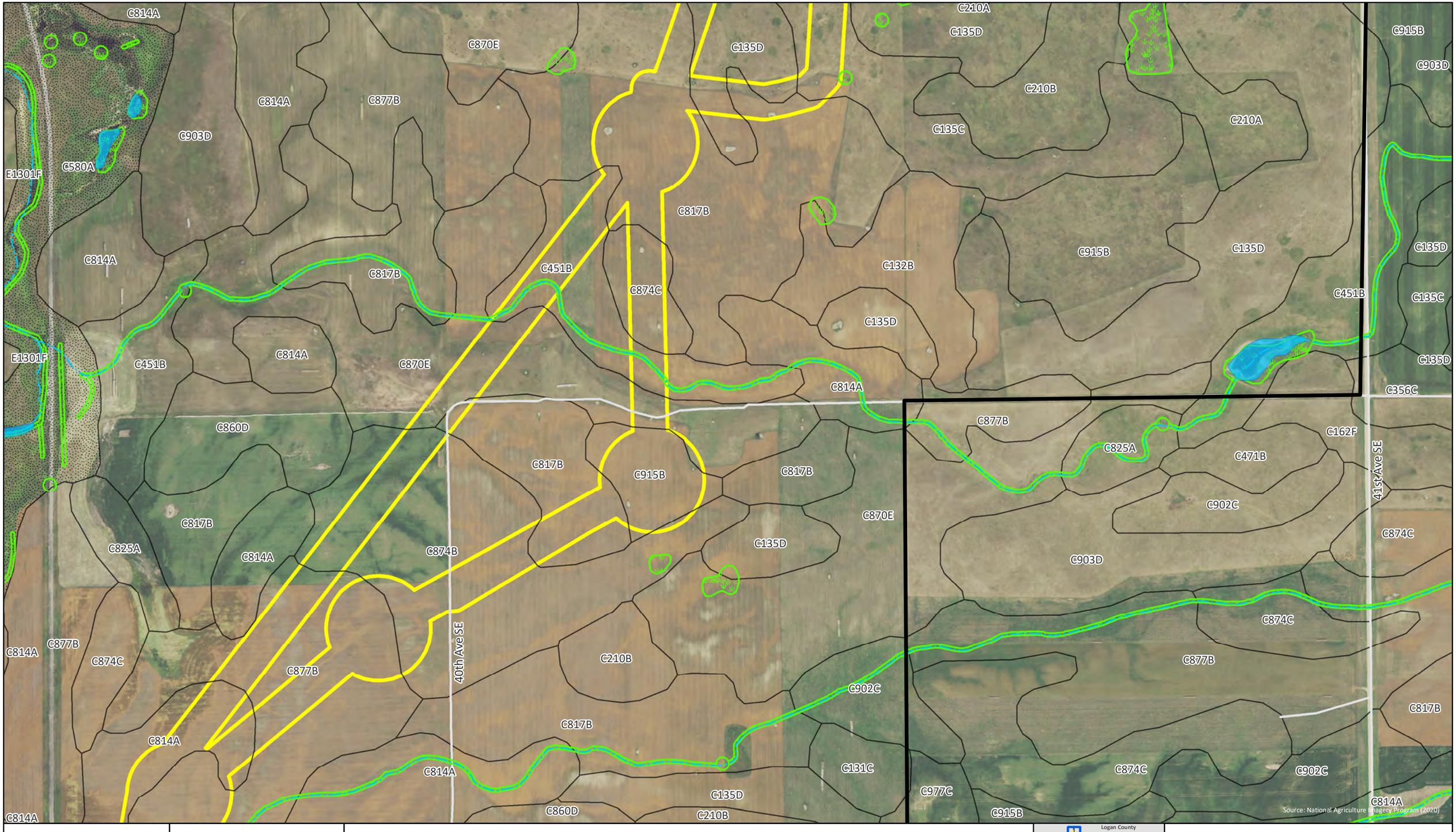


Figure 2
Map 14 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
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County

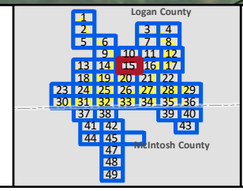
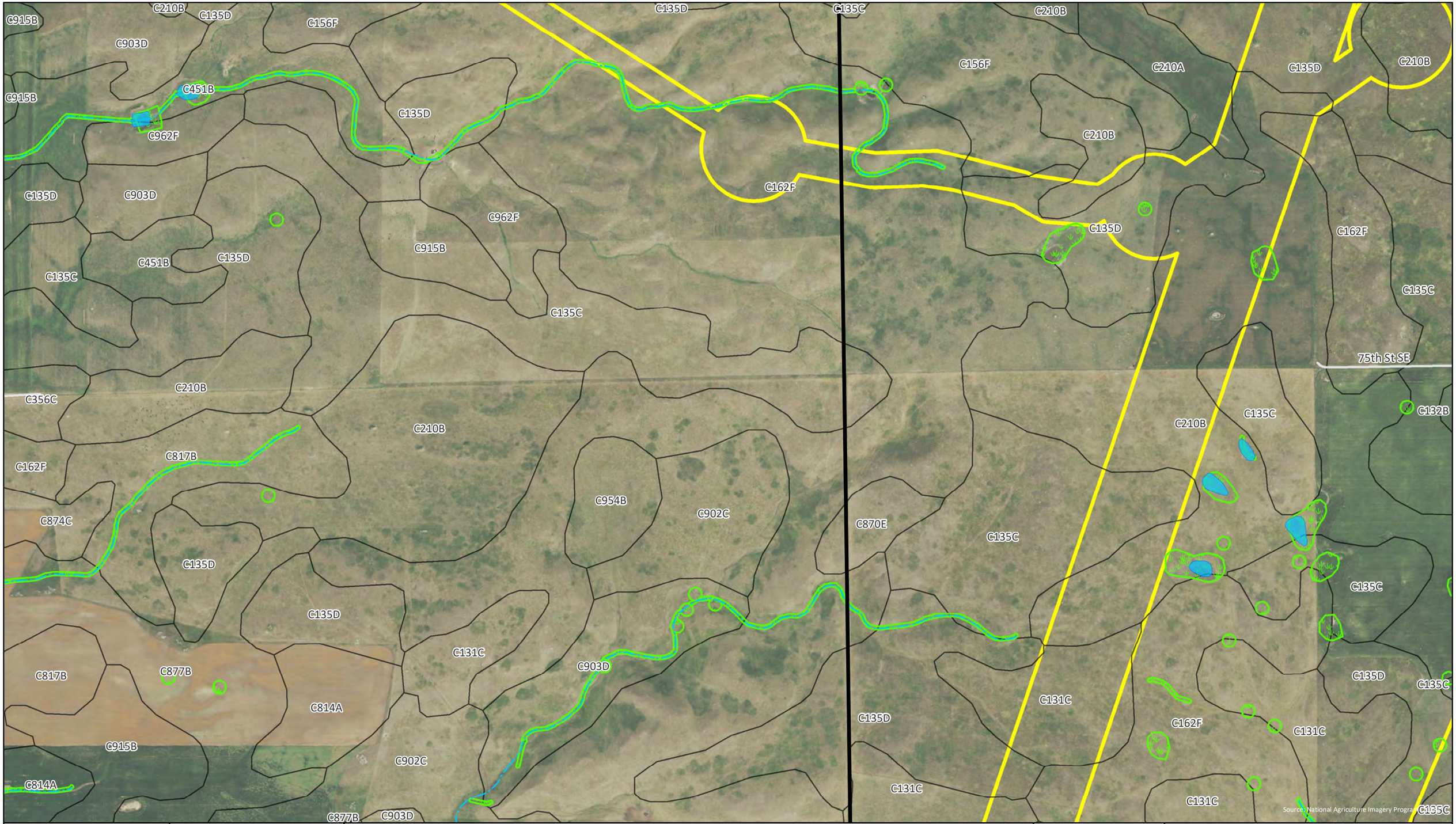


Figure 2
Map 15 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
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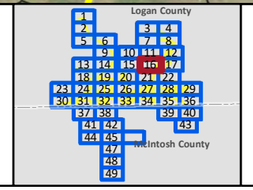
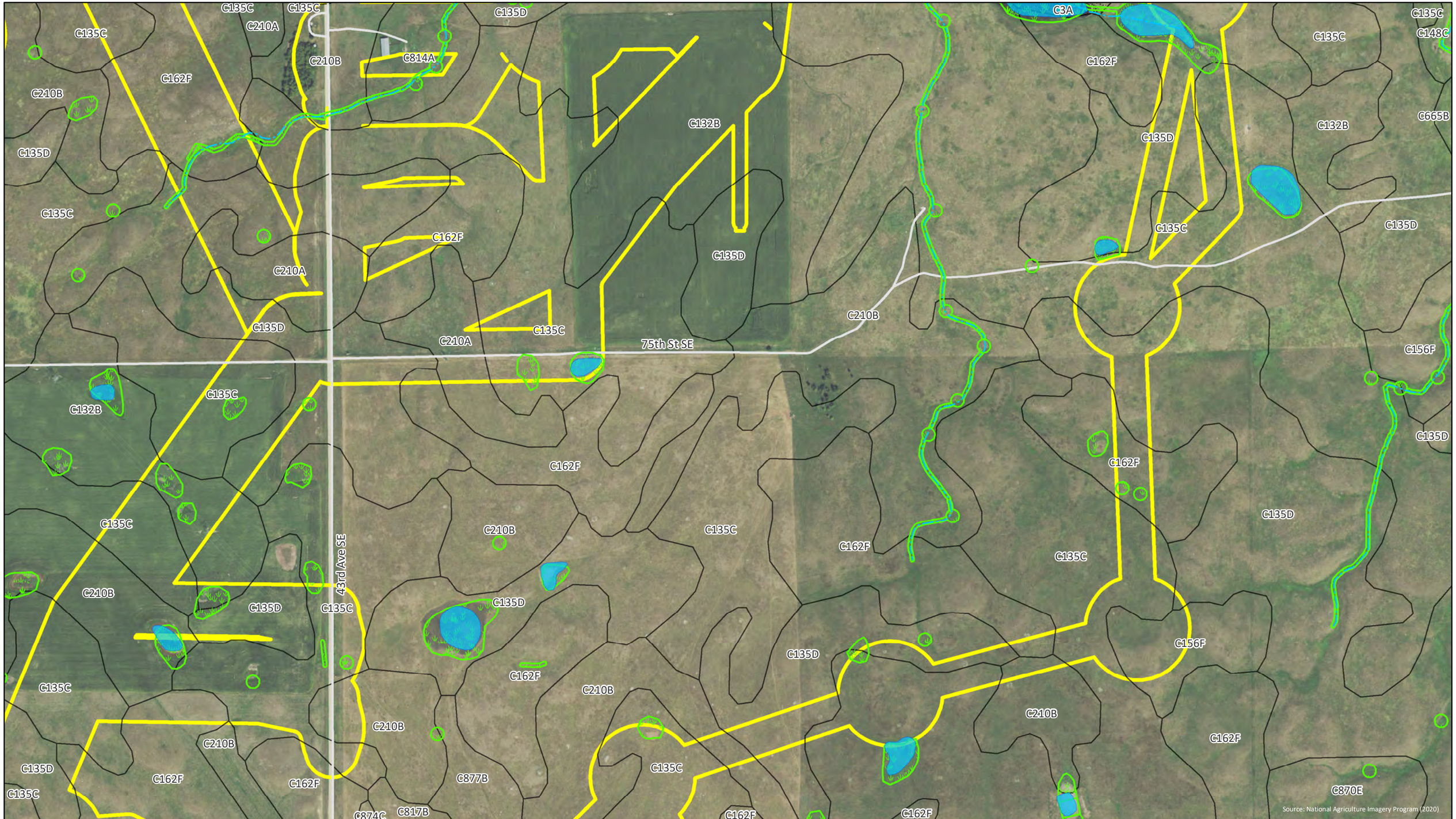


Figure 2
Map 16 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
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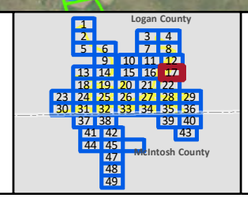
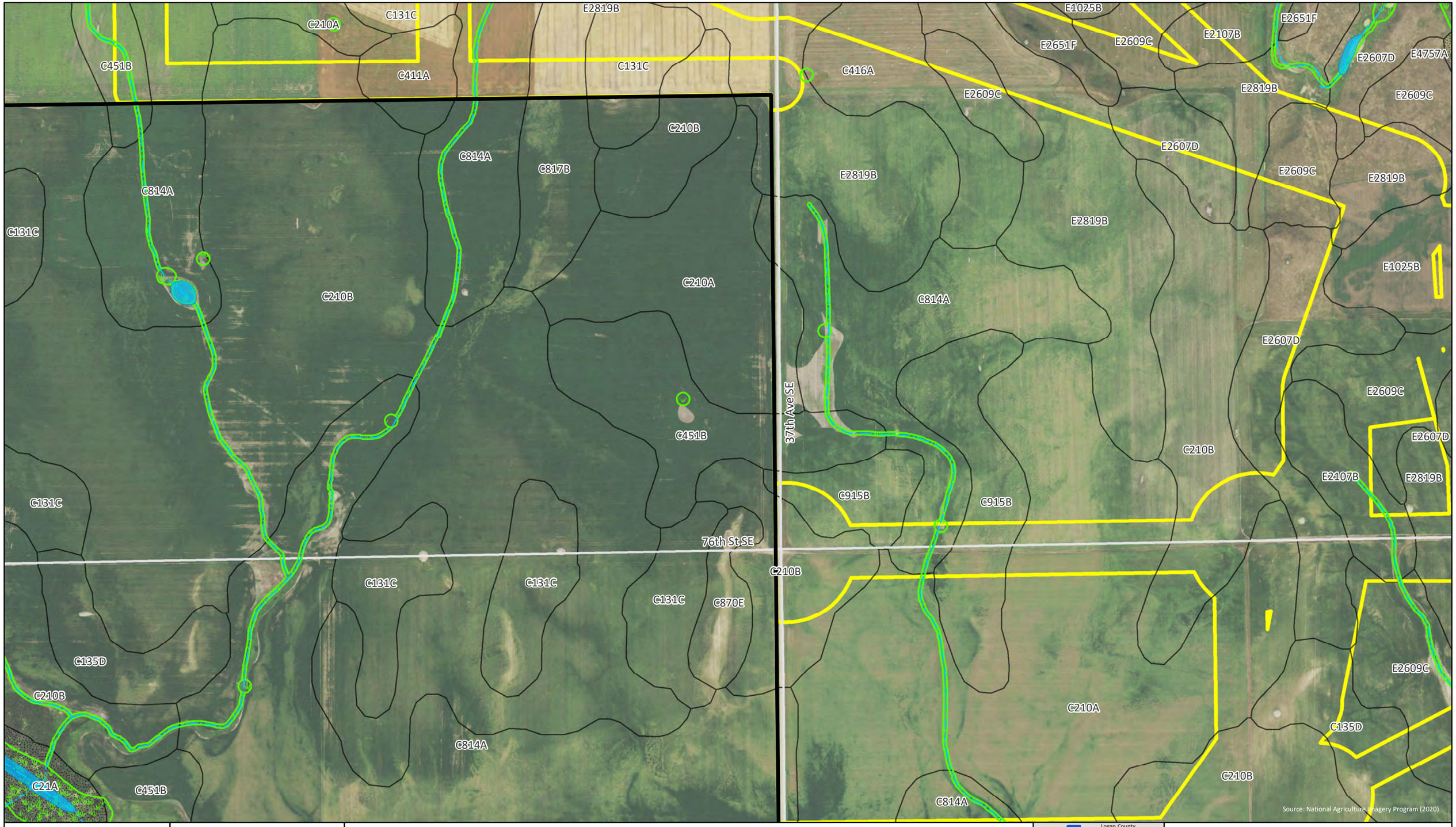


Figure 2
Map 17 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
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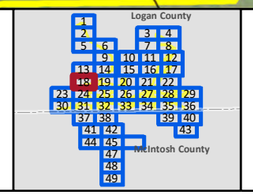
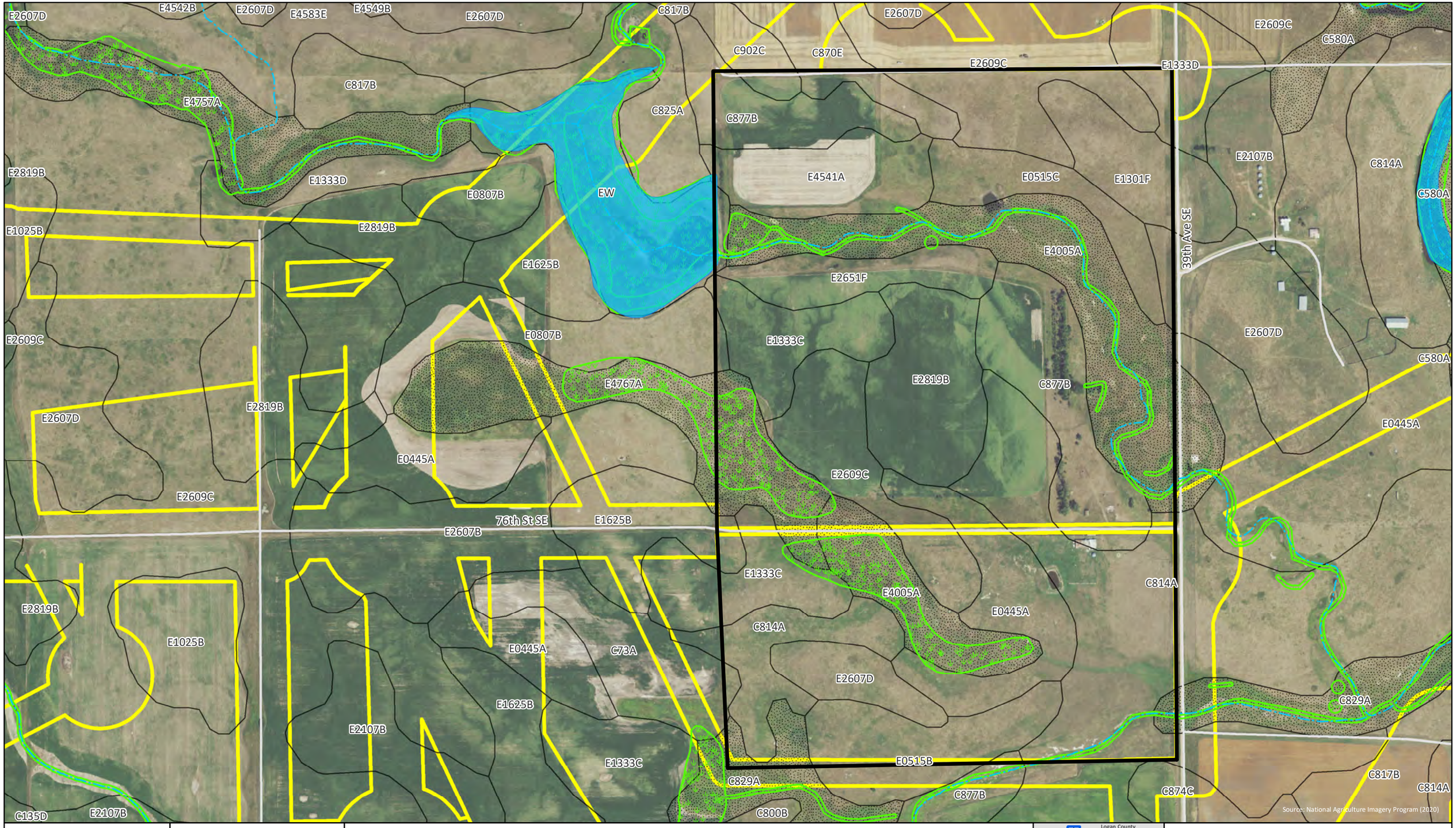


Figure 2
Map 18 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
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0 500
Feet

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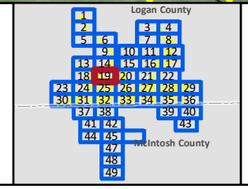
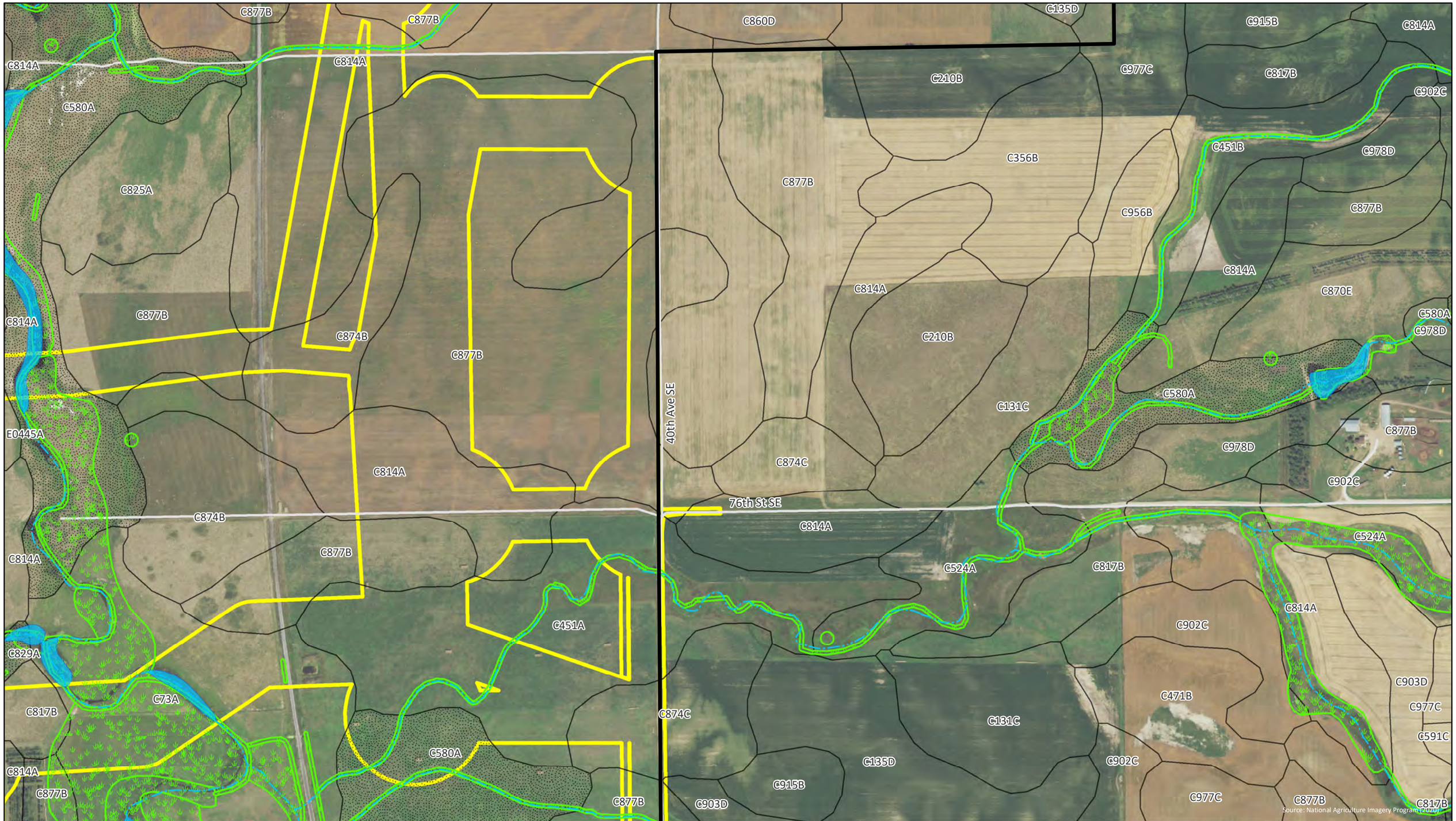


Figure 2
Map 19 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Badger Wind, LLC
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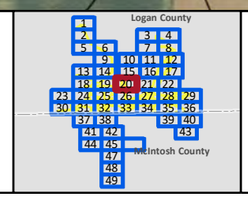
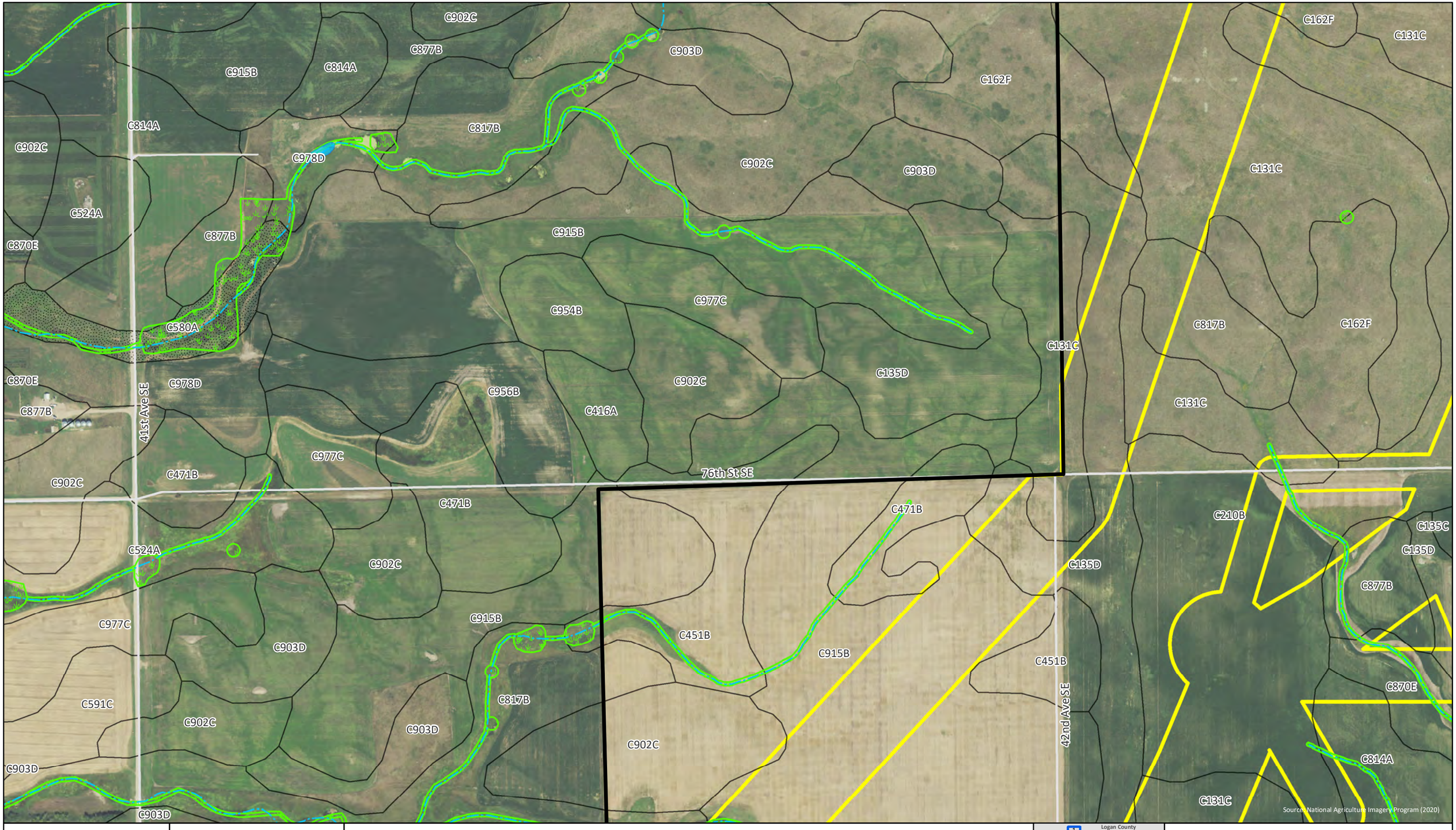


Figure 2
Map 20 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
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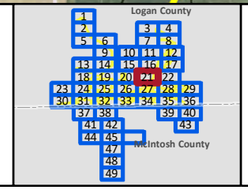
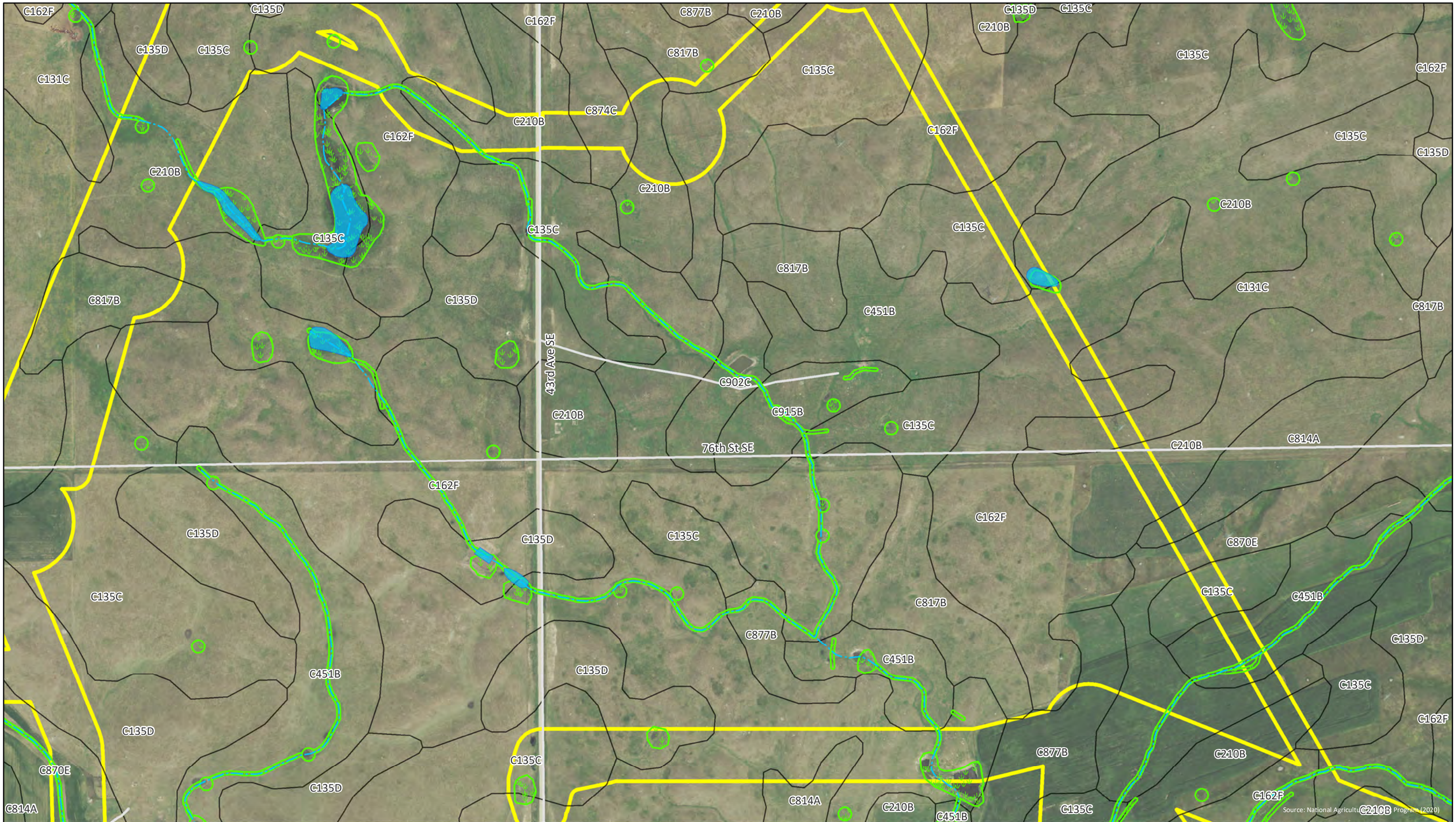


Figure 2
Map 21 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
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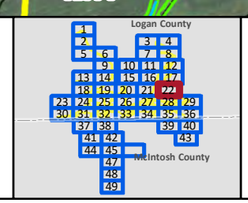


Figure 2
Map 22 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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C21A
C131C
C915B
C451B
C954B
36th Ave SE
C902C
77th St SE
C915B
C451B
C954B
C915B
C954B
C902C
Source: National Agriculture Imagery Program (2020)

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

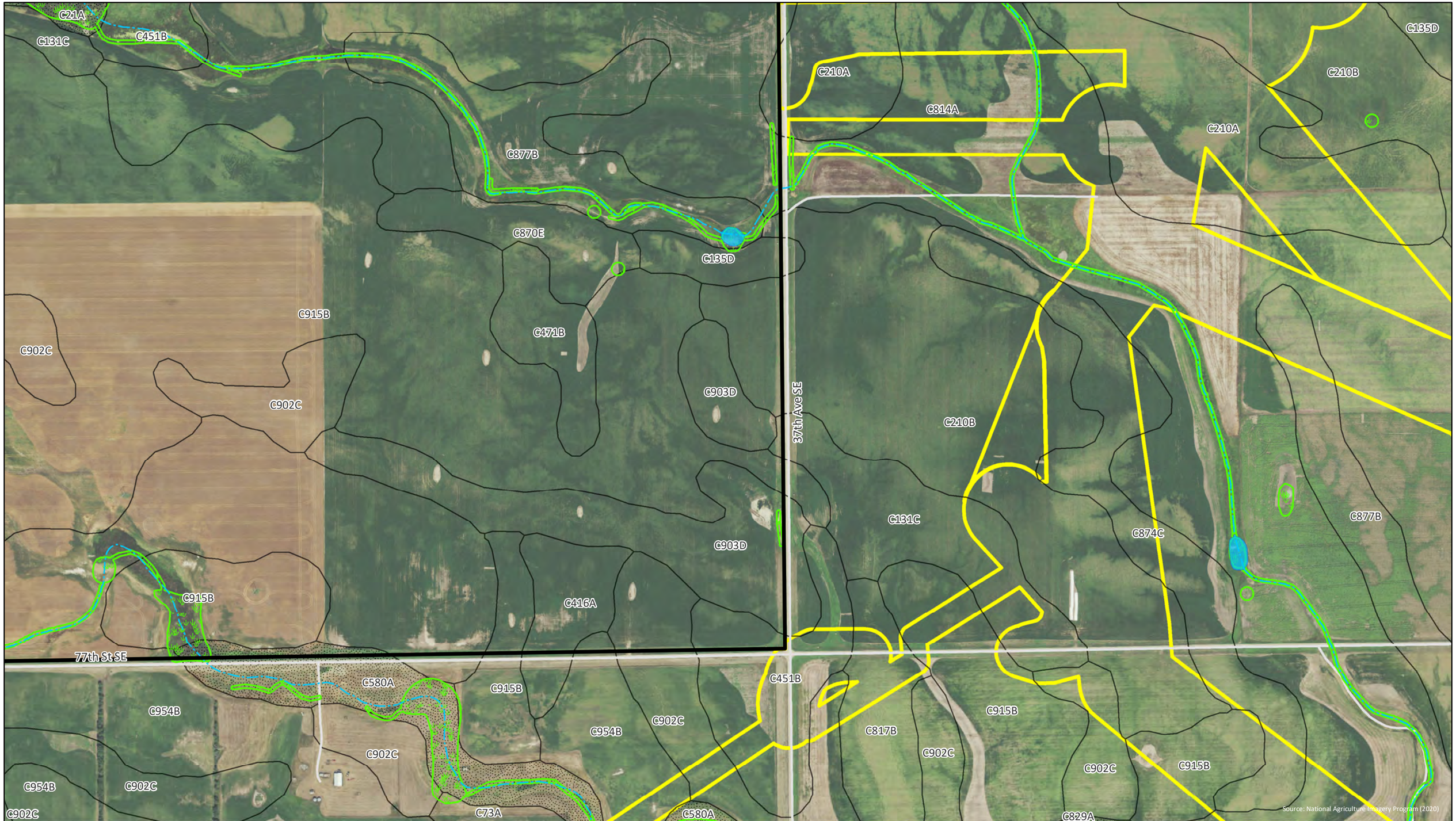
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Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

Logan County
McIntosh County

Figure 2
Map 23 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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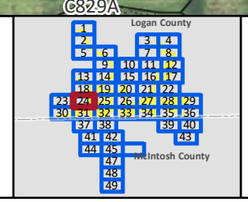
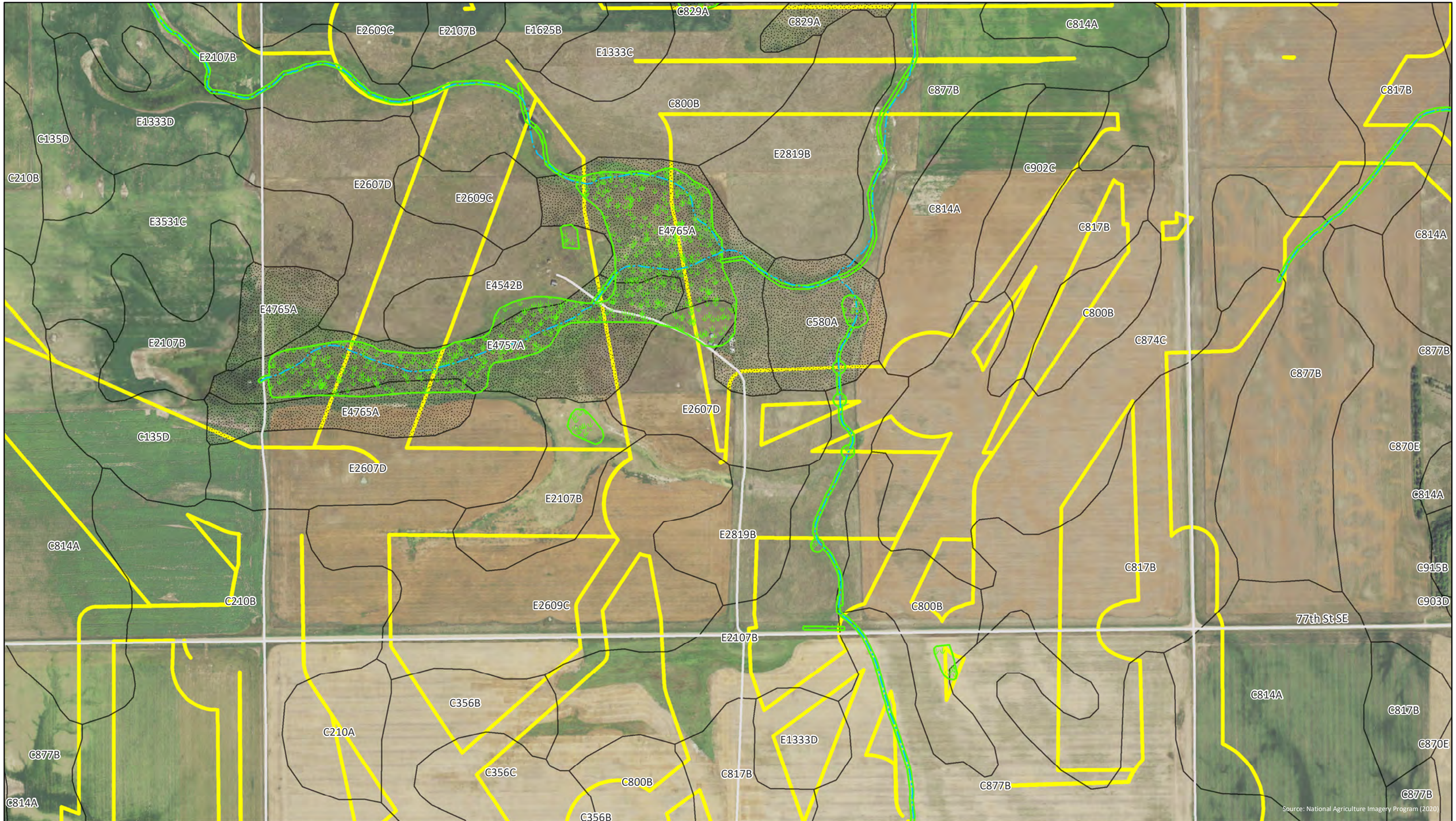


Figure 2
Map 24 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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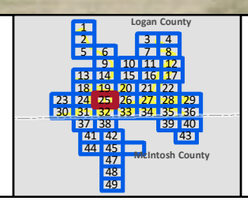
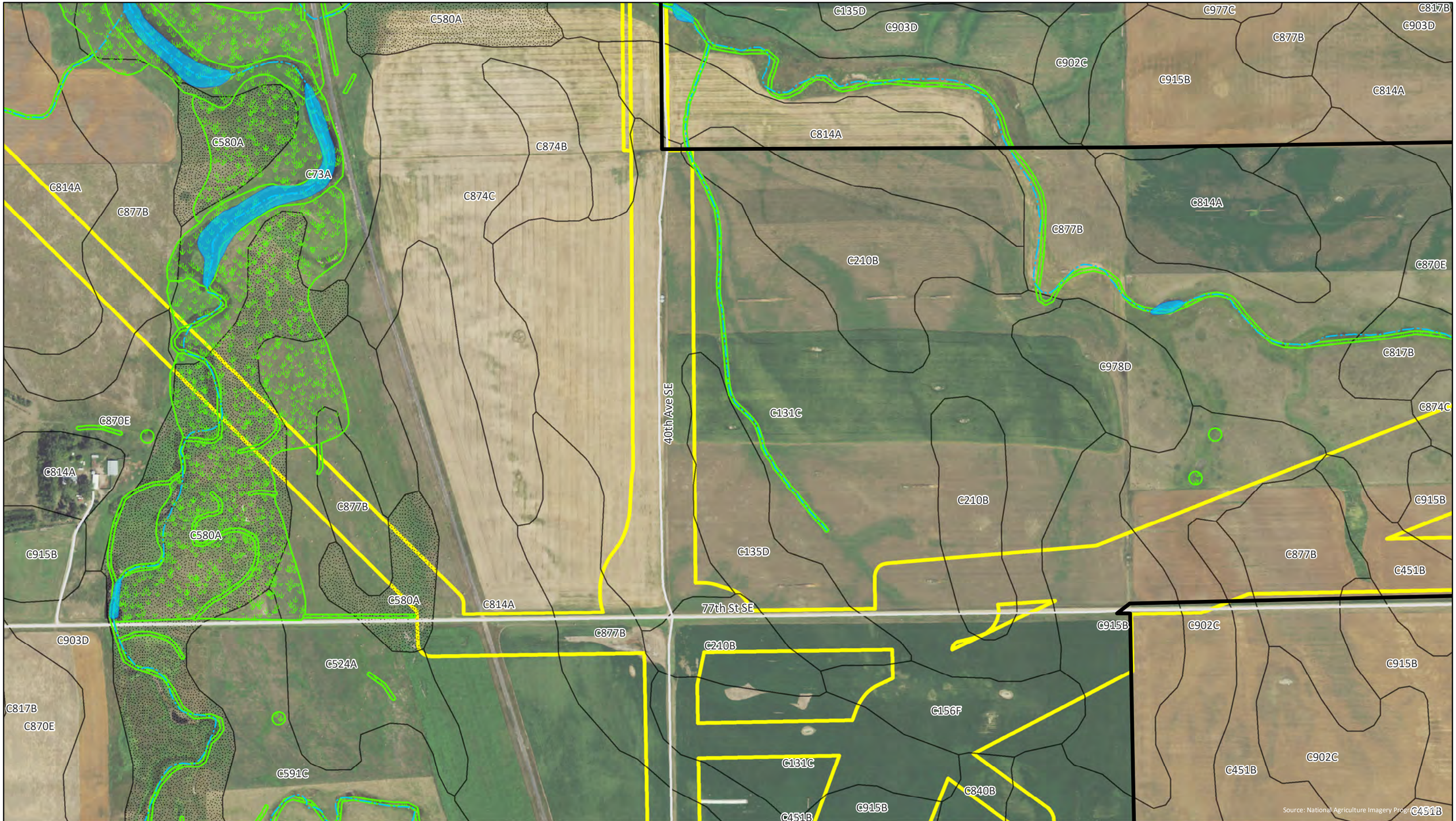


Figure 2
Map 25 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
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19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

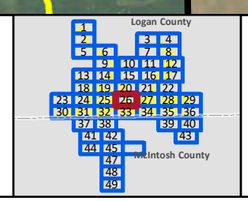
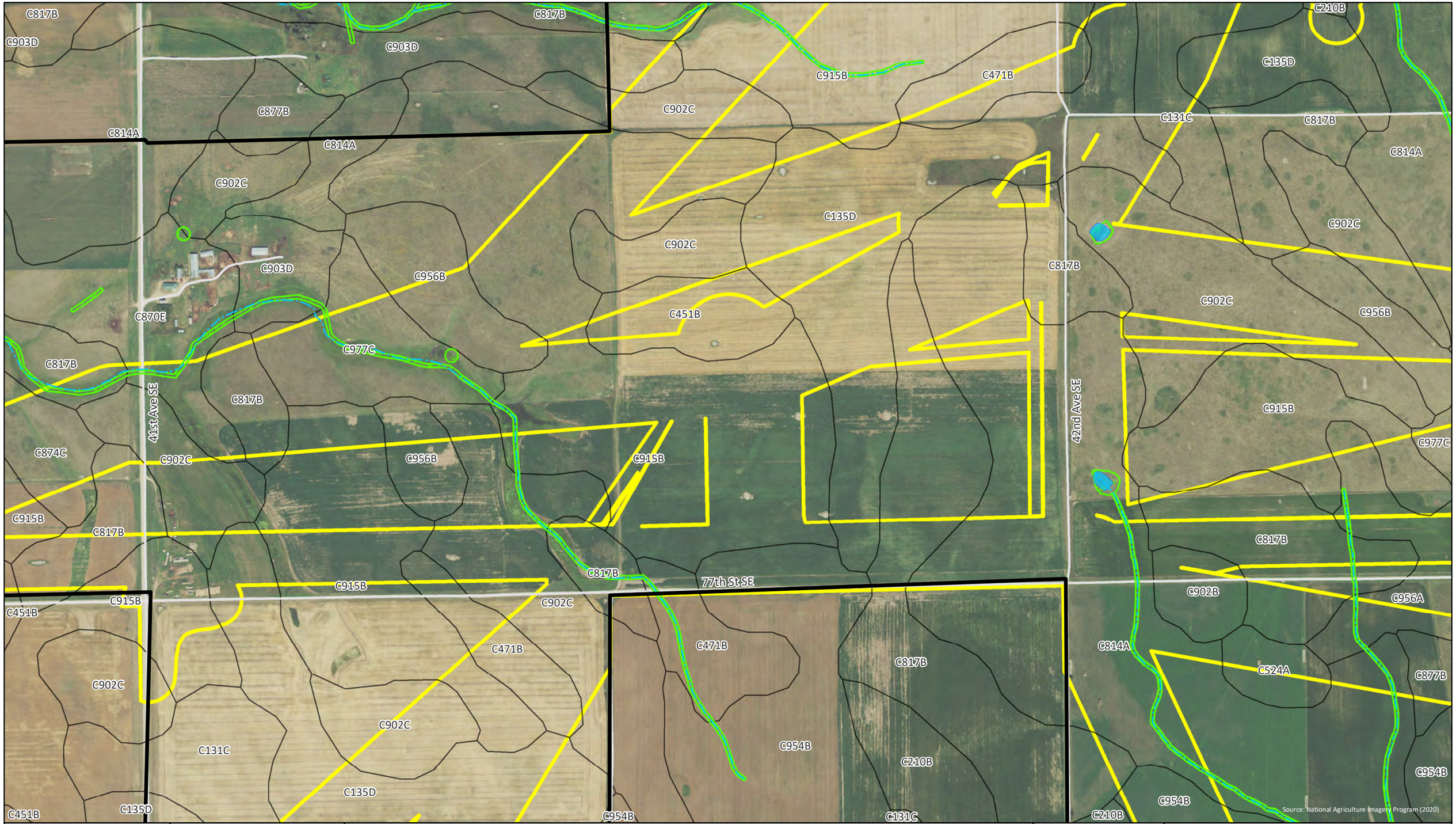


Figure 2
Map 26 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

- Watercourse (NHD)
- Waterbody (NHD)
- Wetland (NWI)
- Hydric Soils (gSSURGO)
- Survey Area (~6,056 acres)
- Project Area (~31,514 acres)
- Road
- County

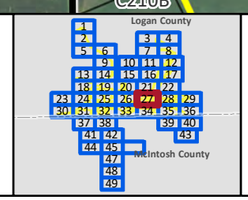
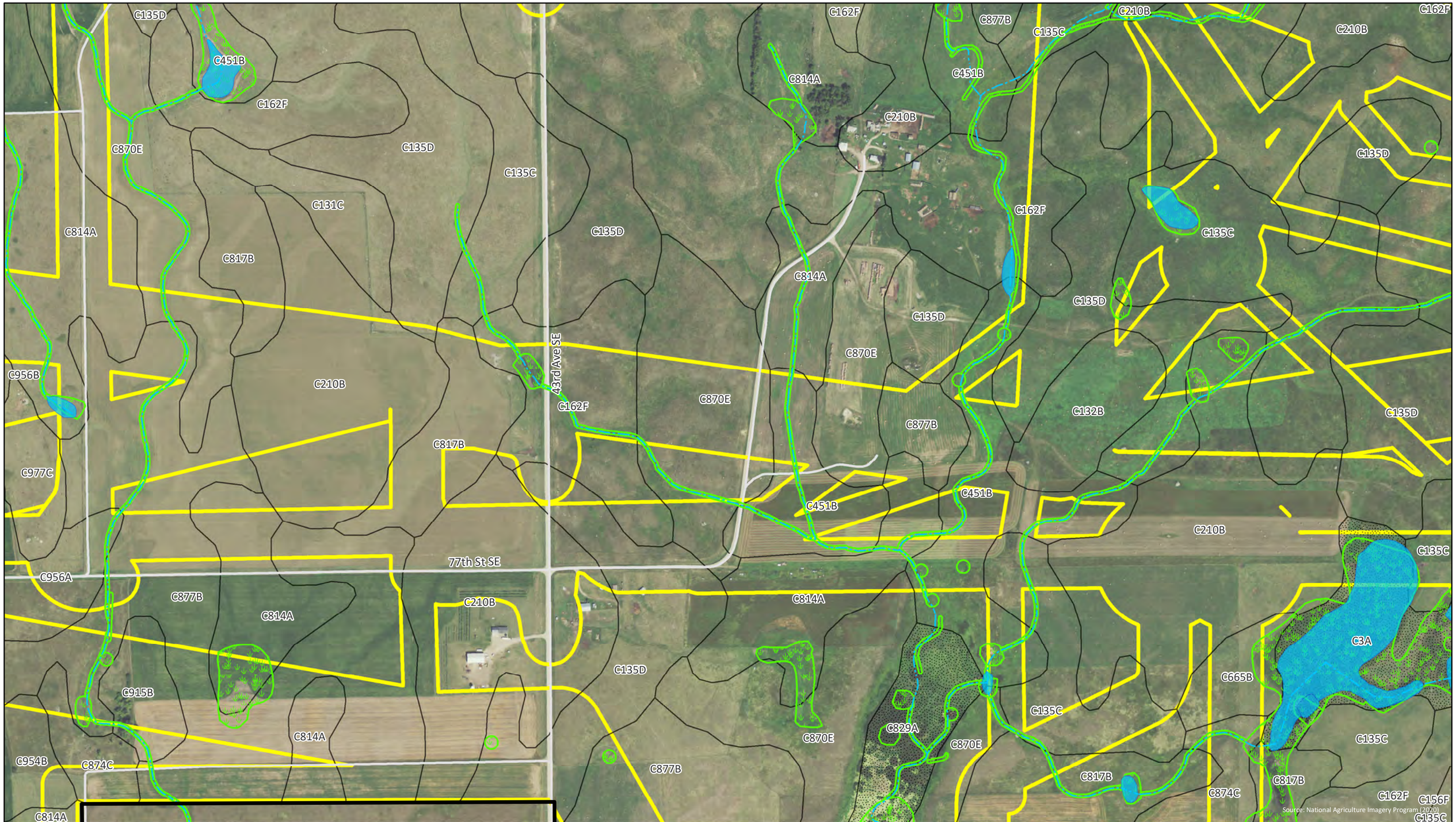


Figure 2
Map 27 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

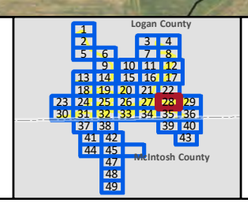
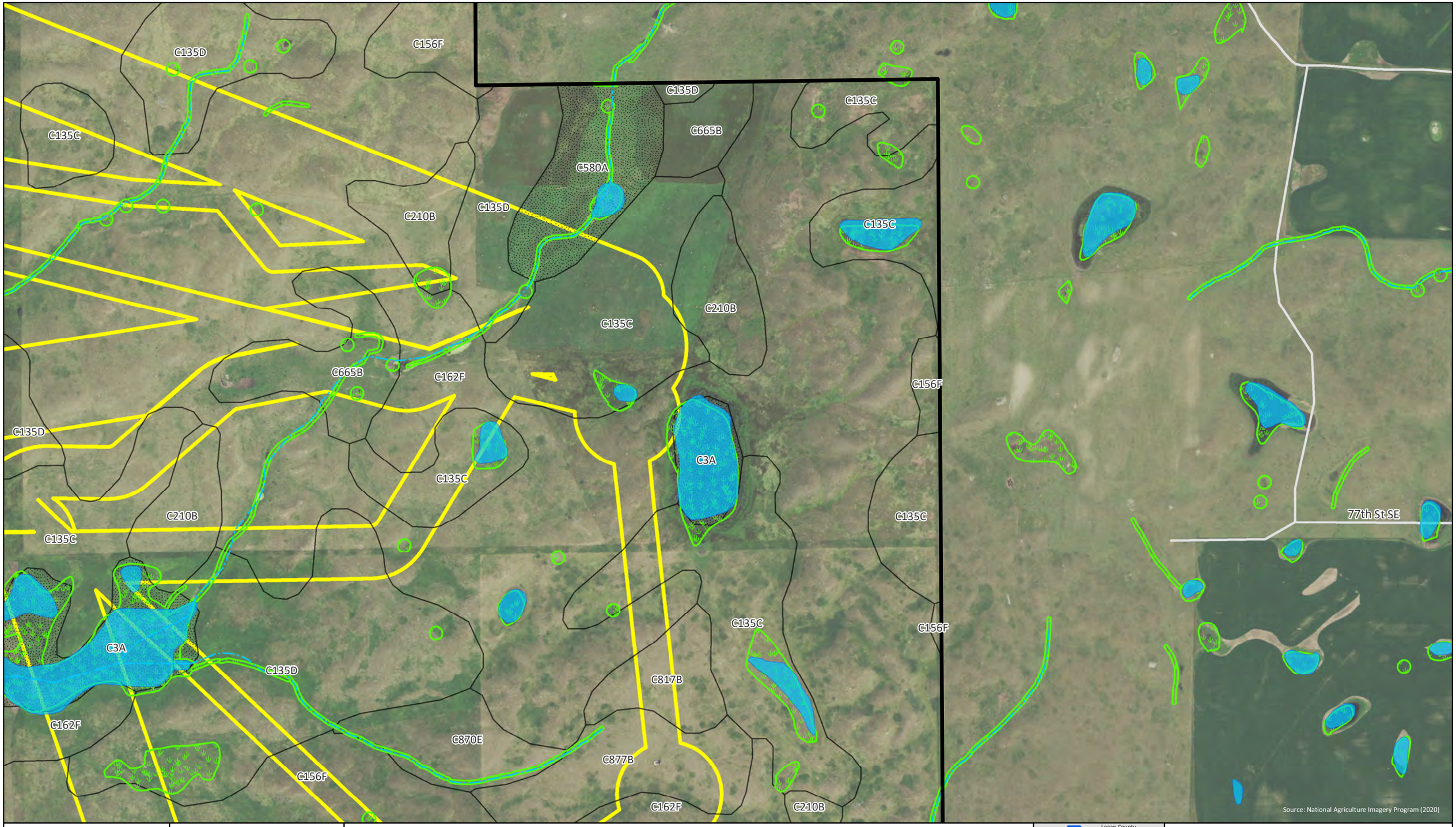


Figure 2
Map 28 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig2_WetlandsDesktopMapbook.mxd 5/16/2022



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

- Watercourse (NHD)
- Waterbody (NHD)
- Wetland (NWI)
- Hydric Soils (gSSURGO)
- Survey Area (~6,056 acres)
- Project Area (~31,514 acres)
- Road
- County

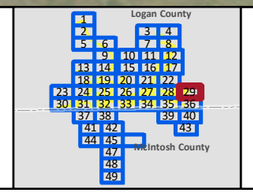
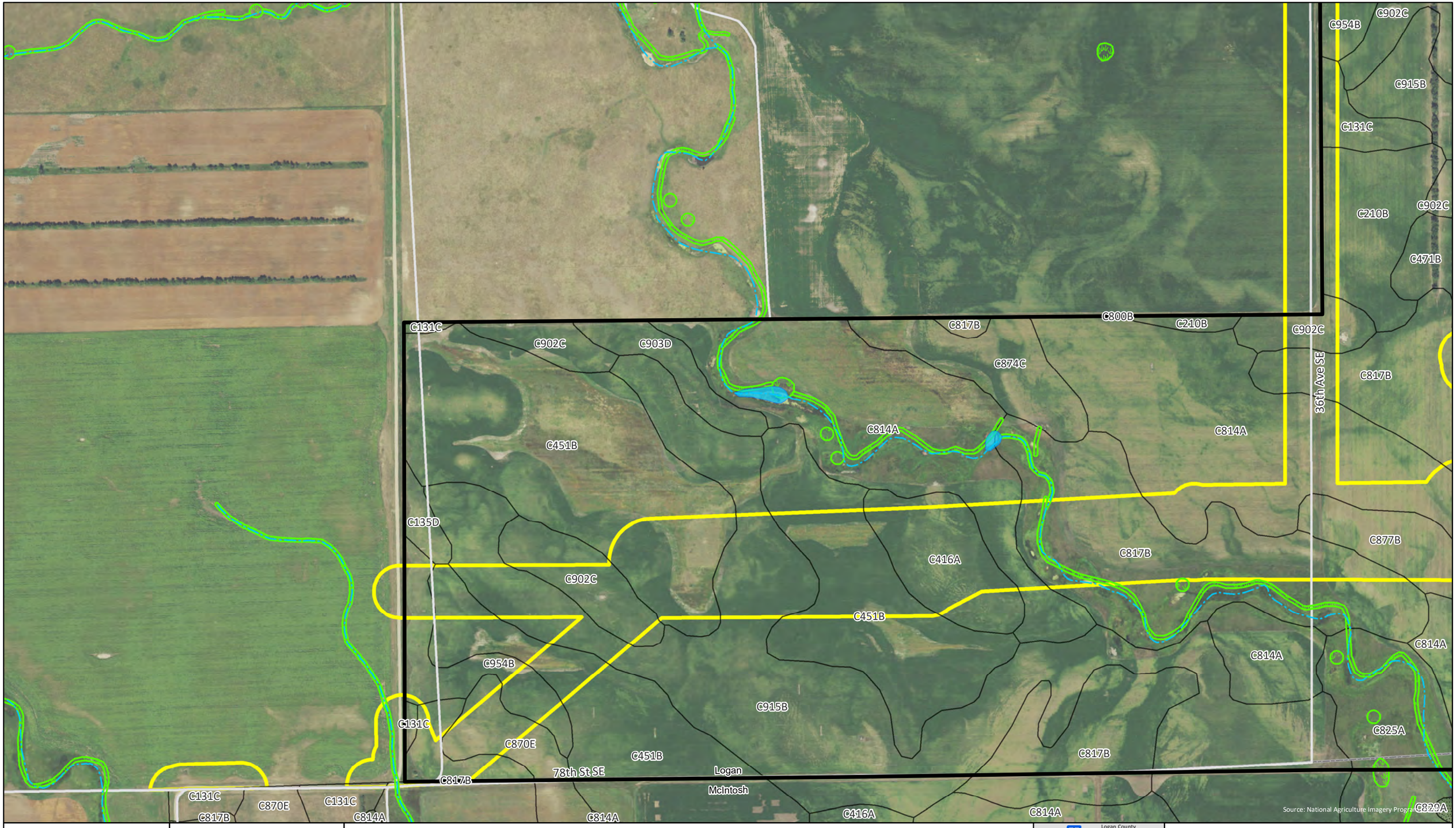


Figure 2
Map 29 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig2_WetlandsDesktopMapbook.mxd 5/16/2022



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

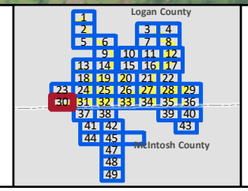
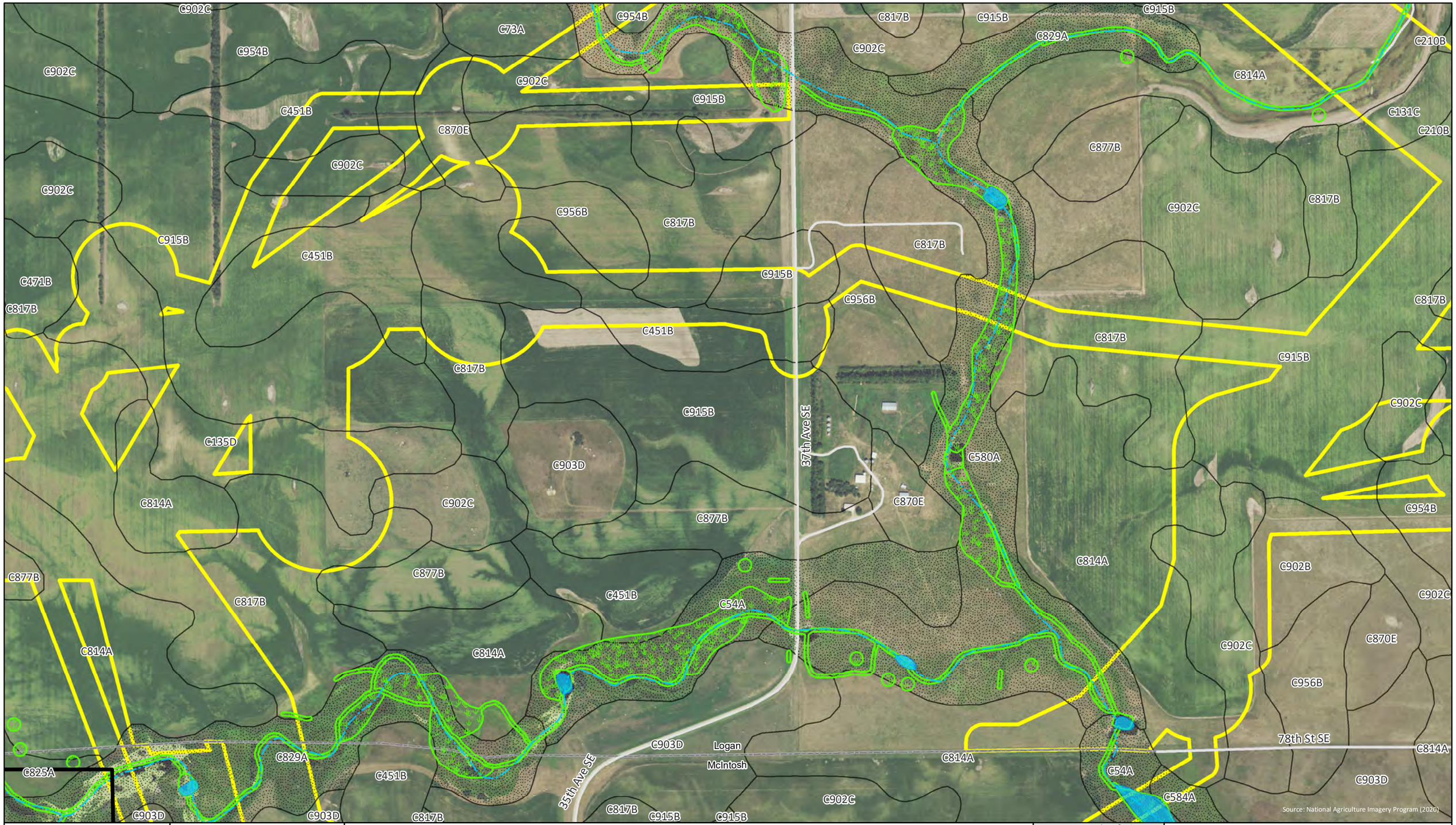


Figure 2
Map 30 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

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- Waterbody (NHD)
- Wetland (NWI)
- Hydric Soils (gSSURGO)
- Survey Area (~6,056 acres)
- Project Area (~31,514 acres)
- Road
- County

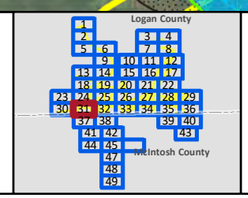
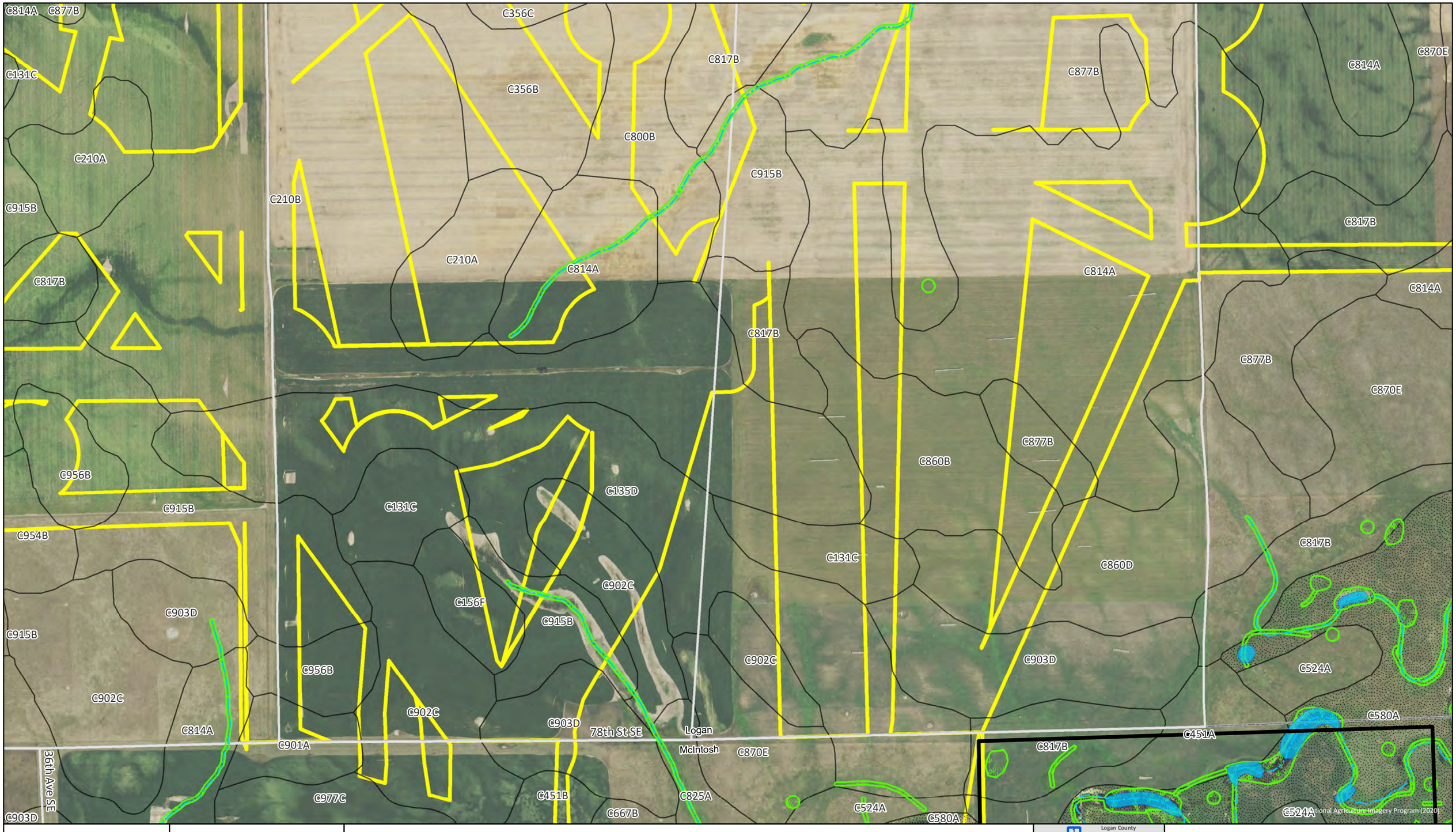


Figure 2
Map 31 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

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- Waterbody (NHD)
- Wetland (NWI)
- Hydric Soils (gSSURGO)
- Survey Area (~6,056 acres)
- Project Area (~31,514 acres)
- Road
- County

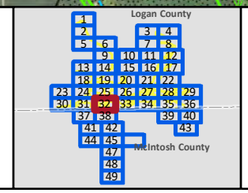


Figure 2
Map 32 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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C877B
C840B
C915B
C814A
C451B
C580A
C451B
C902C
C903D
C870E
C877B
C356B
C580A
C591C
C915B
C817B
C131C
C877B
C874C
C814A
C915B
C870E
C135D
C814A
C135D
40th Ave SE
C817B
C874C
C210B
C814A
C131C
C73A
C903D
C877B
C956B
C817B
C356C
C524A
C814A
C524A
C580A
C131C
C915B
C814A
C978D
C580A
C977C
C817B
C990F
C829A
C877B
C317B
C451B
C451B
Logan
78th St SE
McIntosh
C870E
38th Ave SE
C877B
39th Ave SE
C870E
C451B

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

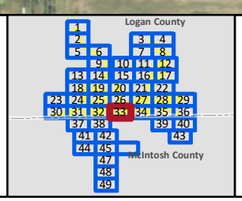
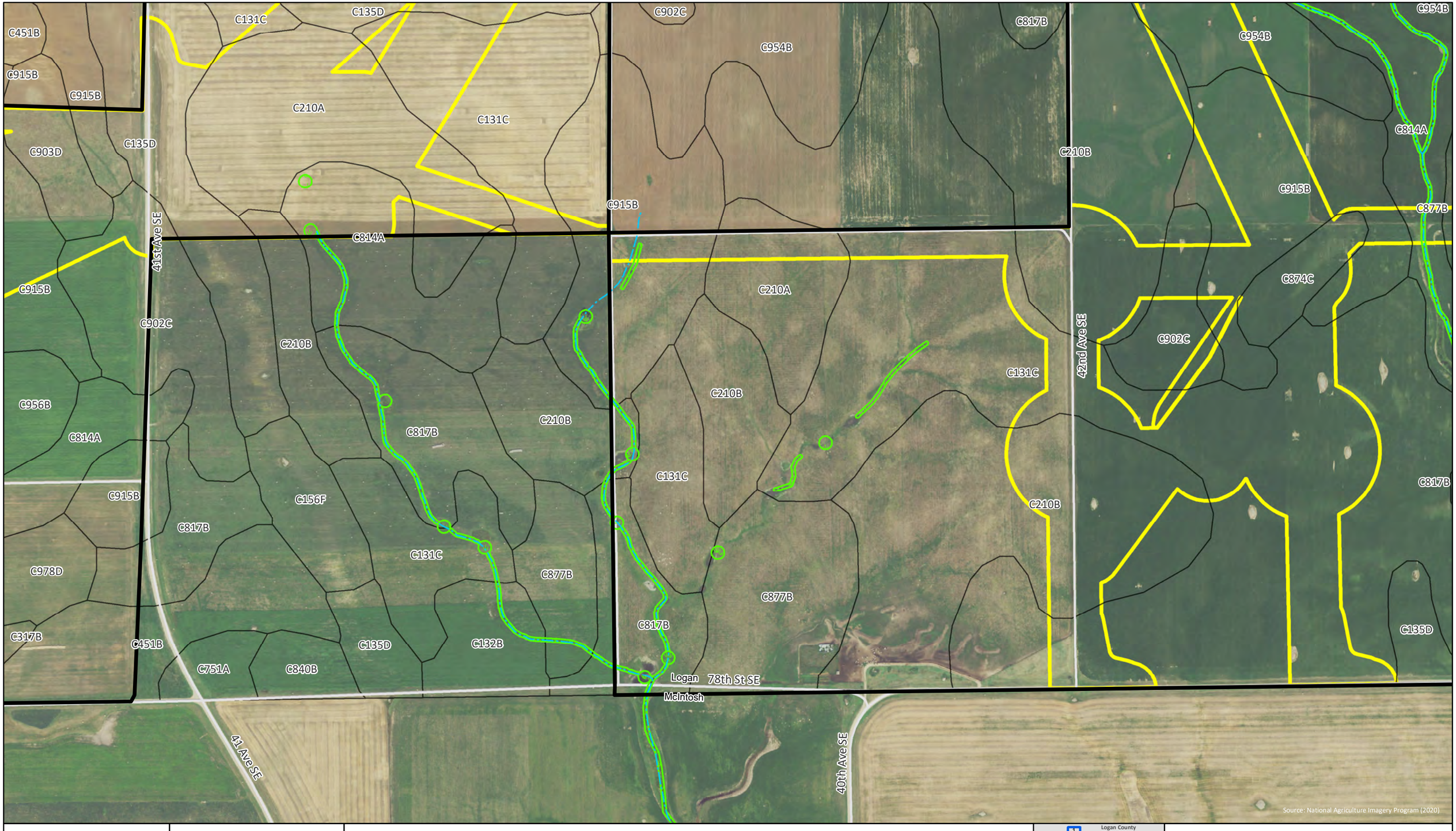


Figure 2
Map 33 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

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- Waterbody (NHD)
- Wetland (NWI)
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- Road
- County

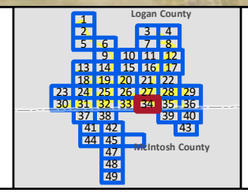
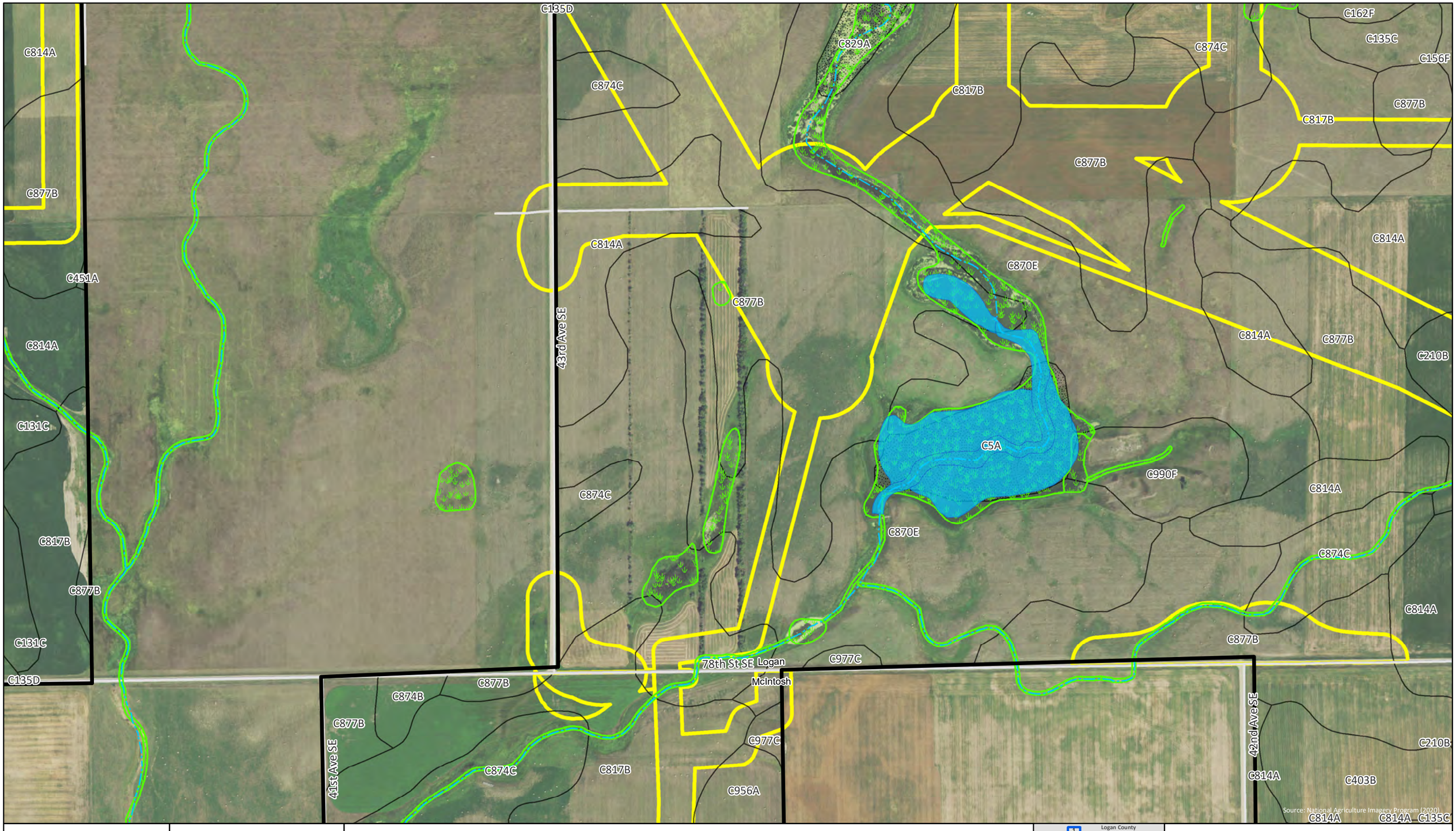


Figure 2
Map 34 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

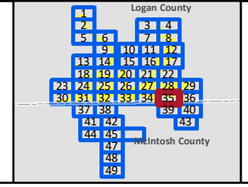
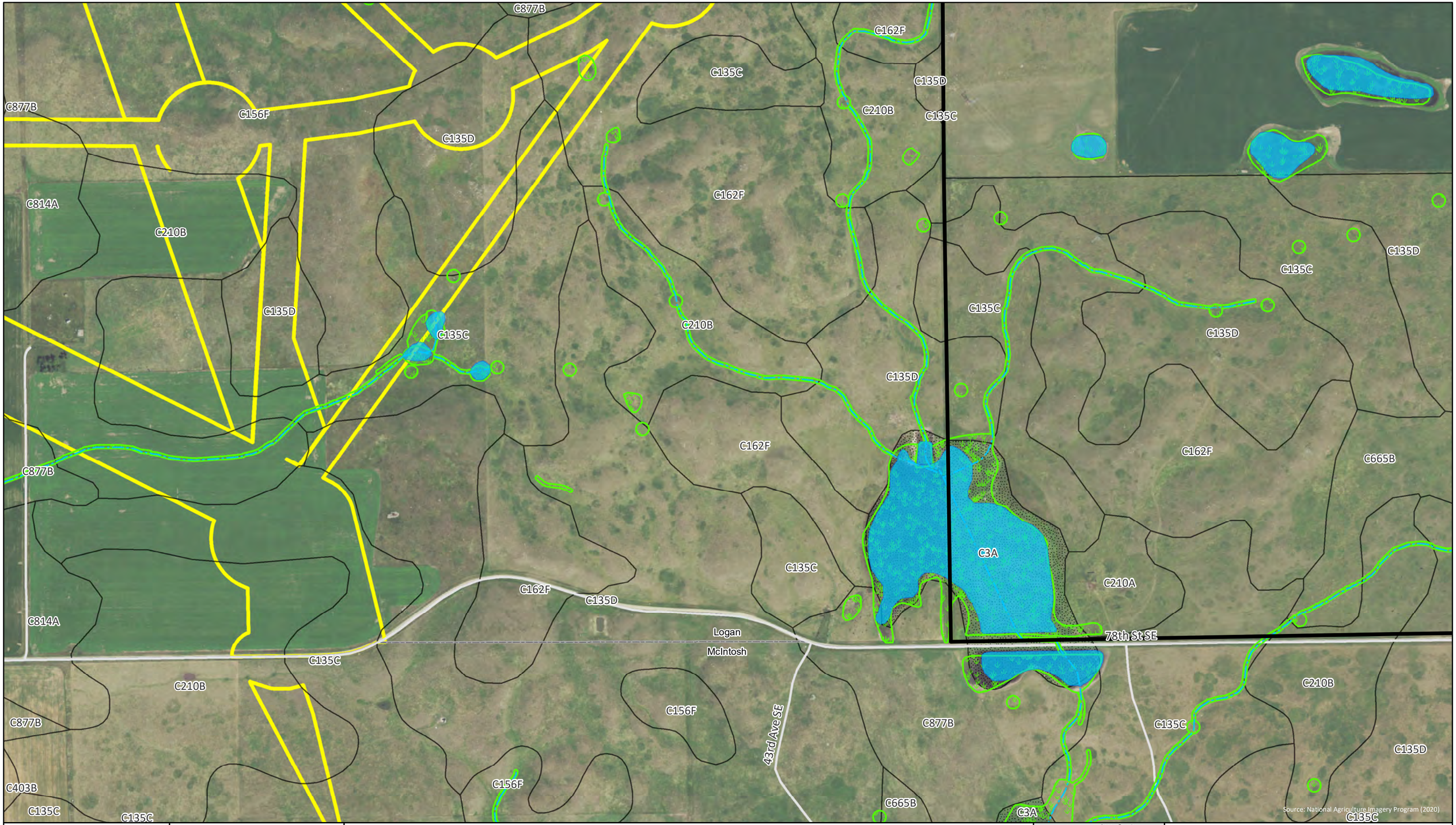


Figure 2
Map 35 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

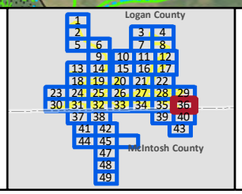
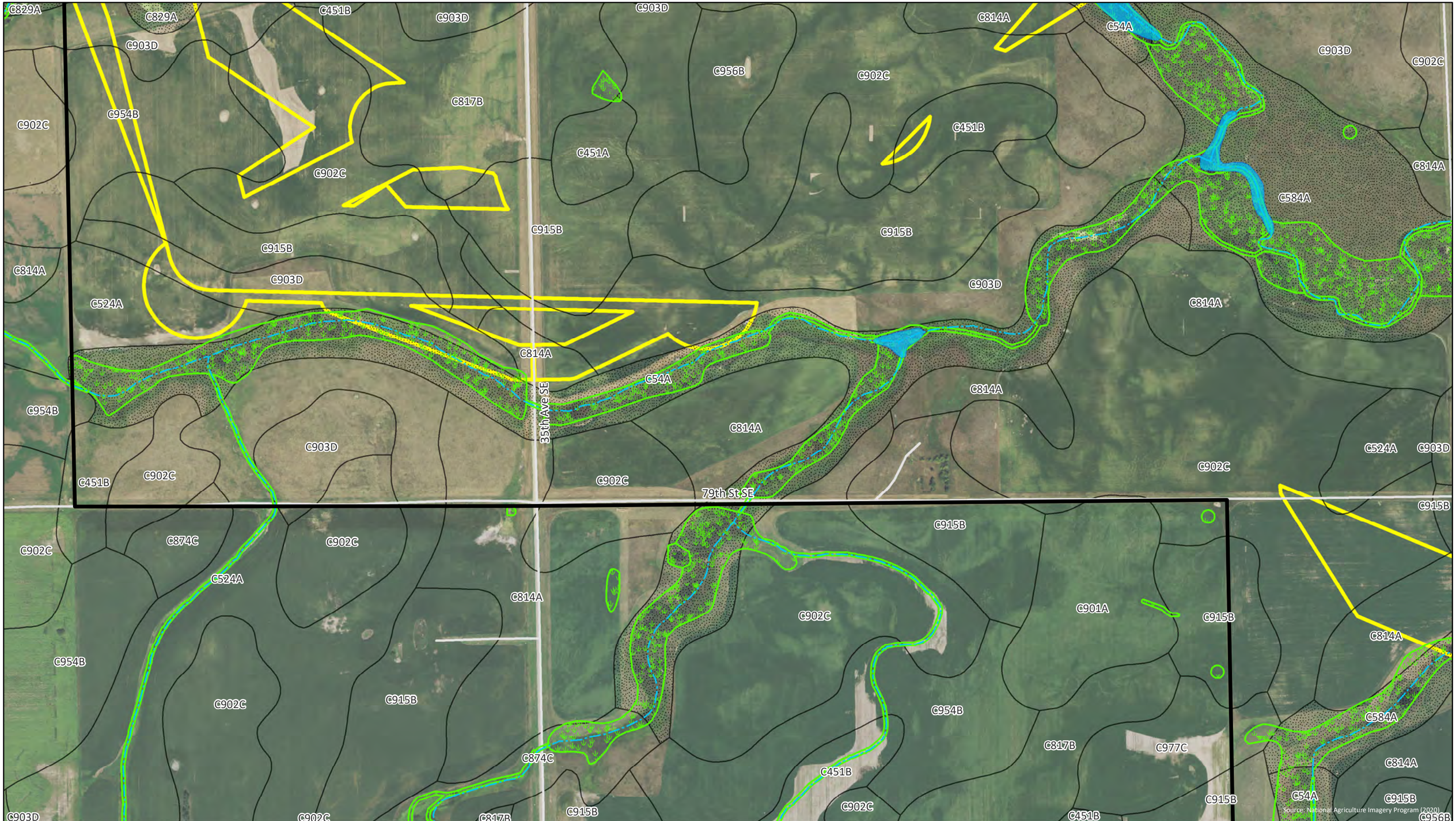


Figure 2
Map 36 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
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Road
County

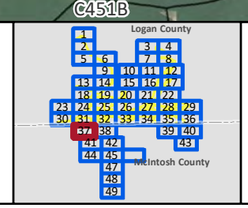
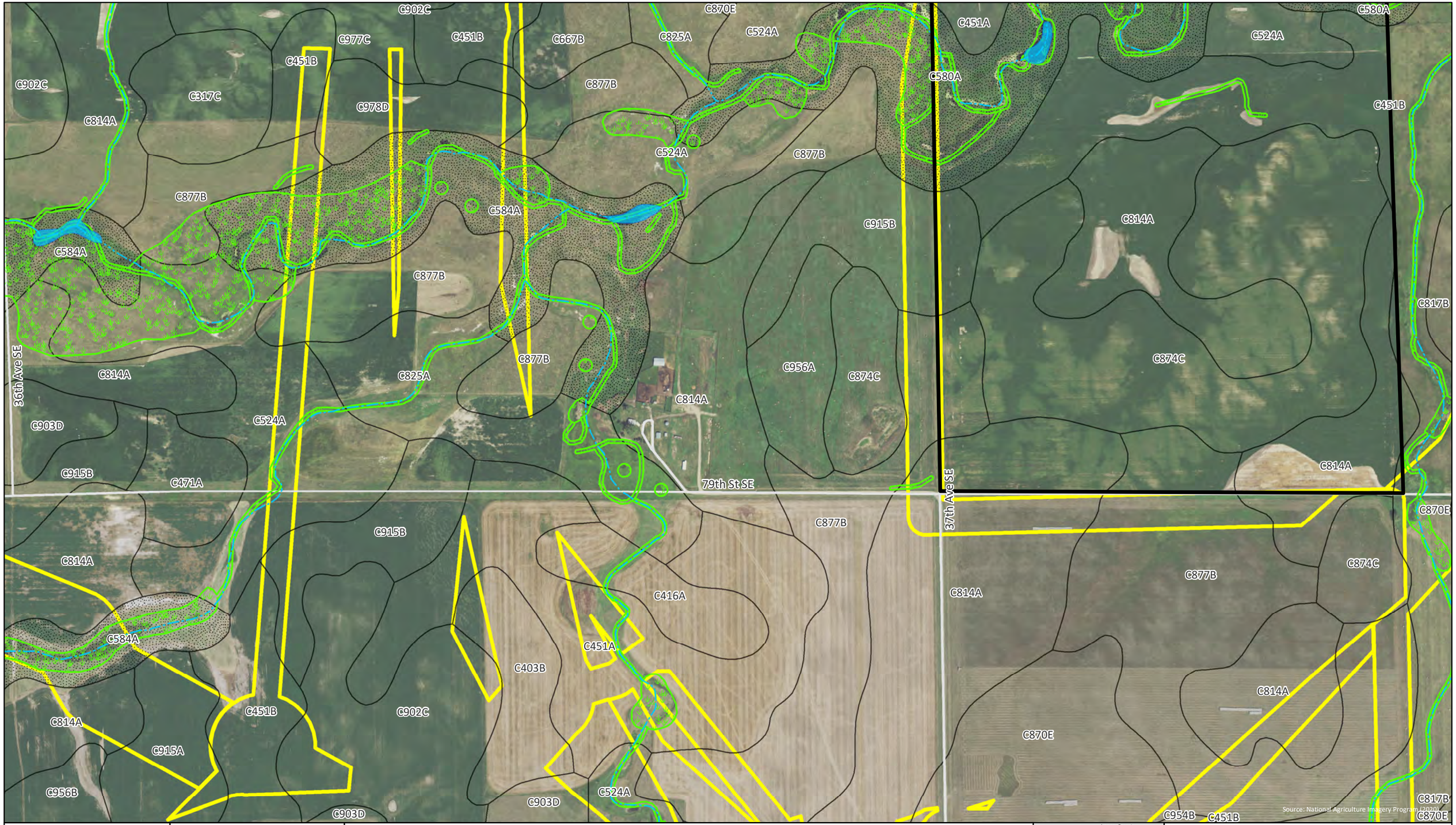


Figure 2
Map 37 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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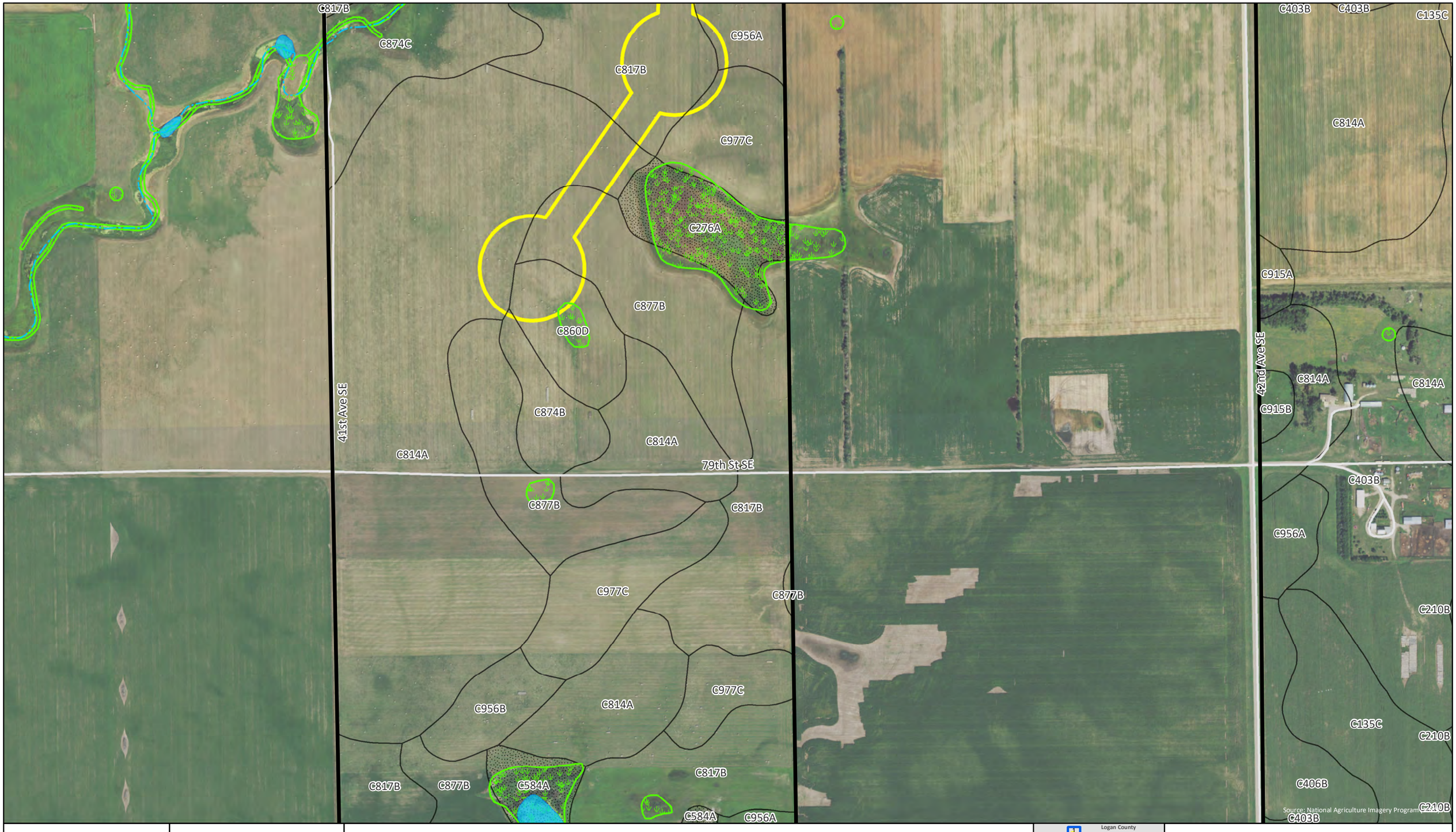
Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

- Watercourse (NHD)
- Waterbody (NHD)
- Wetland (NWI)
- Hydric Soils (gSSURGO)
- Survey Area (~6,056 acres)
- Project Area (~31,514 acres)
- Road
- County

Figure 2
Map 38 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig2_WetlandsDesktopMapbook.mxd 5/16/2022



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

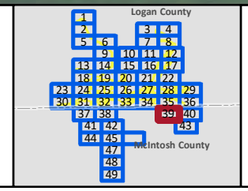


Figure 2
Map 39 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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C3A
C135D
C135C
C210B
C665B
C877B
C403B
43rd Ave SE
C135D
C877B
C870E
C135D
C135C
C210B
C210A
C135C
C814A
C210A
C135C
C210B
C270A
79th St SE
C403B
C135C
C210B
C814A
C403B
C210B
C276A
C877B
C135C
C874B
C135C
Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
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Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

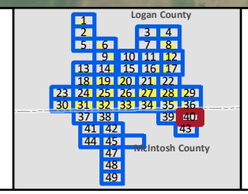
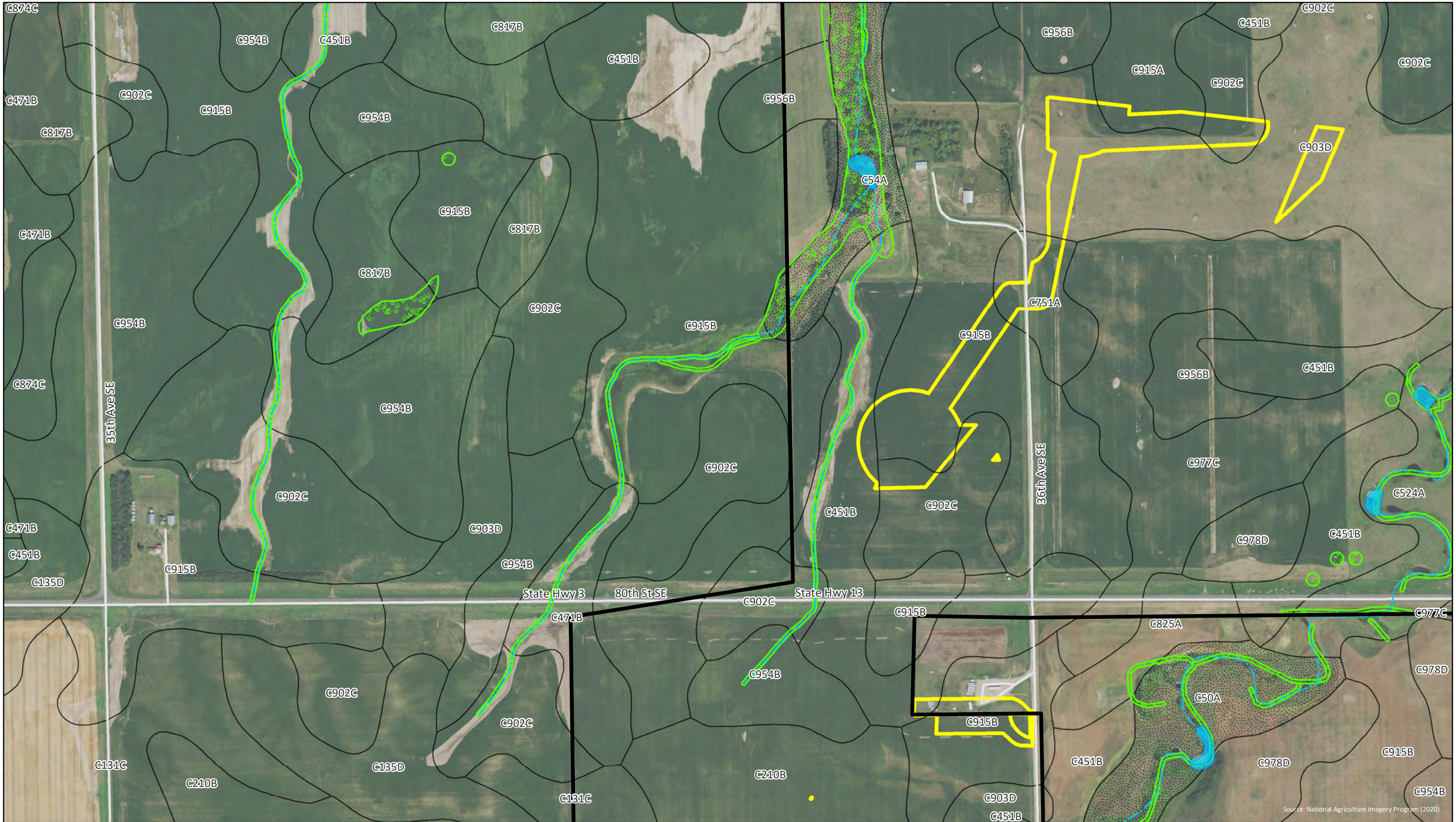


Figure 2
Map 40 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

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County

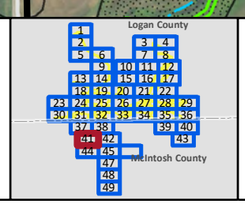


Figure 2
Map 41 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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C870E
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C903D
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C451B
C877B
C870E
C874C
C870E
C451B
C524A
C978D
C915B
C954B
C451B
C977C
C814A
37th Ave SE
C814A
38th Ave SE
C915B
C915A
C977C
C956B
C751A
State Hwy 3
80th St SE
State Hwy 13
C584A
C915B
C471B
C817B
C915B
C956B
C978D
C902C
C977C
C73A
C471A
C814A
C915A
C451B
C915B
C954B
C915B
C915B
C901A
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Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

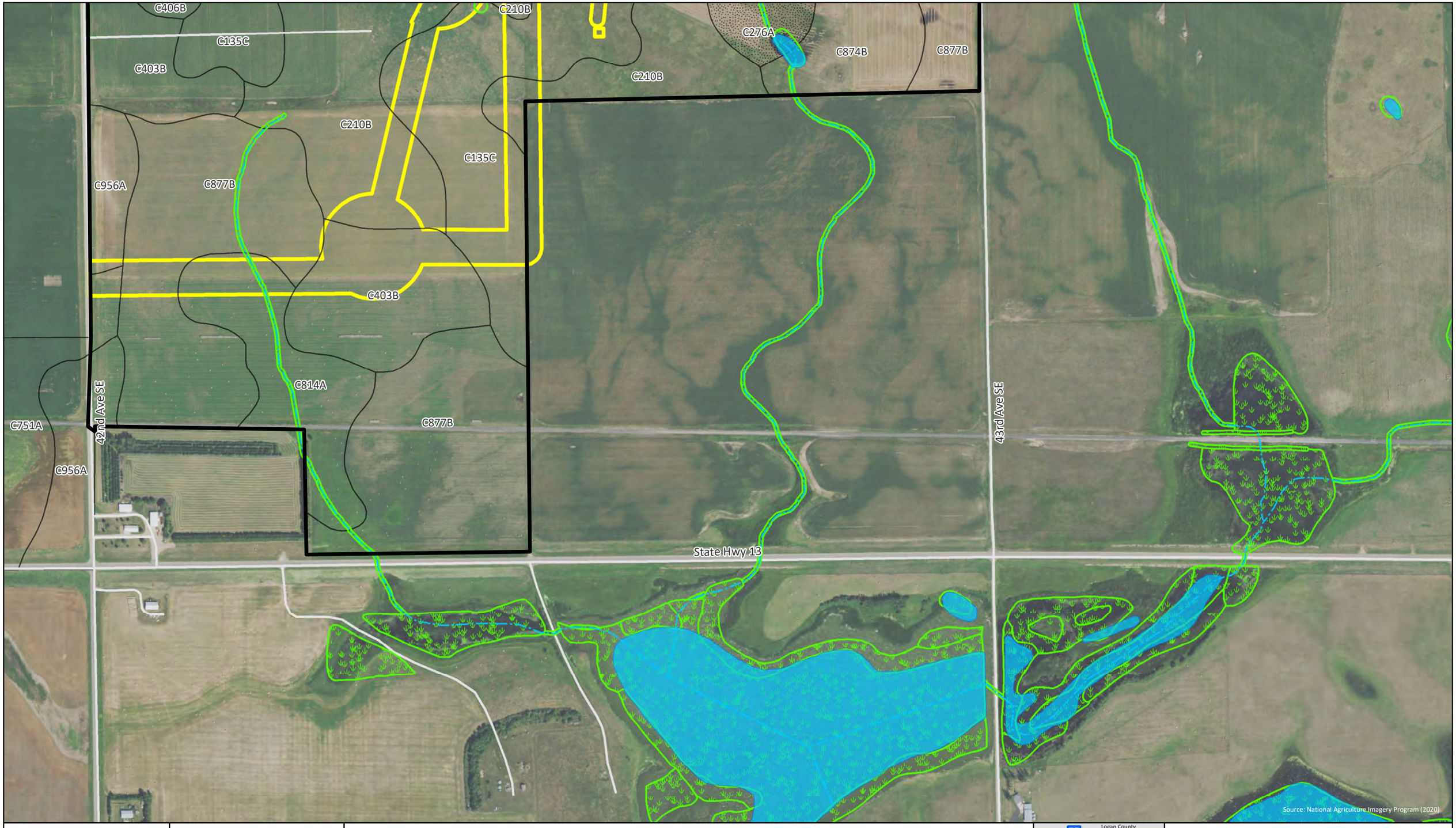
0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

Logan County
McIntosh County

Figure 2
Map 42 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig2_WetlandsDesktopMapbook.mxd 5/16/2022



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
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Road
County

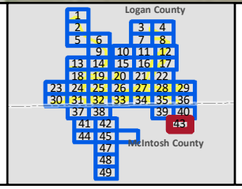
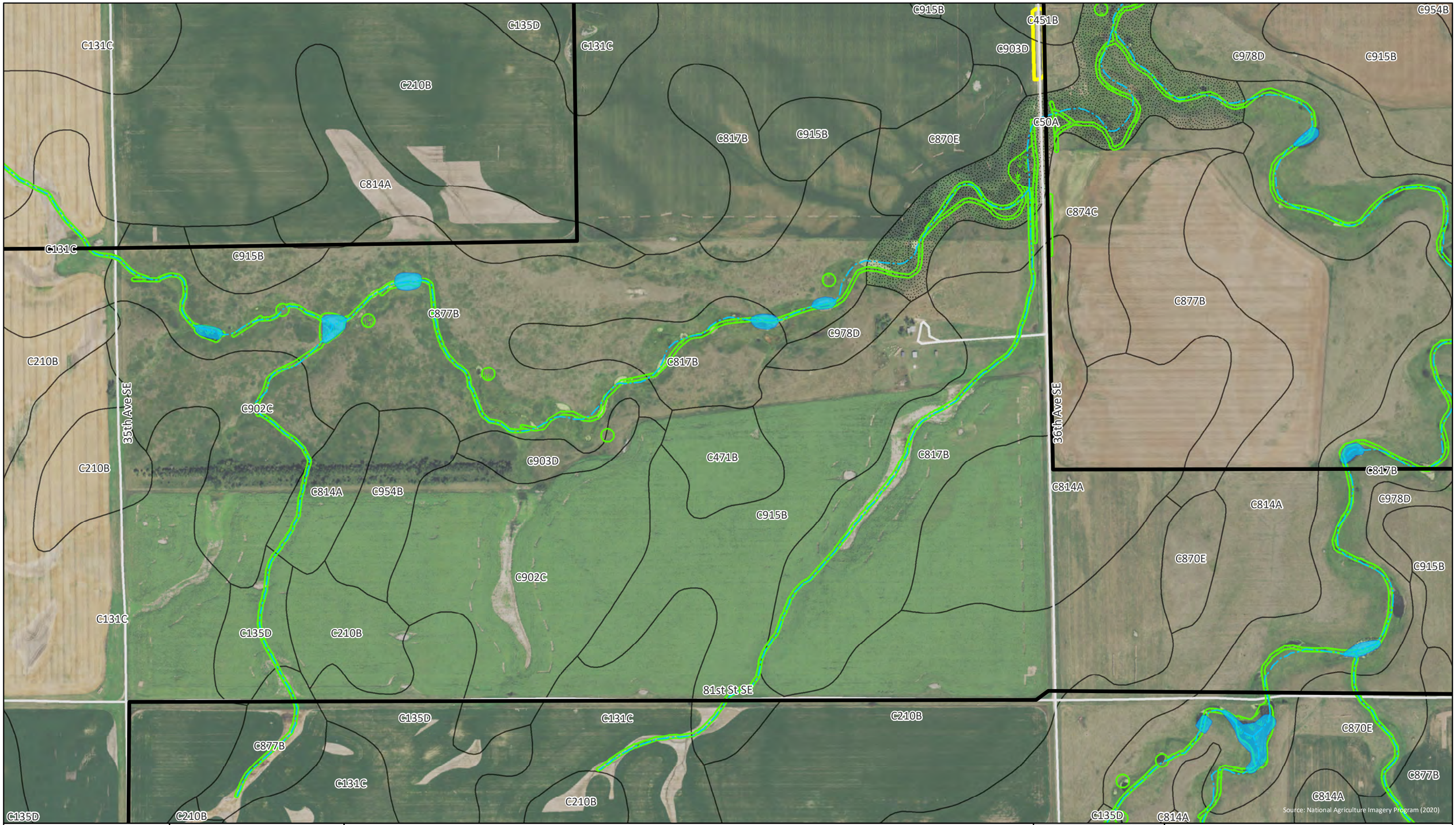


Figure 2
Map 43 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig2_WetlandsDesktopMapbook.mxd 5/16/2022



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

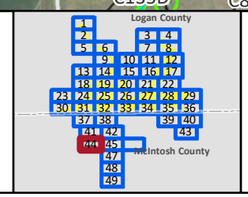
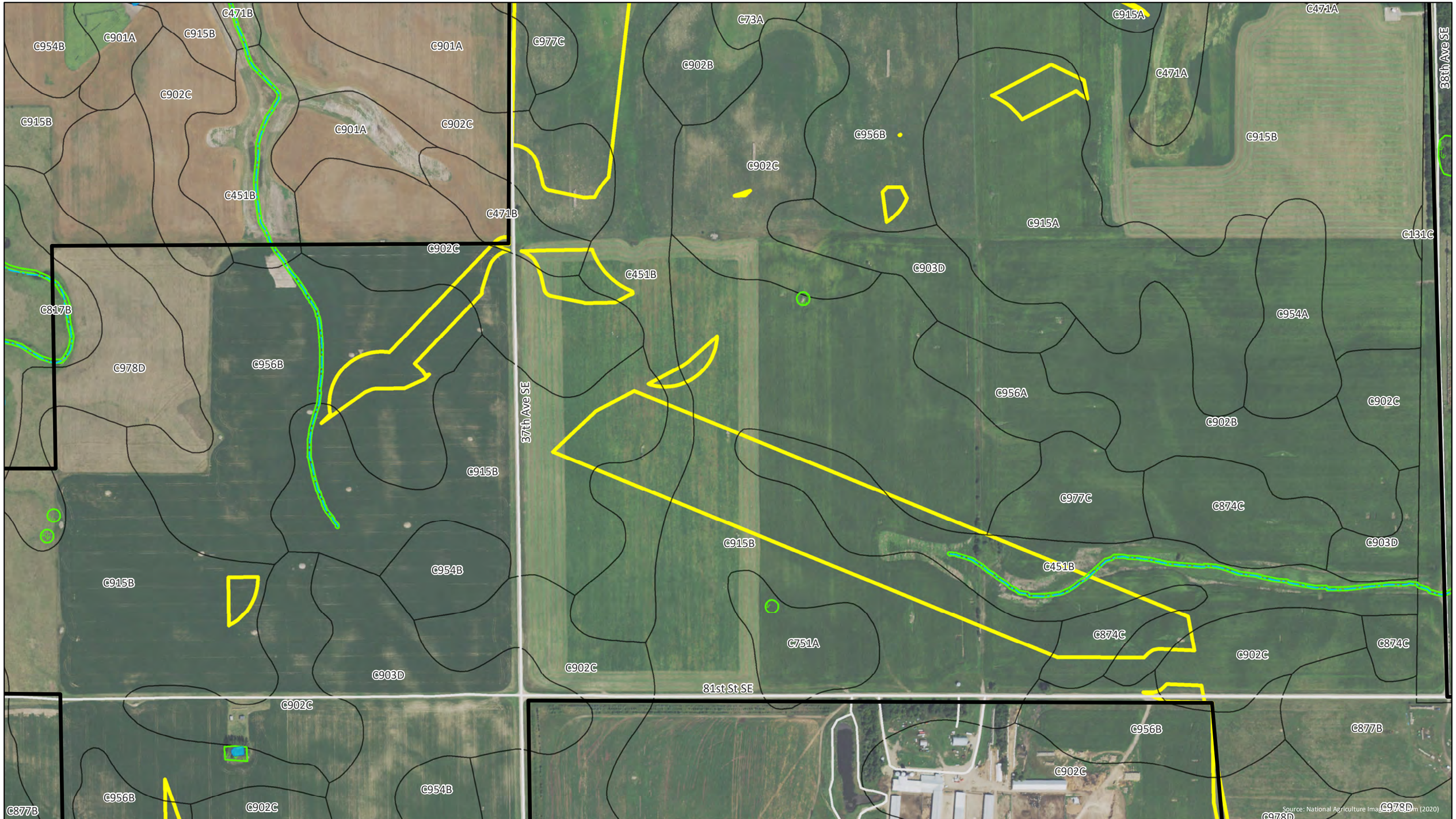


Figure 2
Map 44 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig2_WetlandsDesktopMapbook.mxd 5/16/2022



Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

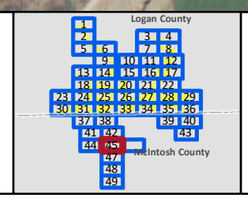


Figure 2
Map 45 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig2_WetlandsDesktopMapbook.mxd 5/16/2022

4th Ave S
5th St S
6th St S
7th St S
5th Ave S
Centennial St S
4th St S
89th Ave SE
8th Ave S
State Hwy 3
May Lake
81st St SE
C902C
C451B
C584A
C877B
C978D
C584A
C524A
C915A
C915B
C870E
C584A
C978D
C915B
C814A
C54A
C956B
Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

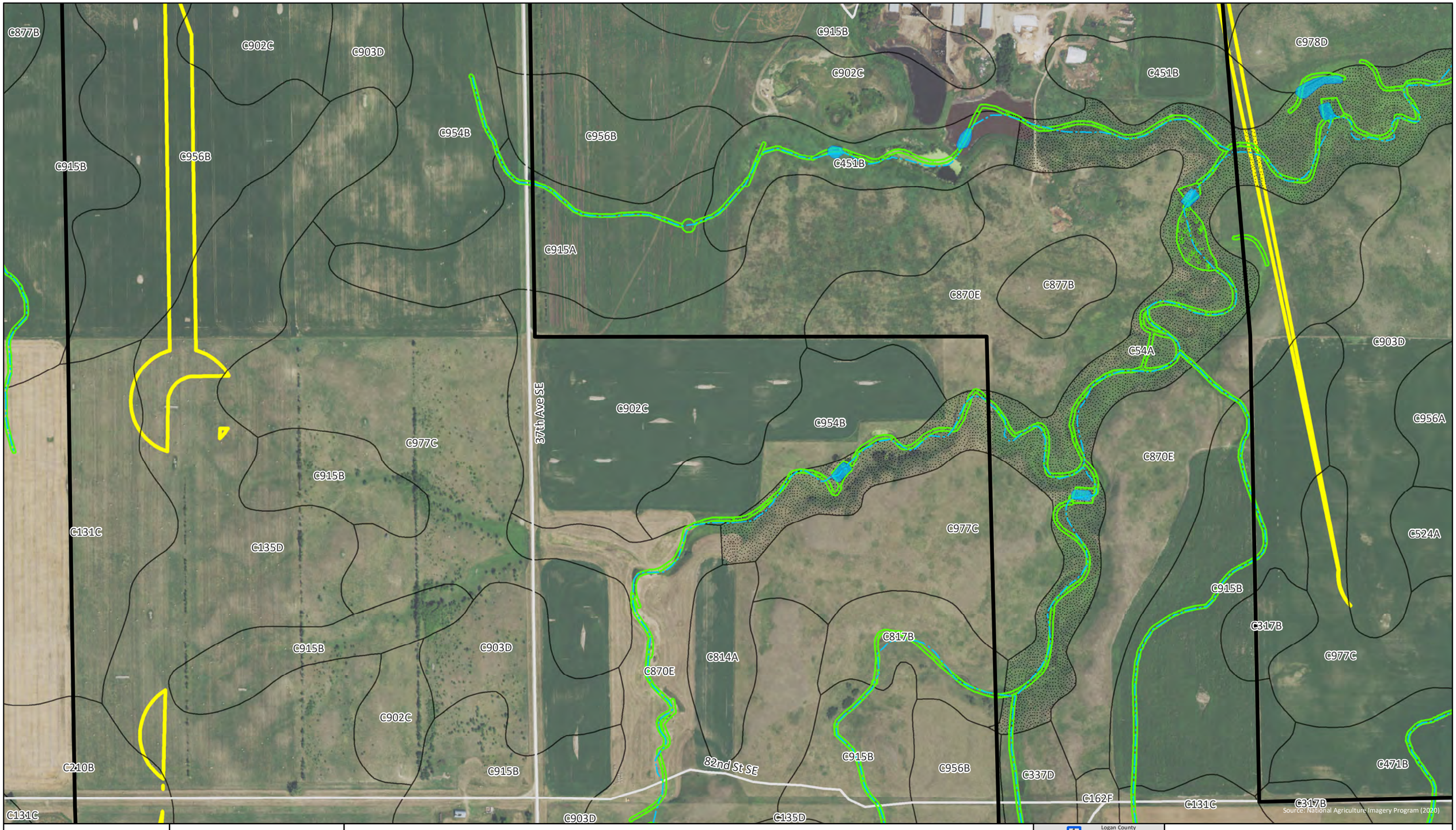
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Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

Logan County
McIntosh County

Figure 2
Map 46 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig2_WetlandsDesktopMapbook.mxd 5/16/2022



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

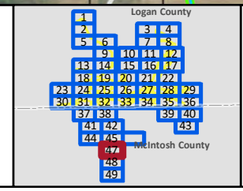
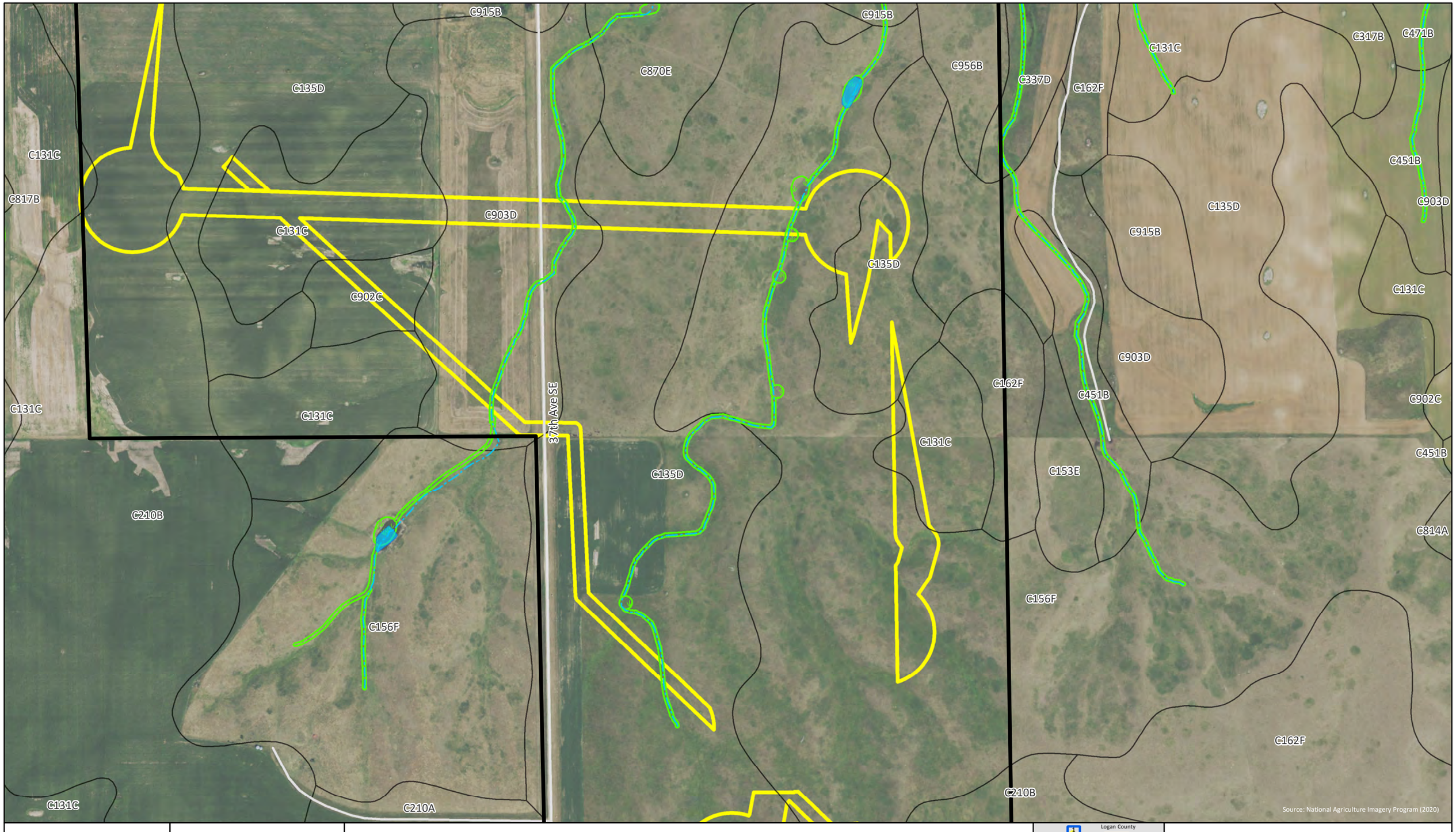


Figure 2
Map 47 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

- Watercourse (NHD)
- Waterbody (NHD)
- Wetland (NWI)
- Hydric Soils (gSSURGO)
- Survey Area (~6,056 acres)
- Project Area (~31,514 acres)
- Road
- County

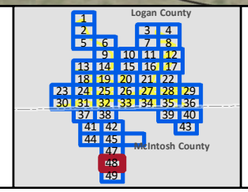
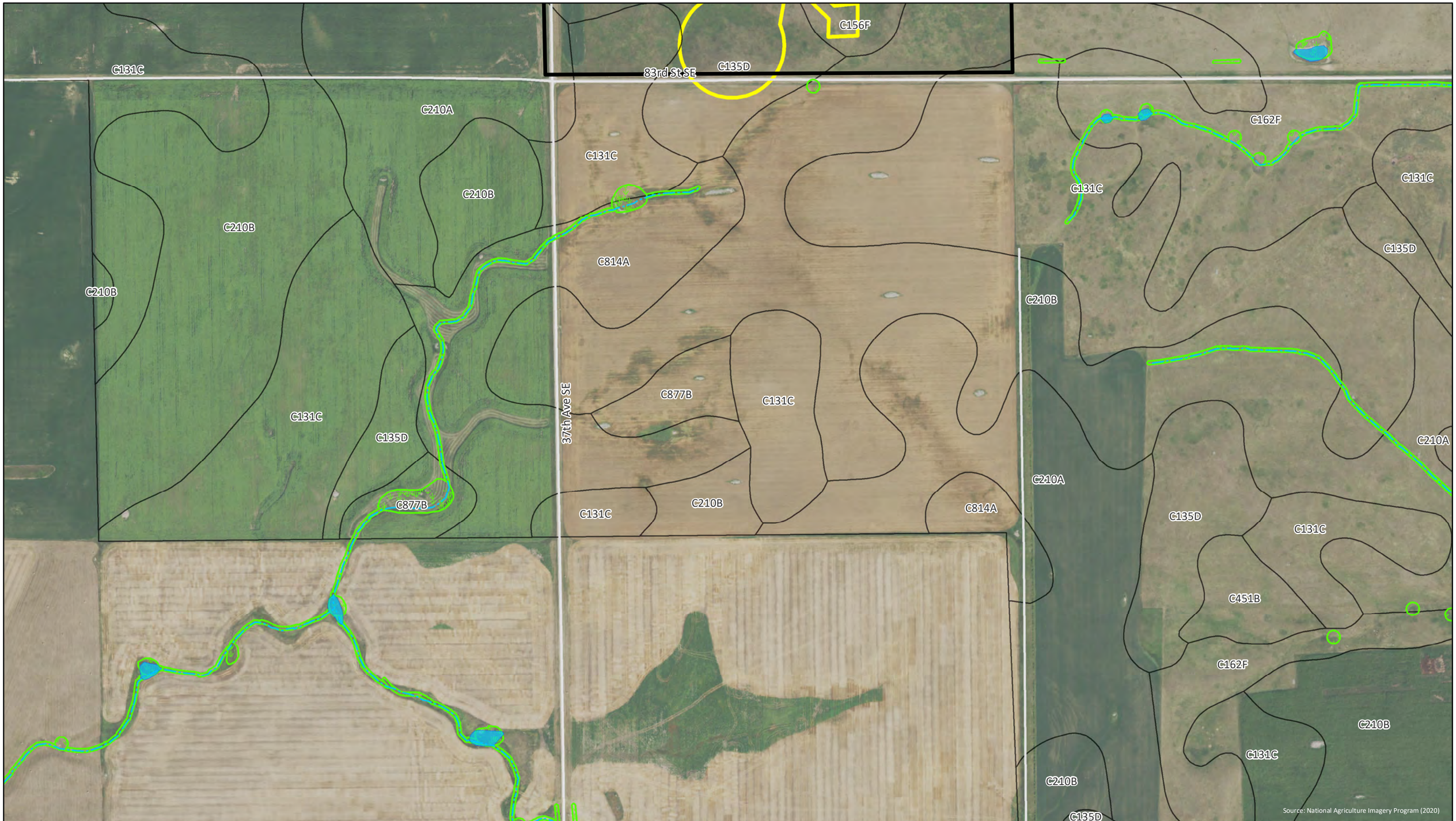


Figure 2
Map 48 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig2_WetlandsDesktopMapbook.mxd 5/16/2022



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 500
Feet

Watercourse (NHD)
Waterbody (NHD)
Wetland (NWI)
Hydric Soils (gSSURGO)
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County

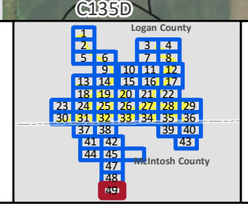


Figure 2
Map 49 of 49
Wind Farm Desktop Review Mapbook
Logan County, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 16, 2022

0 1 2 Miles

Map Index
Survey Area (~6,056 acres)
Project Area (~31,514 acres)
Road
County



Figure 3
Index Map
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

Source: National Agriculture Imagery Program (2020)

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsIndex.mxd 5/16/2022

37th Ave SE

Wetland B5

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

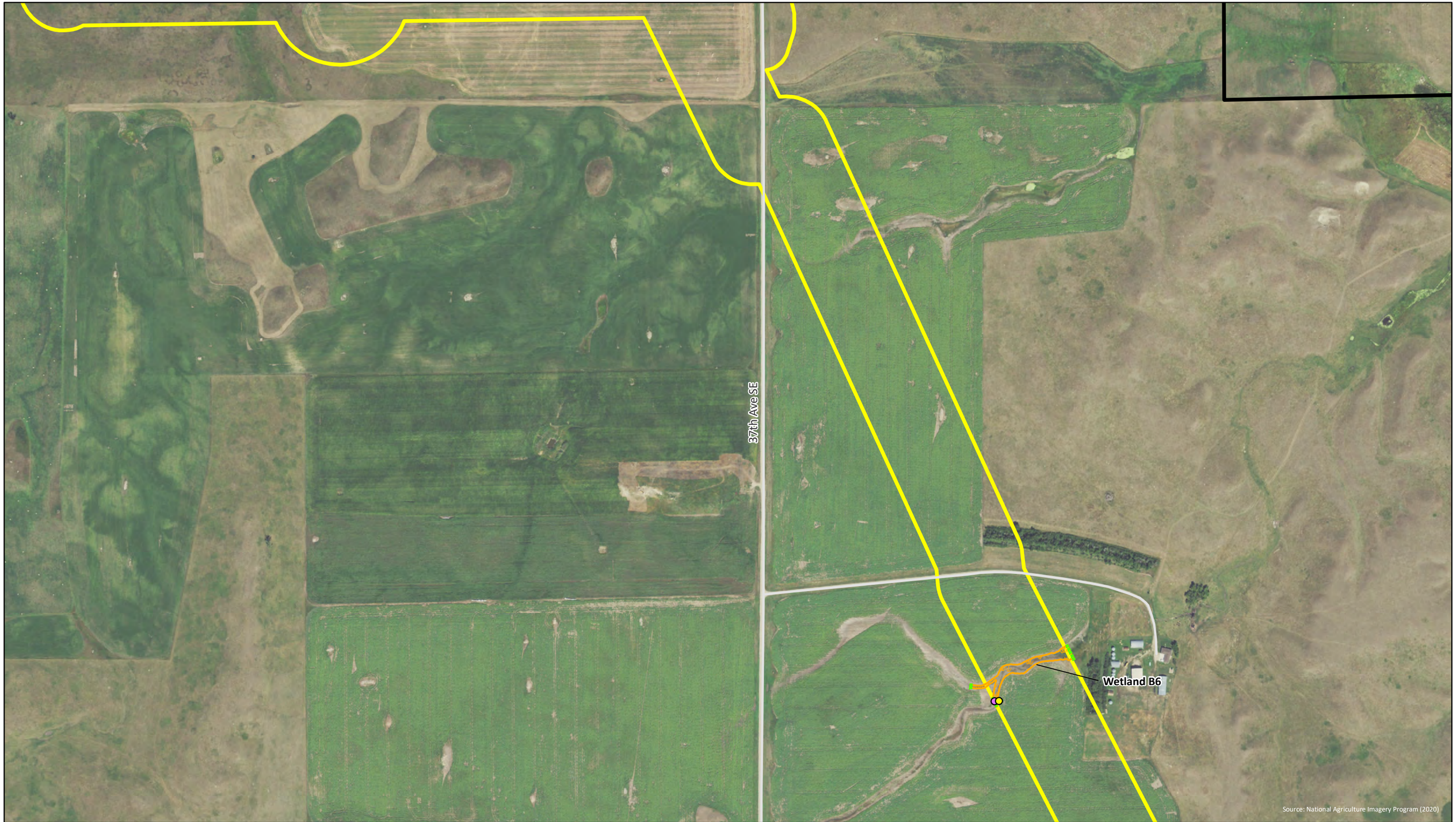
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Feet

- Wetland Data Point
- Upland Data Point
- Watercourse (Field Identified)
- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
- Project Area (~55,745 acres)
- Road
- County

Logan County
McIntosh County

Figure 3
Map 1 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

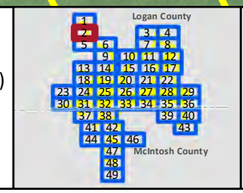


Figure 3
Map 2 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

41st Ave SE

Wetland H1 (2020)

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
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- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
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- Road
- County

Logan County

McIntosh County

Figure 3
Map 3 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
- Watercourse (Field Identified)
- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
- Project Area (~55,745 acres)
- Road
- County

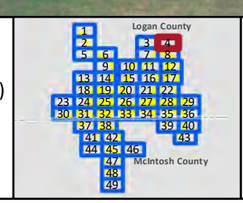


Figure 3
Map 4 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

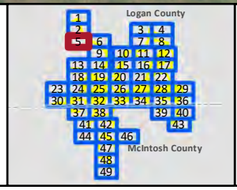


Figure 3
Map 5 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

73rd St SE

Wetland B4

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

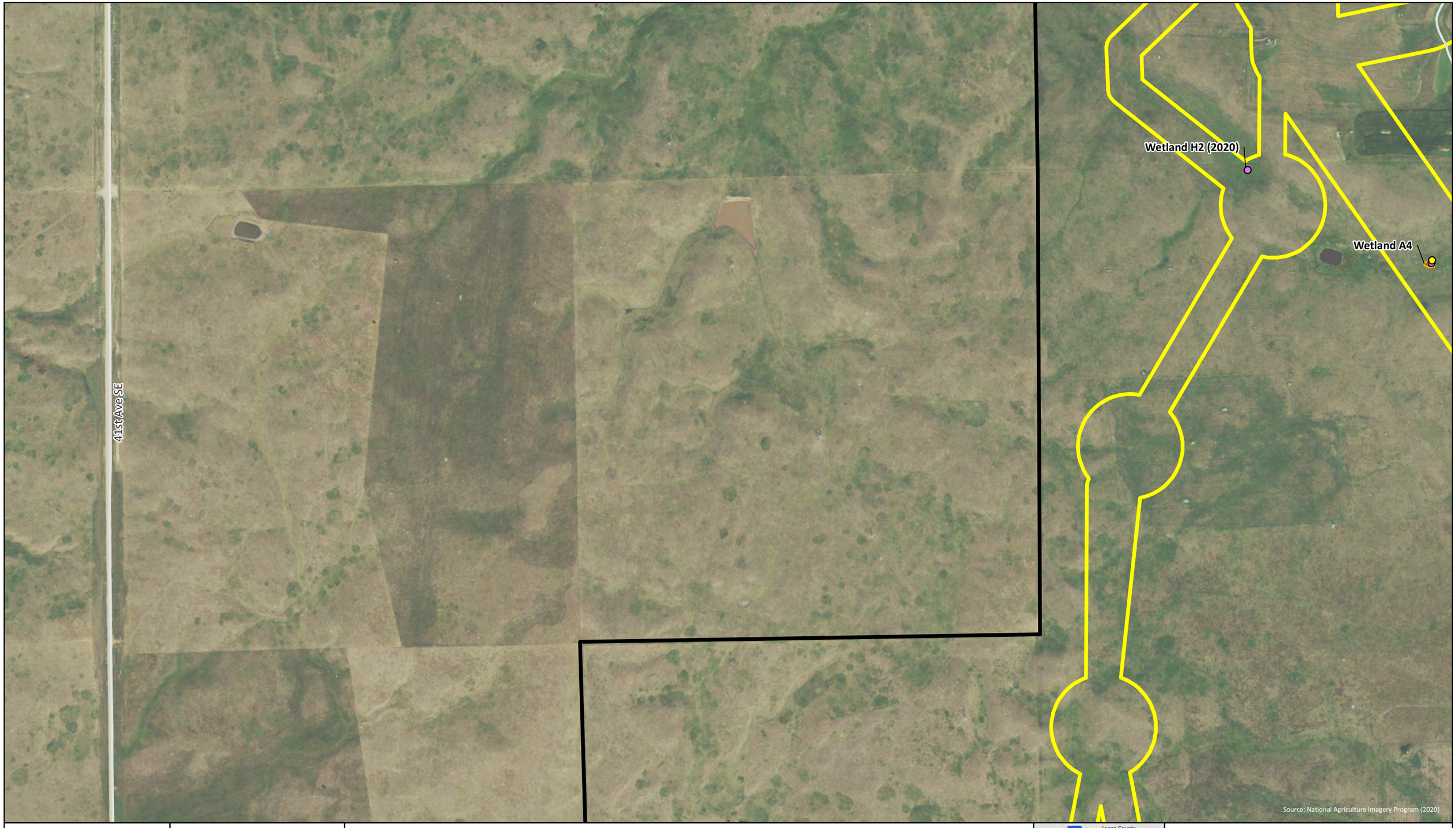
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Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

Logan County
McIntosh County

Figure 3
Map 6 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

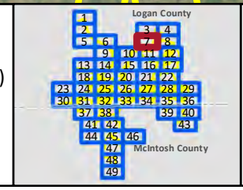
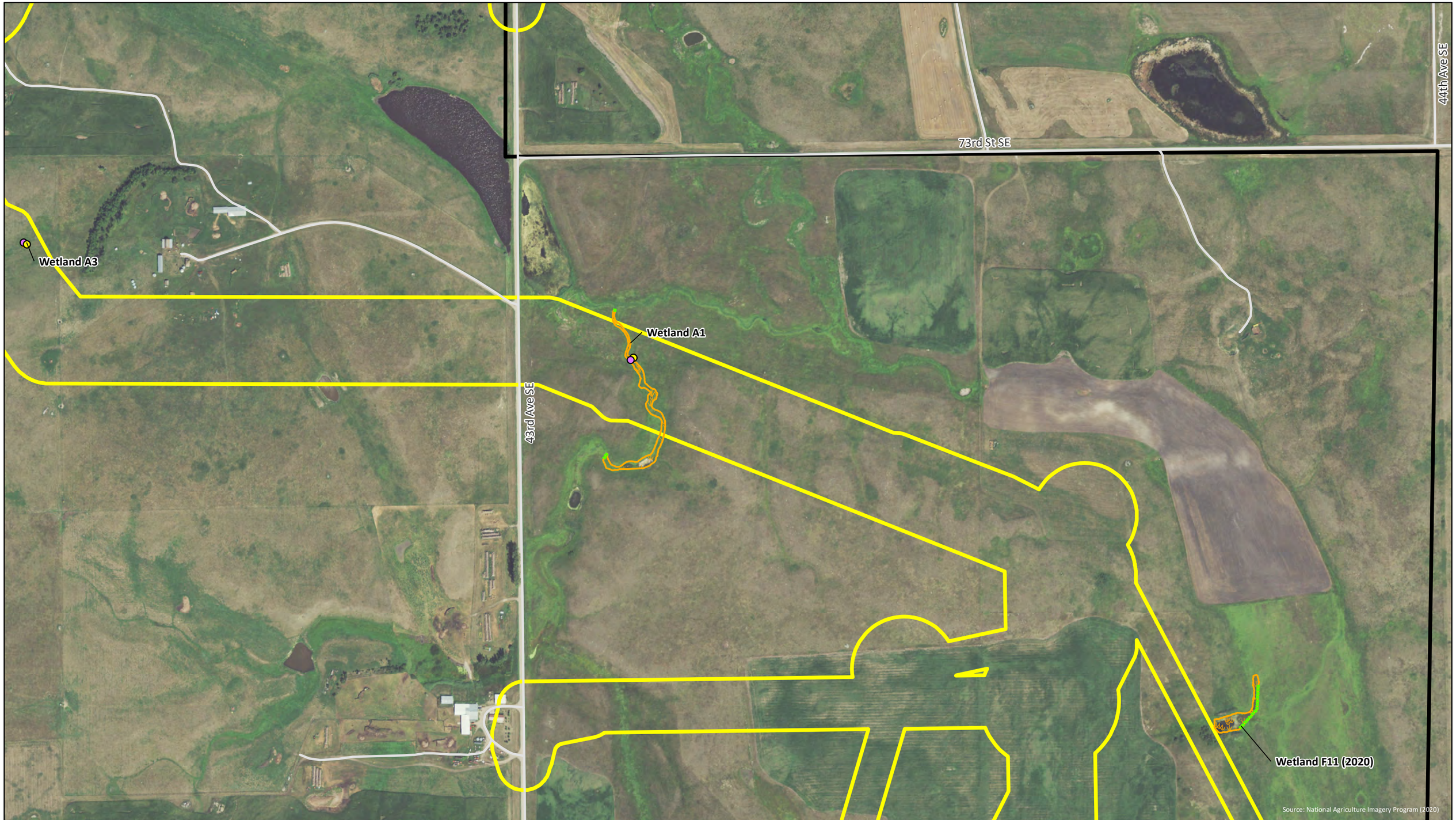


Figure 3
Map 7 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

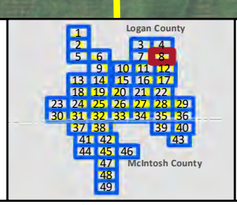
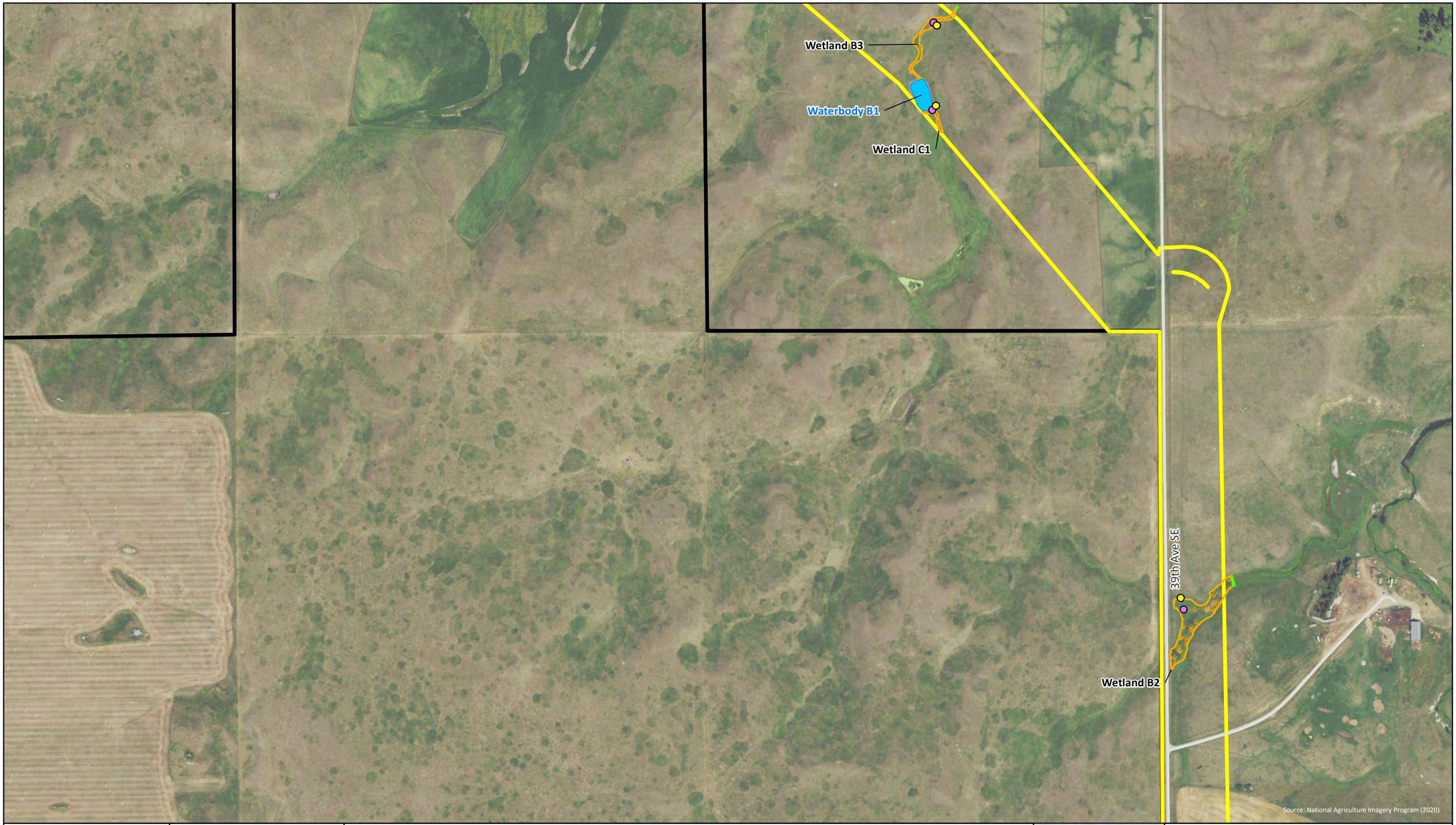


Figure 3
Map 8 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
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- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
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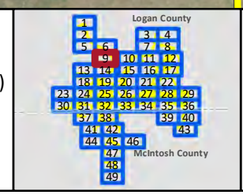


Figure 3
Map 9 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

74th St SE

Wetland G17 (2020)

Wetland I1 (2020)

Wetland I2 (2020)

41st Ave SE

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

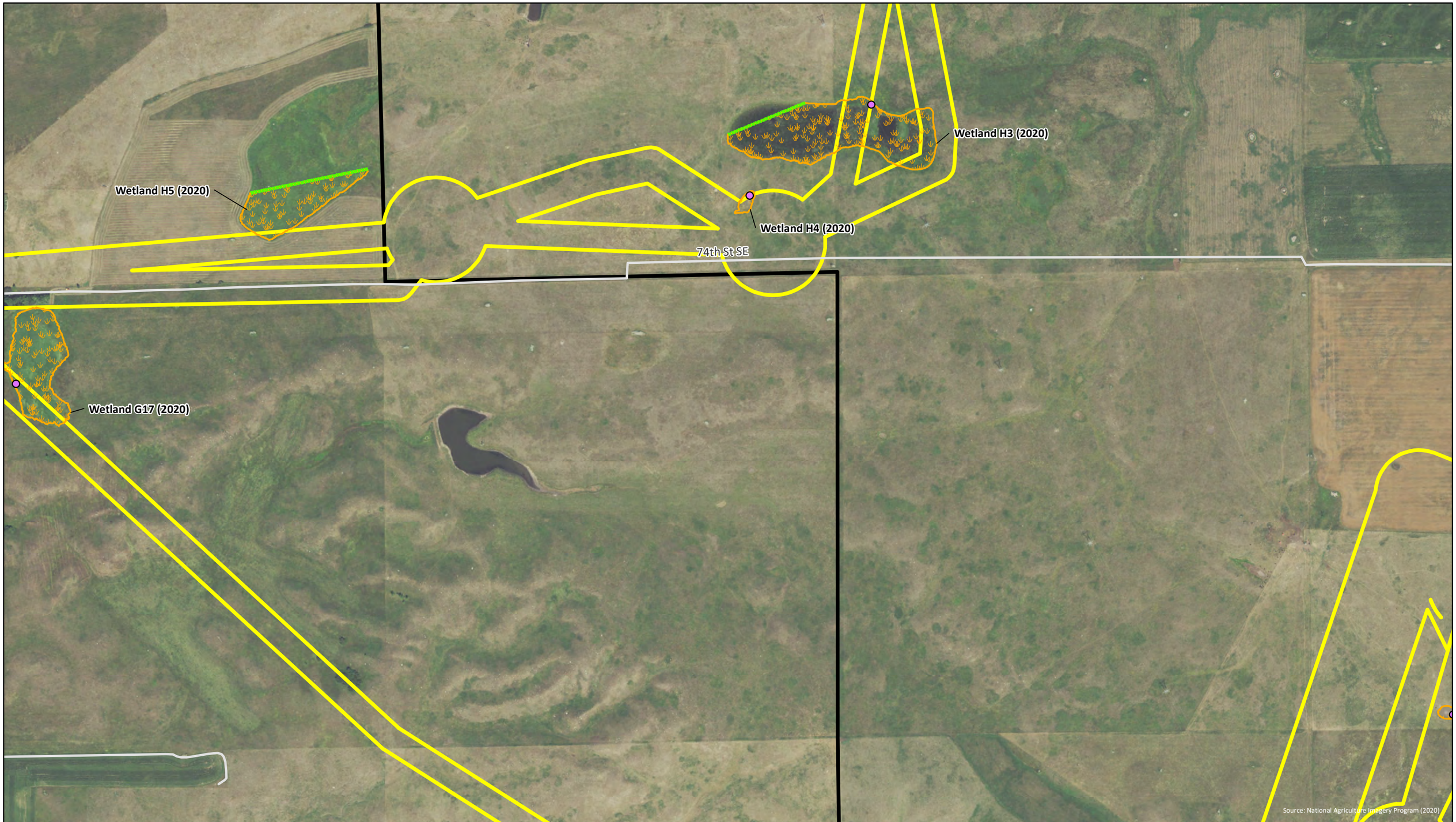
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- Upland Data Point
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- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
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- Road
- County

Logan County

McIntosh County

Figure 3
Map 10 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
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0 500
Feet

Wetland Data Point
Upland Data Point
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Waterbody (Field Identified)
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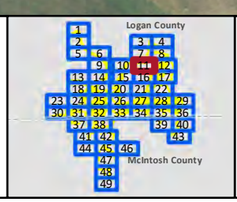


Figure 3
Map 11 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

Wetland F4
Wetland K1
Wetland F10 (2020)
Wetland F9 (2020)
74th St SE
Wetland G13 (2020)
Wetland F8 (2020)
Wetland F3
Wetland G12 (2020)
43rd Ave SE
Wetland K3
Wetland K2
Wetland G11 (2020)
Wetland G10 (2020)
Wetland K4
Wetland K5
Wetland G9 (2020)
Wetland G14 (2020)
Wetland K6
Wetland K7
Wetland F2
Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
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Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
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Project Area (~55,745 acres)
Road
County

Logan County
McIntosh County

Figure 3
Map 12 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

75th St SE

37th Ave SE

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

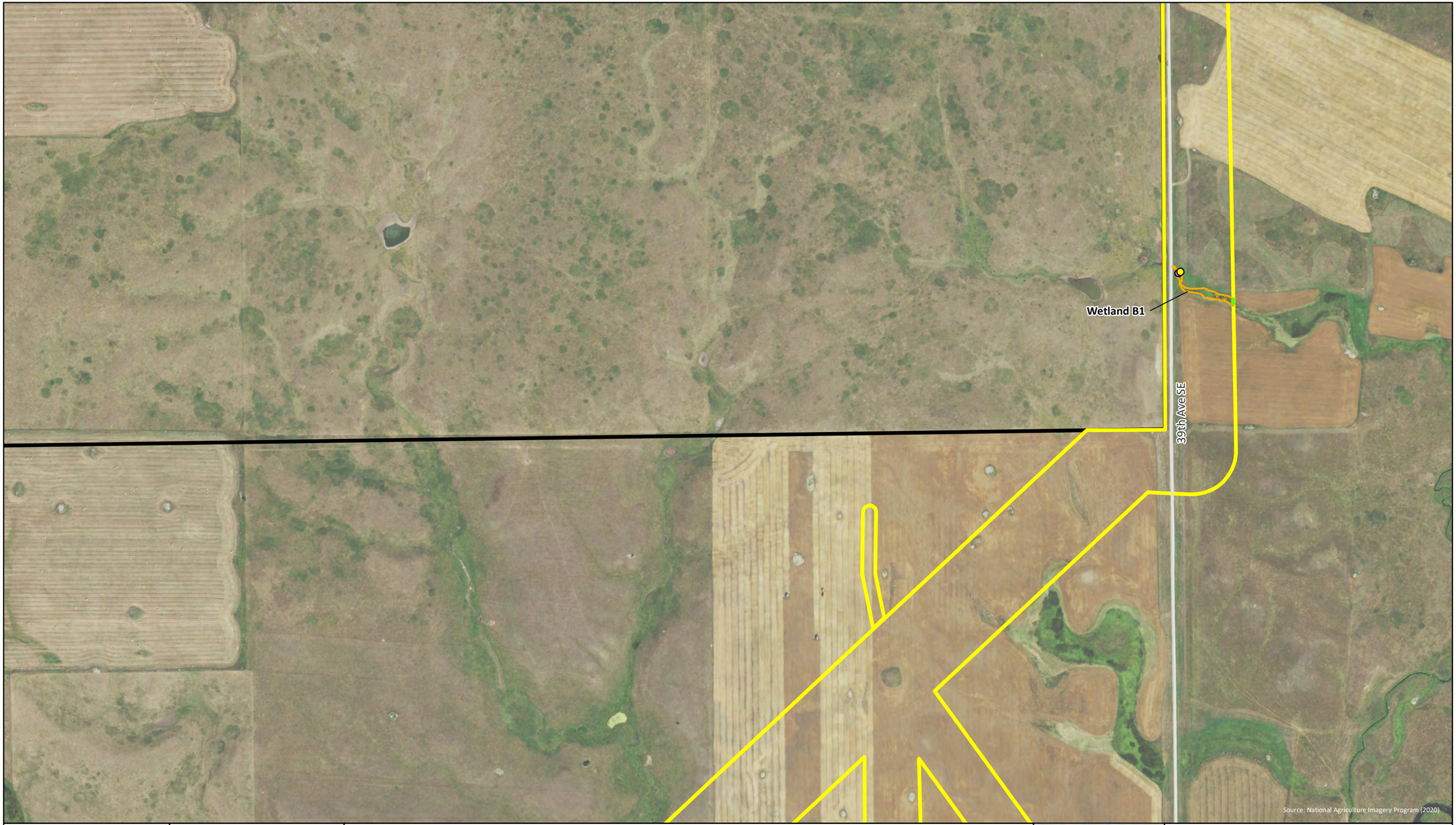
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- Upland Data Point
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- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
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- County

Logan County

McIntosh County

Figure 3
Map 13 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
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Road
County

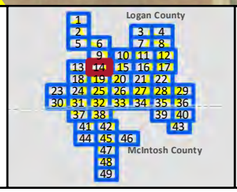
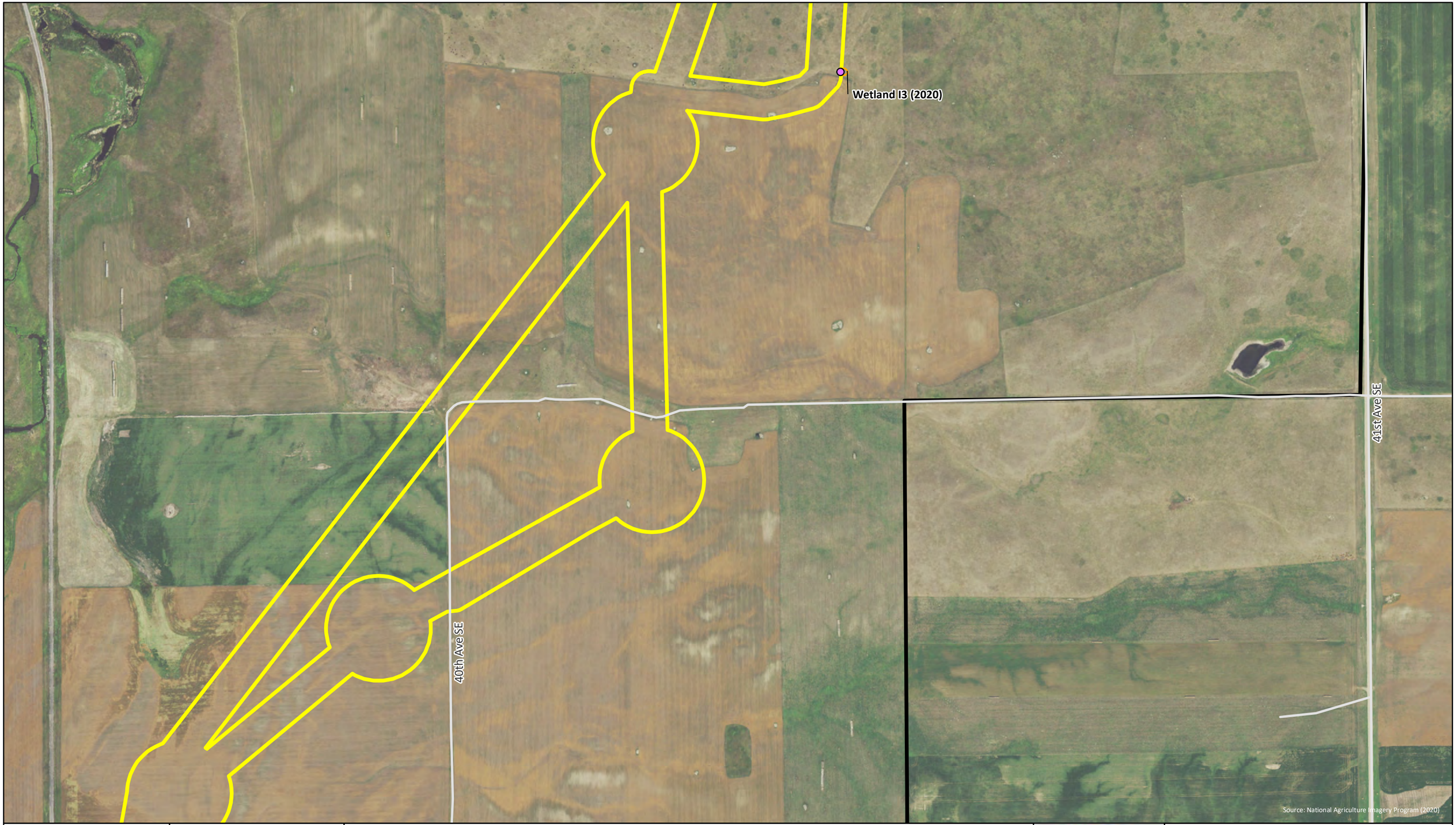


Figure 3
Map 14 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

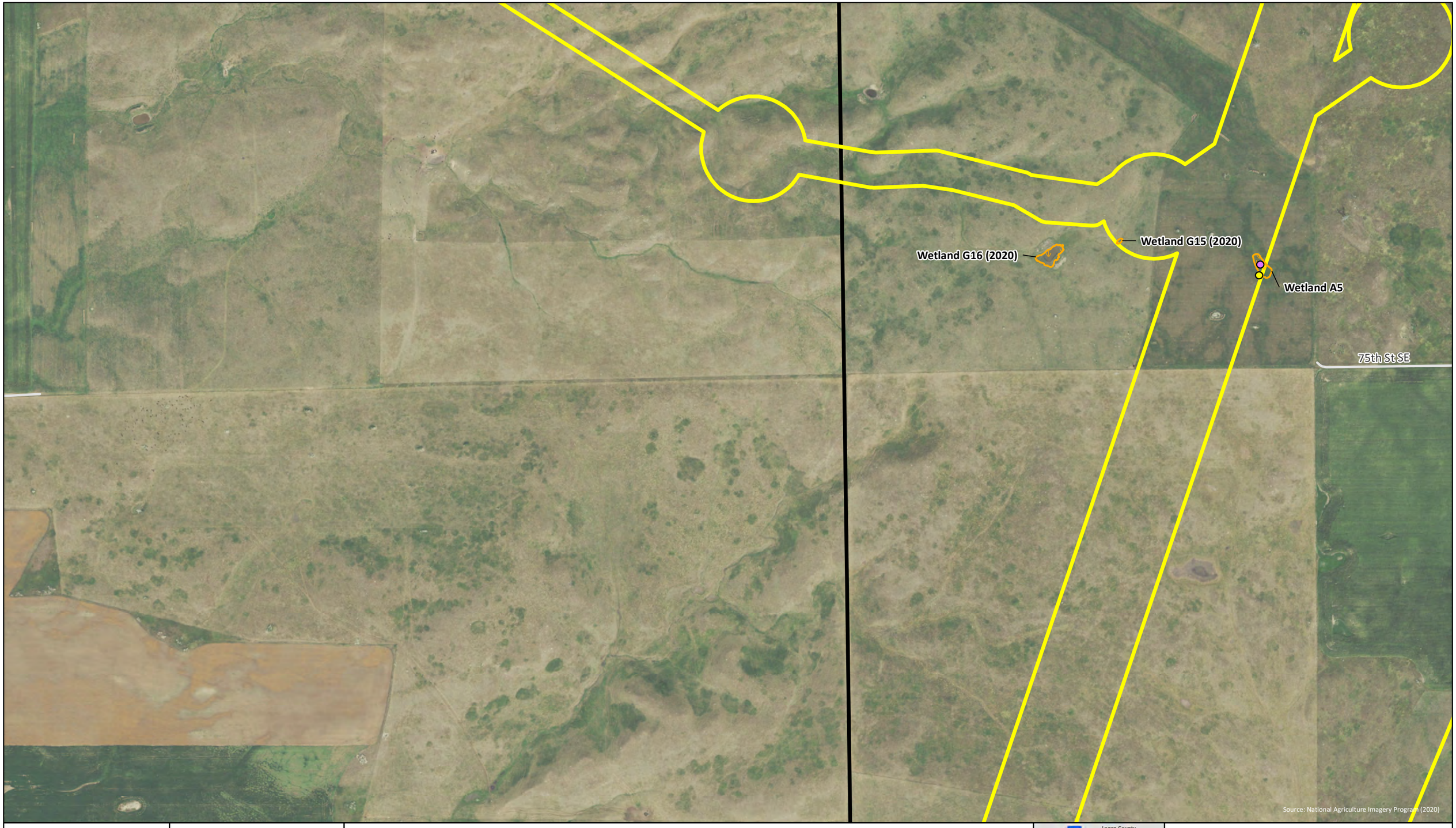
0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

Logan County
McIntosh County

Figure 3
Map 15 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

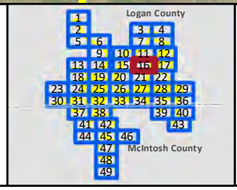
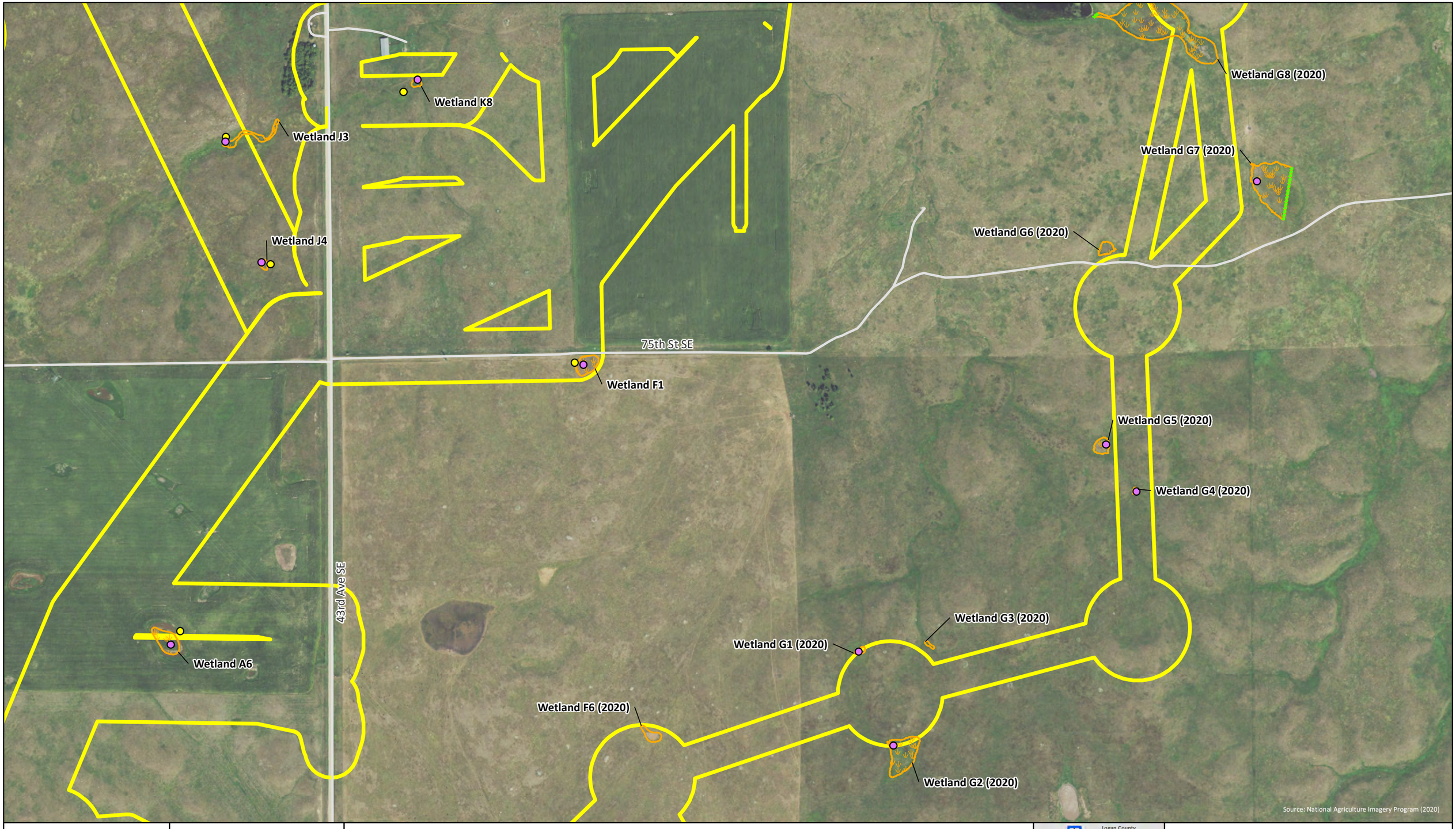


Figure 3
Map 16 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
- Watercourse (Field Identified)
- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
- Project Area (~55,745 acres)
- Road
- County

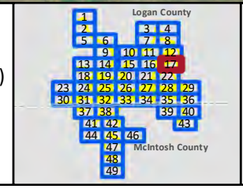


Figure 3
Map 17 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

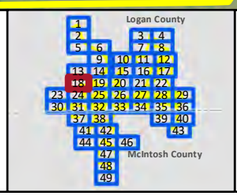
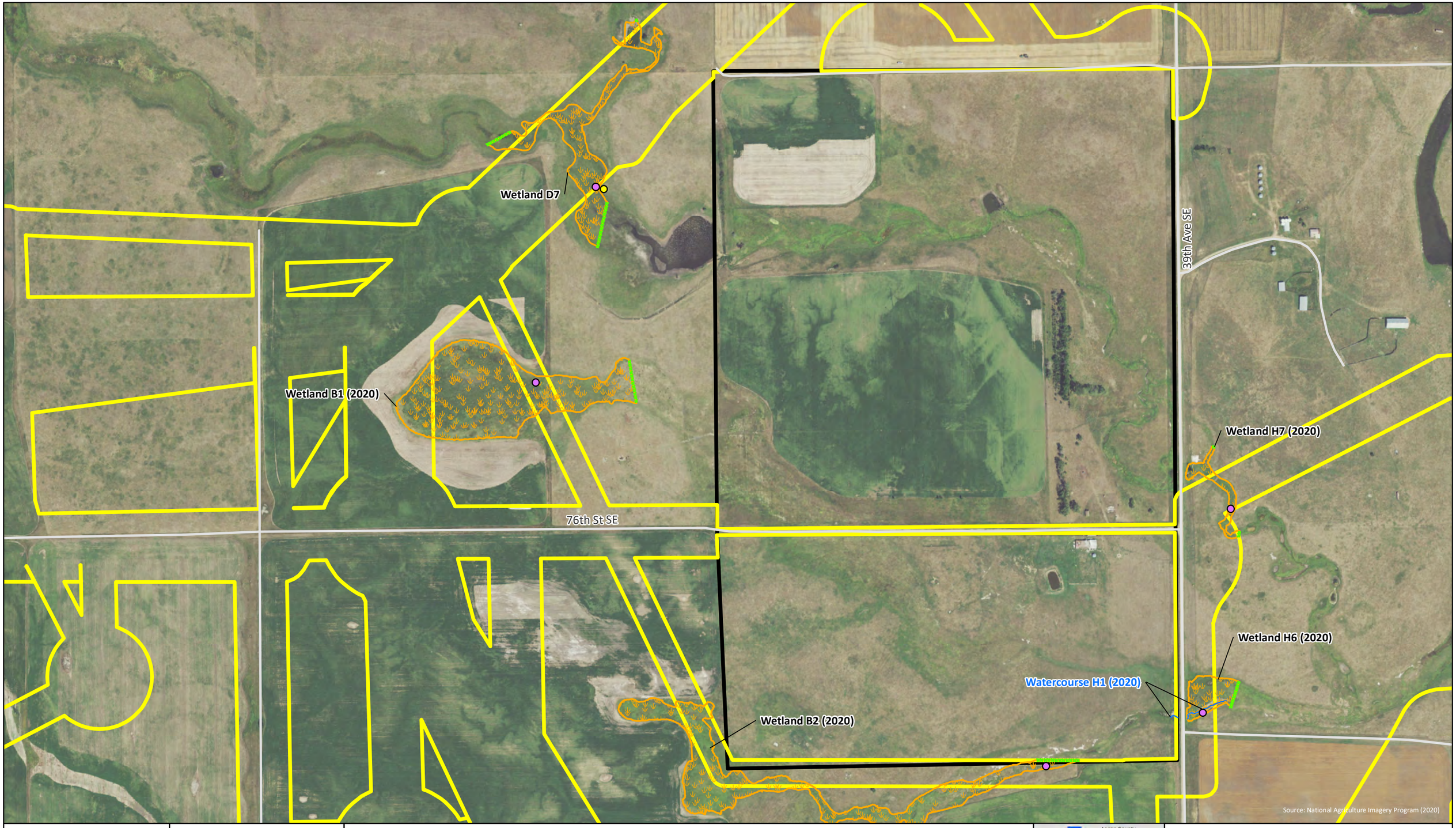


Figure 3
Map 18 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
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- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
- Project Area (~55,745 acres)
- Road
- County

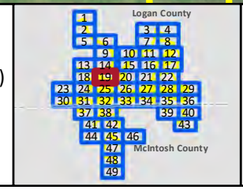


Figure 3
Map 19 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Watercourse H2 (2020)
Wetland H8 (2020)
Watercourse D1
Wetland G8
Wetland D6
Wetland G7
Wetland G6
40th Ave SE
76th St SE

Source: National Agriculture Imagery Program (2020)

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
- Watercourse (Field Identified)
- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
- Project Area (~55,745 acres)
- Road
- County

Logan County
McIntosh County

Figure 3
Map 20 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

41st Ave SE

76th St SE

42nd Ave SE

Wetland G3

Source: National Agriculture Imagery Program (2020)

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
- Watercourse (Field Identified)
- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
- Project Area (~55,745 acres)
- Road
- County

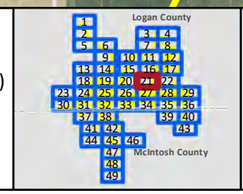


Figure 3
Map 21 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

Wetland D12 (2020)
Wetland D11 (2020)
Wetland D13 (2020)
Wetland D10 (2020)
Wetland D9 (2020)
Wetland F7 (2020)
Wetland F5 (2020)
43rd Ave SE
76th St SE
Wetland F10
Waterbody F1
Wetland F8
Source: National Agriculture Imagery Program (2020)

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
- Watercourse (Field Identified)
- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
- Project Area (~55,745 acres)
- Road
- County

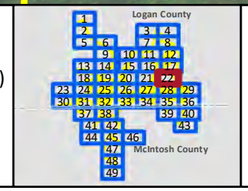


Figure 3
Map 22 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

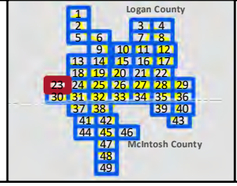


Figure 3
Map 23 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Wetland A4 (2020)

37th Ave SE

77th St SE

Wetland A1 (2020)

Source: National Agriculture Imagery Program (2020)

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

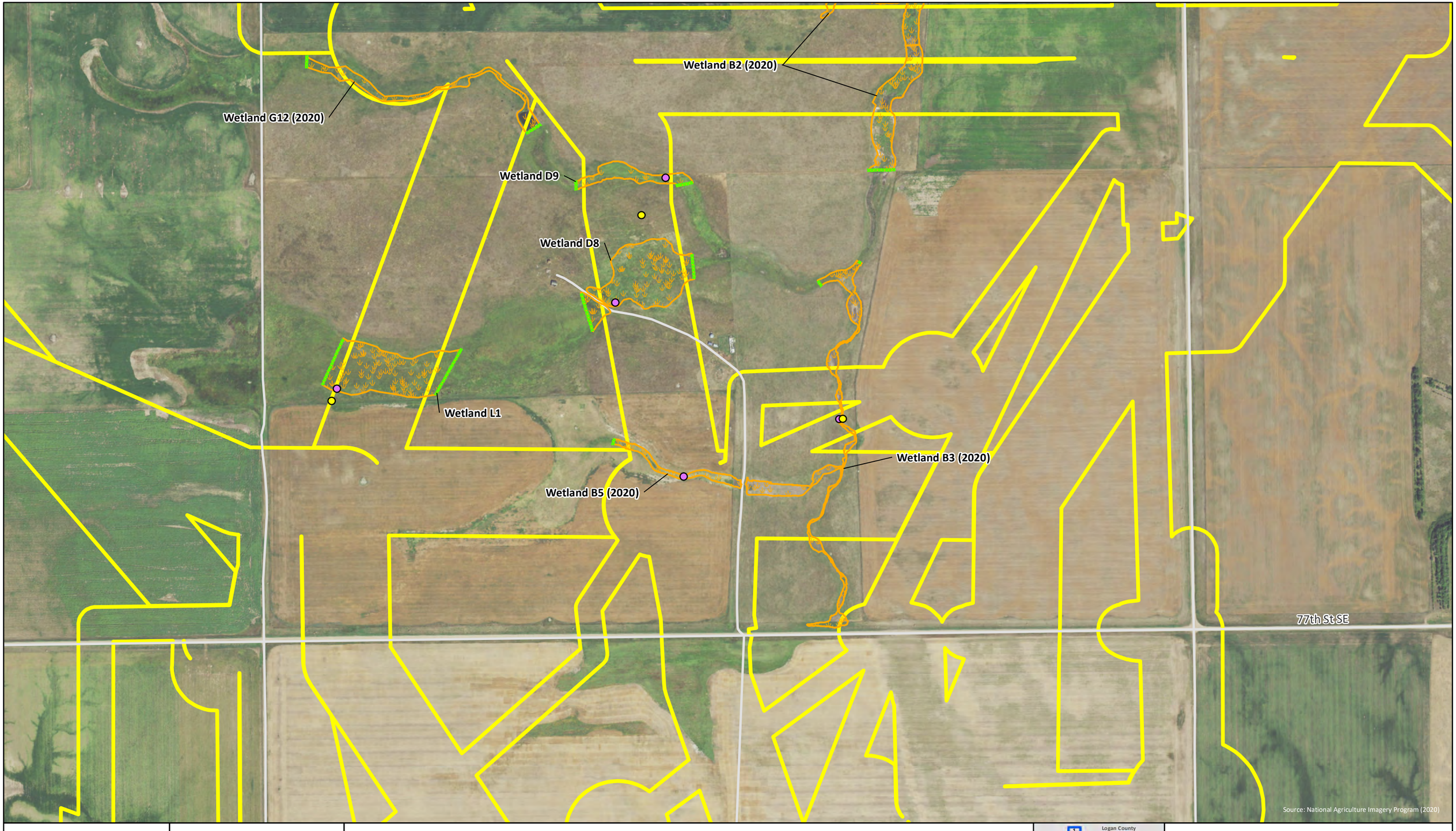
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Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

Logan County
McIntosh County

Figure 3
Map 24 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

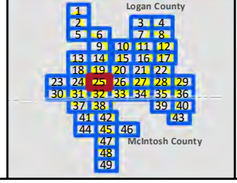
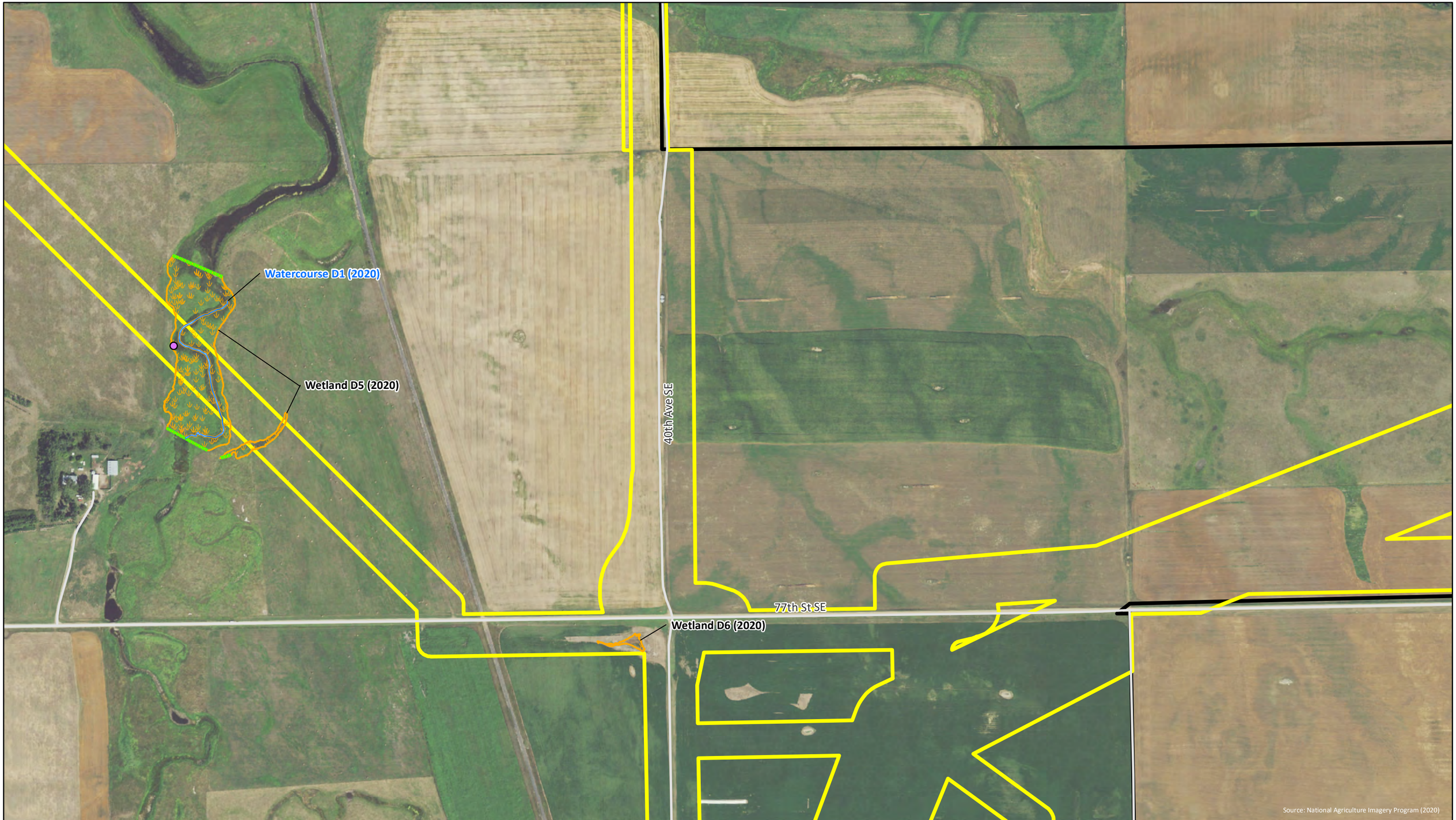


Figure 3
Map 25 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

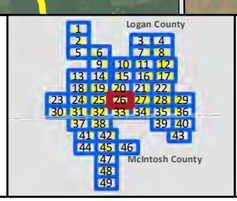
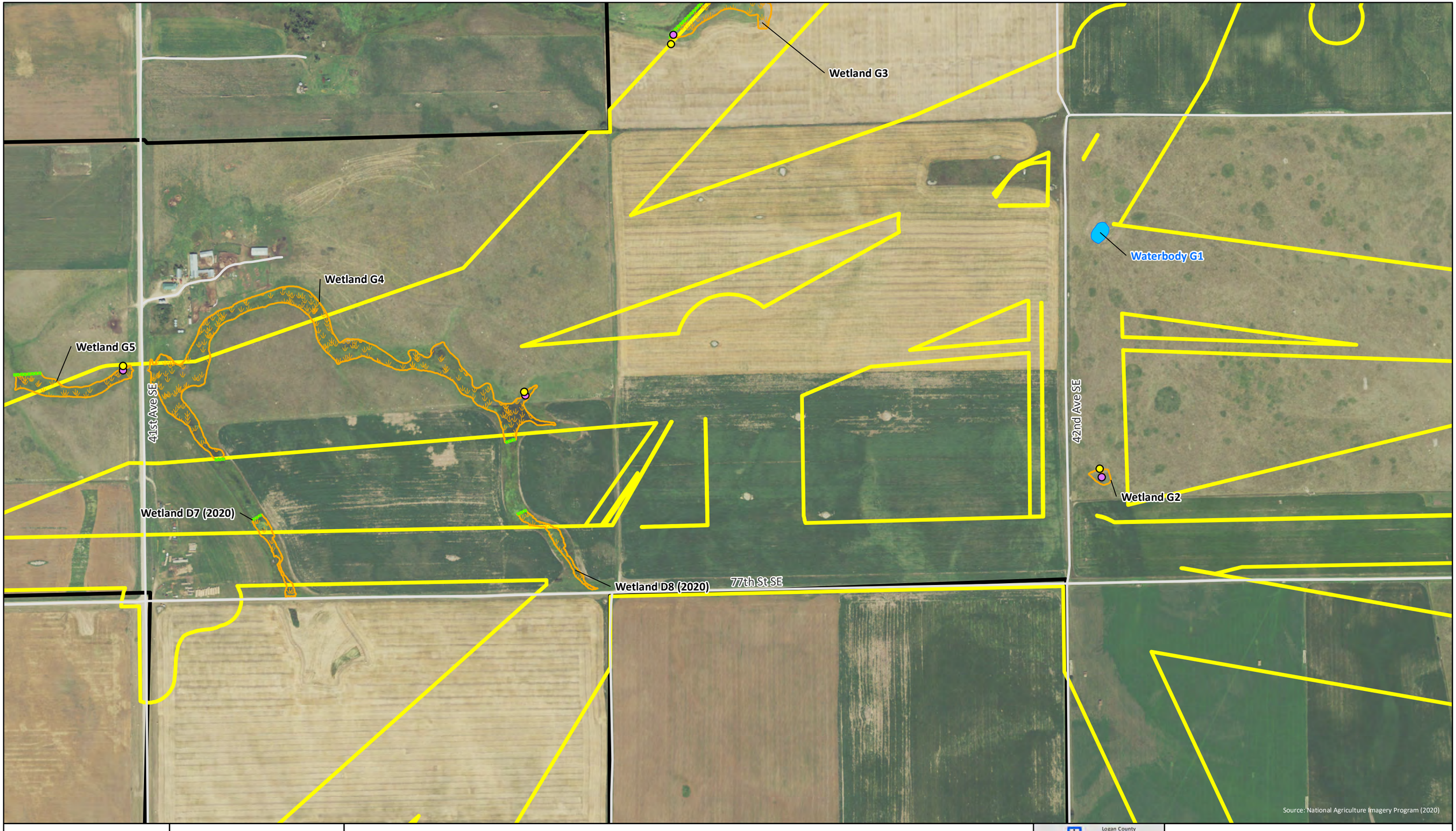


Figure 3
Map 26 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
- Watercourse (Field Identified)
- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
- Project Area (~55,745 acres)
- Road
- County

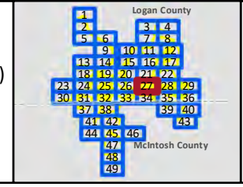


Figure 3
Map 27 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

Wetland F9
Wetland E22 (2020)
Wetland E21 (2020)
Wetland E2 (2020)
Wetland J2
Wetland E1 (2020)
Wetland F14
Wetland G1
43rd Ave SE
77th St SE
Wetland E9 (2020)
Wetland E3 (2020)
Wetland E4 (2020)
Wetland E5 (2020)
Wetland F11
Source: National Agriculture Imagery Program (2020)

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

Logan County
McIntosh County

Figure 3
Map 28 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

Wetland E19 (2020)
Wetland E18 (2020)
Wetland E20 (2020)
Wetland E17 (2020)
Wetland E16 (2020)
Wetland E11 (2020)
Wetland E10 (2020)
Wetland E13 (2020)
Wetland E12 (2020)
Wetland F6
Wetland E15 (2020)
Wetland F5
Wetland F7
Wetland E14 (2020)
Wetland E9 (2020)
Wetland J1
Wetland E8 (2020)
77th St SE

Source: National Agriculture Imagery Program (2020)

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

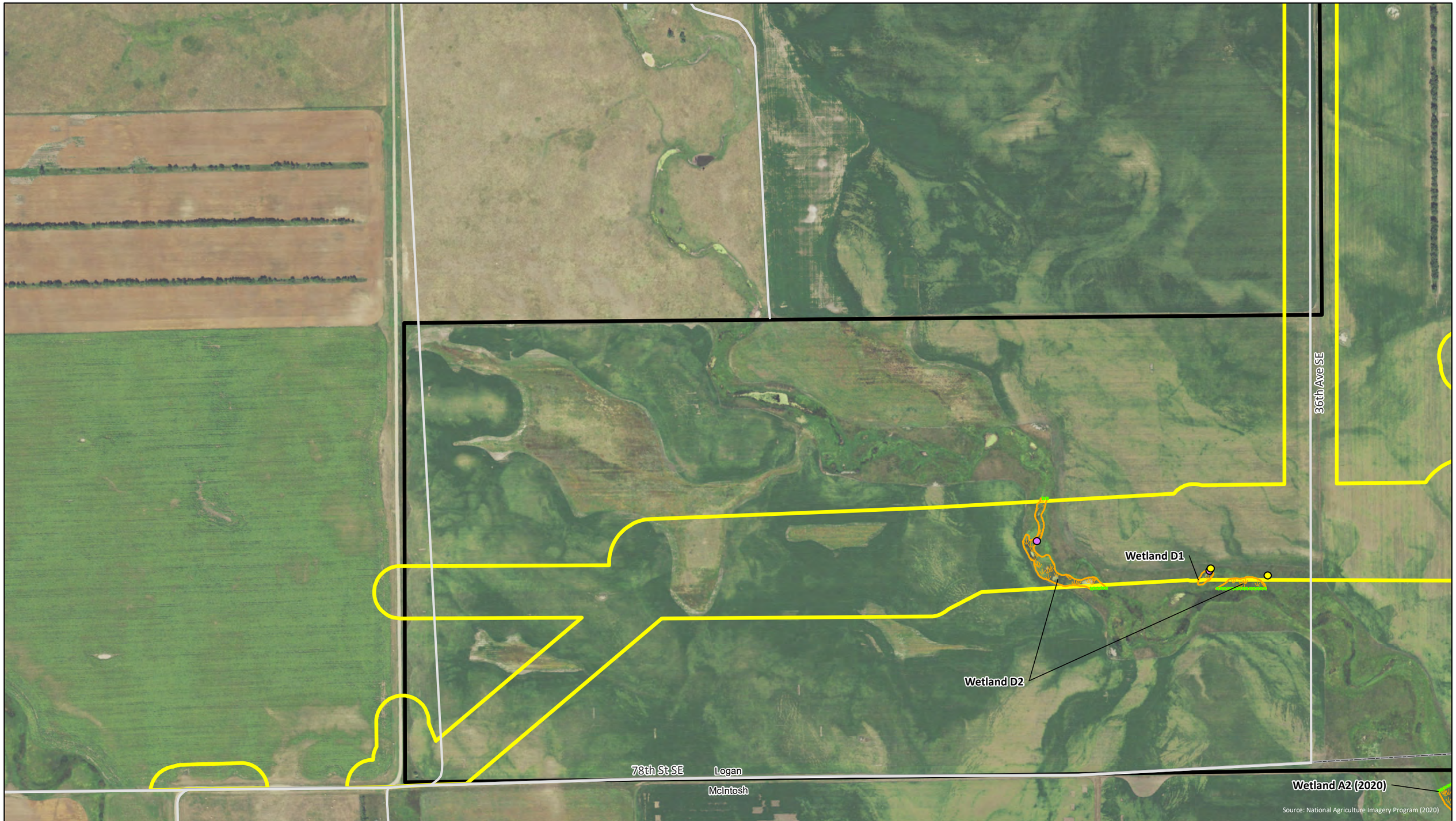
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Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

Logan County
McIntosh County

Figure 3
Map 29 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
- Watercourse (Field Identified)
- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
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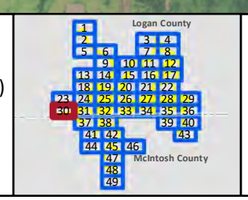
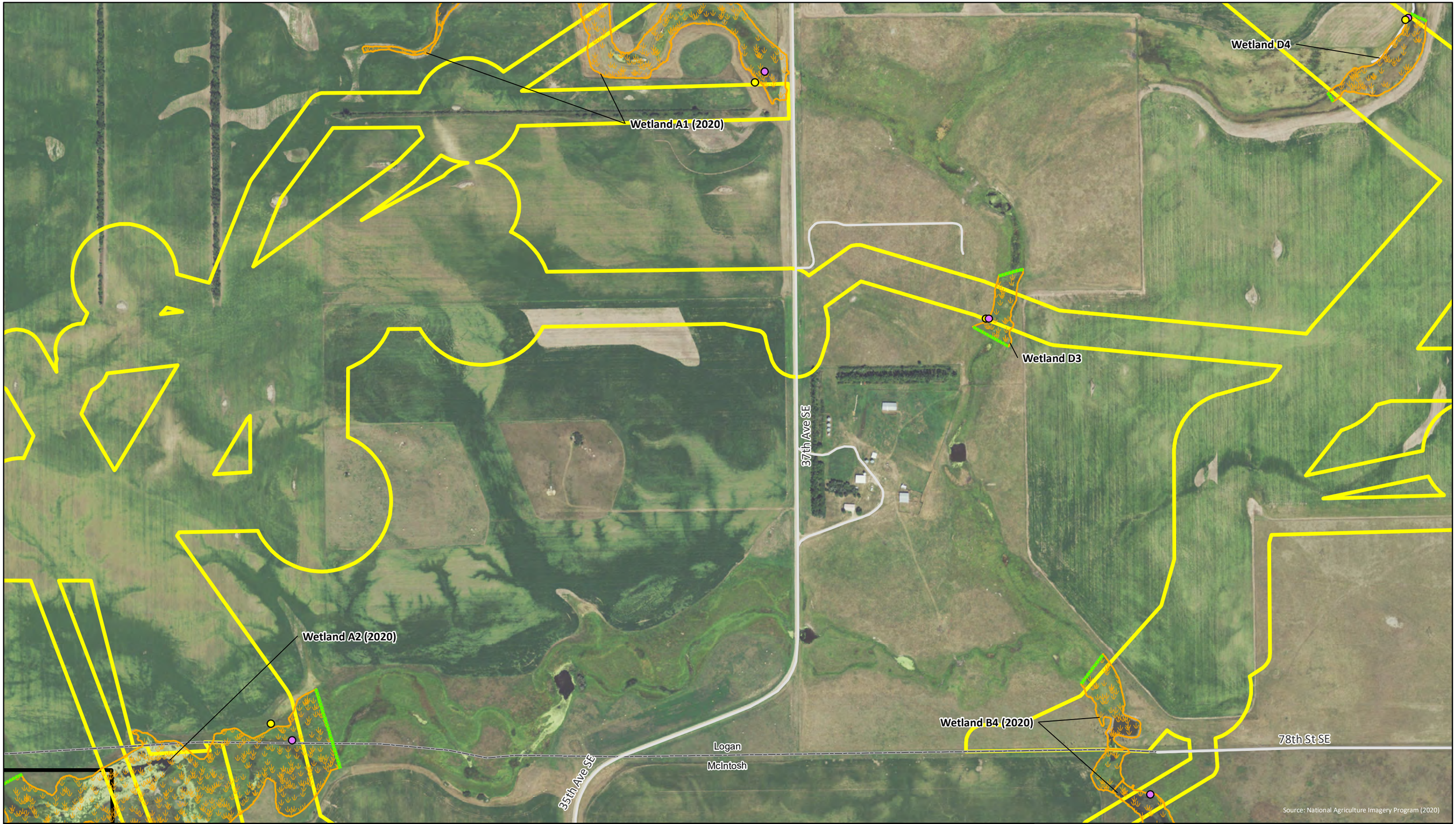


Figure 3
Map 30 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

Wetland Data Point
Upland Data Point
Watercourse (Field Identified)
Waterbody (Field Identified)
Wetland (Field Identified)
Continues Outside Survey Area
Survey Area (~6,056 acres)
Project Area (~55,745 acres)
Road
County

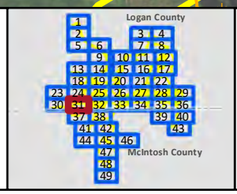


Figure 3
Map 31 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

Wetland D5

78th St SE

36th Ave SE

Logan

McIntosh

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
- Watercourse (Field Identified)
- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
- Project Area (~55,745 acres)
- Road
- County

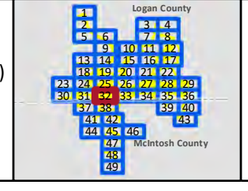


Figure 3
Map 32 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Wetland G9
Wetland G12
Wetland G10
40th Ave SE
Wetland G11
Wetland G13
Watercourse G1
Logan
McIntosh
78th St SE
38th Ave SE
39th Ave SE
Source: National Agriculture Imagery Program (2020)

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Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

- Wetland Data Point
- Upland Data Point
- Watercourse (Field Identified)
- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
- Project Area (~55,745 acres)
- Road
- County

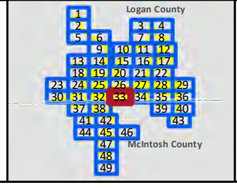


Figure 3
Map 33 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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Wetland F13

Wetland F12

41st Ave SE

42nd Ave SE

78th St SE

Logan

McIntosh

41 Ave SE

40th Ave SE

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

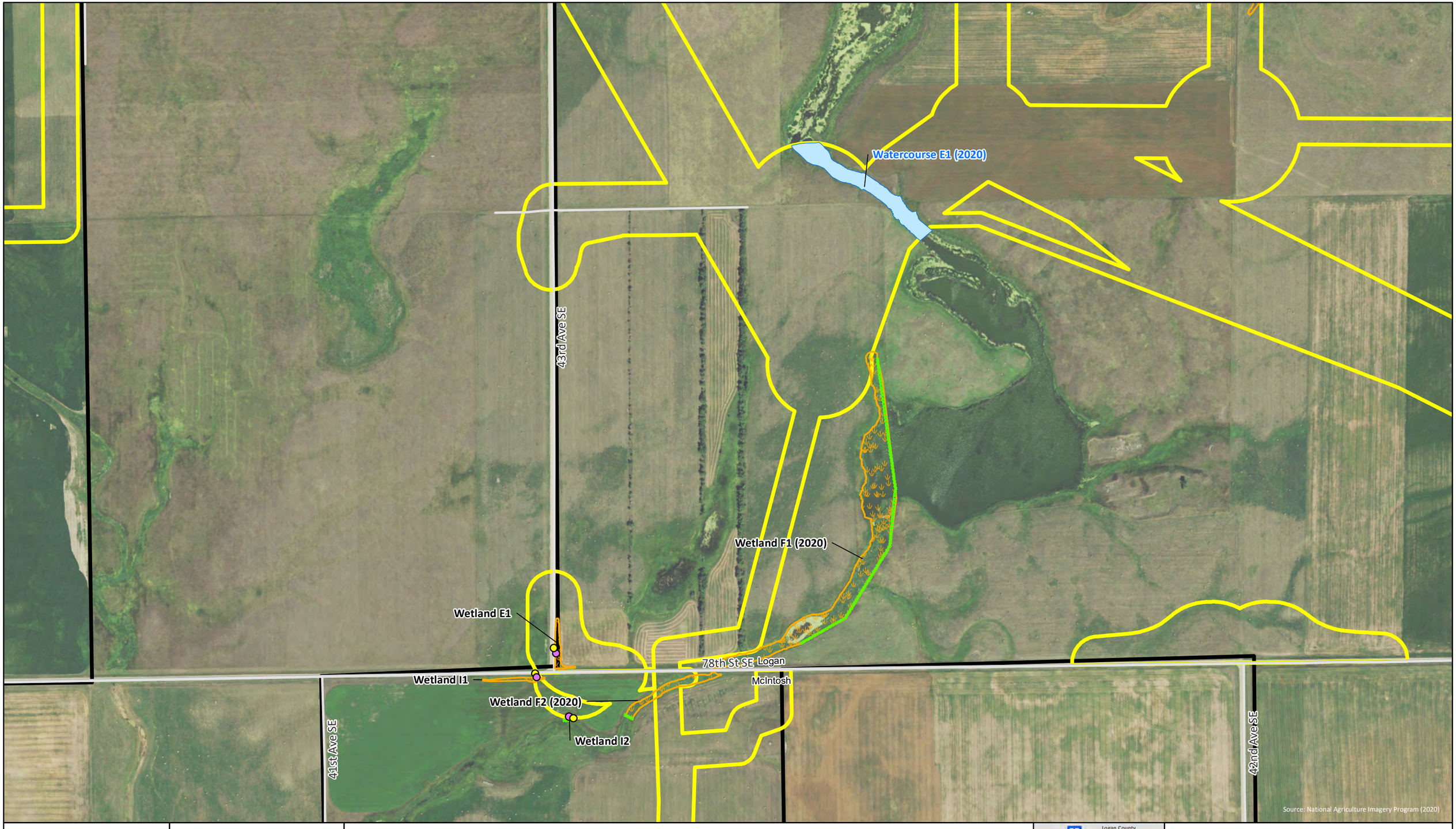
- Wetland Data Point
- Upland Data Point
- Watercourse (Field Identified)
- Waterbody (Field Identified)
- Wetland (Field Identified)
- Continues Outside Survey Area
- Survey Area (~6,056 acres)
- Project Area (~55,745 acres)
- Road
- County

Logan County

McIntosh County

Figure 3
Map 34 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

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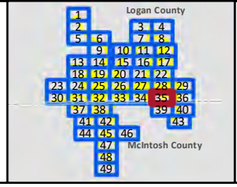


Figure 3
Map 35 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

Wetland E7 (2020)

Logan

McIntosh

78th St SE

43rd Ave SE

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

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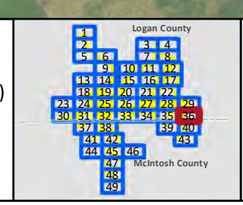


Figure 3
Map 36 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

Wetland A2 (2020)

Wetland B4 (2020)

Wetland A3 (2020)

35th Ave SE

Wetland C1 (2020)

79th St SE

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

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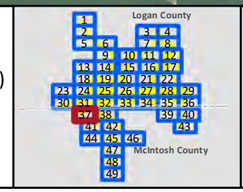


Figure 3
Map 37 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

Wetland D2 (2020)

Wetland D1 (2020)

36th Ave SE

Wetland C2 (2020)

79th St SE

37th Ave SE

Wetland H2

Wetland C3 (2020)

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

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Waterbody (Field Identified)
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Project Area (~55,745 acres)
Road
County

Logan County
McIntosh County

Figure 3
Map 38 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022



ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

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Waterbody (Field Identified)
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County

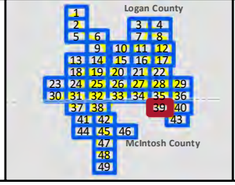
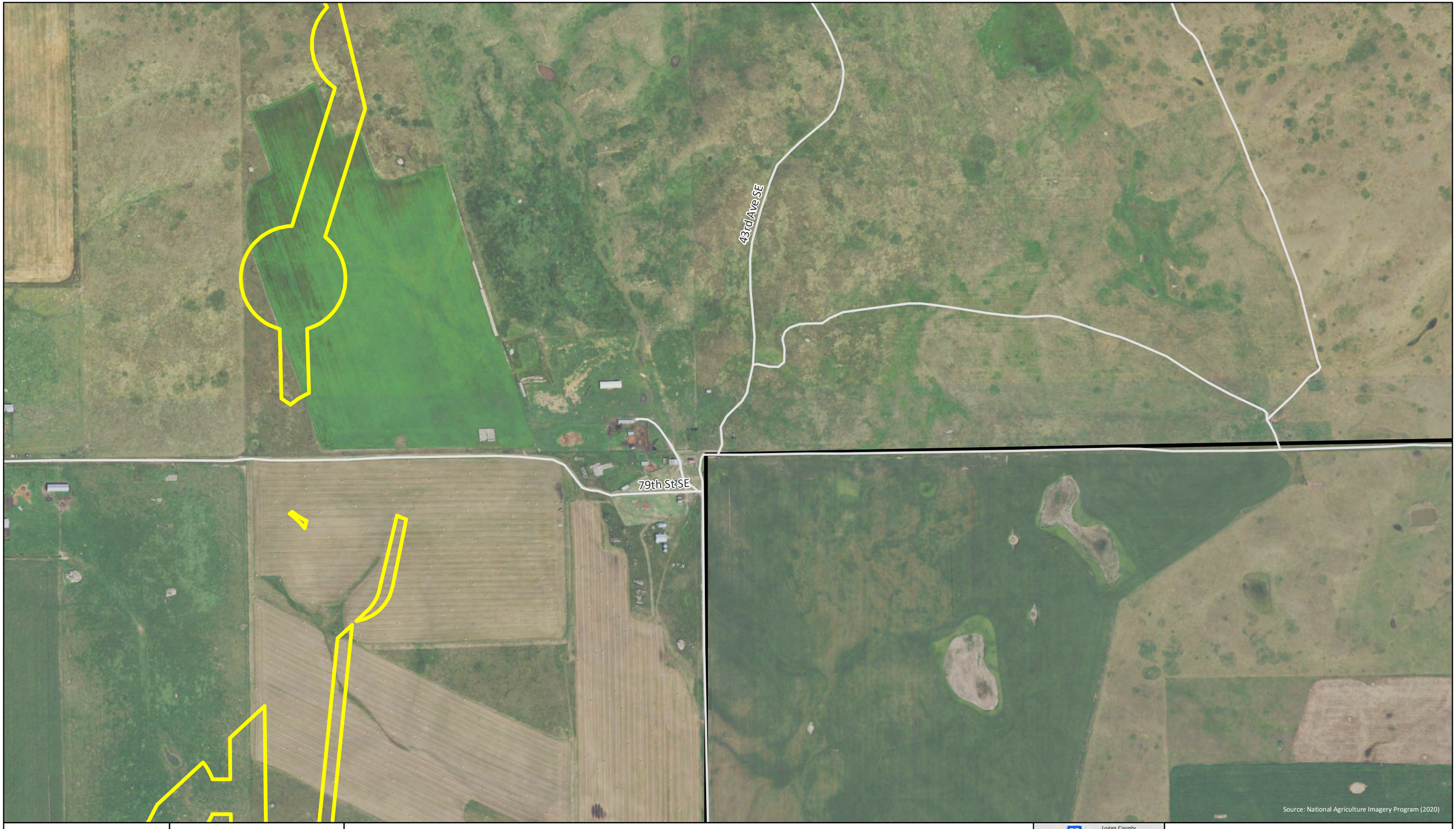


Figure 3
Map 39 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

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County

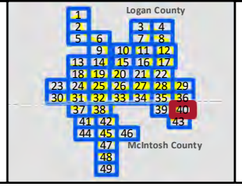


Figure 3
Map 40 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

35th Ave SE

36th Ave SE

State Hwy 13 80th St SE State Hwy 3

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

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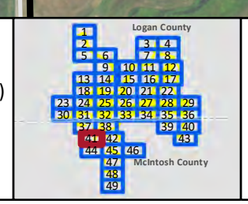


Figure 3
Map 41 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

Wetland C3 (2020)
w-kf-024a (WEST, 2021)
Wetland C4 (2020)
Wetland D4 (2020)
Wetland D3 (2020)
Wetland H9 (2020)
37th Ave SE
38th Ave SE
State Hwy 13
80th St SE
State Hwy 3
Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

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Project Area (~55,745 acres)
Road
County

Logan County
McIntosh County

Figure 3
Map 42 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

Wetland F3 (2020)

42nd Ave SE

43rd Ave SE

State Hwy 13

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
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0 500
Feet

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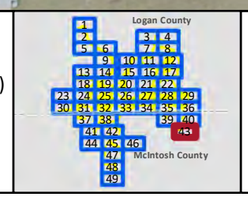


Figure 3
Map 43 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

G:\Jobs\19000785_BadgerWind_McIntoshCo_ND\Projects\Wetlands\T19000785_WDR_Fig3_WetlandsMapbook.mxd 5/18/2022

35th Ave SE

36th Ave SE

81st St SE

Source: National Agriculture Imagery Program (2020)

ATWELL

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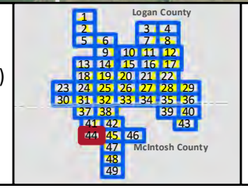
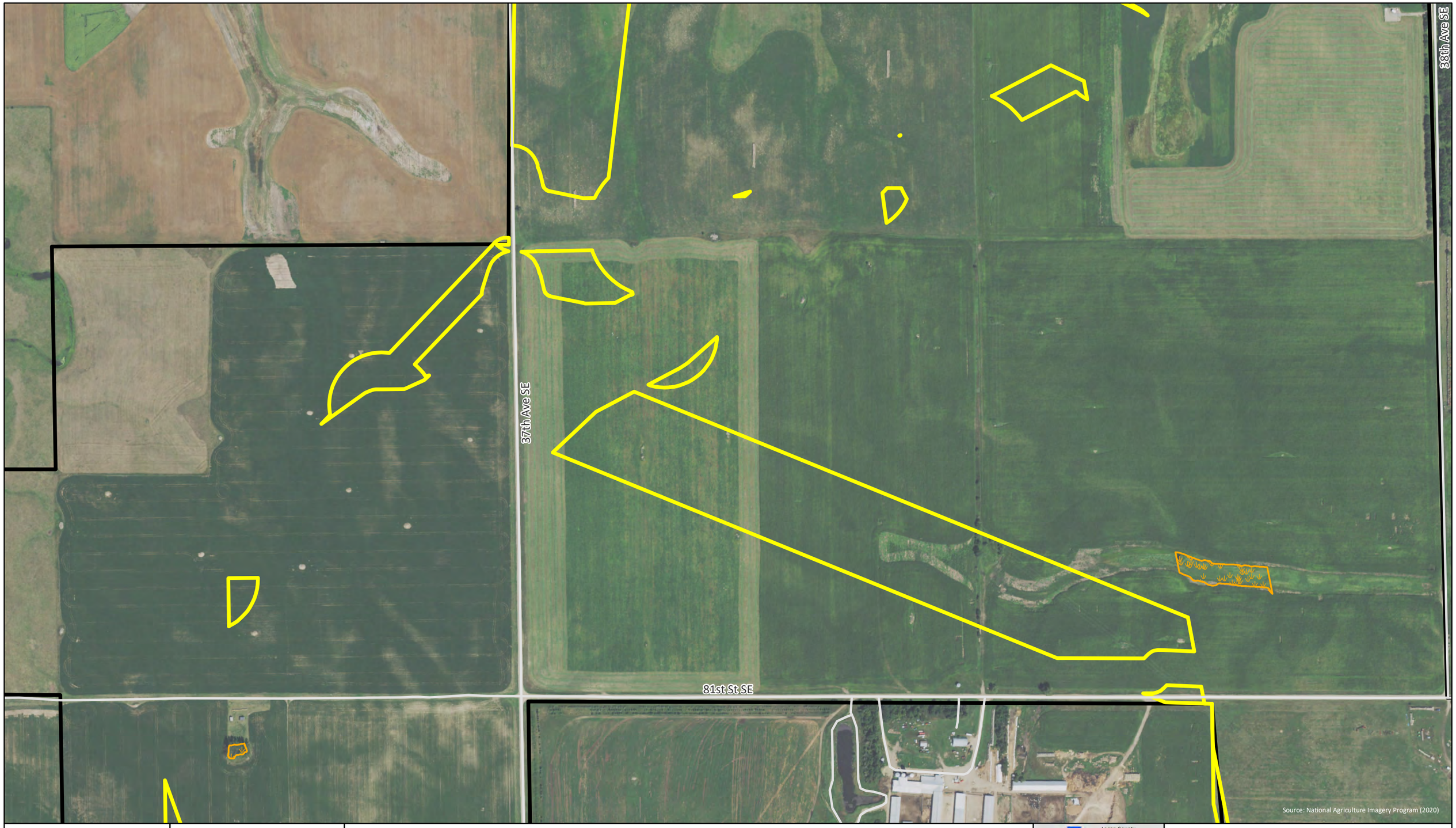


Figure 3
Map 44 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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19000785
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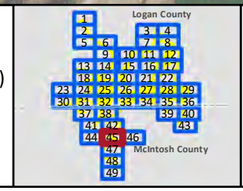


Figure 3
Map 45 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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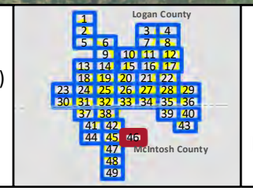


Figure 3
Map 46 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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w-ab-015a

Wetland H1

37th Ave SE

82nd St SE

Source: National Agriculture Imagery Program (2020)

ATWELL

Aquatic Resource Delineation Report
Badger Wind, LLC
19000785
May 18, 2022

0 500
Feet

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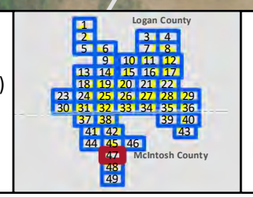
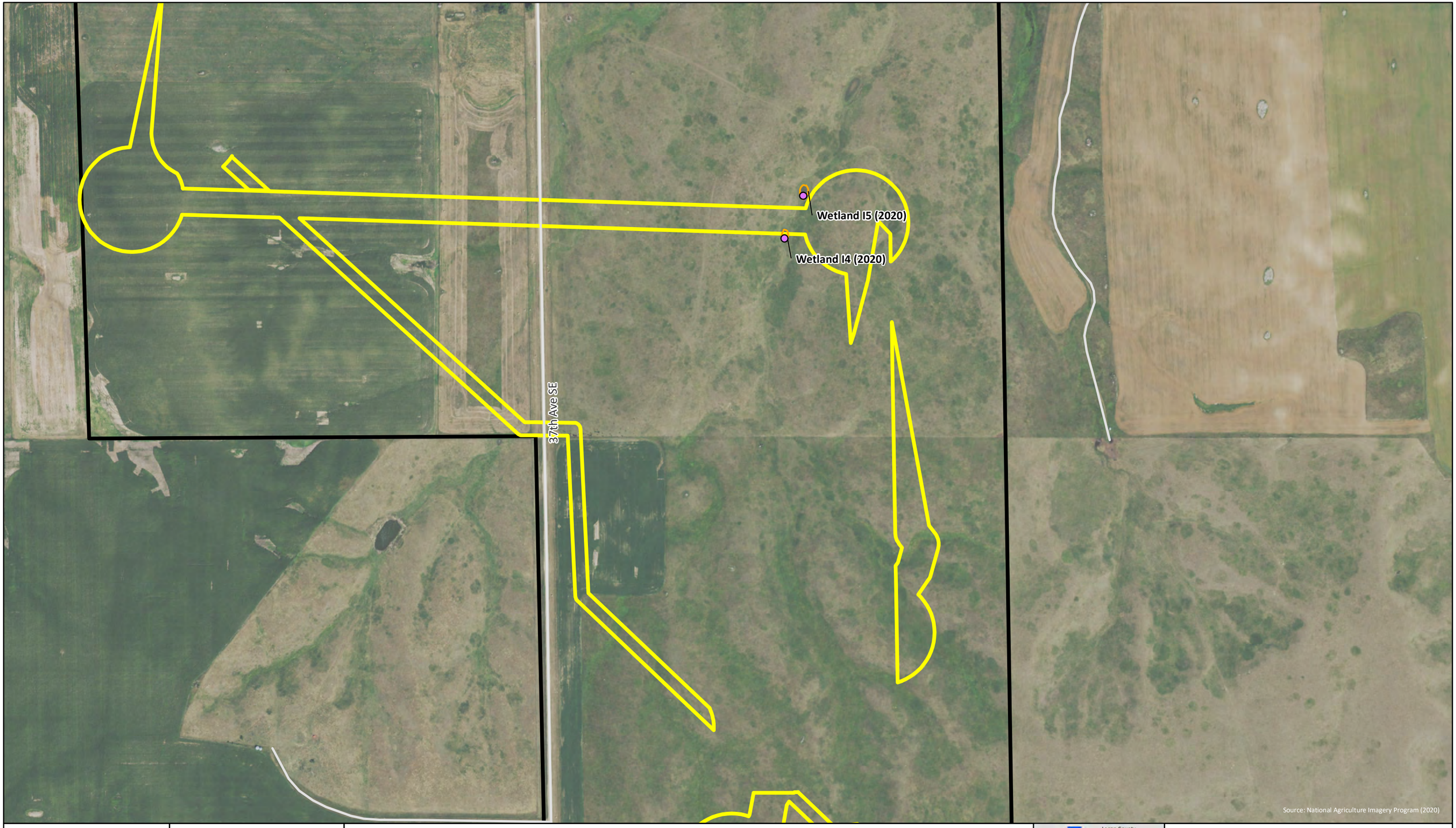


Figure 3
Map 47 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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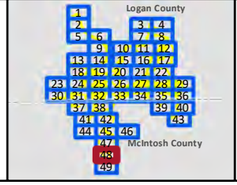


Figure 3
Map 48 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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ATWELL

Aquatic Resource Delineation Report
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19000785
May 18, 2022

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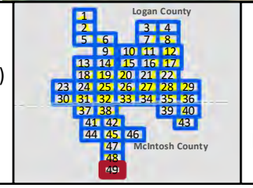


Figure 3
Map 49 of 49
Wind Farm Delineated Features Mapbook
Logan and McIntosh Counties, North Dakota

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APPENDICES

APPENDIX A

NRCS SSURGO SOIL MAP UNIT TABLE

Table 1. NRCS SSURGO Soil Map Units present within the Project Area

MUSYM	Soil Map Unit Name	Hydric Soil?	Acreage	% of Project Area
C210B	Williams-Bowbells loams, 3 to 6 percent slopes	No	2,520.3	8.0%
C135D	Zahl-Williams loams, 9 to 15 percent slopes	No	2,124.7	6.7%
C135C	Zahl-Williams-Zahill complex, 6 to 9 percent slopes	No	1,574.6	5.0%
C814A	Bowdle-Lehr loams, 0 to 2 percent slopes	No	1,564.6	5.0%
C870E	Wabek-Lehr-Appam complex, 9 to 25 percent slopes	No	1,383.6	4.4%
C162F	Max-Zahl-Arnegard complex, 9 to 35 percent slopes, very stony	No	1,377.7	4.4%
C817B	Lehr-Bowdle loams, 2 to 6 percent slopes	No	1,287.8	4.1%
C877B	Wabek-Lehr complex, 2 to 6 percent slopes	No	1,068.8	3.4%
C131C	Williams loam, 6 to 9 percent slopes	No	866.8	2.8%
E2607D	Amor-Werner loams, 9 to 15 percent slopes	No	837.5	2.7%
C580A	Harriet-Regan-Stirum complex, 0 to 2 percent slopes, occasionally flooded	Yes	826.4	2.6%
E2609C	Amor-Werner-Farnuf loams, 6 to 9 percent slopes	No	793.6	2.5%
C915B	Reeder-Arnegard loams, 3 to 6 percent slopes	No	750.4	2.4%
C915B	Reeder-Arnegard loams, 3 to 6 percent slopes	No	716.6	2.3%
E2819B	Reeder-Farnuf loams, 3 to 6 percent slopes	No	600.8	1.9%
C814A	Bowdle-Lehr loams, 0 to 2 percent slopes	No	548.4	1.7%
C877B	Wabek-Lehr complex, 2 to 6 percent slopes	No	506.8	1.6%
C451B	Arnegard loam, 2 to 6 percent slopes	No	489.4	1.6%
C902C	Amor-Cabba loams, 6 to 9 percent slopes	No	464.9	1.5%
C135D	Zahl-Williams loams, 9 to 15 percent slopes	No	464.6	1.5%
C132B	Williams-Zahl loams, 3 to 6 percent slopes	No	461.7	1.5%
C210A	Williams-Bowbells loams, 0 to 3 percent slopes	No	455.8	1.4%
C902C	Amor-Cabba loams, 6 to 9 percent slopes	No	425.6	1.4%
C156F	Zahl-Max-Bowbells loams, 6 to 35 percent slopes	No	395.4	1.3%
C870E	Wabek-Lehr-Appam complex, 9 to 25 percent slopes	No	392.2	1.2%
C903D	Amor-Werner loams, 9 to 15 percent slopes	No	343.9	1.1%
C451B	Arnegard loam, 2 to 6 percent slopes	No	331.1	1.1%
C135C	Zahl-Williams-Zahill complex, 6 to 9 percent slopes	No	316.4	1.0%
E2107B	Arnegard loam, 2 to 6 percent slopes	No	290.2	0.9%

MUSYM	Soil Map Unit Name	Hydric Soil?	Acreage	% of Project Area
C874C	Wabek-Appam complex, 6 to 9 percent slopes	No	289.5	0.9%
C956B	Vebar fine sandy loam, 3 to 6 percent slopes	No	273.2	0.9%
C451A	Arnegard loam, 0 to 2 percent slopes	No	268.7	0.9%
C73A	Hamerly-Vallers loams, moderately saline, 0 to 3 percent slopes	No	265.4	0.8%
C524A	Daglum-Belfield complex, 0 to 2 percent slopes	No	262.0	0.8%
C977C	Vebar-Cohagen fine sandy loams, 6 to 9 percent slopes	No	256.9	0.8%
E2651F	Werner-Amor-Arnegard loams, 9 to 50 percent slopes	No	236.5	0.8%
C155F	Zahl-Max-Arnegard loams, 15 to 60 percent slopes	No	236.2	0.7%
C584A	Harriet loam, 0 to 2 percent slopes	Yes	226.8	0.7%
C903D	Amor-Werner loams, 9 to 15 percent slopes	No	216.6	0.7%
C978D	Vebar-Flasher complex, 9 to 15 percent slopes	No	208.6	0.7%
E1025B	Regent-Savage silty clay loams, 3 to 6 percent slopes	No	207.3	0.7%
C915A	Reeder-Arnegard loams, 0 to 3 percent slopes	No	175.2	0.6%
C829A	Marysland loam, 0 to 1 percent slopes	Yes	158.4	0.5%
C156F	Zahl-Max-Bowbells loams, 6 to 35 percent slopes	No	143.3	0.5%
C54A	Lowe loam, 0 to 2 percent slopes, occasionally flooded	Yes	137.7	0.4%
E1333D	Vebar-Cohagen fine sandy loams, 9 to 15 percent slopes	No	135.0	0.4%
C665B	Noonan-Niobell-Williams loams, 0 to 6 percent slopes	No	130.5	0.4%
E1301F	Cohagen-Vebar-Parshall fine sandy loams, 9 to 35 percent slopes	No	125.7	0.4%
C954B	Regent-Savage silty clay loams, 3 to 6 percent slopes	No	125.5	0.4%
C524A	Daglum-Belfield complex, 0 to 2 percent slopes	No	123.8	0.4%
E2607B	Amor-Werner loams, 3 to 6 percent slopes	No	121.2	0.4%
C874C	Wabek-Appam complex, 6 to 9 percent slopes	No	117.0	0.4%
C954B	Regent-Savage silty clay loams, 3 to 6 percent slopes	No	114.0	0.4%
C902B	Amor-Cabba loams, 3 to 6 percent slopes	No	112.8	0.4%
C403B	Tansem-Makoti complex, 2 to 6 percent slopes	No	110.1	0.3%
E1625B	Vebar-Parshall fine sandy loams, 3 to 6 percent slopes	No	109.8	0.3%
C860D	Schaller loamy sand, 6 to 15 percent slopes	No	107.3	0.3%
C3A	Parnell silty clay loam, 0 to 1 percent slopes	Yes	106.8	0.3%
C54A	Lowe loam, 0 to 2 percent slopes, occasionally flooded	Yes	106.1	0.3%

MUSYM	Soil Map Unit Name	Hydric Soil?	Acreage	% of Project Area
C956B	Vebar fine sandy loam, 3 to 6 percent slopes	No	99.4	0.3%
C874B	Wabek-Appam complex, 2 to 6 percent slopes	No	95.4	0.3%
E4583E	Wabek-Appam sandy loams, 6 to 25 percent slopes	No	92.8	0.3%
C800B	Appam sandy loam, 2 to 6 percent slopes	No	89.6	0.3%
C956A	Vebar fine sandy loam, 0 to 3 percent slopes	No	88.9	0.3%
C148C	Williams-Zahl-Parnell complex, 0 to 9 percent slopes	No	83.5	0.3%
C471B	Grail silty clay loam, 2 to 6 percent slopes	No	77.3	0.2%
C953F	Flasher-Vebar-Parshall complex, 15 to 50 percent slopes	No	68.3	0.2%
E0445A	Daglum-Belfield loams, 0 to 2 percent slopes	No	67.2	0.2%
E1333C	Vebar-Cohagen fine sandy loams, 6 to 9 percent slopes	No	61.2	0.2%
C591C	Rhoades-Daglum complex, 2 to 9 percent slopes	No	60.4	0.2%
C825A	Divide loam, 0 to 2 percent slopes	No	59.3	0.2%
E3555D	Zahl-Williams loams, 9 to 15 percent slopes	No	57.2	0.2%
E4542B	Lehr-Bowdle loams, 2 to 6 percent slopes	No	53.4	0.2%
C825A	Divide loam, 0 to 2 percent slopes	No	52.9	0.2%
C451A	Arnegard loam, 0 to 2 percent slopes	No	51.8	0.2%
C977C	Vebar-Cohagen fine sandy loams, 6 to 9 percent slopes	No	50.1	0.2%
E3567F	Zahl-Max loams, dissected, 15 to 45 percent slopes	No	48.6	0.2%
E3531C	Williams loam, 6 to 9 percent slopes	No	47.2	0.1%
E0807B	Grail silty clay loam, till, 2 to 6 percent slopes	No	45.1	0.1%
E4757A	Regan silt loam, 0 to 2 percent slopes, occasionally flooded	Yes	41.9	0.1%
C317B	Lihen-Telfer loamy fine sands, 0 to 6 percent slopes	No	38.4	0.1%
C356B	Flaxton-Williams complex, 0 to 6 percent slopes	No	35.1	0.1%
C270A	Hamerly loam, 0 to 3 percent slopes	No	34.9	0.1%
E4765A	Tonka-Hamerly complex, 0 to 3 percent slopes	No	33.1	0.1%
C471A	Grail silty clay loam, 0 to 2 percent slopes	No	30.8	0.1%
C751A	Parshall fine sandy loam, 0 to 2 percent slopes	No	30.1	0.1%
C416A	Farnuf loam, 0 to 2 percent slopes	No	29.0	0.1%
C276A	Hamerly-Tonka-Parnell complex, 0 to 3 percent slopes	No	27.0	0.1%
C874B	Wabek-Appam complex, 2 to 6 percent slopes	No	26.2	0.1%

MUSYM	Soil Map Unit Name	Hydric Soil?	Acreage	% of Project Area
E4549B	Wabek-Lehr complex, 2 to 6 percent slopes	No	26.1	0.1%
C356C	Flaxton-Williams complex, 6 to 9 percent slopes	No	24.9	0.1%
C580A	Harriet-Regan-Stirum complex, 0 to 2 percent slopes, occasionally flooded	Yes	24.6	0.1%
C860B	Schaller loamy sand, 0 to 6 percent slopes	No	22.4	0.1%
C210A	Williams-Bowbells loams, 0 to 3 percent slopes	No	22.0	0.1%
C978D	Vebar-Flasher complex, 9 to 15 percent slopes	No	21.5	0.1%
EW	Water	No	19.9	0.1%
C5A	Southam silty clay loam, 0 to 1 percent slopes	Yes	19.5	0.1%
E4541A	Bowdle-Lehr loams, 0 to 2 percent slopes	No	18.5	0.1%
C990F	Pits, gravel and sand, 0 to 60 percent slopes	No	18.5	0.1%
E1823A	Parshall fine sandy loam, 0 to 2 percent slopes	No	16.5	0.1%
C954A	Regent-Savage silty clay loams, 0 to 3 percent slopes	No	16.3	0.1%
C416A	Farnuf loam, 0 to 2 percent slopes	No	16.0	0.1%
E4767A	Regan silt loam, saline, 0 to 2 percent slopes, occasionally flooded	Yes	15.6	<0.1%
C800B	Appam sandy loam, 2 to 6 percent slopes	No	13.1	<0.1%
C317C	Lihen-Telfer loamy fine sands, 6 to 9 percent slopes	No	11.9	<0.1%
C50A	Lowe-Fluvaquents channeled, complex, 0 to 2 percent slopes, flooded	Yes	10.5	<0.1%
C162F	Max-Zahl-Arnegard complex, 9 to 35 percent slopes, very stony	No	10.1	<0.1%
E3527B	Williams-Bowbells loams, 3 to 6 percent slopes	No	9.8	<0.1%
C996	Water	-	9.6	<0.1%
C962F	Werner-Amor-Arnegard loams, 9 to 50 percent slopes	No	9.0	<0.1%
C406B	Makoti-Sakakawea complex, 2 to 6 percent slopes	No	9.0	<0.1%
C276A	Hamerly-Tonka-Parnell complex, 0 to 3 percent slopes	No	9.0	<0.1%
C860D	Schaller loamy sand, 6 to 15 percent slopes	No	8.6	<0.1%
E2801A	Amor-Arnegard loams, 0 to 3 percent slopes	No	8.1	<0.1%
C3A	Parnell silty clay loam, 0 to 1 percent slopes	Yes	7.9	<0.1%
C21A	Vallers loam, 0 to 1 percent slopes	Yes	6.9	<0.1%
C667B	Williams-Niobell loams, 3 to 6 percent slopes	No	6.4	<0.1%
E0515C	Rhoades-Daglum complex, 6 to 9 percent slopes	No	5.6	<0.1%
C840B	Manning fine sandy loam, 0 to 6 percent slopes	No	5.3	<0.1%

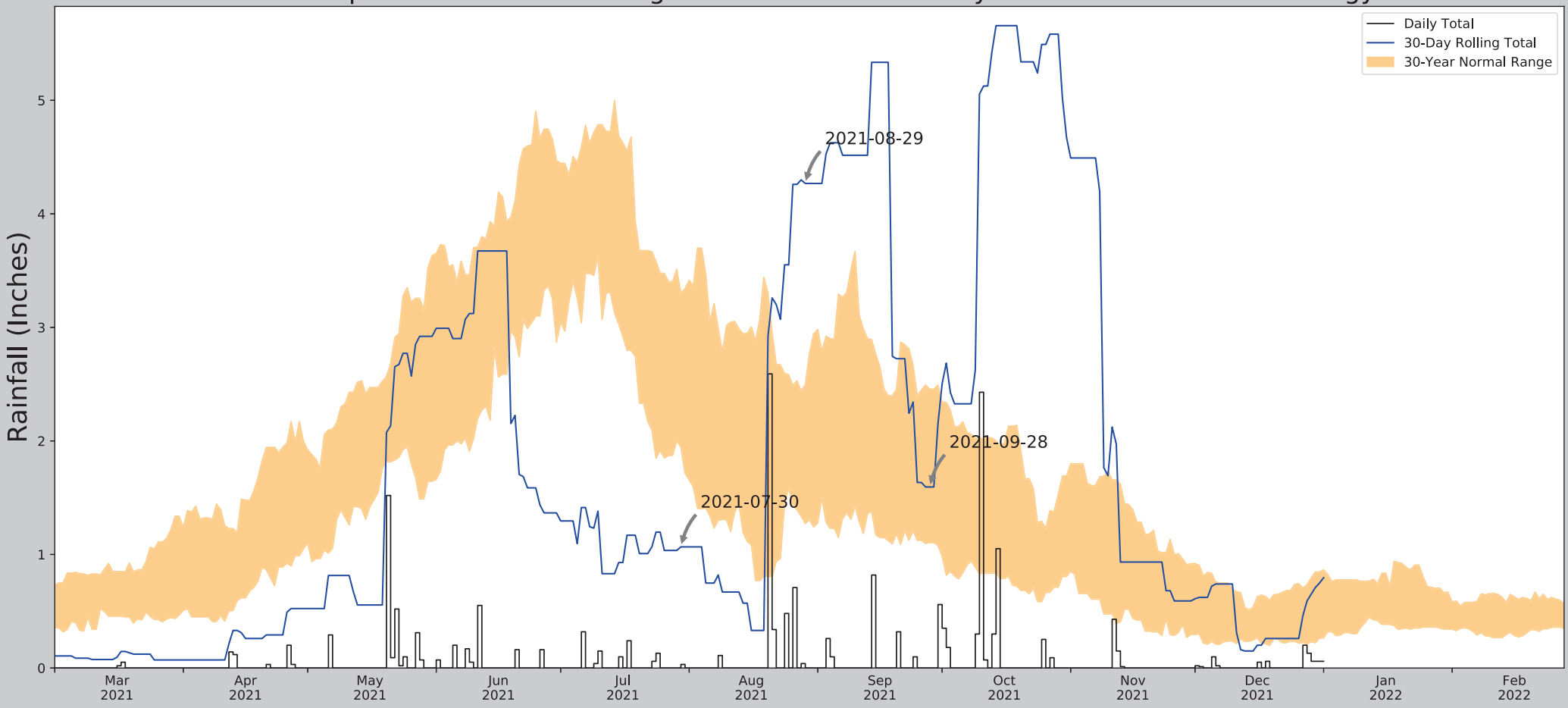
MUSYM	Soil Map Unit Name	Hydric Soil?	Acreage	% of Project Area
C901A	Amor-Arnegard loams, 0 to 3 percent slopes	No	5.2	<0.1%
C411A	Makoti silty clay loam, 0 to 2 percent slopes	No	4.9	<0.1%
C317B	Lihen-Telfer loamy fine sands, 0 to 6 percent slopes	No	4.5	<0.1%
E4005A	Harriet loam, 0 to 2 percent slopes, occasionally flooded	Yes	4.0	<0.1%
E0515B	Rhoades-Daglum complex, 0 to 6 percent slopes	No	3.5	<0.1%
	Total		31,585.61	100.00

Source: NRCS SSURGO

APPENDIX B

RESULTS OF ANTECEDENT PRECIPITATION TOOL

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2021-09-28
Elevation (ft)	2030.69
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

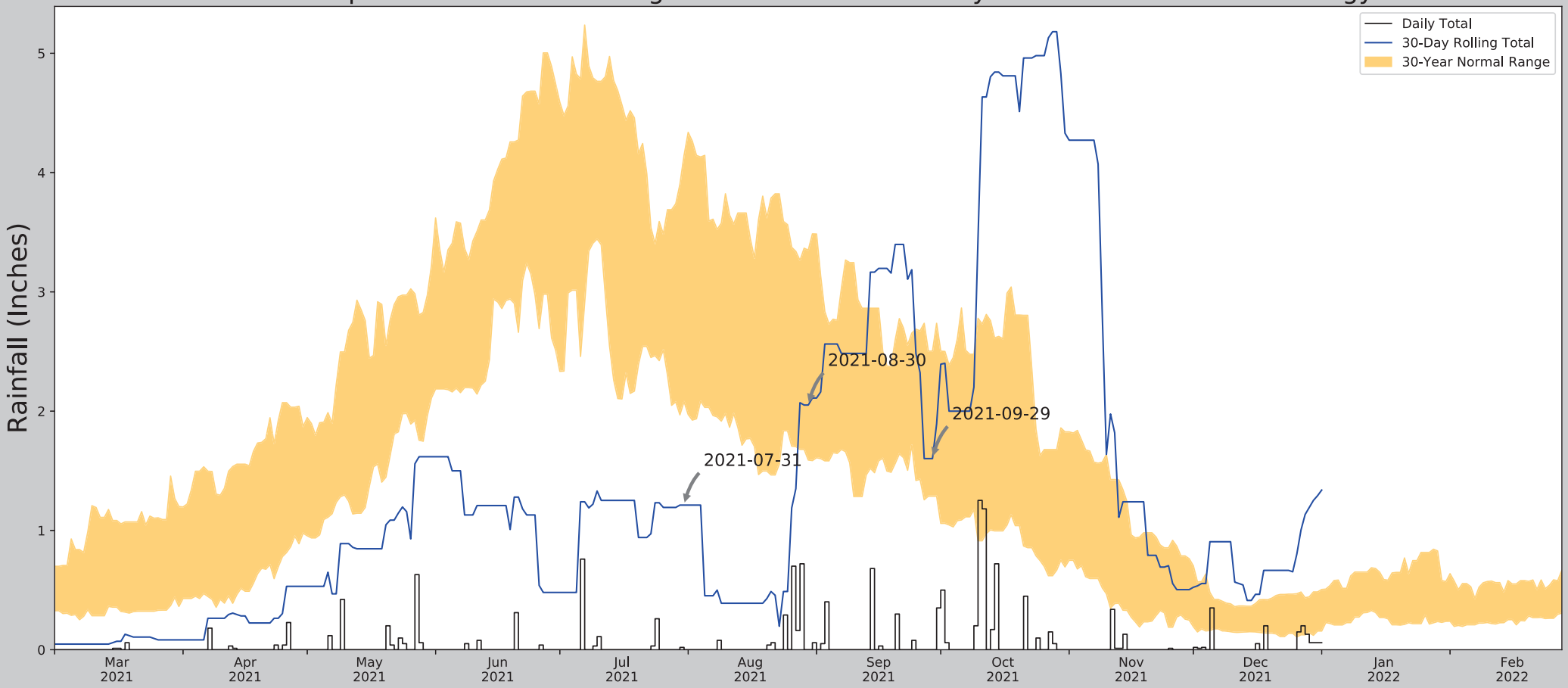
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-09-28	1.104724	2.455906	1.594488	Normal	2	3	6
2021-08-29	1.272047	2.495669	4.267717	Wet	3	2	6
2021-07-30	1.943307	3.30315	1.066929	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	11283	90
WISHEK	46.2608, -99.56	2037.074	19.7	57.087	9.99	26	0
ASHLEY	46.0406, -99.3742	2014.108	37.323	34.121	18.069	44	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2021-09-29
Elevation (ft)	2030.69
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

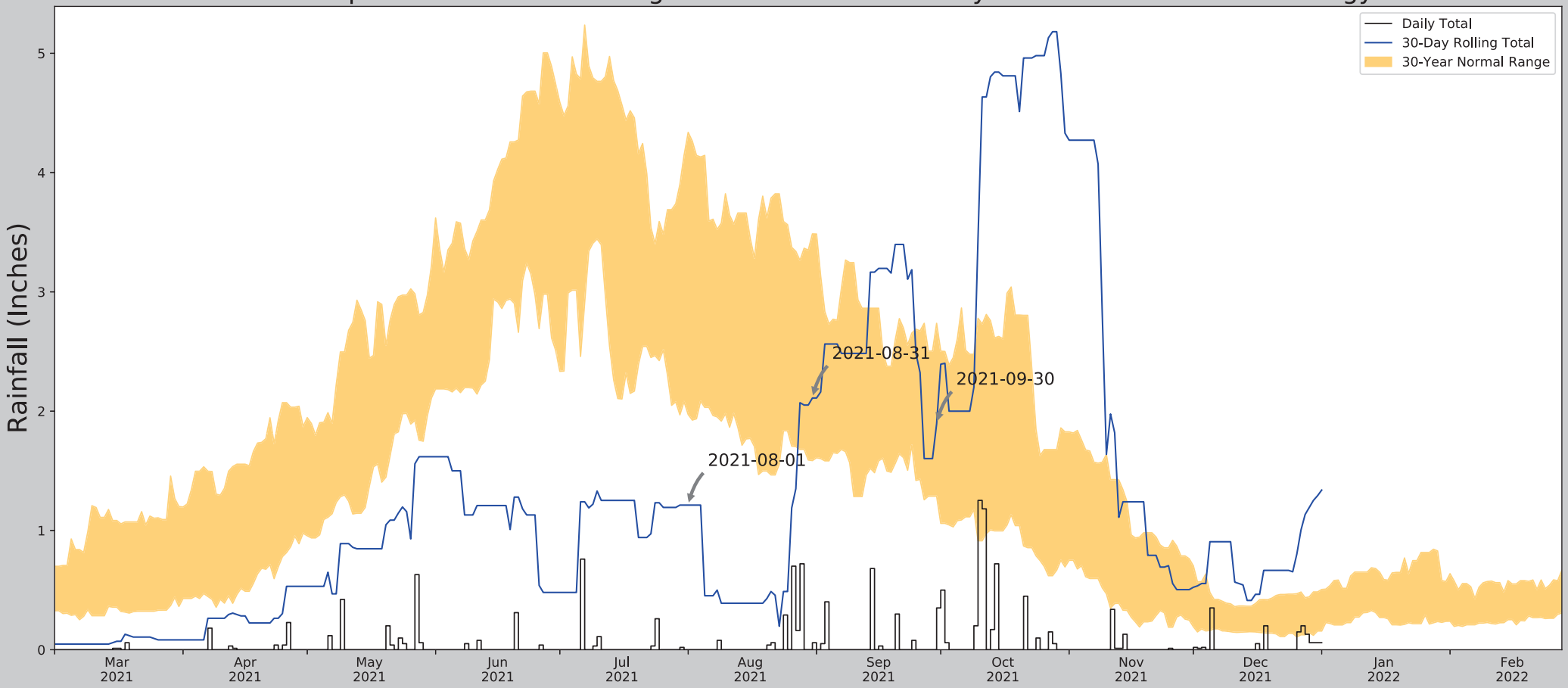
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-09-29	1.287402	2.50315	1.602362	Normal	2	3	6
2021-08-30	1.590551	3.350394	2.051181	Normal	2	2	4
2021-07-31	2.079921	4.144095	1.212598	Dry	1	1	1
Result							Normal Conditions - 11

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	246	0
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	202	55
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	6793	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	4026	35
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	37	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2021-09-30
Elevation (ft)	2030.69
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

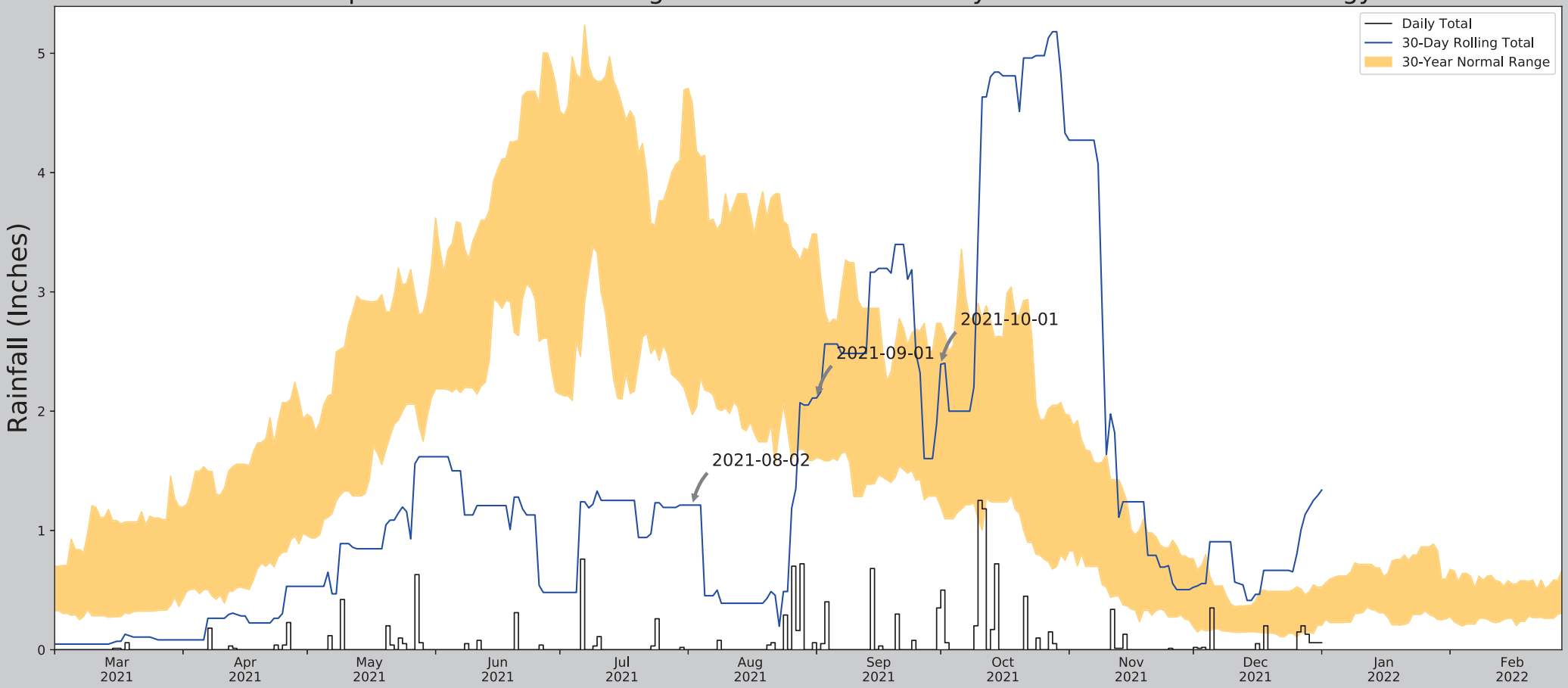
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-09-30	1.287402	2.736221	1.893701	Normal	2	3	6
2021-08-31	1.585827	3.486221	2.110236	Normal	2	2	4
2021-08-01	1.971654	4.337008	1.212598	Dry	1	1	1
Result							Normal Conditions - 11

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	246	0
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	202	55
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	6793	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	4026	35
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	37	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2021-10-01
Elevation (ft)	2030.69
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Dry Season

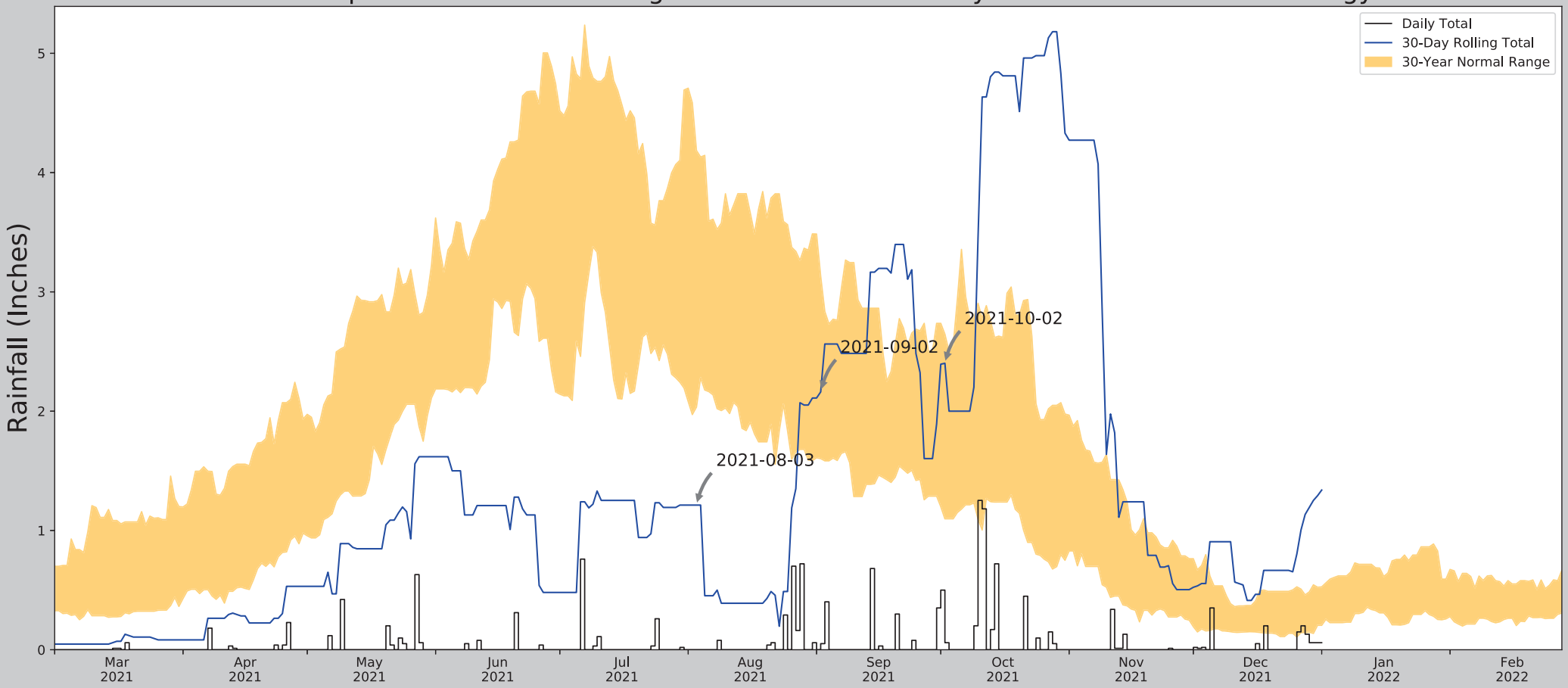
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-10-01	1.199606	2.736221	2.393701	Normal	2	3	6
2021-09-01	1.609449	3.485039	2.110236	Normal	2	2	4
2021-08-02	1.971654	4.58504	1.212598	Dry	1	1	1
Result							Normal Conditions - 11

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	246	0
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	293	55
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	6430	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	4298	35
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	37	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2021-10-02
Elevation (ft)	2030.69
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Dry Season

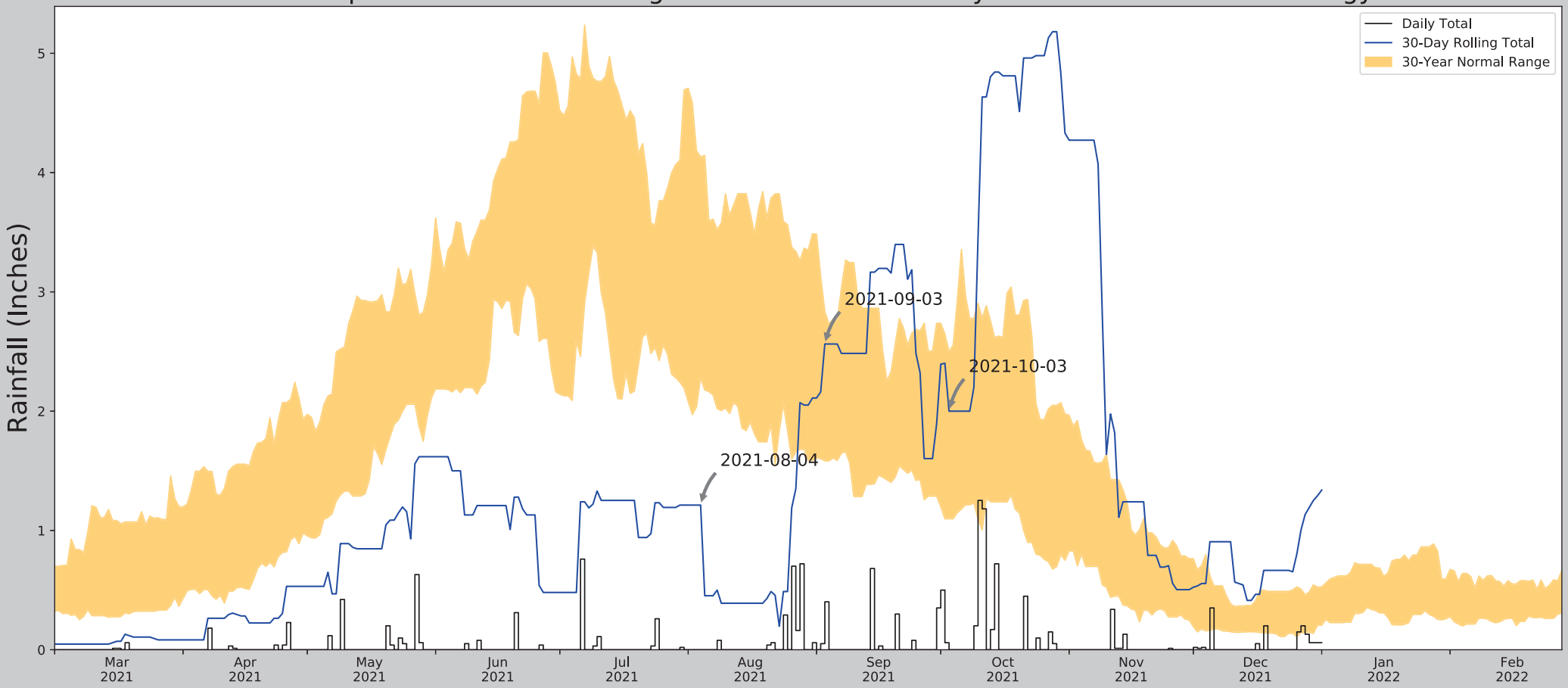
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-10-02	1.097638	2.645276	2.401575	Normal	2	3	6
2021-09-02	1.602362	3.131102	2.161417	Normal	2	2	4
2021-08-03	2.034252	4.18504	1.212598	Dry	1	1	1
Result							Normal Conditions - 11

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	246	0
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	293	55
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	6430	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	4298	35
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	37	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2021-10-03
Elevation (ft)	2030.69
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Dry Season

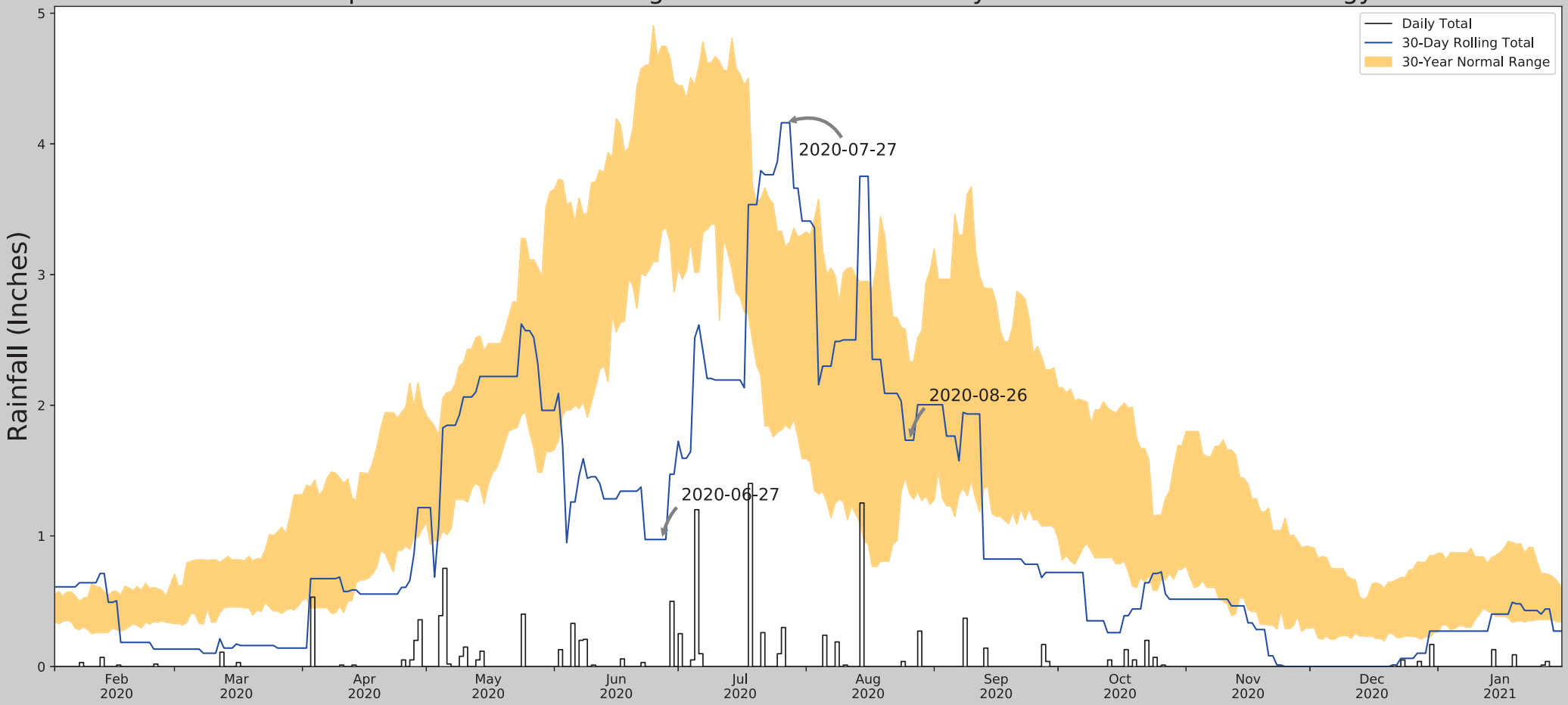
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-10-03	1.097638	2.500394	2.0	Normal	2	3	6
2021-09-03	1.583465	2.835039	2.562992	Normal	2	2	4
2021-08-04	2.279134	4.130709	1.212598	Dry	1	1	1
Result							Normal Conditions - 11

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	246	0
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	293	55
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	6430	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	4298	35
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	37	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2020-08-26
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

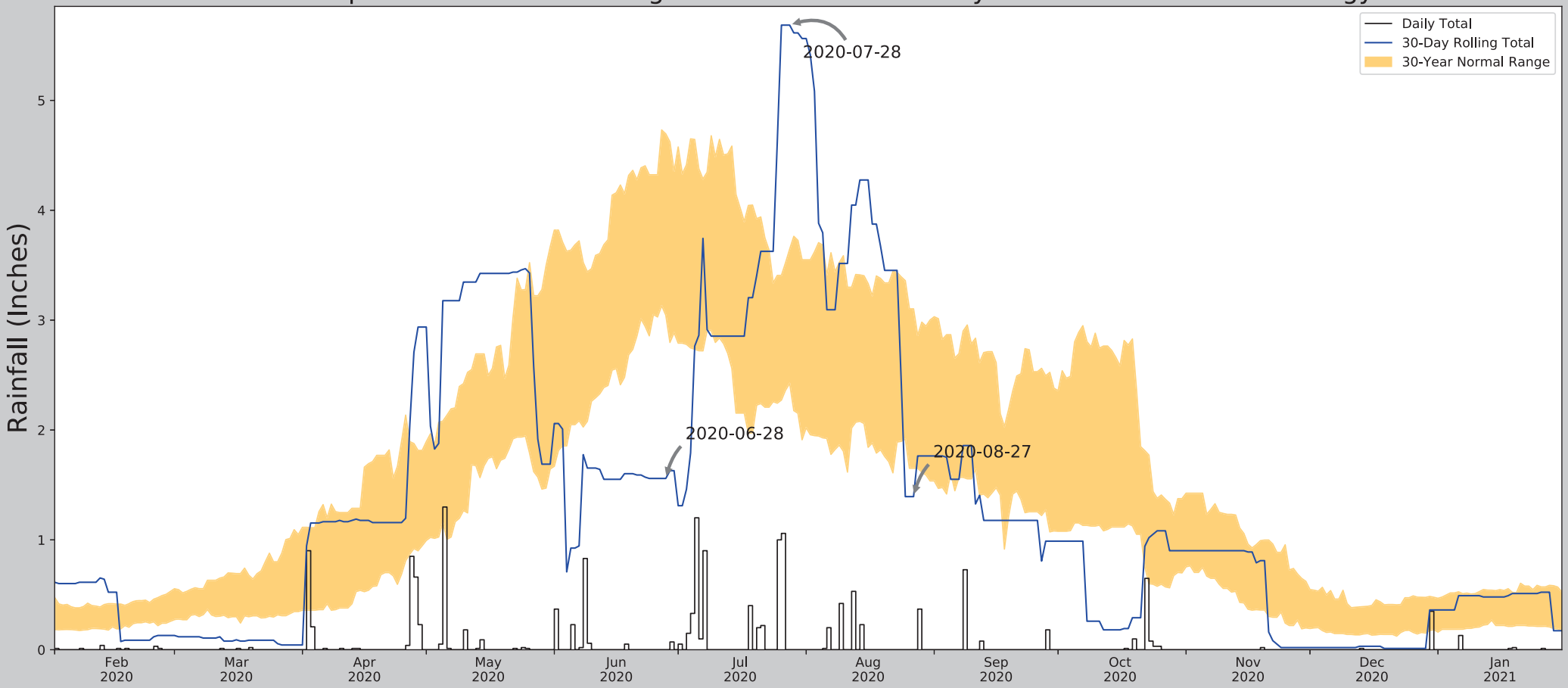
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-08-26	1.326772	2.330709	1.732284	Normal	2	3	6
2020-07-27	1.849213	3.212205	4.161417	Wet	3	2	6
2020-06-27	3.327953	4.746457	0.972441	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	11281	86
WISHEK	46.2608, -99.56	2037.074	19.7	57.087	9.99	35	0
ASHLEY	46.0406, -99.3742	2014.108	37.323	34.121	18.069	36	4

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2020-08-27
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

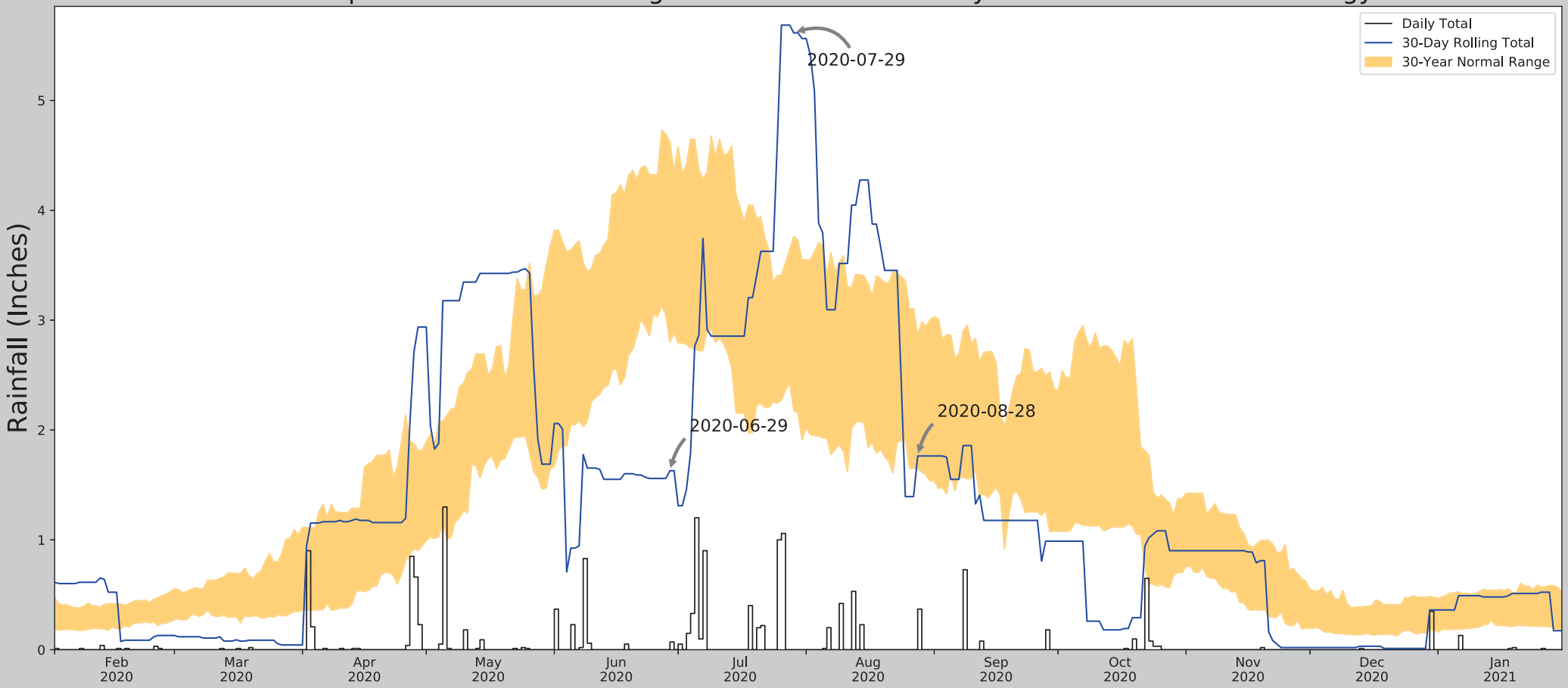
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-08-27	1.651575	3.102756	1.393701	Dry	1	3	3
2020-07-28	2.424016	3.646851	5.68504	Wet	3	2	6
2020-06-28	3.045669	4.694882	1.559055	Dry	1	1	1
Result							Normal Conditions - 10

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	128	44
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	240	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	10874	46
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	29	0
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	32	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2020-08-28
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

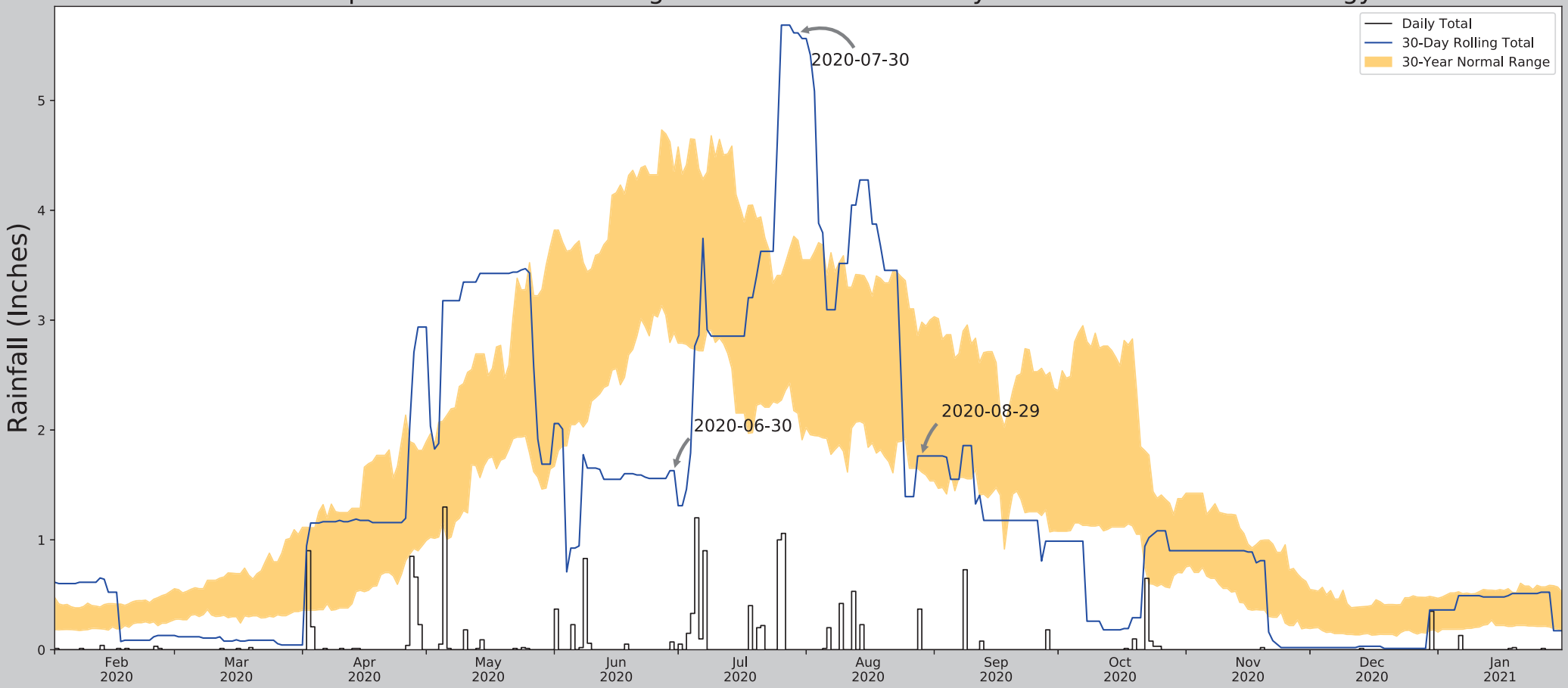
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-08-28	1.651575	2.861024	1.76378	Normal	2	3	6
2020-07-29	2.176378	3.762599	5.614173	Wet	3	2	6
2020-06-29	2.797244	4.622047	1.629921	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	128	45
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	240	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	10874	45
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	29	0
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	32	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2020-08-29
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

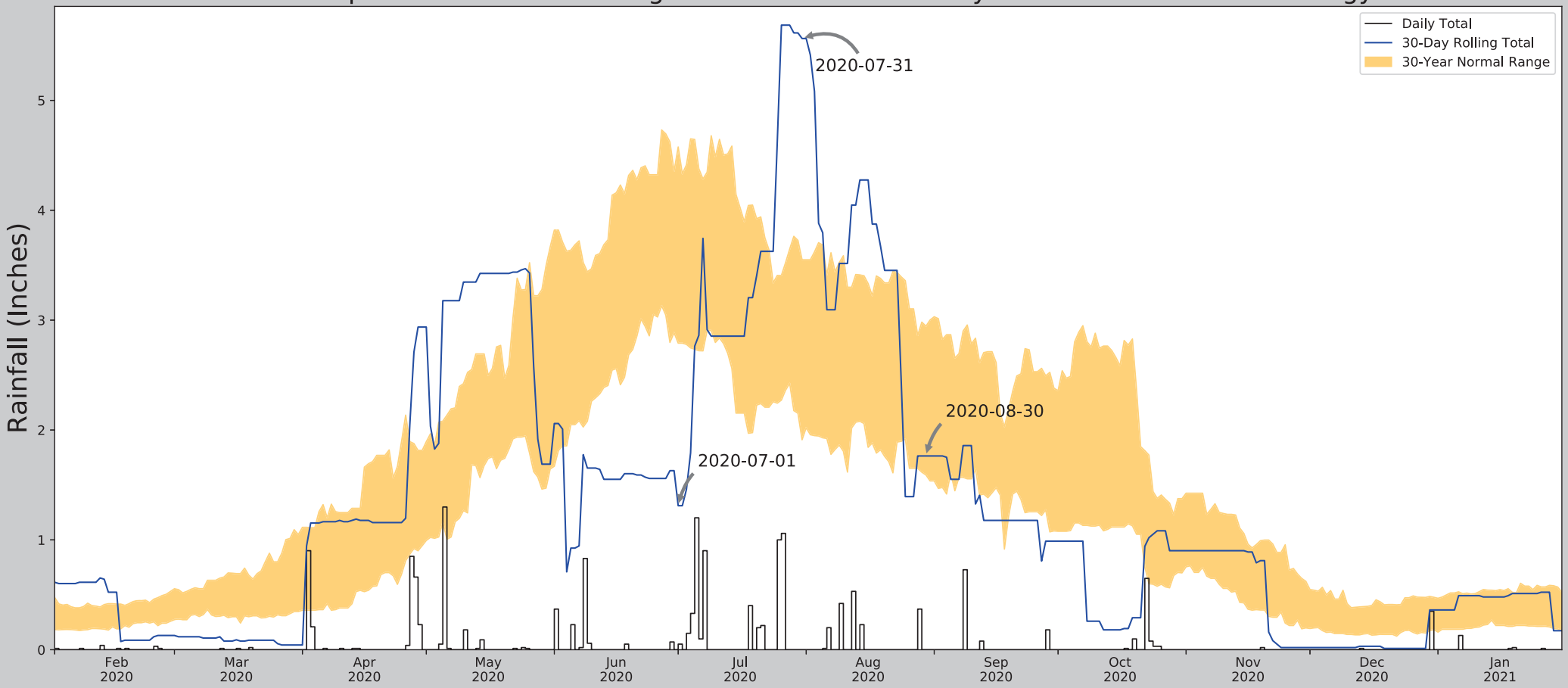
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-08-29	1.616142	2.981496	1.76378	Normal	2	3	6
2020-07-30	2.152362	3.725591	5.614173	Wet	3	2	6
2020-06-30	2.885827	4.355512	1.629921	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	128	45
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	240	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	10874	45
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	29	0
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	32	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2020-08-30
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

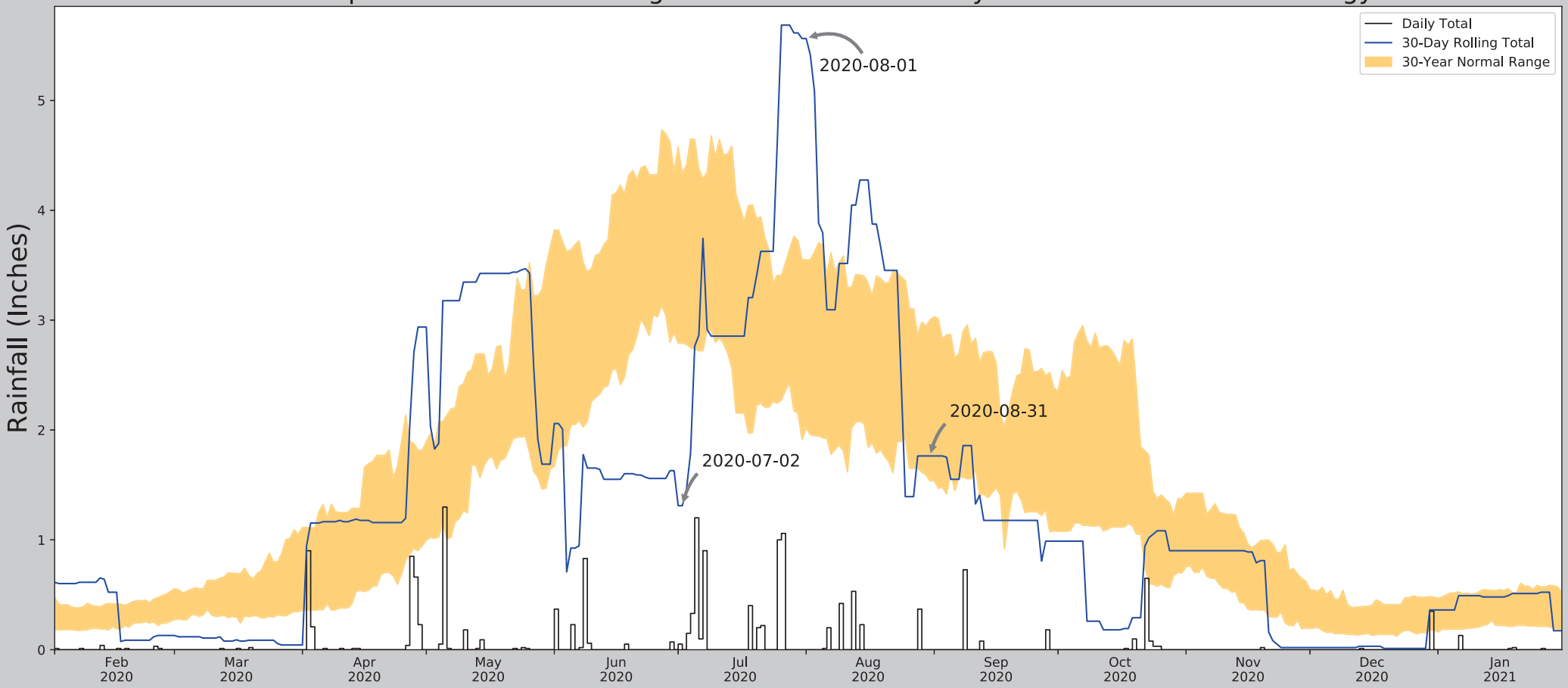
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-08-30	1.590551	2.945276	1.76378	Normal	2	3	6
2020-07-31	1.911417	3.549213	5.562992	Wet	3	2	6
2020-07-01	2.790551	4.575984	1.311024	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	128	44
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	240	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	10874	46
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	29	0
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	32	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2020-08-31
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

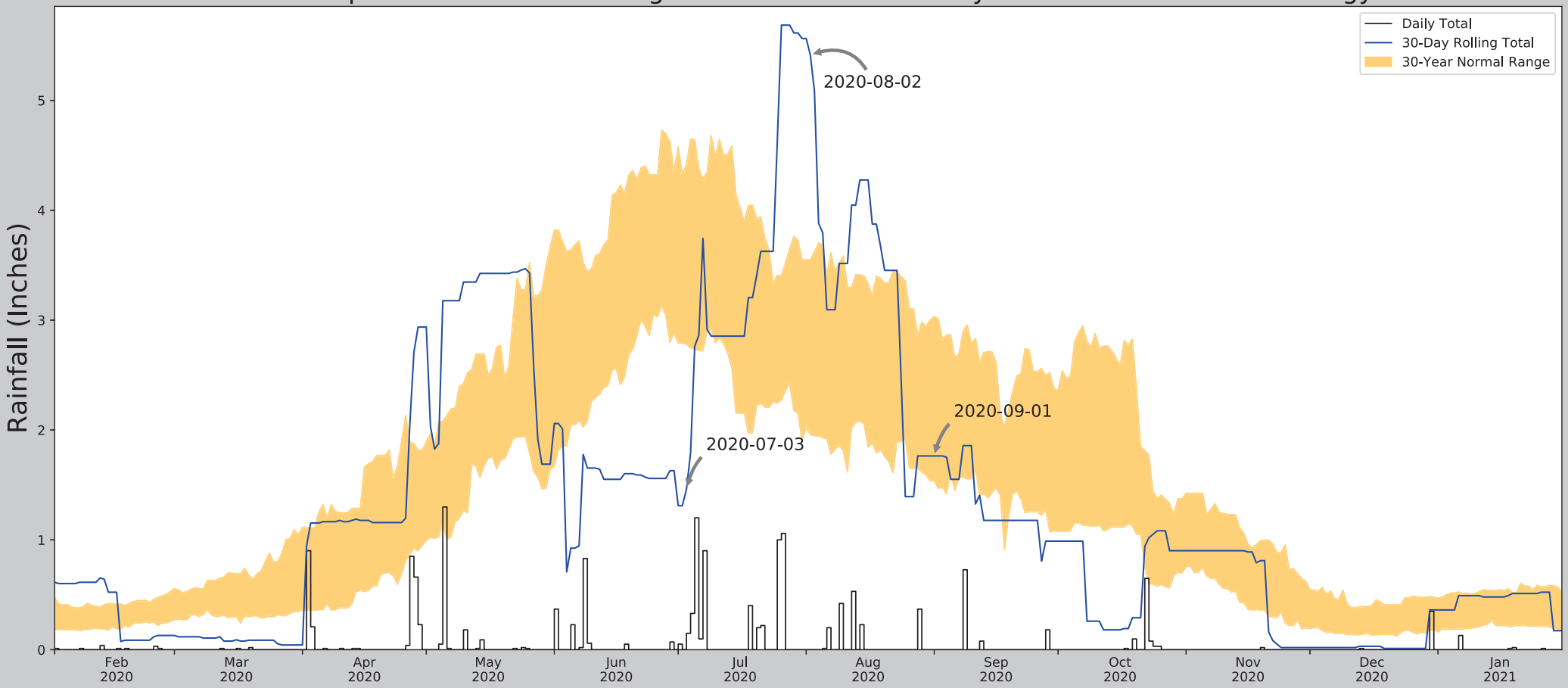
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-08-31	1.536614	3.001181	1.76378	Normal	2	3	6
2020-08-01	2.020473	3.549213	5.562992	Wet	3	2	6
2020-07-02	2.790551	4.332284	1.311024	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	128	44
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	240	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	10874	46
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	29	0
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	32	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2020-09-01
Elevation (ft)	2030.69
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

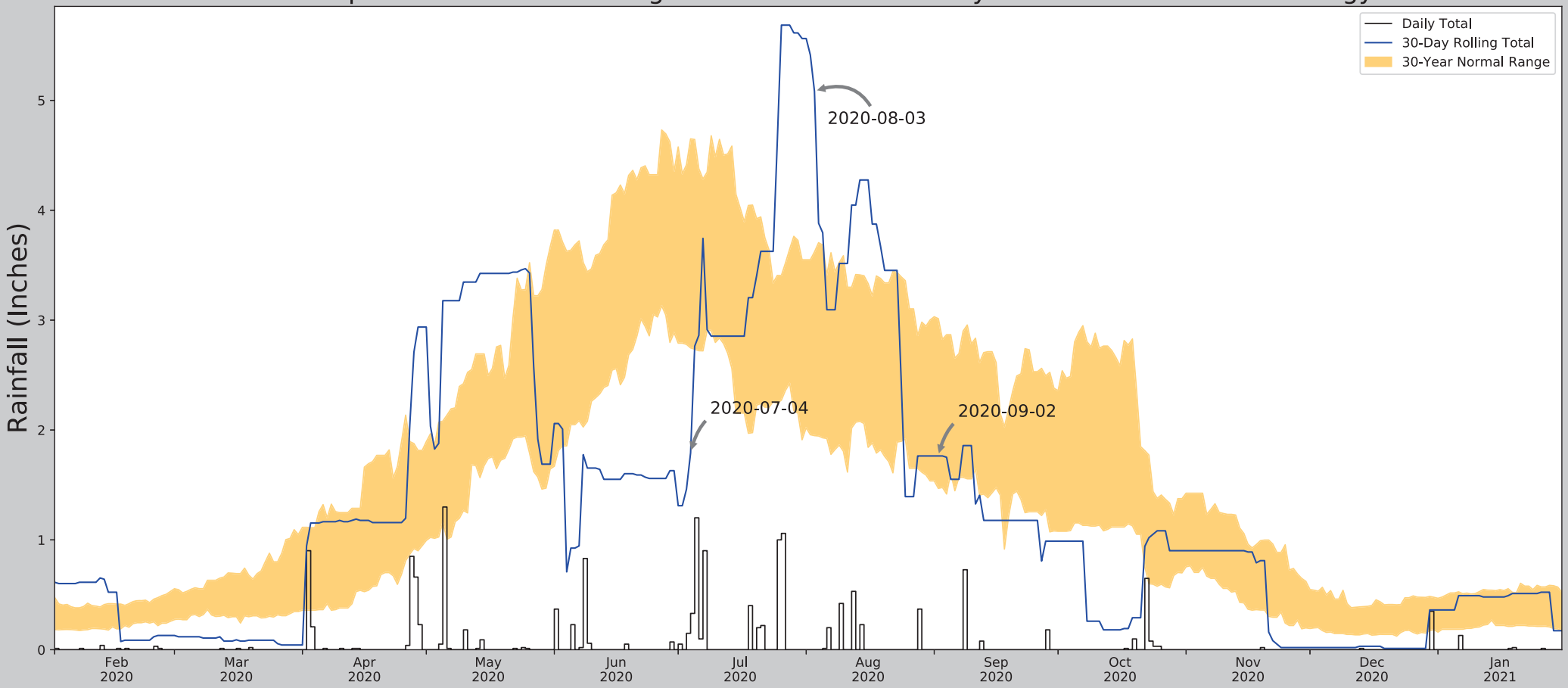
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-09-01	1.536614	3.030709	1.76378	Normal	2	3	6
2020-08-02	1.957087	3.549213	5.413386	Wet	3	2	6
2020-07-03	2.779528	4.412992	1.46063	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	128	44
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	240	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	10874	46
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	29	0
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	32	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2020-09-02
Elevation (ft)	2030.69
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

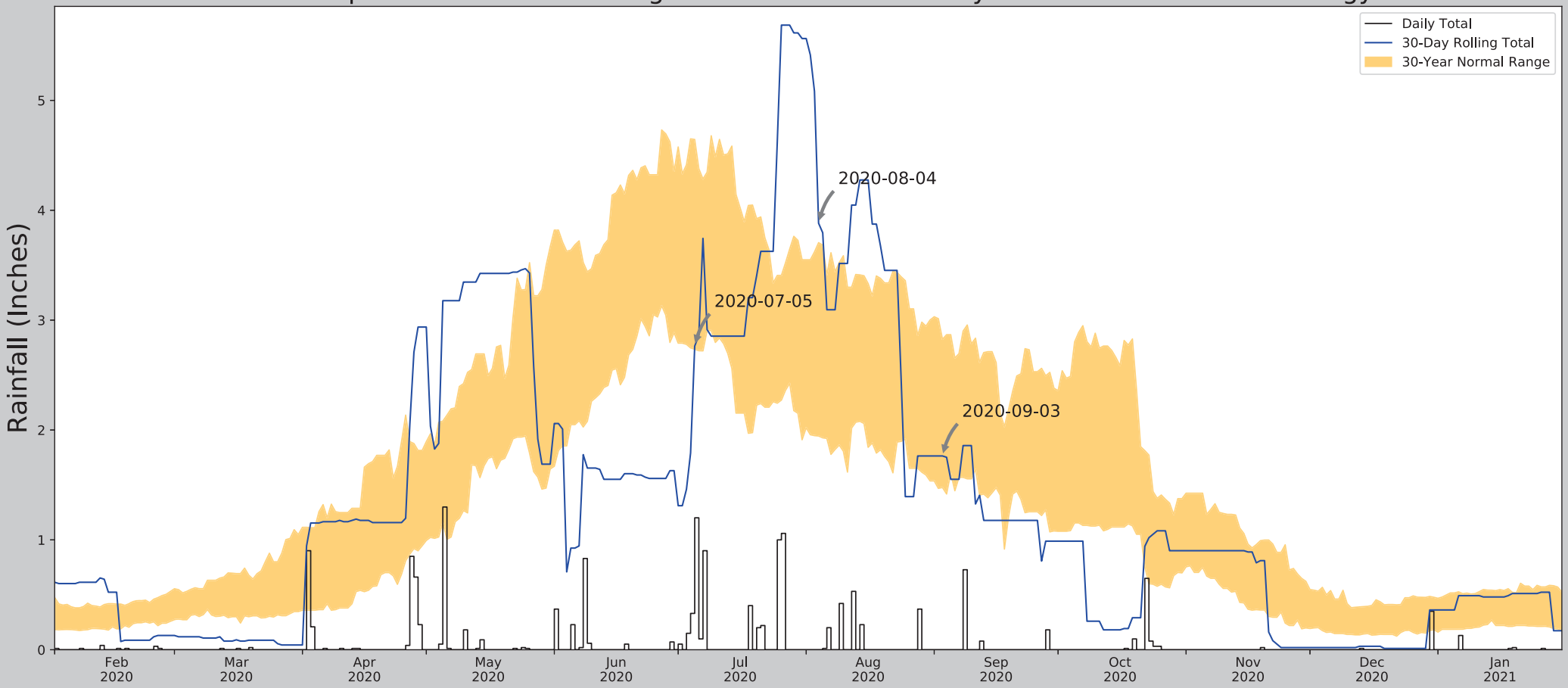
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-09-02	1.468898	3.013386	1.76378	Normal	2	3	6
2020-08-03	1.948819	3.620473	5.082677	Wet	3	2	6
2020-07-04	2.747244	4.65	1.791339	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	128	43
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	240	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	10874	47
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	29	0
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	32	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2020-09-03
Elevation (ft)	2030.69
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

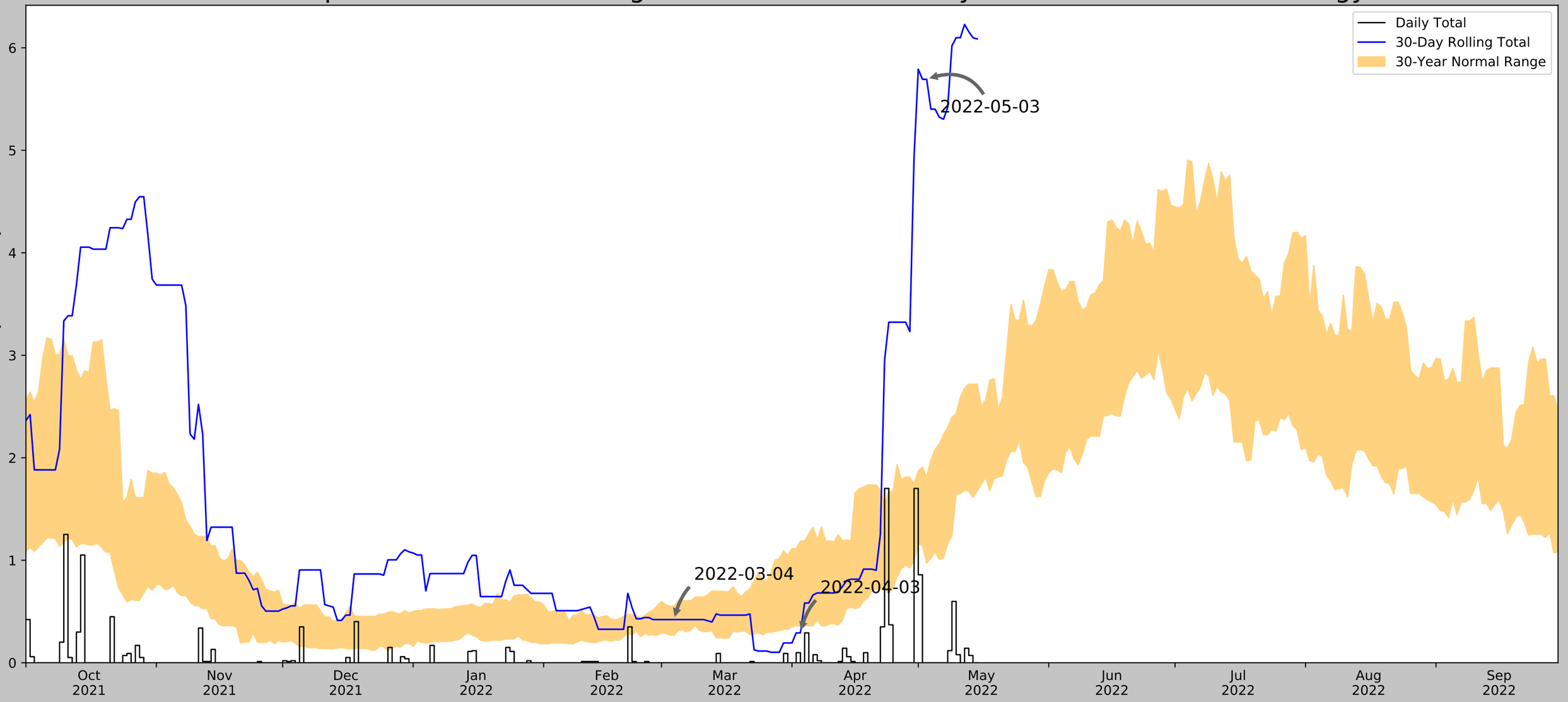
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-09-03	1.476772	2.825984	1.76378	Normal	2	3	6
2020-08-04	1.945276	3.705118	3.88189	Wet	3	2	6
2020-07-05	2.735039	4.644095	2.76378	Normal	2	1	2
Result							Normal Conditions - 14

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
EUREKA 13.6 NNE	45.9385, -99.4787	2076.116	24.792	45.426	12.283	128	43
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	24.887	0.15	11.203	240	0
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	10874	47
WISHEK	46.2608, -99.56	2037.074	2.67	6.384	1.219	29	0
HAGUE	46.025, -99.9911	1897.966	26.019	132.724	15.162	49	0
NAPOLEON	46.5067, -99.7692	1979.987	17.158	50.703	8.591	32	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2022-05-03
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness (2022-04)
WebWIMP H_2O Balance	Dry Season

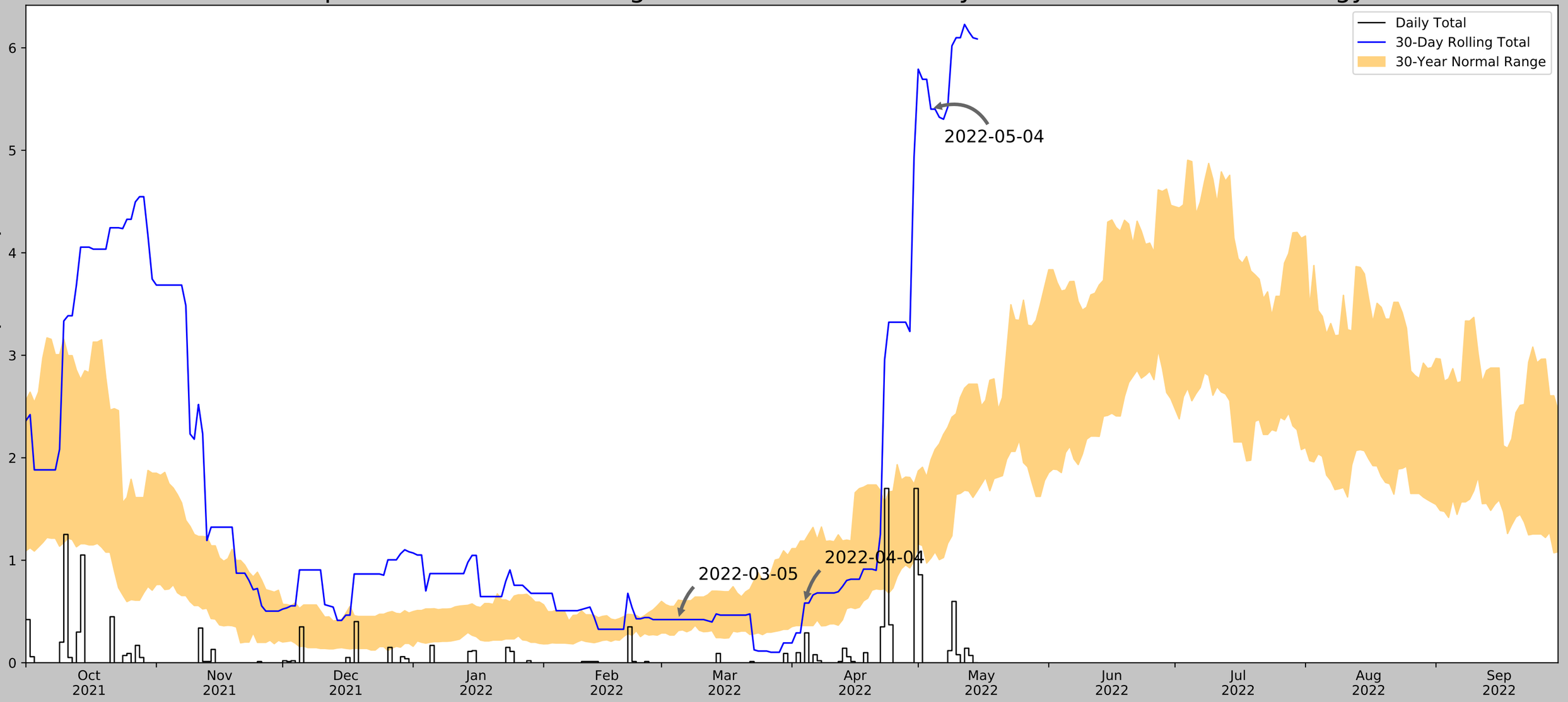
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-05-03	0.972835	1.81378	5.692914	Wet	3	3	9
2022-04-03	0.362205	1.187795	0.291339	Dry	1	2	2
2022-03-04	0.269685	0.550394	0.42126	Normal	2	1	2
Result							Normal Conditions - 13

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	11221	90
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	8.932	16.732	4.169	17	0
WISHEK	46.2608, -99.56	2037.074	17.623	22.966	8.335	29	0
ARTAS 1S	45.8811, -99.7983	1814.961	23.16	199.147	15.034	77	0
HAGUE	46.025, -99.9911	1897.966	29.611	116.142	16.764	9	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2022-05-04
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness (2022-04)
WebWIMP H_2O Balance	Dry Season

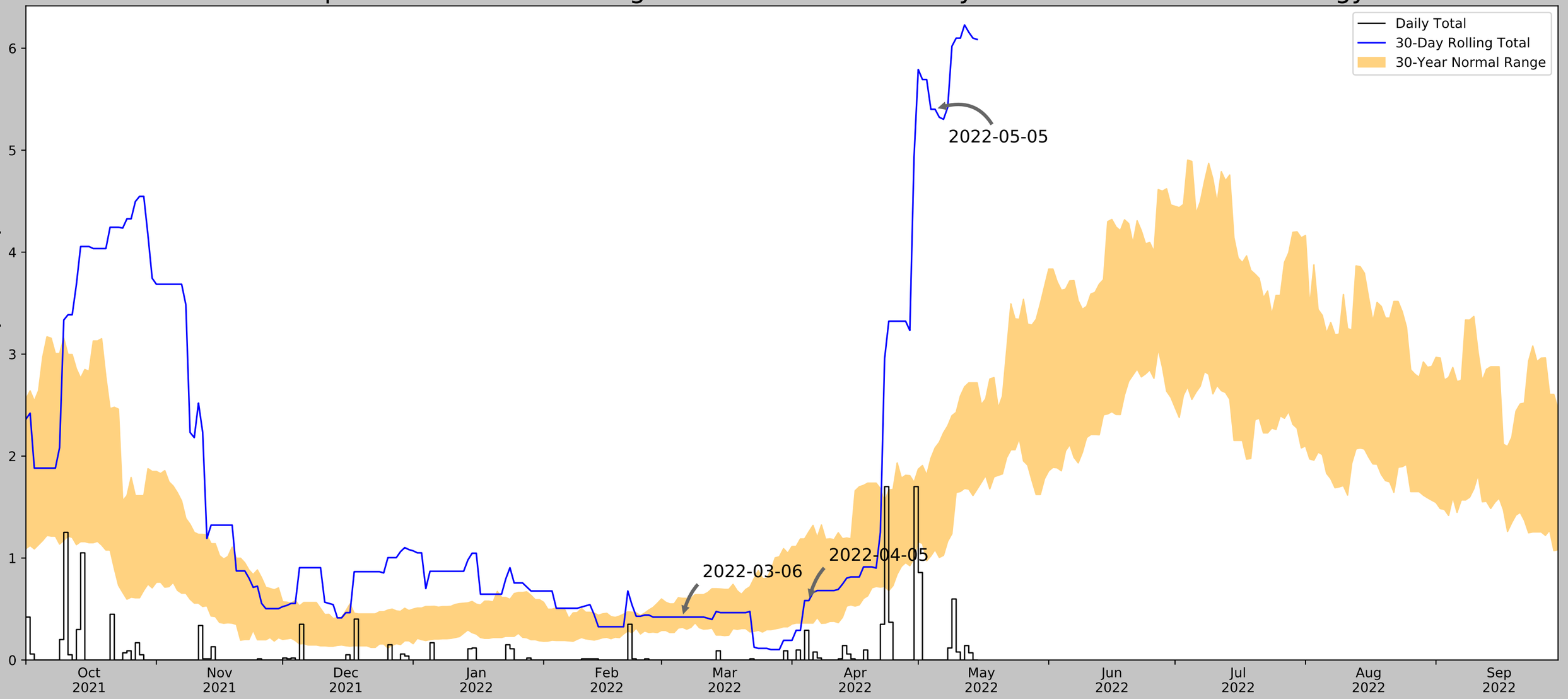
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-05-04	1.020472	1.978347	5.401575	Wet	3	3	9
2022-04-04	0.362205	1.187795	0.582677	Normal	2	2	4
2022-03-05	0.314173	0.611024	0.42126	Normal	2	1	2
Result							Wetter than Normal - 15

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	11221	90
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	8.932	16.732	4.169	17	0
WISHEK	46.2608, -99.56	2037.074	17.623	22.966	8.335	29	0
ARTAS 1S	45.8811, -99.7983	1814.961	23.16	199.147	15.034	77	0
HAGUE	46.025, -99.9911	1897.966	29.611	116.142	16.764	9	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2022-05-05
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness (2022-04)
WebWIMP H_2O Balance	Dry Season

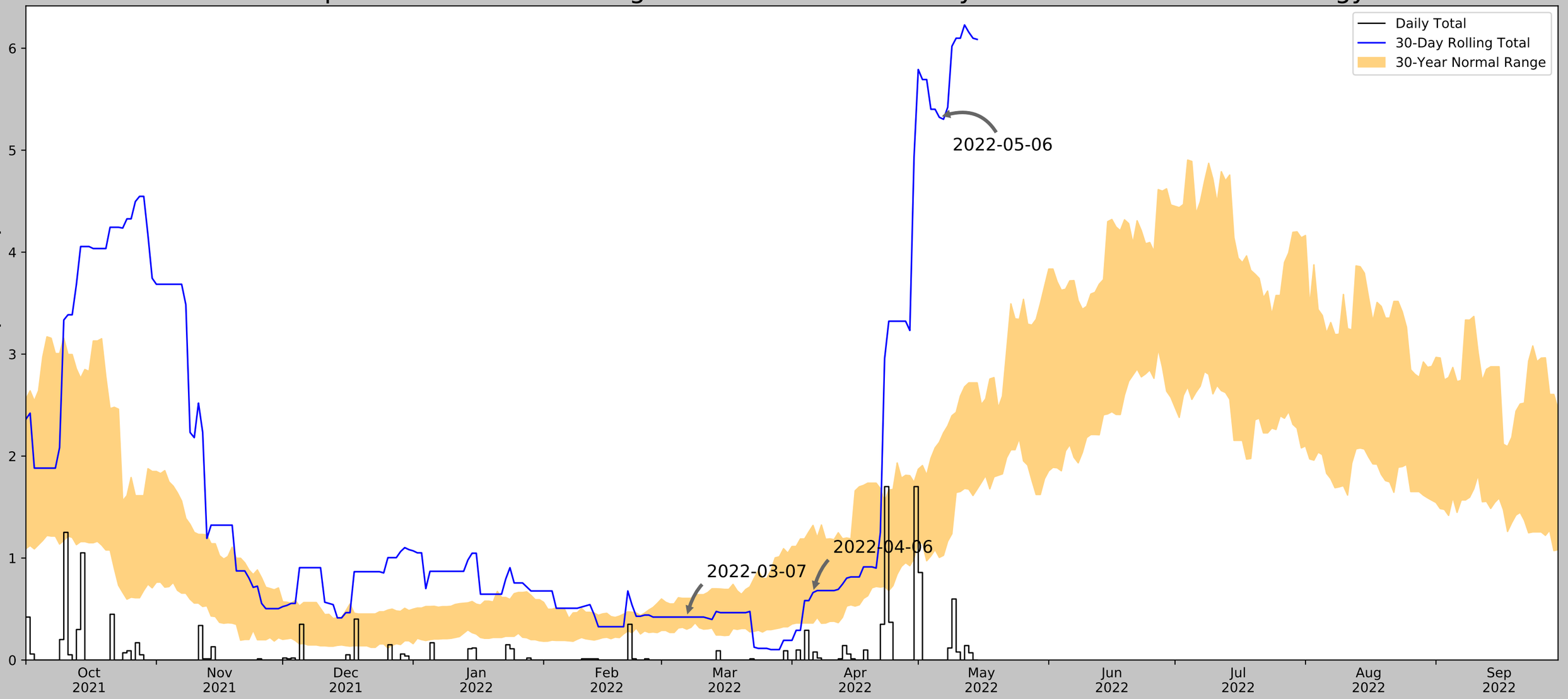
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-05-05	1.082283	2.080709	5.401575	Wet	3	3	9
2022-04-05	0.362205	1.256693	0.582677	Normal	2	2	4
2022-03-06	0.320472	0.605118	0.42126	Normal	2	1	2
Result							Wetter than Normal - 15

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	11221	89
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	8.932	16.732	4.169	17	0
WISHEK	46.2608, -99.56	2037.074	17.623	22.966	8.335	29	0
ARTAS 1S	45.8811, -99.7983	1814.961	23.16	199.147	15.034	77	0
HAGUE	46.025, -99.9911	1897.966	29.611	116.142	16.764	9	0
Linear Interpolation	N/A	N/A	N/A	N/A	N/A	0	1

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2022-05-06
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness (2022-04)
WebWIMP H_2O Balance	Dry Season

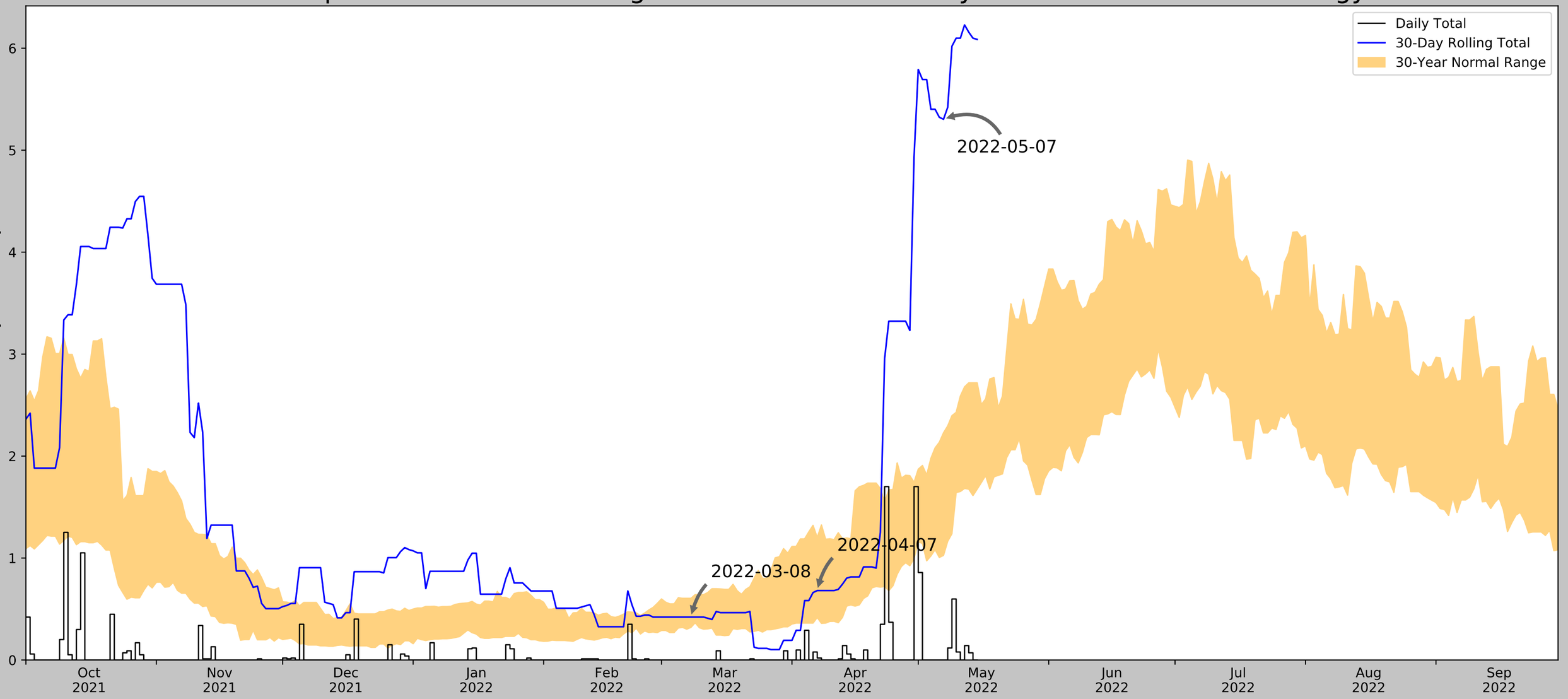
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-05-06	1.005906	2.135039	5.322835	Wet	3	3	9
2022-04-06	0.362205	1.320866	0.661417	Normal	2	2	4
2022-03-07	0.302362	0.605118	0.42126	Normal	2	1	2
Result							Wetter than Normal - 15

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	11221	89
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	8.932	16.732	4.169	17	0
WISHEK	46.2608, -99.56	2037.074	17.623	22.966	8.335	29	0
ARTAS 1S	45.8811, -99.7983	1814.961	23.16	199.147	15.034	77	0
HAGUE	46.025, -99.9911	1897.966	29.611	116.142	16.764	9	0
Linear Interpolation	N/A	N/A	N/A	N/A	N/A	0	1

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2022-05-07
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness (2022-04)
WebWIMP H_2O Balance	Dry Season

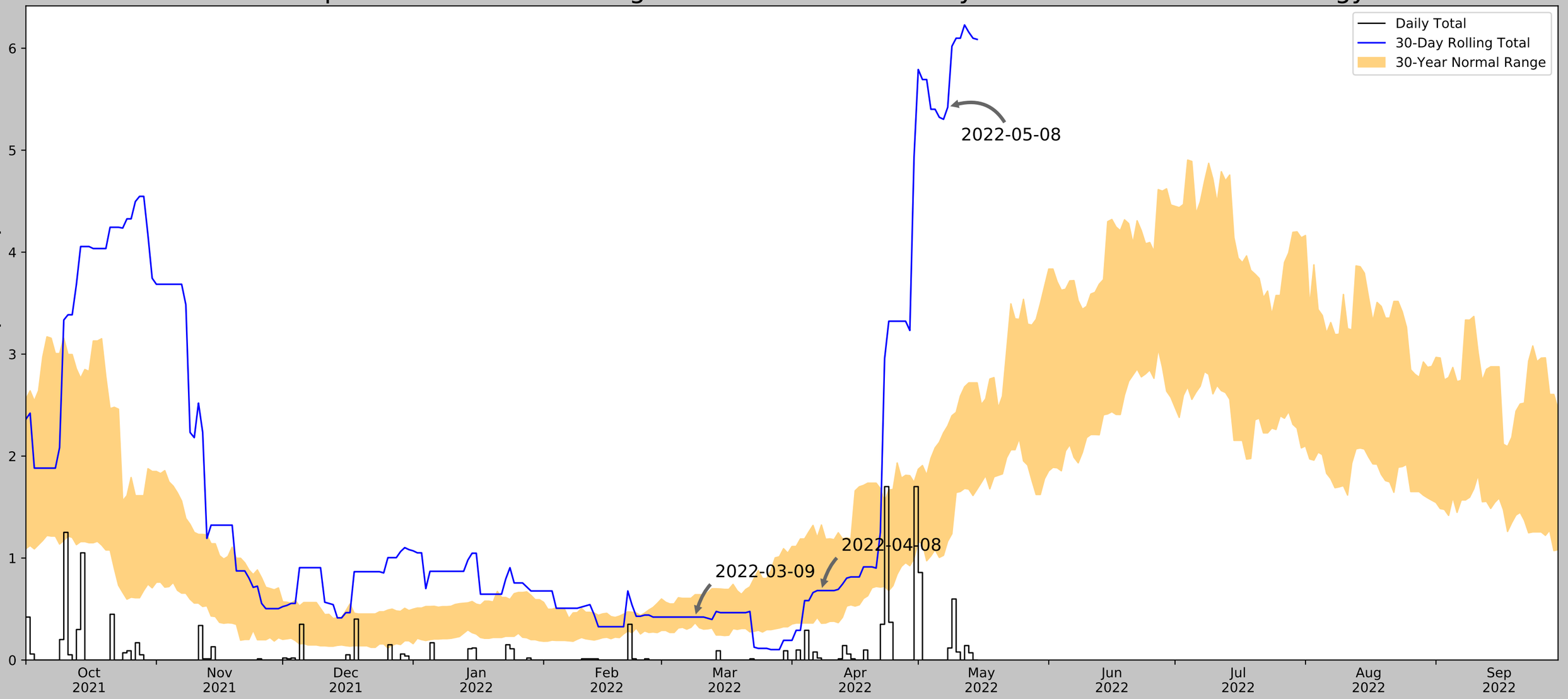
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-05-07	1.026378	2.228347	5.30315	Wet	3	3	9
2022-04-07	0.417323	1.201575	0.681102	Normal	2	2	4
2022-03-08	0.320079	0.605118	0.42126	Normal	2	1	2
Result							Wetter than Normal - 15

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	11221	89
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	8.932	16.732	4.169	17	0
WISHEK	46.2608, -99.56	2037.074	17.623	22.966	8.335	29	0
ARTAS 1S	45.8811, -99.7983	1814.961	23.16	199.147	15.034	77	0
HAGUE	46.025, -99.9911	1897.966	29.611	116.142	16.764	9	0
Linear Interpolation	N/A	N/A	N/A	N/A	N/A	0	1

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2022-05-08
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness (2022-04)
WebWIMP H_2O Balance	Dry Season

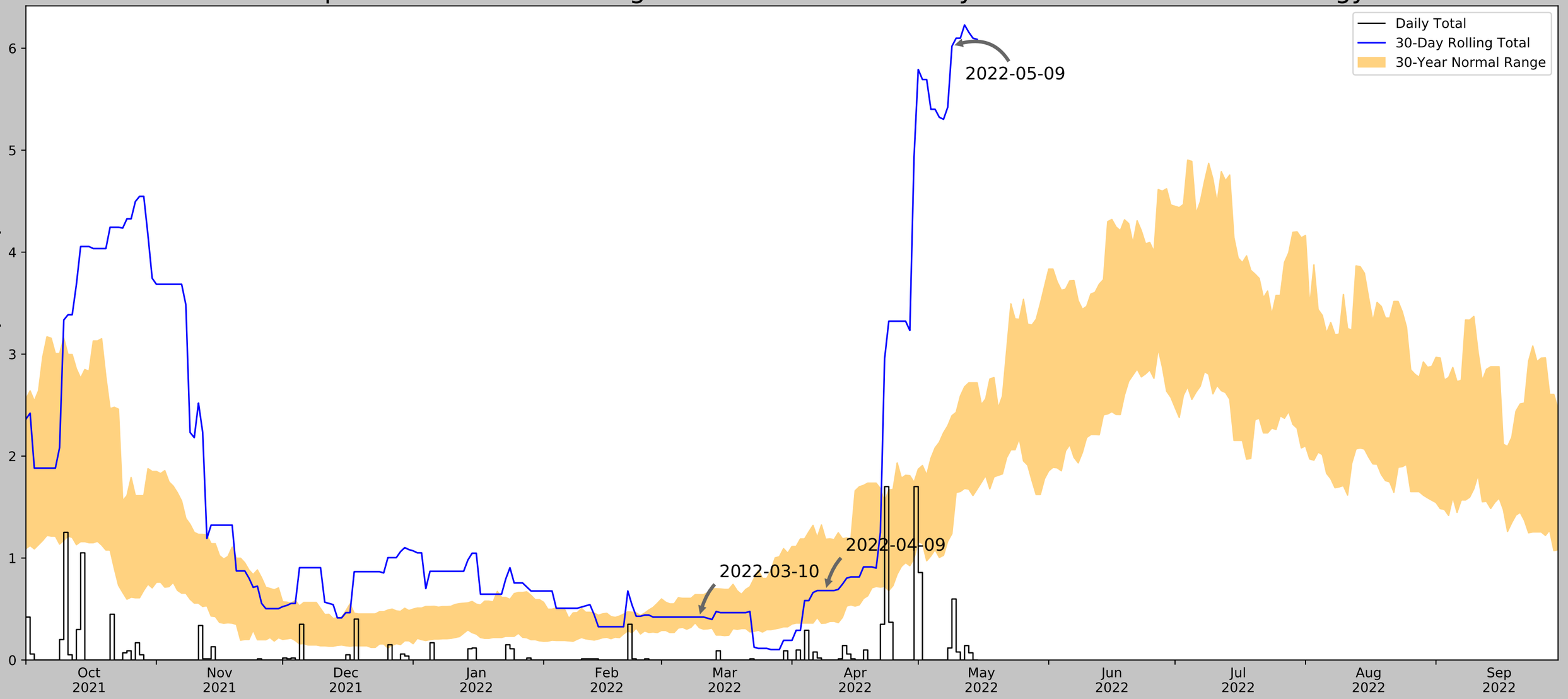
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-05-08	1.164961	2.296063	5.42126	Wet	3	3	9
2022-04-08	0.359843	1.324803	0.681102	Normal	2	2	4
2022-03-09	0.365354	0.641339	0.42126	Normal	2	1	2
Result							Wetter than Normal - 15

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	11221	89
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	8.932	16.732	4.169	17	0
WISHEK	46.2608, -99.56	2037.074	17.623	22.966	8.335	29	0
ARTAS 1S	45.8811, -99.7983	1814.961	23.16	199.147	15.034	77	0
HAGUE	46.025, -99.9911	1897.966	29.611	116.142	16.764	9	0
Linear Interpolation		N/A	N/A	N/A	N/A	0	1

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	46.287179, -99.600842
Observation Date	2022-05-09
Elevation (ft)	2030.69
Drought Index (PDSI)	Extreme wetness (2022-04)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-05-09	1.238583	2.396063	6.019685	Wet	3	3	9
2022-04-09	0.362205	1.184252	0.681102	Normal	2	2	4
2022-03-10	0.316535	0.641339	0.42126	Normal	2	1	2
Result							Wetter than Normal - 15

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ASHLEY	46.0406, -99.3742	2014.108	20.196	16.582	9.423	11221	89
ASHLEY 9.0 ENE	46.0651, -99.1913	2030.84	8.932	16.732	4.169	17	0
WISHEK	46.2608, -99.56	2037.074	17.623	22.966	8.335	29	0
ARTAS 1S	45.8811, -99.7983	1814.961	23.16	199.147	15.034	77	0
HAGUE	46.025, -99.9911	1897.966	29.611	116.142	16.764	9	0
Linear Interpolation		N/A	N/A	N/A	N/A	0	1

APPENDIX C

PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG

Photo #: 1 Date: 09/28/2021

Direction: North

General view of upland landscape in agricultural setting (soybean field).

46.306183, -99.529285

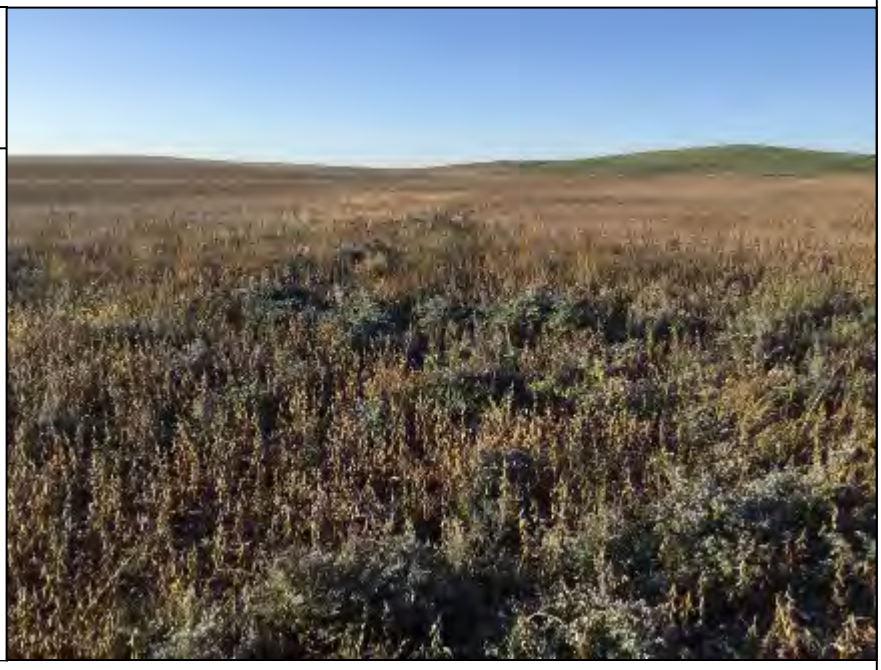


Photo #: 2 Date: 09/28/2021

Direction: North

General view of upland landscape within the Survey Area.

46.306183, -99.529285



PHOTOGRAPHIC LOG

Photo #: 3 Date: 08/26/2020



Photo of site conditions where flat topography was observed within the Project Area.

Photo #: 4 Date: 08/26/2020



Photo of site conditions in areas with gently rolling hills and agricultural fields within the Project Area.

PHOTOGRAPHIC LOG

Photo #: 5 Date: 08/26/2020



Photo of site conditions showing disturbed agricultural fields within the Project Area.

Photo #: 6 Date: 08/26/2020



Photo of site conditions showing general planted crop fields.

PHOTOGRAPHIC LOG

Photo #: 7 Date: 09/28/2021

Direction: West

Drainage feature dominated by upland grass species.

46.306915, -99.581883

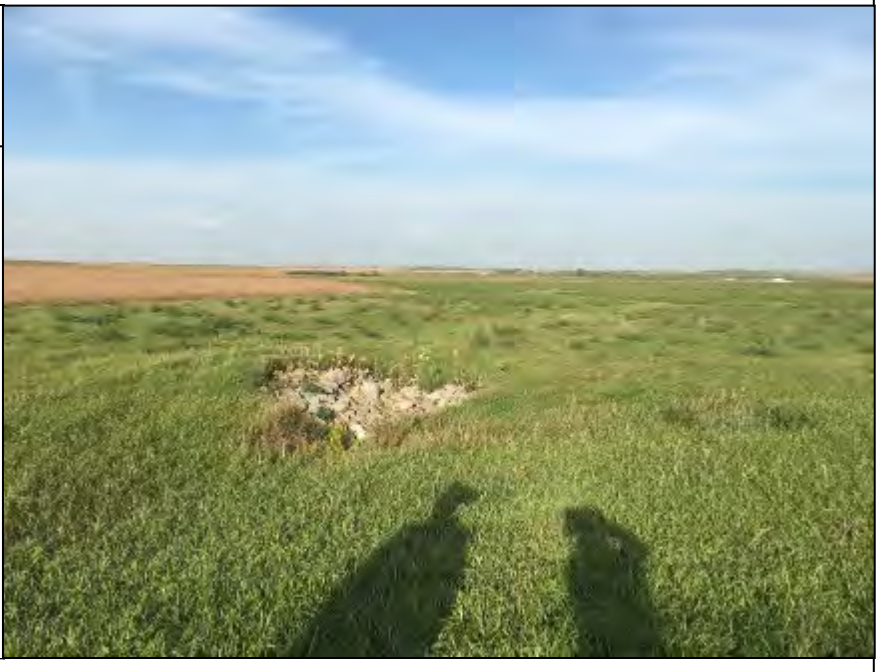


Photo #: 8 Date: 09/28/2021

Direction: Northwest

Upland swale in soybean field. No evidence of crop being stunted or stressed.

46.308651, -99.531390



PHOTOGRAPHIC LOG

Photo #: 9 Date: 09/28/2021

Direction: West

Upland swale; no watercourse present.

46.308457, -99.587015



Photo #: 10 Date: 09/28/2021

Direction: North

Dry farm pond.

46.352073, -99.522866



PHOTOGRAPHIC LOG

Photo #: 11 Date: 09/28/2021

Direction: North

Wetland A1 - PEM

46.352497, -99.515981



Photo #: 12 Date: 09/28/2021

Direction: North

Wetland A2 - PEM

46.359245, -99.518401



PHOTOGRAPHIC LOG

Photo #: 13 Date: 09/28/2021

Direction: West

Wetland A3 - PEM

46.354463, -99.529694



Photo #: 14 Date: 09/28/2021

Direction: West

Wetland A4 - PEM

46.354212, -99.530589



PHOTOGRAPHIC LOG

Photo #: 15 Date: 09/28/2021

Direction: East

Wetland A5 - PEM

46.328292, -99.530411



Photo #: 16 Date: 09/28/2021

Direction: North

Wetland A6 - PEM

46.322162, -99.522126



PHOTOGRAPHIC LOG

Photo #: 17 Date: 09/29/2021

Direction: East

Wetland B1 - PEM

46.328882, -99.602712



Photo #: 18 Date: 09/29/2021

Direction: East

Wetland B2 - PEM

46.336653, -99.602699



PHOTOGRAPHIC LOG

Photo #: 19 Date: 09/29/2021

Direction: Southeast

Wetland B3 - PEM

46.345664, -99.607884



Photo #: 20 Date: 09/29/2021

Direction: Southwest

Wetland B4 - PEM

46.353137, -99.623630



PHOTOGRAPHIC LOG

Photo #: 21 Date: 09/29/2021

Direction: West

Wetland B5 - PEM

46.374519, -99.647077



Photo #: 22 Date: 09/29/2021

Direction: Northeast

Wetland B6 - PEM

46.360928, -99.639066



PHOTOGRAPHIC LOG

Photo #: 23 Date: 09/29/2021

Direction: Southeast

Wetland C1 - PEM

46.344362, -99.607900



Photo #: 24 Date: 09/30/2021

Direction: East

Wetland D1 - PEM

46.309054, -99.594868



PHOTOGRAPHIC LOG

Photo #: 25 Date: 09/30/2021

Direction: South

Wetland D2 - PEM

46.294374, -99.630842



Photo #: 26 Date: 09/30/2021

Direction: Southwest

Wetland D3 - PEM

46.294374, -99.630842



PHOTOGRAPHIC LOG

Photo #: 27 Date: 09/30/2021

Direction: North

Wetland D7 - PEM

46.316423, -99.615988



Photo #: 28 Date: 09/30/2021

Direction: East

Wetland D8 - PEM

46.303393, -99.615542



PHOTOGRAPHIC LOG

Photo #: 29 Date: 09/30/2021

Direction: West

Wetland D9 - PEM

46.304598, -99.614361



Photo #: 30 Date: 10/01/2021

Direction: Northeast

Wetland E1 - PEM

46.283329, -99.519041



PHOTOGRAPHIC LOG

Photo #: 31 Date: 10/02/2021

Direction: South

Wetland F1 - PEM

46.326781, -99.512773



Photo #: 32 Date: 10/02/2021

Direction: Northwest

Wetland F2 - PEM

46.332902, -99.512234



PHOTOGRAPHIC LOG

Photo #: 33 Date: 10/02/2021

Direction: Northwest

Wetland F3 - PEM

46.339372, -99.510247

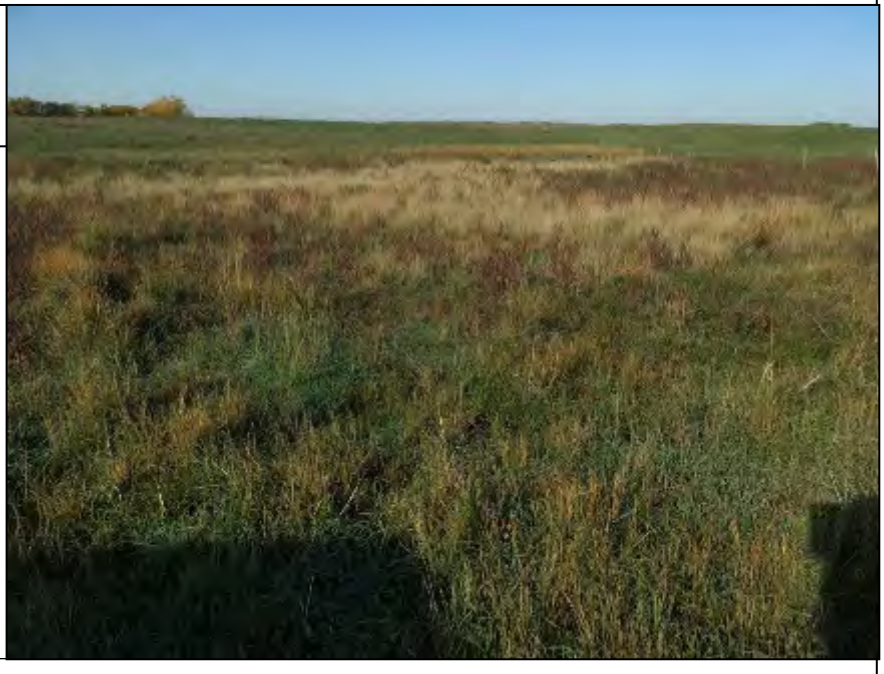


Photo #: 34 Date: 10/02/2021

Direction: West

Wetland F4 - PEM

46.344052, -99.507033



PHOTOGRAPHIC LOG

Photo #: 35 Date: 10/02/2021

Direction: Southeast

Wetland F5 - PEM

46.300280, -99.490455



Photo #: 36 Date: 10/02/2021

Direction: Northwest

Wetland F6 - PEM

46.300287, -99.490418



PHOTOGRAPHIC LOG

Photo #: 37 Date: 10/02/2021

Direction: Southeast

Wetland F7 - PEM

46.299415, -99.487635



Photo #: 38 Date: 10/02/2021

Direction: Southeast

Wetland F8 - PEM

46.306895, -99.502179



PHOTOGRAPHIC LOG

Photo #: 39 Date: 10/02/2021

Direction: Southwest

Wetland F9 - PEM

46.306059, -99.507123



Photo #: 40 Date: 10/02/2021

Direction: Northwest

Wetland F10 - PEM

46.307384, -99.509902



PHOTOGRAPHIC LOG

Photo #: 41 Date: 10/02/2021

Direction: South

Wetland F11 - PEM

46.297944, -99.500655



Photo #: 42 Date: 10/02/2021

Direction: South

Wetland F12 - PEM

46.290200, -99.532004



PHOTOGRAPHIC LOG

Photo #: 43 Date: 10/02/2021

Direction: North

Wetland F13 - PEM

46.289891, -99.550012



Photo #: 44 Date: 10/02/2021

Direction: North

Wetland F14 - PEM

46.300427, -99.519202



PHOTOGRAPHIC LOG

Photo #: 45 Date: 10/03/2021

Direction: South

Wetland G2 - PEM

46.299426, -99.539114



Photo #: 46 Date: 10/03/2021

Direction: Northeast

Wetland G3 - PEM

46.306253, -99.548801



PHOTOGRAPHIC LOG

Photo #: 47 Date: 10/03/2021

Direction: Southwest

Wetland G4 - PEM

46.300702, -99.552192



Photo #: 48 Date: 10/03/2021

Direction: Southwest

Wetland G7 - PEM

46.310028, -99.585185



PHOTOGRAPHIC LOG

Photo #: 49 Date: 10/03/2021

Direction: North

Wetland G8 - PEM

46.309467, -99.590383



Photo #: 50 Date: 10/03/2021

Direction: East

Wetland G9 - PEM

46.293163, -99.581179



PHOTOGRAPHIC LOG

Photo #: 51 Date: 10/03/2021

Direction: South

Wetland G10 - PEM

46.289575, -99.581686



Photo #: 52 Date: 10/03/2021

Direction: North

Wetland G11 - PEM

46.286152, -99.579393



PHOTOGRAPHIC LOG

Photo #: 53 Date: 5/09/2022

Direction: East

Wetland G12 - PEM

46.306584, -99.622834



Photo #: 54 Date: 5/03/2022

Direction: East

Wetland H1 - PEM

46.239383, -99.590778



PHOTOGRAPHIC LOG

Photo #: 55 Date: 5/03/2022

Direction: South

Wetland H2 - PEM

46.273783, -99.596996



Photo #: 56 Date: 5/04/2022

Direction: West

Wetland I1 - PEM

46.283102, -99.519404



PHOTOGRAPHIC LOG

Photo #: 57 Date: 5/04/2022

Direction: West

Wetland I2 - PEM

46.282481, -99.51868



Photo #: 58 Date:5/05/2022

Direction: West

Wetland J1 - PEM

46.29421, -99.495453



PHOTOGRAPHIC LOG

Photo #: 59 Date: 5/05/2022

Direction: North

Wetland J2 - PEM

46.300436, -99.504055



Photo #: 60 Date: 5/05/2022

Direction: East

Wetland J3 - PEM

46.330186, -99.520921



PHOTOGRAPHIC LOG

Photo #: 61 Date: 5/05/2022

Direction: South

Wetland J4 - PEM

46.328283, -99.520137



Photo #: 62 Date: 5/07/2022

Direction: East

Wetland K1 - PEM

46.283329, -99.519041



PHOTOGRAPHIC LOG

Photo #: 63 Date: 5/07/2022

Direction: South

Wetland K2 - PEM

46.339497, -99.507337

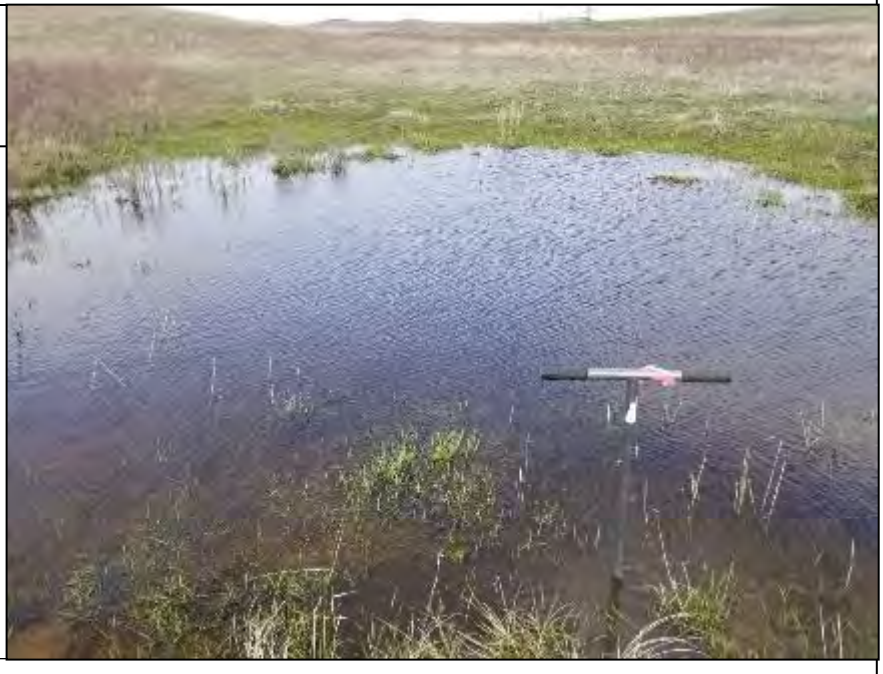


Photo #: 64 Date: 5/07/2022

Direction: East

Wetland K3 - PEM

46.339113, -99.508413



PHOTOGRAPHIC LOG

Photo #: 65 Date: 5/07/2022

Direction: South

Wetland K4 - PEM

46.335851, -99.509219



Photo #: 66 Date: 5/07/2022

Direction: West

Wetland K5 - PEM

46.334858, -99.507955



PHOTOGRAPHIC LOG

Photo #: 67 Date: 5/07/2022

Direction: North

Wetland K6 - PEM

46.333604, -99.511127



Photo #: 68 Date: 5/07/2022

Direction: West

Wetland K7 - PEM

46.333015, -99.511221



PHOTOGRAPHIC LOG

Photo #: 69 Date: 5/07/2022

Direction: South

Wetland K8 - PEM

46.331122, -99.516545



Photo #: 70 Date: 5/09/2022

Direction: Northeast

Wetland L1 - PEM

46.301373, -99.622128



PHOTOGRAPHIC LOG

Photo #: 71 Date: 08/26/2020



Wetland A1 (2020) - PEM

Photo #: 72 Date: 08/26/2020



Wetland A2 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 73 Date: 08/26/2020



Wetland A3 (2020) - PEM

Photo #: 74 Date: 08/26/2020



Wetland A4 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 75 Date: 08/27/2020



Wetland B1 (2020) - PEM

Photo #: 76 Date: 08/27/2020



Wetland B2 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 77 Date: 08/27/2020



Wetland B3 (2020)- PEM

Photo #: 78 Date: 08/27/2020



Wetland B4 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 79 Date: 08/27/2020



Wetland B5 (2020) - PEM

Photo #: 80 Date: 08/28/2020



Wetland C1 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 81 Date: 08/29/2020



Wetland C2 (2020) - PEM

Photo #: 82 Date: 08/29/2020



Wetland C3 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 83 Date: 08/29/2020



Wetland C4 (2020) - PEM

Photo #: 84 Date: 08/29/2020



Wetland D1 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 85 Date: 08/29/2020



Wetland D2 (2020) - PEM

Photo #: 86 Date: 08/29/2020



Wetland D3 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 87 Date: 08/29/2020



Wetland D4 (2020) - PEM

Photo #: 88 Date: 08/29/2020



Wetland D5 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 89 Date: 08/29/2020



Wetland D6 (2020) - PEM

Photo #: 90 Date: 08/29/2020



Wetland D7 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 91 Date: 08/29/2020



Wetland D8 (2020) - PEM

Photo #: 92 Date: 08/29/2020



Wetland D9 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 93 Date: 08/29/2020



Wetland D10 (2020) - PEM

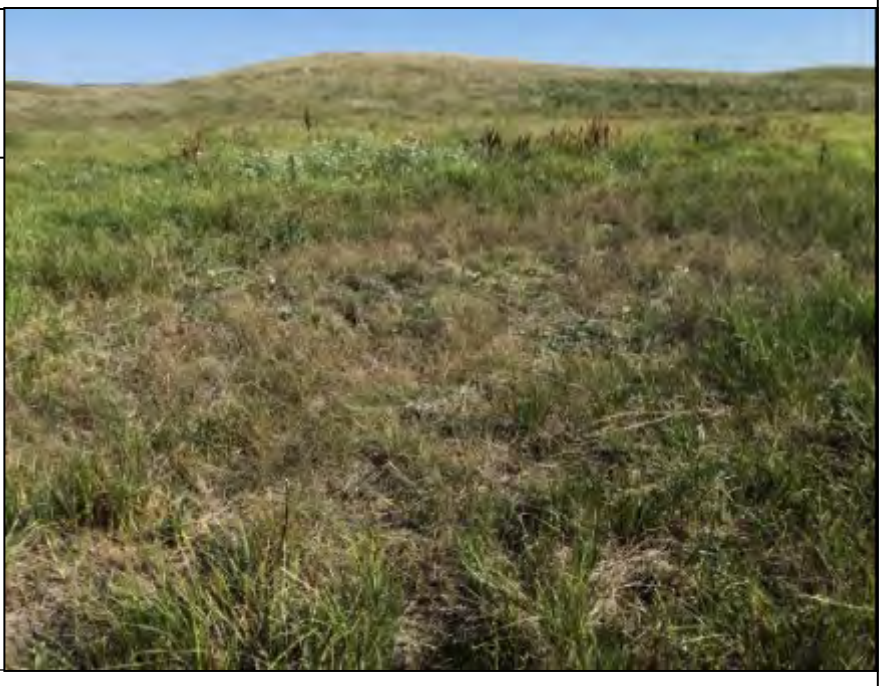
Photo #: 94 Date: 08/29/2020



Wetland D11 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 95 Date: 08/29/2020



Wetland D12 (2020) - PEM

Photo #: 96 Date: 08/29/2020



Wetland D13 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 97 Date: 08/30/2020



Wetland E1 (2020) - PEM

Photo #: 98 Date: 08/30/2020



Wetland E2 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 99 Date: 08/30/2020



Wetland E3 (2020) - PEM

Photo #: 100 Date: 08/30/2020



Wetland E4 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 101 Date: 08/30/2020



Wetland E5 (2020) - PEM

Photo #: 102 Date: 08/30/2020



Wetland E7 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 103 Date: 08/30/2020



Wetland E8 (2020) - PEM

Photo #: 104 Date: 08/30/2020



Wetland E9 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 105 Date: 08/30/2020



Wetland E10 (2020) – PEM – Dyked/impounded inundated wetland

Photo #: 106 Date: 08/30/2020



Wetland E11 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 107 Date: 08/30/2020



Wetland E12 (2020) - PEM

Photo #: 108 Date: 08/30/2020



Wetland E13 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 109 Date: 08/30/2020



Wetland E14 (2020) - PEM

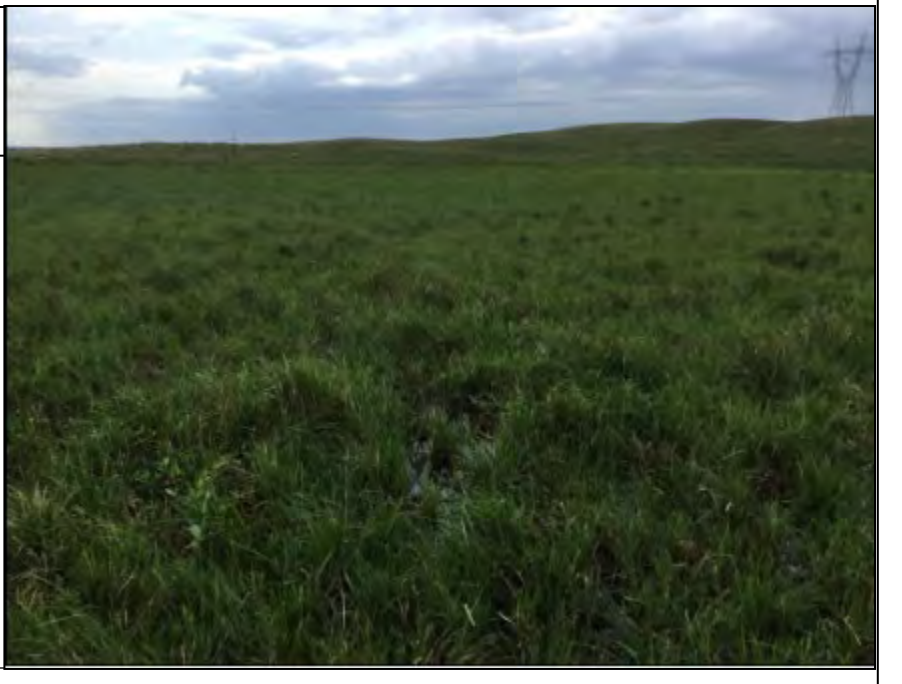
Photo #: 110 Date: 08/30/2020



Wetland E15(2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 111 Date: 08/30/2020



Wetland E16 (2020) - PEM

Photo #: 112 Date: 08/30/2020



Wetland E17 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 113 Date: 08/30/2020



Wetland E18 (2020) - PEM

Photo #: 114 Date: 08/30/2020



Wetland E19 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 115 Date: 08/30/2020



Wetland E20 (2020) - PEM

Photo #: 116 Date: 08/30/2020



Wetland E21(2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 117 Date: 08/30/2020



Wetland E22 (2020) - PEM

Photo #: 118 Date: 08/31/2020



Wetland F1 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 119 Date: 08/31/2020



Wetland F2 (2020) - PEM

Photo #: 120 Date: 08/31/2020



Wetland F3 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 121 Date: 08/31/2020



Wetland F5 (2020) - PEM

Photo #: 122 Date: 08/31/2020



Wetland F6 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 123 Date: 08/31/2020



Wetland F7 (2020) - PEM

Photo #: 124 Date: 08/31/2020



Wetland F8 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 125 Date: 08/31/2020



Wetland F9 (2020) - PEM

Photo #: 126 Date: 08/31/2020



Wetland F10 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 127 Date: 08/31/2020



Wetland F11 (2020) - PEM

Photo #: 128 Date: 09/01/2020



Wetland G1 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 129 Date: 09/01/2020



Wetland G2 (2020) - PEM

Photo #: 130 Date: 09/01/2020



Wetland G3 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 131 Date: 09/01/2020



Wetland G4 (2020) - PEM

Photo #: 132 Date: 09/01/2020



Wetland G5 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 133 Date: 09/01/2020



Wetland G6 (2020) - PEM

Photo #: 134 Date: 09/01/2020



Wetland G7 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 135 Date: 09/01/2020



Wetland G8 (2020) - PEM

Photo #: 136 Date: 09/01/2020



Wetland G9 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 137 Date: 09/01/2020



Wetland G10 (2020) - PEM

Photo #: 138 Date: 09/01/2020



Wetland G11 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 139 Date: 09/01/2020



Wetland G12 (2020) - PEM

Photo #: 140 Date: 09/01/2020



Wetland G13 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 141 Date: 09/01/2020



Wetland G14 (2020) - PEM

Photo #: 142 Date: 09/01/2020



Wetland G15 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 143 Date: 09/01/2020



Wetland G16 (2020) - PEM

Photo #: 144 Date: 09/01/2020



Wetland G17 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 145 Date: 09/01/2020



Wetland G16 (2020) - PEM

Photo #: 146 Date: 09/01/2020



Wetland G17 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 147 Date: 09/02/2020



Wetland H1 (2020) - PEM

Photo #: 148 Date: 09/02/2020



Wetland H2 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 149 Date: 09/02/2020



Wetland H3 (2020) - PEM

Photo #: 150 Date: 09/02/2020



Wetland H4 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 151 Date: 09/02/2020



Wetland H5 2020) - PEM

Photo #: 152 Date: 09/02/2020



Wetland H6 2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 153 Date: 09/02/2020



Wetland H7 (2020) - PEM

Photo #: 154 Date: 09/02/2020



Wetland H8 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 155 Date: 09/02/2020



Wetland H9 (2020) - PEM

Photo #: 156 Date: 09/03/2020



Wetland I1 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 157 Date: 09/03/2020



Wetland I2 (2020) - PEM

Photo #: 158 Date: 09/03/2020



Wetland I3 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 159 Date: 09/03/2020



Wetland I4 (2020) - PEM

Photo #: 160 Date: 09/03/2020



Wetland I5 (2020) - PEM

PHOTOGRAPHIC LOG

Photo #: 161 Date: 08/29/2020



Watercourse D1 (2020)

Photo #: 162 Date: 08/30/2020



Watercourse E1 (2020)

PHOTOGRAPHIC LOG

Photo #: 163 Date: 09/30/2021

Direction: East

Watercourse D1

46.309054, -99.594868



Photo #: 164 Date: 10/01/2021

Direction: Southwest

Watercourse E1

46.290758, -99.511861



PHOTOGRAPHIC LOG

Photo #: 165 Date: 10/02/2021

Direction: South

Waterbody F1

46.307470, -99.509272



Photo #: 166 Date: 10/03/2021

Direction: Southwest

Waterbody G1

46.303352, -99.538949



PHOTOGRAPHIC LOG

Photo #: 167 Date: 09/02/2020



Watercourse H1 (2020)

Photo #: 168 Date: 09/02/2020



Watercourse H2 (2020)

PHOTOGRAPHIC LOG

Photo #: 169 Date: 10/03/2021

Direction: East

Watercourse G1

46.283920, -99.590681



Photo #: 170 Date: 09/29/2021

Direction: South

Waterbody B1

46.344988, -99.607603



APPENDIX D

WETLAND DETERMINATION FORMS

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-28

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A1

Investigator(s): David Nigro - Atwell, LLC Section, Township, Range: 8, 133N, 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.3525051 Long: -99.5160204 Datum: WGS 84

Soil Map Unit Name: Hamerly loam, 0 to 3 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Palustrine emergent (PEM) wetland located along a drainage swale. Northern portion of wetland is mowed and hayed by landowner. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Rumex crispus	30	✓	FAC
2. Leersia oryzoides	25	✓	OBL
3. Phalaris arundinacea	20	✓	FACW
4. Echinochloa muricata	15		FACW
5. Bromus inermis	5		UPL
6. Typha angustifolia	5		OBL
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	35	x 2 =	70
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	5	x 5 =	25
Column Totals:	100 (A)		215 (B)

Prevalence Index = B/A = 2.15

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL A1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 2/1	100					Sandy Loam	
8 - 14	10YR 2/1	50	10YR 3/2	50	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ✓ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-28

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A1 Upland

Investigator(s): David Nigro - Atwell, LLC Section, Township, Range: 8, 133N, 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.3525402 Long: -99.5159619 Datum: WGS 84

Soil Map Unit Name: Hamerly loam, 0 to 3 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Area is representative of uplands adjacent to wetland A1. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	100	✓	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	100	x 5 =	500
Column Totals:	100 (A)		500 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL A1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-28

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A2

Investigator(s): David Nigro - Atwell, LLC Section, Township, Range: 5, 133N, 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.3592621 Long: -99.5184071 Datum: WGS 84

Soil Map Unit Name: Vallers loam, 0 to 1 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Salix interior	15	✓	FACW
2. Salix bebbiana	10	✓	FACW
3.			
4.			
5.			
	25% = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Typha sp.	70	✓	FACW
2. Urtica dioica	10		FAC
3. Solidago gigantea	5		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	95	x 2 =	190
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	110 (A)		235 (B)

Prevalence Index = B/A = 2.14

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL A2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 3/2	100					Silt Loam	
3 - 7	10YR 3/1	60	2.5Y 7/1	38	RM	M	Silty Clay Loam	
-			7.5YR 5/8	2	C	M	Silty Clay Loam	
7 - 12	2.5Y 7/1	70	7.5YR 5/8	30	C	M	Silty Clay Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ✓ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 3

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-28

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A2 Upland

Investigator(s): David Nigro - Atwell, LLC Section, Township, Range: 5, 133N, 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.3591924 Long: -99.5184036 Datum: WGS 84

Soil Map Unit Name: Vallers loam, 0 to 1 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Area is representative of uplands adjacent to wetland A2. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	15	✓	UPL
2. Solidago nemoralis	15	✓	
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	15	x 5 =	75
Column Totals:	15 (A)		75 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

70% bare ground.

SOIL

Sampling Point: WL A2 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 3/2	100					Loamy Sand	
8 - 12	10YR 5/6	100					Sand	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-28

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A3

Investigator(s): David Nigro - Atwell, LLC Section, Township, Range: 6, 133N, 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.3544546 Long: -99.5297362 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 0 to 3 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area is classified as a palustrine emergent (PEM) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			FAC
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Rumex crispus	50	✓	FAC
2. Leersia oryzoides	35	✓	OBL
3. Amaranthus viridis	10		FAC
4. Artemisia absinthium	5		
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		215 (B)

Prevalence Index = B/A = 2.26

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL A3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 3/2	100					Silt Loam	
3 - 12	10YR 3/2	60	10YR 3/1	38	C	M	Silt Loam	
-			10YR 4/6	2	C	M	Silt Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ✓ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-28

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A3 Upland

Investigator(s): David Nigro - Atwell, LC Section, Township, Range: 6, 133N, 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.3544422 Long: -99.529694 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 0 to 3 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Area is representative of uplands adjacent to wetland A3. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	80	✓	UPL
2. Amaranthus viridis	8		FAC
3. Glycyrrhiza lepidota	5		FACU
4. Rumex crispus	5		FAC
5. Artemisia absinthium	2		
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	13	x 3 =	39
FACU species	5	x 4 =	20
UPL species	80	x 5 =	400
Column Totals:	98 (A)		459 (B)

Prevalence Index = B/A = 4.68

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL A3 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 4/3	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-28

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A4

Investigator(s): David Nigro - Atwell, LLC Section, Township, Range: 6, 133N, 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.3541562 Long: -99.5306893 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 0 to 3 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area is classified as a palustrine emergent (PEM) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5ft r)			
1. Rumex crispus	50	✓	FAC
2. Leersia oryzoides	35	✓	OBL
3. Amaranthus viridis	10		FAC
4. Artemisia absinthium	5		
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		215 (B)

Prevalence Index = B/A = 2.26

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL A4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 3/2	100					Silt Loam	
3 - 12	10YR 3/2	60	10YR 3/1	38	C	M	Silt Loam	
-			10YR 4/6	2	C	M	Silt Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-18

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A4 Upland

Investigator(s): David Nigro - Atwell, LC Section, Township, Range: 6, 133N, 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.3544422 Long: -99.529694 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 0 to 3 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Area is representative of uplands adjacent to wetland A3. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	80	✓	UPL
2. Amaranthus viridis	8		FAC
3. Glycyrrhiza lepidota	5		FACU
4. Rumex crispus	5		FAC
5. Artemisia absinthium	2		
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	13	x 3 =	39
FACU species	5	x 4 =	20
UPL species	80	x 5 =	400
Column Totals:	98 (A)		459 (B)

Prevalence Index = B/A = 4.68

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL A4 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 4/3	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-28

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A5

Investigator(s): David Nigro - Atwell, LLC Section, Township, Range: 18, 133N, 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.328334 Long: -99.5303426 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area is classified as a palustrine emergent (PEM) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Phalaris arundinacea	85	✓	FACW
2. Rumex crispus	15		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	85	x 2 =	170
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		215 (B)

Prevalence Index = B/A = 2.15

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL A5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/1	85	10YR 5/8	15	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-28

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A5 Upland

Investigator(s): David Nigro - Atwell, LLC Section, Township, Range: 18, 133N, 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.3281660 Long: -99.5303770 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Area is representative of uplands adjacent to wetland A5. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	80	✓	UPL
2. Amaranthus viridis	8		FAC
3. Glycyrrhiza lepidota	5		FACU
4. Rumex crispus	5		FAC
5. Artemisia absinthium	2		
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	13	x 3 =	39
FACU species	5	x 4 =	20
UPL species	80	x 5 =	400
Column Totals:	98 (A)		459 (B)

Prevalence Index = B/A = 4.68

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL A5 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 4/3	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-28

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A6

Investigator(s): David Nigro - Atwell, LLC. Section, Township, Range: 19, 133N, 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.3222910 Long: -99.5223064 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area is classified as a palustrine emergent (PEM) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Rumex crispus	40	✓	FAC
2. Echinochloa muricata	20	✓	FACW
3. Poa pratensis	10		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	40	x 3 =	120
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	70 (A)		200 (B)

Prevalence Index = B/A = 2.86

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

30% bare ground. Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL A6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 2/1	90	10YR 4/4	10	C	M	Sandy Loam	
12 - 18	10YR 2/1	90	10YR 4/6	10	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-28

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL A6 Upland

Investigator(s): David Nigro - Atwell, LLC Section, Township, Range: 19, 133N, 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): F 53B Lat: 46.3222546 Long: -99.5220845 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Area is representative of uplands adjacent to wetland A6. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Artemisia absinthium	85	✓	
2. Sporobolus heterolepis	15		UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NaN (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	15	x 5 =	75
Column Totals:	15 (A)		75 (B)

Prevalence Index = B/A = 5.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL A6 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 4/2	100					Sand	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B1

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 15, 133N, 71W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3288101 Long: -99.6025956 Datum: WGS 84

Soil Map Unit Name: Arnegard loam, 2 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Leersia oryzoides	75	✓	OBL
2. Erigeron glabellus	10		FACW
3. Bromus inermis	5		FACU
4. Scirpus cyperinus	5		OBL
5. Rumex crispus	3		FAC
6. Sonchus oleraceus	2		FACU
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species	10	x 2 =	20
FAC species	3	x 3 =	9
FACU species	7	x 4 =	28
UPL species	0	x 5 =	0
Column Totals:	100 (A)		137 (B)

Prevalence Index = B/A = 1.37

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL B1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/2	95	10YR 4/6	5	C	M	Clay Loam	
6 - 12	10YR 2/1	85	10YR 4/6	10	C	M	Clay Loam	
-			10YR 3/3	5	C	M	Clay Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B1 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz - Atwell, LLC Section, Township, Range: 15, 133N, 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 2 Lat: 46.3288359 Long: -99.6025520 Datum: WGS 84

Soil Map Unit Name: Arnegard loam, 2 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland B1. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	90	✓	FACU
2. Sonchus oleraceus	5		FACU
3. Artemisia absinthium	2		
4. Poa pratensis	2		FAC
5. Asclepias syriaca	1		FACU
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	2	x 3 =	6
FACU species	96	x 4 =	384
UPL species	0	x 5 =	0
Column Totals:	98 (A)		390 (B)

Prevalence Index = B/A = 3.98

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL B1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B2

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 15, 133N, 71W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3364194 Long: -99.6023541 Datum: WGS 84

Soil Map Unit Name: Cohagen-Vebar-Parshall fine sandy loams, 9 to 35 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMC) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Leersia oryzoides	45	✓	OBL
2. Typha angustifolia	45	✓	OBL
3. Scirpus atrovirens	4		OBL
4. Erigeron glabellus	3		FACW
5. Scirpus cyperinus	3		OBL
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	97	x 1 =	97
FACW species	3	x 2 =	6
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		103 (B)

Prevalence Index = B/A = 1.03

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL B2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 2	10YR 3/2	100					Muck	
2 - 6	10YR 2/1	100					Muck	
6 - 8	5GY 4/	100					Muck	
8 - 18	10YR 2/2	80	5GY 4/	20	C	M	Muck	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ✓ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 0

Water Table Present? Yes ✓ No _____ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B2 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz - Atwell, LLC Section, Township, Range: 15, 133N, 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 2 Lat: 46.3366010 Long: -99.6024125 Datum: WGS 84

Soil Map Unit Name: Cohagen-Vebar-Parshall fine sandy loams, 9 to 35 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland B2. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	40	✓	FAC
2. Bromus inermis	20	✓	FACU
3. Solidago nemoralis	10		
4. Trifolium repens	10		FACU
5. Dalea purpurea	5		
6. Erigeron canadensis	5		FACU
7. Melilotus officinalis	5		FACU
8. Taraxacum officinale	5		FACU
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	85 (A)		300 (B)

Prevalence Index = B/A = 3.53

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL B2 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B3

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 9, 133N, 71W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.3456875 Long: -99.6078719 Datum: WGS 84

Soil Map Unit Name: Wabek-Lehr-Appam complex, 9 to 25 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMC) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Eleocharis acicularis	30	✓	OBL
2. Leersia oryzoides	25	✓	OBL
3. Rumex crispus	5		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	55	x 1 =	55
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	60 (A)		70 (B)

Prevalence Index = B/A = 1.17

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

40% bare soils. Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL B3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 3/1	100					Silty Clay Loam	
3 - 8	10YR 3/1	95	7.5YR 4/4	5	C	M	Silty Clay Loam	
8 - 12	10YR 3/1	90	7.5YR 4/4	10	C	M	Silty Clay Loam	
12 - 16	10YR 3/2	80	7.5YR 4/4	20	C	M	Silty Clay Loam	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B3 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz - Atwell, LLC Section, Township, Range: 9, 133N, 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 2 Lat: 46.3456399 Long: -99.6078039 Datum: WGS 84

Soil Map Unit Name: Amor-Werner-Farnuf loams, 6 to 9 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland B3. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	60	✓	FACU
2. Erigeron canadensis	20	✓	FACU
3. Trifolium repens	20	✓	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL B3 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/3	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B4

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 9, 133N, 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.3533134 Long: -99.6237434 Datum: WGS 84

Soil Map Unit Name: Arnegard loam, 0 to 2 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMC) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Leersia oryzoides	75	✓	OBL
2. Calamagrostis canadensis	5		OBL
3. Rumex crispus	2		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	82% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species	0	x 2 =	0
FAC species	2	x 3 =	6
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	82 (A)		86 (B)

Prevalence Index = B/A = 1.05

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

18% bare ground present. Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL B4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 4	10YR 2/2	98	10YR 4/6	2	C	M	Sandy Clay Loam	
4 - 12	10YR 2/2	90	10YR 4/6	10	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ✓ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ✓ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ✓ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B4 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 9, 133N, 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.3532778 Long: -99.6236300 Datum: WGS 84

Soil Map Unit Name: Arnegard loam, 2 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland B4. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Schizachyrium scoparium	70	✓	FACU
2. Bromus inermis	20	✓	FACU
3. Artemisia absinthium	5		
4. Asclepias syriaca	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	95	x 4 =	380
UPL species	0	x 5 =	0
Column Totals:	95 (A)		380 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL B4 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/3	100					Silt Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B5

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 31, 134N, 71W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-2 Lat: 46.3740524 Long: -99.6470362 Datum: WGS 84

Soil Map Unit Name: Arnegard loam, 2 to 6 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Typha angustifolia	65	✓	OBL
2. Leersia oryzoides	20	✓	OBL
3. Eleocharis palustris	8		OBL
4. Asclepias incarnata	4		OBL
5. Rumex crispus	3		FAC
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	97	x 1 =	97
FACW species	0	x 2 =	0
FAC species	3	x 3 =	9
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		106 (B)

Prevalence Index = B/A = 1.06

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

40% bare soils. Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL B5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/1	100					Silty Clay Loam	
6 - 8	10YR 2/1	90	10YR 4/4	10	C	M	Sandy Clay Loam	
8 - 12	10G 2/1	60	10YR 4/4	10	C	M	Silty Clay Loam	
-			N 2.5/	30	D	M	Sandy Clay Loam	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ✓ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B5 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 31 134N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.3740847 Long: -99.6470217 Datum: WGS 84

Soil Map Unit Name: Amor-Werner loams, 3 to 6 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✓ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland B5. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	85	✓	FACU
2. Melilotus officinalis	3		FACU
3. Trifolium repens	3		FACU
4. Ambrosia artemisiifolia	2		FACU
5. Asclepias syriaca	2		FACU
6. Medicago sativa	2		FACU
7. Sonchus oleraceus	2		FACU
8. Erigeron lonchophyllus	1		FACW
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	1	x 2 =	2
FAC species	0	x 3 =	0
FACU species	99	x 4 =	396
UPL species	0	x 5 =	0
Column Totals:	100 (A)		398 (B)

Prevalence Index = B/A = 3.98

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL B5 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 12	10YR 4/1	100					Sandy Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B6

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 5 133N 71W

Landform (hillslope, terrace, etc.): Ditch Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.3102813 Long: -99.63910423 Datum: WGS 84

Soil Map Unit Name: Reeder-Farnuf loams, 3 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Setaria pumila	60	✓	FAC
2. Persicaria maculosa	30	✓	FACW
3. Hordeum jubatum	5		FAC
4. Typha angustifolia	5		OBL
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	30	x 2 =	60
FAC species	65	x 3 =	195
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		260 (B)

Prevalence Index = B/A = 2.60

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL B6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 2/1	100					Sandy Clay Loam	
3 - 8	10YR 2/1	90	10YR 4/6	10	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ✓ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ✓ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL B6 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 5 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 2 Lat: 46.3103239 Long: -99.63900799 Datum: WGS 84

Soil Map Unit Name: Reeder-Farnuf loams, 3 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✓ (If no, explain in Remarks.)

Are Vegetation ✓, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland B6. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Zea mays	80	✓	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	80	x 5 =	400
Column Totals:	80 (A)		400 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

Data point is located in agricultural field. 20% bare soils present.

SOIL

Sampling Point: WL B6 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 10	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL C1

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 9 133N 71W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.34431673 Long: -99.60792091 Datum: WGS 84

Soil Map Unit Name: Amor-Werner-Farnuf loams, 6 to 9 percent slopes NWI classification: PABFx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Eleocharis acicularis	30	✓	OBL
2. Leersia oryzoides	25	✓	OBL
3. Rumex crispus	5		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	55	x 1 =	55
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	60 (A)		70 (B)

Prevalence Index = B/A = 1.17

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

40% bare soils present. Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL C1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 3/1	100					Silty Clay Loam	
3 - 8	10YR 3/1	95	7.5YR 4/4	5	C	M	Silty Clay Loam	
8 - 12	10YR 3/1	90	7.5YR 4/4	10	C	M	Silty Clay Loam	
12 - 16	10YR 3/2	80	7.5YR 4/4	20	C	M	Silty Clay Loam	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-29

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL C1 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz - Atwell, LLC Section, Township, Range: 9 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 2 Lat: 46.3443791 Long: -99.6078427 Datum: WGS 84

Soil Map Unit Name: Amor-Werner-Farnuf loas, 6 to 9 percent slopes NWI classification: PABFx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland C1. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	60	✓	FACU
2. Erigeron canadensis	20	✓	FACU
3. Trifolium repens	20	✓	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL C1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 12	10YR 3/3	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D1

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 36, 133N, 72W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.2859898 Long: -99.6682404 Datum: WGS 84

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area is classified as a palustrine emergent (PEMC) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Typha angustifolia	15	✓	OBL
2. Elymus virginicus	10	✓	FACW
3. Leersia oryzoides	3		OBL
4. Equisetum arvense	1		FAC
5. Rumex crispus	1		FAC
6.			
7.			
8.			
9.			
10.			
	30% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	18	x 1 =	18
FACW species	10	x 2 =	20
FAC species	2	x 3 =	6
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	30 (A)		44 (B)

Prevalence Index = B/A = 1.47

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

70% open water. Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL D1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 5	10YR 2/1	85	10YR 4/4	15	C	PL / M	Silt Loam	
5 - 12	10YR 2/2	100					Silt Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ✓ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 6

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D1 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 36 133N 72W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 46.2860110 Long: -99.6682262 Datum: WGS 84

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland D1. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	70	✓	FACU
2. Elymus virginicus	15		FACW
3. Trifolium repens	10		FACU
4. Taraxacum officinale	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	0	x 3 =	0
FACU species	85	x 4 =	340
UPL species	0	x 5 =	0
Column Totals:	100 (A)		370 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL D1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10R 3/2	100					Silt Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D2

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 36 133N 72W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.2864706 Long: -99.6721581 Datum: WGS 84

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMC) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Typha angustifolia	65	✓	OBL
2. Leersia oryzoides	15		OBL
3. Eleocharis palustris	10		OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		90 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

10% open water present. Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL D2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 5	10YR 2/1	85	10YR 4/4	15	C	PL / M	Silt Loam	
5 - 12	10YR 2/2	100					Silt Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 3

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D2 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 36 133N 72W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.2858913 Long: -99.6669364 Datum: WGS 84

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland D2. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	70	✓	FACU
2. Elymus virginicus	15		FACW
3. Trifolium repens	10		FACU
4. Taraxacum officinale	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	0	x 3 =	0
FACU species	85	x 4 =	340
UPL species	0	x 5 =	0
Column Totals:	100 (A)		370 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL D2 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10R 3/2	100					Silt Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D3

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 32, 133N, 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 3 Lat: 46.2897253 Long: -99.6403711 Datum: WGS 84

Soil Map Unit Name: Harriet-Regan-Stirum complex, 0 to 2 percent slopes, occasionally flooded NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Leersia oryzoides	80	✓	OBL
2. Eleocharis palustris	10		OBL
3. Rumex crispus	5		FAC
4. Typha angustifolia	3		OBL
5. Erigeron glabellus	2		FACW
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	93	x 1 =	93
FACW species	2	x 2 =	4
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		112 (B)

Prevalence Index = B/A = 1.12

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL D3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 3/2	100					Silt Loam	
3 - 9	10YR 2/2	100					Silt Loam	
9 - 16	5GY 4/	75	10YR 5/6	25			Silt Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ✓ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 6

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D3 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 32, 133N, 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.2897269 Long: -99.6404393 Datum: WGS 84

Soil Map Unit Name: Harriet-Regan-Stirum complex, 0 to 2 percent slopes, occasionally flooded NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland D3. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	100	✓	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL D3 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Silt Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D4

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 32, 133N, 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.2943715 Long: -99.6307909 Datum: WGS 84

Soil Map Unit Name: Bowdle-Lehr loams, 0 to 2 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEM) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Schoenoplectus tabernaemontani	50	✓	OBL
2. Scirpus cyperinus	15	✓	OBL
3. Carex vulpinoidea	10		FACW
4. Hordeum jubatum	10		FAC
5. Agrostis stolonifera	5		FACW
6. Leonurus cardiaca	5		
7. Rumex crispus	3		FAC
8. Typha angustifolia	2		OBL
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	67	x 1 =	67
FACW species	15	x 2 =	30
FAC species	13	x 3 =	39
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		136 (B)

Prevalence Index = B/A = 1.43

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL D4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 2/1	98	5G 4/	2	C	M	Silt Loam	
8 - 12	10YR 2/1	90	10YR 6/4	10	C	PL / M	Silt Loam	
12 - 16	10YR 4/3	100					Silt Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 6

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D4 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 32 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.2943455 Long: -99.6308571 Datum: WGS 84

Soil Map Unit Name: Bowdle-Lehr loams, 2 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland D4. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Hordeum jubatum	85	✓	FAC
2. Leonurus cardiaca	10		
3. Setaria pumila	3		FAC
4. Erigeron canadensis	2		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	88	x 3 =	264
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	90 (A)		272 (B)

Prevalence Index = B/A = 3.02

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL D4 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project | City/County: Logan | Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC | State: North Dakota | Sampling Point: WL D5

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC | Section, Township, Range: 33, 133N, 71W

Landform (hillslope, terrace, etc.): Basin | Local relief (concave, convex, none): Concave

Slope (%): 2 | Lat: 46.2841399 | Long: -99.6163922 | Datum: WGS 84

Soil Map Unit Name: Reeder-Arnegard loams, 3 to 6 percent slopes | NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Typha angustifolia	60	✓	OBL
2. Cannabis sativa	15		
3. Cirsium arvense	5		FACU
4. Hieracium caespitosum	5		
5. Rumex crispus	5		FAC
6.			
7.			
8.			
9.			
10.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	70 (A)		95 (B)

Prevalence Index = B/A = 1.36

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL D5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 4	10YR 2/2	90	10YR 4/4	10	C	M	Sandy Clay Loam	
4 - 12	10YR 2/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ____ Depth (inches): 7

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D5 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 33, 133N, 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.2841408 Long: -99.6164683 Datum: WGS 84

Soil Map Unit Name: Reeder-Arnegard loams, 3 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✓ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands (agricultural fields) adjacent to wetland D5. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Zea mays	80	✓	
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NaN (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = NaN

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

20% bare ground present.

SOIL

Sampling Point: WL D5 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D6

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 27, 133N, 71W

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave

Slope (%): 1 Lat: 46.3088860 Long: -99.5952098 Datum: WGS 84

Soil Map Unit Name: Hamerly-Vallers loams, moderately saline, 0 to 3 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Typha angustifolia	25	✓	OBL
2. Eleocharis palustris	20	✓	OBL
3. Leersia oryzoides	20	✓	OBL
4. Agrostis stolonifera	15		FACW
5. Hordeum jubatum	10		FAC
6. Trifolium repens	5		FACU
7.			
8.			
9.			
10.			
	95% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	65	x 1 =	65
FACW species	15	x 2 =	30
FAC species	10	x 3 =	30
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	95 (A)		145 (B)

Prevalence Index = B/A = 1.53

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

5% bare ground present. Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL D6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 3/1	100					Sandy Clay Loam	
3 - 8	10YR 3/1	90	10YR 4/4	10	C	PL / M	Sandy Clay Loam	
8 - 16	10YR 3/2	100						
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No _____ Depth (inches): 3

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D6 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 27, 133N, 71W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave

Slope (%): 3 Lat: 46.3088860 Long: -99.5952098 Datum: WGS 84

Soil Map Unit Name: Hamerly-Vallers loams, moderately saline, 0 to 3 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland D6. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	40	✓	FACU
2. Schizachyrium scoparium	25	✓	FACU
3. Trifolium repens	10		FACU
4. Agrostis stolonifera	5		FACW
5. Elymus virginicus	5		FACW
6. Taraxacum officinale	3		FACU
7. Eleocharis palustris	2		OBL
8.			
9.			
10.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	78	x 4 =	312
UPL species	0	x 5 =	0
Column Totals:	90 (A)		334 (B)

Prevalence Index = B/A = 3.71

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

10% bare ground present.

SOIL

Sampling Point: WL D6 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 3	10YR 3/2	100					Silty Clay Loam	
3 - 12	10YR 5/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D7

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 21, 133N, 71W

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave

Slope (%): 1 Lat: 46.3173874 Long: -99.6159993 Datum: WGS 84

Soil Map Unit Name: Water NWI classification: PABFh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Agrostis stolonifera	20	✓	FACW
2. Elymus virginicus	20	✓	FACW
3. Schoenoplectus tabernaemontani	20	✓	OBL
4. Calamagrostis canadensis	15		OBL
5. Hordeum jubatum	15		FAC
6. Carex spp.	5		OBL
7. Lycopus americanus	5		OBL
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	40	x 2 =	80
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		170 (B)

Prevalence Index = B/A = 1.70

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL D7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 5	10YR 2/2	100					Sandy Clay Loam	
5 - 10	10YR 2/2	90	7.5YR 4/4	10	C	M	Sandy Clay Loam	
10 - 16	10YR 4/1	70	10YR 4/3	30	C	M	Sandy Clay Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 0

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D7 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 21, 133N, 71W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave

Slope (%): 3 Lat: 46.3173466 Long: -99.6158134 Datum: WGS 84

Soil Map Unit Name: Water NWI classification: PABFh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland D7. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	70	✓	FACU
2. Elymus trachycaulus	20	✓	FACU
3. Solidago nemoralis	10		
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals:	90 (A)		360 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL D7 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/1	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D8

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 28 133N 71W

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.30267715 Long: -99.61579536 Datum: WGS 84

Soil Map Unit Name: Regan silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No _____	
Hydric Soil Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Wetland Hydrology Present?	Yes _____	No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Leersia oryzoides	85	✓	OBL
2. Typha angustifolia	15		OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:
OBL species	100	x 1 =	100
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		100 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL D8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 2/2	100					Sandy Clay Loam	
8 - 16	10YR 2/2	90	10YR 4/4	10	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 1

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D8/D9 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz - Atwell, LLC Section, Township, Range: 28 133N 71W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave

Slope (%): 2 Lat: 46.30404094 Long: -99.61517845 Datum: WGS 84

Soil Map Unit Name: Tonka-Hamerly complex, 0 to 3 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetlands D8 and D9. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	50	✓	FACU
2. Poa pratensis	30	✓	FAC
3. Artemisia absinthium	20	✓	
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	80 (A)		290 (B)

Prevalence Index = B/A = 3.63

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL D8/D9 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 2/2	100					Silt Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-09-30

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL D9

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 28 133N 71W

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave

Slope (%): 1 Lat: 46.3046301 Long: -99.6146222 Datum: WGS 84

Soil Map Unit Name: Tonka-Hamerly complex, 0 to 3 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. The Palmer Drought Severity Index indicates the area is in severe drought, but the Antecedent Precipitation Tool indicates that conditions are normal for this location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Leersia oryzoides	85	✓	OBL
2. Typha angustifolia	15		OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	100	x 1 =	100
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		100 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL D9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 2/2	100					Sandy Clay Loam	
8 - 16	10YR 2/2	90	10YR 4/4	10			Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 1

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-01

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL E1

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 32, 133N, 71W

Landform (hillslope, terrace, etc.): Ditch Local relief (concave, convex, none): Concave

Slope (%): 3 Lat: 46.2834760 Long: -99.5189577 Datum: WGS 84

Soil Map Unit Name: Wabek-Lehr complex, 2 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Phalaris arundinacea	45	✓	FACW
2. Typha angustifolia	40	✓	OBL
3. Rumex crispus	15		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	45	x 2 =	90
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		175 (B)

Prevalence Index = B/A = 1.75

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL E1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/1	100					Sandy Clay Loam	
6 - 12	10YR 3/1	95	10YR 5/6	5	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-01

Applicant/Owner: Badger WInd, LLC State: North Dakota Sampling Point: WL E1 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 32, 133N, 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.2835588 Long: -99.5190040 Datum: WGS 84

Soil Map Unit Name: Wabek-Lehr complex, 2 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland E1.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	50	✓	FACU
2. Poa pratensis	50	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	100 (A)		350 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL E1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 4/1	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-01

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL E2

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 1, 13N, 71W

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.2830959 Long: -99.5188977 Datum: WGS 84

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Phalaris arundinacea	90	✓	FACW
2. Rumex crispus	10		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		210 (B)

Prevalence Index = B/A = 2.10

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL E2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/1	100					Sandy Clay Loam	
6 - 12	10YR 3/1	95	10YR 5/6	5	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-01

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL E2 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 1, 132N, 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.2831259 Long: -99.5189322 Datum: WGS 84

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland E2.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	50	✓	FACU
2. Poa pratensis	50	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	100 (A)		350 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL E2 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 4/1	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F1

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 20, 133N, 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 4 Lat: 46.3266130 Long: -99.5128672 Datum: WGS 84

Soil Map Unit Name: Zahl-Williams-Zahill complex, 6 to 9 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Eleocharis palustris	55	✓	OBL
2. Rumex crispus	15		FAC
3. Artemisia biennis	10		FACW
4. Persicaria maculosa	10		FACW
5. Phalaris arundinacea	5		FACW
6. Amaranthus cruentus	3		
7. Taraxacum officinale	2		FACU
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	55	x 1 =	55
FACW species	25	x 2 =	50
FAC species	15	x 3 =	45
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	97 (A)		158 (B)

Prevalence Index = B/A = 1.63

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculate for reference purposes only.

SOIL

Sampling Point: WL F1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/2	98	10YR 4/6	2	C	PL / M	Sandy Clay Loam	
6 - 12	10YR 3/1	95	10YR 5/6	5	C	PL / M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F1 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 20, 133N, 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3266444 Long: -99.5130613 Datum: WGS 84

Soil Map Unit Name: Zahl-Williams-Zahill complex, 6 to 9 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland F1.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	100	✓	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 12	10YR 3/3	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F2

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 17 133N 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3329604 Long: -99.5123002 Datum: WGS 84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Echinochloa crus-galli	65	✓	FACW
2. Bromus inermis	10		FACU
3. Eleocharis palustris	8		OBL
4. Amaranthus cruentus	5		
5. Leersia oryzoides	5		OBL
6. Rumex crispus	5		FAC
7. Artemisia vulgaris	2		UPL
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	13	x 1 =	13
FACW species	65	x 2 =	130
FAC species	5	x 3 =	15
FACU species	10	x 4 =	40
UPL species	2	x 5 =	10
Column Totals:	95 (A)		208 (B)

Prevalence Index = B/A = 2.19

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL F2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 2	10YR 3/2	100					Sandy Clay Loam	
2 - 8	10YR 3/2	98	7.5YR 4/4	2	C	M	Sandy Clay Loam	
8 - 12	10YR 3/2	90	7.5YR 4/4	10	C	M	Sandy Clay Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F2 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 17 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3329135 Long: -99.5122186 Datum: WGS 84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland F2.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	100	✓	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F2 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 8	10YR 3/3	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F3

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 17 133N 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3394206 Long: -99.5102716 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Elymus trachycaulus	40	✓	FACU
2. Hordeum jubatum	20	✓	FAC
3. Leersia oryzoides	20	✓	OBL
4. Bromus inermis	10		FACU
5. Rumex crispus	5		FAC
6. Eleocharis palustris	3		OBL
7. Echinochloa crus-galli	2		FACW
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	23	x 1 =	23
FACW species	2	x 2 =	4
FAC species	25	x 3 =	75
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	100 (A)		302 (B)

Prevalence Index = B/A = 3.02

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL F3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 3/2	100					Sandy Clay Loam	
3 - 12	10YR 3/1	85	10YR 4/4	5	C	M	Sandy Clay Loam	
-			10YR 4/2	10	C	M	Sandy Clay Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 3

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F3 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 17 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3393984 Long: -99.5103246 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland F3.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	95	✓	FACU
2. Cirsium arvense	4		FACU
3. Taraxacum officinale	1		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F3 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 3/3	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F4

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 8 133N 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3440064 Long: -99.5072209 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 0 to 3 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Hordeum jubatum	60	✓	FAC
2. Carex stricta	15		OBL
3. Rumex crispus	15		FAC
4. Amaranthus cruentus	5		
5. Persicaria posumbu	5		
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		240 (B)

Prevalence Index = B/A = 2.67

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL F4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 3/2	100					Sandy Clay Loam	
3 - 8	10YR 3/1	95	10YR 4/6	5	C	M	Sandy Clay Loam	
8 - 16	10YR 3/2	60	10YR 4/6	15	C	M	Sandy Clay Loam	
-			10YR 4/2	25	C	M	Sandy Clay Loam	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 3

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F4 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 8 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3439947 Long: -99.5070393 Datum: WGS 84

Soil Map Unit Name: Williams-Bowbells loams, 0 to 3 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Area is representative of uplands adjacent to wetland F4.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	80	✓	FACU
2. Poa pratensis	15		FAC
3. Artemisia vulgaris	3		UPL
4. Carex stricta	2		OBL
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	80	x 4 =	320
UPL species	3	x 5 =	15
Column Totals:	100 (A)		382 (B)

Prevalence Index = B/A = 3.82

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F4 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F5

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 28 133N 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3002438 Long: -99.4902786 Datum: WGS 84

Soil Map Unit Name: Noonan-Niobell-Williams loams, 0 to 6 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as palustrine emergent (PEMB) wetlands.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Hordeum jubatum	80	✓	FAC
2. Carex stricta	5		OBL
3. Polygonum aviculare	5		FAC
4. Rumex crispus	3		FAC
5. Chenopodium album	2		FACU
6.			
7.			
8.			
9.			
10.			
	95% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	88	x 3 =	264
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	95 (A)		277 (B)

Prevalence Index = B/A = 2.92

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

5% bare soils present. Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL F5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 2/1	100					Sandy Clay Loam	
8 - 16	10YR 2/1	98	10YR 4/6	2	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 3

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F5 & F6 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 28 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3002717 Long: -99.4903619 Datum: WGS 84

Soil Map Unit Name: Noonan-Niobell-Williams loams, 0 to 6 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetlands F5 and F6.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	50	✓	FACU
2. Poa pratensis	50	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	100 (A)		350 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F5 & F6 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/1	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F6

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 28 133N 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3003079 Long: -99.4904582 Datum: WGS 84

Soil Map Unit Name: Noonan-Niobell-Williams loams, 0 to 6 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Hordeum jubatum	80	✓	FAC
2. Carex stricta	5		OBL
3. Polygonum aviculare	5		FAC
4. Rumex crispus	3		FAC
5. Chenopodium album	2		FACU
6.			
7.			
8.			
9.			
10.			
	95% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	88	x 3 =	264
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	95 (A)		277 (B)

Prevalence Index = B/A = 2.92

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

5% bare soils present. Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL F6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 2/1	100					Sandy Clay Loam	
8 - 16	10YR 2/1	98	10YR 4/6	2	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 3

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F7

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 31 133N 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3003079 Long: -99.4904582 Datum: WGS 84

Soil Map Unit Name: Noonan-Niobell-Williams loams, 0 to 6 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is representative of a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Hordeum jubatum	25	✓	FAC
2. Rumex crispus	25	✓	FAC
3. Carex stricta	20	✓	OBL
4. Eleocharis palustris	20	✓	OBL
5. Aster sp.	5		
6. Typha angustifolia	5		OBL
7.			FAC
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		195 (B)

Prevalence Index = B/A = 2.05

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL F7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/1	80	10YR 4/6	20	C	PL / M	Silty Clay Loam	
6 - 12	10YR 2/1	80	10YR 4/6	20	C	PL / M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 3

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F7 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 31 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.2993674 Long: -9.4876917 Datum: WGS 84

Soil Map Unit Name: Zahl-Williams-Zahill complex, 6 to 9 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland F7.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	50	✓	FACU
2. Poa pratensis	50	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	100 (A)		350 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F7 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/1	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F8

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 29 133N 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3069657 Long: -99.5020687 Datum: WGS 84

Soil Map Unit Name: Max-Zahl-Arnegard complex, 9 to 25 percent slopes, very stony NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Amaranthus cruentus	35	✓	
2. Carex stricta	20	✓	OBL
3. Xanthium strumarium	20	✓	FAC
4. Echinochloa crus-galli	15		FACW
5. Medicago lupulina	5		FACU
6. Cannabis sativa	3		
7. Rumex crispus	2		FAC
8.			OBL
9.			
10.			FAC
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	15	x 2 =	30
FAC species	22	x 3 =	66
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	62 (A)		136 (B)

Prevalence Index = B/A = 2.19

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL F8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 2/2	99	10YR 4/6	1	C	M	Sandy Clay Loam	
8 - 12	10YR 2/2	95	10YR 4/6	5	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 3

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F8 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 29 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3069126 Long: -99.5022153 Datum: WGS 84

Soil Map Unit Name: Max-Zahl-Arnegard complex, 9 to 25 percent slopes, very stony NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland F8.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	98	✓	FACU
2. Asclepias syriaca	2		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F8 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F9

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 29 133N 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3059980 Long: -99.5070852 Datum: WGS 84

Soil Map Unit Name: Zahl-Williams-Zahill complex, 6 to 9 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Carex stricta	40	✓	OBL
2. Rumex crispus	40	✓	FAC
3. Helianthus sp.	13		
4. Agrostis stolonifera	5		FACW
5. Symphyotrichum lanceolatum	2		FAC
6.			FAC
7.			FAC
8.			
9.			
10.			OBL
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	5	x 2 =	10
FAC species	42	x 3 =	126
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	87 (A)		176 (B)

Prevalence Index = B/A = 2.02

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL F9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 4	10YR 2/2	100					Sandy Clay Loam	
4 - 10	10YR 2/2	85	7.5YR 4/4	15	C	M	Silty Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 3

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F9 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 29 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3059730 Long: -99.5071713 Datum: WGS 84

Soil Map Unit Name: Zahl-Williams-Zahill complex, 6 to 9 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland F9.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	50	✓	FACU
2. Poa pratensis	50	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	100 (A)		350 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F9 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/1	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F10

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 29 133N 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3073972 Long: -99.5101931 Datum: WGS 84

Soil Map Unit Name: Max-Zahl-Arnegard complex, 9 to 35 percent slopes, very stony NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Eleocharis palustris	15	✓	OBL
2. Rumex crispus	15	✓	FAC
3. Symphyotrichum lanceolatum	10	✓	FAC
4. Echinochloa crus-galli	5		FACW
5.			
6.			FAC
7.			
8.			
9.			
10.			
	45% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	5	x 2 =	10
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	45 (A)		100 (B)

Prevalence Index = B/A = 2.22

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

55% bare ground present. Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL F10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/2	100					Silty Clay Loam	
6 - 12	10YR 3/2	95	10YR 4/4	5	C	M	Silty Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F10 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 29 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3073980 Long: -99.5099796 Datum: WGS 84

Soil Map Unit Name: Max-Zahl-Arnegard complex, 9 to 35 percent slopes, very stony NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland F10.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	50	✓	FAC
2. Bromus inermis	45	✓	FACU
3. Erigeron canadensis	4		FACU
4. Melilotus officinalis	1		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	100 (A)		350 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F10 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/3	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F11

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 32 133N 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.2937239 Long: -99.5024553 Datum: WGS 84

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Rumex crispus	50	✓	FAC
2. Agrostis stolonifera	10		FACW
3. Eleocharis palustris	10		OBL
4. Hordeum jubatum	10		FAC
5. Artemisia vulgaris	5		UPL
6. Echinochloa crus-galli	5		FACW
7.			
8.			
9.			
10.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	15	x 2 =	30
FAC species	60	x 3 =	180
FACU species	0	x 4 =	0
UPL species	5	x 5 =	25
Column Totals:	90 (A)		245 (B)

Prevalence Index = B/A = 2.72

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

10% bare soils present. Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL F11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 4	10YR 2/2	100					Silty Clay Loam	
4 - 10	10YR 2/2	80	5YR 4/6	20	C	M	Sandy Clay Loam	
10 - 16	7.5YR 3/2	50	5YR 4/6	50			Sandy Clay Loam	Mixed Matrix
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F11 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 32 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.2969581 Long: -99.4990089 Datum: WGS 84

Soil Map Unit Name: Zahl-Williams-Zahill complex, 6 to 9 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland F11.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	50	✓	FACU
2. Poa pratensis	50	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	100 (A)		350 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F11 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 12	10YR 3/1	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F12

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 31 133N 70W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.2901932 Long: -99.5320623 Datum: WGS 84

Soil Map Unit Name: Bowdle-Lehr loams, 0 to 2 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Elymus trachycaulus	30	✓	FACU
2. Rumex crispus	25	✓	FAC
3. Hordeum jubatum	15		FAC
4. Setaria pumila	15		FAC
5. Typha angustifolia	10		OBL
6. Agrostis stolonifera	5		FACW
7.			
8.			FAC
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	5	x 2 =	10
FAC species	55	x 3 =	165
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	100 (A)		305 (B)

Prevalence Index = B/A = 3.05

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 2/2	95	10YR 4/6	5	C	M	Sandy Clay Loam	
8 - 14	10YR 2/2	85	5YR 4/6	15	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F12 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.2902090 Long: -99.5319590 Datum: WGS 84

Soil Map Unit Name: Bowdle-Lehr loams, 0 to 2 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland F12.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Zea mays	80	✓	
2. Taraxacum officinale	20	✓	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	20 (A)		80 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F12 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F13

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 36 133N 71W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.2898774 Long: -99.5500131 Datum: WGS 84

Soil Map Unit Name: Reeder-Arnegard loams, 3 to 6 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Polygonum aviculare	65	✓	FAC
2. Malva neglecta	20	✓	
3. Echinochloa crus-galli	5		FACW
4. Chenopodium album	2		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	92% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	65	x 3 =	195
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	72 (A)		213 (B)

Prevalence Index = B/A = 2.96

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

8% bare soils present. Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL F13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/2	100					Sandy Clay Loam	
6 - 14	10YR 2/2	85	5YR 4/6	15	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F13 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 36 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.2899515 Long: -99.5500314 Datum: WGS 84

Soil Map Unit Name: Reeder-Arnegard loams, 3 to 6 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland F13.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	100	✓	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F13 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F14

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range:

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 2-5 Lat: 46.3008112 Long: -99.5192569 Datum: WGS 84

Soil Map Unit Name: Max-Zahl-Arnegard complex, 9 to 35 percent slopes, very stony NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Persicaria longiseta	30	✓	FAC
2. Phalaris arundinacea	25	✓	FACW
3. Rumex crispus	20	✓	FAC
4. Hordeum jubatum	15		FAC
5. Helianthella sp.	10		
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	65	x 3 =	195
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		245 (B)

Prevalence Index = B/A = 2.72

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL F14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/2	100					Sandy Clay Loam	
6 - 14	10YR 2/2	85	10YR 4/6	15	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-02

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL F14 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 30 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3007555 Long: -99.5193293 Datum: WGS 84

Soil Map Unit Name: Max-Zahl-Arnegard complex, 9 to 35 percent slopes, very stony NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland F14.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	85	✓	FACU
2. Taraxacum officinale	15		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL F14 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G1

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 30 133N 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2-5% Lat: 46.3002268 Long: -99.5297061 Datum: WGS 84

Soil Map Unit Name: Bowdle-Lehr loams, 0 to 2 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEM) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Eleocharis palustris	40	✓	OBL
2. Polygonum aviculare	25	✓	FAC
3. Hordeum jubatum	20	✓	FAC
4. Rumex crispus	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		190 (B)

Prevalence Index = B/A = 2.11

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

10% bare soils present. Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL G1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 5	10YR 2/2	100					Sandy Clay Loam	
5 - 12	10YR 2/2	90	10YR 4/4	10	C	PL / M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ✓ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 1

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G1 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 30 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3004063 Long: -99.5295743 Datum: WGS 84

Soil Map Unit Name: Bowdle-Lehr loams, 0 to 2 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland G1.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	60	✓	FAC
2. Achillea millefolium	20	✓	FACU
3. Taraxacum officinale	15		FACU
4. Grindelia squarrosa	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	100 (A)		340 (B)

Prevalence Index = B/A = 3.40

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G2

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 30 133N 70W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2-5% Lat: 46.2993127 Long: -99.5391435 Datum: WGS 84

Soil Map Unit Name: Bowdle-Lehr loams, 0 to 2 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland. Vegetation is disturbed by grazing.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Hordeum jubatum	40	✓	FAC
2. Polygonum aviculare	35	✓	FAC
3. Rumex crispus	5		FAC
4. Taraxacum officinale	5		FACU
5. Echinochloa crus-galli	2		FACW
6.			
7.			
8.			
9.			
10.			
	87% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	2	x 2 =	4
FAC species	80	x 3 =	240
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	87 (A)		264 (B)

Prevalence Index = B/A = 3.03

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

13% bare soils present. Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL G2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 5	10YR 2/2	100					Sandy Clay Loam	
5 - 12	10YR 2/2	95	10YR 4/4	5	C	PL / M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G2 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 30 133N 70W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.29944713 Long: -99.53918605 Datum: WGS 84

Soil Map Unit Name: Bowdle-Lehr loams, 0 to 2 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland G2.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	75	✓	FAC
2. Taraxacum officinale	15		FACU
3. Artemisia frigida	10		
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	90 (A)		285 (B)

Prevalence Index = B/A = 3.17

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G2 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G3

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 25 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2-5% Lat: 46.3063378 Long: -99.5487283 Datum: WGS 84

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Hordeum jubatum	45	✓	FAC
2. Typha latifolia	40	✓	OBL
3. Glycyrrhiza lepidota	5		FACU
4. Rumex crispus	5		FAC
5. Schoenoplectus tabernaemontani	3		OBL
6. Erigeron canadensis	2		FACU
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	43	x 1 =	43
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	7	x 4 =	28
UPL species	0	x 5 =	0
Column Totals:	100 (A)		221 (B)

Prevalence Index = B/A = 2.21

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

13% bare soils present. Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL G3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 4	10YR 2/2	100					Sandy Clay Loam	
4 - 10	10YR 2/2	95	10YR 4/4	5	C	PL / M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G3 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: Amor-Werner loams, 9 to 15 percent slopes

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3061904 Long: -99.5487816 Datum: WGS 84

Soil Map Unit Name: Amor-Werner loams, 9 to 15 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland G3.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Hordeum jubatum	40	✓	FAC
2. Glycine max	20	✓	
3. Glycyrrhiza lepidota	20	✓	FACU
4. Poa pratensis	10		FAC
5. Setaria pumila	10		FAC
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	80 (A)		260 (B)

Prevalence Index = B/A = 3.25

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G3 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 3/1	100					Sandy Clay Loam	
8 - 14	10YR 3/1	70	10YR 6/3	30			Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G4

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 25 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2-5% Lat: 46.3007063 Long: -99.5521816 Datum: WGS 84

Soil Map Unit Name: Reeder-Arnegard loams, 3 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area is classified as a palustrine emergent (PEM) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Typha latifolia	35	✓	OBL
2. Hordeum jubatum	30	✓	FAC
3. Leersia oryzoides	20	✓	OBL
4. Rumex crispus	2		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	87% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	55	x 1 =	55
FACW species	0	x 2 =	0
FAC species	32	x 3 =	96
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	87 (A)		151 (B)

Prevalence Index = B/A = 1.74

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

13% open water present. Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL G4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/1	75	10YR 4/4	25	C	PL / M	Silty Clay Loam	
6 - 12	10YR 2/1	100					Silty Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 1

Water Table Present? Yes ✓ No _____ Depth (inches): 4

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G4 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 25 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3007653 Long: -99.5522094 Datum: WGS 84

Soil Map Unit Name: Reeder-Arnegard loams, 3 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland G4.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	70	✓	FAC
2. Hordeum jubatum	20	✓	FAC
3. Cirsium arvense	10		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	100 (A)		310 (B)

Prevalence Index = B/A = 3.10

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL G4 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G5

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 26 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2-5% Lat: 46.3011713 Long: -99.5612961 Datum: WGS 84

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMC) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Carex stricta	63	✓	OBL
2. Leersia oryzoides	20	✓	OBL
3. Hordeum jubatum	10		FAC
4. Typha sp.	5		OBL
5. Rumex crispus	2		FAC
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	88	x 1 =	88
FACW species	0	x 2 =	0
FAC species	12	x 3 =	36
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		124 (B)

Prevalence Index = B/A = 1.24

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/1	75	10YR 4/4	25	C	PL / M	Silty Clay Loam	
6 - 12	10YR 2/1	100					Silty Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 1

Water Table Present? Yes ✓ No _____ Depth (inches): 4

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G5 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 26 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3012441 Long: -99.5612946 Datum: WGS 84

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland G5.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	70	✓	FAC
2. Hordeum jubatum	20	✓	FAC
3. Cirsium arvense	10		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	100 (A)		310 (B)

Prevalence Index = B/A = 3.10

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G5 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G6

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 27 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2-5% Lat: 46.3112740 Long: -99.5824775 Datum: WGS 84

Soil Map Unit Name: Arnegard loam, 0 to 2 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Phalaris arundinacea	65	✓	FACW
2. Rumex crispus	35	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	65	x 2 =	130
FAC species	35	x 3 =	105
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		235 (B)

Prevalence Index = B/A = 2.35

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL G6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 2	10YR 2/1	100					Silty Clay Loam	
2 - 8	10YR 2/2	85	7.5YR 4/6	15	C	PL / M	Sandy Clay Loam	
8 - 14	10YR 2/1	75	10YR 5/3	25	C	PL / M	Sandy Clay Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 1

Water Table Present? Yes ✓ No _____ Depth (inches): 4

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G6 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 27 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3112158 Long: -99.5824287 Datum: WGS 84

Soil Map Unit Name: Arnegard loam, 0 to 2 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland G6.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	60	✓	FACU
2. Medicago sativa	40	✓	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G6 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G7

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 29 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 2-5% Lat: 46.3101483 Long: -99.5849440 Datum: WGS 84

Soil Map Unit Name: Arnegard loam, 0 to 2 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Phalaris arundinacea	55	✓	FACW
2. Leersia oryzoides	20	✓	OBL
3. Bromus inermis	10		FACU
4. Taraxacum officinale	10		FACU
5. Rumex crispus	5		FAC
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	55	x 2 =	110
FAC species	5	x 3 =	15
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	100 (A)		225 (B)

Prevalence Index = B/A = 2.25

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 2	10YR 2/1	100					Silty Clay Loam	
2 - 8	10YR 2/2	85	7.5YR 4/6	15	C	PL / M	Sandy Clay Loam	
8 - 14	10YR 2/1	75	10YR 5/3	25	C	PL / M	Sandy Clay Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 1

Water Table Present? Yes ✓ No _____ Depth (inches): 4

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G7 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 27 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3100980 Long: -99.5849213 Datum: WGS 84

Soil Map Unit Name: Arnegard loam, 0 to 2 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland G7.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Medicago sativa	70	✓	FACU
2. Bromus inermis	30	✓	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

✓ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G7 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G8

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 27 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 0-2% Lat: 46.3095130 Long: -99.5903868 Datum: WGS 84

Soil Map Unit Name: Hamerly-Vallers loams, moderately saline, 0 to 3 percent slopes NWI classification: PEM1Ax

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMC) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Phalaris arundinacea	60	✓	FACW
2. Leersia oryzoides	20	✓	OBL
3. Bromus inermis	10		FACU
4. Eleocharis palustris	10		OBL
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	60	x 2 =	120
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	100 (A)		190 (B)

Prevalence Index = B/A = 1.90

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 2/1	100					Sandy Clay Loam	
3 - 9	10YR 2/1	85	7.5YR 4/6	15	C	PL / M	Sandy Clay Loam	
9 - 14	10YR 6/1	75	7.5YR 4/6	25	C	PL / M	Sandy Clay Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 1

Water Table Present? Yes ✓ No _____ Depth (inches): 4

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G8 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 27 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.3094735 Long: -99.5903231 Datum: WGS 84

Soil Map Unit Name: Hamerly-Vallers loams, moderately saline, 0 to 3 percent slopes NWI classification: PEM1Ax

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland G8.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Elymus trachycaulus	70	✓	FACU
2. Bromus inermis	25	✓	FACU
3. Cirsium arvense	5		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G8 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G9

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 25 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 0-2% Lat: 46.2930945 Long: -99.5791883 Datum: WGS 84

Soil Map Unit Name: Arnegard loam, 2 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Typha angustifolia	60	✓	OBL
2. Phalaris arundinacea	25	✓	FACW
3. Agrostis stolonifera	5		FACW
4. Carex stricta	5		OBL
5. Rumex crispus	5		FAC
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	65	x 1 =	65
FACW species	30	x 2 =	60
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		140 (B)

Prevalence Index = B/A = 1.40

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 2/1	100					Silty Clay Loam	
8 - 16	10YR 6/1	85	10YR 4/6	15	C	PL / M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ✓ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 2

Water Table Present? Yes ✓ No _____ Depth (inches): 5

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G9 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.2929713 Long: -99.5791042 Datum: WGS 84

Soil Map Unit Name: Arnegard loam, 2 to 6 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland G9.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	75	✓	FACU
2. Cirsium arvense	15		FACU
3. Elymus trachycaulus	8		FACU
4. Hieracium caespitosum	2		
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	98	x 4 =	392
UPL species	0	x 5 =	0
Column Totals:	98 (A)		392 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G9 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/1	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G10

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 34 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 0-2% Lat: 46.2895577 Long: -99.5816908 Datum: WGS 84

Soil Map Unit Name: Wabek-Appam complex, 6 to 9 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEM) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Hordeum jubatum	60	✓	FAC
2. Eleocharis palustris	30	✓	OBL
3. Phalaris arundinacea	10		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	10	x 2 =	20
FAC species	60	x 3 =	180
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		230 (B)

Prevalence Index = B/A = 2.30

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL G10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 2/1	100					Silty Clay Loam	
3 - 12	10YR 2/1	98	10YR 4/4	2	C	PL / M	Sandy Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G10 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 34 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.2895928 Long: -99.5816481 Datum: WGS 84

Soil Map Unit Name: Wabek-Appam complex, 6 to 9 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data point is representative of uplands adjacent to wetland G10.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	100	✓	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G10 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/1	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G11

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 35 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 0-2% Lat: 46.2861522 Long: -99.5794315 Datum: WGS 84

Soil Map Unit Name: Hamerly-Vallers loams, moderately saline, 0 to 3 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMC) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Typha angustifolia	60	✓	OBL
2. Eleocharis palustris	30	✓	OBL
3. Phalaris arundinacea	10		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		110 (B)

Prevalence Index = B/A = 1.10

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 7	10YR 2/1	100					Clay Loam	
7 - 16	10YR 4/1	80	7.5YR 4/6	20	C	PL / M	Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 2

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G11 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 35 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.28607171 Long: -99.57912613 Datum: WGS 84

Soil Map Unit Name: Hamerly-Vallers loams, moderately saline, 0 to 3 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland G11.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	50	✓	FACU
2. Trifolium pratense	30	✓	FACU
3. Elymus trachycaulus	20	✓	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G11 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/1	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G12

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 34 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 0-2% Lat: 46.28851726 Long: -99.58235642 Datum: WGS 84

Soil Map Unit Name: Hamerly-Vallers loams, moderately saline, 0 to 3 percent slopes NWI classification: PEM1Ax

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Typha angustifolia	60	✓	OBL
2. Eleocharis palustris	30	✓	OBL
3. Phalaris arundinacea	10		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		110 (B)

Prevalence Index = B/A = 1.10

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 7	10YR 2/1	100					Clay Loam	
7 - 16	10YR 4/1	80	7.5YR 4/6	20	C	PL / M	Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 2

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G12 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 34 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.2882708 Long: -99.5823664 Datum: WGS 84

Soil Map Unit Name: Hamerly-Vallers loams, moderately saline, 0 to 3 percent slopes NWI classification: PEM1Ax

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland G12.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	50	✓	FACU
2. Trifolium pratense	30	✓	FACU
3. Elymus trachycaulus	20	✓	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G12 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/1	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G13

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 34 133N 71W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave

Slope (%): 0-2% Lat: 46.28486881 Long: -99.58775856 Datum: WGS 84

Soil Map Unit Name: Harriet-Regan-Stirum complex, 0 to 2 percent slopes, occasionally flooded NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Area is classified as a palustrine emergent (PEMB) wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Leersia oryzoides	70	✓	OBL
2. Carex stricta	10		OBL
3. Phalaris arundinacea	10		FACW
4. Echinochloa crus-galli	5		FACW
5. Typha angustifolia	5		OBL
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	85	x 1 =	85
FACW species	15	x 2 =	30
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		115 (B)

Prevalence Index = B/A = 1.15

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 9	10YR 2/1	100					Muck	
9 - 16	10YR 4/2	98	10YR 4/6	2	C	PL / M	Muck	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 2

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Badger Wind Project City/County: Logan Sampling Date: 2021-10-03

Applicant/Owner: Badger Wind, LLC State: North Dakota Sampling Point: WL G13 Upland

Investigator(s): D. Nigro, C. Scholten, K. Yantz -Atwell, LLC Section, Township, Range: 3 133N 71W

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 46.2847094 Long: -99.5880095 Datum: WGS 84

Soil Map Unit Name: Harriet-Regan-Stirum complex, 0 to 2 percent slopes, occasionally flooded NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	
Hydric Soil Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Data Point is representative of uplands adjacent to wetland G13.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus inermis	50	✓	FACU
2. Trifolium pratense	30	✓	FACU
3. Elymus trachycaulus	20	✓	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL G13 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/2	100					Silty Clay Loam	
6 - 12	10YR 4/3	100					Silty Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: McIntosh County Sampling Date: 2022-05-03

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL H1

Investigator(s): K. Yantz, D Nigro-Atwell, LLC Section, Township, Range: sec 20 T132N R071W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.239390 Long: -99.590779 Datum: WGS84

Soil Map Unit Name: Wabek-Lehr-Appam complex, 9 to 25 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Spartina pectinata*	70	Y	FACW
2. *Panicum virgatum*	20	Y	FAC
3. *Bromus inermis*	5	N	UPL
4. *Symphyotrichum lanceolatum*	3	N	FACW
5. *Poa sp.*	2	N	FACU
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	73.00	x 2 =	146.00
FAC species	20.00	x 3 =	60.00
FACU species	2.00	x 4 =	8.00
UPL species	5.00	x 5 =	25.00
Column Totals:	100.00 (A)		239.00 (B)

Prevalence Index = B/A = 2.39

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL H1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					CL	
8-18	10YR 2/1	95	5YR 6/2	5	D	M	CL	Prominent redox.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ✓ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 0

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: McIntosh County Sampling Date: 2022-05-03

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL H1 Upland

Investigator(s): K. Yantz, D Nigro-Atwell, LLC Section, Township, Range: sec 20 T132N R071W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.239589 Long: -99.590786 Datum: WGS84

Soil Map Unit Name: Wabek-Lehr-Appam complex, 9 to 25 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa annua*	76	Y	FACU
2. *Bromus inermis*	20	Y	UPL
3. *Cornus racemosa*	2	N	FAC
4. *Solidago altissima*	2	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	2.00	x 3 =	6.00
FACU species	78.00	x 4 =	312.00
UPL species	20.00	x 5 =	100.00
Column Totals:	100.00 (A)		418.00 (B)

Prevalence Index = B/A = 4.18

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL H1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/2	100					CL	
10-18	10YR 3/4	100					CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: McIntosh County Sampling Date: 2022-05-03

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL H2

Investigator(s): K. Yantz, D Nigro-Atwell, LLC Section, Township, Range: sec 05 T132N R071W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.273806 Long: -99.596890 Datum: WGS84

Soil Map Unit Name: Arnegard loam, 2 to 6 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
PEM depression within fallow field

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Typha X glauca*	50	Y	OBL
2. *Carex lacustris*	20	Y	OBL
3. *Phalaris arundinacea*	10	N	FACW
4. *Rumex crispus*	5	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70.00	x 1 =	70.00
FACW species	10.00	x 2 =	20.00
FAC species	5.00	x 3 =	15.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	85.00 (A)		105.00 (B)

Prevalence Index = B/A = 1.24

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL H2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	100					MUCK	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ✓ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 4

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: McIntosh County Sampling Date: 2022-05-03

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL H2 Upland

Investigator(s): K. Yantz, D Nigro-Atwell, LLC Section, Township, Range: sec 05 T132N R071W

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.273752 Long: -99.596585 Datum: WGS84

Soil Map Unit Name: Arnegard loam, 2 to 6 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa annua*	90	Y	FACU
2. *Bromus inermis*	10	N	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	0.00	x 3 =	0.00
FACU species	90.00	x 4 =	360.00
UPL species	10.00	x 5 =	50.00
Column Totals:	100.00 (A)		410.00 (B)

Prevalence Index = B/A = 4.1

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL H2 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-18	10YR 3/2	100					CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: McIntosh County Sampling Date: 2022-05-03

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL I1

Investigator(s): K. Yantz, D Nigro-Atwell, LLC Section, Township, Range: sec 31 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.283135 Long: -99.519376 Datum: WGS84

Soil Map Unit Name: Wabek-Lehr complex, 2 to 6 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:
PEM roadside ditch

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	30	Y	FACW
2. *Panicum virgatum*	15	Y	FAC
3. *Rumex crispus*	10	N	FAC
4. *Typha X glauca*	3	N	OBL
5.			
6.			
7.			
8.			
9.			
10.			
	58 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 42

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	3.00	x 1 =	3.00
FACW species	30.00	x 2 =	60.00
FAC species	25.00	x 3 =	75.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	58.00 (A)		138.00 (B)

Prevalence Index = B/A = 2.38

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL I1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	97	5YR 5/2	3	D	M	CL	Faint redox.
6-16	10YR 2/1	100					MUCK	
16-18	10YR 2/1	80	5YR 5/2	20	D	M	CL	Prominent redox.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ✓ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 6

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: McIntosh County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL I1 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 15 T131N R069W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.16593 Long: -99.31107 Datum: WGS84

Soil Map Unit Name: Max-Zahl-Arnegard complex, 9 to 35 percent slopes, very stony NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa annua*	90	Y	FACU
2. *Bromus inermis*	10	N	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	0.00	x 3 =	0.00
FACU species	90.00	x 4 =	360.00
UPL species	10.00	x 5 =	50.00
Column Totals:	100.00 (A)		410.00 (B)

Prevalence Index = B/A = 4.1

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL I1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	60	10YR 3/3	40			SCL	Faint redox. Mixed matrix.
6-18	10YR 3/2	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: McIntosh County Sampling Date: 2022-05-03

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL I2

Investigator(s): K. Yantz, D Nigro-Atwell, LLC Section, Township, Range: sec 01 T132N R071W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.282490 Long: -99.518647 Datum: WGS84

Soil Map Unit Name: Wabek-Appam complex, 6 to 9 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
PEM depression attached to larger wetland outside of the corridor.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	80	Y	FACW
2. *Rumex crispus*	10	N	FAC
3. *Typha X glauca*	10	N	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 10.00	x 1 = 10.00
FACW species 80.00	x 2 = 160.00
FAC species 10.00	x 3 = 30.00
FACU species 0.00	x 4 = 0.00
UPL species 0.00	x 5 = 0.00
Column Totals: 100.00 (A)	200.00 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL I2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					CL	
6-17	10YR 2/1	90	10YR 6/4	10	C	M	CL	Prominent redox.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Frozen ground

Depth (inches): 17

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: McIntosh County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL I2 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 15 T131N R069W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.16572 Long: -99.31066 Datum: WGS84

Soil Map Unit Name: Zahl-Max-Bowbells loams, 6 to 35 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa annua*	90	Y	FACU
2. *Bromus inermis*	10	N	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	0.00	x 3 =	0.00
FACU species	90.00	x 4 =	360.00
UPL species	10.00	x 5 =	50.00
Column Totals:	100.00 (A)		410.00 (B)

Prevalence Index = B/A = 4.1

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL I2 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/3	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL J1

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 33 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 8-15

Subregion (LRR): LRR F, MLRA 53B Lat: 46.294193 Long: -99.495439 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
PEM depression within fallow field

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5)			
1. *Panicum virgatum*	15	Y	FAC
2. *Symphyotrichum lanceolatum*	10	Y	FACW
3. *Agrostis stolonifera*	10	Y	FACW
4. *Rumex crispus*	5	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 60

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	20.00	x 2 =	40.00
FAC species	20.00	x 3 =	60.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	40.00 (A)		100.00 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL J1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					CL	
8-14	10YR 3/2	80	10YR 6/4	20	C	M/PL	CL	Distinct redox.
14-18	10YR 3/2	100					LS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ✓ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 24

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL J1 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 33 T133N R070W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.256731 Long: -99.552240 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa annua*	60	Y	FACU
2. *Bromus inermis*	30	Y	UPL
3. *Rumex crispus*	10	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	10.00	x 3 =	30.00
FACU species	60.00	x 4 =	240.00
UPL species	30.00	x 5 =	150.00
Column Totals:	100.00 (A)		420.00 (B)

Prevalence Index = B/A = 4.2

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL J1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/1	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Thick rock layer

Depth (inches): 16

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL J2

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 29 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.300450 Long: -99.504017 Datum: WGS84

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	20	Y	FACW
2. *Rumex crispus*	10	Y	FAC
3. *Typha X glauca*	5	N	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	35 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 65

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5.00	x 1 =	5.00
FACW species	20.00	x 2 =	40.00
FAC species	10.00	x 3 =	30.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	35.00 (A)		75.00 (B)

Prevalence Index = B/A = 2.14

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL J2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/2	95	10YR 5/4	5	C	M	CL	Distinct redox.
8-18	10YR 3/2	100					C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 24

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL J2 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 29 T133N R070W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.300542 Long: -99.503706 Datum: WGS84

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa annua*	60	Y	FACU
2. *Bromus inermis*	30	Y	UPL
3. *Rumex crispus*	10	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	10.00	x 3 =	30.00
FACU species	60.00	x 4 =	240.00
UPL species	30.00	x 5 =	150.00
Column Totals:	100.00 (A)		420.00 (B)

Prevalence Index = B/A = 4.2

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL J2 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/1	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL J3

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 18 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 3-7

Subregion (LRR): LRR F, MLRA 53B Lat: 46.330169 Long: -99.520892 Datum: WGS84

Soil Map Unit Name: Max-Zahl-Arnegard complex, 9 to 35 percent slopes, very stony NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	20	Y	FACW
2. *Juncus effusus*	20	Y	OBL
3. *Rumex crispus*	10	N	FAC
4. *Cyperus esculentus*	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	55 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 45

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20.00	x 1 =	20.00
FACW species	25.00	x 2 =	50.00
FAC species	10.00	x 3 =	30.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	55.00 (A)		100.00 (B)

Prevalence Index = B/A = 1.82

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL J3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/2	95	10YR 6/4	5	C	M	SCL	Prominent redox.
8-18	10YR 2/2	90	10YR 6/4	10	C	M	SCL	Prominent redox.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 6

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL J3 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 18 T133N R070W

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 3-7

Subregion (LRR): LRR F, MLRA 53B Lat: 46.330251 Long: -99.520886 Datum: WGS84

Soil Map Unit Name: Max-Zahl-Arnegard complex, 9 to 35 percent slopes, very stony NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa annua*	80	Y	FACU
2. *Bromus inermis*	15	N	UPL
3. *Rumex crispus*	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	5.00	x 3 =	15.00
FACU species	80.00	x 4 =	320.00
UPL species	15.00	x 5 =	75.00
Column Totals:	100.00 (A)		410.00 (B)

Prevalence Index = B/A = 4.1

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL J3 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/2	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL J4

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 18 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.328329 Long: -99.520249 Datum: WGS84

Soil Map Unit Name: Williams-Bowbells loams, 0 to 3 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	35	Y	FACW
2. *Erigeron lonchophyllus*	30	Y	FACW
3. *Symphyotrichum lanceolatum*	15	N	FACW
4. *Rumex crispus*	10	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	80.00	x 2 =	160.00
FAC species	10.00	x 3 =	30.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	90.00 (A)		190.00 (B)

Prevalence Index = B/A = 2.11

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL J4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					SCL	
8-12	10YR 3/2	70	10YR 4/4	30	C	M	SCL	Distinct redox.
12-18	10YR 3/4	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 6

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL J4 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 18 T133N R070W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3-7

Subregion (LRR): LRR F, MLRA 53B Lat: 46.328247 Long: -99.519921 Datum: WGS84

Soil Map Unit Name: Max-Zahl-Arnegard complex, 9 to 35 percent slopes, very stony NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5)			
1. *Bromus inermis*	100	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	0.00	x 3 =	0.00
FACU species	0.00	x 4 =	0.00
UPL species	100.00	x 5 =	500.00
Column Totals:	100.00 (A)		500.00 (B)

Prevalence Index = B/A = 5.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL J4 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/2	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K1

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 08 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.342178 Long: -99.506825 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	40	Y	FACW
2. *Spartina pectinata*	20	Y	FACW
3. *Rumex crispus*	5	N	FAC
4. *Cyperus esculentus*	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	65.00	x 2 =	130.00
FAC species	5.00	x 3 =	15.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	70.00 (A)		145.00 (B)

Prevalence Index = B/A = 2.07

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL K1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	100					SCL	
8-15	10YR 3/1	90	10YR 6/4	5	C	M	SCL	Distinct redox.
			10YR 6/2	5	D	M	SCL	
15-18	10YR 3/1	40	10YR 6/8	20	C	M	CL	Prominent redox.
			10YR 6/3	40	D	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 24

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K1 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 08 T133N R070W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.342133 Long: -99.506886 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Bromus inermis*	60	Y	UPL
2. *Poa annua*	20	Y	FACU
3. *Rumex crispus*	20	Y	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	20.00	x 3 =	60.00
FACU species	20.00	x 4 =	80.00
UPL species	60.00	x 5 =	300.00
Column Totals:	100.00 (A)		440.00 (B)

Prevalence Index = B/A = 4.4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL K1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3	100					SCL	
4-18	10YR 3/2	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K2

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.339510 Long: -99.507342 Datum: WGS84

Soil Map Unit Name: Zahl-Max-Bowbells loams, 6 to 35 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	40	Y	FACW
2. *Spartina pectinata*	20	Y	FACW
3. *Carex stricta*	10	N	OBL
4. *Rumex crispus*	5	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10.00	x 1 =	10.00
FACW species	60.00	x 2 =	120.00
FAC species	5.00	x 3 =	15.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	75.00 (A)		145.00 (B)

Prevalence Index = B/A = 1.93

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL K2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					SCL	
8-15	10YR 3/1	85	10YR 6/4	5	C	M	CL	Distinct redox.
			10YR 6/2	10	D	M	SCL	
15-18	10YR 3/2	90	10YR 6/4	5	C	M	SL	Distinct redox.
			10YR 6/2	5	D	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 18

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K2 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 08 T133N R070W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3-7

Subregion (LRR): LRR F, MLRA 53B Lat: 46.339588 Long: -99.507267 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa annua*	80	Y	FACU
2. *Bromus inermis*	20	Y	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 80

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	0.00	x 3 =	0.00
FACU species	80.00	x 4 =	320.00
UPL species	20.00	x 5 =	100.00
Column Totals:	100.00 (A)		420.00 (B)

Prevalence Index = B/A = 4.2

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL K2 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	100					SCL	
6-18	10YR 4/6	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K3

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.339106 Long: -99.508369 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
Small PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	40	Y	FACW
2. *Spartina pectinata*	20	Y	FACW
3. *Carex stricta*	10	N	OBL
4. *Rumex crispus*	5	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10.00	x 1 =	10.00
FACW species	60.00	x 2 =	120.00
FAC species	5.00	x 3 =	15.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	75.00 (A)		145.00 (B)

Prevalence Index = B/A = 1.93

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL K3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	95	10YR 6/6	5	C	M	SCL	Prominent redox.
6-18	10YR 3/1	90	10YR 3/6	10	C	M	SCL	Prominent redox.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 18

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K3 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3-7

Subregion (LRR): LRR F, MLRA 53B Lat: 46.338975 Long: -99.508380 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa annua*	80	Y	FACU
2. *Bromus inermis*	10	N	UPL
3. *Cornus racemosa*	10	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	10.00	x 3 =	30.00
FACU species	80.00	x 4 =	320.00
UPL species	10.00	x 5 =	50.00
Column Totals:	100.00 (A)		400.00 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL K3 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-18	10YR 3/4	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K4

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.335953 Long: -99.509275 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Spartina pectinata*	50	Y	FACW
2. *Carex stricta*	40	Y	OBL
3. *Rumex crispus*	10	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40.00	x 1 =	40.00
FACW species	50.00	x 2 =	100.00
FAC species	10.00	x 3 =	30.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	100.00 (A)		170.00 (B)

Prevalence Index = B/A = 1.7

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL K4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100					SCL	
6-12	10YR 3/1	90	10YR 6/4	10	C	M	SCL	Distinct redox.
12-18	10YR 3/1	85	10YR 6/4	15	C	M	CL	Distinct redox.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 12

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K4 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.336004 Long: -99.509123 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa annua*	80	Y	FACU
2. *Bromus inermis*	20	Y	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	0.00	x 3 =	0.00
FACU species	80.00	x 4 =	320.00
UPL species	20.00	x 5 =	100.00
Column Totals:	100.00 (A)		420.00 (B)

Prevalence Index = B/A = 4.2

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL K4 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/6	100					SL	
12-18	10YR 3/6	60	10YR 7/3	40	D	M	SL	Prominent redox.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K5

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.334793 Long: -99.507923 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
Small PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Spartina pectinata*	50	Y	FACW
2. *Carex stricta*	15	Y	OBL
3. *Rumex crispus*	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15.00	x 1 =	15.00
FACW species	50.00	x 2 =	100.00
FAC species	5.00	x 3 =	15.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	70.00 (A)		130.00 (B)

Prevalence Index = B/A = 1.86

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL K5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100					MUCK	
4-12	10YR 3/1	90	10YR 6/4	10	C	M	SCL	Distinct redox.
12-18	10YR 3/1	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 18

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K5 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.334711 Long: -99.508059 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa annua*	70	Y	FACU
2. *Bromus inermis*	20	Y	UPL
3. *Solidago altissima*	10	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	0.00	x 3 =	0.00
FACU species	80.00	x 4 =	320.00
UPL species	20.00	x 5 =	100.00
Column Totals:	100.00 (A)		420.00 (B)

Prevalence Index = B/A = 4.2

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL K5 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/3	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K6

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.333585 Long: -99.511102 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
Small PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Spartina pectinata*	50	Y	FACW
2. *Rumex crispus*	5	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	55 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 45

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	50.00	x 2 =	100.00
FAC species	5.00	x 3 =	15.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	55.00 (A)		115.00 (B)

Prevalence Index = B/A = 2.09

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL K6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100					MUCK	
4-12	10YR 3/1	90	10YR 6/4	10	C	M	SCL	Distinct redox.
12-18	10YR 3/1	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 24

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K6 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.333513 Long: -99.511060 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Bromus inermis*	90	Y	UPL
2. *Rumex crispus*	10	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	10.00	x 3 =	30.00
FACU species	0.00	x 4 =	0.00
UPL species	90.00	x 5 =	450.00
Column Totals:	100.00 (A)		480.00 (B)

Prevalence Index = B/A = 4.8

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL K6 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-18	10YR 3/3	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K7

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.333080 Long: -99.511169 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
Small PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Spartina pectinata*	50	Y	FACW
2. *Rumex crispus*	5	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	55 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 45

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	50.00	x 2 =	100.00
FAC species	5.00	x 3 =	15.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	55.00 (A)		115.00 (B)

Prevalence Index = B/A = 2.09

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL K7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100					MUCK	
4-12	10YR 3/1	90	10YR 6/4	10	C	M	SCL	Distinct redox.
12-18	10YR 3/1	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 24

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K7 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.333025 Long: -99.511177 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Bromus inermis*	90	Y	UPL
2. *Rumex crispus*	10	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	10.00	x 3 =	30.00
FACU species	0.00	x 4 =	0.00
UPL species	90.00	x 5 =	450.00
Column Totals:	100.00 (A)		480.00 (B)

Prevalence Index = B/A = 4.8

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL K7 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-18	10YR 3/3	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K8

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.331140 Long: -99.516496 Datum: WGS84

Soil Map Unit Name: Bowdle-Lehr loams, 0 to 2 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
Small PEM depression within pasture

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5)			
1. *Carex stricta*	30	Y	OBL
2. *Spartina pectinata*	20	Y	FACW
3. *Artemisia vulgaris*	10	N	UPL
4. *Rumex crispus*	5	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 35

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30.00	x 1 =	30.00
FACW species	20.00	x 2 =	40.00
FAC species	5.00	x 3 =	15.00
FACU species	0.00	x 4 =	0.00
UPL species	10.00	x 5 =	50.00
Column Totals:	65.00 (A)		135.00 (B)

Prevalence Index = B/A = 2.08

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL K8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	100					SCL	
8-15	10YR 3/1	90	10YR 3/6	10	C	M	SCL	Prominent redox.
15-18	10YR 3/1	90	10YR 3/6	10	C	M	SCL	Prominent redox.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 12

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL K8 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 17 T133N R070W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.330860 Long: -99.516859 Datum: WGS84

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Bromus inermis*	90	Y	UPL
2. *Rumex crispus*	10	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	10.00	x 3 =	30.00
FACU species	0.00	x 4 =	0.00
UPL species	90.00	x 5 =	450.00
Column Totals:	100.00 (A)		480.00 (B)

Prevalence Index = B/A = 4.8

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL K8 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	60	10YR 3/3	40			SCL	Faint redox. Mixed Matrix.
6-18	10YR 3/2	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL L1

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 28 T133N R071W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.301407 Long: -99.622210 Datum: WGS84

Soil Map Unit Name: Regan silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
Large PEM depression within pasture

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5)			
1. *Spartina patens*	60	Y	FACW
2. *Phalaris arundinacea*	30	Y	FACW
3. *Carex stricta*	10	N	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10.00	x 1 =	10.00
FACW species	90.00	x 2 =	180.00
FAC species	0.00	x 3 =	0.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	100.00 (A)		190.00 (B)

Prevalence Index = B/A = 1.9

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL L1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	100					CL	
4-12	10YR 2/2	60	10Y 6/1	40	D	M	SCL	Prominent redox.
12-18	10YR 2/2	90	10Y 6/1	10	D	M	SCL	Prominent redox.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ✓ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 2

Water Table Present? Yes ✓ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL L1 Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 28 T133N R071W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.301162 Long: -99.622314 Datum: WGS84

Soil Map Unit Name: Tonka-Hamerly complex, 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5)			
1. *Bromus inermis*	80	Y	UPL
2. *Bromus tectorum*	18	N	UPL
3. *Asclepias syriaca*	2	N	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	0.00	x 3 =	0.00
FACU species	0.00	x 4 =	0.00
UPL species	100.00	x 5 =	500.00
Column Totals:	100.00 (A)		500.00 (B)

Prevalence Index = B/A = 5.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL L1 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR 3/2	100					SCL	
15-18	10YR 3/2	65	10YR 5/2	35	C	M	SCL	Faint redox.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 08/26/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL A1 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 31 133N 71W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.29365 | Long: -99.645451 | Datum: NAD83

Soil Map Unit Name: Hamerly and Vallers loams, saline, 0 to 3 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Yes		
Hydric soil present?	Yes	**Is the sampled area within a wetland?**	YES
Wetland hydrology present?	Yes	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Data form representative for Wetlands A1, A2, A3, A4, & C1

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 *Typha latifolia*	50	Y	OBL
2 *Carex lacustris*	20	Y	OBL
3 *Pastinaca sativa*	10	N	UPL
4 *Juncus effusus*	10	N	OBL
5 *Eleocharis palustris*	5	N	OBL
6			
7			
8			
9			
10			
	95	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	85	x 1 =	85
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	10	x 5 =	50
Column totals	95 (A)		135 (B)

Prevalence Index = B/A = 1.42

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Yes

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL A1 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Saturation present to soil surface.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Project | City/County: Logan County | Sampling Date: 08/27/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL A1 (2020) Upland

Investigator(s): James Freshwater, Atwell, LLC | Section, Township, Range: 31 133N 71W

Landform (hillslope, terrace, etc.): upland terrace | Local relief (concave, convex, none): Convex | Slope (%): 0-2

Subregion (LRR): F | Lat: 46.293347 | Long: - 99.645896 | Datum: NAD83

Soil Map Unit Name: Williams loam, 6 to 9 percent slopes | NWI Classification: N/A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N
Hydric soil present?	N
Wetland hydrology present?	N

Is the sampled area within a wetland? No

If yes, optional wetland site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

The sample location is in the upper reaches of the watershed and is within the OHWM of an ephemeral channel. It may also be considered to be part of an ephemeral channel. Soils do not meet NTCHS definition of a hydric soil and no wetland hydrology observed.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5' radius)			
1 *Zea mays*	40	Y	UPL
2 *Glycine max*	40	Y	UPL
3			
4			
5			
6			
7			
8			
9			
10			
	80	= Total Cover	

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum ____

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	80	x 5 =	400
Column totals	80 (A)		400 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

___ Rapid test for hydrophytic vegetation

___ Dominance test is >50%

___ Prevalence index is ≤3.0*

___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)

___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

Sample taken within planted corn and soybean agricultural field.

SOIL

Sampling Point: WL A1 (2020) Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-8	10YR 3/1	100					Silt Loam	
8-12+	10YR 4/3	100					Silt Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present? Yes ___ No X Depth (inches): ___

Water table present? Yes ___ No X Depth (inches): ___

Saturation present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

No wetland hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL A2 (2020)

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 31 T133N R071W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.283227 Long: -99.656270 Datum: WGS84

Soil Map Unit Name: Marysland loam, 0 to 1 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
Large PEM depression within fallow field

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Typha X glauca*	60	Y	OBL
2. *Spartina patens*	20	Y	FACW
3. *Phalaris arundinacea*	10	N	FACW
4. *Carex stricta*	10	N	OBL
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70.00	x 1 =	70.00
FACW species	30.00	x 2 =	60.00
FAC species	0.00	x 3 =	0.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	100.00 (A)		130.00 (B)

Prevalence Index = B/A = 1.3

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WL A2 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/2	100					CL	
8-18	10YR 6/1	100					CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 24

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Badger Wind City/County: Logan County Sampling Date: 2022-05-05

Applicant/Owner: Orsted State: North Dakota Sampling Point: WL A2 (2020) Upland

Investigator(s): K. Yantz, D. Nigro -Atwell, LLC Section, Township, Range: sec 31 T133N R071W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2

Subregion (LRR): LRR F, MLRA 53B Lat: 46.283503 Long: -99.656789 Datum: WGS84

Soil Map Unit Name: Marysland loam, 0 to 1 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Bromus inermis*	80	Y	UPL
2. *Taraxacum officinale*	15	N	FACU
3. *Artemisia vulgaris*	5	N	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	0.00	x 3 =	0.00
FACU species	15.00	x 4 =	60.00
UPL species	85.00	x 5 =	425.00
Column Totals:	100.00 (A)		485.00 (B)

Prevalence Index = B/A = 4.85

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WL A2 (2020) Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-18	10YR 3/3	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 08/27/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL B1 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 21 133N 71W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): Concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.314293 | Long: -99.617395 | Datum: NAD83

Soil Map Unit Name: Hamerly and Vallers loams, saline, 0 to 3 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y	If yes, optional wetland site ID:	
Wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Seasonally saturated drainage basin which converges to linear swale; data also representative of Wetland C5

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 *Phalaris arundinacea*	50	Y	FACW
2 *Juncus effusus*	10	N	OBL
3 *Juncus tenuis*	10	N	FAC
4 *Typha latifolia*	10	N	OBL
5 *Hordeum jubatum*	10	N	FACW
6			
7			
8			
9			
10			
	90	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum: 10

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	20	x 1 =	20	
FACW species	60	x 2 =	120	
FAC species	10	x 3 =	30	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	90	(A)	170	(B)

Prevalence Index = B/A = 1.89

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL B1 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	98	10YR 3/6	2	C	M	Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 08/27/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL B2 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 28 133N 71W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): Concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.308205 | Long: -99.605972 | Datum: NAD83

Soil Map Unit Name: Bowdle-Lehr loams, 0 to 2 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y	If yes, optional wetland site ID:	
Wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Seasonally saturated drainage basin which converges to linear drainage swale

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 *Typha latifolia*	20	Y	OBL
2 *Persicaria amphibia*	10	Y	OBL
3 *Ranunculus scleratus*	5	N	OBL
4 *Juncus effusus*	5	N	OBL
5			
6			
7			
8			
9			
10			
	40	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum: 50

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	40	x 1 =	40	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	40	(A)	40	(B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? YES

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL B2 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	98	10YR 3/6	2	C	M	Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- X Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 08/27/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL B3 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 28 133N 71W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): Concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.300804 | Long: -99.610761 | Datum: NAD83

Soil Map Unit Name: Arnegard loam, 0 to 6 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y
Hydric soil present?	Y
Wetland hydrology present?	Y
Is the sampled area within a wetland?	Y
If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Seasonally saturated linear drainage swale

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Typha latifolia*	50	Y	OBL
2 *Spartina pectinata*	25	Y	FACW
3 *Juncus effusus*	20	N	OBL
4 *Eleocharis palustris*	5	N	OBL
5			
6			
7			
8			
9			
10			
	100 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	75	x 1 =	75
FACW species	25	x 2 =	50
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		125 (B)

Prevalence Index = B/A = 1.25

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? YES

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: WL B3 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- X Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 08/27/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL B3 (2020) Upland

Investigator(s): James Freshwater, Atwell, LLC | Section, Township, Range: 28 133N 71W

Landform (hillslope, terrace, etc.): slight hillslope | Local relief (concave, convex, none): Convex | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.301193 | Long: -99.611004 | Datum: NAD83

Soil Map Unit Name: Williams-Zahl-Parnell complex, 0 to 9 percent slopes | NWI Classification: R4SBC

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	N		
Hydric soil present?	N	**Is the sampled area within a wetland?**	N
Wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 *Bromus inermis*	40	Y	UPL
2 *Poa pratensis*	20	Y	FACU
3 *Artemisia absinthium*	10	N	UPL
4 *Cirsium arvense*	5	N	FACU
5 *Ambrosia artemisiifolia*	5	N	FACU
6			
7			
8			
9			
10			
	80	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:				
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	30	x 4 =	120	
UPL species	50	x 5 =	250	
Column totals	80	(A)	370	(B)

Prevalence Index = B/A = 4.63

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

Vegetation heavily grazed by cattle

SOIL

Sampling Point: WL B3 (2020) Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-7	10YR 2/2	100					Clay Loam	
7-12+	10YR 5/6	100					Silty Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

No wetland hydrology observed.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: McIntosh County | Sampling Date: 08/27/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL B4 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 1 132N 72W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): Concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.282241 | Long: - 99.636832 | Datum: NAD83

Soil Map Unit Name: Colvin Silt Loam | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y
Hydric soil present?	Y
Wetland hydrology present?	Y
Is the sampled area within a wetland?	Y
If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Permanently saturated/flooded drainage basin which converges to linear drainage swale

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Typha latifolia*	50	Y	OBL
2 *Spartina pectinata*	20	Y	FACW
3 *Juncus effusus*	10	N	OBL
4 *Schoenoplectus tabernaemontani*	10	N	OBL
5 *Sonchus arvensis*	5	N	FAC
6 *Eleocharis palustris*	5	N	OBL
7			
8			
9			
10			
	100 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	75	x 1 =	75
FACW species	20	x 2 =	40
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		130 (B)

Prevalence Index = B/A = 1.30

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL B4 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- X Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	12-36+
Water table present?	Yes	X	No		Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Wetland partially inundated

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 08/27/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL B5 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 28 133N 71W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): Concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.299927 | Long: - 99.614296 | Datum: NAD83

Soil Map Unit Name: Williams-Zahl-Parnell Complex, 0 to 9 percent slopes | NWI Classification: PEMF

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Y
Hydric soil present? Y	If yes, optional wetland site ID: Wetland B2
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Permanently saturated/flooded drainage basin which converges to linear drainage swale

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 *Hordeum jubatum*	50	Y	FACW
2 *Typha latifolia*	10	N	OBL
3 *Juncus effusus*	10	N	OBL
4 *Schoenoplectus tabernaemontani*	10	N	OBL
5 *Sonchus arvensis*	5	N	FAC
6 *Eleocharis palustris*	5	N	OBL
7 *Spartina pectinata*	3	N	FACW
8			
9			
10			
	93	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	35	x 1 =	35
FACW species	53	x 2 =	106
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	93 (A)		156 (B)

Prevalence Index = B/A = 1.68

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? YES

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL B5 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes	X	No		Depth (inches):	10
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: McIntosh County | Sampling Date: 08/28/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL C2 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 6 132N 71W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): Concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.273939 | Long: - 99.62295 | Datum: NAD83

Soil Map Unit Name: Zahl-Max loams, 15 to 25 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y
Hydric soil present?	Y
Wetland hydrology present?	Y
Is the sampled area within a wetland?	Y
If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Large wetland complex; flooded network of drainage swales within hay field and active pasture; data form represents wetlands C2 and D1

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Typha latifolia*	50	Y	OBL
2 *Spartina pectinata*	20	Y	FACW
3 *Juncus effusus*	10	N	OBL
4 *Schoenoplectus tabernaemontani*	10	N	OBL
5 *Sonchus arvensis*	5	N	FAC
6 *Eleocharis palustris*	5	N	OBL
7			
8			
9			
10			
	100 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:				
OBL species	75	x 1 =	75	
FACW species	20	x 2 =	40	
FAC species	5	x 3 =	15	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	100	(A)	130	(B)

Prevalence Index = B/A = 1.30

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? YES

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL C2 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	1
Water table present?	Yes	X	No		Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Inundated wetland

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Project | City/County: Logan County | Sampling Date: 08/28/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL C2 (2020) Upland

Investigator(s): James Freshwater, Atwell, LLC | Section, Township, Range: 6 132N 71W

Landform (hillslope, terrace, etc.): slight hillslope | Local relief (concave, convex, none): none | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.277247 | Long: - 99.617659 | Datum: NAD83

Soil Map Unit Name: Zahl-Max-Arnegard loams, 15 to 60 percent slopes | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	N
Hydric soil present?	N
Wetland hydrology present?	N

Is the sampled area within a wetland? No

If yes, optional wetland site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

The sample location is in the upper reaches of the watershed and is within the OHWM of an ephemeral channel. It may also be considered to be part of an ephemeral channel. Soils do not meet NTCHS definition of a hydric soil and no indicators of wetland hydrology present.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5' radius)			
1 *Poa pratensis*	40	Y	FACU
2 *Grindelia squarrosa*	10	N	UPL
3 *Bromus inermis*	10	N	UPL
4			
5			
6			
7			
8			
9			
10			
	60	= Total Cover	

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum ____

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:				
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	40	x 4 =	160	
UPL species	20	x 5 =	100	
Column totals	60	(A)	260	(B)

Prevalence Index = B/A = 4.33

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

Vegetation heavily grazed by cattle

SOIL

Sampling Point: WL C2 (2020) Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-8	10YR 2/2	100					Clay Loam	Restrictive gravel layer at 8"

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 8" below soil surface

Hydric soil present? N

Remarks:

Restrictive gravel layer at 8"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present? Yes ___ No X Depth (inches): ___

Water table present? Yes ___ No X Depth (inches): ___

Saturation present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

No wetland hydrology indicators observed.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: McIntosh County | Sampling Date: 08/28/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL C3 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 7 132N 71W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): Concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.272066 | Long: - 99.615619 | Datum: NAD83

Soil Map Unit Name: Zahl-Max-Bowbells loams, 6 to 25 percent slopes | NWI Classification: R4SBC

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y	If yes, optional wetland site ID:	
Wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Seasonally saturated linear drainage swale within pasture; data representative for Wetland D2

VEGETATION -- Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Staus
Tree Stratum (Plot size: 30' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 *Phalaris arundinacea*	80	Y	FACW
2 *Persicaria amphibia*	10	N	OBL
3 *Xanthium strumarium*	5	N	FAC
4			
5			
6			
7			
8			
9			
10			
	95	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	10	x 1 =	10
FACW species	80	x 2 =	160
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	95 (A)		185 (B)

Prevalence Index = B/A = 1.95

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? YES

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL C3 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	98	10YR 3/6	2	C	M	Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: McIntosh County | Sampling Date: 08/28/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL C4 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 8 132N 71W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): Concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.267675 | Long: - 99.602144 | Datum: NAD83

Soil Map Unit Name: Zahl-Max-Bowbells loams, 6 to 35 percent slopes | NWI Classification: R4SBC

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y	If yes, optional wetland site ID:	
Wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Seasonally saturated linear drainage swale within hay

VEGETATION -- Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Staus
Tree Stratum (Plot size: 30' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Persicaria amphibia*	70	Y	OBL
2 *Cirsium arvense*	20	Y	FACU
3 *Xanthium strumarium*	5	N	FAC
4			
5			
6			
7			
8			
9			
10			
	95 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	70	x 1 =	70
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column totals	95 (A)		165 (B)

Prevalence Index = B/A = 1.74

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? YES

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: WL C4 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	98	10YR 3/6	2	C	M	Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: McIntosh County | Sampling Date: 08/29/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL D3 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 8 132N 71W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): Concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.260911 | Long: - 99.592574 | Datum: NAD83

Soil Map Unit Name: Bearpaw loam, 6 to 9 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Y
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Permanently saturated/seasonally flooded drainage swale

VEGETATION -- Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Staus
Tree Stratum (Plot size: 30' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Phalaris arundinacea*	75	Y	FACW
2 *Typha latifolia*	10	N	OBL
3 *Sonchus arvensis*	10	N	FAC
4			
5			
6			
7			
8			
9			
10			
	95 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	10	x 1 =	10
FACW species	75	x 2 =	150
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	95 (A)		190 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? YES

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL D3 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-12	10YR 3/2	100					Loam	
12-18+	10YR 3/2	90	10YR 3/6	10	C	M	Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: McIntosh County | Sampling Date: 08/29/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL D4 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 8 132N 71W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): Concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.265628 | Long: - 99.595921 | Datum: NAD83

Soil Map Unit Name: Bearpaw-Zeeland loams, 0 to 3 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y	If yes, optional wetland site ID:	
Wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Temporarily flooded drainage swale

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5' radius)			
1 *Typha latifolia*	50	Y	OBL
2 *Phalaris arundinacea*	20	Y	FACW
3 *Symphyotrichum lanceolatum*	10	N	FACW
4 *Sonchus arvensis*	10	N	FAC
5 *Schoenoplectus tabernaemontani*	5	N	OBL
6			
7			
8			
9			
10			
	95	= Total Cover	

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	55	x 1 =	55	
FACW species	30	x 2 =	60	
FAC species	10	x 3 =	30	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	95	(A)	145	(B)

Prevalence Index = B/A = 1.53

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? YES

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL D4 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 08/29/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL D5 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 27 133N 71W

Landform (hillslope, terrace, etc.): Drainage swale | Local relief (concave, convex, none): Concave | Slope (%): 2-5%

Subregion (LRR): LRR F | Lat: 46.301826 | Long: - 99.59299 | Datum: NAD83

Soil Map Unit Name: Bearpaw-Zeeland loams, 3 to 6 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y	If yes, optional wetland site ID:	
Wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Fringe wetland associated with Watercourse D1

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 *Typha latifolia*	65	Y	OBL
2 *Symphyotrichum lanceolatum*	10	N	FACW
3 *Hordeum jubatum*	10	N	FACW
4 *Schoenoplectus tabernaemontani*	10	N	OBL
5 *Sonchus arvensis*	5	N	FAC
6			
7			
8			
9			
10			
	100	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	75	x 1 =	75	
FACW species	20	x 2 =	40	
FAC species	5	x 3 =	15	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	100	(A)	130	(B)

Prevalence Index = B/A = 1.30

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? YES

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL D5 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Project | City/County: Logan County | Sampling Date: 08/29/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL D12 (2020) Upland

Investigator(s): James Freshwater, Atwell, LLC | Section, Township, Range: 19 133N 70W

Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Linear slope | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.31865 | Long: - 99.523407 | Datum: NAD83

Soil Map Unit Name: Vallers loam, 0 to 1 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N		
Hydric soil present?	N	**Is the sampled area within a wetland?**	No
Wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5' radius)			
1 *Poa pratensis*	30	Y	FACU
2 *Grindelia squarosa*	10	Y	UPL
3 *Artemisia frigida*	10	Y	UPL
4			
5			
6			
7			
8			
9			
10			
	50	= Total Cover	

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:				
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	30	x 4 =	120	
UPL species	20	x 5 =	100	
Column totals	50	(A)	220	(B)

Prevalence Index = B/A = 4.40

Hydrophytic Vegetation Indicators:

___ Rapid test for hydrophytic vegetation

___ Dominance test is >50%

___ Prevalence index is ≤3.0*

___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)

___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

Vegetation difficult to identify due to heavy grazing in the area by cattle.

SOIL

Sampling Point: WL D12 (2020) Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-4	10YR 2/2	100					Clay Loam	
4-6	10YR 3/3	100					Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Clay layer

Depth (inches): 6

Hydric soil present? N

Remarks:

Restrictive clay layer at 6" - unable to dig father down below layer.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

No wetland hydrology observed.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind | City/County: Logan County | Sampling Date: 08/30/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL E1 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 29 133N 70W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 1 to 2

Subregion (LRR): F | Lat: 46.30052 | Long: - 99.509334 | Datum: NAD83

Soil Map Unit Name: Hamerly loam, 0 to 3 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	Yes
Wetland hydrology present?	Y	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Data form represents wetlands E1, E2, E4, E7, E8

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Persicaria amphibia*	60	Y	OBL
2 *Typha latifolia*	10	N	OBL
3 *Bidens cernua*	10	N	OBL
4 *Echinochloa crus-galli*	10	N	FAC
5 *Spartina pectinata*	10	N	FACW
6			
7			
8			
9			
10			
	100 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	80	x 1 =	80	
FACW species	10	x 2 =	20	
FAC species	10	x 3 =	30	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	100	(A)	130	(B)

Prevalence Index = B/A = 1.30

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL E1 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	98	10YR 3/6	2	C	M	Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind | City/County: Logan County | Sampling Date: 08/30/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL E3 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 32 133N 70W

Landform (hillslope, terrace, etc.): Depressional swale | Local relief (concave, convex, none): concave | Slope (%): 0 to 2

Subregion (LRR): F | Lat: 46.29762 | Long: - 99.510649 | Datum: NAD83

Soil Map Unit Name: Hamerly-Tonka-Parnell complex, 0 to 3 percent slopes | NWI Classification: R44SBC

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	Yes
Wetland hydrology present?	Y	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Data form represents wetlands E3 & E5

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5' radius)			
1 *Typha latifolia*	50	Y	OBL
2 *Spartina pectinata*	30	Y	FACW
3 *Persicaria amphibia*	10	N	OBL
4 *Sonchus arvensis*	5	N	FAC
5			
6			
7			
8			
9			
10			
	95	= Total Cover	

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	60	x 1 =	60	
FACW species	30	x 2 =	60	
FAC species	5	x 3 =	15	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	95	(A)	135	(B)

Prevalence Index = B/A = 1.42

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL E3 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 08/30/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL E5 (2020) Upland

Investigator(s): James Freshwater, Atwell, LLC | Section, Township, Range: 32 133N 70W

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): Convex | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.29561 | Long: - 99.508384 | Datum: NAD83

Soil Map Unit Name: Lihen-Telfer loamy fine sands, 0 to 6 percent slopes | NWI Classification: N/A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	No
Wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5' radius)			
1 *Bromus inermis*	40	Y	UPL
2 *Poa pratensis*	25	Y	FACU
3 *Pascopyrum smithii*	10	N	FACU
4 *Grindelia squarrosa*	7	N	UPL
5			
6			
7			
8			
9			
10			
	82	= Total Cover	

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:				
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	35	x 4 =	140	
UPL species	47	x 5 =	235	
Column totals	82	(A)	375	(B)

Prevalence Index = B/A = 4.57

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: WL E5 (2020) Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-10	10YR 2/1	100					Clay Loam	
10-14+	10YR 2/2	100					Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

No wetland hydrology indicators observed.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind | City/County: Logan County | Sampling Date: 08/30/20
Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL E10 (2020)
Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 28 133N 70W
Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5
Subregion (LRR): LRR F | Lat: 46.300729 | Long: - 99.488705 | Datum: NAD83
Soil Map Unit Name: Flaxton fine sandy loam, 3 to 6 percent slopes | NWI Classification: PEM1C
Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	Yes
Wetland hydrology present?	Y	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Data form represents Wetlands E10, E11, E12, E13, E17, E18, E19, & E20

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Typha latifolia*	30	Y	OBL
2 *Persicaria amphibia*	20	Y	OBL
3 *Spartina pectinata*	20	Y	FACW
4 *Xanthium strumarium*	10	N	FAC
5 *Echinochloa crus-galli*	10	N	FAC
6			
7			
8			
9			
10			
	90 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across all Strata: 3 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	50	x 1 =	50	
FACW species	20	x 2 =	40	
FAC species	20	x 3 =	60	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	90	(A)	150	(B)

Prevalence Index = B/A = 1.67

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL E10 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- _X_ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- _X_ Saturation Visible on Aerial Imagery (C9)
- _X_ Geomorphic Position (D2)
- _X_ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	1-12"
Water table present?	Yes	X	No		Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Semi-permanently flooded depressions

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 08/30/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL E14 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 28 133N 70W

Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 2-5

Subregion (LRR): LRR F | Lat: 46.299553 | Long: - 99.483299 | Datum: NAD83

Soil Map Unit Name: Parnell silty clay loam, 0 to 1 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y
Hydric soil present?	Y
Wetland hydrology present?	Y

Is the sampled area within a wetland? Yes

If yes, optional wetland site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Large permanently flooded drainage basin within fallow field

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5' radius)			
1 *Typha latifolia*	50	Y	OBL
2 *Spartina pectinata*	30	Y	FACW
3 *Persicaria amphibia*	10	N	OBL
4			
5			
6			
7			
8			
9			
10			
	90	= Total Cover	

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum ____

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	60	x 1 =	60	
FACW species	30	x 2 =	60	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	90	(A)	120	(B)

Prevalence Index = B/A = 1.33

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL E14 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	1-12"
Water table present?	Yes	X	No		Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

permanently flooded drainage basin

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: McIntosh County | Sampling Date: 08/31/20
Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL F3 (2020)
Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 7 132N 70W
Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5
Subregion (LRR): F | Lat: 46.26754 | Long: - 99.494564 | Datum: NAD83
Soil Map Unit Name: Wildrose silty clay, 0 to 2 percent slopes | NWI Classification: PEM1A
Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y
Hydric soil present?	Y
Wetland hydrology present?	Y
Is the sampled area within a wetland?	Yes
If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Data form represents Wetlands F3, F4, F5, F6, F7, & F8

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Persicaria amphibia*	50	Y	OBL
2 *Echinochloa crus-galli*	30	Y	FAC
3 *Ambrosia artemisiifolia*	10	N	FACU
4 *Eleocharis palustris*	10	N	OBL
5			
6			
7			
8			
9			
10			
	100 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across all Strata: 2 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	60	x 1 =	60
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column totals	100 (A)		190 (B)

Prevalence Index = B/A = 1.90

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: F3 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	1-12"
Water table present?	Yes	X	No		Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Seasonally saturated/temporarily flooded wetland depressions

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 08/31/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL F9 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 8 133N 70W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.34294 | Long: - 99.514052 | Datum: NAD83

Soil Map Unit Name: Arnegard loam, 2 to 6 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Data form represents Wetlands F9 & F10

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Persicaria amphibia*	50	Y	OBL
2 *Spartina pectinata*	20	Y	FACW
3 *Echinochloa crus-galli*	10	N	FAC
4 *Alisma triviale*	5	N	OBL
5 *Bidens cernua*	5	N	OBL
6			
7			
8			
9			
10			
	90 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	60	x 1 =	60
FACW species	20	x 2 =	40
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	90 (A)		130 (B)

Prevalence Index = B/A = 1.44

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: F9 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Semi-permanently flooded depressions (divided by existing two-track)

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/01/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL G1 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 20 133N 70W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.322064 | Long: - 99.506714 | Datum: NAD83

Soil Map Unit Name: Grail silty clay loam, 0 to 2 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Data form represents Wetlands G1 & G3

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Persicaria amphibia*	50	Y	OBL
2 *Echinochloa crus-galli*	30	Y	FAC
3 *Spartina pectinata*	10	N	FACW
4 *Eleocharis palustris*	10	N	OBL
5			
6			
7			
8			
9			
10			
	100 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	60	x 1 =	60
FACW species	10	x 2 =	20
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		170 (B)

Prevalence Index = B/A = 1.70

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: G1 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Seasonally saturated/temporarily flooded wetland depressions

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/01/20
Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL G2 (2020)
Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 20 133N 70W
Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5
Subregion (LRR): F | Lat: 46.320567 | Long: - 99.505958 | Datum: NAD83
Soil Map Unit Name: Grail silty clay loam, 2 to 6 percent slopes | NWI Classification: PEM1C
Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y
Hydric soil present?	Y
Wetland hydrology present?	Y
Is the sampled area within a wetland?	Yes
If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Data form represents Wetlands G2, G12, G14, & G15

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Persicaria amphibia*	30	Y	OBL
2 *Phalaris arundinacea*	30	Y	FACW
3 *Alisma triviale*	20	Y	OBL
4 *Spartina pectinata*	10	N	FACW
5 *Echinochloa crus-galli*	10	N	FAC
6			
7			
8			
9			
10			
	100 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across all Strata: 3 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	50	x 1 =	50
FACW species	40	x 2 =	80
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		160 (B)

Prevalence Index = B/A = 1.60

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G2 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Seasonally saturated/temporarily flooded wetland depressions

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/01/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL G4 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 20 133N 70W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): concave | Slope (%): 2-5

Subregion (LRR): LRR F | Lat: 46.324518 | Long: - 99.500376 | Datum: NAD83

Soil Map Unit Name: Lowe-Fluvaquents channeled complex, 0 to 2 percent slopes, flooded | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Seasonally saturated /temporarily flooded wetland depression

VEGETATION -- Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Staus
Tree Stratum (Plot size: 30' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 Hordeum jubatum	30	Y	FACW
2 Spartina pectinata	30	Y	FACW
3 Phalaris arundinacea	20	Y	FACW
4 Rumex crispus	10	N	FAC
5			
6			
7			
8			
9			
10			
	90 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	80	x 2 =	160
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	90 (A)		190 (B)

Prevalence Index = B/A = 2.11

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G4 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/01/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL G5 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 20 133N 70W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.325255 | Long: - 99.501062 | Datum: NAD83

Soil Map Unit Name: Daglum-Belfield complex, 0 to 2 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Seasonally saturated /temporarily flooded wetland depression; data represents wetlands G5 and G6

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 Calamagrostis canadensis	30	Y	FACW
2 Symphyotrichum lanceolatum	20	Y	FACW
3 Persicaria amphibia	20	Y	OBL
4 Rumex crispus	20	Y	FAC
5			
6			
7			
8			
9			
10			
	90 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	20	x 1 =	20
FACW species	50	x 2 =	100
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	90 (A)		180 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL G5 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Seasonally saturated/temporarily flooded depressions

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/01/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL G7 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 16 133N 70W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5

Subregion (LRR): LRR F | Lat: 46.329341 | Long: - 99.497559 | Datum: NAD83

Soil Map Unit Name: Lowe loam, 0 to 2 percent slopes, occasionally flooded | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y
Hydric soil present?	Y
Wetland hydrology present?	Y

Is the sampled area within a wetland? Yes

If yes, optional wetland site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Data form represents Wetlands G7, G8, G9, & G10

VEGETATION -- Use scientific names of plants.

		Absolute % Cover	Dominant Species	Indicator Staus
Tree Stratum (Plot size: 30' radius)				
1				
2				
3				
4				
5				
		0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)				
1				
2				
3				
4				
5				
		0	= Total Cover	
Herb stratum (Plot size: 5' radius)				
1	Typha latifolia	50	Y	OBL
2	Spartina pectinata	20	Y	FACW
3	Persicaria amphibia	20	Y	OBL
4	Alisma triviale	5	N	OBL
5				
6				
7				
8				
9				
10				
		95	= Total Cover	
Woody vine stratum (Plot size: 30' radius)				
1				
2				
		0	= Total Cover	

% Bare Ground in Herb Stratum ____

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	75	x 1 =	75
FACW species	20	x 2 =	40
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	95 (A)		115 (B)

Prevalence Index = B/A = 1.21

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G7 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Seasonally flooded depressions

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/01/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL G11 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 16 133N 70W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.336941 | Long: - 99.495511 | Datum: NAD83

Soil Map Unit Name: Harriet loam, 0 to 2 percent slopes | NWI Classification: PUBFx

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Large seasonally saturated basin with small permanently flooded area of open water

VEGETATION -- Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Staus
Tree Stratum (Plot size: 30' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 Typha latifolia	50	Y	OBL
2 Spartina pectinata	20	Y	FACW
3 Calamagrostis canadensis	20	N	FACW
4 Juncus effusus	10	N	OBL
5 Persicaria amphibia	5	N	OBL
6 Schoenoplectus tabernaemontani	3	N	OBL
7			
8			
9			
10			
	108 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	68	x 1 =	68
FACW species	40	x 2 =	80
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	108 (A)		148 (B)

Prevalence Index = B/A = 1.37

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G11 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	1-12"
Water table present?	Yes	X	No		Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Inundated seasonally saturated basin, small area of open water present

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/01/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL G13 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 17 133N 70W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5

Subregion (LRR): LRR F | Lat: 46.340107 | Long: - 99.498633 | Datum: NAD83

Soil Map Unit Name: Rhoades-Daglum loams, 2 to 9 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Large permanently flooded isolated basin with a small open water feature

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		

Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		

Herb stratum (Plot size: 5' radius)			
1 Typha latifolia	50	Y	OBL
2 Spartina pectinata	20	Y	FACW
3 Calamagrostis canadensis	20	N	FACW
4 Juncus effusus	10	N	OBL
5 Persicaria amphibia	5	N	OBL
6 Schoenoplectus tabernaemontani	3	N	OBL
7			
8			
9			
10			
	108 = Total Cover		

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	68	x 1 =	68
FACW species	40	x 2 =	80
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	108 (A)		148 (B)

Prevalence Index = B/A = 1.37

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL G13 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	1-12"
Water table present?	Yes	X	No		Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Isolated permanently flooded basin with open water feature

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/01/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL G16 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 18 133N 70W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5

Subregion (LRR): LRR F | Lat: 46.328646 | Long: - 99.534902 | Datum: NAD83

Soil Map Unit Name: Noonan-Niobell-Williams loams, 0 to 6 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Yes
Hydric soil present?	Y	If yes, optional wetland site ID:	
Wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Data form represents Wetlands G16, G15, & G14

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 Spartina pectinata	30	Y	FACW
2 Echinochloa crus-galli	20	Y	FAC
3 Bidens cernua	20	Y	OBL
4 Juncus effusus	10	N	OBL
5 Alisma triviale	10	N	OBL
6 Persicaria amphibia	5	N	OBL
7			
8			
9			
10			
	95	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	45	x 1 =	45	
FACW species	30	x 2 =	60	
FAC species	20	x 3 =	60	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	95	(A)	165	(B)

Prevalence Index = B/A = 1.74

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL G16 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	1-12"
Water table present?	Yes	X	No		Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Permanently flooded with open water feature

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/01/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL G17 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 13 133N 71W

Landform (hillslope, terrace, etc.): drainage | Local relief (concave, convex, none): concave | Slope (%): 2-5

Subregion (LRR): LRR F | Lat: 46.339605 | Long: - 99.558377 | Datum: NAD83

Soil Map Unit Name: Noonan-Niobell-Williams loams, 0 to 6 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Yes
Hydric soil present?	Y	If yes, optional wetland site ID:	
Wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Data form represents Wetlands G17 & H5

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 Persicaria amphibia	30	Y	OBL
2 Phalaris arundinacea	20	Y	FACW
3 Spartina pectinata	20	Y	FACW
4 Echinochloa crus-galli	5	N	FAC
5			
6			
7			
8			
9			
10			
	75	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	30	x 1 =	30
FACW species	40	x 2 =	80
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	75 (A)		125 (B)

Prevalence Index = B/A = 1.67

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- X Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

These areas were disturbed by agricultural practices (hayed). Dominance Test & Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL G17 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	98	10YR 3/6	2			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches): 0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Seasonally saturated shallow basins

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/02/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL H1 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 6 133N 70W

Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.360815 | Long: - 99.534859 | Datum: NAD83

Soil Map Unit Name: Williams-Niobell loams, 3 to 6 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Temporarily flooded isolated depression

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 Persicaria amphibia	60	Y	OBL
2 Spartina pectinata	20	Y	FACW
3 Rumex crispus	10	N	FAC
4 Symphyotrichum lanceolatum	3	N	FACW
5			
6			
7			
8			
9			
10			
	93 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	60	x 1 =	60
FACW species	23	x 2 =	46
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	93 (A)		136 (B)

Prevalence Index = B/A = 1.46

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL H1 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Temporarily flooded

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/02/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL H2 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 7 133N 70W

Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.355654 | Long: - 99.534849 | Datum: NAD83

Soil Map Unit Name: Hamerly-Vallers loams, 3 to 6 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Temporarily flooded depressional wetland

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 Persicaria amphibia	75	Y	OBL
2 Bidens cernua	10	N	OBL
3 Symphyotrichum lanceolatum	10	N	FACW
4 Rumex crispus	5	N	FAC
5			
6			
7			
8			
9			
10			
	100 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	85	x 1 =	85
FACW species	10	x 2 =	20
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		120 (B)

Prevalence Index = B/A = 1.20

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- X Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: WL H2 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	98	10YR 3/6	2			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Temporarily flooded

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/02/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL H3 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 7 133N 70W

Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.343811 | Long: - 99.538917 | Datum: NAD83

Soil Map Unit Name: Hamerly-Vallers loams, moderately saline, 0 to 3 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Yes
Hydric soil present?	Y	If yes, optional wetland site ID:	
Wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Large basin with a small permanently flooded open water feature

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 Typha latifolia	50	Y	OBL
2 Spartina pectinata	20	Y	FACW
3 Persicaria amphibia	10	N	OBL
4 Juncus effusus	10	N	OBL
5 Alisma triviale	3	N	OBL
6			
7			
8			
9			
10			
	93 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	73	x 1 =	73
FACW species	20	x 2 =	40
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	93 (A)		113 (B)

Prevalence Index = B/A = 1.22

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- X Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL H3 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18	10YR 2/1	100					Mucky clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	1-12"
Water table present?	Yes	X	No		Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

small permanently flooded open water feature present

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/02/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL H4 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 12 133N 71W

Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.342418 | Long: - 99.541685 | Datum: NAD83

Soil Map Unit Name: Parshall fine sandy loam, 0 to 2 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Temporarily flooded depressional wetland

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 Typha latifolia	50	Y	OBL
2 Eleocharis palustris	10	N	OBL
3			
4			
5			
6			
7			
8			
9			
10			
	60	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	60	x 1 =	60
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	60 (A)		60 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- X Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index calculated for reference purposes only.

SOIL

Sampling Point: WL H4 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- _X_ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches): 0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

temporarily flooded depression

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/02/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL H6 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 27 133N 71W

Landform (hillslope, terrace, etc.): drainage | Local relief (concave, convex, none): concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.309049 | Long: - 99.602388 | Datum: NAD83

Soil Map Unit Name: Appam sandy loam, 2 to 6 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Fringe wetland system

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 *Spartina pectinata*	30	Y	FACW
2 *Phalaris arundinacea*	20	Y	FACW
3 *Typha latifolia*	20	Y	OBL
4 *Persicaria amphibia*	10	N	OBL
5 *Sonchus arvensis*	5	N	FAC
6			
7			
8			
9			
10			
	85 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	30	x 1 =	30
FACW species	50	x 2 =	100
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	85 (A)		145 (B)

Prevalence Index = B/A = 1.71

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL H6 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	X	No	___	Depth (inches):	6-24"
Water table present?	Yes	X	No	___	Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Permanently flooded wetland on fringe of watercourse

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/02/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL H7 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 22 133N 71W

Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.31222 | Long: - 99.601723 | Datum: NAD83

Soil Map Unit Name: Appam sandy loam, 2 to 6 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Seasonally flooded drainage swale

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 *Spartina pectinata*	60	Y	FACW
2 *Typha latifolia*	20	Y	OBL
3 *Persicaria amphibia*	10	N	OBL
4 *Sonchus arvensis*	5	N	FAC
5			
6			
7			
8			
9			
10			
	95	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	30	x 1 =	30
FACW species	60	x 2 =	120
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	95 (A)		165 (B)

Prevalence Index = B/A = 1.74

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL H7 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Seasonally flooded

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/02/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL H8 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 22 133N 71W

Landform (hillslope, terrace, etc.): drainage | Local relief (concave, convex, none): concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.314295 | Long: - 99.596402 | Datum: NAD83

Soil Map Unit Name: Bowdle-Lehr loams, 0 to 2 percent slopes | NWI Classification: R4SBC

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Wetland fringe system

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 Spartina pectinata	50	Y	FACW
2 Typha latifolia	20	Y	OBL
3 Persicaria amphibia	10	N	OBL
4 Sonchus arvensis	5	N	FAC
5 Xanthium strumarium	5	N	FAC
6 Schoenoplectus tabernaemontani	5	N	OBL
7			
8			
9			
10			
	95 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	35	x 1 =	35
FACW species	50	x 2 =	100
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	95 (A)		165 (B)

Prevalence Index = B/A = 1.74

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL H8 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	X	No	___	Depth (inches):	6-24"
Water table present?	Yes	X	No	___	Depth (inches):	0
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

permanently flooded; contains watercourse flowing through wetland

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/03/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL I1 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 14 133N 71W

Landform (hillslope, terrace, etc.): drainage | Local relief (concave, convex, none): concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.3387 | Long: - 99.573163 | Datum: NAD83

Soil Map Unit Name: Bowdle-Lehr loams, 0 to 2 percent slopes | NWI Classification: R4SBC

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Seasonally saturated wetland

VEGETATION -- Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Staus
Tree Stratum (Plot size: 30' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 Spartina pectinata	50	Y	FACW
2 Eleocharis palustris	20	Y	OBL
3 Juncus effusus	10	N	OBL
4 Scirpus atrovirens	10	N	OBL
5 Sonchus arvensis	5	N	FAC
6			
7			
8			
9			
10			
	95 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	40	x 1 =	40
FACW species	50	x 2 =	100
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	95 (A)		155 (B)

Prevalence Index = B/A = 1.63

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL I1 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18+	10YR 2/1	100					Mucky Clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- X 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Seasonally saturated

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/03/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL I2 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 14 133N 71W

Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.337953 | Long: - 99.571981 | Datum: NAD83

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes | NWI Classification: R4SBC

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Yes
Hydric soil present?	Y	If yes, optional wetland site ID:	
Wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Seasonally saturated wetland

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5' radius)			
1 Spartina pectinata	75	Y	FACW
2			
3			
4			
5			
6			
7			
8			
9			
10			
	75	= Total Cover	

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum: 25

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	75	x 2 =	150
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	75 (A)		150 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL I2 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	98	10YR 3/6	2			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Seasonally saturated

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: Logan County | Sampling Date: 09/03/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL I3 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 14 133N 71W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.331724 | Long: - 99.572678 | Datum: NAD83

Soil Map Unit Name: Lehr-Bowdle loams, 2 to 6 percent slopes | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Temporarily flooded depressional wetland

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 Typha latifolia	50	Y	OBL
2 Spartina pectinata	20	Y	FACW
3 Phalaris arundinacea	20	Y	FACW
4 Echinchloa drus-galli	10	N	FAC
5			
6			
7			
8			
9			
10			
	100 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum: 25

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	50	x 1 =	50
FACW species	40	x 2 =	80
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		160 (B)

Prevalence Index = B/A = 1.60

Hydrophytic Vegetation Indicators:

- X Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Dominance Test and Prevalence Index are calculated for reference purposes only.

SOIL

Sampling Point: WL I3 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Temporarily flooded depression

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: McIntosh County | Sampling Date: 09/03/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL I4 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 29 132N 71W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.226255 | Long: - 99.601916 | Datum: NAD83

Soil Map Unit Name: Divide loam, 0 to 2 percent slopes | NWI Classification: R4SBC

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Yes
Hydric soil present?	Y	If yes, optional wetland site ID:	
Wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Temporarily flooded depressional wetland

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5' radius)			
1 Echinochloa crus-galli	75	Y	FAC
2 Juncus effusus	10	N	OBL
3 Eleocharis palustris	5	N	OBL
4 Symphyotrichum lanceolatum	5	N	FACW
5 Ambrosia atremisiifolia	5	N	FACU
6			
7			
8			
9			
10			
	100	= Total Cover	
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

% Bare Ground in Herb Stratum: 25

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	15	x 1 =	15	
FACW species	5	x 2 =	10	
FAC species	75	x 3 =	225	
FACU species	5	x 4 =	20	
UPL species	0	x 5 =	0	
Column totals	100	(A)	270	(B)

Prevalence Index = B/A = 2.70

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL I4 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches) _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

seasonally saturated/temporarily flooded

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm | City/County: McIntosh County | Sampling Date: 09/03/20

Applicant/Owner: Badger Wind, LLC | State: ND | Sampling Point: WL I5 (2020)

Investigator(s): Ernest Schenk, Atwell, LLC | Section, Township, Range: 29 132N 71W

Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave | Slope (%): 2-5

Subregion (LRR): F | Lat: 46.226912 | Long: - 99.601496 | Datum: NAD83

Soil Map Unit Name: Divide loam, 0 to 2 percent slopes | NWI Classification: PEM1C

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	**Is the sampled area within a wetland?** Yes
Hydric soil present? Y	If yes, optional wetland site ID:
Wetland hydrology present? Y	

Remarks: (Explain alternative procedures here or in a separate report.)

Seasonally saturated/temporarily flooded depressional wetland

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5' radius)			
1 Echinochloa crus-galli	50	Y	FAC
2 Xanthium strumarium	20	Y	FAC
3 Symphyotrichum lanceolatum	10	N	FACW
4 Ambrosia atremisiifolia	10	N	FACU
5 Eleocharis palustris	5	N	OBL
6			
7			
8			
9			
10			
	95 = Total Cover		
Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

% Bare Ground in Herb Stratum: 25

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	5	x 1 =	5
FACW species	10	x 2 =	20
FAC species	70	x 3 =	210
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column totals	95 (A)		275 (B)

Prevalence Index = B/A = 2.89

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Prevalence Index is calculated for reference purposes only.

SOIL

Sampling Point: WL I5 (2020)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-11	10YR 3/2	100					Loam	
11-18+	10YR 3/2	90	10YR 3/6	10			Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Mat

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise note

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16 (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils:

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR K, L)
- ___ High Plains Depressions (F16) (LRR H outside of M:RA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

Seasonally saturated/temporarily flooded depression

APPENDIX E

AQUATIC RESOURCES TABLES

Table 2a. Field-delineated wetlands within the Survey Area

Feature ID	Cowardin Class[1]	Delineated Acreage	Latitude	Longitude	Likely Jurisdictional Status	Mapbook Page
Wetland A1	PEM	0.81	46.351601	-99.515810	Likely Jurisdictional	8
Wetland A2	PEM	0.09	46.359364	-99.518336	Likely Jurisdictional	4
Wetland A3	PEM	0.02	46.354464	-99.529774	Likely Jurisdictional	8
Wetland A4	PEM	0.04	46.354137	-99.530740	Likely Jurisdictional	7
Wetland A5	PEM	0.18	46.328309	-99.530308	Likely Isolated	16
Wetland A6	PEM	0.34	46.322352	-99.522399	Likely Isolated	17
Wetland B1	PEM	0.27	46.328523	-99.602005	Likely Jurisdictional	14
Wetland B2	PEM	1.22	46.336294	-99.602075	Likely Jurisdictional	9
Wetland B3	PEM	0.26	46.345466	-99.608037	Likely Jurisdictional	9
Wetland B4	PEM	0.52	46.352812	-99.624754	Likely Jurisdictional	6
Wetland B5	PEM	2.75	46.374102	-99.647178	Likely Jurisdictional	1
Wetland B6	PEM	0.65	46.361542	-99.638420	Likely Jurisdictional	2
Wetland C1	PEM	0.07	46.344199	-99.607878	Likely Jurisdictional	9
Wetland D1	PEM	0.10	46.285881	-99.668352	Likely Jurisdictional	30
Wetland D2	PEM	1.31	46.286183	-99.671807	Likely Jurisdictional	30
Wetland D3	PEM	1.22	46.289884	-99.640063	Likely Jurisdictional	31
Wetland D4	PEM	2.36	46.293660	-99.631281	Likely Jurisdictional	31
Wetland D5	PEM	1.58	46.284790	-99.616925	Likely Jurisdictional	32
Wetland D6	PEM	4.16	46.309120	-99.593674	Likely Jurisdictional	20
Wetland D7	PEM	3.99	46.318109	-99.616252	Likely Jurisdictional	19
Wetland D8	PEM	3.91	46.302558	-99.616266	Likely Jurisdictional	25
Wetland D9	PEM	0.96	46.304667	-99.615406	Likely Jurisdictional	25

Feature ID	Cowardin Class[1]	Delineated Acreage	Latitude	Longitude	Likely Jurisdictional Status	Mapbook Page
Wetland E1	PEM	0.20	46.283545	-99.518903	Likely Isolated	35
Wetland F1	PEM	0.25	46.326612	-99.512792	Likely Isolated	17
Wetland F2	PEM	0.04	46.332953	-99.512319	Likely Jurisdictional	12
Wetland F3	PEM	0.03	46.339464	-99.510361	Likely Jurisdictional	12
Wetland F4	PEM	0.41	46.344220	-99.507461	Likely Isolated	12
Wetland F5	PEM	0.02	46.300248	-99.490269	Likely Isolated	29
Wetland F6	PEM	<0.01	46.300308	-99.490460	Likely Isolated	29
Wetland F7	PEM	0.71	46.299414	-99.487307	Likely Isolated	29
Wetland F8	PEM	0.02	46.306963	-99.502058	Likely Jurisdictional	22
Wetland F9	PEM	0.25	46.305672	-99.507416	Likely Jurisdictional	28
Wetland F10	PEM	0.30	46.307322	-99.509922	Likely Jurisdictional	22
Wetland F11	PEM	12.52	46.296426	-99.501109	Likely Jurisdictional	28
Wetland F12	PEM	0.14	46.289992	-99.532060	Likely Jurisdictional	34
Wetland F13	PEM	0.02	46.289890	-99.550022	Likely Jurisdictional	34
Wetland F14	PEM	0.20	46.300726	-99.519212	Likely Jurisdictional	28
Wetland G1	PEM	0.40	46.300330	-99.529812	Likely Isolated	28
Wetland G2	PEM	0.18	46.299327	-99.539155	Likely Jurisdictional	27
Wetland G3	PEM	1.56	46.306738	-99.547519	Likely Jurisdictional	21
Wetland G4	PEM	7.42	46.301237	-99.556873	Likely Jurisdictional	27
Wetland G5	PEM	1.15	46.300961	-99.562543	Likely Jurisdictional	27
Wetland G6	PEM	0.08	46.311324	-99.582651	Likely Jurisdictional	20
Wetland G7	PEM	0.06	46.309641	-99.585550	Likely Jurisdictional	20
Wetland G8	PEM	0.26	46.309362	-99.590386	Likely Jurisdictional	20
Wetland G9	PEM	5.69	46.293442	-99.576707	Likely Jurisdictional	33

Feature ID	Cowardin Class[1]	Delineated Acreage	Latitude	Longitude	Likely Jurisdictional Status	Mapbook Page
Wetland G10	PEM	0.04	46.289571	-99.581693	Likely Jurisdictional	33
Wetland G11	PEM	5.54	46.287506	-99.580730	Likely Jurisdictional	33
Wetland G12	PEM	0.61	46.287962	-99.582127	Likely Jurisdictional	33
Wetland G13	PEM	2.31	46.285648	-99.587206	Likely Jurisdictional	33
Wetland H1	PEM	0.21	46.239439	-99.590733	Likely Jurisdictional	47
Wetland H2	PEM	2.74	46.273683	-99.596823	Likely Jurisdictional	38
Wetland I1	PEM	0.12	46.283075	-99.519862	Likely Jurisdictional	35
Wetland I2	PEM	0.01	46.282469	-99.518691	Likely Jurisdictional	35
Wetland J1	PEM	0.66	46.294329	-99.495287	Likely Jurisdictional	29
Wetland J2	PEM	0.36	46.300300	-99.504249	Likely Jurisdictional	28
Wetland J3	PEM	0.19	46.330262	-99.520323	Likely Jurisdictional	17
Wetland J4	PEM	0.05	46.328252	-99.520087	Likely Isolated	17
Wetland K1	PEM	3.35	46.342805	-99.506203	Likely Isolated	12
Wetland K2	PEM	0.63	46.339351	-99.507191	Likely Jurisdictional	12
Wetland K3	PEM	0.02	46.339107	-99.508441	Likely Jurisdictional	12
Wetland K4	PEM	0.38	46.335235	-99.509448	Likely Jurisdictional	12
Wetland K5	PEM	0.19	46.333641	-99.507779	Likely Jurisdictional	12
Wetland K6	PEM	0.13	46.333641	-99.511172	Likely Jurisdictional	12
Wetland K7	PEM	0.08	46.332995	-99.511352	Likely Jurisdictional	12
Wetland K8	PEM	0.05	46.331076	-99.516576	Likely Jurisdictional	17
Wetland L1	PEM	3.93	46.301641	-99.620982	Likely Jurisdictional	25
Wetland A1 (2020)	PEM	11.26	46.294566	-99.648780	Likely Jurisdictional	24
Wetland A2 (2020)	PEM	19.97	46.282465	-99.659645	Likely Jurisdictional	30
Wetland A3 (2020)	PEM	11.78	46.276429	-99.653603	Likely Jurisdictional	37

Feature ID	Cowardin Class[1]	Delineated Acreage	Latitude	Longitude	Likely Jurisdictional Status	Mapbook Page
Wetland A4 (2020)	PEM	4.19	46.303925	-99.639571	Likely Jurisdictional	24
Wetland B1 (2020)	PEM	10.23	46.314159	-99.618301	Likely Jurisdictional	19
Wetland B2 (2020)	PEM	9.80	46.308065	-99.611488	Likely Jurisdictional	1
Wetland B3 (2020)	PEM	2.27	46.300551	-99.611125	Likely Jurisdictional	25
Wetland B4 (2020)	PEM	3.90	46.282647	-99.637065	Likely Jurisdictional	31
Wetland B5 (2020)	PEM	0.61	46.300071	-99.614339	Likely Jurisdictional	25
Wetland C1 (2020)	PEM	6.57	46.276142	-99.645904	Likely Jurisdictional	37
Wetland C2 (2020)	PEM	9.64	46.273166	-99.623785	Likely Jurisdictional	38
Wetland C3 (2020)	PEM	2.34	46.272343	-99.614878	Likely Jurisdictional	38
Wetland C4 (2020)	PEM	0.23	46.267314	-99.602124	Likely Jurisdictional	42
Wetland D1 (2020)	PEM	2.40	46.279702	-99.608128	Likely Jurisdictional	38
Wetland D2 (2020)	PEM	0.03	46.281105	-99.608223	Likely Jurisdictional	38
Wetland D3 (2020)	PEM	1.00	46.260442	-99.592410	Likely Jurisdictional	42
Wetland D4 (2020)	PEM	1.85	46.264021	-99.595125	Likely Jurisdictional	42
Wetland D5 (2020)	PEM	7.28	46.301687	-99.592436	Likely Jurisdictional	26
Wetland D6 (2020)	PEM	0.16	46.297081	-99.582690	Likely Isolated	26
Wetland D7 (2020)	PEM	0.46	46.298354	-99.557949	Likely Jurisdictional	27
Wetland D8 (2020)	PEM	0.49	46.298409	-99.551573	Likely Jurisdictional	27
Wetland D9 (2020)	PEM	0.03	46.316643	-99.527733	Likely Isolated	22
Wetland D10 (2020)	PEM	0.34	46.316845	-99.526518	Likely Jurisdictional	22
Wetland D11 (2020)	PEM	0.07	46.318915	-99.525355	Likely Jurisdictional	22
Wetland D12 (2020)	PEM	0.07	46.318914	-99.523444	Likely Jurisdictional	22
Wetland D13 (2020)	PEM	0.02	46.318134	-99.522365	Likely Jurisdictional	22
Wetland E1 (2020)	PEM	0.17	46.300579	-99.509364	Likely Jurisdictional	28

Feature ID	Cowardin Class[1]	Delineated Acreage	Latitude	Longitude	Likely Jurisdictional Status	Mapbook Page
Wetland E2 (2020)	PEM	0.10	46.301219	-99.508517	Likely Jurisdictional	28
Wetland E3 (2020)	PEM	0.08	46.297528	-99.510484	Likely Jurisdictional	28
Wetland E4 (2020)	PEM	0.08	46.297630	-99.509496	Likely Jurisdictional	28
Wetland E5 (2020)	PEM	1.31	46.296008	-99.508991	Likely Jurisdictional	28
Wetland E7 (2020)	PEM	0.10	46.292352	-99.485160	Likely Isolated	36
Wetland E8 (2020)	PEM	0.03	46.293544	-99.490111	Likely Isolated	29
Wetland E9 (2020)	PEM	14.20	46.296542	-99.495027	Likely Jurisdictional	29
Wetland E10 (2020)	PEM	0.83	46.300811	-99.488534	Likely Jurisdictional	29
Wetland E11 (2020)	PEM	0.11	46.300996	-99.489841	Likely Jurisdictional	29
Wetland E12 (2020)	PEM	0.04	46.300813	-99.490011	Likely Jurisdictional	29
Wetland E13 (2020)	PEM	0.03	46.301012	-99.490410	Likely Jurisdictional	29
Wetland E14 (2020)	PEM	0.73	46.299679	-99.483096	Likely Jurisdictional	29
Wetland E15 (2020)	PEM	0.90	46.300172	-99.484417	Likely Isolated	29
Wetland E16 (2020)	PEM	0.84	46.301958	-99.488474	Likely Jurisdictional	29
Wetland E17 (2020)	PEM	0.01	46.303125	-99.495705	Likely Isolated	29
Wetland E18 (2020)	PEM	0.04	46.303274	-99.495480	Likely Isolated	29
Wetland E19 (2020)	PEM	0.06	46.303191	-99.494532	Likely Isolated	29
Wetland E20 (2020)	PEM	0.10	46.303120	-99.492422	Likely Isolated	29
Wetland E21 (2020)	PEM	0.21	46.301756	-99.505885	Likely Jurisdictional	28
Wetland E22 (2020)	PEM	1.75	46.303260	-99.504728	Likely Jurisdictional	28
Wetland F1 (2020)	PEM	5.36	46.285337	-99.512214	Likely Jurisdictional	35
Wetland F2 (2020)	PEM	0.51	46.282873	-99.516396	Likely Jurisdictional	35
Wetland F3 (2020)	PEM	0.17	46.267471	-99.494380	Likely Isolated	43
Wetland F5 (2020)	PEM	0.24	46.315040	-99.507355	Likely Isolated	22

Feature ID	Cowardin Class[1]	Delineated Acreage	Latitude	Longitude	Likely Jurisdictional Status	Mapbook Page
Wetland F6 (2020)	PEM	0.13	46.320780	-99.511435	Likely Isolated	17
Wetland F7 (2020)	PEM	0.03	46.318325	-99.514883	Likely Isolated	22
Wetland F8 (2020)	PEM	0.06	46.339904	-99.513549	Likely Isolated	12
Wetland F9 (2020)	PEM	6.09	46.343343	-99.514044	Likely Jurisdictional	12
Wetland F10 (2020)	PEM	3.19	46.343378	-99.510531	Likely Jurisdictional	12
Wetland F11 (2020)	PEM	0.50	46.346815	-99.502340	Likely Jurisdictional	8
Wetland G1 (2020)	PEM	0.04	46.322063	-99.506670	Likely Isolated	17
Wetland G2 (2020)	PEM	0.64	46.320425	-99.505742	Likely Isolated	17
Wetland G3 (2020)	PEM	0.02	46.322143	-99.505109	Likely Jurisdictional	17
Wetland G4 (2020)	PEM	0.02	46.324519	-99.500391	Likely Jurisdictional	17
Wetland G5 (2020)	PEM	0.15	46.325231	-99.501140	Likely Jurisdictional	17
Wetland G6 (2020)	PEM	0.12	46.328334	-99.500988	Likely Isolated	17
Wetland G7 (2020)	PEM	1.15	46.329293	-99.497196	Likely Isolated	17
Wetland G8 (2020)	PEM	2.33	46.331815	-99.499631	Likely Jurisdictional	12
Wetland G9 (2020)	PEM	1.08	46.334071	-99.498573	Likely Isolated	12
Wetland G10 (2020)	PEM	1.69	46.336452	-99.497285	Likely Jurisdictional	12
Wetland G11 (2020)	PEM	6.71	46.337360	-99.495376	Likely Jurisdictional	12
Wetland G12 (2020)	PEM	0.26	46.339527	-99.497012	Likely Isolated	12
Wetland G12 (2020)	PEM	1.32	46.306189	-99.621359	Likely Jurisdictional	25
Wetland G13 (2020)	PEM	2.19	46.340836	-99.498484	Likely Isolated	12
Wetland G14 (2020)	PEM	0.14	46.334164	-99.525999	Likely Isolated	11
Wetland G15 (2020)	PEM	0.01	46.328735	-99.533529	Likely Isolated	16
Wetland G16 (2020)	PEM	0.24	46.328517	-99.535101	Likely Isolated	16
Wetland G17 (2020)	PEM	5.19	46.339966	-99.558202	Likely Jurisdictional	10

Feature ID	Cowardin Class[1]	Delineated Acreage	Latitude	Longitude	Likely Jurisdictional Status	Mapbook Page
Wetland H1 (2020)	PEM	0.94	46.360867	-99.535345	Likely Isolated	3
Wetland H2 (2020)	PEM	0.01	46.355659	-99.534853	Likely Isolated	7
Wetland H3 (2020)	PEM	7.23	46.343373	-99.539590	Likely Jurisdictional	11
Wetland H4 (2020)	PEM	0.18	46.342305	-99.541764	Likely Jurisdictional	11
Wetland H5 (2020)	PEM	2.95	46.342379	-99.552058	Likely Jurisdictional	11
Wetland H6 (2020)	PEM	1.14	46.309309	-99.602216	Likely Jurisdictional	19
Wetland H7 (2020)	PEM	0.68	46.312539	-99.602020	Likely Jurisdictional	19
Wetland H8 (2020)	PEM	1.82	46.314172	-99.595731	Likely Jurisdictional	20
Wetland H9 (2020)	PEM	1.51	46.257577	-99.591612	Likely Jurisdictional	42
Wetland I1 (2020)	PEM	0.59	46.338433	-99.573612	Likely Jurisdictional	10
Wetland I2 (2020)	PEM	0.01	46.337980	-99.571947	Likely Jurisdictional	10
Wetland I3 (2020)	PEM	0.04	46.331723	-99.572616	Likely Isolated	15
Wetland I4 (2020)	PEM	0.04	46.226294	-99.601903	Likely Jurisdictional	48
Wetland I5 (2020)	PEM	0.07	46.226977	-99.601463	Likely Jurisdictional	48
w-ab-007	PEM	3.02	46.244159	-99.566666	Likely Jurisdictional	46
w-ab-013	PEM	0.83	46.244243	-99.581670	Likely Jurisdictional	46
w-ab-015a	PEM	1.84	46.240380	-99.589902	Likely Jurisdictional	47

[1] PEM = Palustrine Emergent Wetland

Table 2b. Field-delineated waterbodies within the Survey Area

Feature ID	Cowardin Class[2]	Delineated Acreage	Latitude	Longitude	Likely Jurisdictional Status	Mapbook Page
Waterbody B1	PUB3H	0.35	46.344557	-99.608160	Likely Jurisdictional	9

Feature ID	Cowardin Class[2]	Delineated Acreage	Latitude	Longitude	Likely Jurisdictional Status	Mapbook Page
Waterbody F1	PUB3H	0.29	46.307140	-99.509203	Likely Jurisdictional	22
Waterbody G1	PUB3H	0.20	46.303156	-99.539116	Likely Isolated	27

[2] PUB3H = Palustrine Unconsolidated Bottom, mud, permanently flooded

Table 2c. Field-delineated watercourses within the Survey Area

Feature ID	Hydrologic Regime	Delineated Linear Feet	Delineated Acreage	Latitude	Longitude	Likely Jurisdictional Status	Mapbook Page
Watercourse D1	Perennial	1232	1.83	46.309314	-99.593630	Likely Jurisdictional	20
Watercourse G1	Perennial	2863	2.43	46.285161	-99.588318	Likely Jurisdictional	33
Watercourse D1 (2020)	Perennial	1291	0.16	46.301362	-99.592306	Likely Jurisdictional	26
Watercourse E1 (2020)	Perennial	1060	1.82	46.290758	-99.511861	Likely Jurisdictional	35
Watercourse H1 (2020)	Intermittent	333	0.02	46.309044	-99.602515	Likely Jurisdictional	19
Watercourse H2 (2020)	Perennial	689	0.18	46.315088	-99.596037	Likely Jurisdictional	20

Wetlands and Waterbodies Assessment
Badger Wind Project
Logan and McIntosh Counties, North Dakota

Report



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TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS IV
INTRODUCTION 1
SURVEY AREA 1
REGULATORY BACKGROUND 5
Waters of the United States 5
METHODS 5
2023 Desktop Assessment 5
2023 Field Reconnaissance Assessment 5
Wetland Delineation 6
Wetland Mapping 8
2024 Desktop Assessment 8
RESULTS 8
2023 Wetland Delineations 8
Vegetation 10
Hydrology 10
Soils 11
Wetland Mapping 11
Wetlands 11
Non-wetland Points 11
2024 Desktop Assessment 13
CONCLUSION 13
REFERENCES 15

LIST OF TABLES

Table 1. Summary of all field delineated wetlands within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, October 24 – 25, 2023.[1] 10
Table 2. Summary of all mapped wetlands within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota, November 1 – 2, November 17, and November 20, 2023. 11

LIST OF FIGURES

Figure 1. Location of the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota. 2
Figure 2. National Wetland Inventory features within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota. 3

Figure 3. National Hydrologic Dataset features within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota. 4

Figure 4. Results of the National Wetland Inventory and National Hydrography Dataset review within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, October 24 – 25 and 31, November 1 – 2, 17, and 20, 2023..... 9

Figure 5. Wetland survey results for field surveys conducted in 2020, 2021, 2022, and 2023, and 2024 desktop review at the Badger Wind Project in Logan and McIntosh counties, North Dakota. 14

LIST OF APPENDICES

Appendix A. Field Delineated and Mapped Wetland Locations within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota

Appendix B. US Army Corps of Engineers Great Plains Region Datasheets for Wetland Delineation within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota

Appendix C. Wetland, Waterbody, and Non-WOTUS Wetlands Photographs within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota

Appendix D. Summary of Non-Wetland and Non-Waterbody Points Recorded within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota

ACRONYMS AND ABBREVIATIONS

Atwell	Atwell, LLC
Badger Wind	Badger Wind, LLC
CWA	Clean Water Act
GPS	Global Positioning System
m	meter
MW	megawatt
NHD	National Hydrography Dataset
NWI	National Wetland Inventory
OHWM	Ordinary High Water Mark
PEM	Palustrine Emergent
PFO	Palustrine Forested
PSS	Palustrine Scrub Shrub
Project	Badger Wind Project
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WEST.	Western EcoSystems Technology, Inc.
WOTUS	waters of the US

INTRODUCTION

Badger Wind, LLC (Badger Wind) is proposing the Badger Wind Project (Project) in Logan and McIntosh counties, North Dakota. The Project is located approximately two miles (mi) west of Wishek, North Dakota (Figure 1). Previously delineated wetlands and waterbodies within the permitted Project area are included in the Aquatic Resources Delineation Report (Atwell 2022).The objective of the assessment was to identify (desktop review) and delineate (field review) precise boundaries of wetlands (land with presence of hydric soils, hydrology, and hydrophytic vegetation) and waterbodies (any type of perennial, intermittent, or ephemeral waterway or catch basin where water flows, or could flow, or is held), and to assign an informal jurisdictional determination (determination) to delineated features within the 2023 Wetland Survey Area. Due to poor weather and late season conditions, which prevented the full wetland delineation protocol from being adequately performed, wetlands and waterbodies were mapped. This report presents the combined results of the aquatic resources delineation surveys conducted for the Project in 2020, 2021, and 2022 (Atwell 2022) and during 2023 to address changes/updates to the Project since 2022.

SURVEY AREA

The 2023 Wetland Survey Area consisted of newly proposed Project infrastructure or previously surveyed infrastructure that changed locations and their associated survey buffers. The 2023 Wetland Survey Area encompassed approximately 1,819 acres (ac) and lies within the larger Project, which is situated in the Northwestern Glaciated Plains Level III Ecoregion, an ecoregion dominated by mixed-grass prairie (US Environmental Protection Agency 2013). The Project will be sited entirely on private lands. Topography within the Project ranges from relatively flat to rolling hills and elevations range from 2,020 to 2,200 feet (ft). Overall, the Project drains to the southwest and to the north, into South Branch Beaver Creek and Beaver Creek, tributaries to the Missouri River. The Project contains numerous unnamed drainages, a few of which may be intermittent or perennial waterbodies or wetlands (Figures 2 and 3). Primary land uses in the Project include agriculture and livestock grazing.

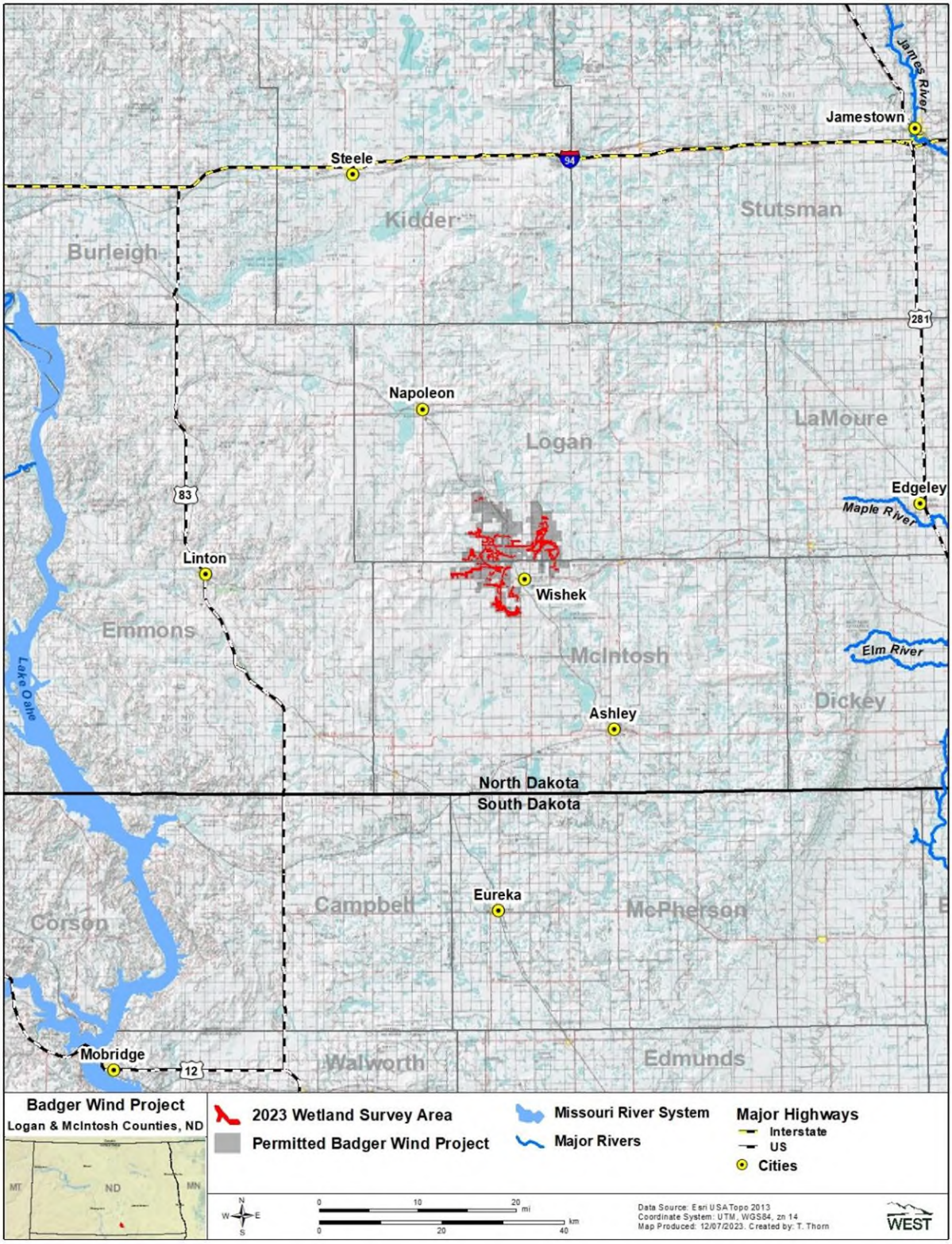


Figure 1. Location of the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota.

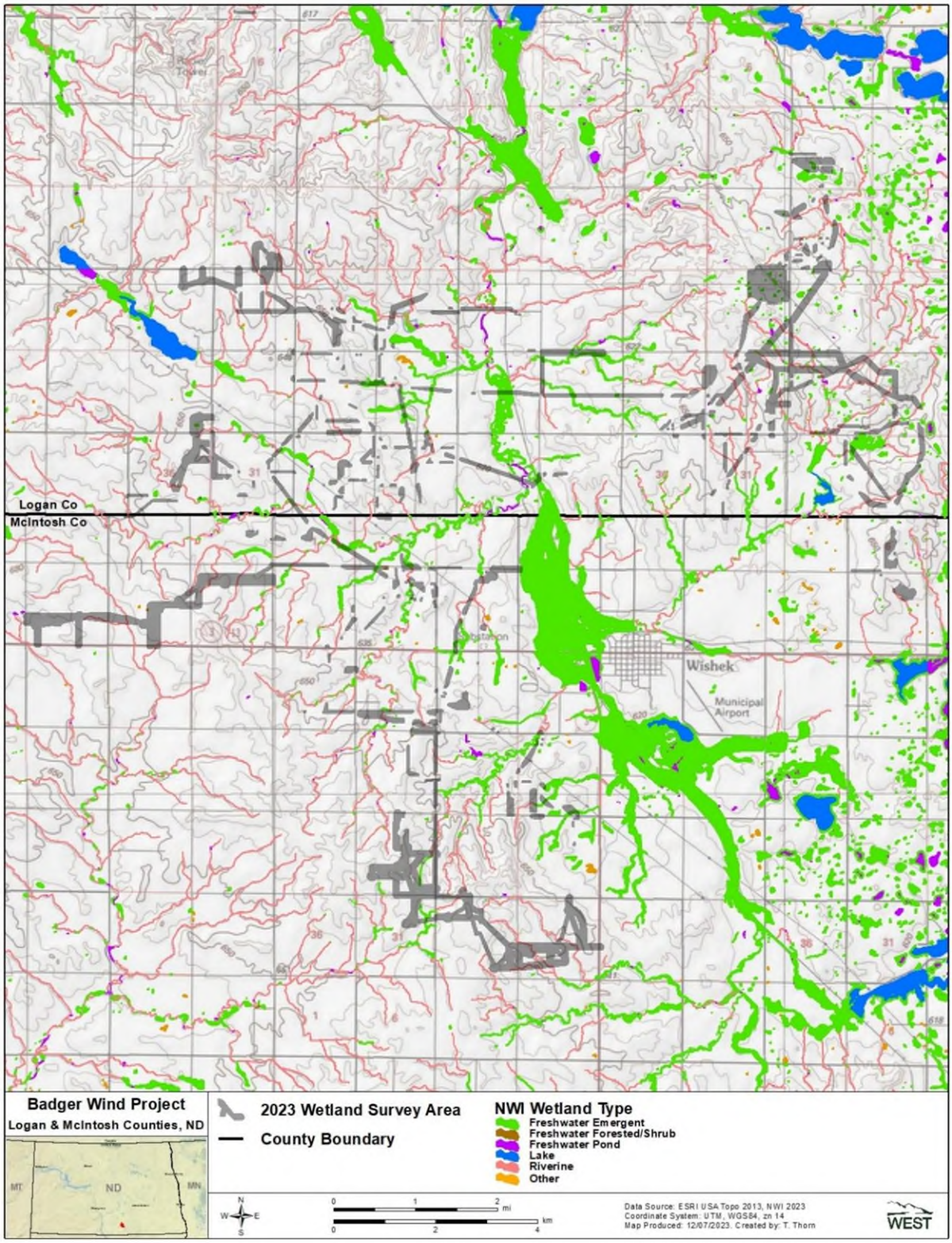


Figure 2. National Wetland Inventory features within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota.

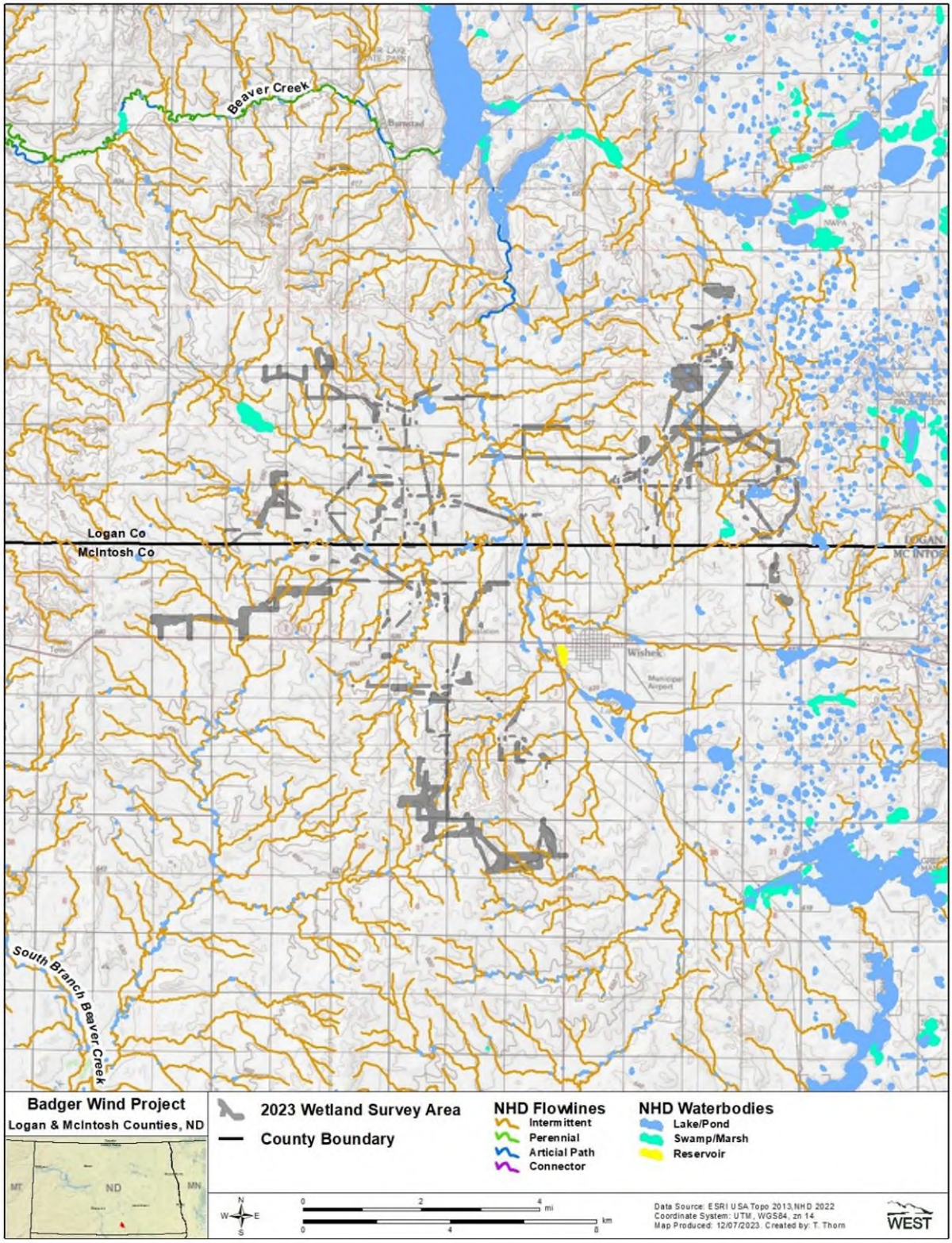


Figure 3. National Hydrologic Dataset features within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota.

REGULATORY BACKGROUND

Waters of the United States

Section 404 of the Clean Water Act (CWA) is the primary federal statute regulating impacts (dredge and fill) to wetlands and waterbodies. Wetlands and waterbodies that are subject to federal jurisdiction under the CWA are referred to as waters of the United States (WOTUS; US Environmental Protection Agency [USEPA] 2023). Under the CWA, it is unlawful to discharge any pollutant from a point source into a WOTUS without a permit.

Waters that have consistently been considered jurisdictional WOTUS by the US Army Corps of Engineers (USACE) include traditional navigable waters (Section 10 waters), interstate waters, territorial seas, and impoundments of these WOTUS. Jurisdictional status of tributaries to these categories of WOTUS and adjacent wetlands continue to be both challenged in courts and clarified by agencies. On August 29, 2023, the US Environmental Protection Agency and USACE jointly released information announcing an Amendment to the definition of Waters of the United States (USEPA 2023). Coordination with the USACE regarding jurisdictional status of wetlands and waterbodies documented in this report will be necessary to evaluate Section 404 permit requirements for the Project.

METHODS

2023 Desktop Assessment

A comprehensive desktop assessment of publicly available wetlands and waterbodies data in the 2023 Wetland Survey Area was completed using United States Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP, NAIP 2021 and 2022), US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) data (USFWS; 2023), and the US Geological Survey (USGS) National Hydrography Dataset (NHD; USGS NHD 2022). Based on this review, areas identified as potentially being wetlands or WOTUS were targeted for field verification along with the rest of the 2023 Wetland Survey Area.

Using these public data sources, potential wetlands and waterbodies located within the 2023 Wetland Survey Area were identified and mapped in the desktop assessment using Geographic Information Systems (GIS) mapping software. Wetland and waterbody types (i.e. freshwater emergent wetland, freshwater pond, riverine, lake, freshwater forested/shrub wetlands, and rivers and streams) are based on wetland nomenclature used by the USFWS NWI (2023; based on Cowardin et al. 1979) and USGS NHD (2022).

2023 Field Reconnaissance Assessment

The field reconnaissance assessment occurred in two phases. Phase one consisted of wetland delineations and phase two consisted of wetland mapping. Wetland delineations indicated wetland and waterbody type and boundaries based on field observations of hydrophytic

vegetation, hydrology, and presence of hydric soils. Wetland mapping indicated type and boundaries based on field observations of hydrophytic vegetation and hydrology; this phase does not evaluate the presence of hydric soils. The goal of both phases was to identify and confirm the presence or absence and extent of wetlands and waterbodies initially identified during the desktop assessment within the 2023 Wetland Survey Area. Wetlands and waterbodies were mapped in both phases using a tablet with Collector for ArcGIS software (ESRI 2023) coupled with an Arrow Lite global positioning system (GPS) receiver with submeter accuracy. Wetlands and waterbodies observed in the field (i.e., wet or saturated features, hydrophytic vegetation, surface hydrology), but not recorded during the initial desktop assessment, were also mapped.

Proposed infrastructure survey corridors were provided by Badger Wind as a spatial file in October 2023. Project infrastructure and associated buffers located within the 2023 Wetland Survey Area included:

- 250-ft radius centered around turbines
- 300-ft wide corridor for turbine access roads
- 100-ft wide corridor for underground collection lines
- 200-ft wide corridor for aircraft detection and lighting system tower, batch plant, crane walk paths, laydown yard, meteorological tower, operations and maintenance facility, marshaling yard, substation, transmission line, and turning radii locations

Shapefiles depicting the infrastructure and associated buffers were loaded onto the tablet and used in the field to ensure boundaries were accurately identified and included during field surveys. NWI and NHD features were also loaded onto the tablet for accurate field-verification.

Photographs were recorded for wetlands identified within the 2023 Wetland Survey Area. Each delineated/mapped wetland was assigned a unique identification (ID) name consisting of an alphanumeric name in a series, differentiated according to the two observers (e.g. WET001, WET201).

NWI or NHD features that intersected the 2023 Wetland Survey Area but clearly did not meet the definition of a WOTUS were photo documented and a non-WOTUS point was collected on the tablet. Such points were identified with a sequential alphanumeric name differentiated according to the two observers (e.g. 212U, 501U; 701U).

Wetland delineations were conducted on October 24 – 25, 2023 and wetland mapping on October 31, November 1-2, and November 17 and 20, 2023.

Wetland Delineation

Wetlands were delineated in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (US Army Corps of Engineers [USACE] 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains* (Version 2.0; USACE 2010). The 1987 manual outlines a three-parameter approach, which requires presence of hydrophytic plants (dominant vegetative cover), hydric soils, and wetland hydrology. All three parameters must be

present and meet the wetland criteria of each parameter in order for an area to be considered a wetland.

The delineated wetlands were classified according to the classification system outlined in Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979). Wetland plant indicator status was determined using the most recent version of the National Wetland Plant List (USACE 2020). Paired sample plots (wetland and upland) were established, and USACE regional datasheets were completed for each potential wetland within the 2023 Wetland Survey Area. Wetland sample plots were located in areas that represented the wetland community that was present, utilizing an upland sample plot to characterize the adjoining upland community. A wetland boundary was then established between these points and the boundary was recorded based on the observations made at the paired sample points. Additional sample plots were established in locations where NWI or aerial signatures suggested wetland conditions may be present. Wetlands are typically categorized as one of three common types of wetlands including:

- Palustrine emergent (PEM) wetlands are defined as inland freshwater areas dominated by hydrophytic vascular plants such as rushes, sedges, forbs, and other herbaceous or grass-like plants.

- Palustrine scrub-shrub (PSS) wetlands are defined as inland freshwater areas dominated by woody vegetation less than 20 feet tall, such as buttonbush, alders, and many kinds of saplings.

- Palustrine forested (PFO) wetlands are defined as inland freshwater areas dominated by woody vegetation equal to or over 20 feet tall.

Drainage features (e.g. streams) and other waterbodies (e.g., stock ponds) within the 2023 Wetland Survey Area, including those identified in the NWI and NHD datasets, were examined for inclusion as potential WOTUS. The field assessment was focused on the presence of a definable bed and bank, ordinary high water mark (OHWM), downstream surface connection to a potential WOTUS, evidence of flow, and/or presence of areas that meet the USACE criteria for wetlands. If present, the OHWM of each of these features was recorded with GPS. These features were mapped and documented in a similar manner as wetlands. If detected, each waterbody feature possessing an OHWM would have been assigned its own unique ID, however none were identified during field surveys.

In addition to evaluating the 2023 Wetland Survey Area for features that met wetland and waterbody definitions, the professional judgment of the WEST delineator was used to make an informal determination of jurisdiction. Certain features are jurisdictional based on regulation and do not require further assessments (e.g., territorial seas, traditional navigable waters, interstate waters, and impoundments of these features). As previously noted in the Regulatory Background section, there have recently been both regulatory guidance changes as well as court decisions that are influencing how the USACE determines jurisdiction of wetlands and waterbodies. WEST utilized the best available information from the agencies to make the determinations; however,

the informal jurisdictional determinations in this report are subject to USACE review and final determination.

The WOTUS definition further identifies features that are exempt from jurisdiction, including prior converted croplands, waste treatment systems, ditches (including roadside ditches), artificially irrigated areas, artificial lakes/ponds, artificial reflecting pools, waterfilled depressions, and swales and erosional features.

The delineator assigned a likely, unlikely, or unknown jurisdictional status to the delineated and mapped wetlands and waterbodies based on best professional judgement and experience in the region. Wetland and waterbody determinations included in this report are informal as only the USACE can make a formal jurisdictional determination.

Wetland Mapping

Wetlands were identified based on two parameters: hydrology and wetland vegetation (see above description). The wetland boundary was mapped following wetland/upland vegetation breaks, slope, and other hydrology indicators. A list of plant species observed was recorded in field notes. All other areas not mapped as wetland were considered uplands (i.e., areas containing upland vegetation and lacking hydrological indicators) and recorded as non-wetland ("no") points. An informal jurisdictional determination was not made for mapped resources.

2024 Desktop Assessment

A comprehensive desktop assessment of publicly available wetlands and waterbodies data for areas adjusted for reroutes that were not included in the previous aquatic resources inventory or wetland mapping efforts. The desktop assessment followed methodology as outlined above in the 2023 desktop assessment section. Based on this review, areas identified as potentially being wetlands or WOTUS will be targeted for wetland delineations in spring 2024.

RESULTS

2023 Wetland Delineations

Thirteen wetlands, totaling 11.76 ac, were identified, and delineated during the field reconnaissance (Table 1, Figure 4). Detailed maps of wetland locations are provided in Appendix A. Table 1 provides a summary of wetland classifications and acreages. All the 13 delineated wetlands were classified as Palustrine Emergent (PEM) wetlands. Nine of the wetlands occurred in depressions, two in flat areas, and two along hillslopes. Five of the delineated wetlands appeared to have a downstream connection to WOTUS and were therefore considered potentially or likely jurisdictional. Eight delineated wetlands were apparently isolated and lacked a downstream surface connection to WOTUS and were therefore considered unlikely to be jurisdictional (Table 1). Wetland determination data forms and representative photographs of wetlands are provided in Appendices B and C, respectively.

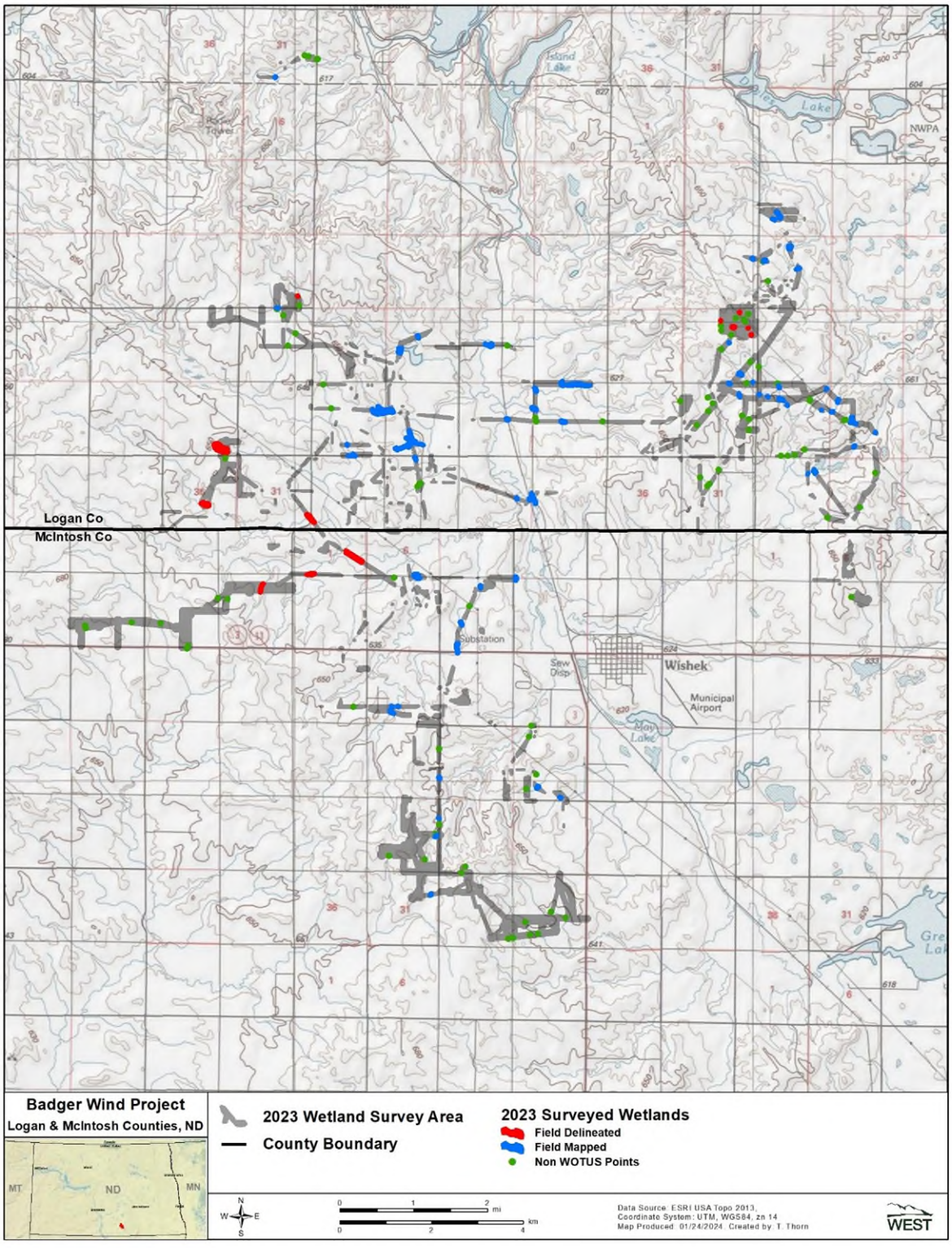


Figure 4. Results of the National Wetland Inventory and National Hydrography Dataset review within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, October 24 – 25 and 31, November 1 – 2, 17, and 20, 2023.

Vegetation

The most common wetland species encountered in the13 delineated wetlands within the 2023 Wetland Survey Area were prairie cordgrass (*Spartina pectinata*), foxtail barley (*Hordeum jubatum*), and cattail (*Typha sp.*).

Hydrology

Hydrology indicators included surface water, high water table, saturation, and inundation visible on aerial imagery. Documented saturation, high water table, and surface water were the primary hydrologic indicators present for wetlands. Other hydrology indicators noted during the field investigation were redox dark surface, algal mat or crust, thin muck surface, salt crust, water-stained leaves, hydrogen sulfide odor, geomorphic position, and FAC-neutral test.

Table 1. Summary of all field delineated wetlands within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, October 24 – 25, 2023.[1]

Feature ID	Acres	Cowardin Classification[2]	Latitude/Longitude[3]	Landform	Informal Jurisdictional Determination[4]
WET001	0.12	PEM	46.321769/-99.520417	Depression	Unlikely
WET003	0.02	PEM	46.323157/-99.521396	Depression	Unlikely
WET004	0.05	PEM	46.326259/-99.523731	Depression	Unlikely
WET005	0.42	PEM	46.323369/-99.525442	Depression	Unlikely
WET006	0.03	PEM	46.324534/-99.529152	Flat fence line	Unlikely
WET007	0.05	PEM	46.328772/-99.648972	Depression	Unlikely
WET008	4.36	PEM	46.297969/-99.668968	Flat	Unlikely
WET009	0.72	PEM	46.287986/-99.675265	Depression	Likely
WET010a	0.65	PEM	46.285454/-99.645177	Depression	Likely
WET010b	0.54	PEM	46.285454/-99.645177	Depression	Likely
WET011	3.65	PEM	46.276730/-99.630194	Hillslope	Likely
WET012	0.78	PEM	46.274184/-99.644255	Hillslope	Likely
WET013	0.37	PEM	46.272032/-99.658492	Depression	Unlikely

[1] Wetlands delineated in 2021 and 2022 are present in Flaig (2021) and Atwell (2022) reports.
[2] PEM = Palustrine emergent wetland
[3] Location from wetland sample plot
[4] Determination based on WEST's professional judgement and subject to change based on USACE review

Soils

Soil colors were predominantly dark (e.g., 10 YR 2/1 and 3/1) and included iron concentrations. The primary field hydric soil indicator used was, redox dark surface. The majority of the soil was clay loams and clay.

Wetland Mapping

Wetlands

Sixty-seven wetlands, totaling 21.93 ac, were identified and mapped during the field assessment (Table 2, Figure 4). Detailed maps of wetland locations are provided in Appendix A. All 67 wetlands were classified as PEM wetlands based on observed vegetation. Landform type was not assessed for mapped wetlands, but generally appeared similar to that of the delineated wetlands. Common wetland species recorded for each mapped wetland were similar to those for delineated wetlands. Hydric soils were not assessed. Photographs of representative wetlands are provided in Appendix C.

Non-wetland Points

Eighty-six NWI/NHD features identified during the desktop assessment as wetlands were evaluated within the 2023 Wetland Survey Area and determined to lack characteristics of WOTUS (Appendix D). These locations were recorded with the tablet with Collector for ArcGIS software coupled with an Arrow Lite GPS as “non-WOTUS” (“no”) points and were photo documented. Fourteen no points were recorded during the wetland delineation field effort (503U – 516U). Specifically, these drainages lacked an OHWM and were composed of upland vegetation. Seventy-two no points were recorded during the wetland mapping field effort, indicating these locations lacked wetland vegetation and hydrology (212U, 517U – 539U, 541U – 554U, 640U, 700U – 711U, 2000U – 2019U, and 5201U). Detailed maps of non-WOTUS points are provided in Appendix A and representative photographs are provided in Appendix C.

Table 2. Summary of all mapped wetlands within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota, November 1 – 2, November 17, and November 20, 2023.

Feature ID	Acres	Cowardin Classification[1]
WET014	0.06	PEM
WET015	0.11	PEM
WET016	0.44	PEM
WET017	0.15	PEM
WET018	0.29	PEM
WET019	0.42	PEM
WET020	0.17	PEM
WET021	0.12	PEM
WET023	0.12	PEM
WET024	0.18	PEM
WET025	0.30	PEM
WET027a	0.03	PEM
WET027b	0.35	PEM
WET028	0.17	PEM
WET029	1.43	PEM

Table 2. Summary of all mapped wetlands within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota, November 1 – 2, November 17, and November 20, 2023.

Feature ID	Acres	Cowardin Classification[1]
WET030	0.01	PEM
WET031	0.13	PEM
WET032	0.15	PEM
WET098	2.39	PEM
WET099	0.13	PEM
WET200	0.64	PEM
WET201	0.23	PEM
WET202	0.02	PEM
WET203	0.08	PEM
WET204	0.06	PEM
WET205	0.42	PEM
WET206	0.06	PEM
WET207	0.04	PEM
WET208	0.15	PEM
WET209	0.15	PEM
WET210	0.42	PEM
WET211	0.08	PEM
WET212	2.91	PEM
WET213	0.13	PEM
WET214	0.21	PEM
WET215	0.26	PEM
WET216	0.26	PEM
WET217	0.69	PEM
WET219	0.25	PEM
WET220	0.11	PEM
WET221	0.26	PEM
WET224	0.09	PEM
WET225	0.59	PEM
WET226	0.13	PEM
WET228	0.47	PEM
WET229	0.14	PEM
WET234	1.42	PEM
WET236	0.81	PEM
WET237	0.13	PEM
WET238	0.09	PEM
WET239	0.07	PEM
WET241	0.06	PEM
WET340	0.39	PEM
WET1002	0.22	PEM
WET1003	0.05	PEM
WET1004	0.01	PEM
WET1005	0.01	PEM
WET1006	0.08	PEM
WET1007	0.00	PEM
WET1008	0.01	PEM
WET1009	1.08	PEM
WET1013	0.70	PEM
WET1014	0.27	PEM
WET1015	0.07	PEM
WET1016	0.12	PEM
WET1017	0.31	PEM

Table 2. Summary of all mapped wetlands within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota, November 1 – 2, November 17, and November 20, 2023.

Feature ID	Acres	Cowardin Classification[1]
WET1018	0.03	PEM

[1] PEM = Palustrine emergent wetland

2024 Desktop Assessment

A total of three potential wetlands totaling 0.24 ac were identified for the re-routed survey area (Figure 5).

CONCLUSION

Aquatic resources delineations and wetland mapping were completed in the months of September 2020, October 2020, September 2021, May 2022, October 2023, and November 2023 and a desktop assessment was completed January 2024 for re-routed infrastructure. Further details regarding surveys conducted pre-2023 can be found in the Aquatic Resources Delineation Report (Atwell 2022). A combined total of 193 wetlands were identified through field delineation, comprising 185.11 ac and 64 additional wetlands were mapped, totaling 30.5 ac during surveys (Figure 5). Four waterbody features were delineated, comprising 0.78 ac and seven watercourses were identified, comprising a cumulative total of 5.18 ac. A total of three potential wetlands as identified by the desktop review totaling 0.24 ac were identified for the re-routed survey area (Figure 5).

Areas identified as potentially being wetlands or WOTUS in the 2024 desktop assessment and mapped wetlands from the 2023 field reconnaissance will be targeted for wetland delineations in spring 2024. Informal jurisdictional determinations provided in this report must be verified and/or finalized with USACE. Project activities that impact WOTUS must be authorized by USACE prior to activities occurring.

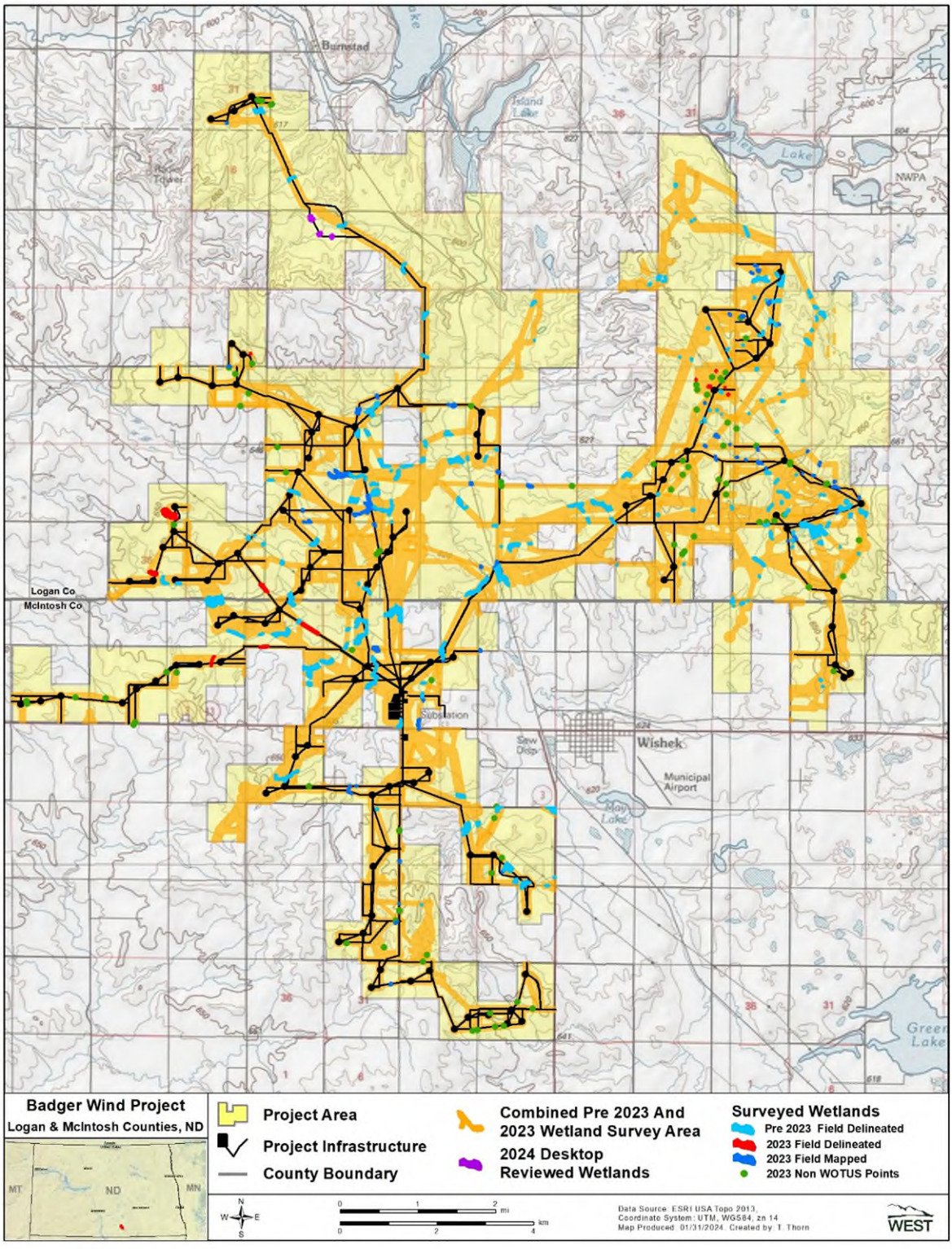


Figure 5. Wetland survey results for field surveys conducted in 2020, 2021, 2022, and 2023, and 2024 desktop review at the Badger Wind Project in Logan and McIntosh counties, North Dakota.

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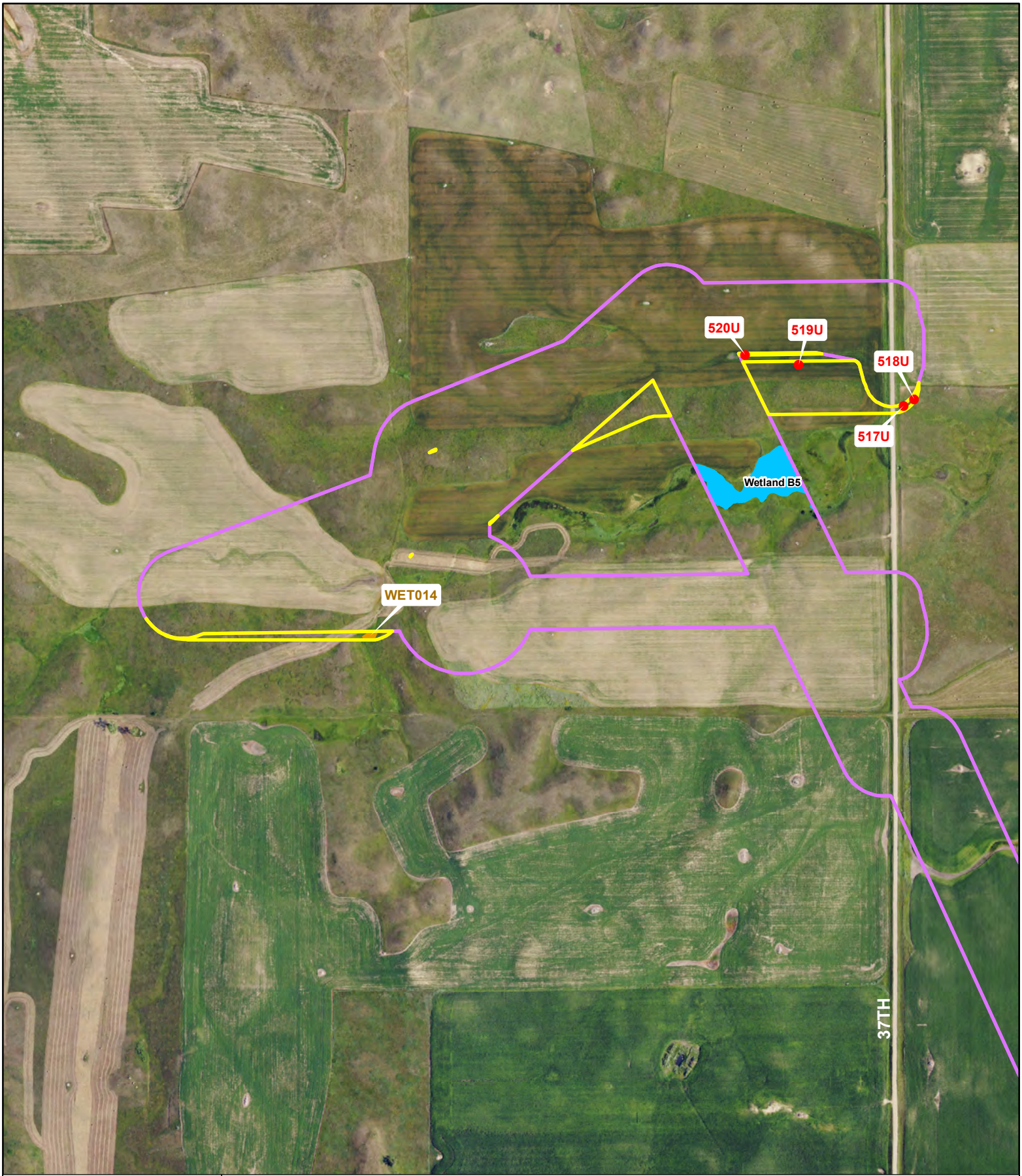
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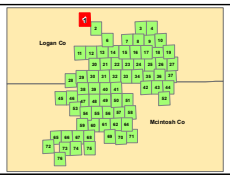
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Appendix A. Field Delineated and Mapped Wetland Locations within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota



Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

Pre 2023 Wetland Survey Area

County Boundary

State Highway

2023 Surveyed Wetlands

Field Delineated

Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Surveyed Wetlands

Field Delineated

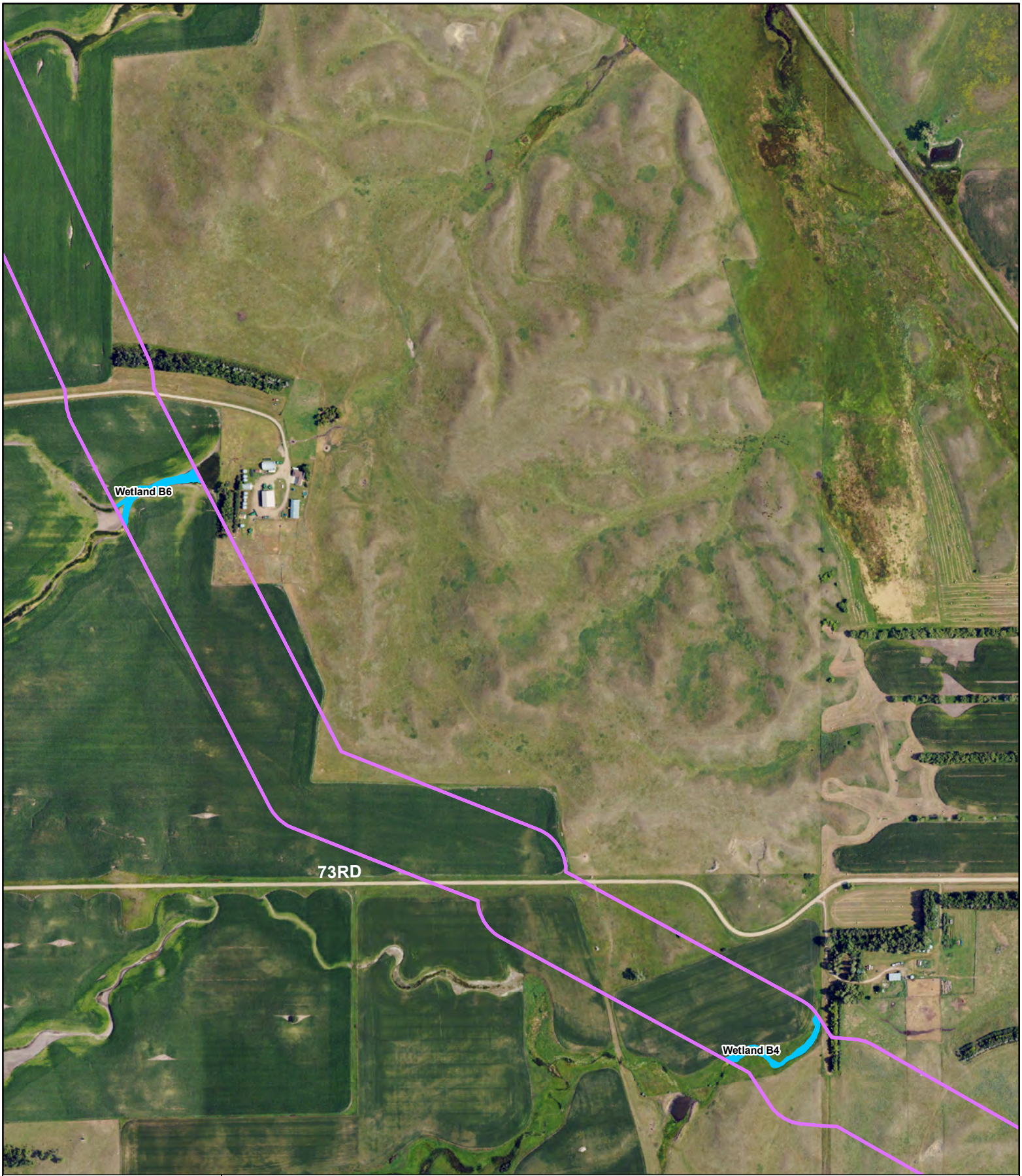
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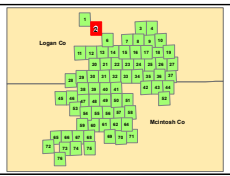
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

Pre 2023 Wetland Survey Area

County Boundary

State Highway

2023 Surveyed Wetlands

Field Delineated

Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Surveyed Wetlands

Field Delineated

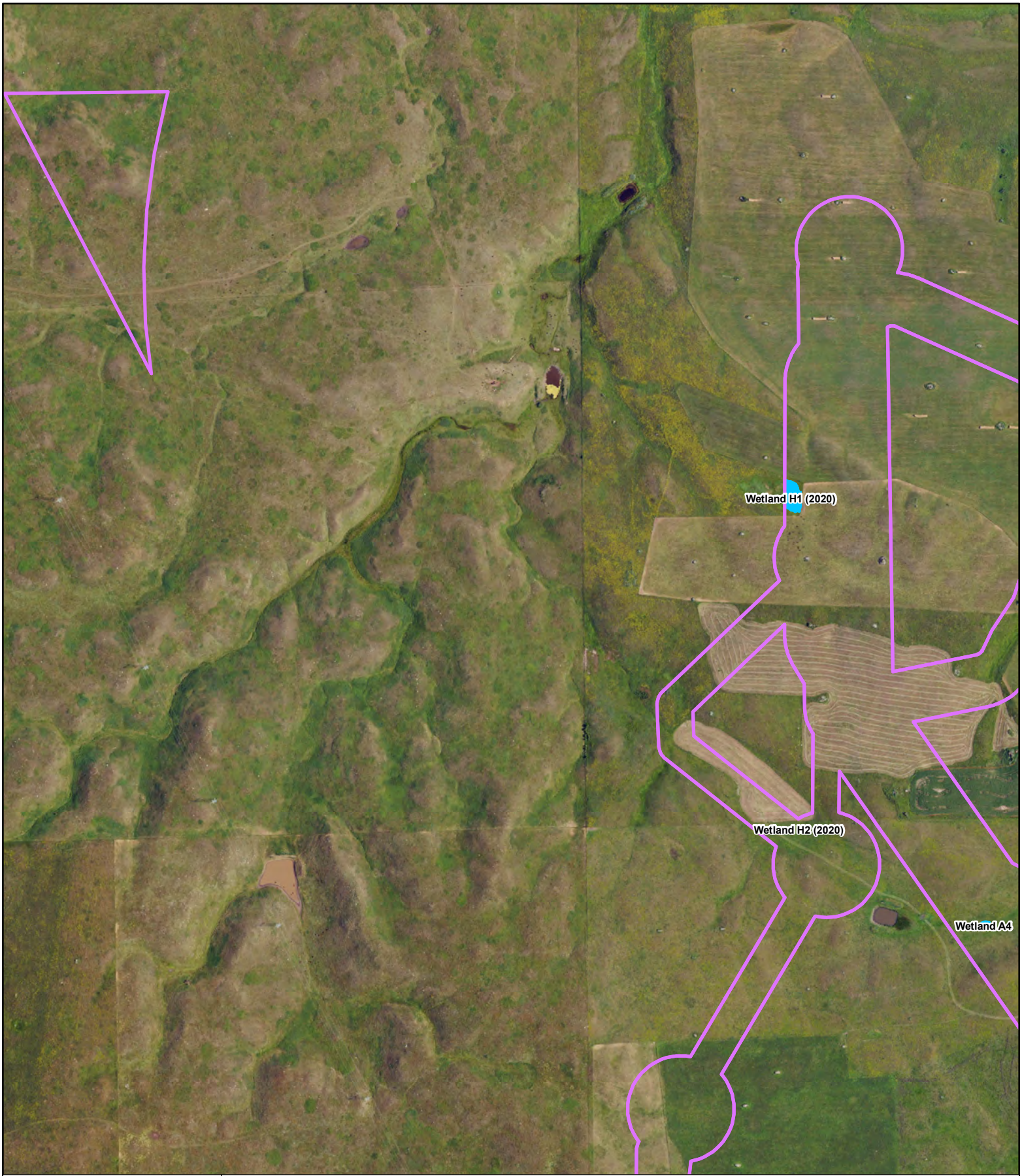
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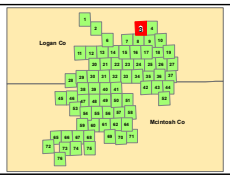
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

2023 Surveyed Wetlands

Field Delineated

Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

Field Delineated

County Boundary

State Highway

N W E S

0 0.1 0.2 mi

0 0.2 0.4 km

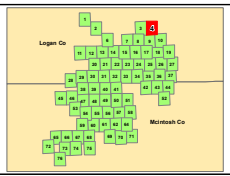
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

Pre 2023 Wetland Survey Area

County Boundary

State Highway

2023 Surveyed Wetlands

Field Delineated

Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Surveyed Wetlands

Field Delineated

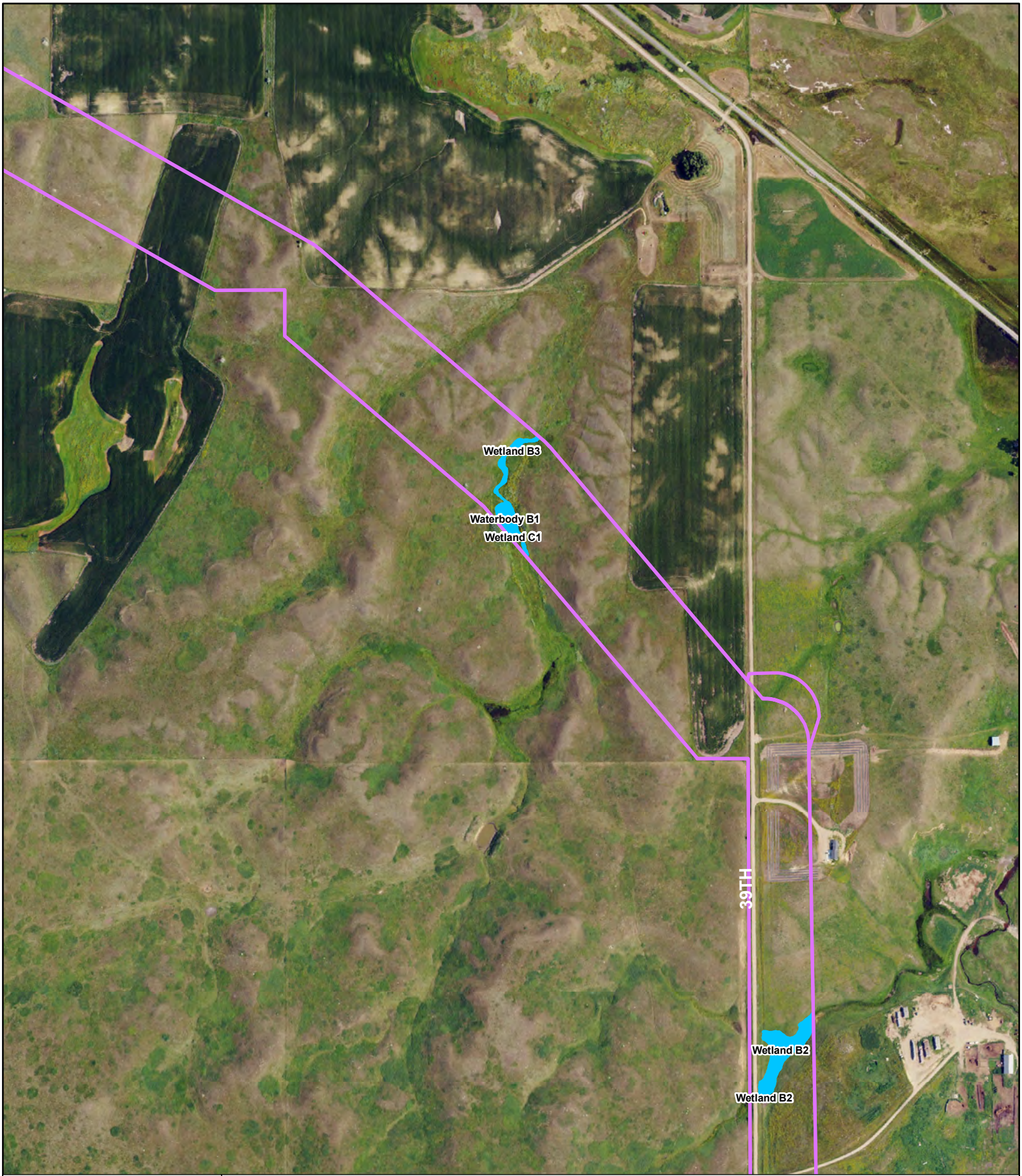
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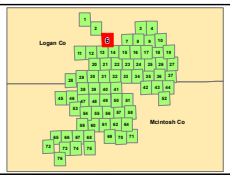
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

2023 Surveyed Wetlands

Field Delineated

Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

Field Delineated

County Boundary

State Highway

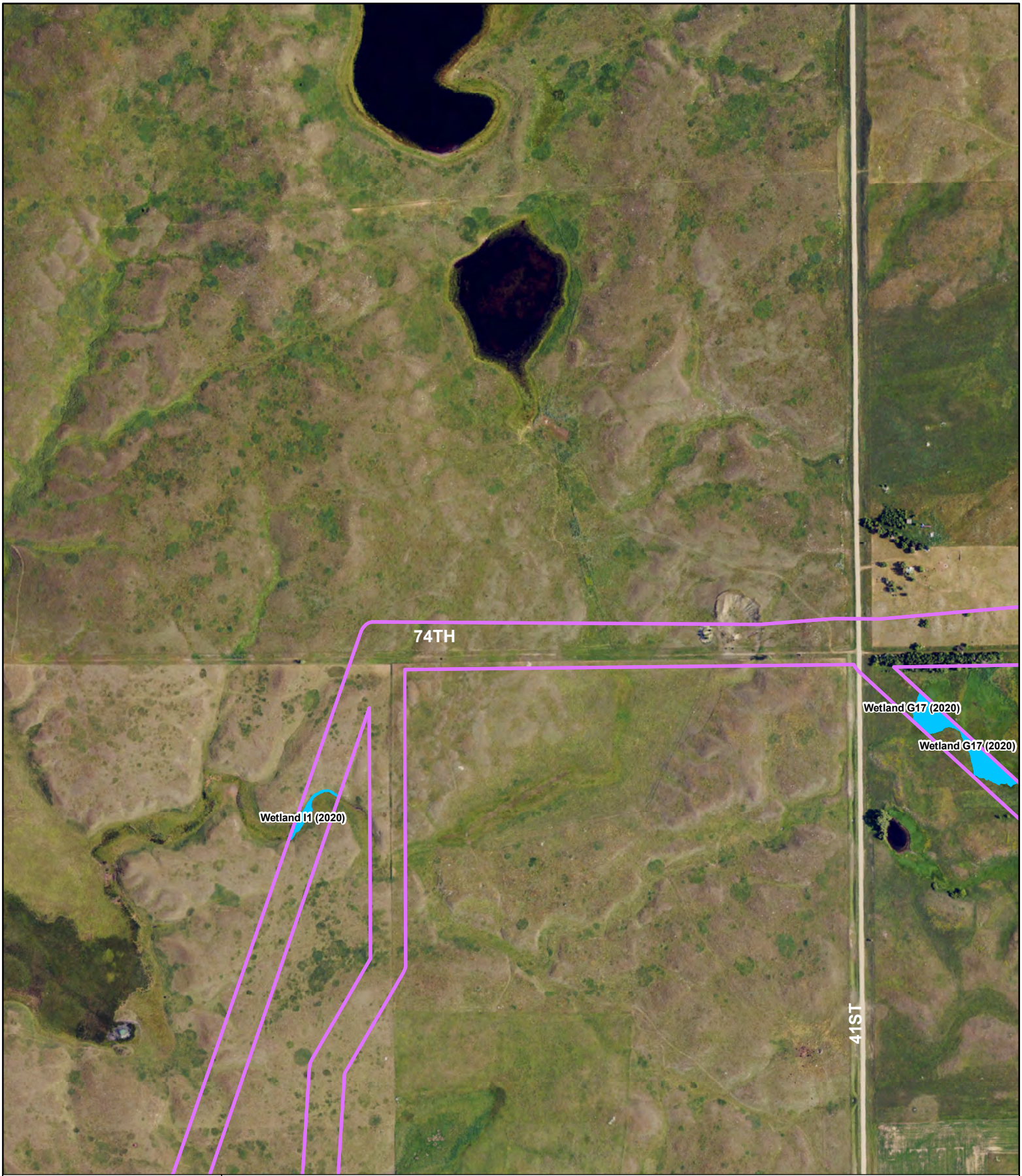
N W E S

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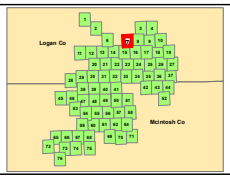
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

2023 Surveyed Wetlands

Field Delineated Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

Field Delineated

County Boundary

State Highway

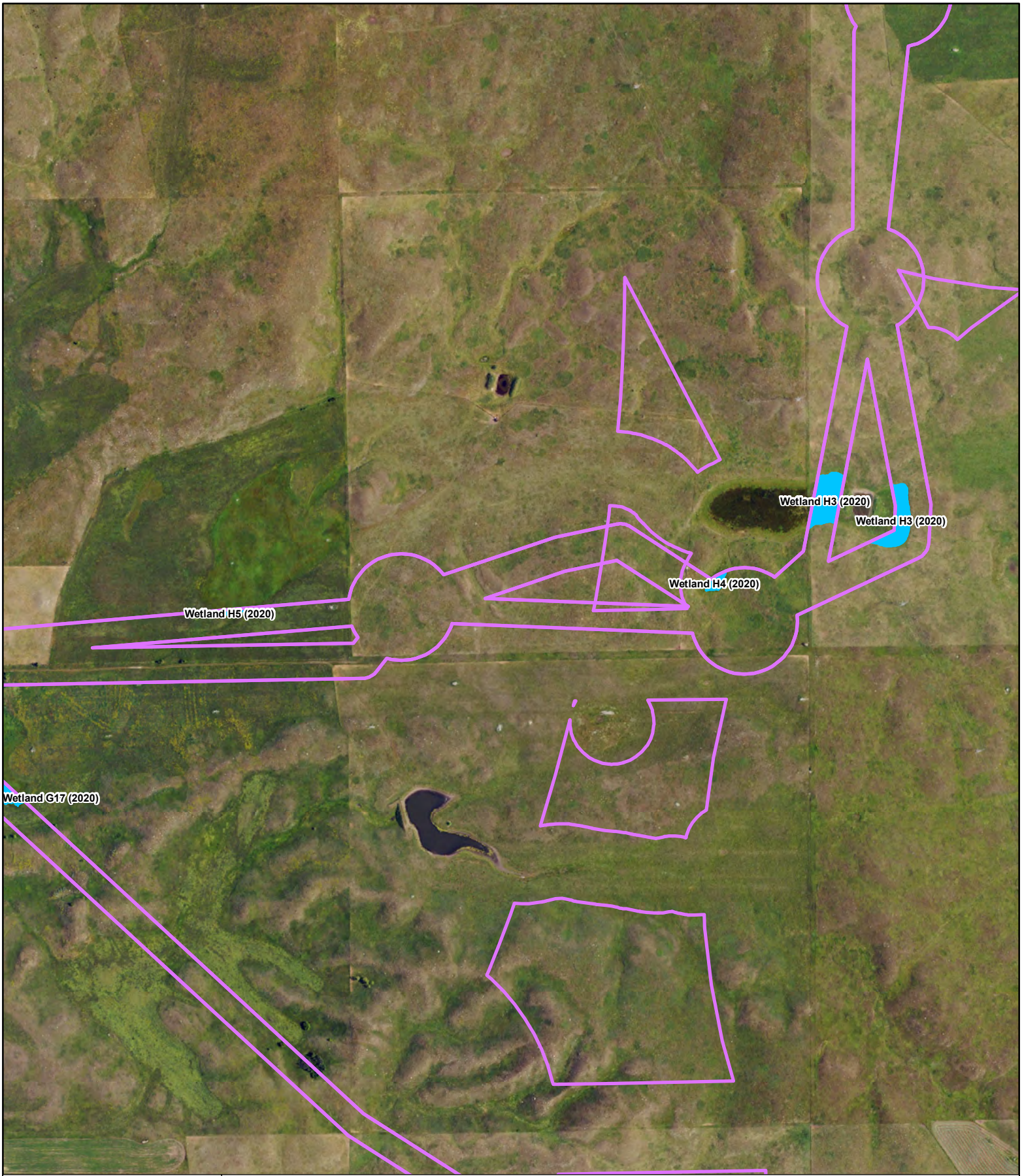
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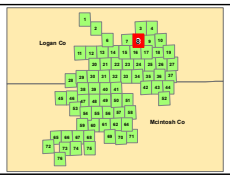
Data Source: NAIP 2023
Coordinate System: UTM, WGS84, zn 14
Map Produced: 01/25/2024. Created by: T. Thorn

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Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

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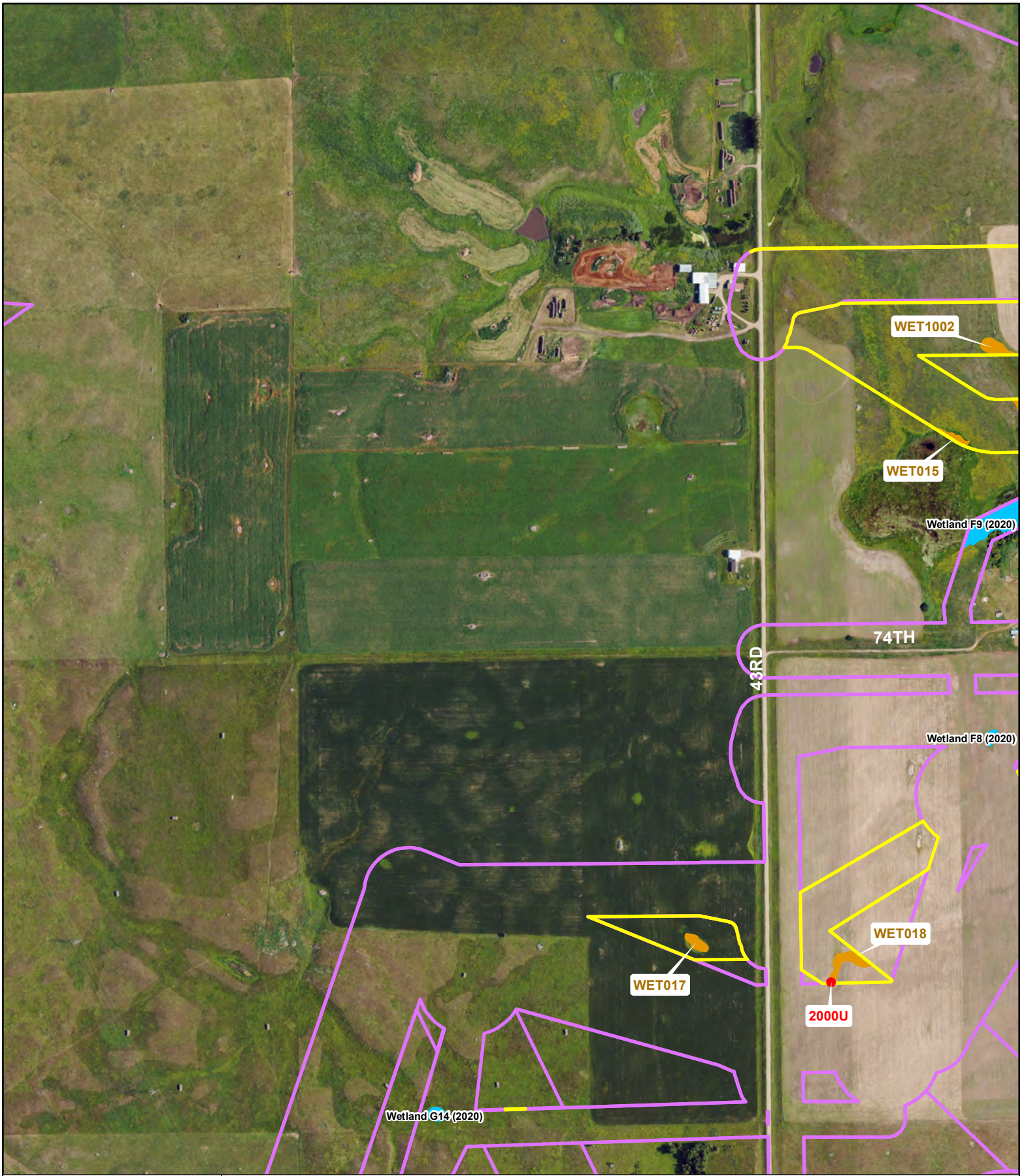
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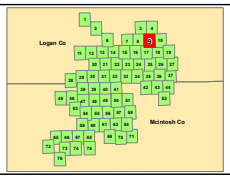
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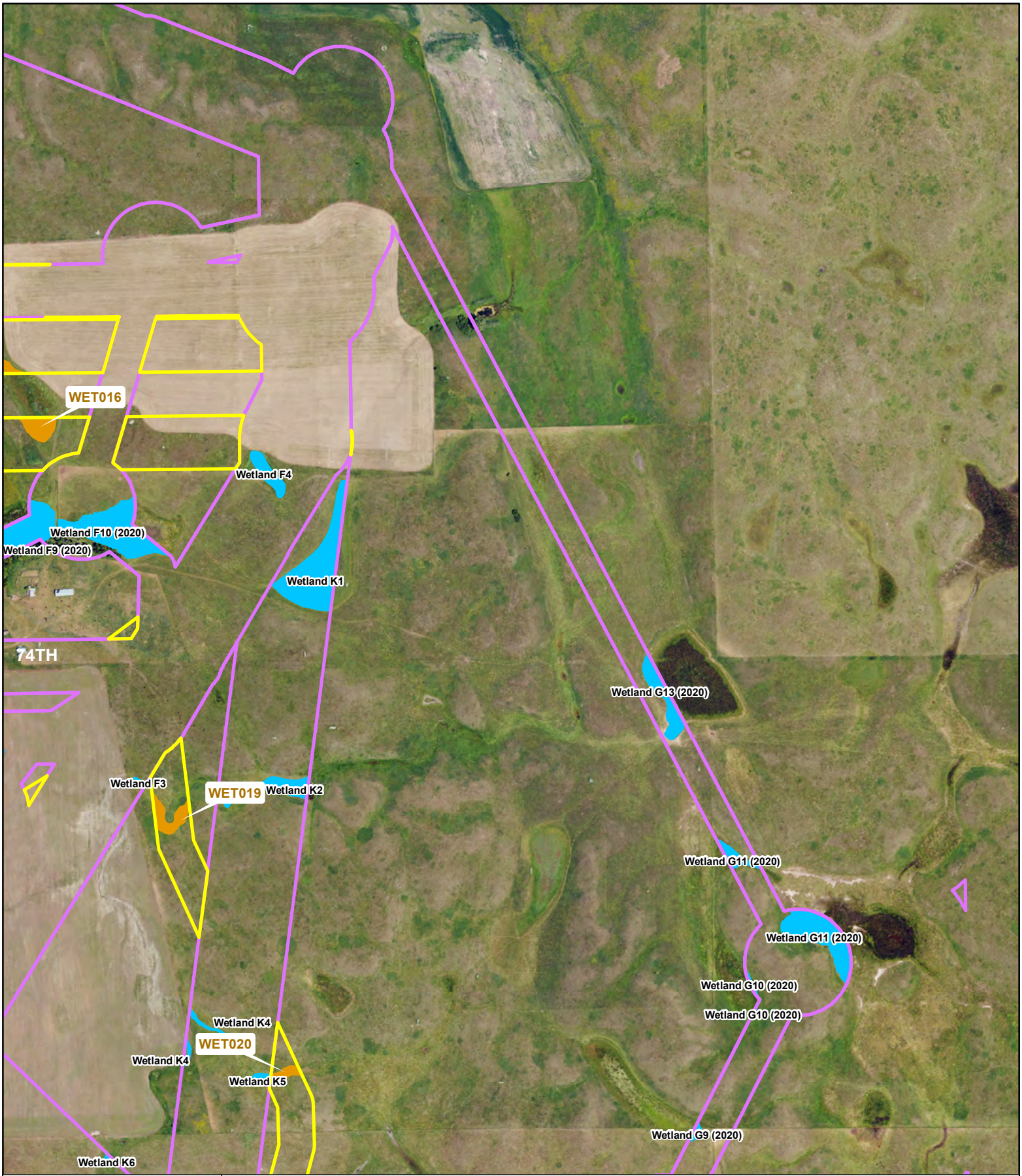
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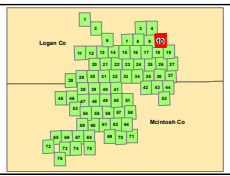
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Badger Wind Project

Logan & McIntosh Counties, ND



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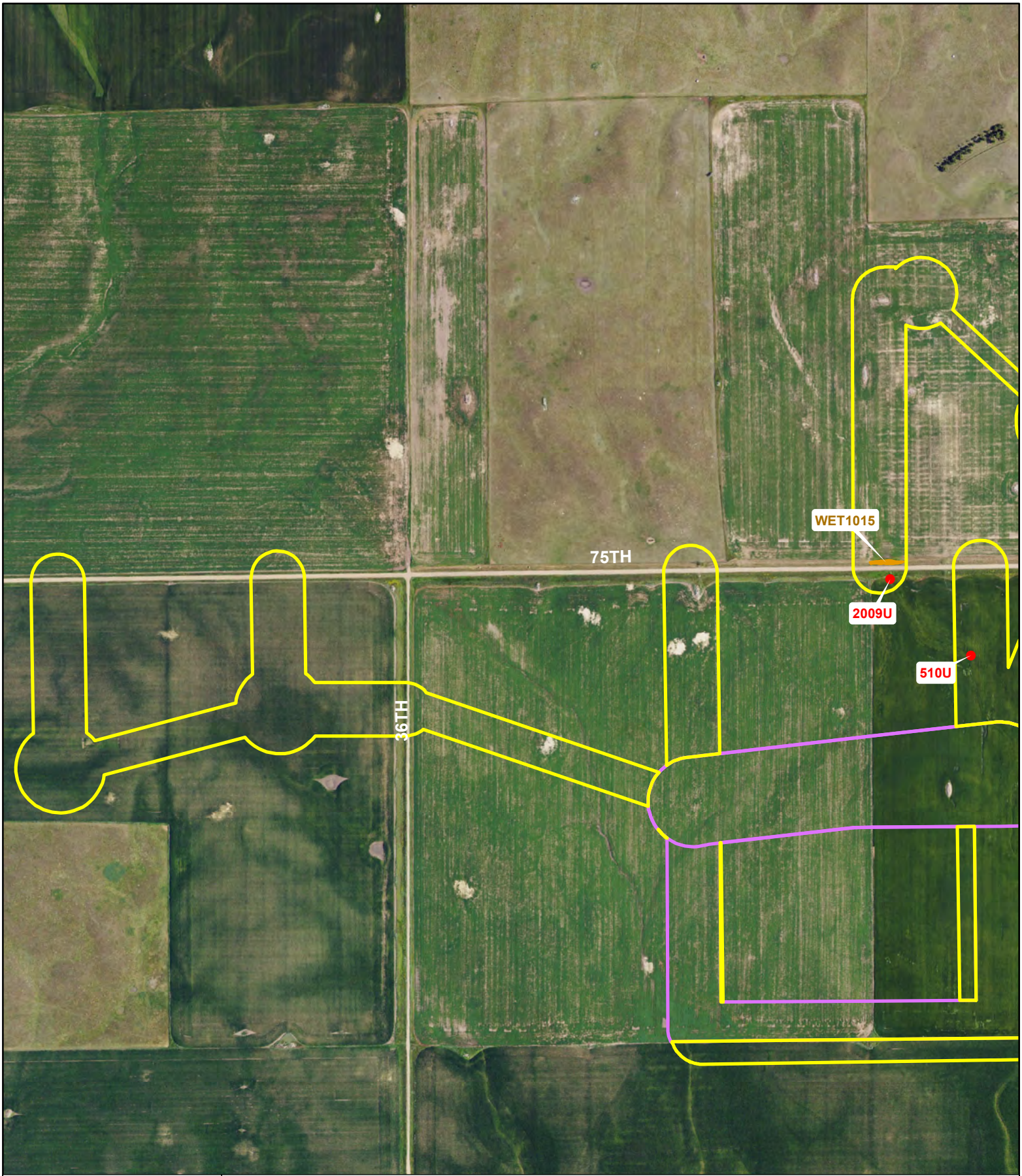
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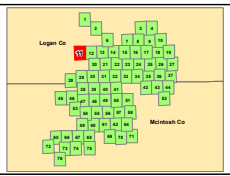
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Logan & McIntosh Counties, ND



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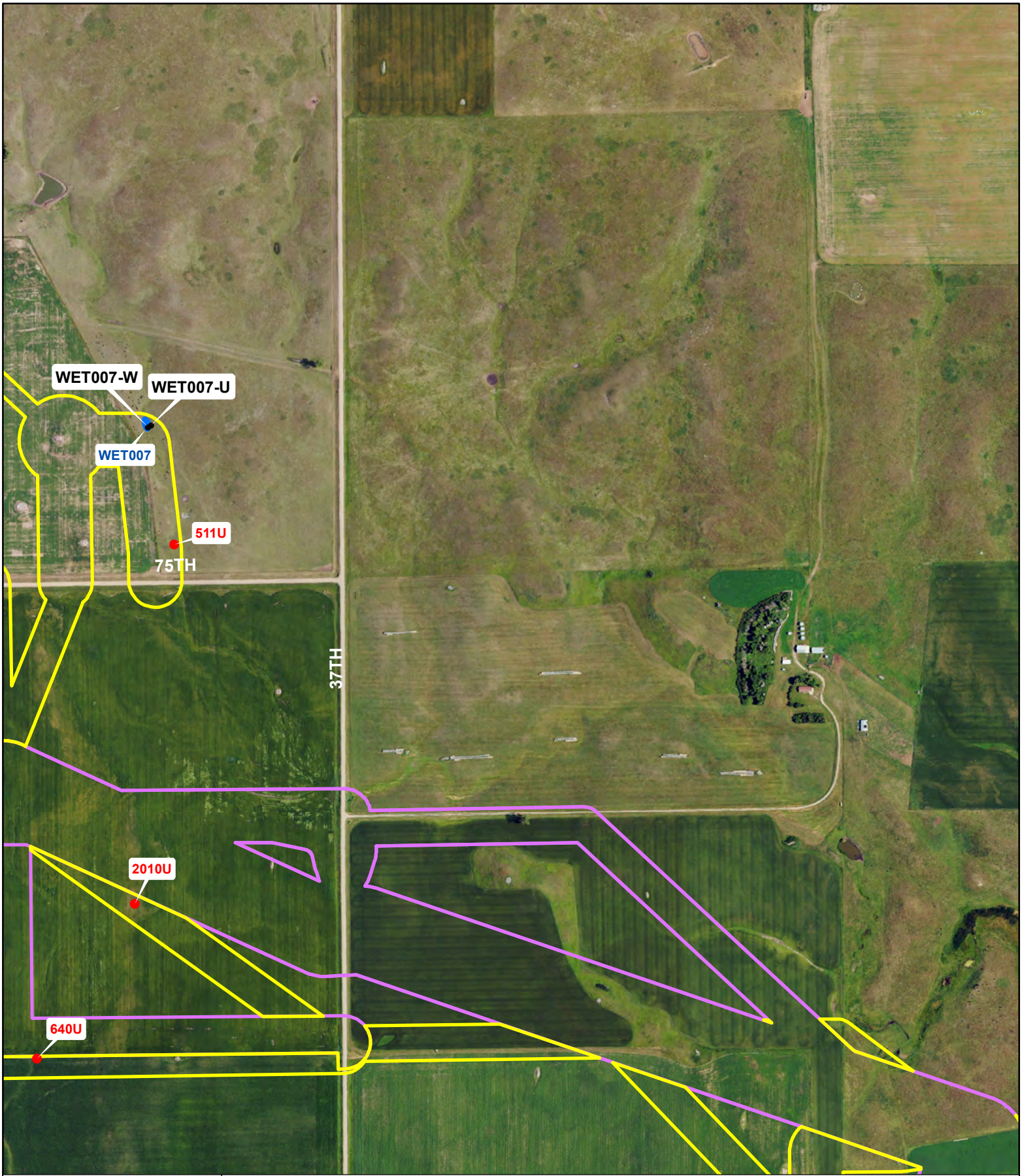
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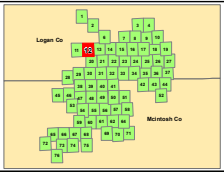
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Badger Wind Project

Logan & McIntosh Counties, ND



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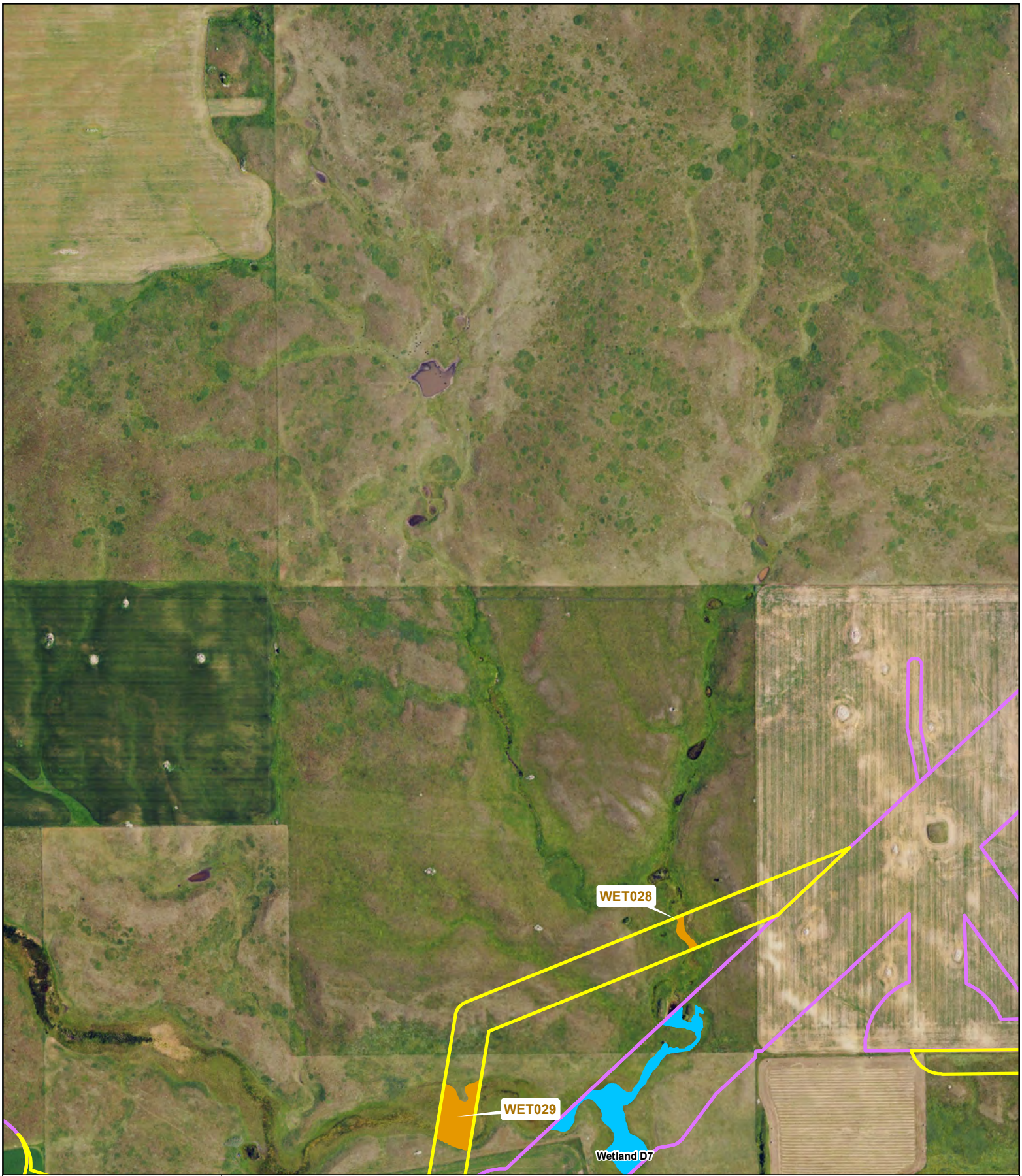
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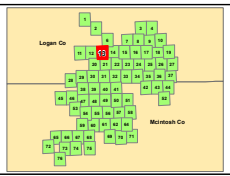
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Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

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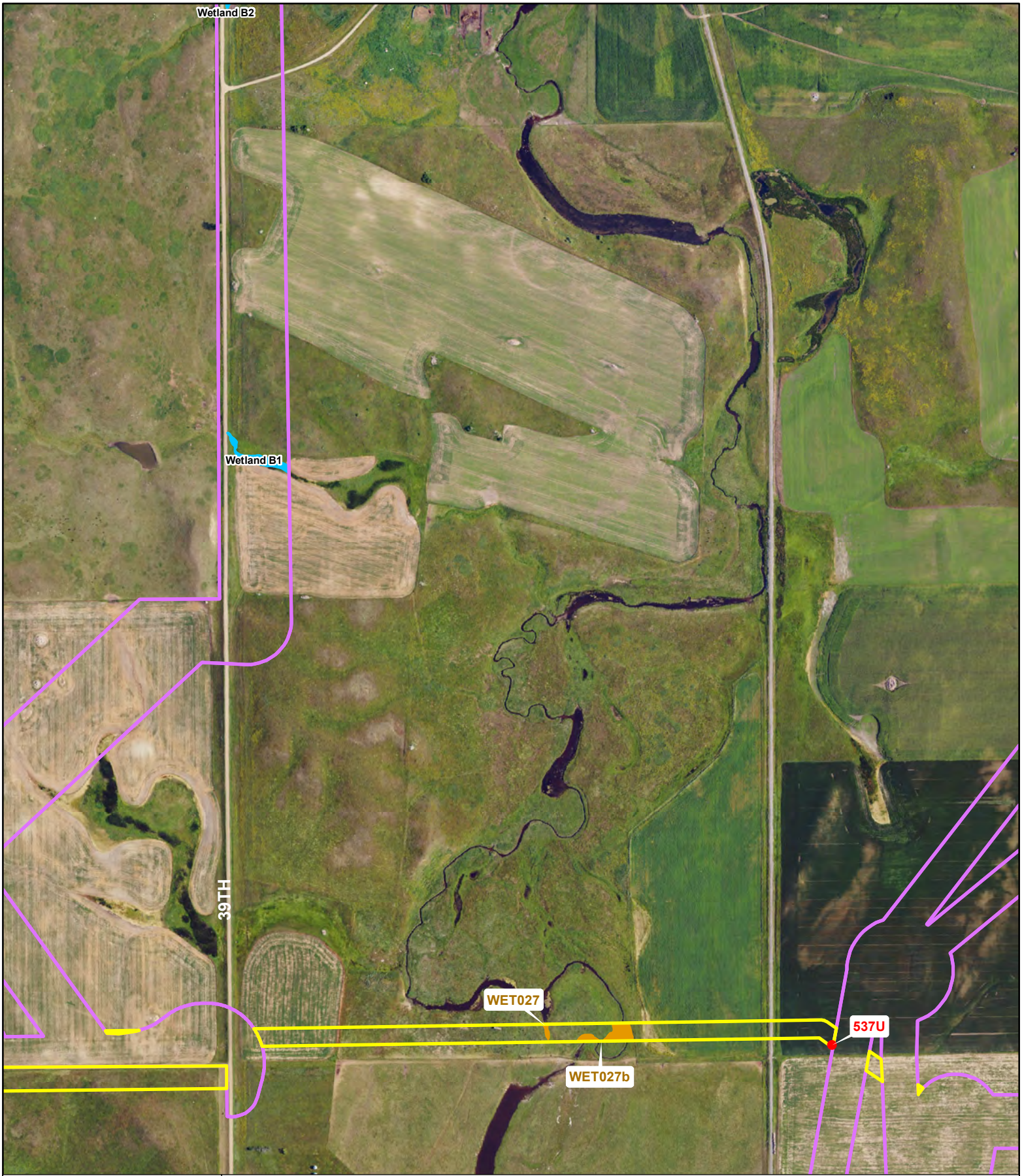
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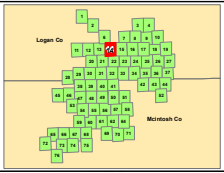
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Badger Wind Project

Logan & McIntosh Counties, ND



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2023 Surveyed Wetlands

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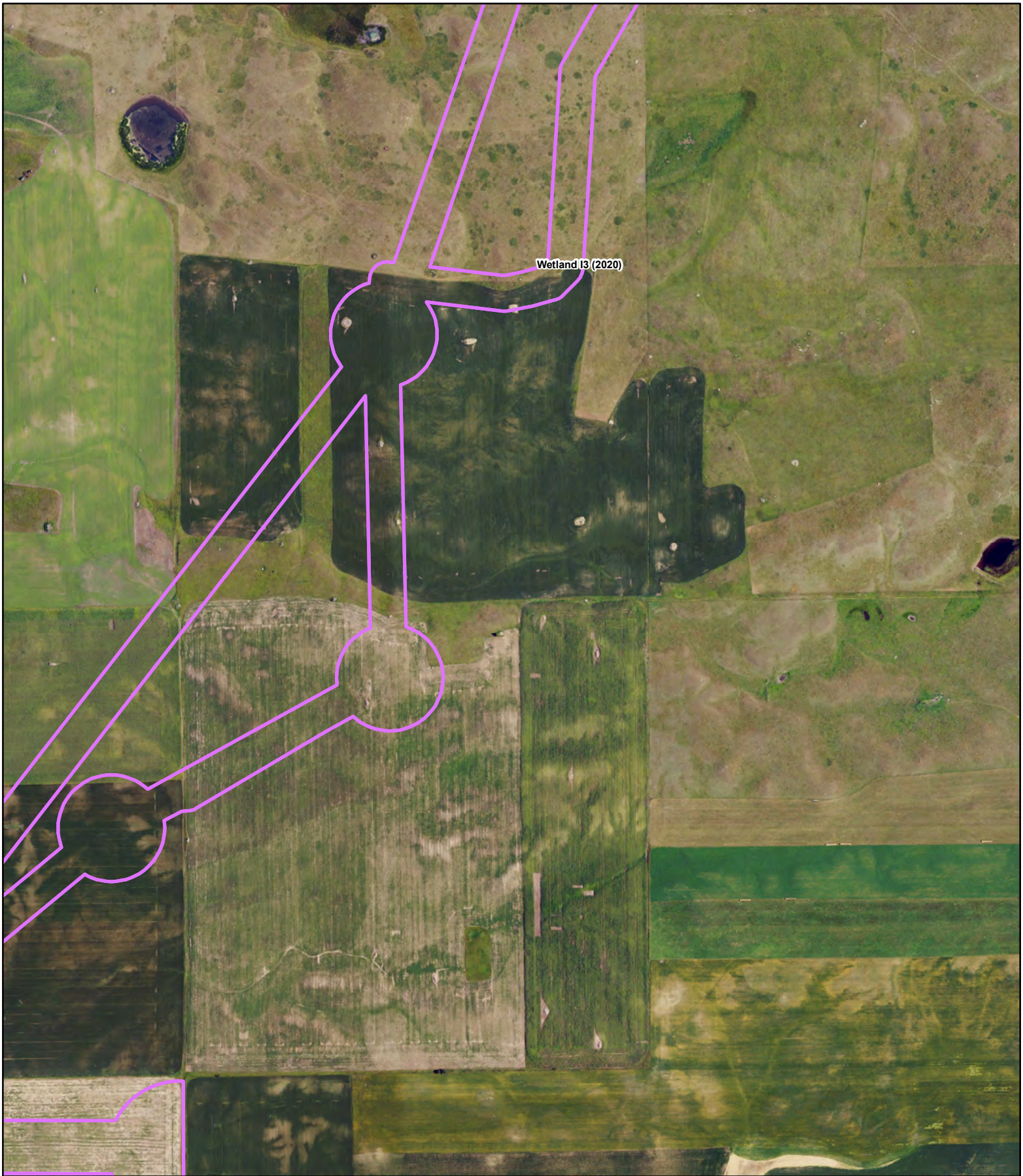
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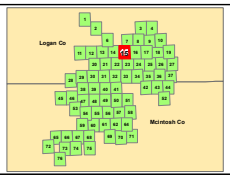
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Badger Wind Project

Logan & McIntosh Counties, ND



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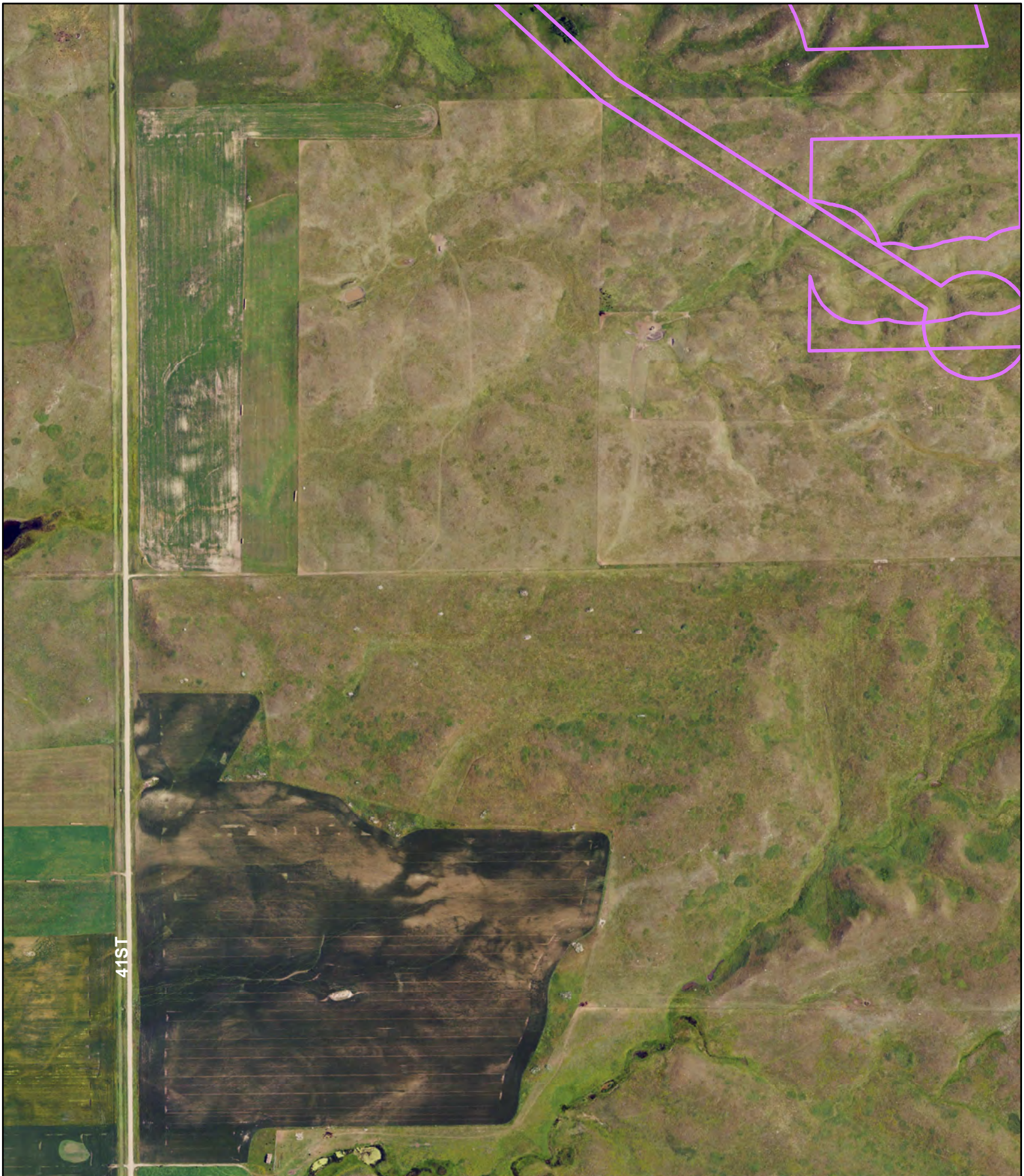
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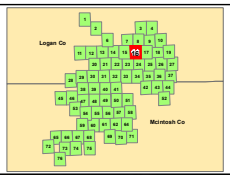
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Logan & McIntosh Counties, ND



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2023 Surveyed Wetlands

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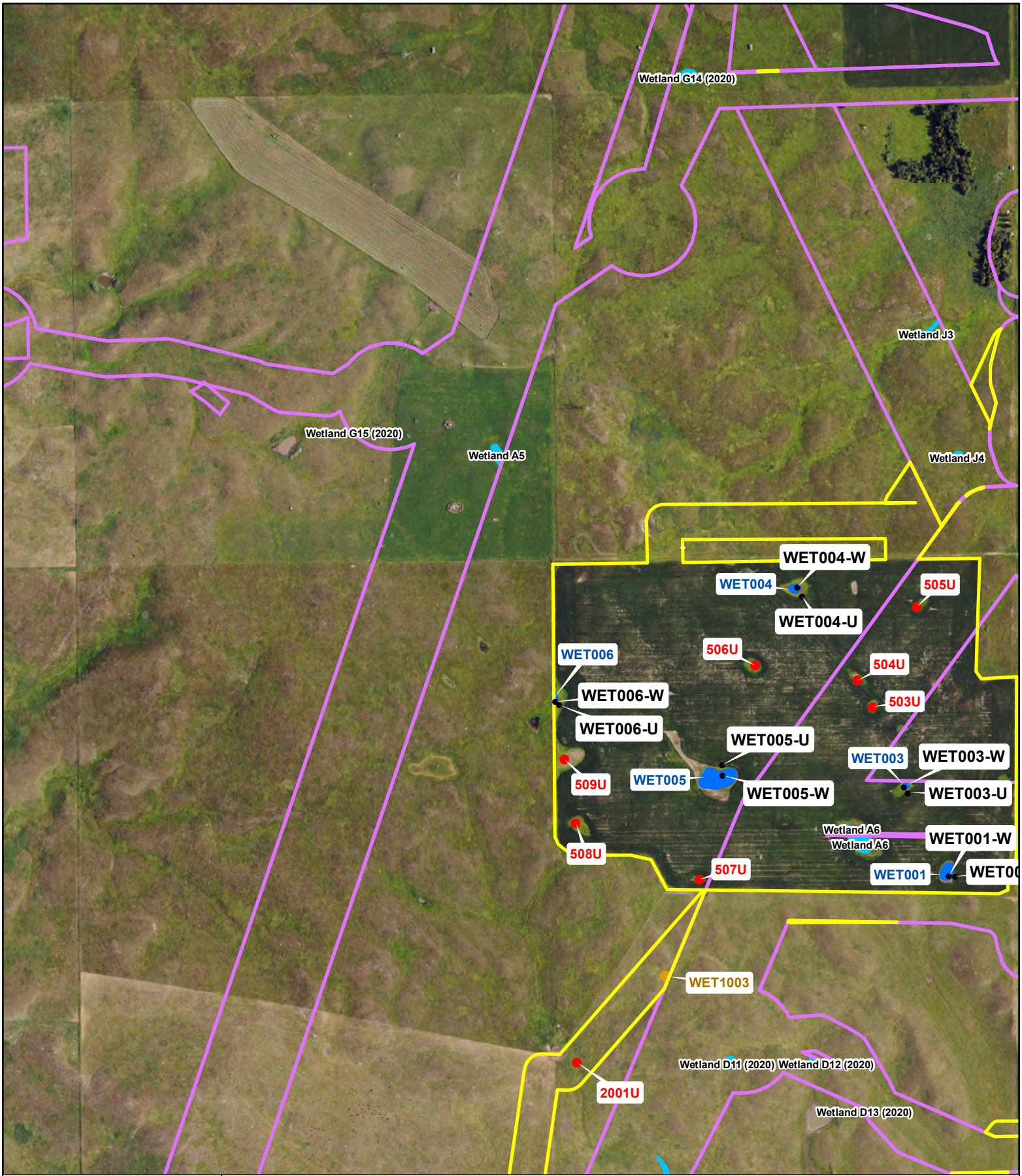
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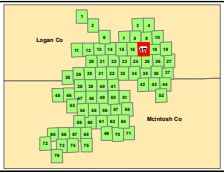
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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

2023 Surveyed Wetlands

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Pre 2023 Surveyed Wetlands

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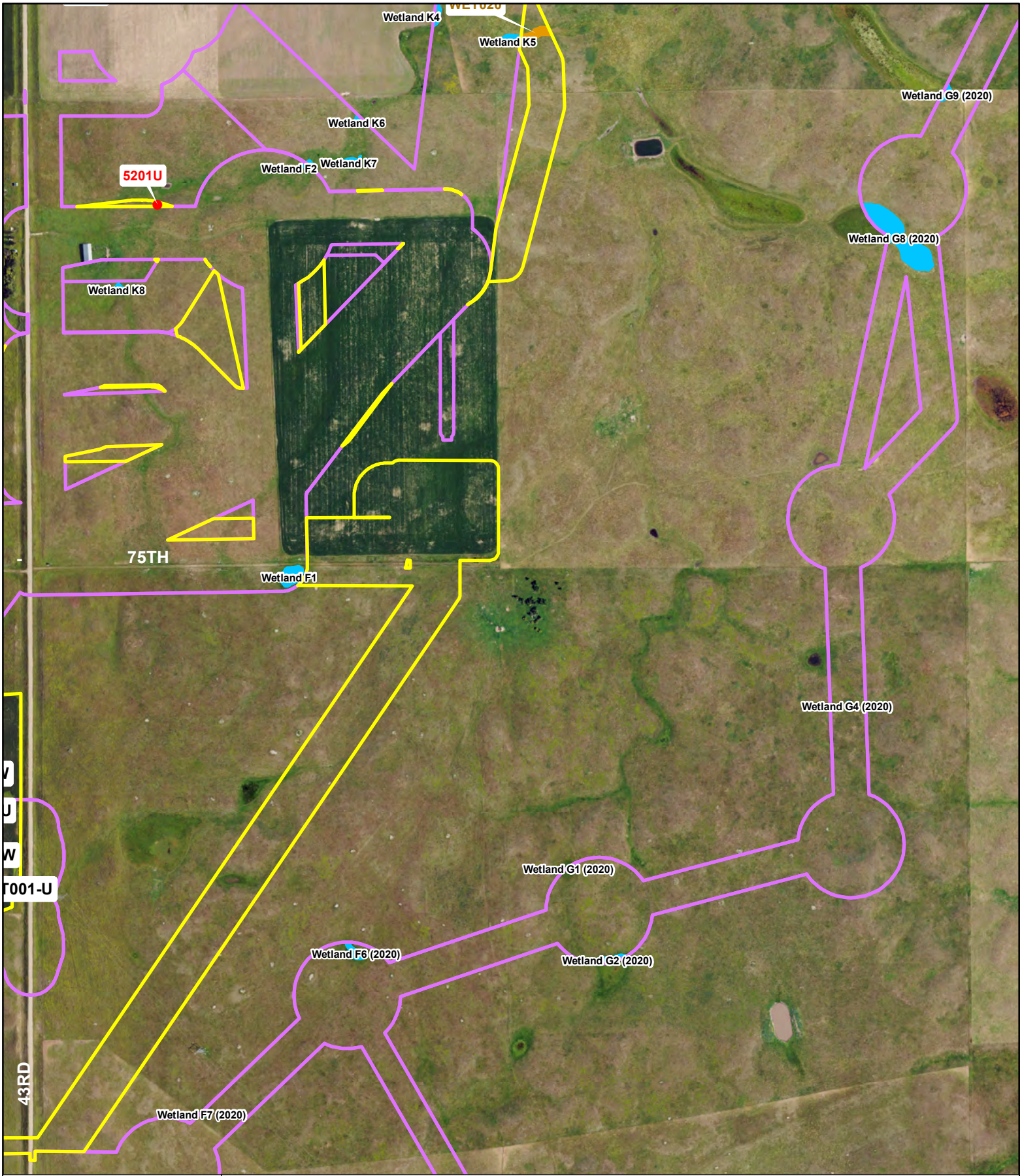
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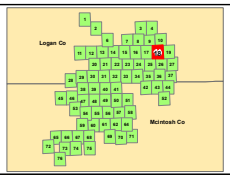
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Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

State Highway

2023 Surveyed Wetlands

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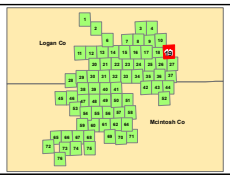
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Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

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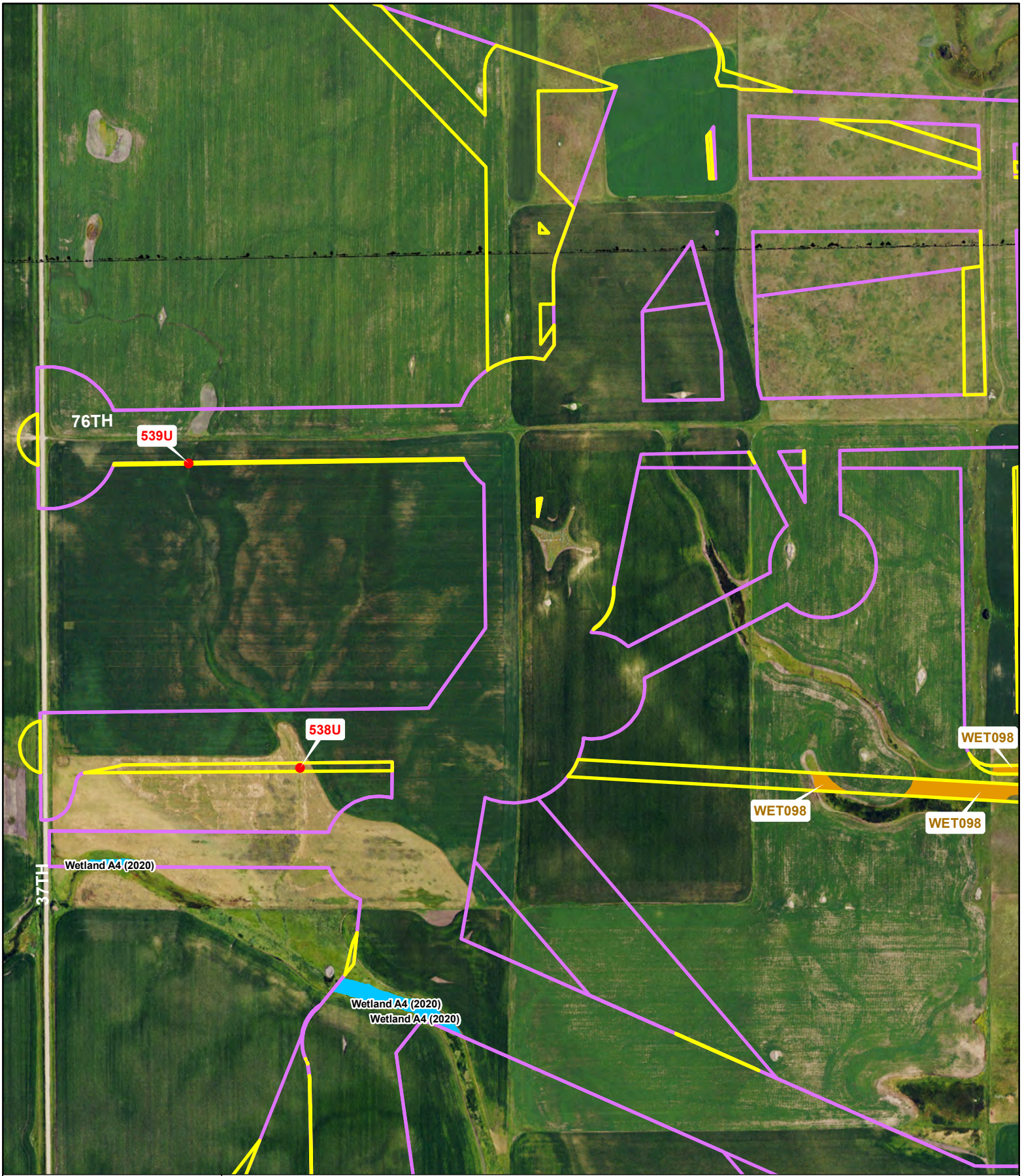
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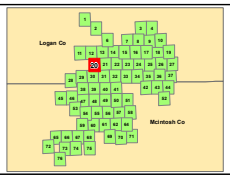
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Pre 2023 Surveyed Wetlands

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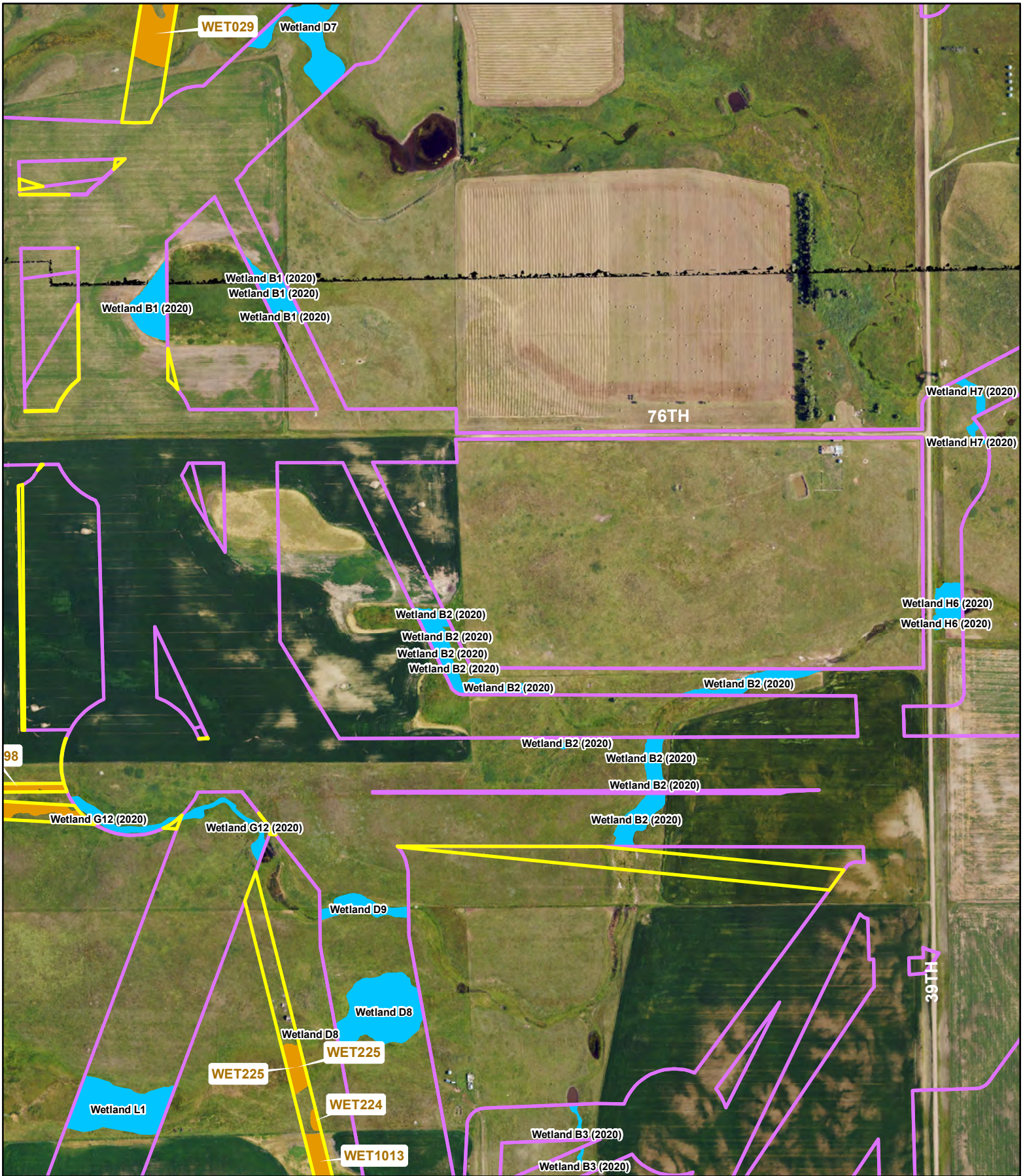
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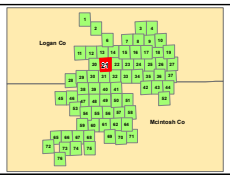
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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

Pre 2023 Wetland Survey Area

County Boundary

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2023 Surveyed Wetlands

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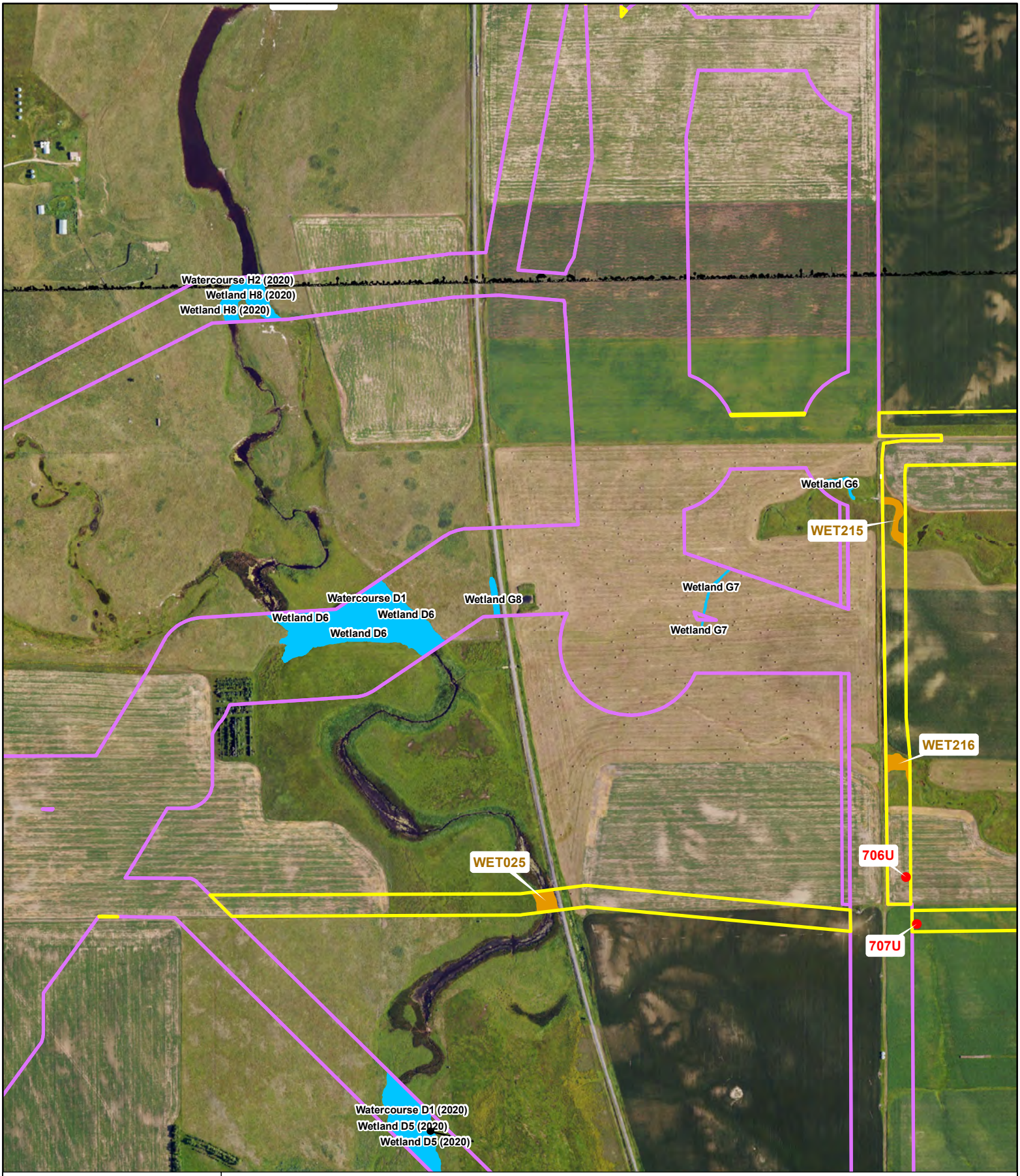
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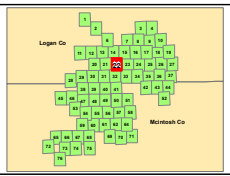
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Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

State Highway

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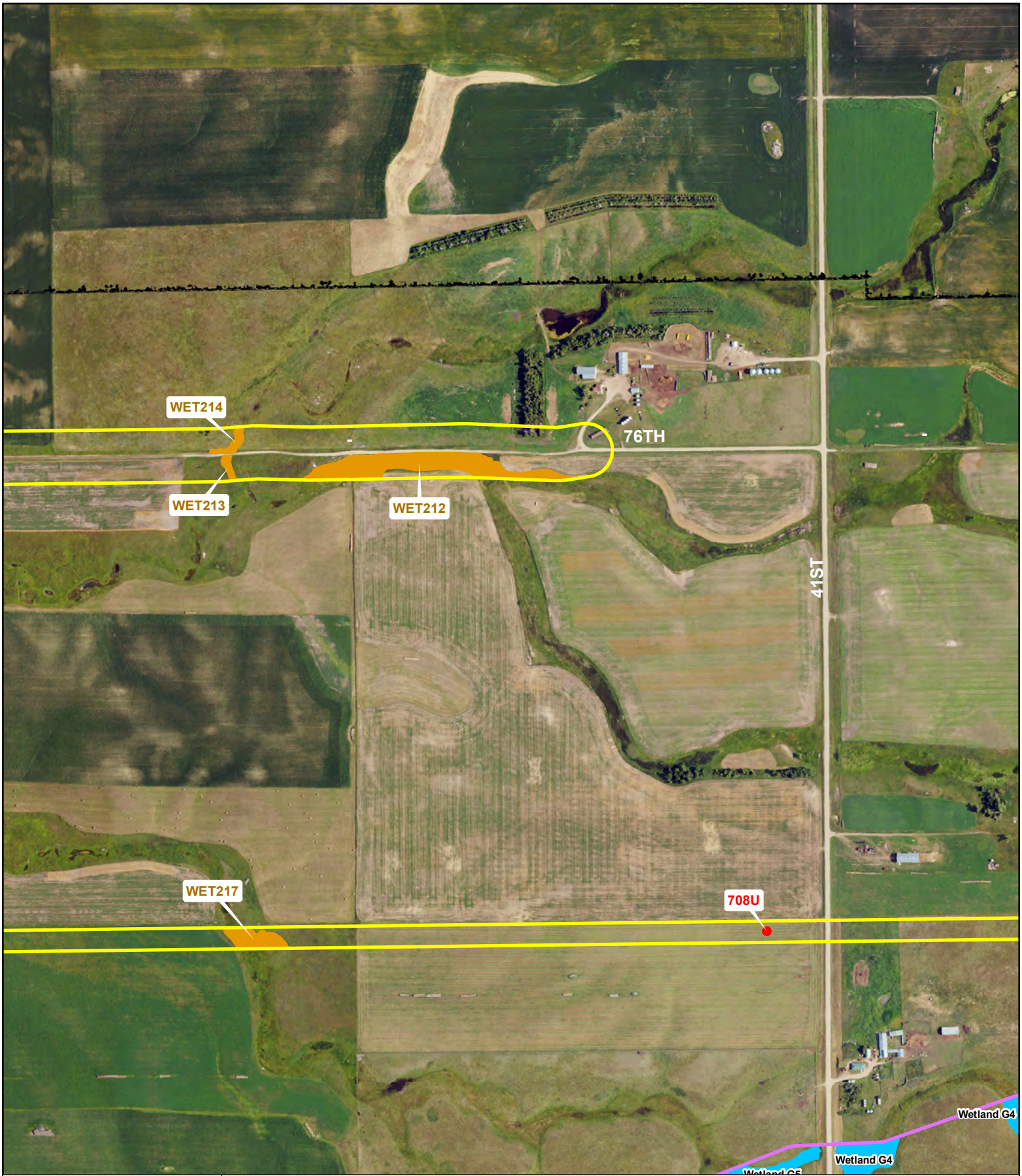
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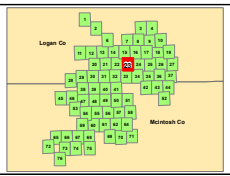
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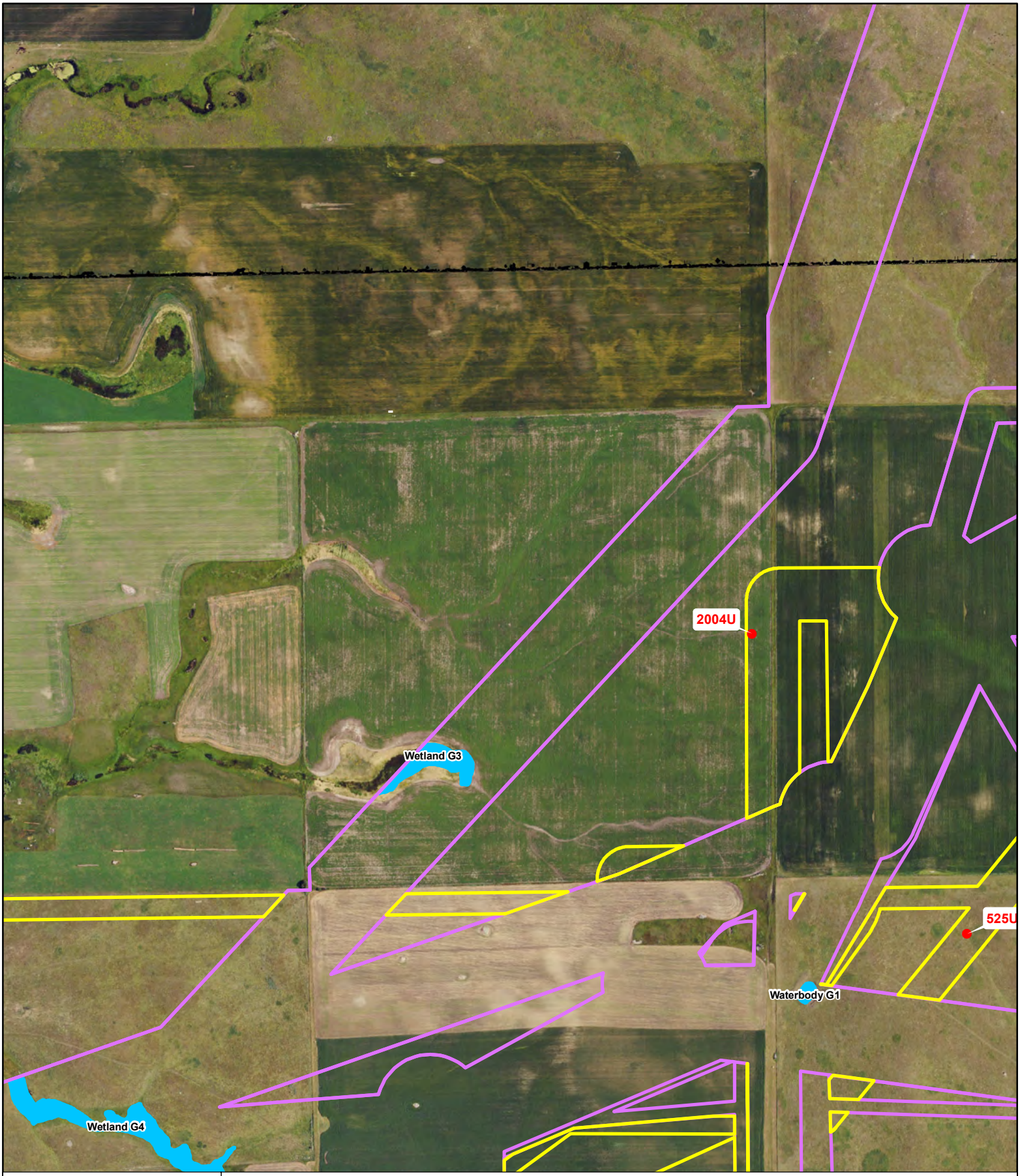
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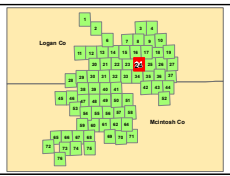
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Badger Wind Project

Logan & McIntosh Counties, ND



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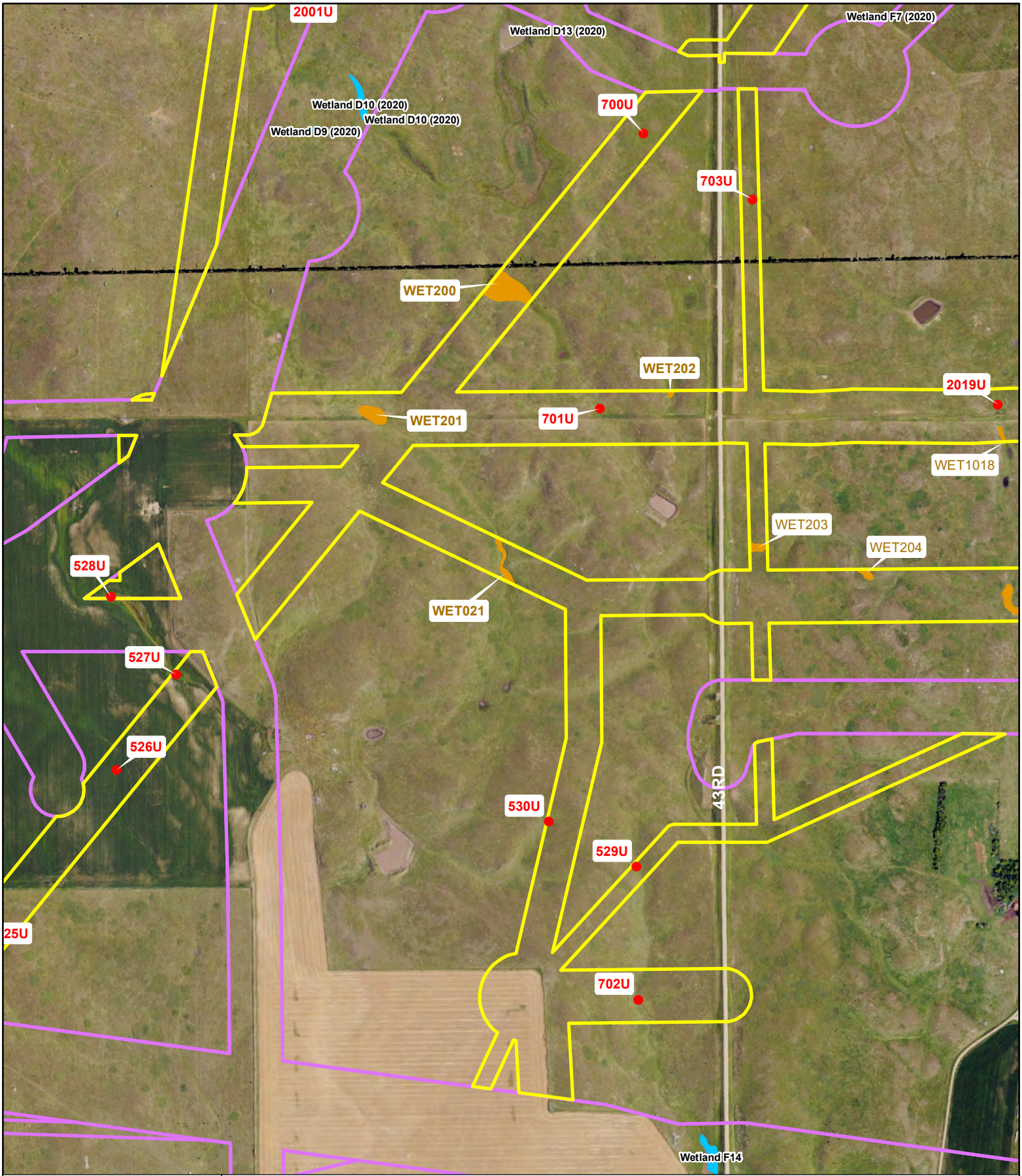
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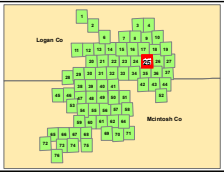
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Badger Wind Project

Logan & McIntosh Counties, ND



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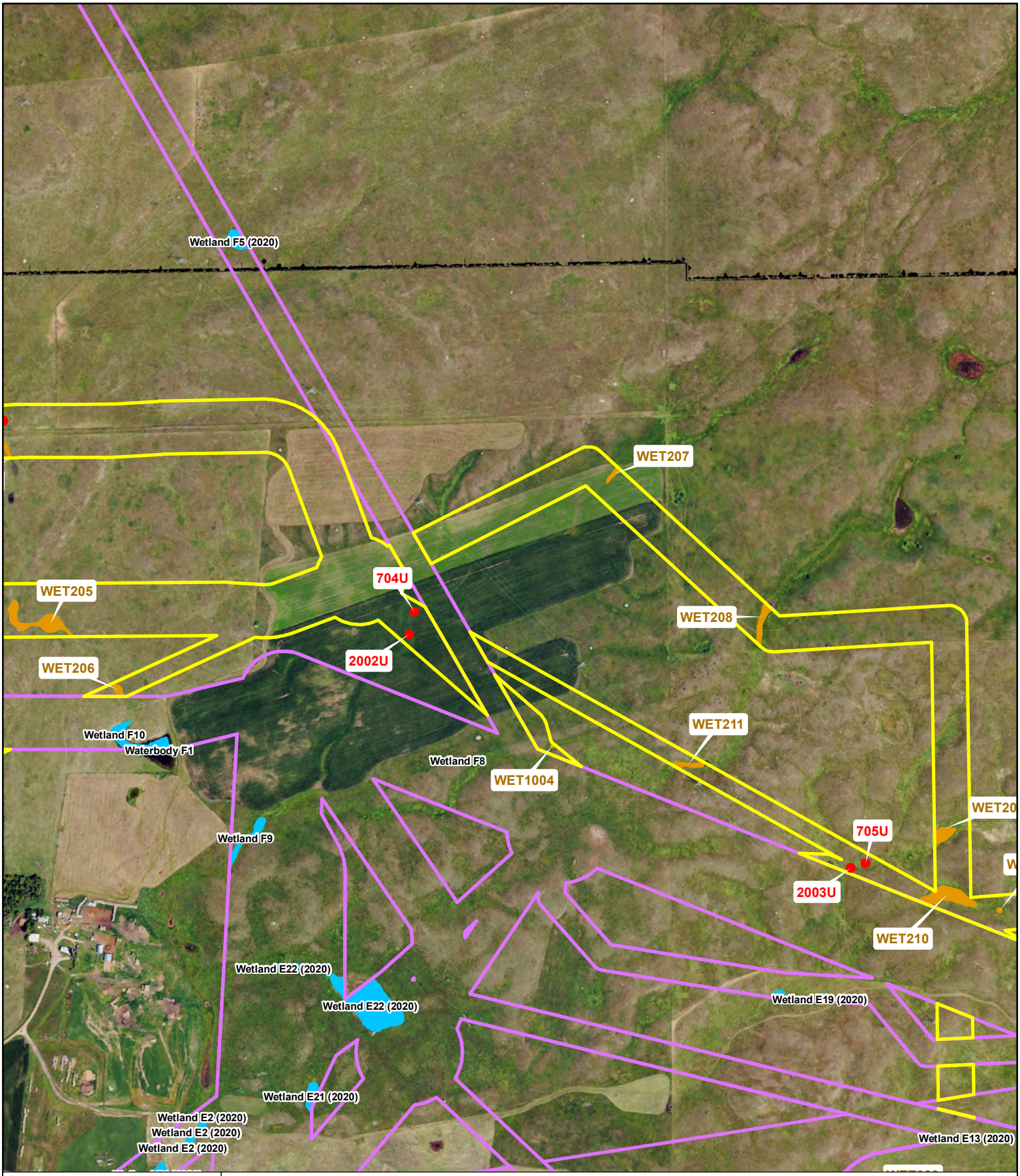
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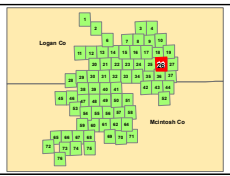
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Coordinate System: UTM, WGS84, zn 14
Map Produced: 01/25/2024. Created by: T. Thorn

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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

Pre 2023 Wetland Survey Area

County Boundary

State Highway

2023 Surveyed Wetlands

Field Delineated

Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Surveyed Wetlands

Field Delineated

N W E S

0 0.1 0.2 mi

0 0.2 0.4 km

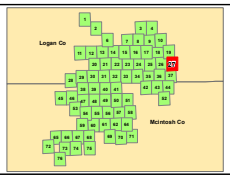
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Badger Wind Project

Logan & McIntosh Counties, ND



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2023 Surveyed Wetlands

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Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

Field Delineated

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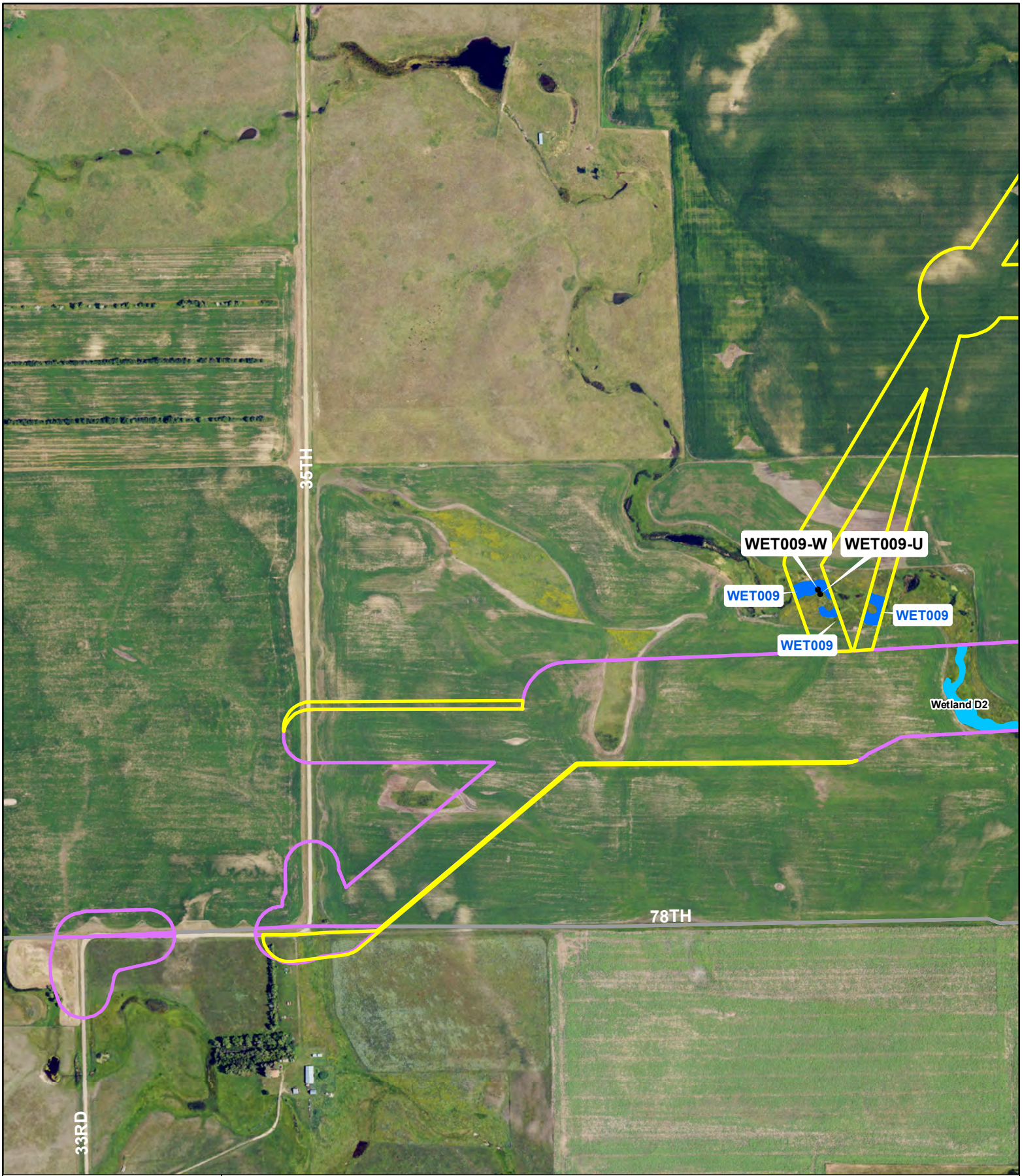
N W E S

0 0.1 0.2 mi

0 0.2 0.4 km

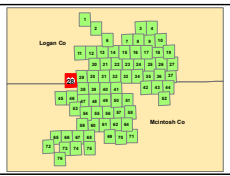
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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

2023 Surveyed Wetlands

Field Delineated Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

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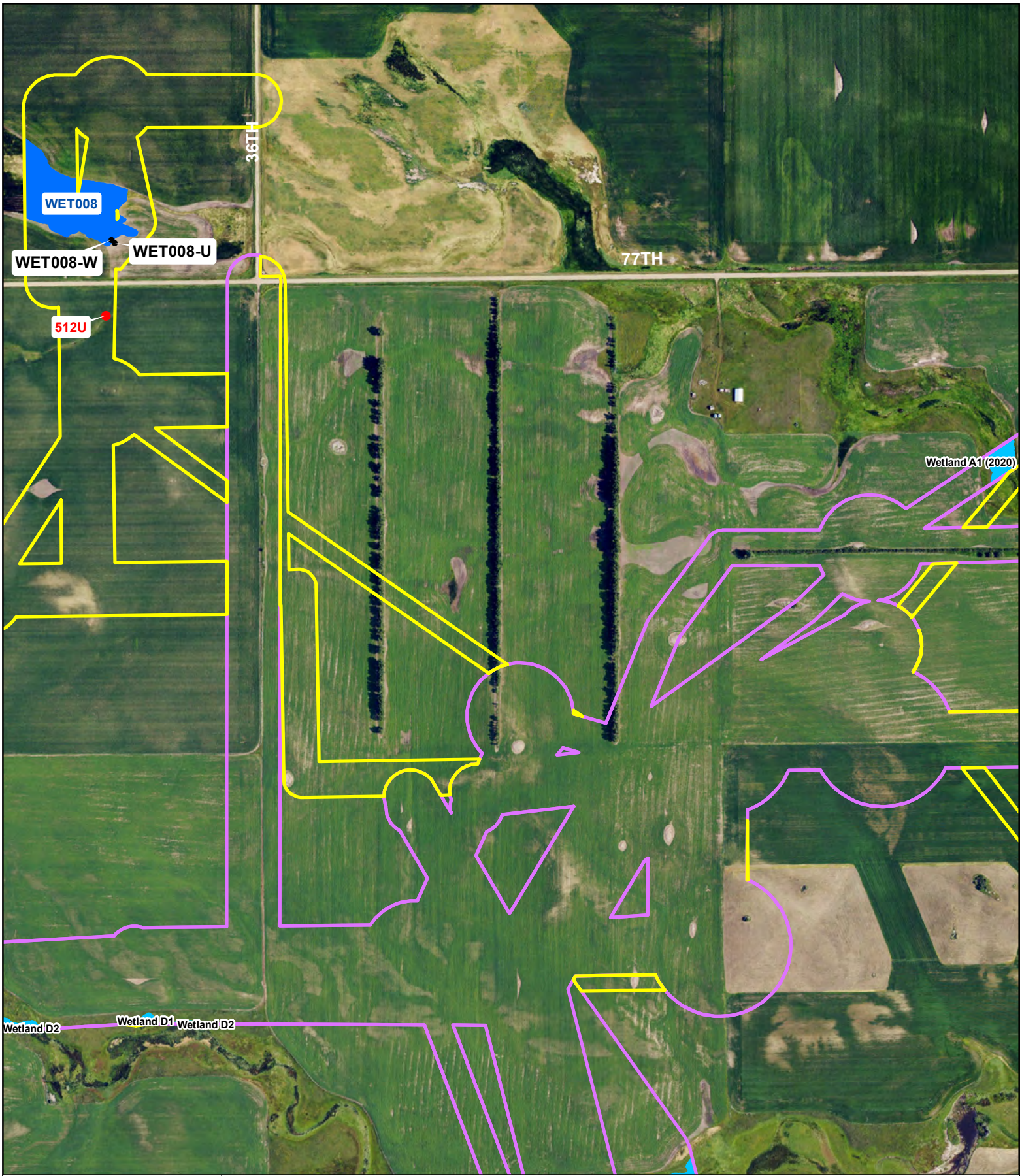
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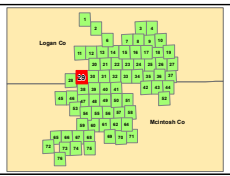
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

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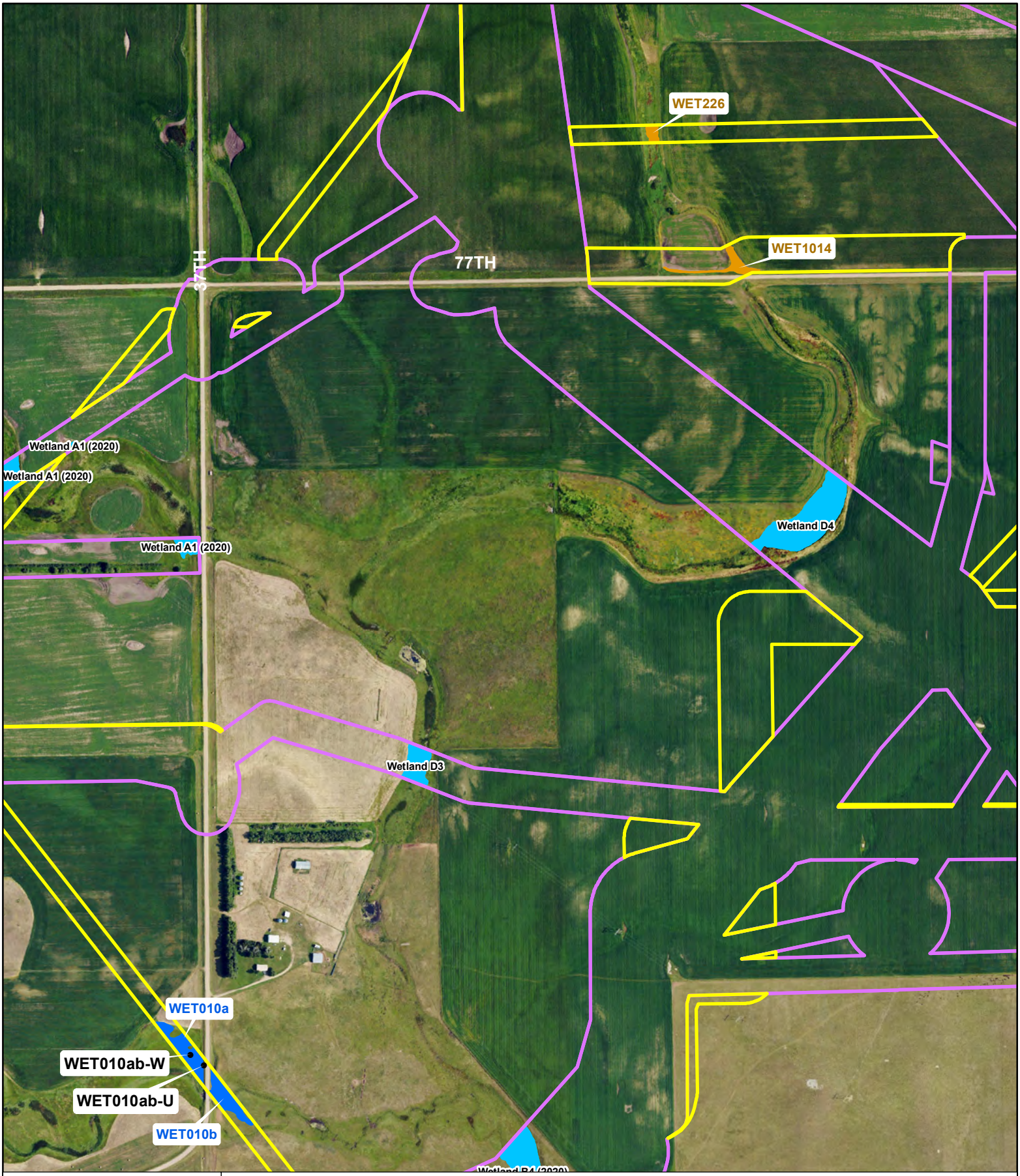
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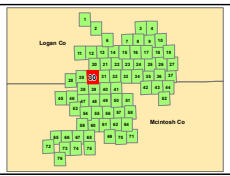
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Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

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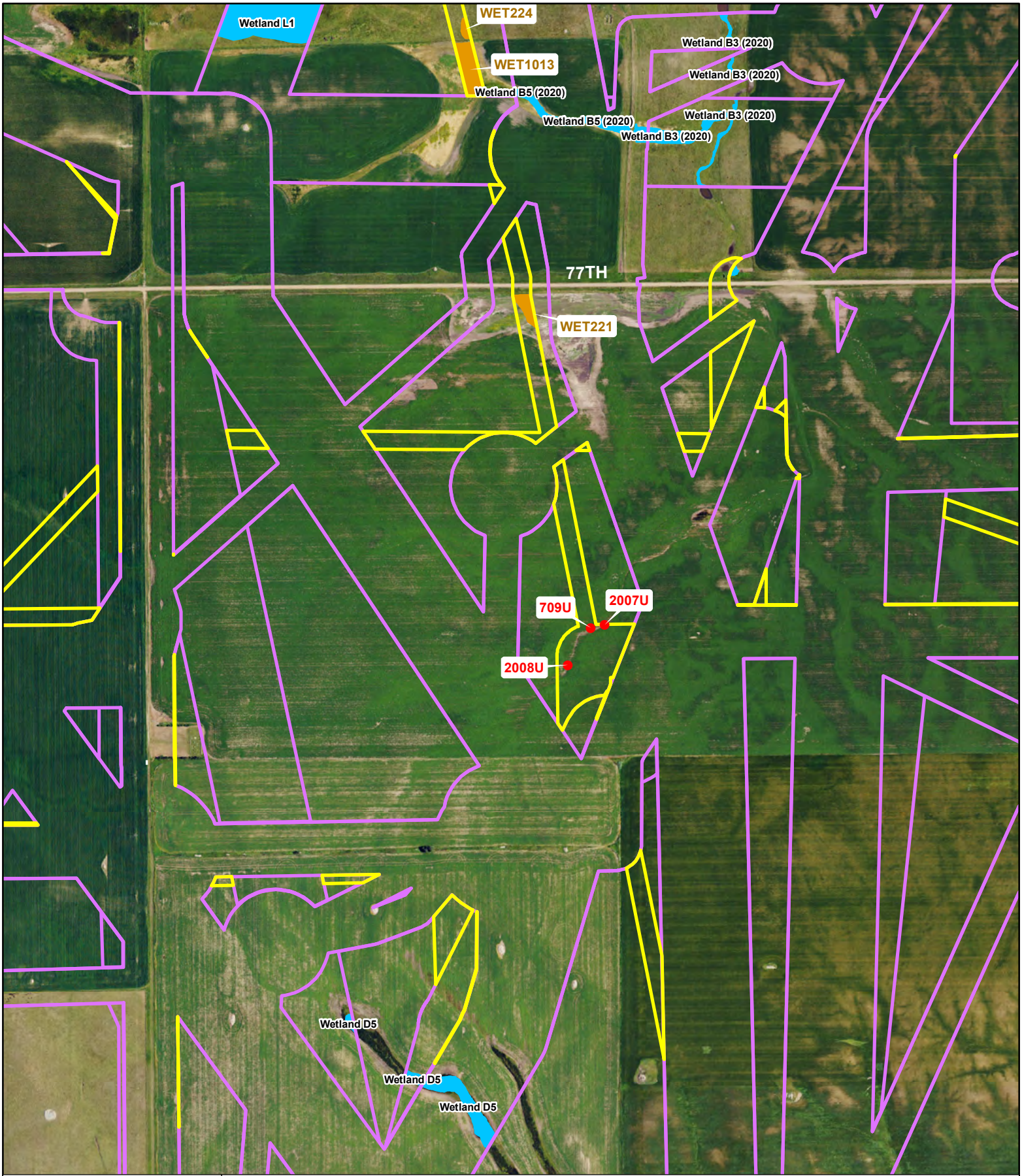
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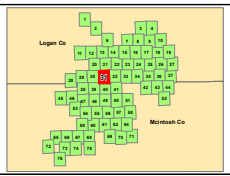
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

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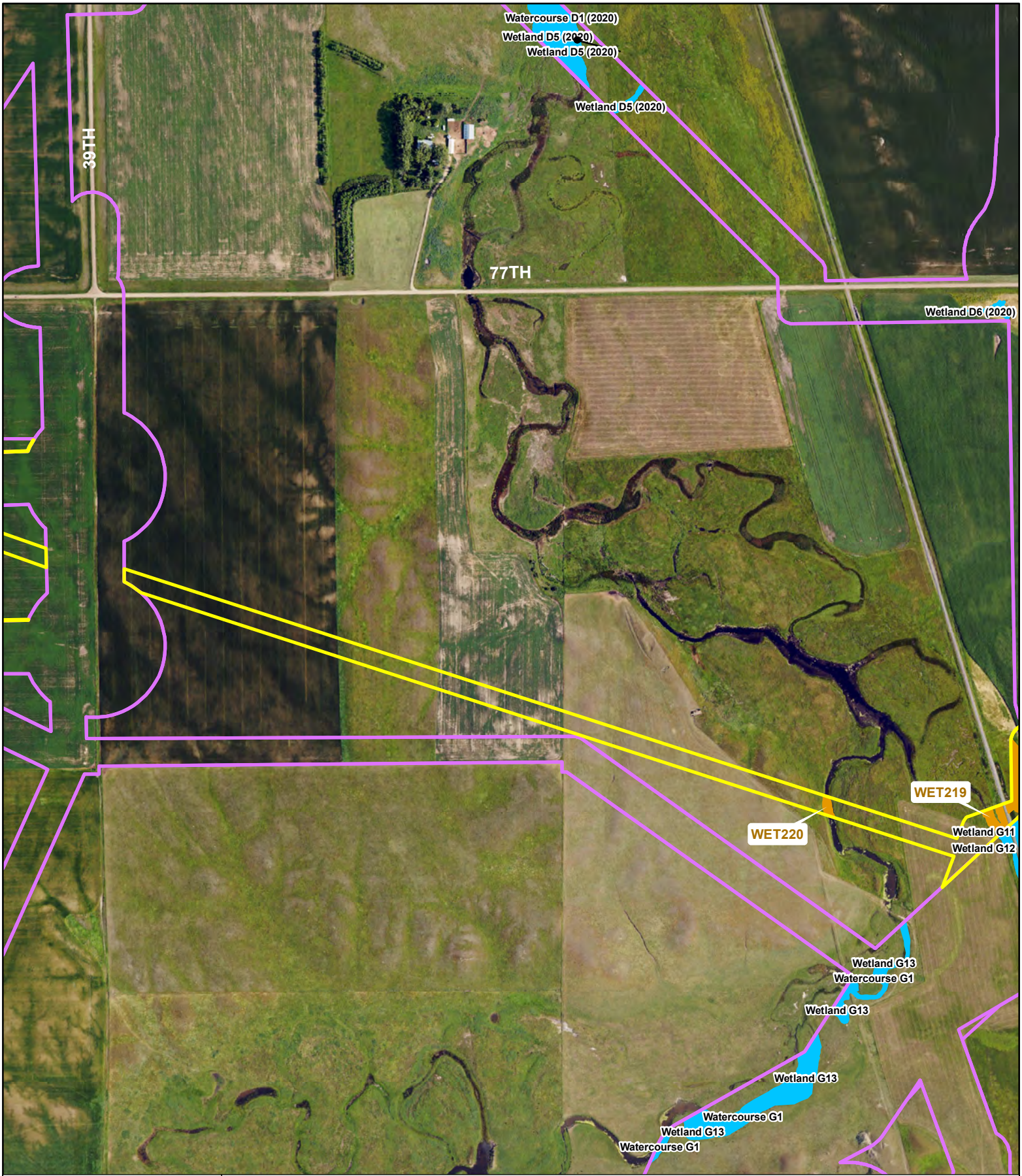
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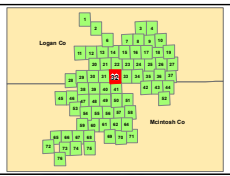
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Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

State Highway

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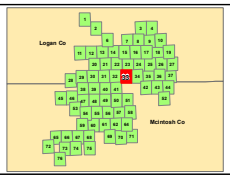
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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

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Field Delineated Field Mapped

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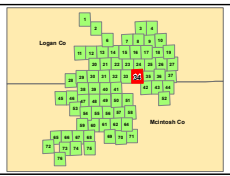
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

State Highway

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Field Mapped

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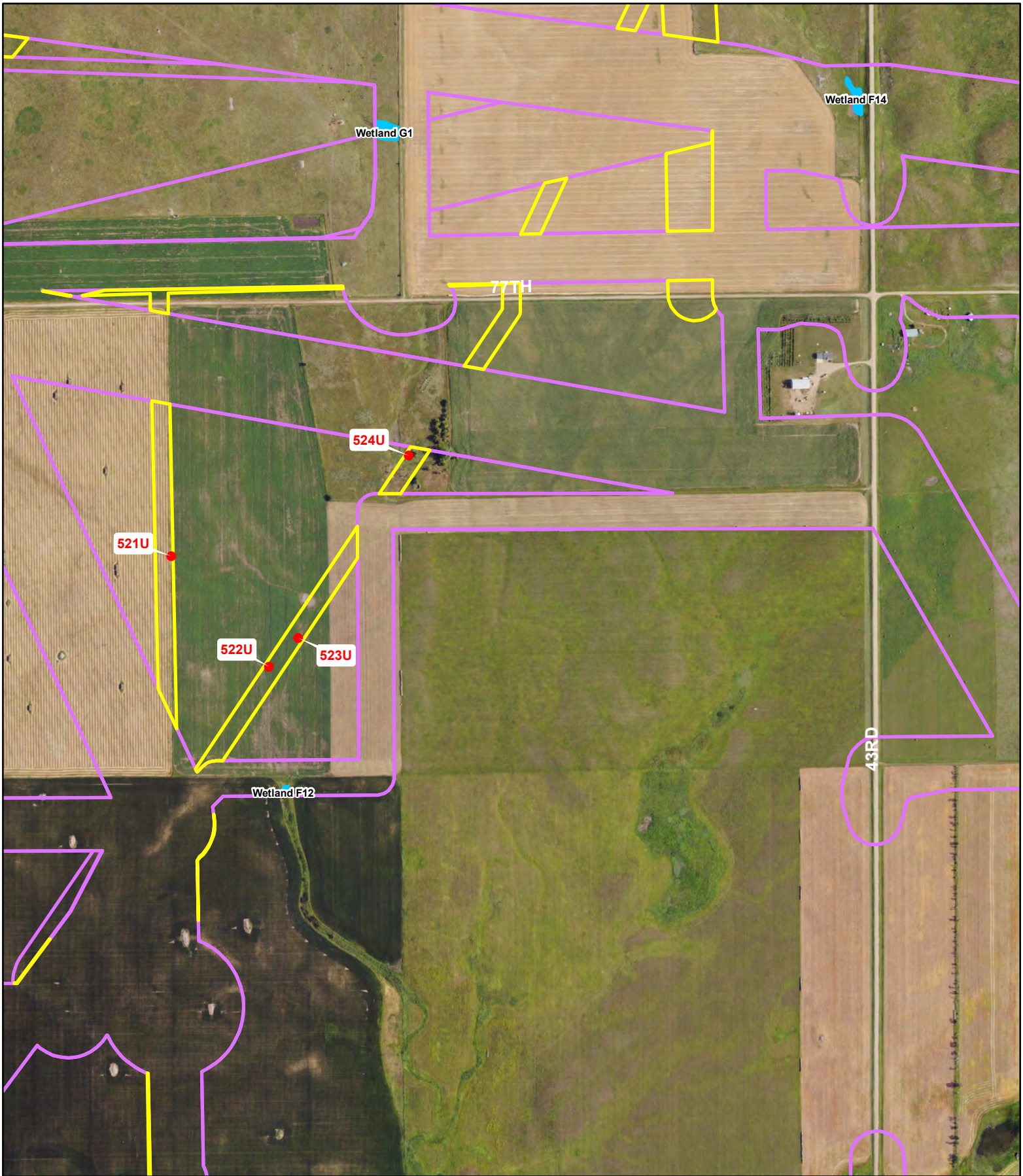
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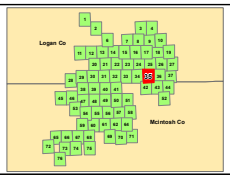
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



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2023 Surveyed Wetlands

Field Delineated Field Mapped

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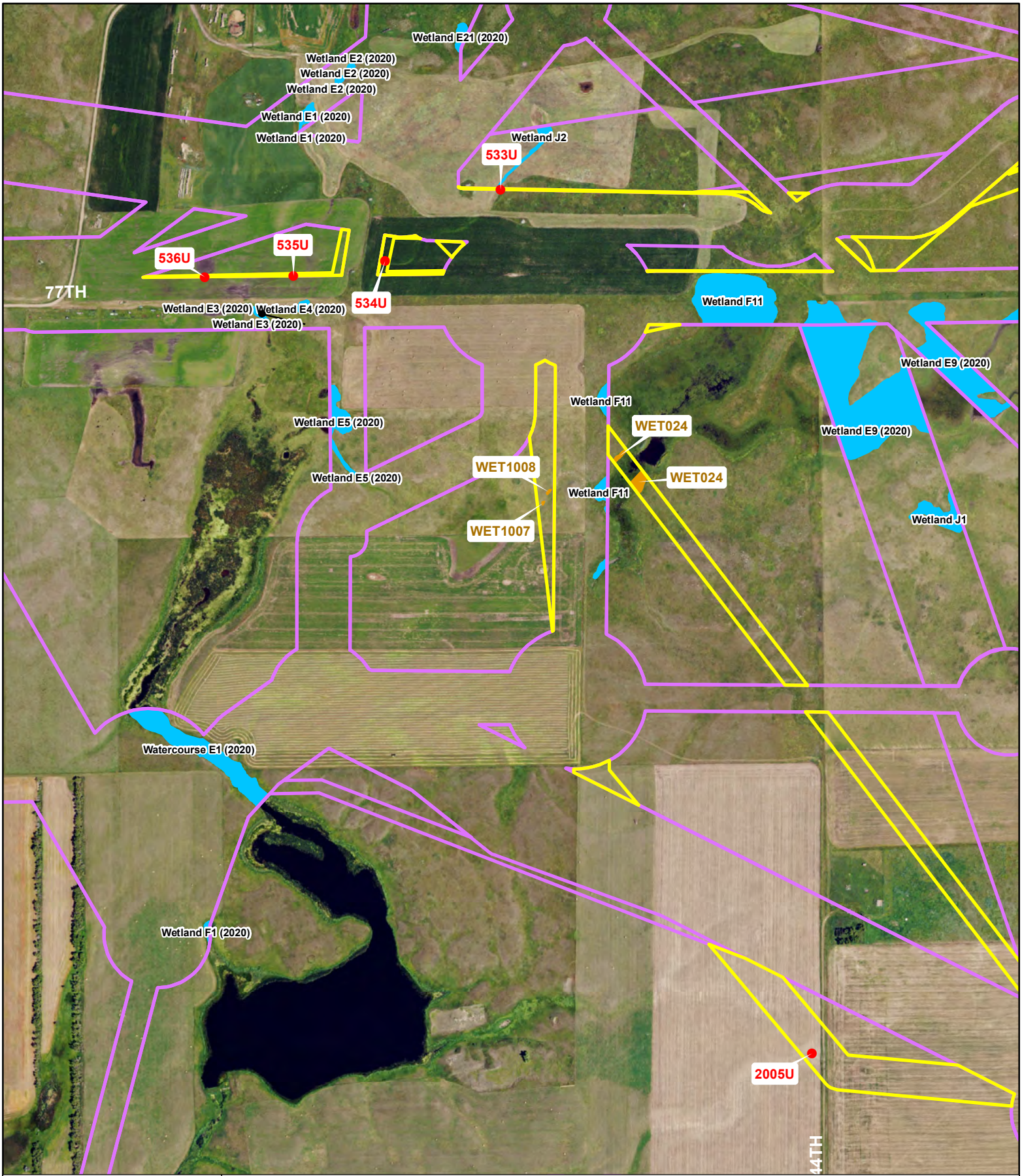
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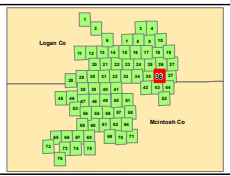
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

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Non WOTUS Points

Wetland/Upland Sample Points

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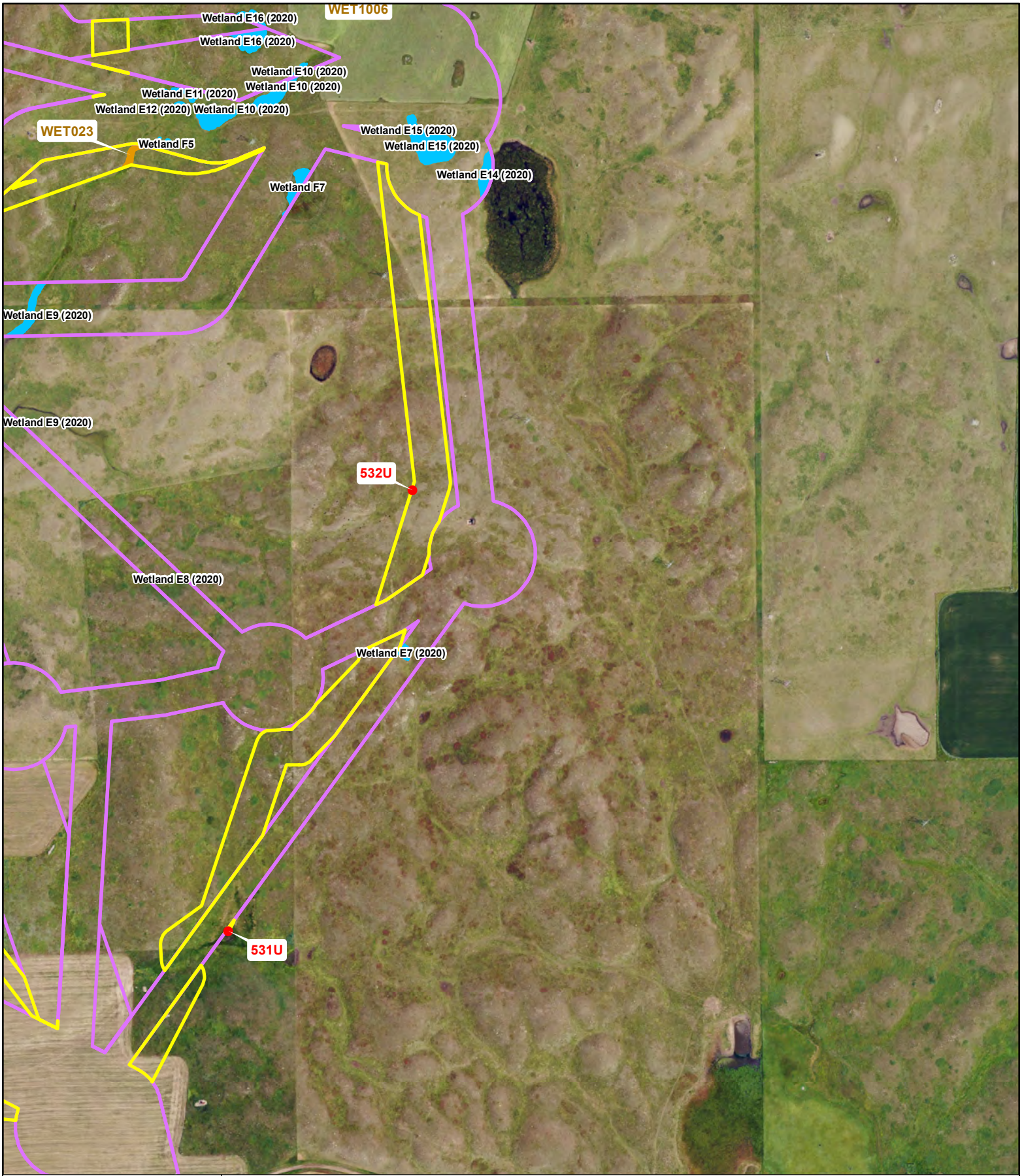
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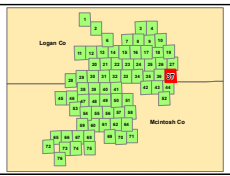
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

2023 Surveyed Wetlands

Field Delineated Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

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County Boundary

State Highway

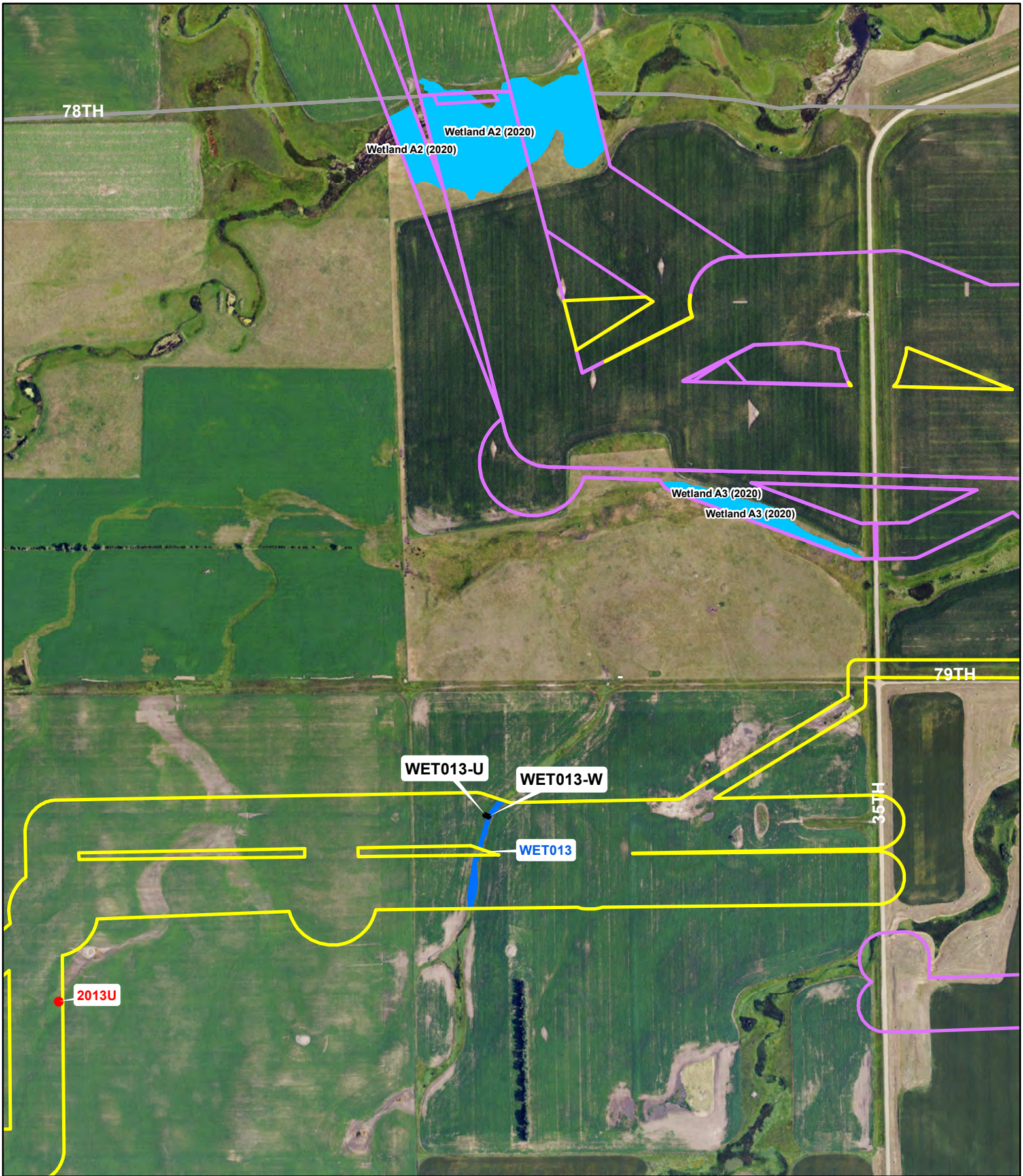
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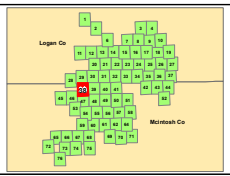
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Badger Wind Project

Logan & McIntosh Counties, ND



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2023 Surveyed Wetlands

Field Delineated Field Mapped

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Pre 2023 Surveyed Wetlands

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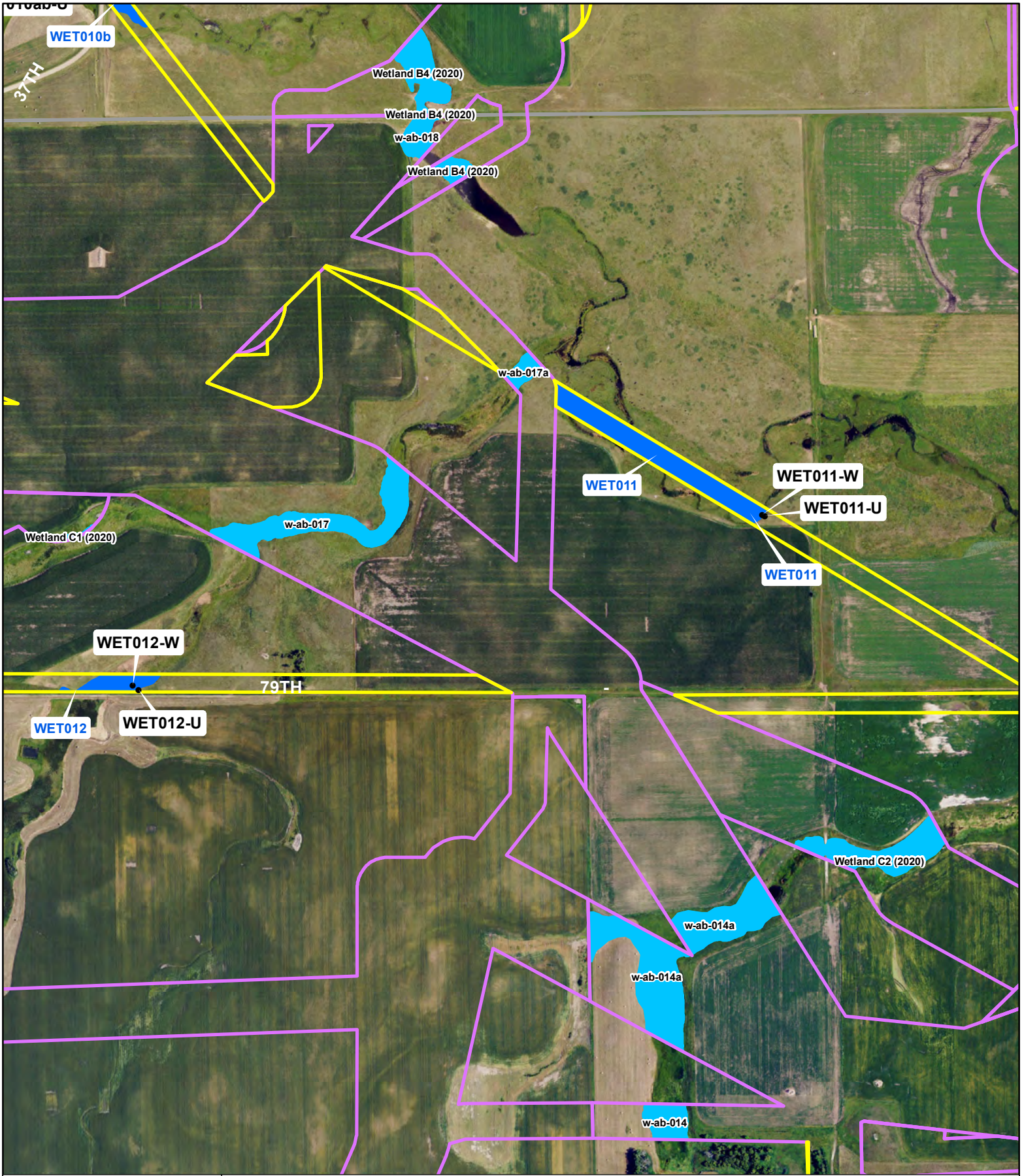
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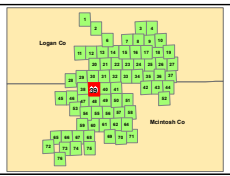
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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

Pre 2023 Wetland Survey Area

County Boundary

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2023 Surveyed Wetlands

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Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

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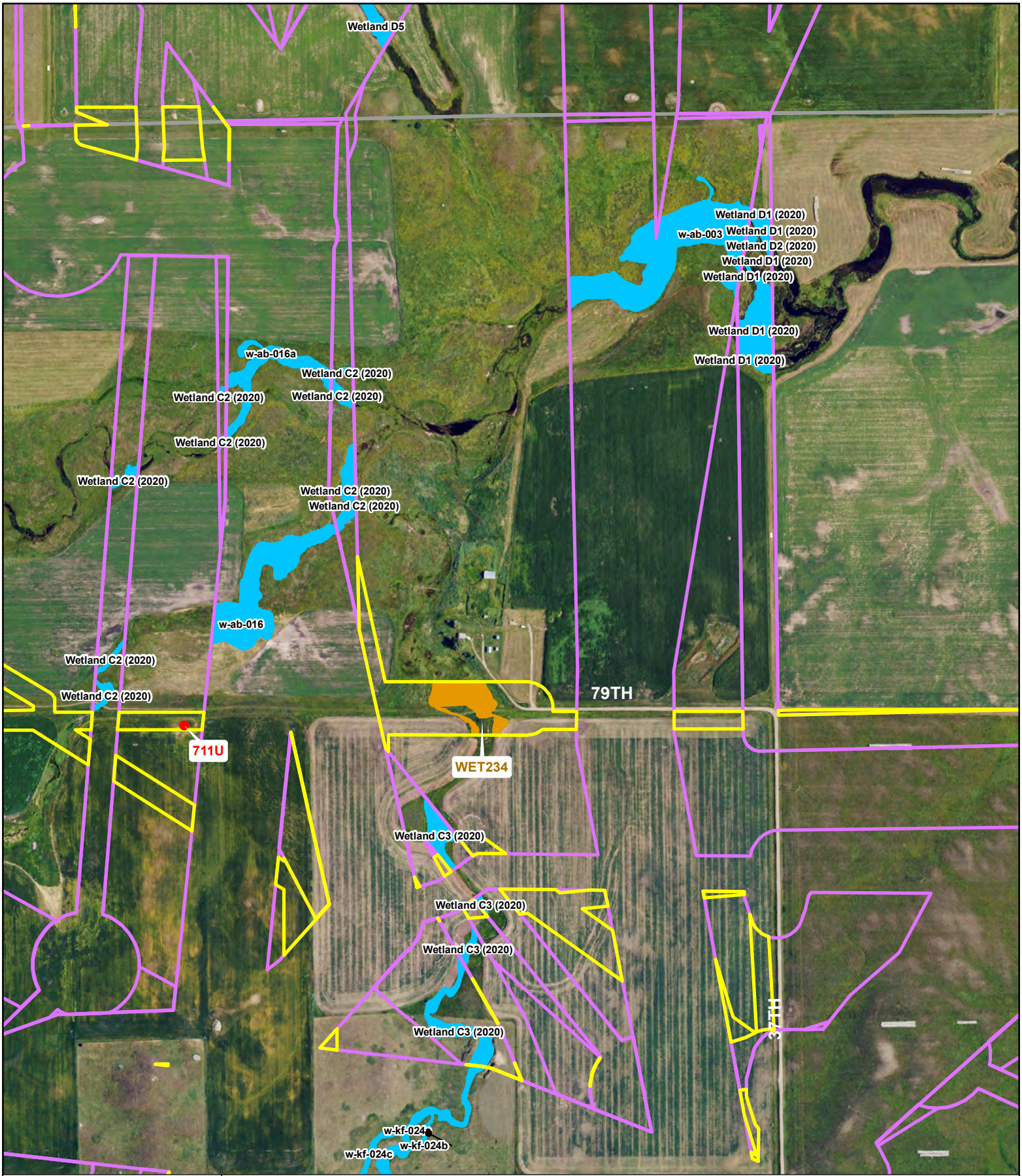
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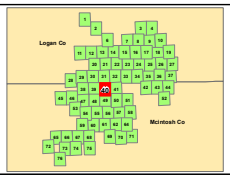
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

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2023 Surveyed Wetlands

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Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

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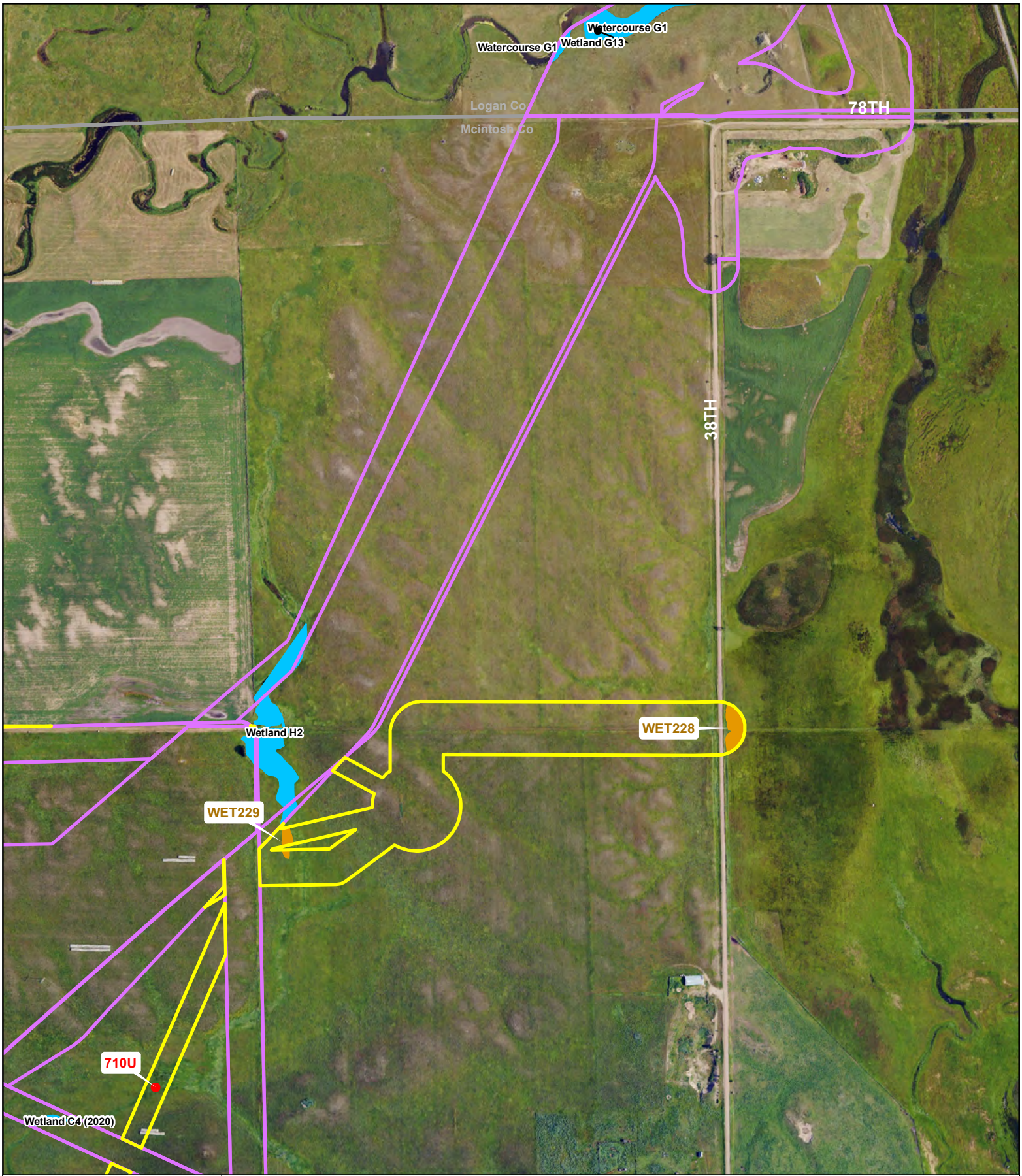
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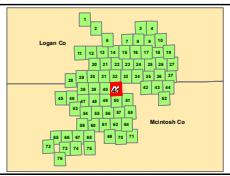
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



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2023 Surveyed Wetlands

Field Delineated Field Mapped

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Pre 2023 Surveyed Wetlands

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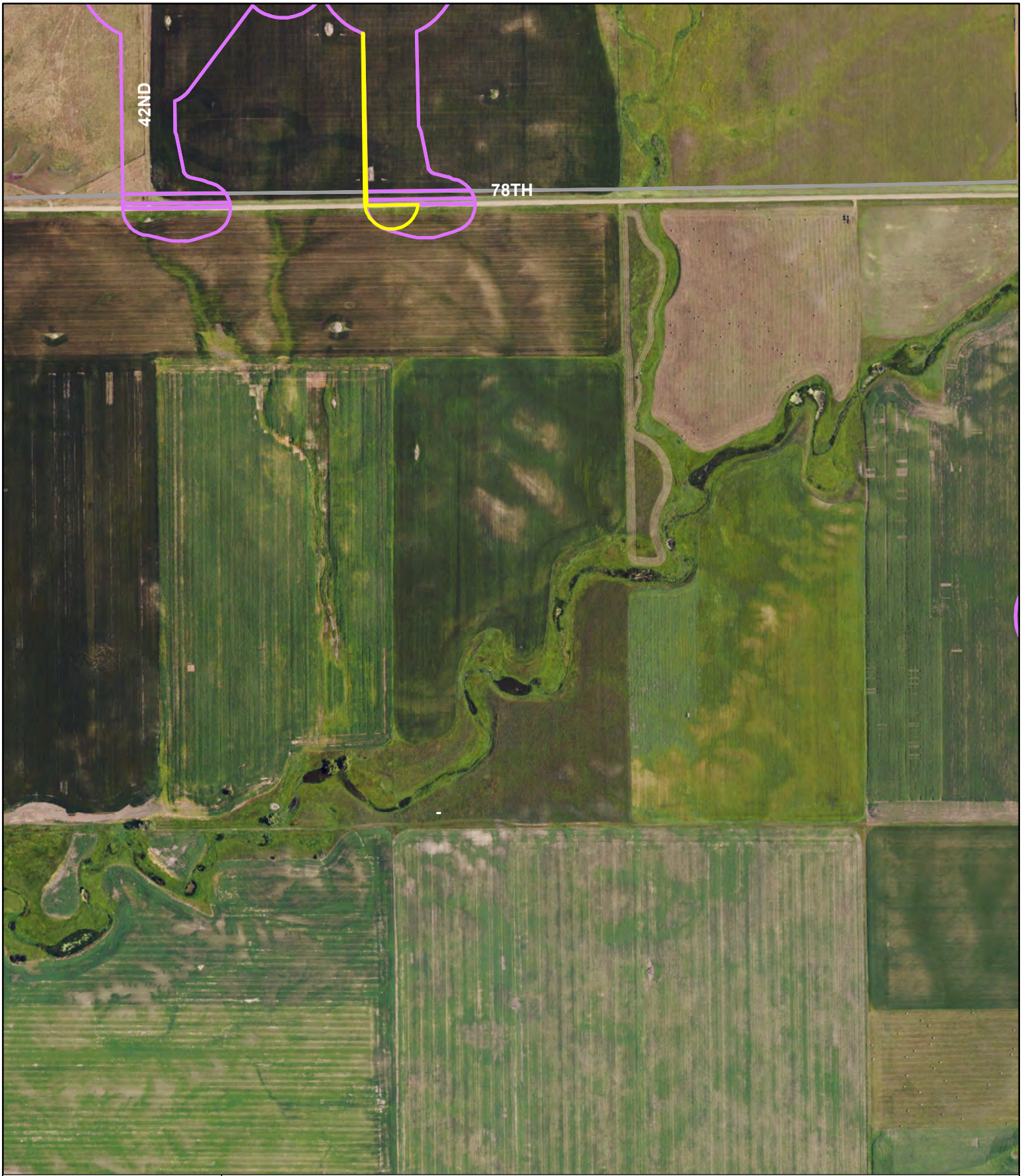
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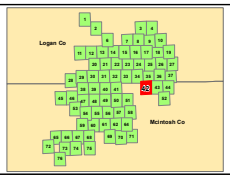
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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

Pre 2023 Wetland Survey Area

County Boundary

State Highway

2023 Surveyed Wetlands

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Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

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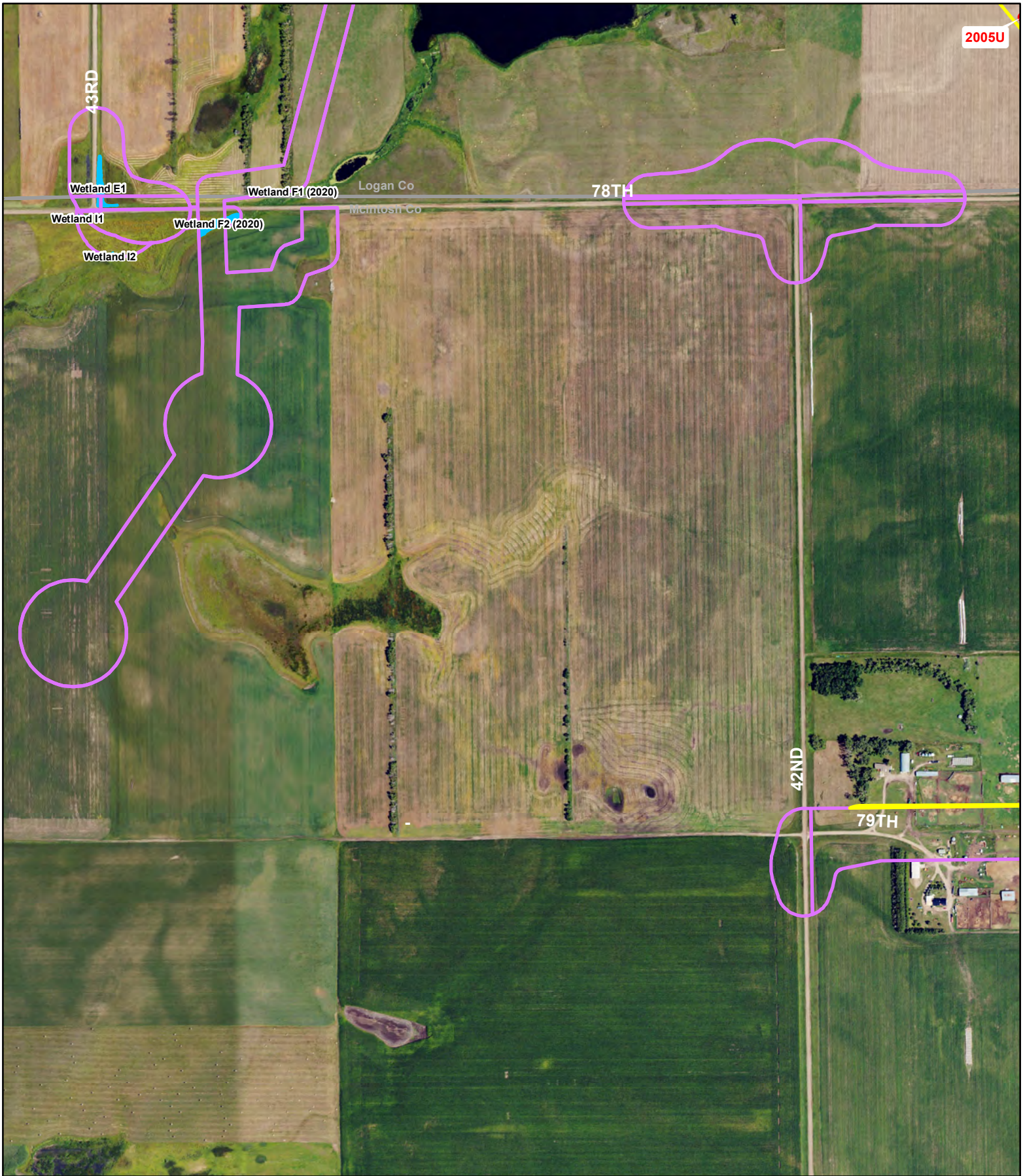
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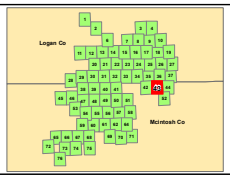
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Badger Wind Project

Logan & McIntosh Counties, ND



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Pre 2023 Wetland Survey Area

County Boundary

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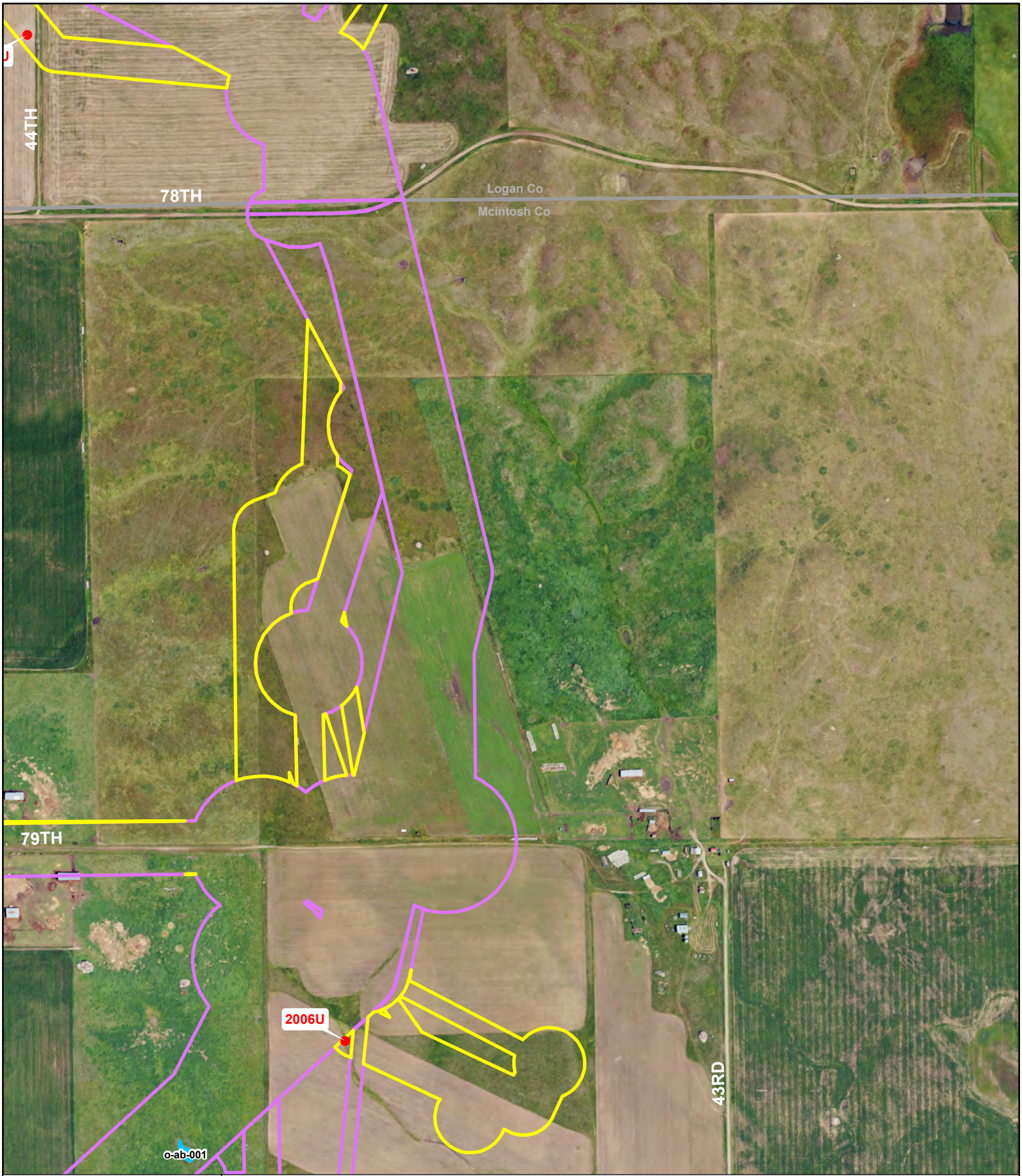
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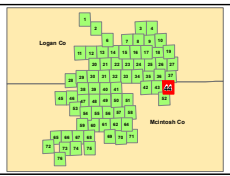
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



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2023 Surveyed Wetlands

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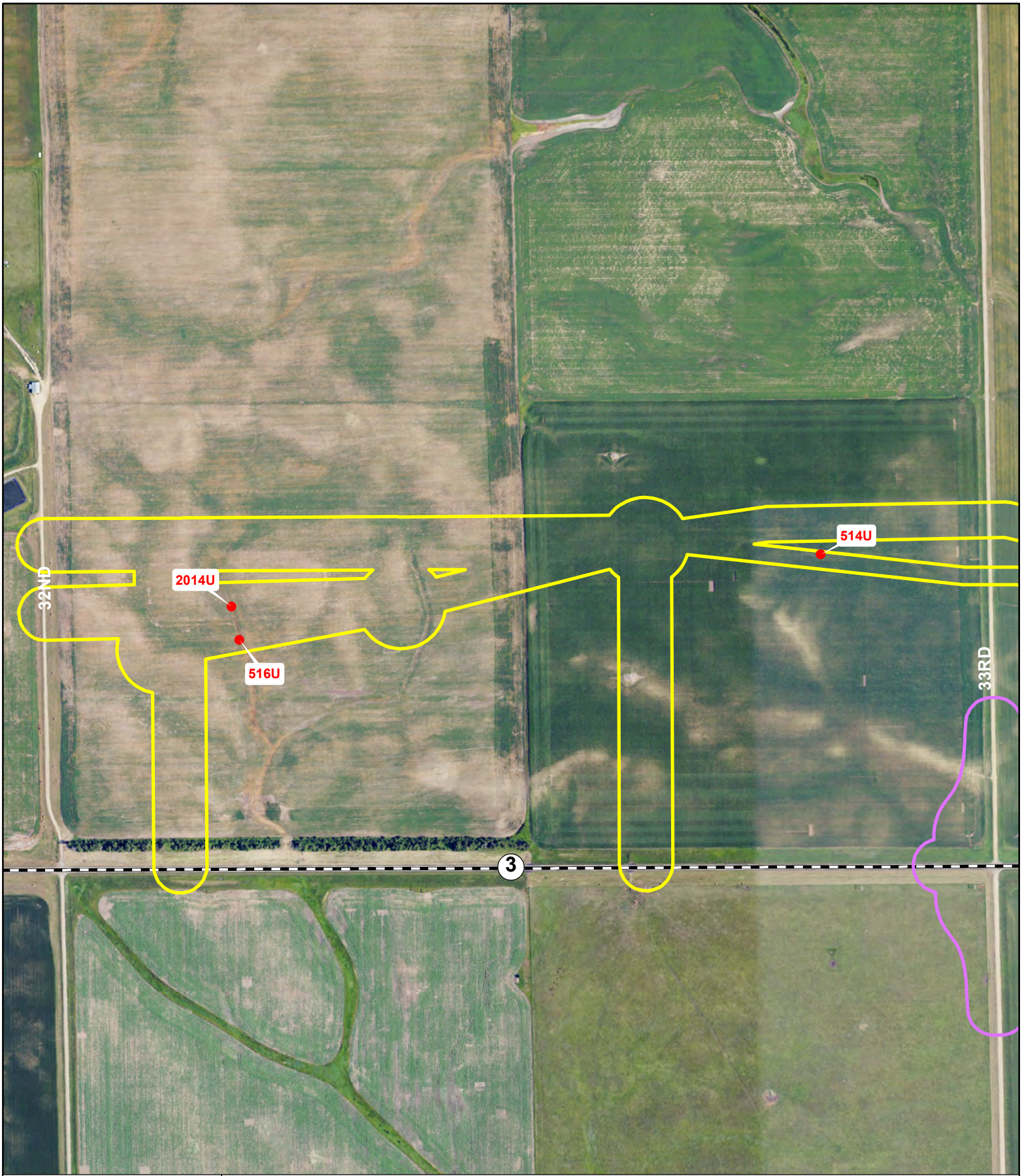
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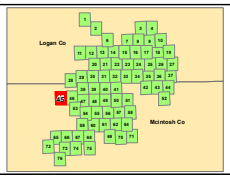
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

2023 Surveyed Wetlands

Field Delineated Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

Field Delineated

County Boundary

State Highway

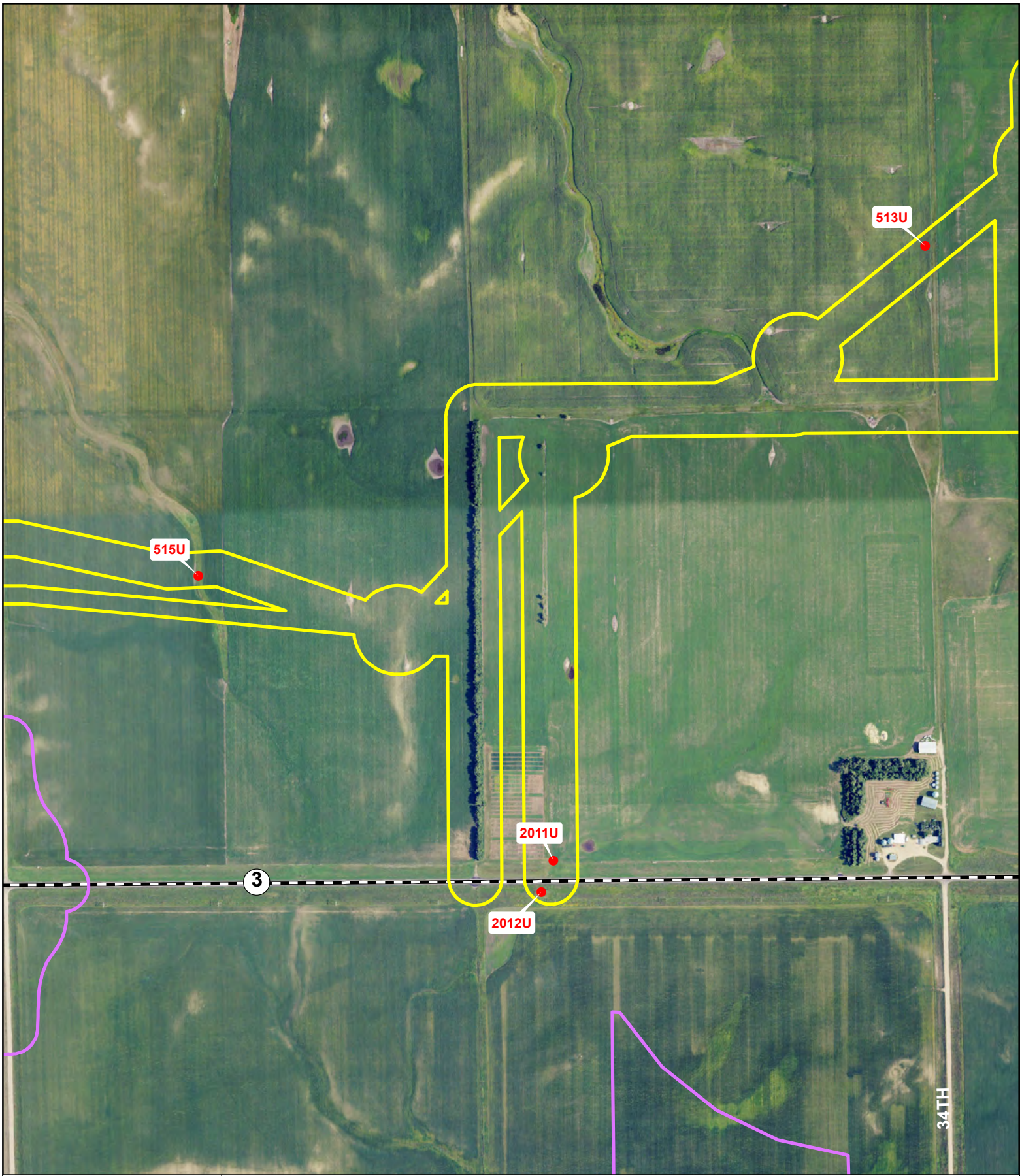
N W E S

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0 0.2 0.4 km

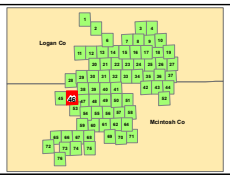
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Coordinate System: UTM, WGS84, zn 14
Map Produced: 01/25/2024. Created by: T. Thorn

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Logan & McIntosh Counties, ND



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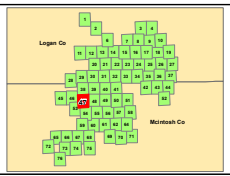
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Logan & McIntosh Counties, ND



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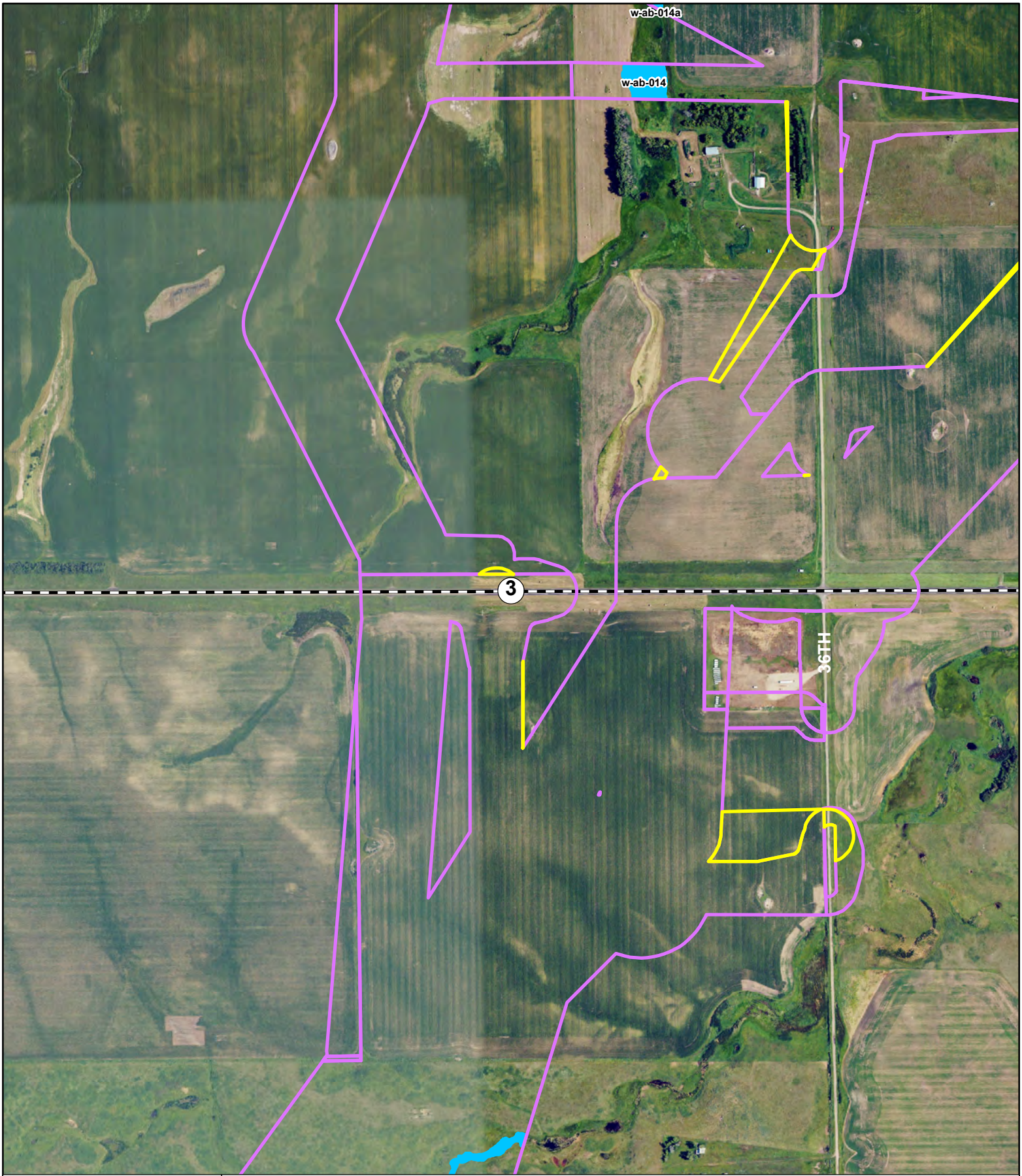
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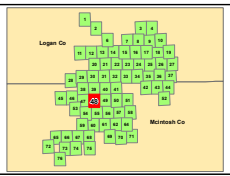
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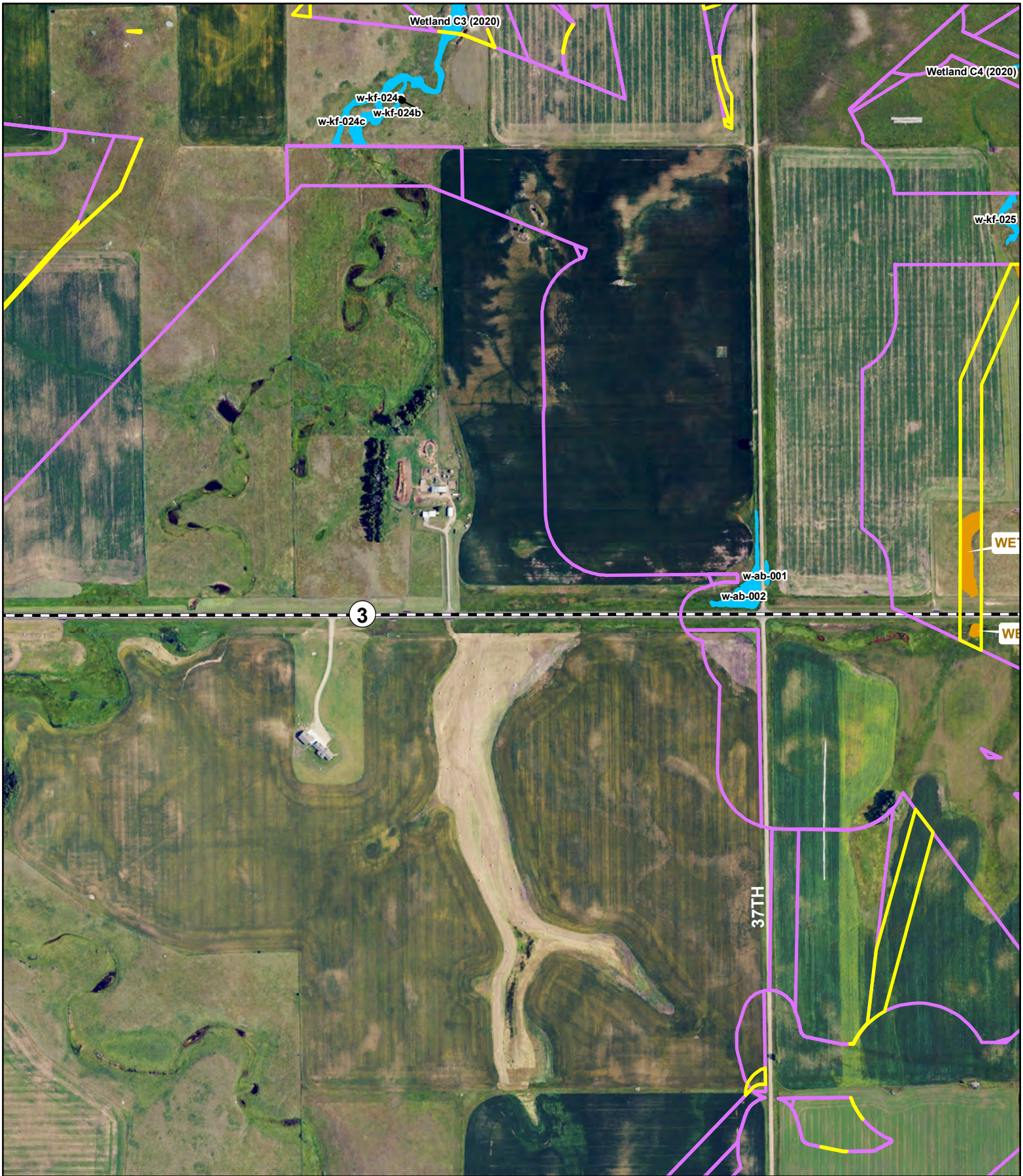
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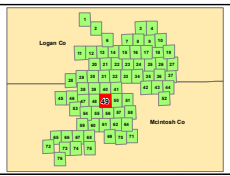
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Logan & McIntosh Counties, ND



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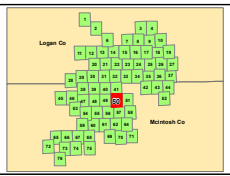
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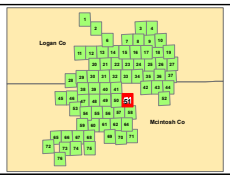
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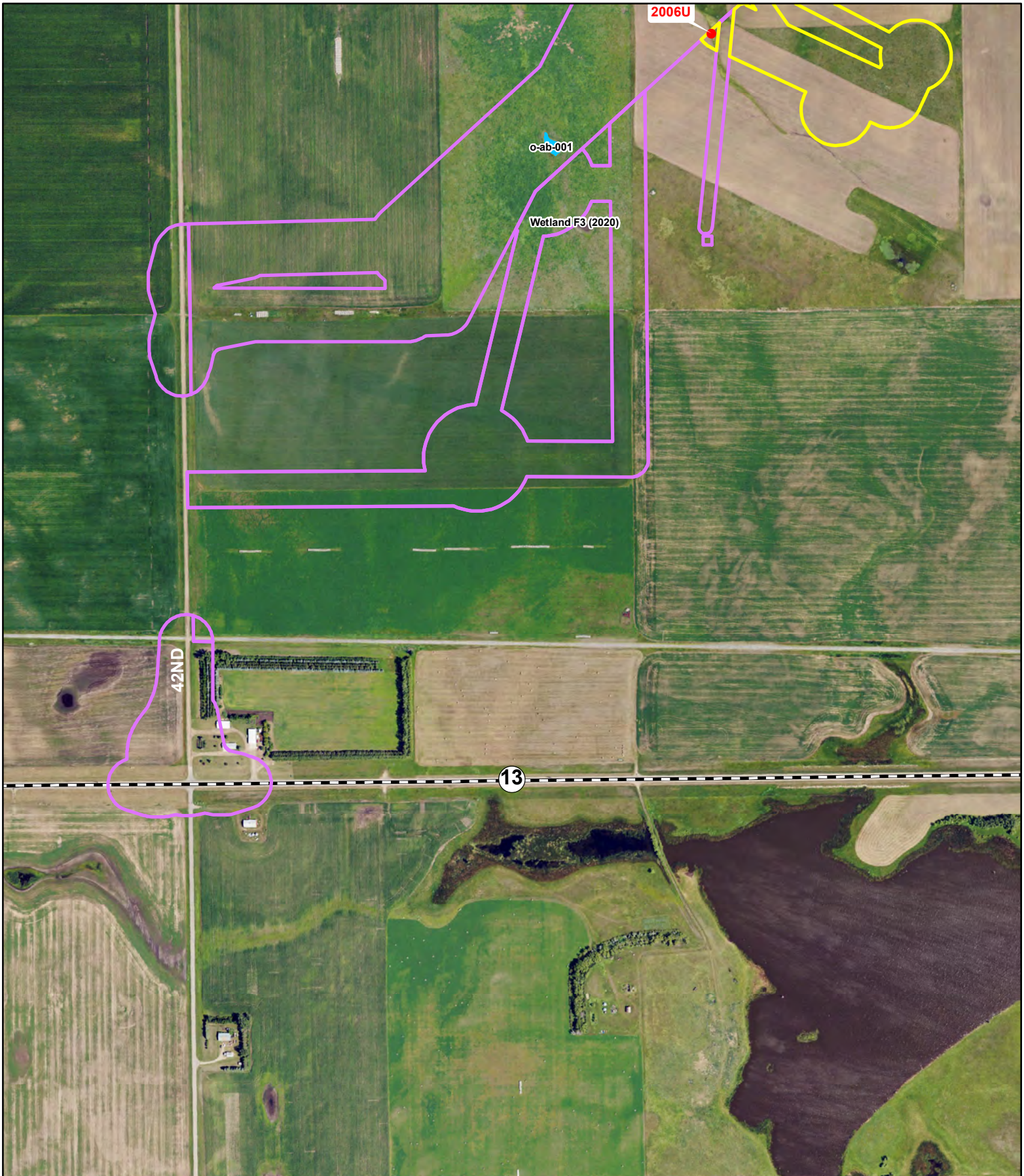
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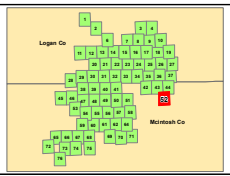
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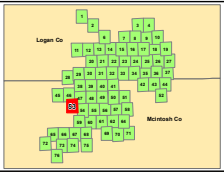
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Logan & McIntosh Counties, ND



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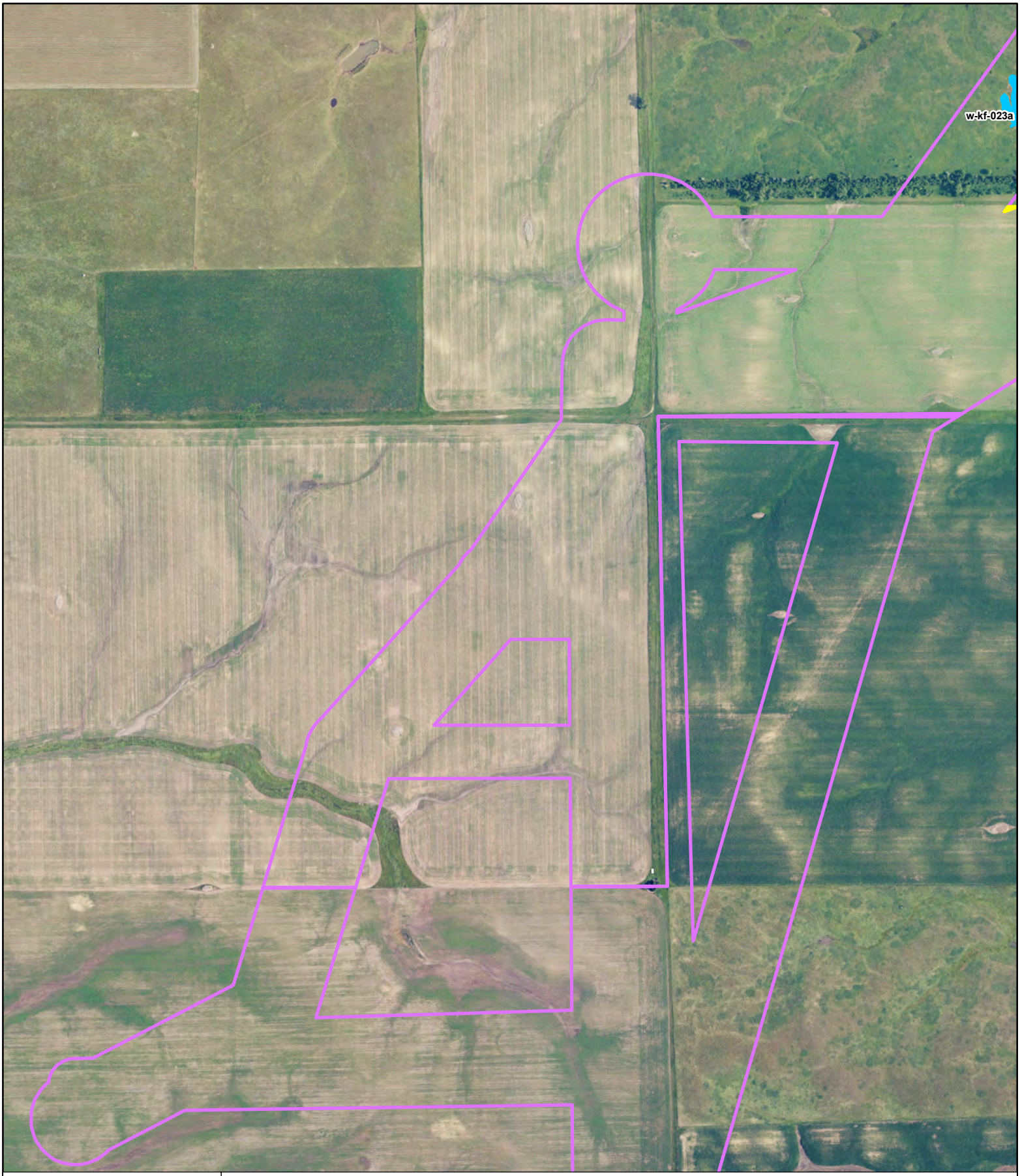
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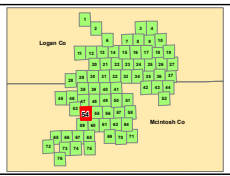
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Logan & McIntosh Counties, ND



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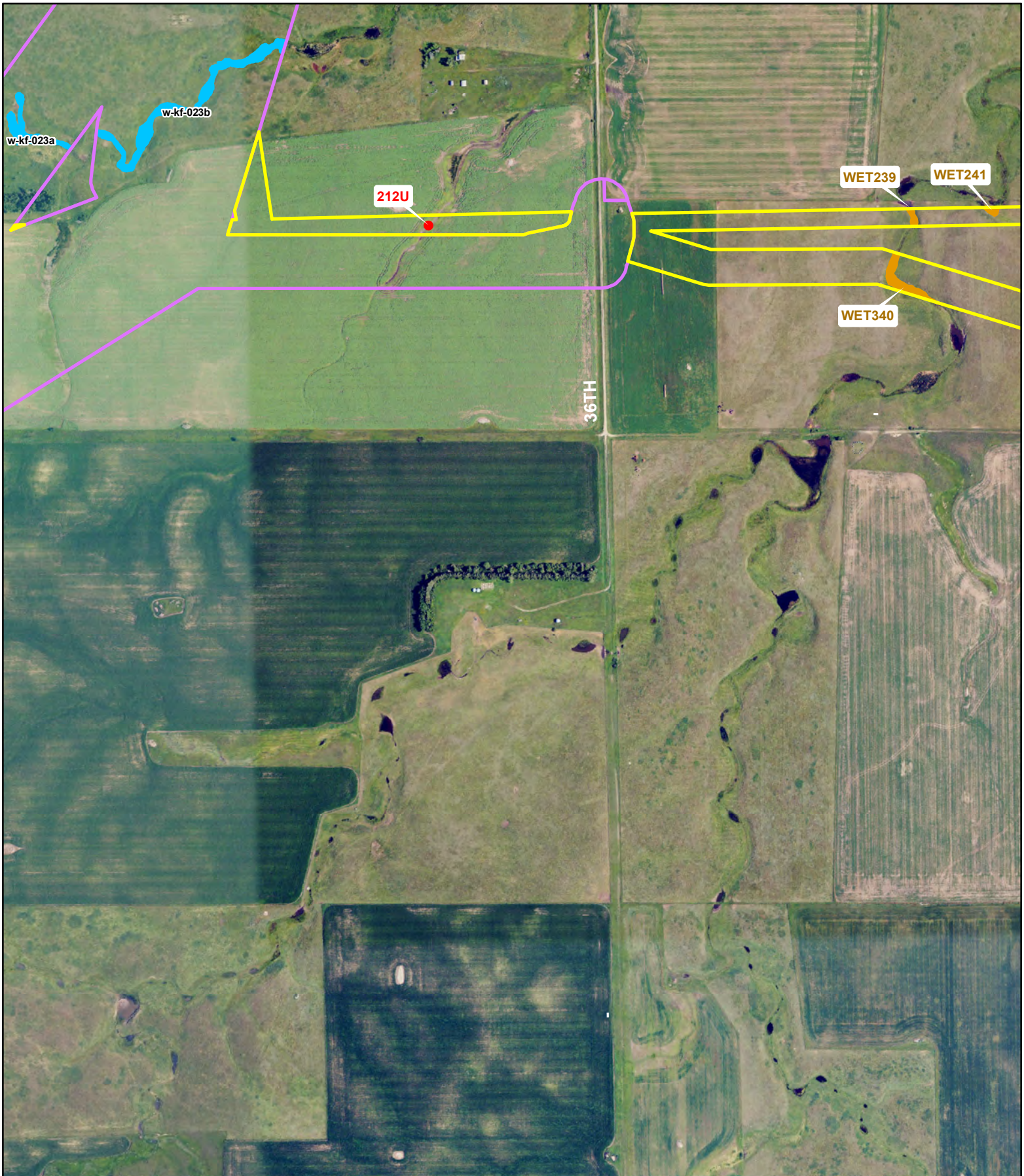
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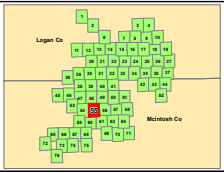
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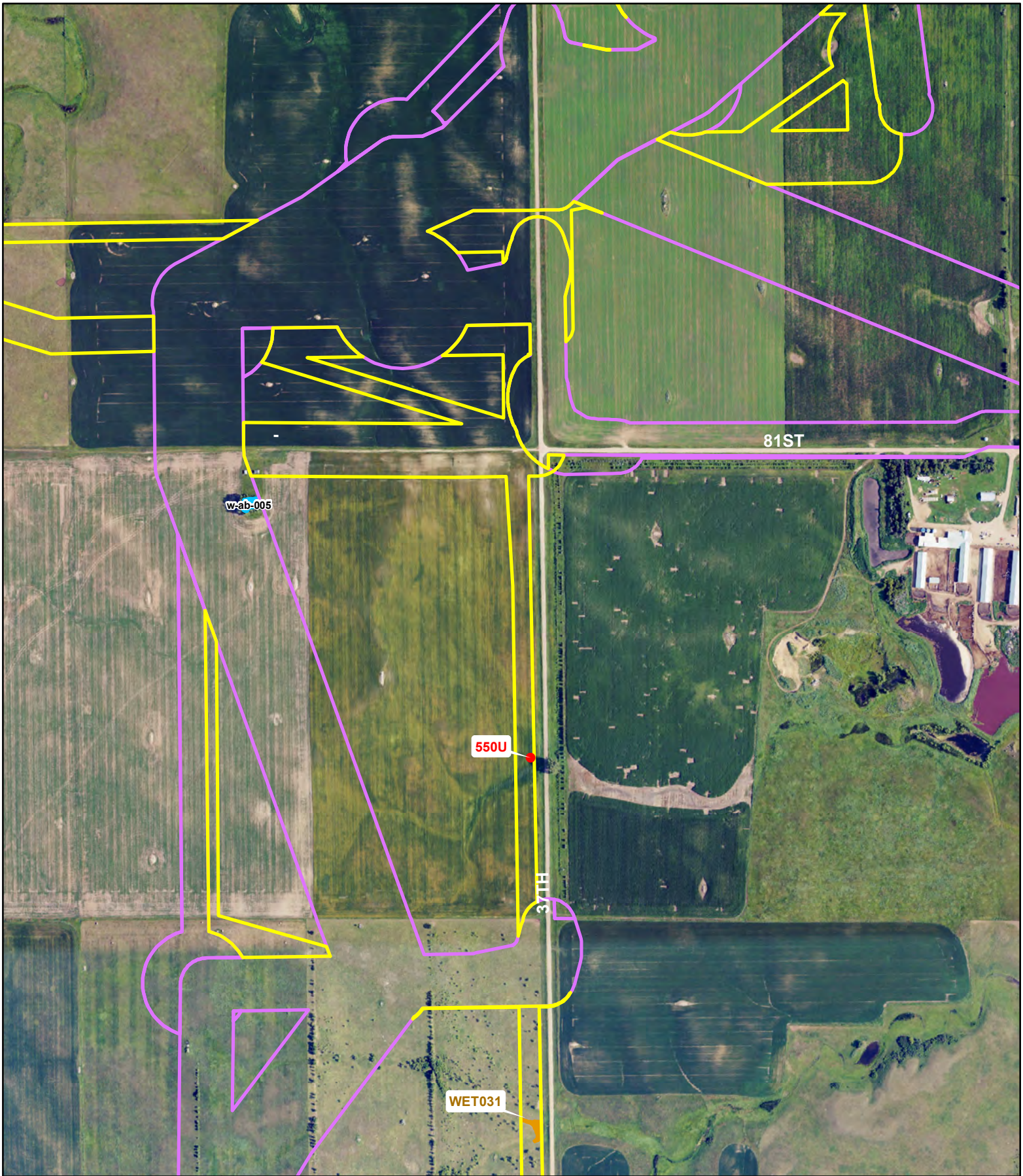
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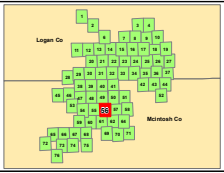
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Badger Wind Project

Logan & McIntosh Counties, ND



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2023 Surveyed Wetlands

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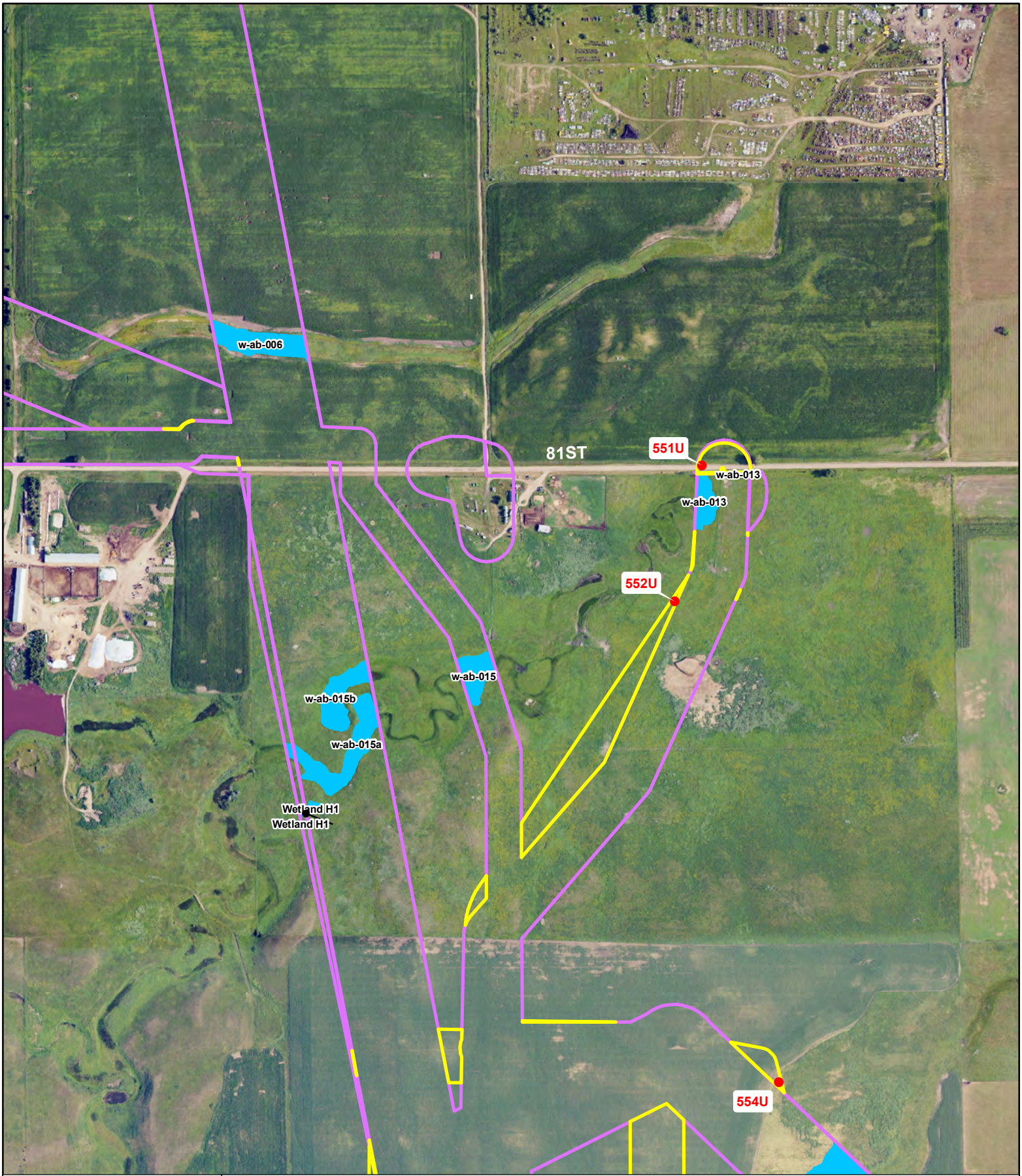
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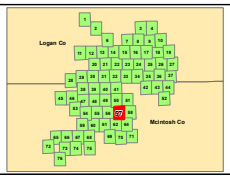
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Logan & McIntosh Counties, ND



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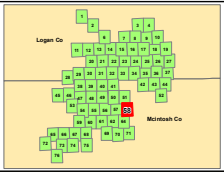
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Logan & McIntosh Counties, ND



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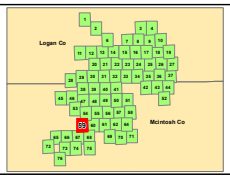
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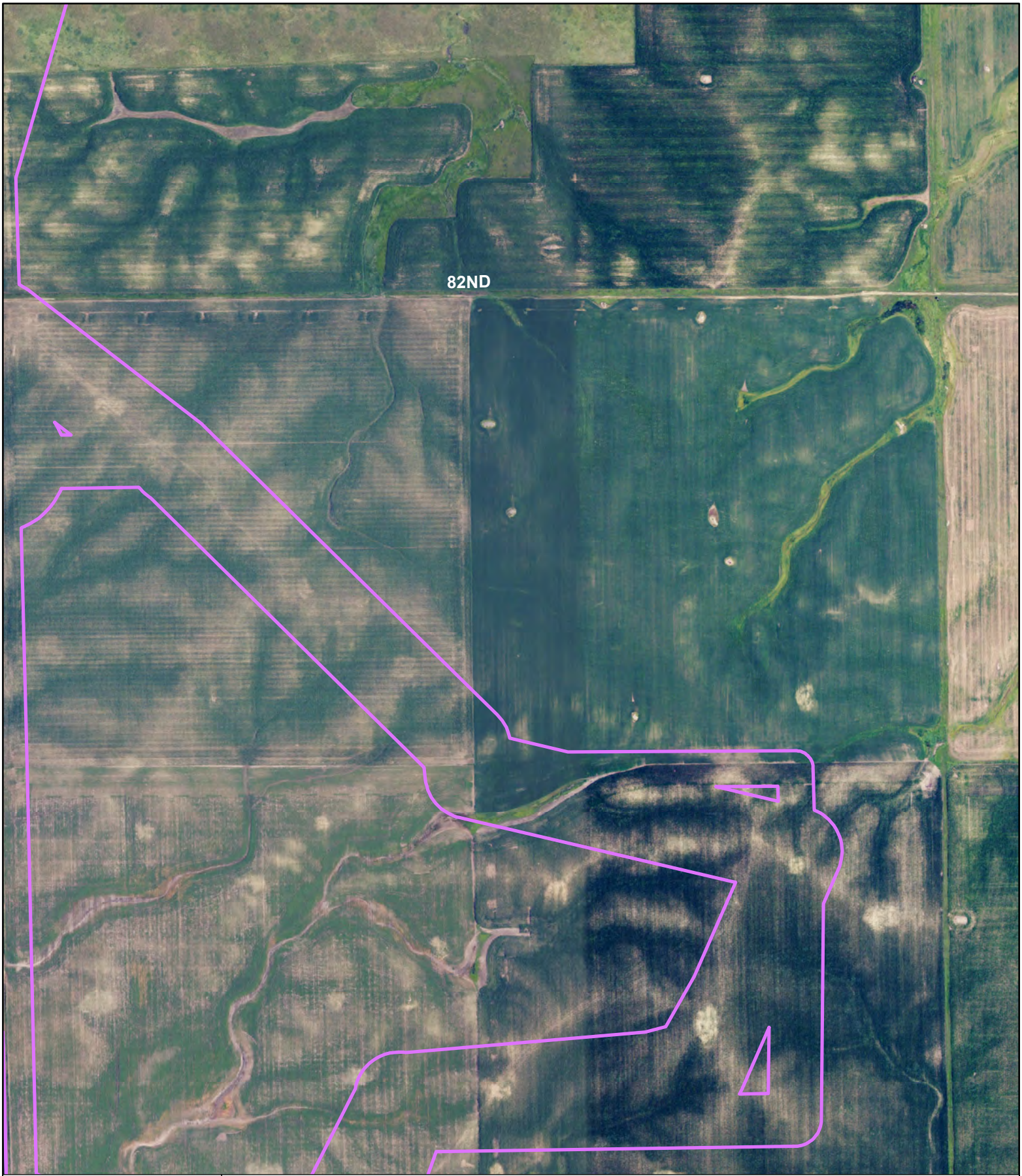
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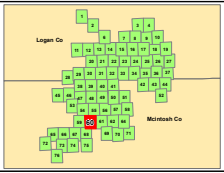
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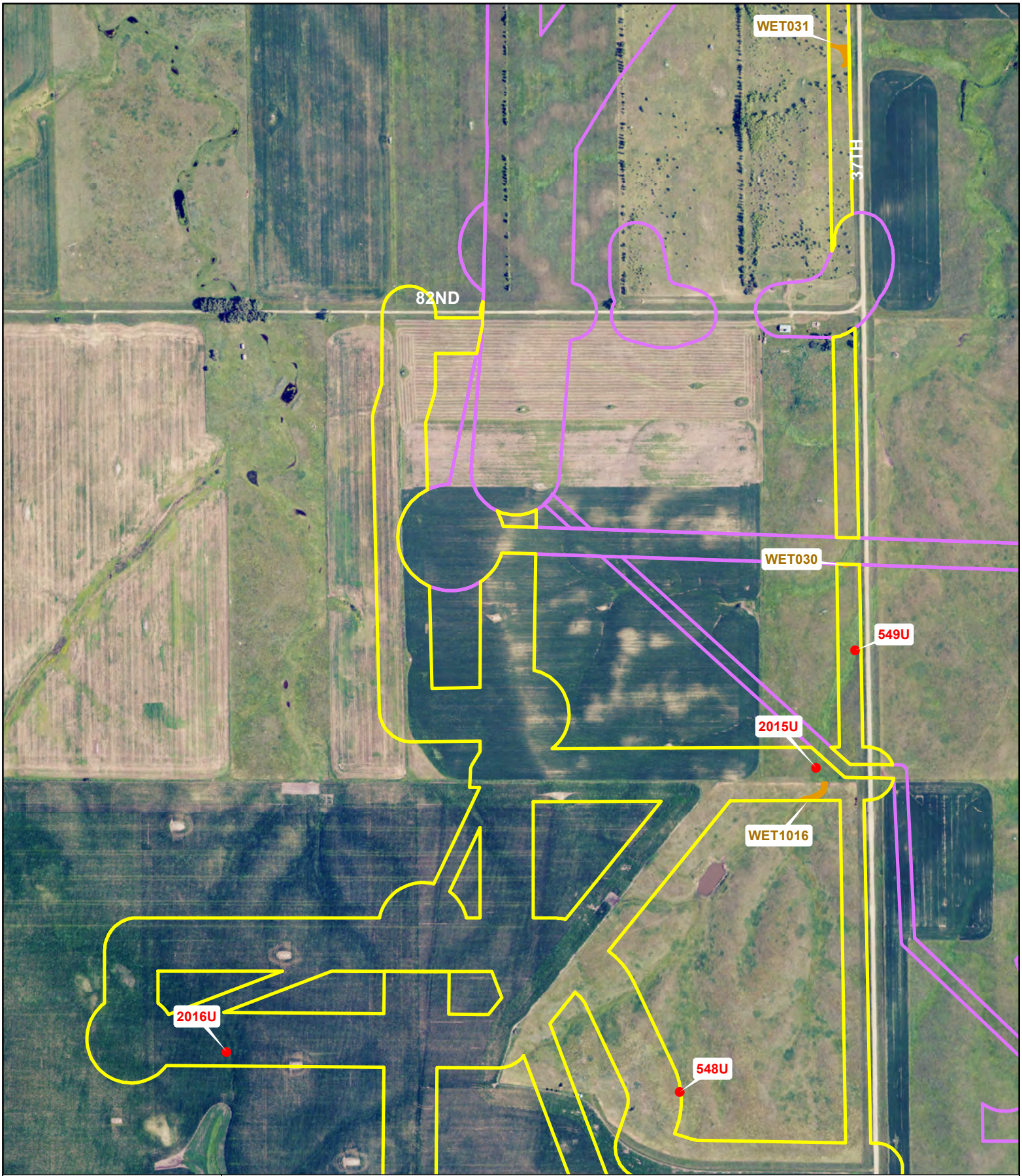
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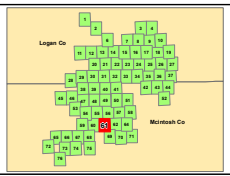
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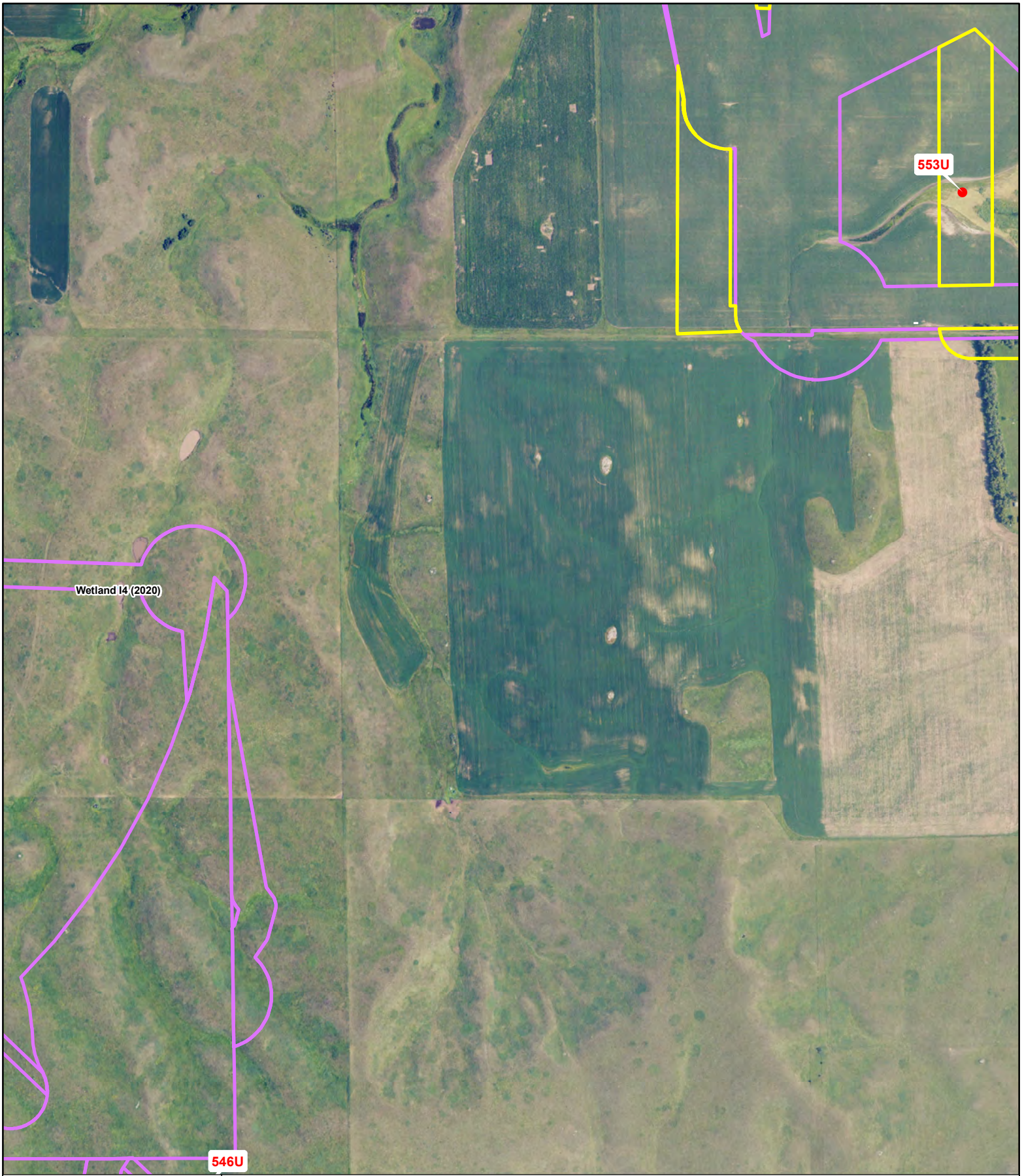
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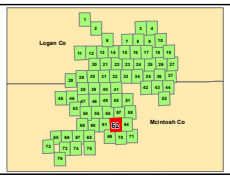
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Pre 2023 Wetland Survey Area

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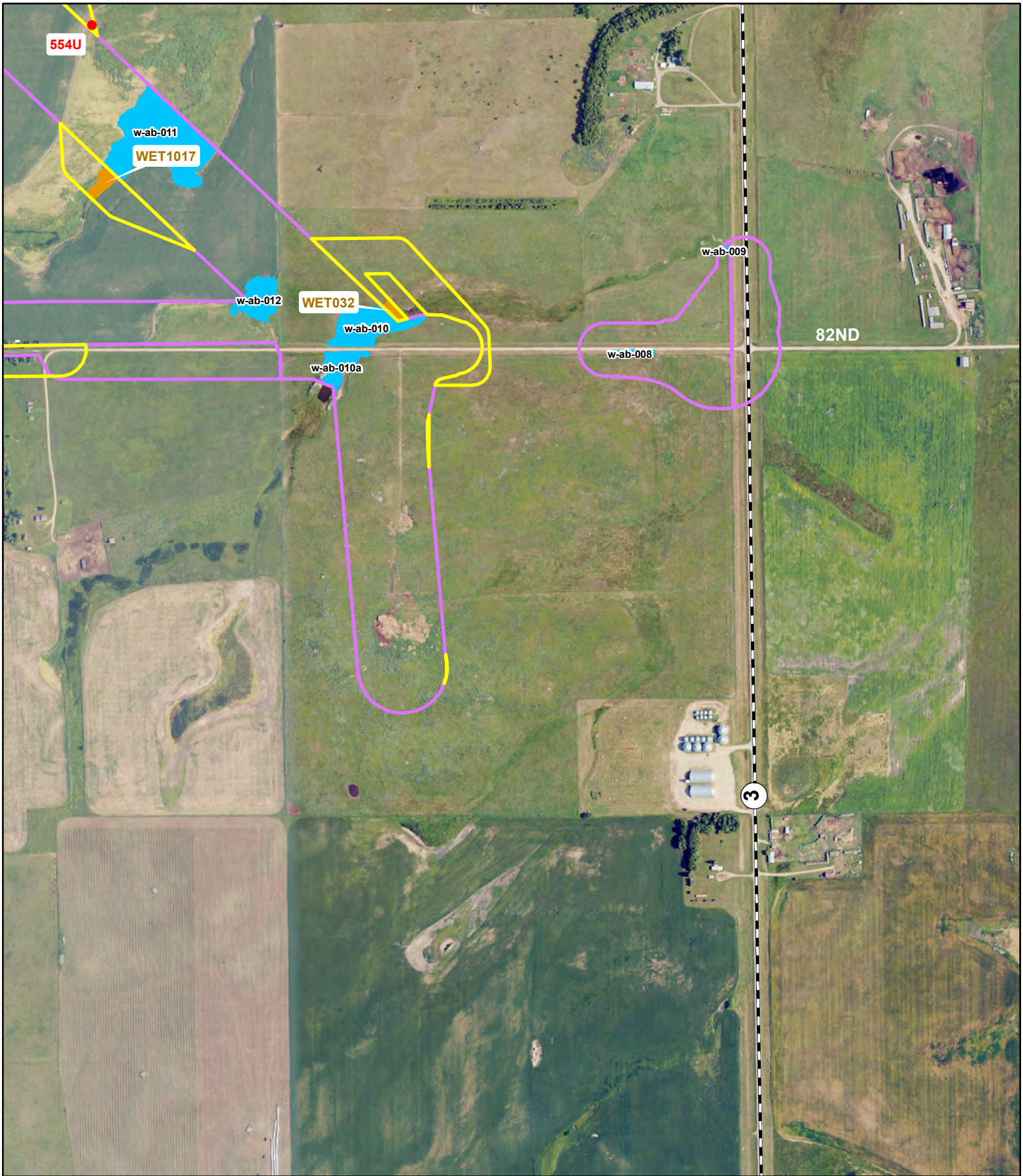
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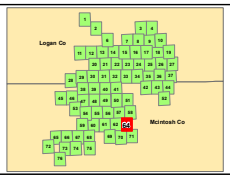
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Badger Wind Project

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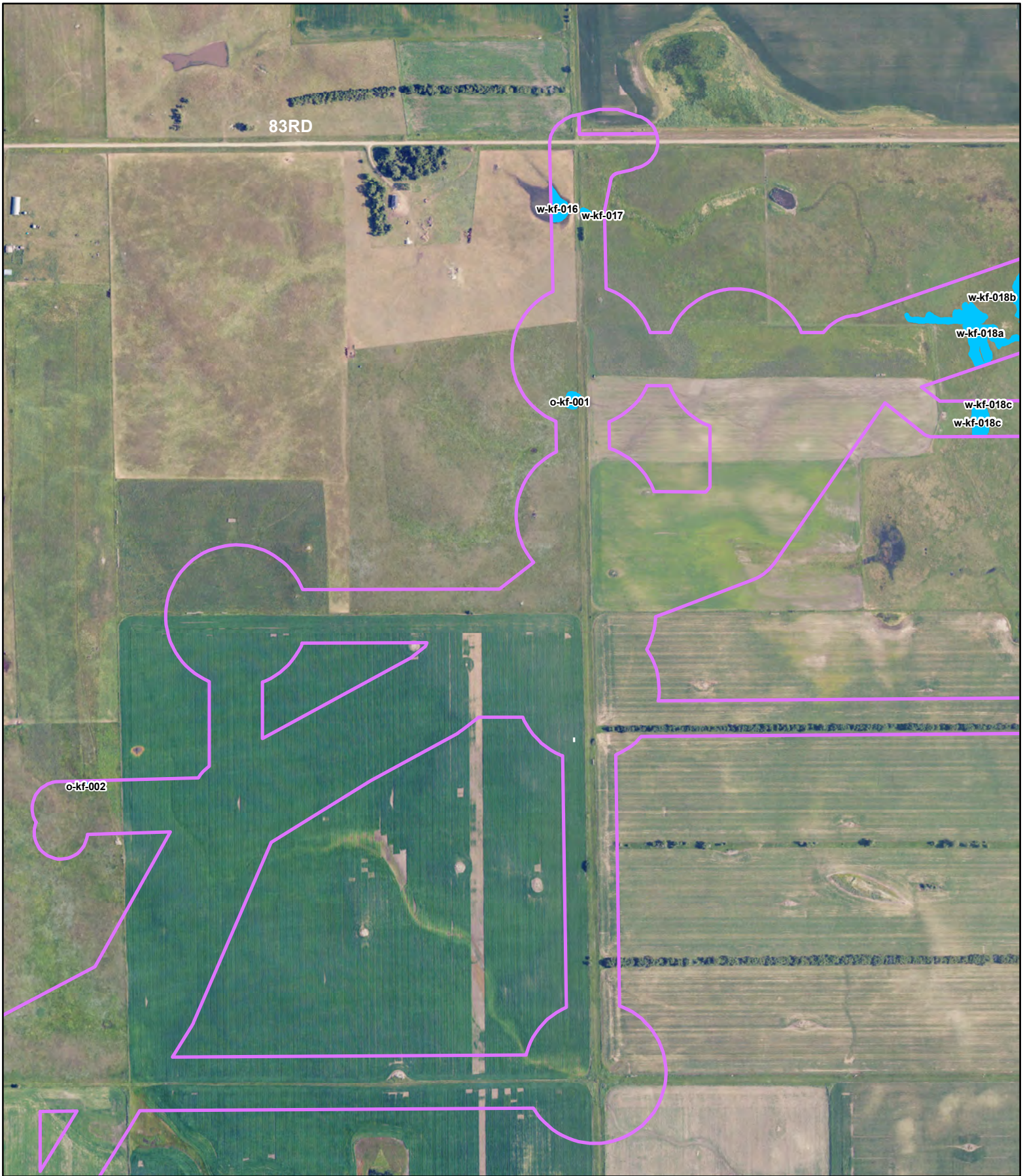
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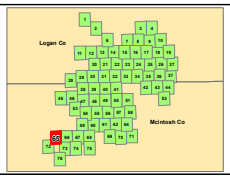
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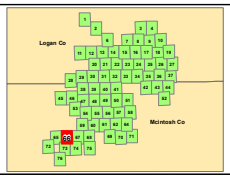
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Badger Wind Project

Logan & McIntosh Counties, ND



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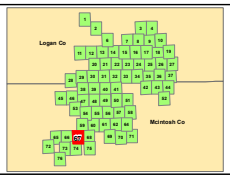
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Logan & McIntosh Counties, ND



2023 Wetland Survey Area

2023 Surveyed Wetlands

Field Delineated **Field Mapped**

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

Field Delineated

County Boundary

State Highway

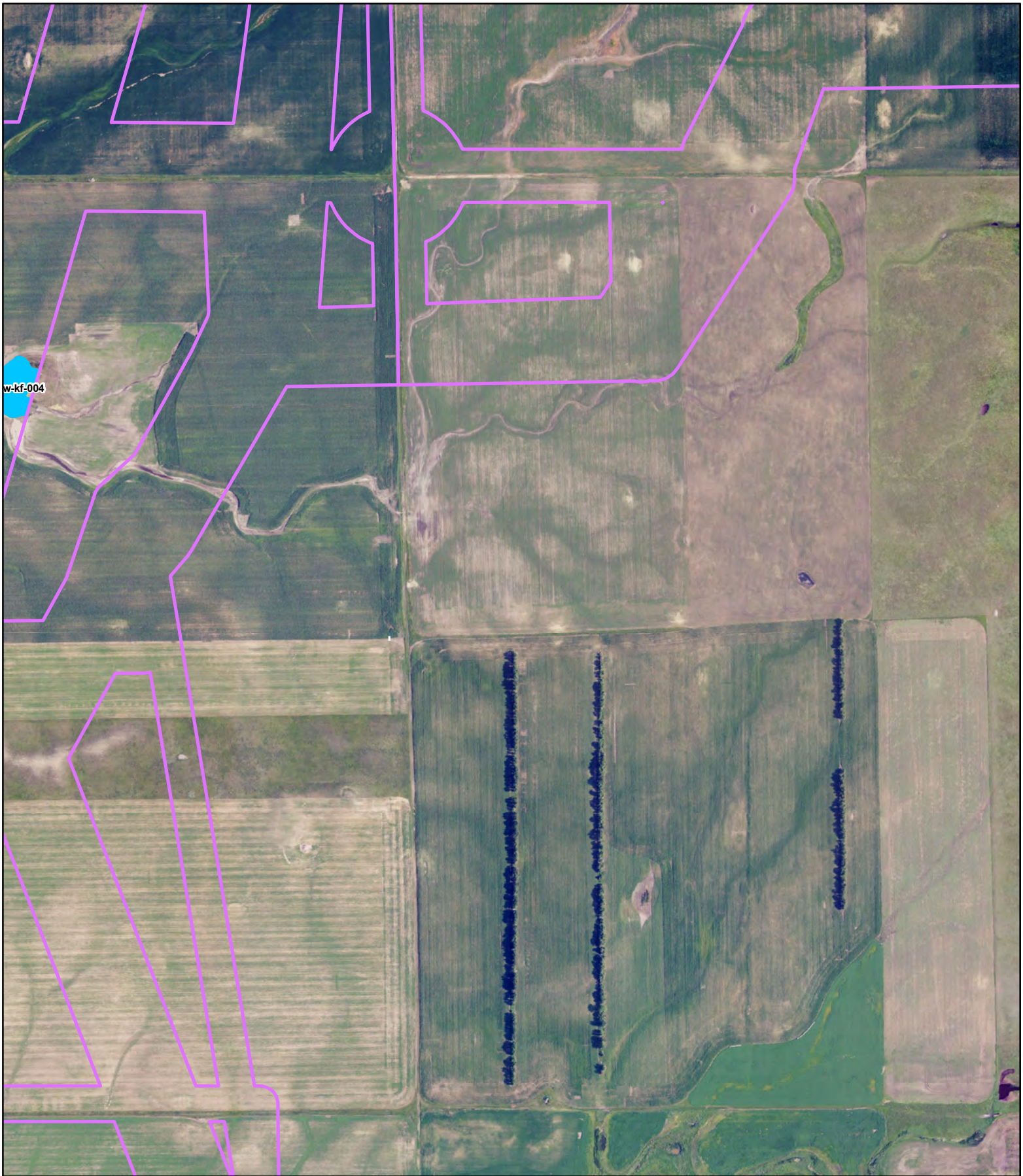
N W E S

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0 0.2 0.4 km

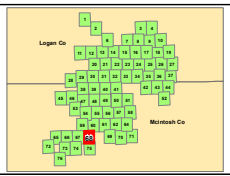
Data Source: NAIP 2023
Coordinate System: UTM, WGS84, zn 14
Map Produced: 01/25/2024. Created by: T. Thorn

WEST



Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

2023 Surveyed Wetlands

Field Delineated Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

Field Delineated

County Boundary

State Highway

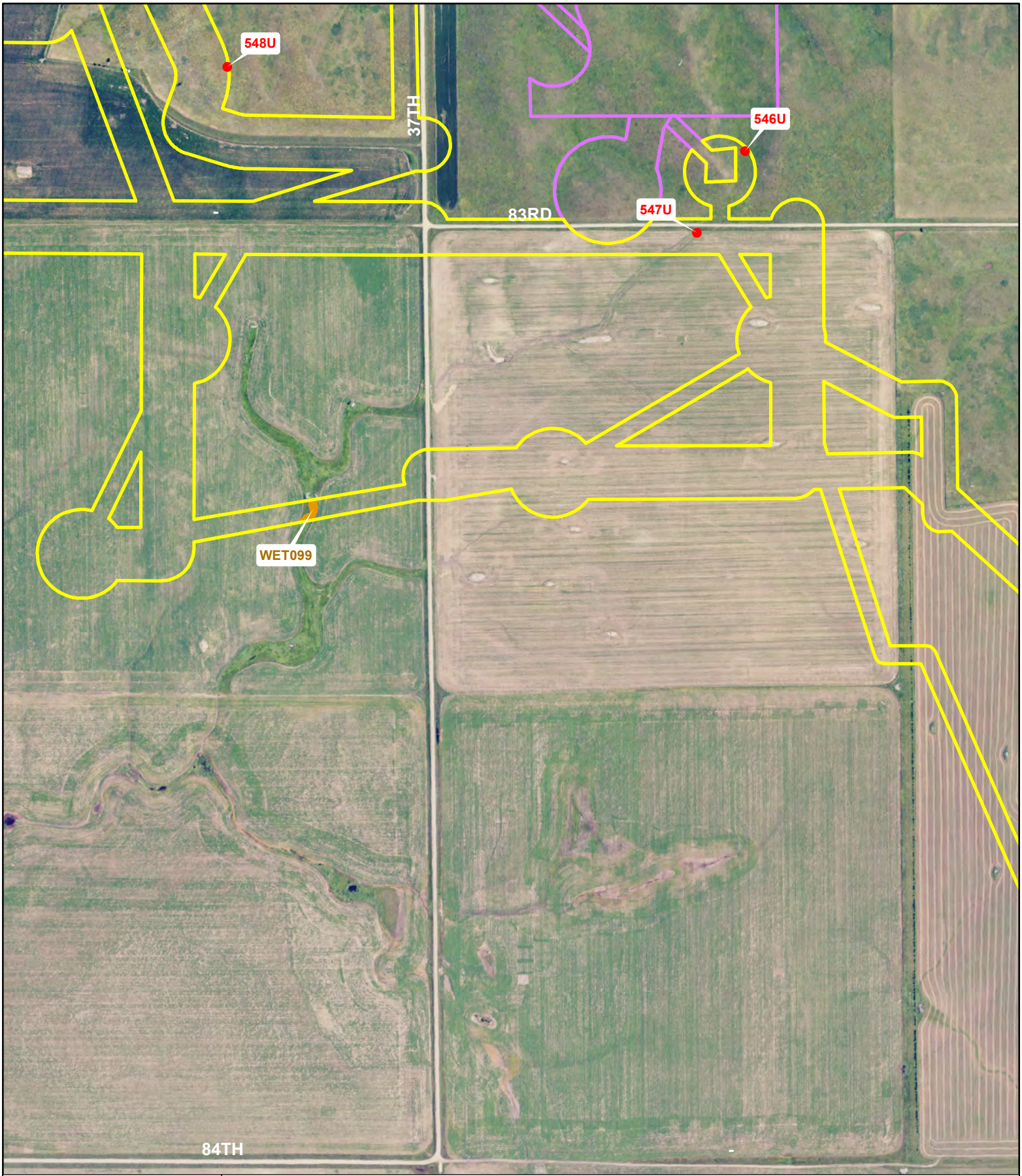
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0 0.1 0.2 mi

0 0.2 0.4 km

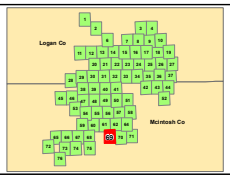
Data Source: NAIP 2023
Coordinate System: UTM, WGS84, zn 14
Map Produced: 01/25/2024. Created by: T. Thorn

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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

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State Highway

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Pre 2023 Surveyed Wetlands

Field Delineated

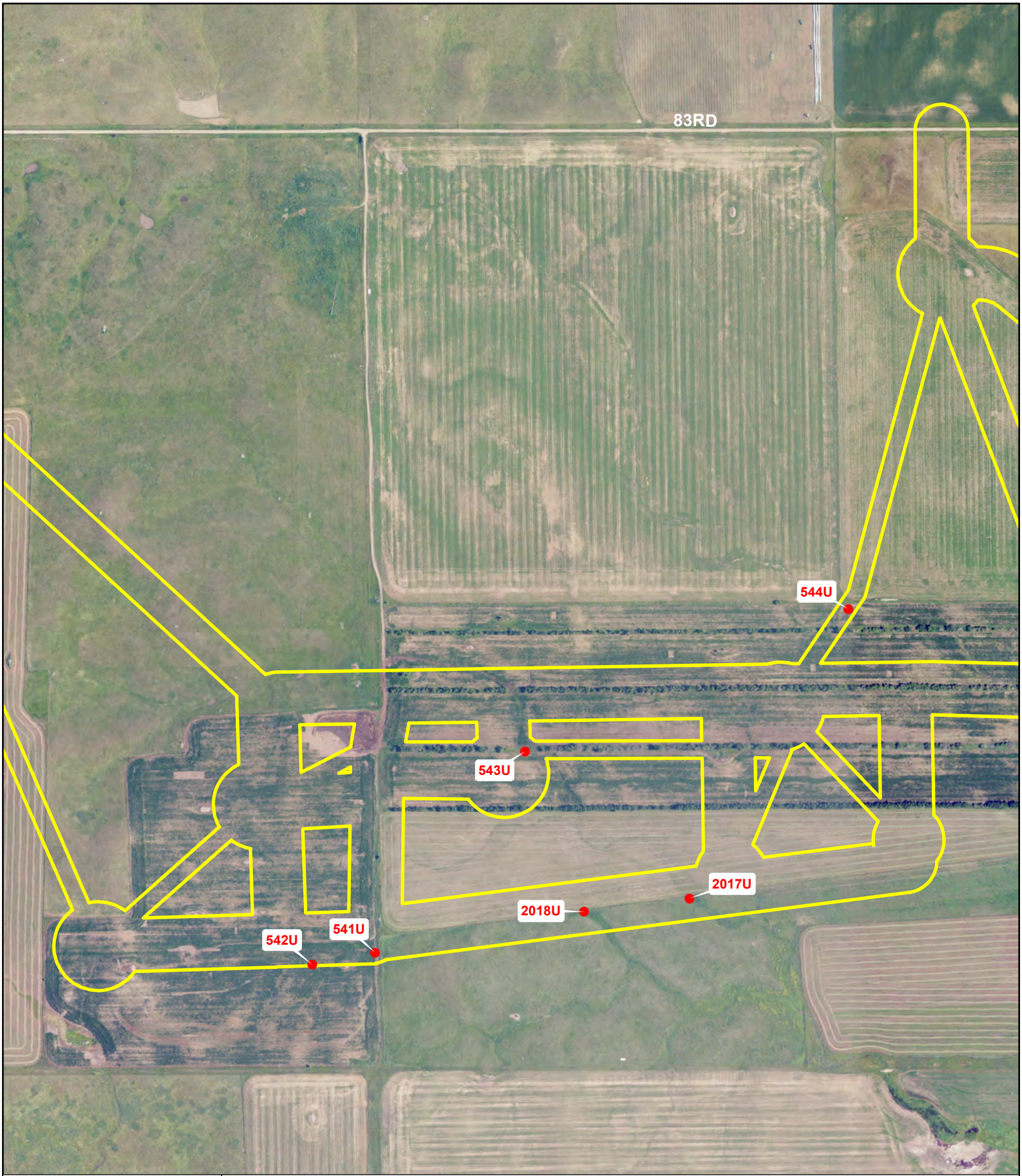
N W E S

0 0.1 0.2 mi

0 0.2 0.4 km

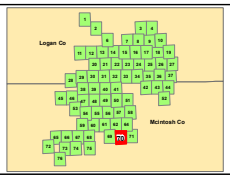
Data Source: NAIP 2023
Coordinate System: UTM, WGS84, zn 14
Map Produced: 01/25/2024. Created by: T. Thorn

WEST



Badger Wind Project

Logan & McIntosh Counties, ND



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2023 Surveyed Wetlands

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Field Mapped

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Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

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State Highway

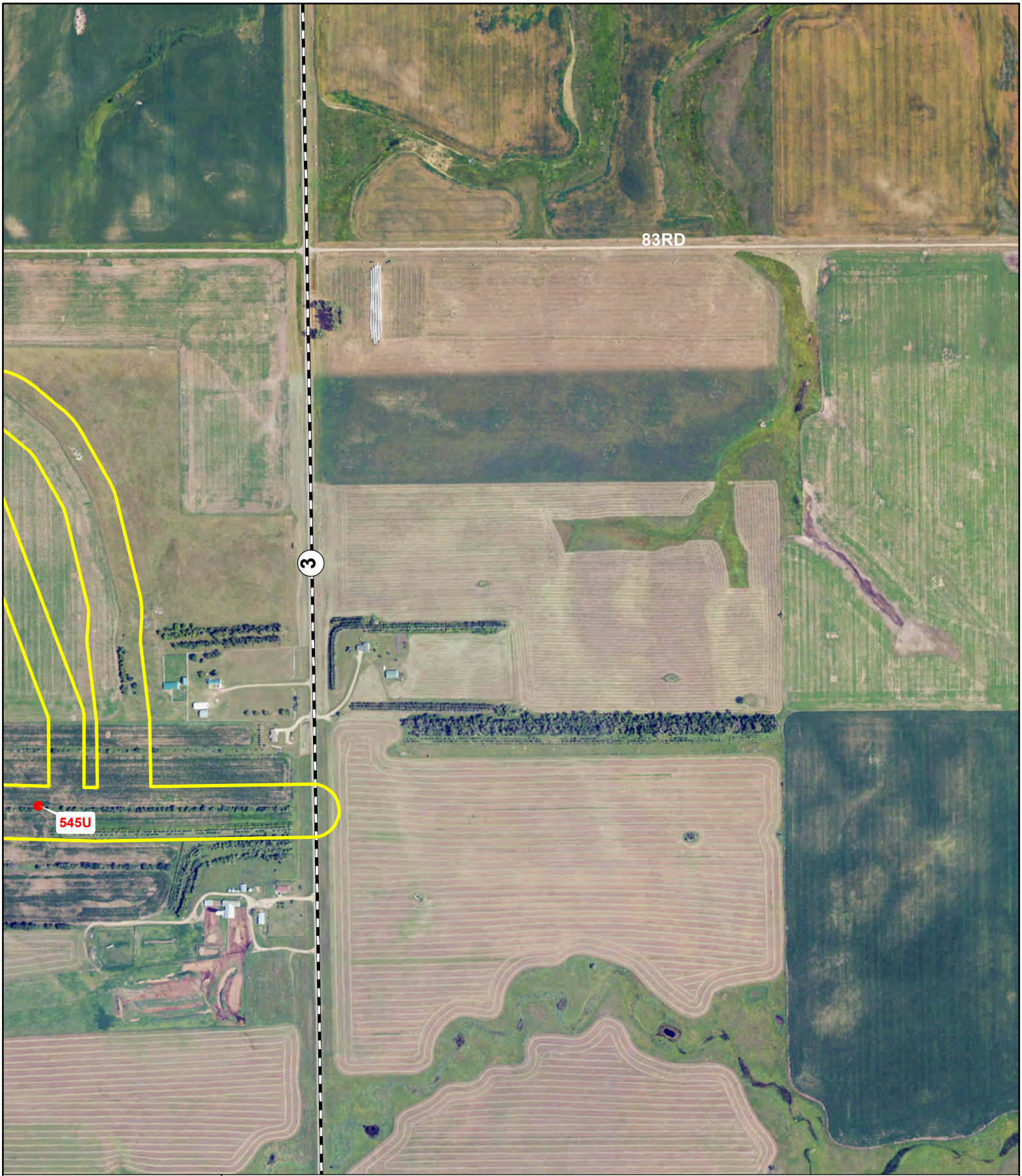
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0 0.2 0.4 km

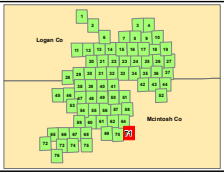
Data Source: NAIP 2023
Coordinate System: UTM, WGS84, zn 14
Map Produced: 01/25/2024. Created by: T. Thorn

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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

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Field Mapped

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Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

Field Delineated

County Boundary

State Highway

N W E S

0 0.1 0.2 mi

0 0.2 0.4 km

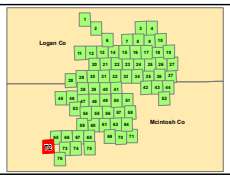
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Coordinate System: UTM, WGS84, zn 14
Map Produced: 01/25/2024. Created by: T. Thorn

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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

2023 Surveyed Wetlands

Field Delineated

Field Mapped

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Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

Field Delineated

County Boundary

State Highway

N

W E

S

0 0.1 0.2 mi

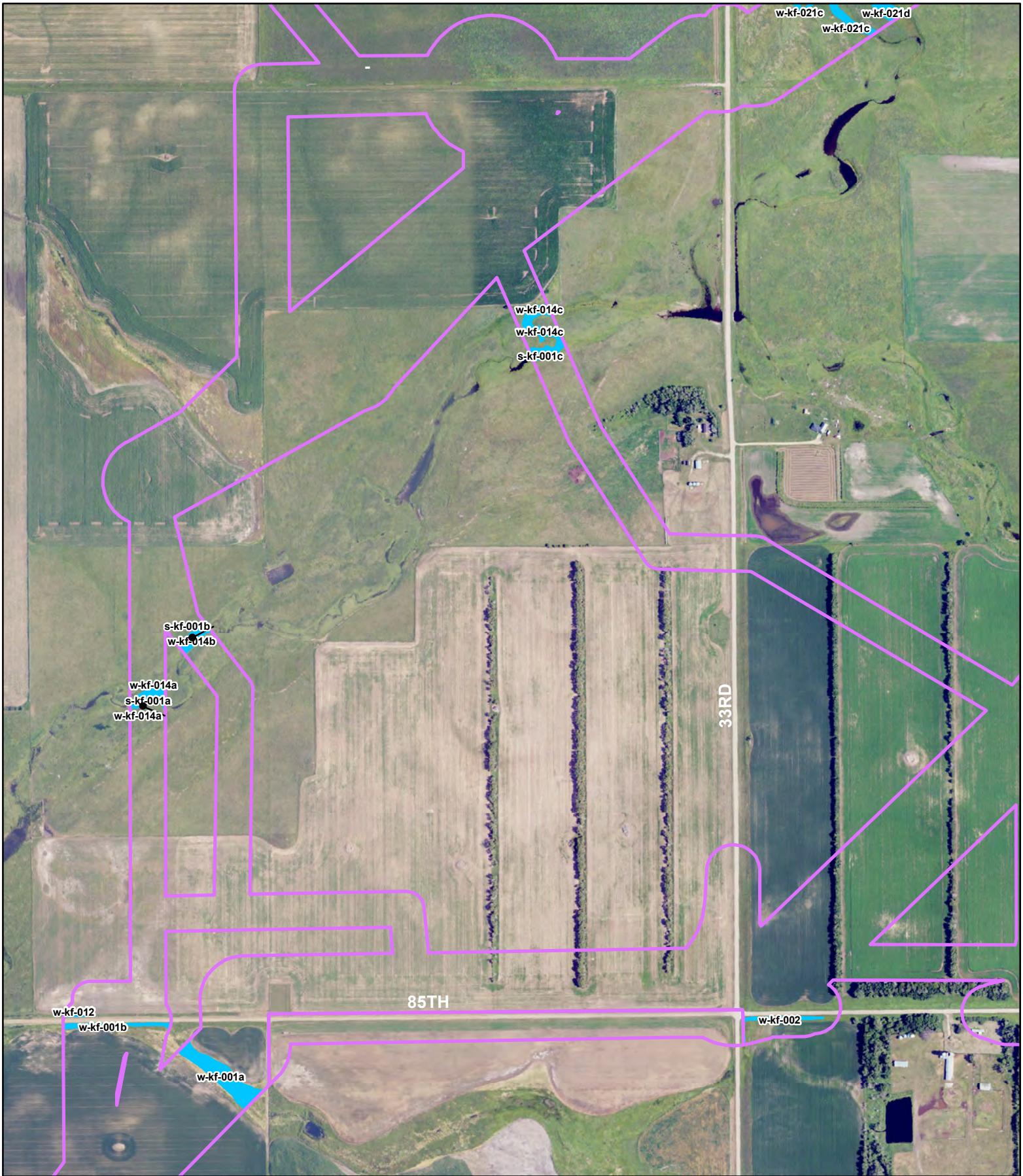
0 0.2 0.4 km

Data Source: NAIP 2023

Coordinate System: UTM, WGS84, zn 14

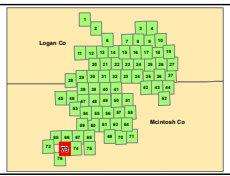
Map Produced: 01/25/2024. Created by: T. Thorn

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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

Pre 2023 Wetland Survey Area

County Boundary

State Highway

2023 Surveyed Wetlands

Field Delineated

Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Surveyed Wetlands

Field Delineated

N W E S

0 0.1 0.2 mi

0 0.2 0.4 km

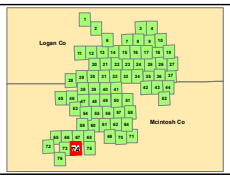
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Coordinate System: UTM, WGS84, zn 14
Map Produced: 01/25/2024. Created by: T. Thorn

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Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

2023 Surveyed Wetlands

Field Delineated Field Mapped

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

Pre 2023 Surveyed Wetlands

Field Delineated

County Boundary

State Highway

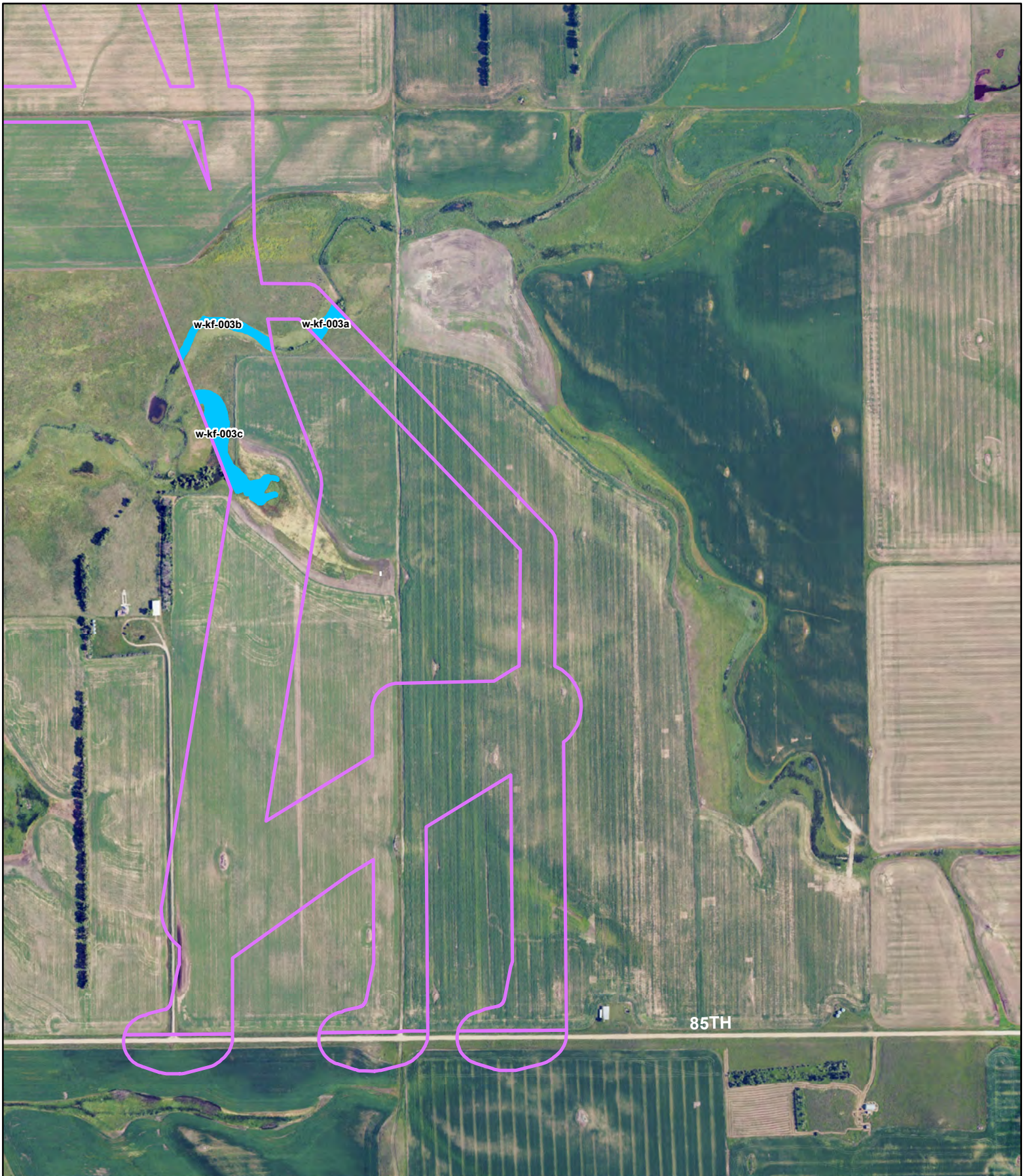
N W E S

0 0.1 0.2 mi

0 0.2 0.4 km

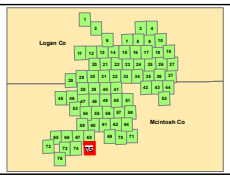
Data Source: NAIP 2023
Coordinate System: UTM, WGS84, zn 14
Map Produced: 01/25/2024. Created by: T. Thorn

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Badger Wind Project

Logan & McIntosh Counties, ND



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Field Delineated **Field Mapped**

Non WOTUS Points

Wetland/Upland Sample Points

Pre 2023 Wetland Survey Area

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County Boundary

State Highway

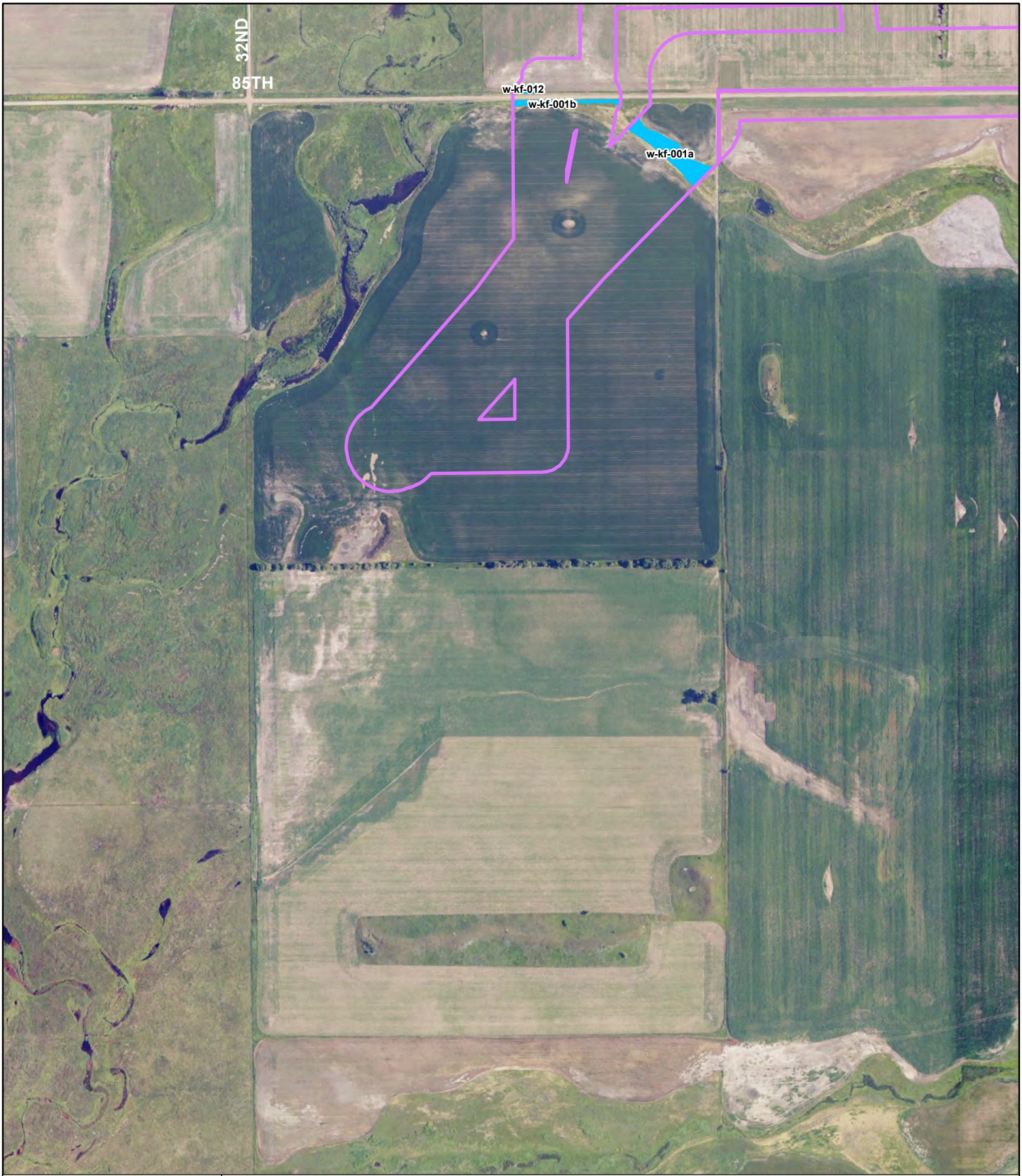
N W E S

0 0.1 0.2 mi

0 0.2 0.4 km

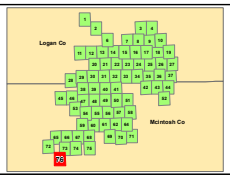
Data Source: NAIP 2023
Coordinate System: UTM, WGS84, zn 14
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WEST



Badger Wind Project

Logan & McIntosh Counties, ND



2023 Wetland Survey Area

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County Boundary

State Highway

N W E S

0 0.1 0.2 mi

0 0.2 0.4 km

Data Source: NAIP 2023
Coordinate System: UTM, WGS84, zn 14
Map Produced: 01/25/2024. Created by: T. Thorn

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Appendix B. US Army Corps of Engineers Great Plains Region Datasheets for Wetland Delineation within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-20

Applicant/Owner: Badger Wind LLC State: ND Sampling Point: OOI W

Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R70W, Section 19

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): LRRF Lat: 46.3217693S Long: -99.6204174S Datum: NAD83

Soil Map Unit Name: 29h/-Williams-Zahill complex, 6-9% slopes NWI Classification: PEMA

Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)

Are Vegetation N, Soil ____, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes Y No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes Y No ____
Hydric Soil Present?	Yes Y	No ____	
Wetland Hydrology Present?	Yes Y	No ____	

Remarks:

Photos:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Juncus spp.	2	NO	OBL
2. Echinochloa crusgalli	50	YES	FAC
3. Amaranthus spp.	10	NO	FAC
4. Setaria pumila	18	NO	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	0	x 2 =	0
FAC species	78	x 3 =	234
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80	(A)	236 (B)

Prevalence Index = B/A = 2.95

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤ 3.0[1]
- ____ 4 - Morphological Adaptations[1] (Explain)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-2023
Applicant/Owner: Badger Wind, LLC State: ND Sampling Point: 001 U
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T113N, R70W, Sec. 19
Landform (hillslope, terrace, etc.): Flat field Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): LRRF Lat: 46.32176470 Long: -99.52027913 Datum: NAD83
Soil Map Unit Name: Zahill-Williams-Zahill complex, 6-9% slopes NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Triticum spp.	100	Yes	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).
Cultivated crop

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-2012
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: CO2 W
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R70W, Sec 19
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR): LRRF Lat: 46.32232562 Long: -99.52211948 Datum: NAD83
Soil Map Unit Name: Zahl-Williams-Zahill complex 6-9% slopes NWI Classification: PEMF
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation X, Soil ____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Spartina pectinata	30	yes	FACW
2. Cicuta spp.	25	NO	OBL
3. Juncus spp.	1	No	OBL
4. Echinochloa crusgalli	30	Yes	FAC
5. Setaria pumila	14	NO	FAC
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	26	x 1 =	26
FACW species	30	x 2 =	60
FAC species	44	x 3 =	132
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		218 (B)

Prevalence Index = B/A = 2.18

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 002 U
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R70W, Sec. 19
Landform (hillslope, terrace, etc.): Flat Field Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): LRRF Lat: 46.32236180 Long: -99.52198079 Datum: NAD83
Soil Map Unit Name: Zahl-Williams-Zahill complex, 6-9% slopes NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation N, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Triticum spp.	100	Yes	N/I
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-2007
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 003W
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R70W, Sec 19
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 1
Subregion (LRR): LRRF Lat: 46.323157440 Long: -99.521329594 Datum: NAD83
Soil Map Unit Name: Williams-Zahl loams, 3-6% NWI Classification: PEMA
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation X, Soil ____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes Y No ____
Hydric Soil Present? Yes Y No ____
Wetland Hydrology Present? Yes Y No ____

Is the Sampled Area within a Wetland? Yes Y No ____

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Echinochloa crusgalli	55	Yes	FAC
2. Setaria pumila	14	NO	FAC
3. Juncus spp.	1	NO	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species	0	x 2 =	0
FAC species	69	x 3 =	207
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	70 (A)		208 (B)

Prevalence Index = B/A = 2.97

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 003 U
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R70W, Sec. 19
Landform (hillslope, terrace, etc.): Flat Field Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): LRRF Lat: 46.32306620 Long: -99.52131209 Datum: NAD83
Soil Map Unit Name: Williams-Zahl loams, 3-6% NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ∝, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ∝	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft.)			
1. Trifolium spp.	100	Yes	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover			
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum 0			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 004W
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R70W, Sec 19
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
Subregion (LRR): LRRF Lat: 46.32625942 Long: -99.52373076 Datum: NAD83
Soil Map Unit Name: Williams-Zahl loams, 3-6% NWI Classification: PEMA
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Artemisia biennis	3	No	FAC
2. Echinochloa crusgalli	50	Yes	FAC
3. Setaria pumila	22	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	75 (A)		225 (B)

Prevalence Index = B/A = 3

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).
Grazed by cattle

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 0040
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R70W, Sec. 19
Landform (hillslope, terrace, etc.): Flat Field Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): LRRF Lat: 46.32611807 Long: -99.52362385 Datum: NAD83
Soil Map Unit Name: Williams-Zahl loams, 3-6% NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation N, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Triticum spp.	100	Yes	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).
Harvested crop

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 005W
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R70W, Sec. 19
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR): LRRF Lat: 46.3233693 Long: -99.52544168 Datum: NAD83
Soil Map Unit Name: Williams-Bowbells loams, 3-6% NWI Classification: PEMC
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Typha spp.	2	No	OBL
2. Persicaria spp.	30	Yes	OBL
3. Cirsium spp.	30	Yes	OBL
4. Carex spp.	3	No	OBL
5. Setaria pumila	25	No	FAC
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	65	x 1 =	65
FACW species	0	x 2 =	0
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90	(A)	140 (B)

Prevalence Index = B/A = 1.56

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).
Grazed and mowed over

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-2022
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 005U
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R70W, Sec. 19
Landform (hillslope, terrace, etc.): Flat Field Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): LRRF Lat: 46.32352727 Long: -99.52614849 Datum: NAD83
Soil Map Unit Name: Williams-Bowbells loams, 3-6% NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft.)			
1. Triticum spp.	100	Yes	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover			
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum 0			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).

Harvested crop

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: CDOGW
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R70W, Sec. 19
Landform (hillslope, terrace, etc.): Flat Fence line Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): LRRF Lat: 46.324534105 Long: -99.579151189 Datum: NAD83
Soil Map Unit Name: Williams-Bowbells loams, 3-6% NWI Classification: PEMC
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes Y No ____
Hydric Soil Present? Yes Y No ____
Wetland Hydrology Present? Yes Y No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Spartina pectinata	95	Yes	FACW
2. Hordeum jubatum	5	no	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		200 (B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤ 3.0[1]
- ____ 4 - Morphological Adaptations[1] (Explain)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).
Fenceline

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-24-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 00 64
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R70W, Sec. 19
Landform (hillslope, terrace, etc.): Flat field Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): LRRF Lat: 46.324618236 Long: -99.529062 18 Datum: NAD83
Soil Map Unit Name: Williams-Bowbells loams, 3-6% NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Triticum spp.	100	Yes	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0	(A)	0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-25-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 007W
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R71W, Sec. 18
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 3
Subregion (LRR): LRRF Lat: 46.32877191 Long: -99.64897192 Datum: NAD83
Soil Map Unit Name: Reeder-Farnuf loams, 3-6% NWI Classification: PEMC
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft.)			
1. Echinochloa crusgalli	35	Yes	FAC
2. Hordeum jubatum	10	No	FACU
3. Carex spp.	25	Yes	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover			
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	10	x 2 =	20
FAC species	35	x 3 =	105
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	70	(A)	150 (B)

Prevalence Index = B/A = 2.14

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-25-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 007U
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R71W, Sec. 18
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR): LRRF Lat: 46.32880252 Long: -99.64890498 Datum: NAD83
Soil Map Unit Name: Bretdet-Farnuf loams, 3-6% NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Poa palustris	70	Yes	FACU
2. Trifolium spp.	10	NO	NI
3. Artemisia campestris	5	NO	UPL
4. Nassella viridula	15	NO	NI
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	70	(A)	280 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-25-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 008W
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R72W, Sec. 25
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): LRRF Lat: 46.29796946 Long: -99.66896850 Datum: NAD83
Soil Map Unit Name: Reeder-Arnegard loams, 3-6% NWI Classification: PEMF
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft.)			
1. Typha spp.	50	Yes	OBL
2. Hordeum jubatum	40	Yes	FACW
3. Artemisia biennis	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover			
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	45	x 2 =	90
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		140 (B)

Prevalence Index = B/A = 1.47

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-25-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 0084
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R72W, Sec. 25
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): LRRF Lat: 46.29791306 Long: -99.16889156 Datum: NAD83
Soil Map Unit Name: Reeder-Arnegard loams, 3-6% NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Glycine max	80	Yes	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	____ = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 80

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).

Harvested crop

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-25-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 009W
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R72W, Sec. 36
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR): LRRF Lat: 46.28798563 Long: -99.67526475 Datum: NAD83
Soil Map Unit Name: Beardle-Lehr loams, 0-2% NWI Classification: PEMF
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Spartina pectinata	60	Yes	FACW
2. Rumex crispus	10	No	FAC
3. Typha spp.	27	Yes	OBL
4. Hordeum jubatum	3	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	27	x 1 =	27
FACW species	63	x 2 =	126
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100	(A)	183 (B)

Prevalence Index = B/A = 1.83

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).

Farmer mowed over wetland

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-25-2021
Applicant/Owner: Badger Wind, LLC State: ND Sampling Point: 0091
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R72W, Sec. 36
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): LRRF Lat: 46.28791195 Long: -99.67521006 Datum: NAD83
Soil Map Unit Name: Bowbells-Lehr loams, 0-2% NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft.)			
1. Bromus inermis	100	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover			
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	100	x 5 =	500
Column Totals:	100 (A)		500 (B)

Prevalence Index = B/A = 5

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).

Mowed over

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-25-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 010w
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R71W, Sec 33
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 1
Subregion (LRR): LRRF Lat: 46.285415409 Long: -99.64517727 Datum: NAD83
Soil Map Unit Name: Lowe loam, 0-2%, occasionally flooded NWI Classification: PEMF
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Spartina pectinata	90	Yes	FACW
2. Polygonaceae	5	NO	UI
3. Hordeum jubatum	5	NO	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	95	x 2 =	190
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		190 (B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).

Mowed over

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: Logan Sampling Date: 10-25-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: d10 U
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T133N, R71W, Sec 33
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 8
Subregion (LRR): LRRF Lat: 46.28528442 Long: -99.64487937 Datum: NAD83
Soil Map Unit Name: Lowell loam, 0-2%, occasionally flooded NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Browns meadowrue	95	Yes	UPL
2. Solidago spp.	5	No	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	100	x 5 =	500
Column Totals:	100	(A)	500 (B)

Prevalence Index = B/A = 5

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).

Mowed over

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: McIntosh Sampling Date: 10-25-2021
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 011W
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T132N, R72W, Sec. 1
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 8
Subregion (LRR): LRRF Lat: 46.276730 24 Long: -99.630193 79 Datum: NAD83
Soil Map Unit Name: Harriet loam, 0-2% NWI Classification: PEMC
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Sparganium eurycarpum	80	Yes	FACW
2. Hordeum jubatum	3	No	FACW
3. Typha spp.	17	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	17	x 1 =	17
FACW species	83	x 2 =	166
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		183 (B)

Prevalence Index = B/A = 1.83

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: McIntosh Sampling Date: 10-25-2021
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: C11A
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T132N, R72W, Sec. 1
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 4
Subregion (LRR): LRRF Lat: 46.27671052 Long: -99.63013720 Datum: NAD83
Soil Map Unit Name: Harriet loam, 0-2% NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. Symphoricarpos occidentalis	5	No	UPL
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Bromus inermis	80	Yes	UPL
2. Grindelia squarrosa	5	No	UPL
3. Melilotus spp.	10	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	90	x 5 =	450
Column Totals:	100	(A)	490 (B)

Prevalence Index = B/A = 4.9

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: McIntosh Sampling Date: 10-25-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 01>W
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T132N, R72W, Sec. 1
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR): LRRF Lat: 46.27418414 Long: -99.64426503 Datum: NAD83
Soil Map Unit Name: Lowe loam, 0-2%, occasionally flooded NWI Classification: PEMC
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Spartina pectinata	90	Yes	FACW
2. Hordeum jubatum	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	95	x 2 =	190
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		190 (B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: McIntosh Sampling Date: 10-25-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 012U
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T132N, R72W, Sec 1
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 5
Subregion (LRR): LRRF Lat: 46.27411408 Long: -99.64412278 Datum: NAD83
Soil Map Unit Name: Lowe loam, 0-2%, occasionally flooded NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
Photos:

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. Symphoricarpos occidentalis	5	No	UPL
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft.)			
1. Bromus inermis	95	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover			
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	100	x 5 =	500
Column Totals:	100 (A)		500 (B)

Prevalence Index = B/A = 5

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: McIntosh Sampling Date: 10-25-2005
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 013W
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T132N, R72W, Sec 11
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR): LRRF Lat: 46.27203170 Long: -99.65849247 Datum: NAD83
Soil Map Unit Name: Daglum-Belfield complex, 0-2% NWI Classification: PEMC
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes Y No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Photos:
Harvested crop boarders wetland

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Typha spp.	40	Yes	OBL
2. Rumex crispus	3	NO	FAC
3. Artemisia ludoviciana	2	NO	FAC
4. Hordeum jubatum	10	NO	FACW
5. Spartina pectinata	25	YES	FACW
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	35	x 2 =	70
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		125 (B)

Prevalence Index = B/A = 1.56

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0[1]
____ 4 - Morphological Adaptations[1] (Explain)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (if observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Badger Wind Farm County: McIntosh Sampling Date: 10-25-2023
Applicant/Owner: Badger Wind LLC State: ND Sampling Point: 013 U
Investigator(s): H. Beckert and A. Blunt Section, Township, Range: T132N, R72W, Sec 11
Landform (hillslope, terrace, etc.): [illegible] Local relief (concave, convex, none): Concave Slope (%): 1
Subregion (LRR): LRRF Lat: 46.27205480 Long: -99.65855912 Datum: NAD83
Soil Map Unit Name: Daglum - Belfield complex, 0-2% NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
Photos:
Harvested crop

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft.)			
1. Glycine max	90	Yes	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover			
Woody Vine Stratum (Plot size: 30 ft.)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (if observed, list morphological adaptations below).

Appendix C. Wetland, Waterbody, and Non-WOTUS Wetlands Photographs within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota



Appendix C1. WET005



Appendix C2. WET012



Appendix C3. WET219



Appendix C4. WET220



Appendix C5. WET225



Appendix C6. WET234



Appendix C7. WET241



Appendix C8. WET1015



Appendix C9. WET1016



Appendix C10. WET1017



Appendix C11. 505U



Appendix C12. 511U



Appendix C13. 2014U

Appendix D. Summary of Non-Wetland and Non-Waterbody Points Recorded within the 2023 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh Counties, North Dakota

Appendix D. Summary of all non-wetland and non-waterbody points recorded within the Survey Area of the Badger Wind Expansion Project in Logan and McIntosh counties, North Dakota.[1]

Non-wetland ID	Type[1]	Latitude	Longitude
212U	Non-wetland	46.248238	-99.632207
503U[2]	Non-wetland	46.324398	-99.522076
504U[2]	Non-wetland	46.324810	-99.522404
505U[2]	Non-wetland	46.325938	-99.521074
506U[2]	Non-wetland	46.325062	-99.524693
507U[2]	Non-wetland	46.321761	-99.525981
508U[2]	Non-wetland	46.322657	-99.528729
509U[2]	Non-wetland	46.323641	-99.528960
510U[2]	Non-wetland	46.324982	-99.652904
511U[2]	Non-wetland	46.326950	-99.648413
512U[2]	Non-wetland	46.296798	-99.669109
513U[2]	Non-wetland	46.269339	-99.670745
514U[2]	Non-wetland	46.264433	-99.695189
515U[2]	Non-wetland	46.264345	-99.687006
516U[2]	Non-wetland	46.263189	-99.708153
517U	Non-wetland	46.375233	-99.643976
518U	Non-wetland	46.375338	-99.643734
519U	Non-wetland	46.375883	-99.646309
520U	Non-wetland	46.376048	-99.647504
521U	Non-wetland	46.293770	-99.534573
522U	Non-wetland	46.292048	-99.532430
523U	Non-wetland	46.292488	-99.531764
524U	Non-wetland	46.295282	-99.529267
525U	Non-wetland	46.304049	-99.535540
526U	Non-wetland	46.306795	-99.532380
527U	Non-wetland	46.308261	-99.531019
528U	Non-wetland	46.309474	-99.532457
529U	Non-wetland	46.305217	-99.520812
530U	Non-wetland	46.305929	-99.522755
531U	Non-wetland	46.288057	-99.489138
532U	Non-wetland	46.294834	-99.484909
533U	Non-wetland	46.299418	-99.505084
534U	Non-wetland	46.298329	-99.507672
535U	Non-wetland	46.298123	-99.509717
536U	Non-wetland	46.298117	-99.511690
537U	Non-wetland	46.319381	-99.589391
538U	Non-wetland	46.306730	-99.639082
539U	Non-wetland	46.311446	-99.641497
541U	Non-wetland	46.203083	-99.586475
542U	Non-wetland	46.202901	-99.587869
543U	Non-wetland	46.206166	-99.583090
544U	Non-wetland	46.208319	-99.575860
545U	Non-wetland	46.207135	-99.571718
546U	Non-wetland	46.216998	-99.600213
547U	Non-wetland	46.215742	-99.601298
548U	Non-wetland	46.218380	-99.611711

Appendix D. Summary of all non-wetland and non-waterbody points recorded within the Survey Area of the Badger Wind Expansion Project in Logan and McIntosh counties, North Dakota.[1]

Non-wetland ID	Type[1]	Latitude	Longitude
549U	Non-wetland	46.225177	-99.607710
550U	Non-wetland	46.240128	-99.607870
551U	Non-wetland	46.244729	-99.581818
552U	Non-wetland	46.242626	-99.582459
553U	Non-wetland	46.232353	-99.583064
554U	Non-wetland	46.235181	-99.580250
640U	Non-wetland	46.319031	-99.651576
700U	Non-wetland	46.316545	-99.520476
701U	Non-wetland	46.312300	-99.521517
702U	Non-wetland	46.303161	-99.520795
703U	Non-wetland	46.315506	-99.518062
704U	Non-wetland	46.309264	-99.503520
705U	Non-wetland	46.305298	-99.493500
706U	Non-wetland	46.305231	-99.581317
707U	Non-wetland	46.304505	-99.581081
708U	Non-wetland	46.304590	-99.562212
709U	Non-wetland	46.292144	-99.613974
710U	Non-wetland	46.268199	-99.599594
711U	Non-wetland	46.273671	-99.620989
2000U	Non-wetland	46.336155	-99.517174
2001U	Non-wetland	46.318950	-99.528759
2002U	Non-wetland	46.308915	-99.503638
2003U	Non-wetland	46.305223	-99.493825
2004U	Non-wetland	46.308736	-99.540264
2005U	Non-wetland	46.286017	-99.498350
2006U	Non-wetland	46.270418	-99.491510
2007U	Non-wetland	46.292183	-99.613666
2008U	Non-wetland	46.291569	-99.614496
2009U	Non-wetland	46.326168	-99.654687
2010U	Non-wetland	46.321404	-99.649365
2011U	Non-wetland	46.259893	-99.679147
2012U	Non-wetland	46.259415	-99.679424
2013U	Non-wetland	46.269236	-99.668095
2014U	Non-wetland	46.263709	-99.708323
2015U	Non-wetland	46.223366	-99.608607
2016U	Non-wetland	46.219068	-99.621789
2017U	Non-wetland	46.203872	-99.579459
2018U	Non-wetland	46.203683	-99.581808
2019U	Non-wetland	46.312297	-99.512643
5201U	Non-wetland	46.332374	-99.515691

[1] Wetlands delineated in 2020, 2021, and 2022 are presented in Atwell (2022) and Flaig (2021) reports.

"Non-WOTUS" ("no") points that lacked wetland or waterbody characteristics and were composed of upland vegetation.

[2] Documented during wetland delineation field effort; other "no" points in table were documented during wetland mapping effort.

Appendix C. Key Contacts

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Appendix C. Overview of study design and search methods for post-construction fatality monitoring at the Dakota Range I and II Wind Project, Grant and Codington counties, South Dakota, from March 16 – December 11, 2022.

Resource	Name, Title	Contact Information
US Fish and Wildlife Service, Region 6 Migratory Bird Office, Denver, Colorado	NA	1-303-236-8171
US Fish and Wildlife Service, North Dakota Field Office Bismarck, North Dakota	Heidi Riddle, Fish and Wildlife Biologist	Heidi_riddle@fws.gov; 1-701-355-8545
North Dakota Game and Fish Department Bismarck, North Dakota	Elisha Mueller, Conservation Biologist	ekmueller@nd.gov; 1-701-328-6300
Federal Environmental Incident Reporting Federal National Response Center (NRC) for the US Environmental Protection Agency (USEPA) and the US Coast Guard	N/A	1-800-424-8802
Local Environmental Incident Reporting North Dakota Department of Environmental Quality (DEQ)	N/A	1-701-328-5210
Badger Wind, LLC Operations and Maintenance	To Be Determined	To Be Determined
Badger Wind, LLC Environmental Operations Support	To Be Determined	To Be Determined