Wetland and Waterbody Delineation Technical Memorandum (Spring 2024)

[Appendices Omitted]

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TECHNICAL MEMORANDUM

Date: June 19, 2024

To: Andrew Krieger and Chris Farmer, Badger Wind, LLC

From: Kristen Chodachek and Wade Hammer; Western EcoSystems Technology, Inc.

Subject: Wetland and Waterbody Delineation Report – Badger Wind Project

INTRODUCTION

Badger Wind, LLC (Badger Wind), is proposing the development of the Badger Wind Project (Project), located approximately two miles west of Wishek, in Logan and McIntosh counties, North Dakota (Figure 1). Results of wetland and waterbody delineations and mapping previously completed within the permitted Project area are included in the Aquatic Resources Delineation Report (Atwell 2022) and Wetlands and Waterbodies Assessment Report (Chodachek and Welsch 2024). The objectives of the 2024 fieldwork documented in this report include completing a desktop review, field delineations of wetlands (i.e., land with presence of hydric soils, hydrology, and hydrophytic vegetation) and waterbodies (i.e., any type of perennial, intermittent, or ephemeral waterway or catch basin where water flows, or could flow, or is held), and assigning an informal jurisdictional determination (determination) to delineated features within the area containing newly proposed Project infrastructure footprints, or modifications of previously delineated infrastructure footprints, and their associated survey buffers (2024 Wetland Survey Area). The following technical memorandum describes the results of the wetland and waterbody delineations conducted for the Project in 2020, 2021, 2022 (Atwell 2022), and 2023 (Chodachek and Welsch 2024), and the methods and results for the fieldwork during 2024 to address changes/updates to the Project since spring of 2024.

SURVEY AREA

The 2024 Wetland Survey Area, within which delineations were completed, consisted of newly proposed Project infrastructure footprints, or modifications of previously delineated infrastructure footprints, and their associated survey buffers. The 2024 Wetland Survey Area encompassed 80.5 acres (ac) of the Project area, which is situated in the Northwestern Glaciated Plains Level III Ecoregion, an ecoregion mainly composed of mixed-grass prairie (US Environmental Protection Agency [USEPA] 2013). The Project will be sited entirely on private lands. Topography within the Project area ranges from relatively flat to rolling hills and elevations range from 2,020–2,200 feet (ft). Overall, the Project area drains to the southwest, into South Branch Beaver Creek, and to the northwest, into Beaver Creek, both of which are tributaries to the Missouri River. The Project area 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 area include agriculture and livestock grazing.

Waters of the US

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 US (WOTUS; USEPA 2023). Under the CWA, it is unlawful to discharge any pollutant 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 (TNWs; 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 USEPA and USACE jointly released information announcing an amendment to the definition of WOTUS (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

Desktop Assessment

A desktop assessment of publicly available wetlands and waterbodies data in the 2024 Wetland Survey Area was completed using the US Department of Agriculture's (USDA's) National Agriculture Imagery Program (USDA Farm Production and Conservation Business Center 2023), US Fish and Wildlife Service's (USFWS's) National Wetlands Inventory (NWI) data (2024), and US Geological Survey's (USGS's) National Hydrography Dataset (NHD; 2022). Based on the desktop review, areas identified as potentially being wetlands or waterbodies within the 2024 Wetland Survey Area were targeted during the 2024 delineation effort, while also evaluating the remainder of the 2024 Wetland Survey Area.

Using these public data sources, potential wetlands and waterbodies located within the 2024 Wetland Survey Area were identified and mapped in the desktop assessment using geographic information systems mapping software. Wetland and waterbody types (i.e., freshwater emergent wetland, freshwater pond, riverine, lake, freshwater forested/shrub wetlands, and rivers and streams) identified in Figure 2 are based on wetland nomenclature used by the USFWS NWI (2023; based on Cowardin et al. 1979 and USGS [2022]).

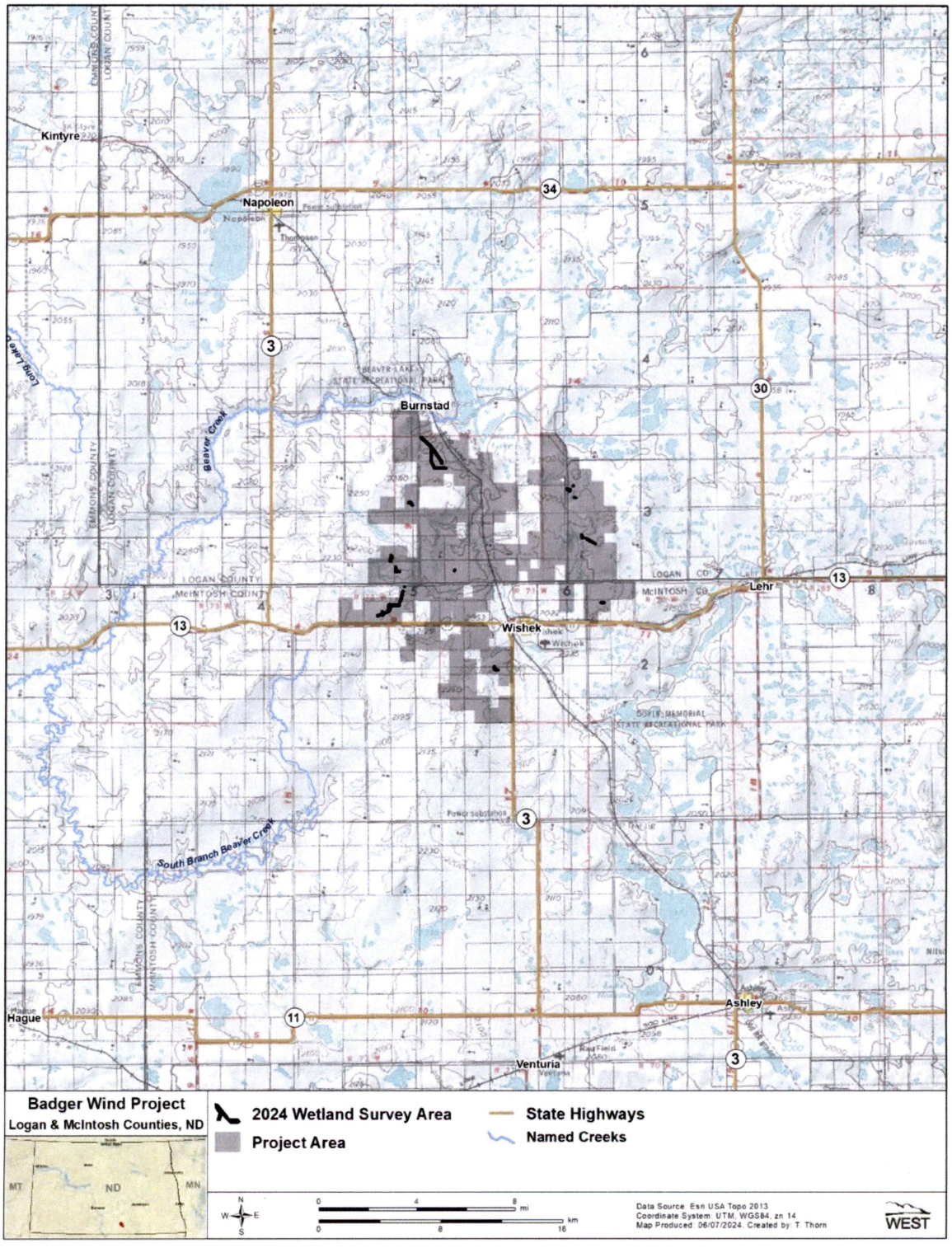

Figure 1. Location of the 2024 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota.

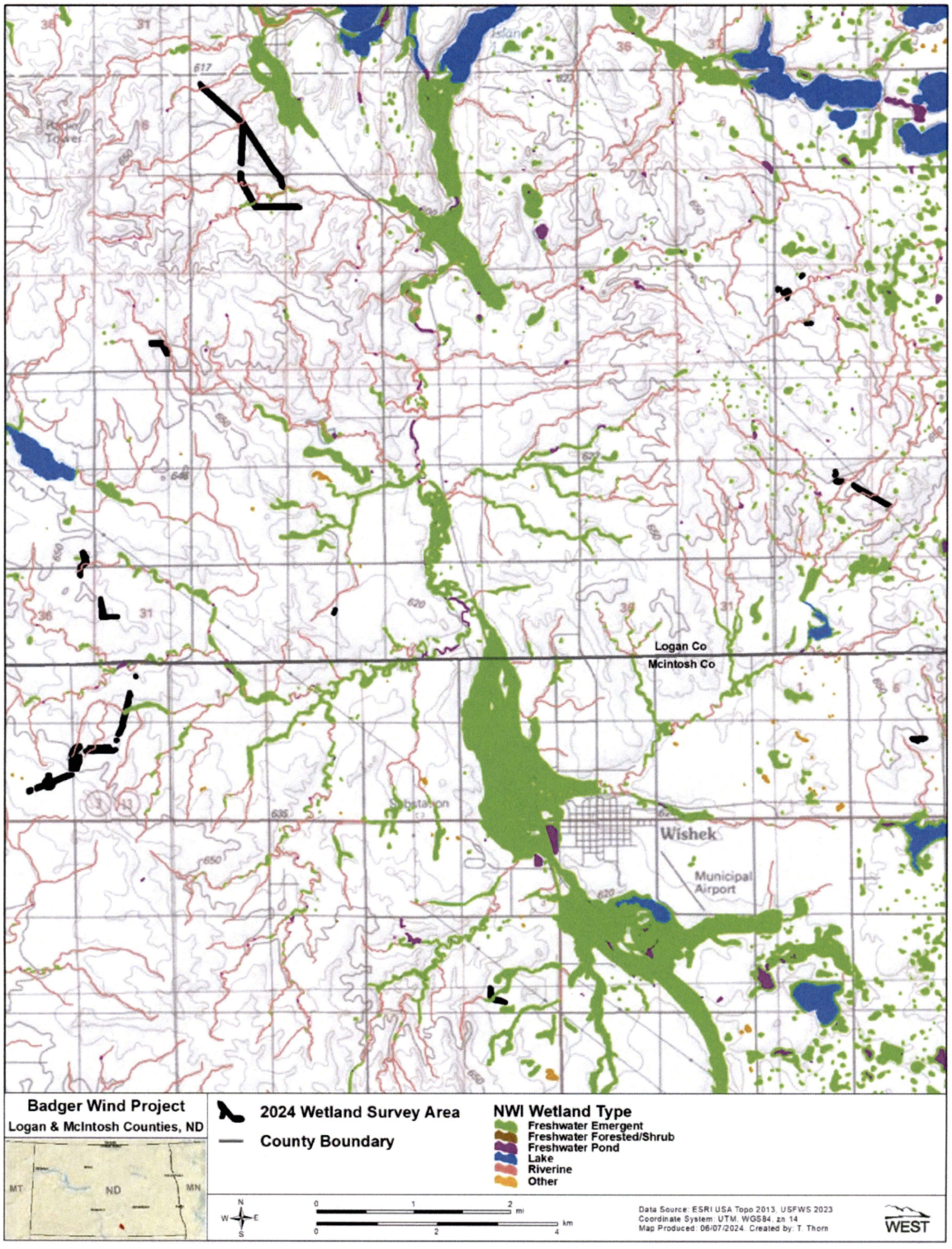

Figure 2. National Wetlands Inventory features within the 2024 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota.

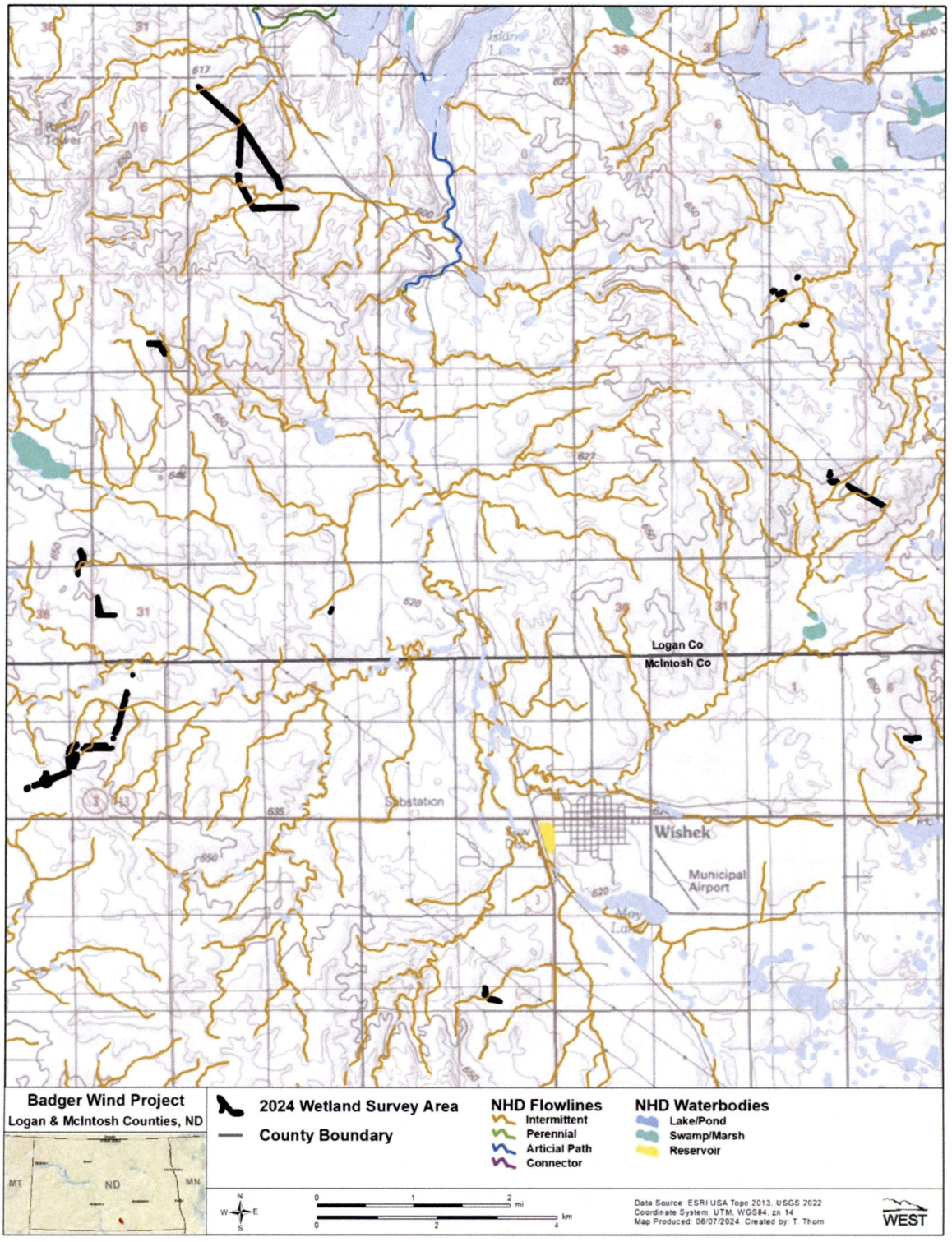

Figure 3. National Hydrography Dataset features within the 2024 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota.

REGULATORY BACKGROUND

Wetland and Waterbody Delineation Fieldwork

Using results of the desktop assessment to identify where wetlands and waterbodies were likely to be present within the 2024 Wetland Survey Area, a field delineation was completed. Wetlands and waterbodies within the 2024 Wetland Survey Area that were observed during fieldwork but not identified during the initial desktop assessment were also mapped. Wetlands and waterbodies were mapped using a tablet with Collector for ArcGIS software (Esri 2024) coupled with an Arrow Lite Global Positioning System (GPS) receiver with submeter accuracy.

Proposed infrastructure survey corridors were provided by Badger Wind as a geospatial file in April 2024 and 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 footprint and associated buffers were loaded onto the tablet and used in the field to verify that boundaries of the 2024 Wetland Survey Area were accurately identified and that field delineations were completed. NWI and NHD features were also loaded onto the tablet to complete field-verification at each of these feature types, where present, within the 2024 Wetland Survey Area.

Photographs (photo) were recorded for wetlands identified within the 2024 Wetland Survey Area. Each delineated wetland was assigned a unique identification name consisting of an alphanumeric name in a series (e.g., WET1, WET2).

NWI or NHD features that intersected the 2024 Wetland Survey Area but clearly did not meet the definition of either a wetland or a waterbody were photo documented and a non-WOTUS point was collected on the tablet. These non-WOTUS points were identified with a sequential alphanumeric name (e.g., 101U, 102U).

Wetland Delineation

Wetland delineations were conducted May 9–10, 2024, in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (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 3-parameter approach, which requires presence of hydrophytic plants, hydric soils, and wetland hydrology. Unless otherwise carefully documented based on

professional judgement, all three parameters must be present and meet the wetland criteria of each parameter for an area to be considered a wetland.

The delineated wetlands were classified according to the classification system outlined in *Classification of 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 2024 Wetland Survey Area. Wetland sample plots were located in areas that were representative of 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. Wetlands were 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 wetlands are defined as inland freshwater areas dominated by woody vegetation less than 20 ft tall, such as buttonbush, alders, and many kinds of woody saplings.
- Palustrine forested wetlands are defined as inland freshwater areas dominated by woody vegetation 20 ft or taller.

Waterbody Delineation

Flowing waterbodies and drainage features (e.g., streams, creeks, ditches) and other waterbodies (e.g., stock ponds) within the 2024 Wetland Survey Area, including those waterbodies identified in the NWI and NHD datasets (Figures 2 and 3), were examined to determine if each met the definition of a waterbody. The field assessment, used to determine the presence of a waterbody, was focused on the presence of a definable bed and bank, ordinary high water mark (OHWM), and evidence of flow. If present, the OHWM of each waterbody was recorded with a GPS. These features were mapped and documented in a similar manner as wetlands.

Informal Jurisdictional Determination

In addition to evaluating the 2024 Wetland Survey Area for features that met regulatory definitions of a wetland and waterbody, the professional judgment of the Western EcoSystems Technology, Inc. (WEST), delineator was used to make an informal determination. Certain features are jurisdictional based on regulation and do not require further assessments (e.g., territorial seas, TNWs, interstate waters, and impoundments of these features). As previously noted in the *Regulatory Background* section, there have recently been court decisions that have resulted in regulatory guidance changes that are influencing how the USACE determines jurisdiction of wetlands and waterbodies. WEST utilized the best available information, based on our team's experience, to make the determinations. However, the informal determinations in this report are

subject to change and require USACE review and final determination prior to utilizing the information determinations for permitting.

The WEST biologist that completed the field delineations assigned a likely, unlikely, or unknown jurisdictional status to the delineated wetlands and waterbodies documented during the 2024 fieldwork based on best professional judgement and experience in the region. Wetland and waterbody determinations included in this report are informal; only the USACE can make a formal determination.

RESULTS

2024 Wetland Delineations

Twelve wetlands, totaling 1.91 ac, were identified and delineated during the 2024 fieldwork (Table 1, Figure 4). Detailed maps of wetland locations are provided in Appendix A. Table 1 provides a summary of wetland classifications and acreages within the 2024 Wetland Survey Area. All 12 delineated wetlands were classified as PEM wetlands. Ten of the wetlands occurred in drainages, one in a seep, and one in a depression. Wetlands delineated during 2024 fieldwork appeared to have a downstream connection to WOTUS and were, therefore, considered potentially or likely jurisdictional (Table 1). Wetland determination datasheets, representative photographs of wetlands, and a summary of wetland and non-wetland waterbody points found within the 2024 Wetland Survey Area are provided in Appendices B, C, and D, respectively.

Table 1. Summary of field delineated wetlands within the 2024 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, May 9–10, 2024.[1]

Feature Identification	Acres	Cowardin Classification[2]	Latitude/Longitude[3]	Landform	Informal Jurisdictional Determination[4]
WET1	0.11	PEM	46.23223/-99.58036	Drainage	Likely
WET2	0.06	PEM	46.27000/-99.66727	Seep	Likely
WET3	0.84	PEM	46.27620/-99.65919	Depression	Likely
WET4	0.13	PEM	46.29826/-99.66763	Drainage	Likely
WET5	0.04	PEM	46.30672/-99.49804	Drainage	Likely
WET6	0.17	PEM	46.35419/-99.63315	Drainage	Likely
WET7	0.09	PEM	46.35390/-99.63269	Drainage	Likely
WET8	0.07	PEM	46.36317/-99.63301	Drainage	Likely
WET9	0.19	PEM	46.35140/-99.63067	Drainage	Likely
WET10	0.08	PEM	46.35076/-99.62741	Drainage	Likely
WET11	0.12	PEM	46.36845/-99.64158	Drainage	Likely
WET12	0.01	PEM	46.36785/-99.64011	Drainage	Likely

1. Wetlands delineated in 2021 and 2022 are present in Flaig (2022) and Atwell (2022) reports.
2. PEM = Palustrine emergent wetland.
3. Location of wetland sample plot.
4. Determination based on Western EcoSystems Technology, Inc.'s professional judgement and subject to change based on US Army Corps of Engineers review.

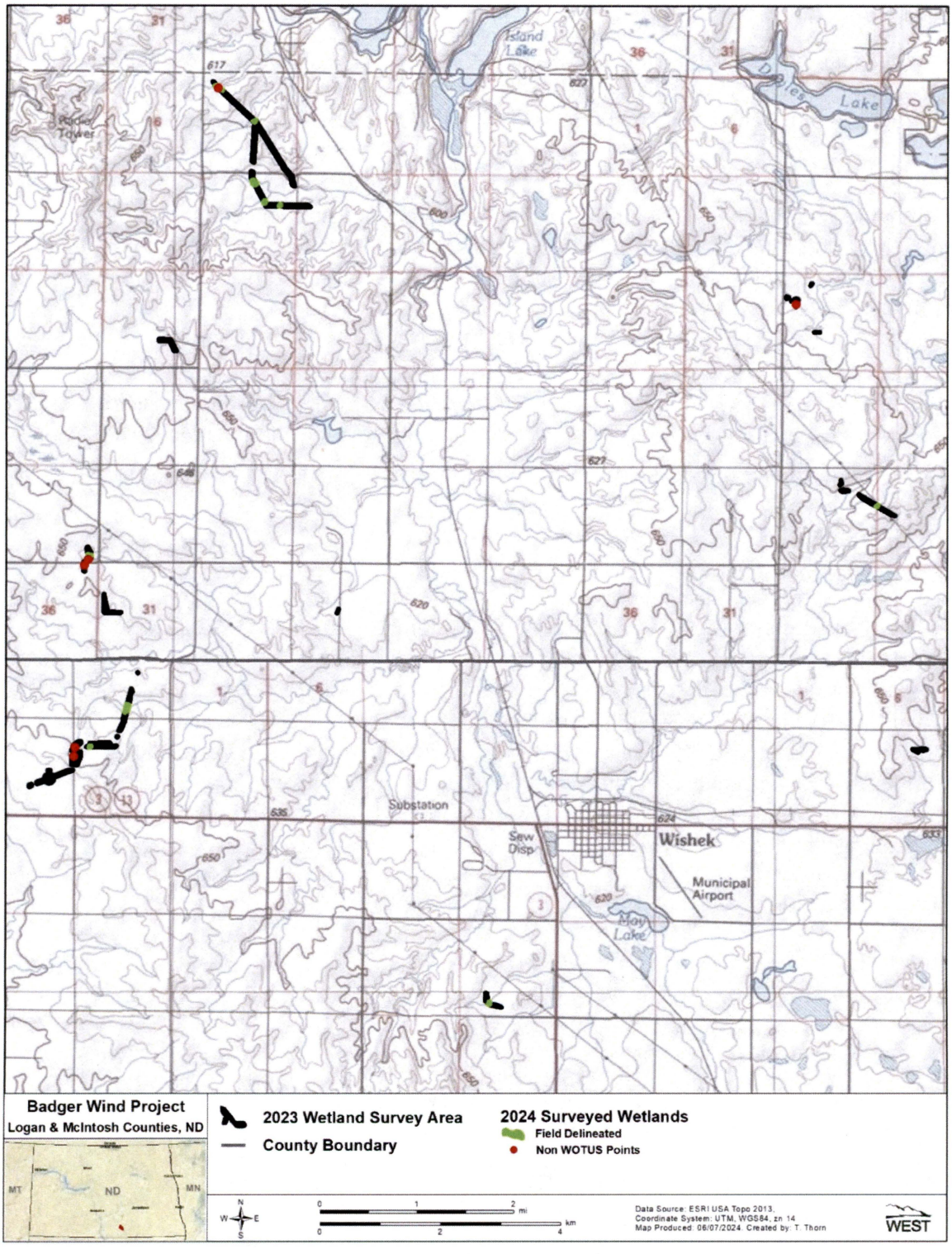

Figure 4. Field delineated wetlands and non-waters of the US points within the 2024 Wetland Survey Area of the Badger Wind Project in Logan and McIntosh counties, North Dakota, May 9–10, 2024.

Vegetation

The most common wetland species encountered in the 12 delineated wetlands within the 2024 Wetland Survey Area were cattail (*Typha* spp.), woolly sedge (*Carex pellita*), foxtail barley (*Hordeum jubatum*), and prairie cordgrass (*Spartina pectinata*).

Hydrology

Documented saturation, high water table, and inundation visible on aerial imagery were the primary hydrologic indicators present for wetlands. Other hydrology indicators noted during the field investigation were saturation visible on aerial imagery, geomorphic position, FAC-neutral test, and drainage patterns.

Soils

Soil colors were predominantly dark (e.g., 10 YR 2/2 and 3/1). The primary field hydric soil indicator used was redox dark surface, followed by depleted below dark surface. The majority of the soil was silt loam and loam.

CONCLUSION

Wetland and waterbody delineations and wetland mapping were completed for the Project in the months of September 2020, October 2020, September 2021, May 2022, October 2023, November 2023, and May 2024. Further details regarding delineations and mapping conducted prior to 2024 can be found in the Aquatic Resources Delineation Report (Atwell 2022) and the Wetlands and Waterbodies Assessment Report (Chodachek and Welsch 2024). Over these combined field efforts, 205 wetlands were identified through field delineation, comprising 217.21 ac, and 64 additional wetlands were mapped, totaling 30.50 ac (Figure 5). Four waterbody features were delineated, comprising 0.78 ac, and seven watercourses were identified, comprising a cumulative of 5.18 ac.

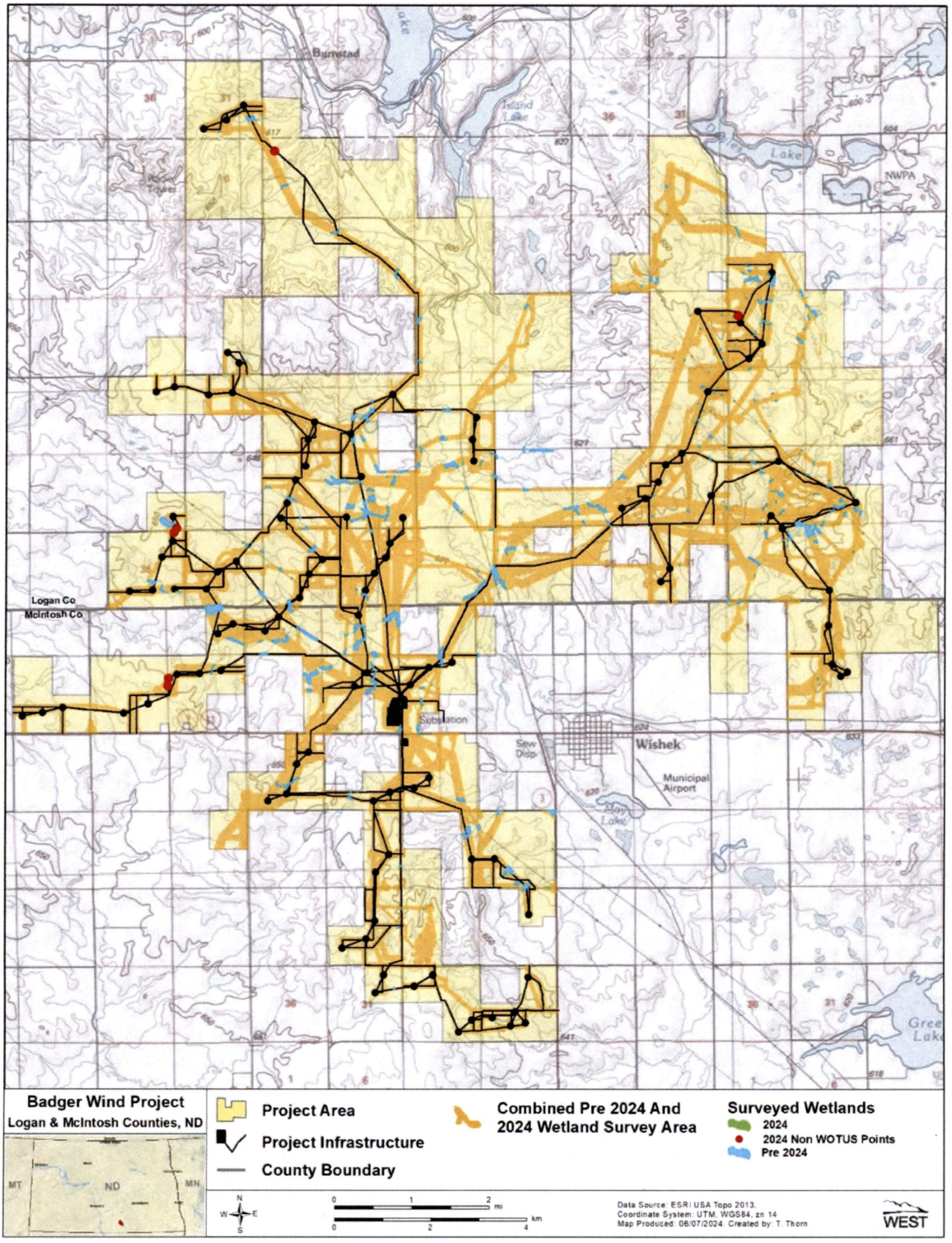

Figure 5. Wetland survey results for field surveys conducted in 2020, 2021, 2022, 2023, and 2024 at the Badger Wind Project in Logan and McIntosh counties, North Dakota.

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