
USFWS
Environmental Assessment
for
Transmission Facilities on Grassland
and Wetland Easements

Center to Grand Forks
345 kV Transmission Line Project

January 2012



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List of Abbreviations

Abbreviation	Definition
ac	acres
AC	Alternating Current
ACSR	Aluminum conductor steel reinforced
AES	Alternatives Evaluation Study
APLIC	Avian Power Line Interaction Committee
BA	Biological Assessment
BMP	Best Management Practice
EA	Environmental Assessment with scoping
EHS	Extra High Strength
ESA	Endangered Species Act of 1973, as amended
FONSI	Finding of No Significant Impact
ft ²	square feet
HVDC	high voltage direct-current
kV	kilovolt
Kcmil	thousand circular mils
Mi	mile
Minnkota	Minnkota Power Cooperative, Inc.
MW	Megawatt
NEPA	National Environmental Policy Act
NESC	National Electricity Safety Council
NMPA	Northern Municipal Power Agency
OPGW	Optical Ground Wire
PPA	power purchase agreements
Project	Center to Grand Forks Transmission Line Project
PSC	North Dakota Public Service Commission
ROW	Right-of-Way
RUS	Rural Utilities Service
Square Butte	Square Butte Electric Cooperative
TW	Trapezoidal wire
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
Young 2	Milton R. Young Generation Station
Western	Western Area Power Administration
WMD	Wetland Management District

1.0 Introduction

1.1 About the Project

Minnkota Power Cooperative, Inc. (Minnkota), proposes to construct, operate, and maintain a 345 kilovolt (kV) transmission line and substation modifications from Center, North Dakota, to Grand Forks, North Dakota, called the Center to Grand Forks 345 kV Transmission Line Project (Project) (Case No. PU-09-670). An Environmental Assessment (EA) was published for the overall Project under Rural Utilities Service (RUS) on November 12, 2010. The Finding of No Significant Impact (FONSI) is expected to be finalized and published in the first quarter of 2012. An application for a Certificate of Corridor Compatibility (Corridor Certificate Application) was submitted by Minnkota to the North Dakota Public Service Commission (PSC) for approval of a Corridor within which to site a Project Route (Minnkota Power Cooperative, Inc., 2011). The PSC issued a Findings of Fact, Conclusions of Law and Order for a Certificate of Site Compatibility for a Transmission Facility Corridor on September 7, 2011.

Minnkota is a wholesale electric generation and transmission cooperative headquartered in Grand Forks, North Dakota. Incorporated on March 28, 1940, Minnkota provides, on a nonprofit basis, wholesale electric service to 11 retail/member-owner distribution cooperatives, which are the members and owners of Minnkota. The member systems' service areas encompass 34,500 square miles in the eastern third of North Dakota and northwestern Minnesota that contains an aggregate population of approximately 300,000 people. These cooperatives serve more than 116,000 retail customers including many of the region's schools, farms, homes, and businesses.

The primary source of baseload generation for the rural cooperatives is the Milton R. Young Generation Station (Young 2), located approximately 24 miles northwest of Bismarck, North Dakota, near the community of Center, North Dakota. Minnkota also serves as the operating agent for the Northern Municipal Power Agency (NMPA) members with respect to their 30 percent share of the output from the Coyote Station near Beulah, North Dakota, and associated transmission facilities. NMPA is the energy supplier for 12 municipal utilities located within the Minnkota service area. In addition, Minnkota has acquired, through power purchase agreements (PPAs) with large wind developers, significant North Dakota-based wind energy resources, totaling about 357 megawatt (MW) of nameplate capacity.

1.2 Environmental Review

A Project-specific EA was completed by the RUS in November 2010. However, impacts to United States Fish and Wildlife Service (USFWS) grassland and wetland easements were not specifically evaluated in the EA, since structure locations were not known at the time of EA development. Therefore, this USFWS EA was developed to specifically address the Project's impact to USFWS easements. This EA is part of the National Environmental Policy Act (NEPA) process for issuance of a Special Use Permit.

2.0 Purpose and Need

2.1 Purpose for Taking Action

In order to fulfill its obligations for future load growth, Minnkota must increase its baseload generation resources. The purpose of this Project is to address future load growth, system voltage stability, and load serving issues in Minnkota's service territory by transmitting the power generated by Young 2 via the AC transmission system to Minnkota's service territory in eastern North Dakota and northwestern Minnesota. The Project would provide a direct link to Minnkota's service territory, while providing a major improvement to the regional transmission grid and a sound technical solution to the northern Red River Valley voltage stability issue, which is documented in the Alternatives Evaluation Study (AES) (Minnkota Power Cooperative, Inc., 2009). Therefore, the Project would be the optimal alternative to address the needs of Minnkota's service area and the region.

2.2 Need for Taking Action

Over the past ten years, Minnkota's load has grown at a rate of 2.9 percent annually (Minnkota Power Cooperative, Inc., 2009). In addition, Minnkota's 2009 Load Forecast Study showed that load would continue to grow at a rate of approximately 1.9 percent annually over the next 25 years (Minnkota Power Cooperative, Inc., 2010). In order to adequately serve this future load growth, Minnkota must increase its baseload generation resources. In particular, additional baseload generation is needed by the winter of 2013 to address an increased need for electricity to serve new residences, commercial accounts, and pipeline pumping projects (Minnkota Power Cooperative, Inc., 2010).

To address the need for additional baseload generation resources, Minnkota recently entered into an agreement to amend an existing PPA with Minnesota Power, a division of ALLETE, and Square Butte Electric Cooperative (Square Butte). Pursuant to this agreement, Minnesota Power released to Minnkota the rights to its share of generation from the Square Butte-owned Young 2 generation station. This allows Minnkota to increase its allocation of generation from Young 2 from 50 percent to 100 percent over the next several years. In return, Minnkota has agreed to release its rights for transmitting power from Young 2 via the Square Butte high-voltage direct-current (HVDC) transmission line that terminates near Duluth, Minnesota. Square Butte, in turn, sold the HVDC transmission line to Minnesota Power. The new agreements between Minnkota, Minnesota Power, and Square Butte provide Minnkota with additional baseload power supply without the need to construct a new coal-fired plant, and provide Minnesota Power with existing transmission facilities to develop and deliver substantial wind energy from North Dakota to its consumers in Minnesota.

The agreement with Minnesota Power and Square Butte would enable Minnkota to begin acquiring additional baseload generation from Young 2 in early 2013. However, because the existing HVDC transmission line would no longer be available to carry the full generation output of Young 2, the power generated by Young 2 would need to be transmitted via the AC

transmission system to Minnkota's service territory in eastern North Dakota and northwestern Minnesota.

Regional transmission-system studies for the eastern North Dakota and northwestern Minnesota area since 2005 have demonstrated the need for improvements due to systemic voltage instability and load serving issues. In addition, these studies have found that the existing AC transmission system is already operating at capacity without any additional load growth. System studies indicate that additional transmission into the northeastern part of North Dakota from the area of concentrated generation in central North Dakota is the preferred alternative in order to address these issues within Minnkota's service territory.

3.0 Project Summary

3.1 General Project Description

The Project consists of approximately 250 miles of new, high voltage AC transmission line from Young 2, the existing Center 345 kV Substation, located approximately 4.5 miles southeast of the town of Center, North Dakota, in Oliver County, to the existing Prairie Substation located on the western boundary of the city of Grand Forks, North Dakota, in Grand Forks County (Figure 1). The Project would deliver energy from existing baseload generation to Minnkota's cooperative members.

For the purposes of this EA, the Project Right-of-Way (ROW) is the 150-foot-wide area in which the transmission line facilities will be constructed, the Project Route refers to the specific locations of the transmission line facilities, and the Project Corridor refers to the Corridor approved by the PSC on September 7, 2011.

While final engineering and design have not been completed, the majority of the line would be constructed with single-pole steel structures. Typical structures would be approximately 140-foot-high and placed approximately 1,000 feet apart. The typical ROW would be approximately 150-foot-wide. Within this USFWS EA, the Project Route refers to the 150-foot-wide ROW.

3.2 Project Schedule

Minnkota's construction schedule would be set by satisfactorily reaching a number of milestone agreements and obtaining required approvals. Minnkota anticipates construction to begin in spring 2012, provided that Minnkota can secure all preconstruction permits and approvals. No Project expansions or additions are anticipated at this time.

1. **Environmental Assessment:** The EA was completed by the RUS in 2010, with public comment period ending on December 17, 2010. The FONSI is expected to be finalized and published in the first quarter of 2012.
2. **Certificate of Corridor Compatibility:** Certificate of Site Compatibility for a Transmission Facility Corridor was issued on September 7, 2011.
3. **Route Application and Permit:** Minnkota submitted a Route Permit Application on December 2, 2011. Minnkota anticipates that the Route Permit would be issued in the first quarter of 2012. It is critical for Minnkota to receive the Route Permit as soon as possible, as completing this step would allow Minnkota to move forward with other commitments associated with the Project, including ordering long-lead-time equipment and securing other permits and approvals.
4. **Equipment Procurement, Manufacture, and Delivery:** Minnkota would order the transmission and substation components as soon as practicable. Once the components have been ordered, delivery is anticipated to occur so as to allow construction to be completed in 2013.

5. **Construction:** Project construction is expected to begin in spring 2012, subject to obtaining applicable permits. Construction would take approximately twenty months to complete.
6. **Test and Operations:** Minnkota expects system commissioning would occur in the fourth quarter of 2013.
7. **In-Service Date:** The expected in-service date is the fourth quarter of 2013.

3.3 Project Route Description

USFWS wetland and grassland easements are scattered along the Project Route. The following is a description of the entire Project Route from west to east starting at the Center 345 kV Substation and ending at the Prairie Substation (Figure 1). The Project Route is approximately 250 miles long. The Project Route proceeds diagonally northeast out of the Center 345 kV Substation for about 0.9 miles to the section line, then proceeds due east along the section line for about 3.25 miles. The Project Route then turns diagonally southeast on a cross-country path for about 0.5 miles, then proceeds east for approximately 0.75 miles, then northeast for about 0.5 miles to the section line. The Project Route travels east along the section line for about 3 miles, then on a diagonal to the northeast for about 1 mile, then turns to travel east for almost 3 miles to the Missouri River. It crosses the Missouri River about 0.16 miles north of the existing HVDC transmission line on the west side of the river and about 0.5 miles north of the existing HVDC transmission line on the east side of the river. From the west side of the Missouri River, the Project Route proceeds diagonally northeast for almost 2 miles, crossing State Highway 1804. Then the Project Route proceeds east along 279th Ave NE for about 2.25 miles. The Project Route then proceeds north for about 0.75 miles before turning diagonally northwest for about 2 miles. The Project Route then proceeds north for 3.75 miles along a section line, and then east for about 5.5 miles along a quarter-section line to within 0.5 miles west of State Highway 41.

The Project Route proceeds north for about 8.5 miles along the quarter-section line about 0.5 miles west of State Highway 41, turns east for approximately 2 miles along State Highway 41, and follows State Highway 41 to the north for about 9 miles; within this segment, the Project Route spans the McClusky Canal and Chain of Lakes Recreation Area. The Project Route turns east for about 2 miles along 3rd St NW to the McLean/Sheridan County line. The Project Route proceeds diagonally cross-country for about 2.4 miles to 5th St NW; then turns east along 5th St NW for about 0.75 miles. The Project Route travels diagonally cross-country for about 7 miles, then diagonally northeast for 0.75 miles, to the west side of 1st Ave NE in Sheridan County. At that point the Project Route proceeds east (about 0.25 miles north of 10th St NE) for about 20.5 miles; within this segment, the Project Route crosses the McClusky Canal and State Highway 14. The Project Route turns south for about 0.25 miles to 10th St NE/the section line; then turns east along the section line for about 4 miles, before turning north for about 0.25 miles to the quarter-section line. The Project Route goes east for about 1 mile approximately 0.25 miles north of 10th St NE. The Project Route turns south for about 0.25 miles to the section line, then travels east for about 2.25 miles along the section line to within 0.25 miles west of State Highway 3, and then proceeds north for about 1 mile to 11th St NE. The Project Route turns east along 11th St NE for about 6.75 miles, crossing State Highway 3, then turns north for about 1 mile on a quarter-

section line to 12th St NE. The Project Route turns east along 12th St NE for about 9 miles, crossing U.S. Highway 52; then turns north for about 1.5 miles on a quarter-section line between 44th Ave NE and 45th Ave NE. The Project Route turns east along a quarter-section line for about 17.5 miles to 62nd Ave NE, crossing State Highway 30. The Project Route turns north along 62nd Ave NE for about 0.25 miles, then turns east for about 2 miles, before turning south for about 0.25 miles to the quarter-section line. The Project Route turns east along a quarter-section line for about 7.5 miles to a quarter-section line between 71st Ave NE and 72nd Ave NE, crossing U.S. Highway 281, where it turns south for about 1 mile to just north of the quarter-section line, and continues east for about 4 miles just north of the quarter-section line to where it turns south for about 0.5 miles to just north of the section line along 12th St NE (Foster/Eddy County line) where it travels approximately 12 miles to the east.

To bypass the towns of McHenry and Binford, the Project Route goes south for approximately 3.25 miles, then east for about 12.5 miles along 3rd St NE/9th St NE (crossing State Highway 20), and north for about 3 miles to 12th St NE. Along 12th St NE, the Project Route heads east for about 20.5 miles, across State Highway 1, Sheyenne River, and State Highway 45, to about 0.5 miles east of 120th Ave NE in Steele County, where the Project Route travels north for about 6 miles on the quarter-section to 18th St NE near Aneta. At Aneta, the Project Route goes northeast, diagonally, cross-country for about 7.5 miles to 6th Ave NE in Grand Forks County. The Project Route travels east along 6th Ave NE for about 7.75 miles, then north for about 0.2 miles along 41st St NE. The Project Route then proceeds east for about 9.5 miles, crossing State Highway 18, and turns north for about 2 miles along the quarter-section line (about 0.5 miles west of 31st St NE). Then the Project Route travels east about 200 feet north of 8th Ave NE for about 4.5 miles to 27th St NE. At 27th St NE, the Project Route travels north for about 0.5 miles and then travels east for about 4.25 miles to the existing Western Area Power Administration (Western) 230 kV transmission line. Then, the Project Route proceeds northeast, diagonally, cross-country for about 4 miles adjacent to the Western line ROW, then north for about 2.5 miles along the quarter-section line, approximately 0.5 miles west of 19th St NE, where it turns to go east along the 14th Ave NE section line for about 0.5 miles to 19th St NE. The Project Route goes north for about 1.5 miles along 19th St NE to the quarter-section line between 15th Ave NE and 16th Ave NE. The Project Route turns to go east along the quarter-section line for almost 4.5 miles. At 0.5 miles west of 14th St NE, the Project Route heads north along the quarter-section line for about 0.75 miles to the south side of the existing 230 kV transmission line and then proceeds east along the south side of the existing transmission line for about 1.5 miles into the Prairie Substation.

3.4 Study Area Description

The Study Area is the general area (typically 1 mile) around the Project ROW and includes portions of 11 counties in central and eastern North Dakota: Oliver, Burleigh, McLean, Sheridan, Wells, Foster, Eddy, Griggs, Nelson, Steele, and Grand Forks Counties. The general land cover within the Study Area consists primarily of agricultural lands including cultivated crops and livestock grazing, with dispersed areas of pasture/hay and woodland. Agriculture is one of the most important industries in North Dakota. Cultivated croplands are more prevalent in the

eastern portion of the Project towards the Red River Valley, with approximately 60 percent cropland from Center, North Dakota (Center 345 kV Substation), to Mercer, North Dakota, to nearly 90 percent cropland from the Sheyenne River to Grand Forks, North Dakota (Prairie Substation). The primary cultivated crops include wheat, soybeans, and corn. Cattle are the major livestock produced in North Dakota. Center pivot irrigation units are present within the Study Area.

Prairies and wetlands are more prevalent in the western portion of the Study Area, toward the Missouri River. Historically, North Dakota was mostly prairie land cover. Prairie covers more land in the western portions of the Study Area and decreases towards the Sheyenne River and Red River Valley. Wetlands occur throughout the Study Area with a higher concentration in the Prairie Pothole Region of the upper Midwest. Wetlands are typically small, isolated depressions, but may also be found along drainages, rivers, and streams. Wetlands cover nearly 12 percent of the land within the western portion of the Study Area, and decrease to about 5 percent in the eastern portion due to the prevalence of cultivated crops. Wooded areas are not prevalent in North Dakota, as the historic land cover was prairie. Currently, the most common wooded areas are shelterbelts around residences and buildings. The major rivers may have a wooded, riparian fringe.

The Study Area contains undulating terrain in the western section within the Prairie Pothole region and near major rivers; otherwise, the eastern half is nearly level within the Red River Valley. Major watercourses within the Study Area include the Missouri, James, and Sheyenne Rivers.

4.0 Alternatives Including the Proposed Action

4.1 Alternative A – No Action Alternative

The “No Action” alternative would place Young 2 generation on the existing transmission system. The substantial wind generation development at the Square Butte bus and subsequent reallocation of Young 2 outlet would result in significant dynamic stability and steady state impacts on the AC transmission system in the North Dakota coal field region, based on transmission outlet studies completed in June 2009. The studies indicated the “no transmission addition” option is not feasible due to these impacts, and a new transmission line is required to transition the output of Young 2 off of the HVDC line and onto the AC system. Therefore, not constructing the Project may result in other facilities being built.

4.2 Alternative B – Preferred Alternative

4.2.1 Description of Proposed Facilities

The transmission line will be designed to meet all relevant state codes, National Electric Safety Code (NESC), RUS standards, and other standards that Minnkota has adopted. Appropriate standards will be met for construction and installation and all applicable safety procedures will be followed during and after installation. The standards have been established to identify minimum conductor distances to ground, conductor spacing, and other parameters. The following summarizes applicable standards as they relate to this Project.

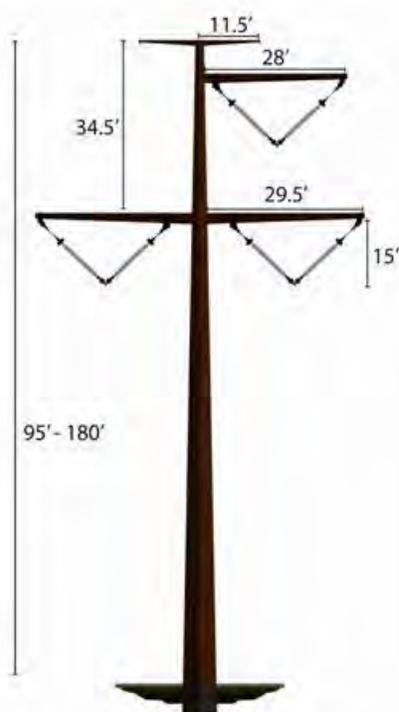
In general, a high-voltage transmission line consists of three phases, each at the end of a separate insulator string (or v-string configuration), all physically supported by structures. Each phase consists of one or more conductors. When more than one conductor is used to make up a phase, the term “bundled” conductors is used. Conductors are metal cables consisting of multiple strands of steel and aluminum wire wound together. There are also two shield wires strung above the electrical phases to prevent, to the extent possible, lighting from striking the phases. Shield wires are typically less than 1 inch in diameter. One of the shield wires will also include fiber optic cable that allows a path for substation protection and control equipment to communicate to equipment at other terminals on the transmission line. Transmission lines are constructed on a ROW in which the width is primarily dependent on structure design, span length, and the electrical safety requirements associated with the transmission line voltage.

Transmission Structure

Single pole, self-weathering tubular steel single circuit structures are proposed for the majority of the Project (Diagram 1). The self-weathering steel oxidizes or rusts to form a dark reddish brown surface coating to protect the structure from further weathering. The steel single poles are placed on large concrete foundations, which are wider than the pole base. Table 3.2-1 outlines typical characteristics of the 345 kV transmission line structures. Final design and geotechnical investigations may warrant the use of special structures to avoid sensitive areas, comply with reasonable landowner desires, or accommodate special engineering circumstances.

Table 4.2-1. Typical Characteristics of 345 kV Transmission Line Structures

345 kV Transmission Line	Details
Voltage (kV)	345 kV
ROW width (feet)	150
Approximate span length (feet)	1,000
Range of structure heights (feet)	95 - 180
Number of structures per mile	5 - 7
Minimum ground clearance beneath conductor (feet)	35 - 40
Depth of concrete footings for the poles (feet)	30 - 40
Diameter of concrete footings for the poles (feet)	7 - 10
Average area of permanent disturbance per structure (square feet)	78.5

Diagram 1: Project Tangent Structure

Conductors and Shield Wires

It is anticipated that each phase wire will consist of bundled conductors composed of two 959.6 kcmil (thousand circular mils) Suwannee trapezoidal wire (TW) type aluminum conductor steel reinforced (ACSR) cables. Each conductor has an outside diameter of 1.1 inches. The trapezoidal configuration of the aluminum strands reduces air gaps between strands and allows

more capacity than in an equal diameter conductor of standard ACSR design. Suwannee TW type ACSR consists of seven steel wires at the center surrounded by 22 trapezoidal shaped aluminum strands. Two shield wires, also known as lightning protection wires, are planned. On one side, the shield wire will be fiber optical ground wire (OPGW), and, on the other side, the shield wire will be 0.5-inch Extra High Strength (EHS) steel cable. OPGW consists of 24 strands of single mode fiber optics conductors in a steel tube wrapped with ten strands of steel wire around the fiber optic tube.

Span

Span represents the distance between structures (regardless of structure type or service design). The average span distance would be about 1,000 feet. Spans used throughout the proposed Project would be adjusted to account for topography, specific physical resources along the transmission line route, and land uses.

Right-of-Way Design

The majority of the new 345 kV transmission line facilities will be built with single pole structures, which typically require a 150-foot-wide ROW for the length of the transmission line. The Missouri River crossing will require a 250-foot-wide ROW due to the long span. The additional ROW will be identified in the easement agreement with the landowner. If the transmission line is placed on property division lines across private land, the easement width to be acquired from each of the adjacent landowner(s) will vary.

It is intended that the Project will not share ROW with existing features; rather, it will parallel ROWs of existing features. Throughout the route development process, Minnkota sought to identify areas to parallel existing linear features including roads. Identification of opportunities to parallel existing linear features minimizes the proliferation of new corridors.

Given the terrain in the area, construction of access roads outside of the ROW will generally not be needed. If obstructions exist that are completely blocking ingress and/or egress along the ROW, such as flowing creeks, Minnkota will arrange with landowners to use existing field roads or create temporary access from state and county highways to access the structure locations.

Minnkota land agents will work individually with property owners to purchase easements for the Project. Under the easement agreements, property owners will not be allowed to place any structures or other objects within the 150-foot ROW that will restrict access to the ROW, inhibit maintenance of the transmission line, or jeopardize safe operations of the transmission line, without Minnkota's prior written approval.

The fiber optic regeneration sites and access roads required for the Project will be purchased in fee. These sites are located near road crossings to provide all-weather access to the sites.

4.2.2 Right-of-Way Preparation, Construction, Restoration and Maintenance

Right-of-Way Preparation

Primarily agricultural and pasture lands would be crossed by the Project. For safety purposes, tree and shrub clearing may be required in some areas in the Project ROW. However, where

safety requirements permit, trees and low growing shrubs would remain (generally less than 15 feet in height). Significant amounts of grading are not anticipated for preparation of the transmission ROW. Some grading would be required for the fiber optic regeneration stations and their associated access roads, as well as temporary access roads required for river crossings (if site conditions deem necessary) and other areas in which direct access is challenged and may require temporary access measures.

Transmission Construction Procedures

Construction will begin after required federal, state, and local approvals are obtained, sufficient property and ROWs are acquired, soil conditions are determined, and final design is completed. The precise timing of construction will depend upon various requirements that may be in place due to permit conditions, weather conditions, and available workforce.

Transmission line structures are generally designed for installation at existing grades. Typically, structure sites with 10 percent or less slope will not be graded or leveled. At sites with more than 10 percent slope, working areas will be graded level or fill will be brought in for working pads. If the landowner permits, Minnkota prefers to leave the leveled areas and working pads in place for use in future maintenance activities. If the landowner does not wish to leave the area leveled, the site will be graded back to its pre-construction condition as much as possible, and all imported fill will be removed.

Laydown areas will be established for the Project to handle delivery and temporary storage of equipment and materials necessary to construct the new transmission line facilities. Structures may either be delivered to the staked location or may be stored temporarily at a laydown area. When the structures are delivered to the location where they will be installed, they will be placed on the ROW out of the clear zone of any adjacent roadways or designated pathways. Insulators and other hardware will be attached while the structure is on the ground. The structure will then be lifted, placed, and secured using a crane.

Minnkota proposes that the majority of structures have a concrete foundation. The foundation contractor will establish batch plants, which may be portable, and may be located within laydown areas. If batch plants are located away from a laydown area, then concrete trucks will be required to bring concrete from a concrete batch plant. The foundation contractor will be responsible for all appropriate permits and agreements. Holes will be drilled in preparation for concrete. Depending on soil conditions, drilled pier foundations for tangent (in-line structures) may vary in diameter from 7 to 10 feet, and be 30 to 40 (or more) feet deep. Drilled pier foundations for deadend structures (angle), which have higher load bearing requirements, may vary in diameter from 11 to 15 feet, and be 45 to 87 (or more) feet deep. After the concrete foundation is set, the structure will be erected and bolted to it.

Most of the construction activity will be limited to the area immediately around each structure. Little additional ground disturbance will be needed at the structure sites. The total area temporarily disturbed in the vicinity of each structure is expected to be confined to an area of about 60 feet in diameter (2,827 square feet). Temporary construction access roads may be needed to access structure locations and will be located within the ROW. If a temporary access

road is needed outside of the ROW, Minnkota will use existing public and private roads where possible. Where no existing roads provide access and if needed, temporary access roads up to 30-footwide will be constructed and located through disturbed uplands (e.g., farmed land) once any necessary access easements have been secured from the landowner(s).

Once the structures have been erected, conductors will be installed by establishing stringing setup areas within the ROW. These areas are usually established every 2 to 5 miles along the Route. Conductor stringing operations require brief access to each structure to secure the conductor wire to the insulator hardware and to install shield wire clamps once final sag is established. Stringing equipment generally consists of wire pullers, tensioners, conductor reels, shield wire reels, and sheave blocks. Stringing operations involve pulling lightweight cables or ropes through the stringing sheaves located at every structure site. This cable or rope will be used to pull the conductors through the sheaves under sufficient tension to keep the conductor from coming into contact with the ground. Temporary guard or clearance poles will be installed as needed over existing distribution or communication lines, streets, roads, highways, or other obstructions, after any necessary notifications are made and permits obtained. This ensures that conductors will not obstruct traffic or contact existing energized conductors or other cables. Helicopters would be utilized to string wires across the Missouri River.

Restoration Procedures

During construction, crews will attempt to limit ground disturbance wherever possible. Upon completion of construction activities, landowners will be contacted to determine if any damage has occurred as a result of the Project. If damage has occurred to crops, fences, or the property, Minnkota will fairly reimburse the landowner for the damages sustained. If necessary, Minnkota may engage an outside contractor to restore the damaged property as near as possible to the preconstruction condition. Disturbed areas will be restored to their preconstruction condition to the maximum extent practicable or as required by regulatory agencies. Post-construction reclamation activities include removing and disposing of debris, dismantling all temporary facilities (including laydown areas and temporary access roads), leveling disturbed soil, alleviating soil compaction, and reseeded non-cultivated areas disturbed by construction activities with vegetation similar to that which was removed.

Erosion control measures will be implemented as necessary to minimize runoff during construction. Specific measures will be determined once final design of the route is complete and a field review is made to determine any areas of concern. Erosion control measures such as silt fencing, straw bale fencing, mulching, seeding, or mesh fabric overlay will be installed when and where appropriate. Access routes to structure locations will be reviewed prior to the mobilization of equipment so erosion concerns can be avoided or minimized. Construction crews will exercise caution when equipment is within 50 feet of streams and rivers and will not drive equipment through streams or rivers crossed by the transmission line.

Maintenance Procedures

Transmission infrastructure has very few mechanical elements and is built to withstand normal weather extremes. With the exception of severe weather, such as tornadoes and extreme ice storms, transmission lines rarely fail. They are automatically taken out of service by the

operation of protective relaying equipment when a fault is sensed on the system; such interruptions are usually only momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is very high, in excess of 99 percent.

Over the life of the Project, Minnkota will use the ROW to perform inspections (usually by fixed wing aircraft), maintain equipment, and make repairs. Minnkota will also conduct routine maintenance to remove undesired vegetation that may interfere with the safe and reliable operation of the proposed line.

5.0 Affected Environment

The Project crosses several properties where the USFWS holds and maintains wetland or grassland easements. The purpose of wetland easements is to conserve the wetland areas, whereas the grassland easements conserve the wetland areas and adjacent grasslands for the benefit of waterfowl and other migratory birds. Easement activities and enforcement actions are delegated to local USFWS Wetland Management District (WMD) personnel. The Project crosses six USFWS WMDs: Audubon, Long Lake, Chase Lake, Arrowwood, Valley City, and Devils Lake.

5.1 Grassland Easements

Providing vegetation for grazing and wildlife forage, cover, and nesting, grasslands are important habitats that also reduce soil erosion from wind and water, trap rain and snow thus recharging groundwater supplies, and filter chemicals (U.S. Fish and Wildlife Service, 2010). Grassland easements are surface easements that minimize impacts to land cover.

Historically, North Dakota was primarily prairie land cover although much of the area has been modified for agricultural production. In the western portions of the Study Area, prairie cover is as high as 24 percent, decreasing to nearly 2 percent in the east. Typical species present in remnant prairies include bluestem (*Andropogon* spp., *Schizachyrium* spp.), needlegrass (*Achnatherum*), Indian grass (*Sorghastrum nutans*), and sideoats (*Bouteloua curtipendula*). Healthy prairie habitats can also include a variety of forbs such as prairie smoke (*Geum triflorum*), pasque flower (*Pulsatilla vulgaris*), and coneflower (*Echinacea* spp., *Ratibida* spp.).

Two USFWS grassland easements (GL1 and GL2) are crossed by the Project Route. Table 5.1-1 provides location and associated transmission line structures within each identified grassland easement. Figure 2 shows locations of the USFWS grassland easements and transmission line structures on the easements.

Grassland easement 1 (GL1) is located in McLean County (T146N/R79W, Section 35, S ½ and T145N/R79W, Section 2, NW ¼, NW ½) east of Highway 41, and north and south of Center Street. Grassland easement 2 (GL2) is located in Sheridan County (T147N/R76W, Section 8, SW ¼, SW ½) east of 7th Avenue NE, north of 10th Street NE, and east of the McClusky Canal.

Table 5.1-1: USFWS Grassland Easements Identified Along the Project Route

Grassland Easement ID	Transmission Line Structure IDs ¹	County	Township/Range	USFWS WMD
GL1	242, 243, 244	McLean	T146N/R79W T145N/R79W	Audubon
GL2	357, 358, 359	Sheridan	T147N/R76W	Audubon

¹ Transmission Line Structure ID number based on November 11, 2011 preliminary design; structure numbers may change during final design.

5.2 Wetland Easements

Wetland easements are legal agreements between landowners and the USFWS. Wetlands protected by easements cannot be drained, burned, filled, or leveled. Lands protected by USFWS easements remain in private ownership. Wetland habitats are beneficial to erosion control and runoff reduction, flood prevention, groundwater recharge, livestock forage, and critical habitat providing food, cover and nesting sites for wildlife species such as duck, pheasants, and deer (U.S. Fish and Wildlife Service, 2010).

Wetlands occur throughout the Study Area as the Project traverses the Prairie Pothole Region of the upper Midwest. Wetlands make up to 12 percent of the land cover near the center of the Study Area, but generally decrease in abundance in eastern portions of the Study Area due to increased losses from drainage. Wetlands are typically small, isolated depressions dominated by emergent vegetation, but also may be found along drainages, rivers, and streams. Common wetland vegetation includes reed canarygrass (*Phalaris arundinaceae*), prairie cordgrass (*Spartina pectinata*), and cattail (*Typha* spp.).

The Project Route crosses about 94 individual USFWS wetland easement parcels, with about 168 easement wetlands located within the Project ROW. Figure 2 illustrates the location of USFWS wetland easement parcels in relation to the Project ROW.

5.3 Biological Assessment

A biological assessment (BA) was completed for the Project and is currently under review by the RUS and USFWS. Six federally-listed species may occur in the counties where the Project is located, including the whooping crane (*Grus americana*), piping plover (*Charadrius melodus*), interior least tern (*Sterna antillarum*), pallid sturgeon (*Scaphirhynchus albus*), gray wolf (*Canis lupus*), and black-footed ferret (*Mustela nigripes*). In addition, two candidate species may occur in the Project area: Dakota skipper (*Hesperia dacotae*) and Sprague's pipit (*Anthus spragueii*). A "no effect" or "may affect, not likely to adversely affect" determination has been recommended for all species present; however this determination has not been confirmed for the whooping crane, interior least tern, or piping plover. The RUS and USFWS are still completing consultation to conclude the Section 7 process.

Additional information regarding the listed species, including the whooping crane, is provided in the RUS Draft Biological Assessment developed for the Center to Grand Forks 345 kV Transmission Line Project (U.S. Department of Agriculture, Rural Utilities Service (RUS), 2011).

6.0 Environmental Consequences

As mentioned previously, the final location of the Project Route would be determined by the PSC. This impact discussion describes the potential effects for Alternative B-Preferred Alternative (Project Route). Impacts are discussed in terms of temporary (short-term), permanent (long-term), and direct versus indirect, depending upon the resource.

6.1 Alternative A – No Action Alternative

Under Alternative A (No Action Alternative), temporary and permanent impacts to the USFWS grassland and wetland easements crossed by the Project Route would not occur as the Project would not be developed. Therefore, there are no direct or indirect impacts as a result of the No Action Alternative.

6.2 Alternative B – Preferred Alternative

6.2.1 Impacts to USFWS Grassland Easements

Two USFWS grassland easements would be impacted by the construction of transmission line structures. During the week of September 12-16, 2011, HDR and USFWS representatives from each WMD conducted a field review of the proposed structures location on USFWS easements. The field-reviewed structure locations were based on the June 9, 2011 Project alignment. Proposed structure locations were identified in the field using a sub-meter GPS unit and route maps.

Each of the grassland easements would be impacted by the construction of three transmission line structures. Table 6.2-1 provides the temporary and permanent impacts associated with the USFWS grassland easements (GL1 and GL2).

Table 6.2-1: Temporary and Permanent Impacts to Identified USFWS Grassland Easements Identified Along the Project Route

Grassland Easement ID	Transmission Line Structure ID ¹	County	USFWS WMD	Impacts to the Grassland Easement	
				Temporary Impacted Areas (ac)	Permanent Impacted Areas (ft ²) (ac)
GL1	242, 243, 244	McLean	Audubon	2.13	234 ft ² (0.005 ac)
GL2	357, 358, 359	Sheridan	Audubon	1.88	234 ft ² (0.005 ac)
Total				4.02	468 ft² (0.011 ac)

¹ Transmission Line Structure ID number based on November 11, 2011, preliminary design; structure numbers may change during final design.

² ROW size calculations are based on the Project's 150-foot ROW.

Temporary Impacts

Temporary (short-term) impacts to the grassland easements include temporary access roads to the structure locations and construction staging at each structure. Table 6.2-1 provides a summary of the temporary impacts for each grassland easement.

As previously mentioned, much of the construction activity would be limited to the area immediately around each transmission line structure. Temporary disturbance for construction staging is expected to be confined to an area of about 60 feet in diameter (2,827 square feet) for each mono-pole structure.

Temporary construction access roads would be needed to access structure locations. Temporary access roads will be up to 30-feet wide and would generally run down the center of the Project ROW. In some cases, with landowner permission, the road alignment would be altered to avoid impacts to wetlands or other sensitive resources. No grading or gravel would be used to construct the temporary access roads, as construction vehicles would likely drive on the existing surface, similar to a trail.

Permanent Impacts

Permanent (long-term) impacts to the grassland easements will be a 10-foot diameter area (78 ft²) for each structure. The three transmission line structures on GL1 would permanently impact about 234 ft² (0.005 acres). Likewise, approximately 234 ft² (0.005 acres) of GL2 would be permanently impacted by the three transmission line structures. Table 6.2-1 provides the total square-feet and acres of permanent disturbance for each of the grassland easements.

Direct and Indirect Impacts

Direct impacts associated with the two USFWS grassland easements include the construction of the transmission line structures and the temporary access road. Additionally, there would be long-term maintenance of the ROW, such as cutting vegetation taller than 15 feet to provide for the safe operation of the line. There are no indirect impacts associated with construction of the Project across USFWS grassland easements. Other than the structures themselves, the Project ROW would continue to be grassland and will continue to conserve the wetland areas and adjacent grasslands for the benefit of waterfowl and other migratory birds. Over the life of the Project, Minnkota will perform inspections, usually by fixed wing aircraft to minimize impacts. If repairs are needed, Minnkota would contact the USFWS to make arrangements for Minnkota to make the necessary repairs.

6.2.2 Impacts to USFWS Wetland Easements

HDR and USFWS representatives from each WMD conducted a field review of 17 proposed structure locations on 15 USFWS wetland easements during the week of September 12-16, 2011 (HDR, Inc., 2011). Proposed structure locations reviewed were based on the June 9, 2011 Project Route. Based on that review, the Project Route was revised to avoid and minimize impacts to USFWS wetland easements. As a result, only two USFWS wetland easements would be directly impacted by the Project Route, structures 880 and 1057 (Table 6.2-2).

There are a number of structures proposed to be located near USFWS wetland easements. As identified by USFWS field staff, these include structures 190, 198, 199, 209, 214, 229, 237, 239, 269, 284, 287, 299, 317, 321, 337, 368, 394, 435, 457, 757, 810, 838, 873, and 895. Preliminary design indicates that all of these structures are outside of the easement areas. If practicable, slight structure shifts may be made during final design to accommodate USFWS recommendations on structure locations.

Table 6.2-2: Potential Temporary and Permanent Impacts to Identified USFWS Managed Wetland Easements Identified Along the Project Route

Transmission Line Structure ID	County	USFWS WMD	Township /Range/ Section	Potential Impacts within the Wetland Easement	
				Temporary Impacted Areas ¹	Permanent Impacted Areas
880	Griggs	Valley City	T147N R61W Sec 18	8,055 sq ft (0.18 ac)	78 ft ² (0.002 ac)
1057	Nelson	Devils Lake	T149N R57W Sec 32	6,749 sq ft (0.15 ac)	78 ft ² (0.002 ac)
Total				14,804 sq ft (0.33 ac)	156 sq ft (0.004 ac)

¹ Includes construction staging area at structure location and temporary access road.

Temporary Impacts

In general, temporary impacts are associated with construction staging at the structure sites and access roads that may need to be constructed within the wetland easement. As previously mentioned, much of the construction staging would be limited to the area immediately around each transmission line structure. Temporary disturbance for construction staging is expected to be confined to an area of about 60 feet in diameter (2,827 square feet) for each mono-pole structure.

Temporary construction access roads through the wetland easements will be needed to access structures 880 and 1057. Temporary access roads to other structures will avoid USFWS wetland easements, provided that landowner agreements for alternative access can be reached. In some cases, temporary access roads may need to extend outside of the permitted Project ROW.

A total of 0.33 acres of USFWS wetland easement would be temporarily impacted by construction activities related to access and installation of structures 880 and 1057, as illustrated in Table 6.2-2.

At this time, no temporary impacts to USFWS wetland easements are anticipated for structures 190, 198, 199, 209, 214, 229, 237, 239, 269, 284, 287, 299, 317, 321, 337, 368, 394, 435, 457, 757, 810, 838, 873, and 895. These wetlands would be staked and flagged 5 feet from the wetland boundary. Best management practices (BMPs) would be put in place to minimize soil disturbance and potential erosion/deposition impacts. Detailed descriptions of BMPs that would

be installed near wetland easements are provided in the 2010 Project EA (U.S. Department of Agriculture, Rural Utilities Service (RUS), 2010).

Permanent Impacts

Permanent impacts to wetland easements include installation of the transmission line structure, which requires an area of 10-foot diameter (78 ft²) per structure. This impact would occur for structures 880 and 1057, as identified in Table 6.2-2 above. This unavoidable impact is a necessary because of the size of the wetland basin in relation to the transmission line span width.

Direct and Indirect Impacts

Direct impacts associated with the wetland easements include the construction of the transmission line structures and temporary access roads. There are no indirect impacts associated with the USFWS wetland easements. Wetlands located within the ROW would continue to provide the same wetland functions that they currently provide.

6.2.3 Biological Impacts

Currently, a BA is being developed for the Project that states that six federally-listed endangered or threatened and two candidate species may occur in the project area and a “no effect” or “may affect, not likely to adversely effect” determination has been recommended for all species present (U.S. Department of Agriculture, Rural Utilities Service (RUS), 2011). However, there is concern regarding the whooping crane and potential collisions with the new transmission line in the area during migration periods.

Potential direct effects to whooping cranes include mortality associated with collisions and permanent loss of habitat. According to the USFWS (Stehn and Wassenich 2008), collisions with power lines are the greatest known source of mortality for fledged whooping cranes. A new transmission line has the potential to affect whooping cranes during their annual spring and fall migration through North Dakota (U.S. Department of Agriculture, Rural Utilities Service (RUS), 2011). However, the Aransas-Wood Buffalo population would only be exposed to the Project during a short time period within the migration periods. USFWS guidelines identify line marking as a means to mitigate the potential affect of transmission lines on whooping crane.

7.0 Mitigation

Detailed descriptions of BMPs that would be implemented in grassland and wetland easements to minimize environmental impacts during construction are provided in the 2010 Project EA (U.S. Department of Agriculture, Rural Utilities Service (RUS), 2010). Minnkota would use BMPs during construction and operation of the transmission line and associated facilities to protect topsoil and adjacent wetland resources and to minimize soil erosion. Sediment and erosion control plans would be developed that specify the types of BMPs necessary. Depending on the site, BMPs may include installation of silt fencing, straw bales, or ditch blocks and/or covering bare soils with mulch, plastic sheeting, or fiber rolls to protect drainage ways and streams from sediment runoff from exposed soils. Erosion control BMPs would be inspected during construction, especially during significant precipitation events.

7.1 Grassland Easement Mitigation

The Project Route would be designed to minimize impacts to the grassland easements. Consideration was made to adjusting structures within the grassland easements. For GL1, the maximum span length and proximity to a road and existing transmission line dictated that the structures crossing the grassland remain as originally proposed. Likewise, the span length dictated that structures crossing GL2 remain generally as originally proposed.

Ground disturbance as a result of construction activities would be limited wherever possible. Minnkota would conduct post-construction restoration activities within the Project ROW. Impacts associated with these transmission line structures would be minimized through coordination with the USFWS; a Special Use Permit will be required to access and install the structures. The permanently impacted grasslands (0.01 acres total) will be replaced through administrative processes.

7.2 Wetland Easement Mitigation

Impacts to the USFWS wetland easements for structures 880 and 1057 have been identified as unavoidable. The wetlands are too wide to span with the transmission structures being used for the Project. Impacts associated with these transmission line structures would be minimized through coordination with the USFWS; a Special Use Permit will be required to access and install the structures. The permanently impacted wetland acres (0.004 acres total) will be replaced through administrative processes.

Ground disturbance as a result of construction activities would be limited wherever possible. Access roads will be placed outside of the wetland easements to the extent practicable, with landowner approval. Minnkota would conduct post-construction restoration activities within the Project ROW as mentioned in Section 3.2.2, Right-of-Way Preparation, Construction, Restoration and Maintenance, Restoration Procedures.

7.3 Whooping Crane Mitigation

Mitigation measures to reduce the potential impacts to the whooping crane as a result of the Project include marking the two overhead shield wires in an alternative pattern. Figure 3

provides the transmission line marking areas along the Project Route and a drawing of the typical flight diverters. Marking the transmission line is known to be an effective method to reduce potential collisions. Specifically, marking of the shield wires has been the focus since it appears that most birds strike these lines due to its small diameter and lower visibility. Both shield wires of the new transmission line would be marked in an alternating pattern with bird-flight-diverter-type markers as a conservation measure.

To reduce the potential collisions, Minnkota would mark the Project transmission line across the grassland and wetland easements and an equal amount of existing transmission lines within one mile of suitable habitat. Table 6.3-1 provides the total length of transmission line that crosses each of the two grassland easements and the two wetland easements with unavoidable impacts. All of these locations are within one mile of suitable whooping crane habitat. As mitigation for potential whooping crane impacts, the Project would mark all of the line that crosses these easements, plus an equal amount (7,542 feet (1.43 mi)) of an existing transmission line that is within one mile of suitable whooping crane habitat.

Table 7.3-1: Length of Transmission Line Crossing USFWS Grassland and Wetland Easements with Structures to be Marked for Whooping Crane Mitigation

Grassland or Wetland ID	Transmission Line Structure ID ¹	County	USFWS WMD	Length of Transmission Line (ft)/(mi)
GL1	242, 243, 244	McLean	Audubon	2,990 ft (0.57 mi)
GL2	357, 358, 359	Sheridan	Audubon	2,635 ft (0.50 mi)
T147N R61W Sec 18	880	Griggs	Valley City	437 ft (0.08 mi)
T149N R57W Sec 32	1057	Nelson	Devils Lake	1,480 ft (0.28 mi)
Total				7,542 ft (1.43 mi)

¹ Transmission Line Structure ID number based on November 11, 2011, preliminary design; structure numbers may change during final design.

Reviewing the identified issues, manufacturer recommendations, what has been performed and studied on other transmission lines, and the Avian Power Line Interaction Committee (APLIC) recommendations, the following line marker spacing will be utilized:

- Line markers placed on center 70 percent of span length (ruling span = 1,000 feet, 700 feet spaced 150 feet from each structure)
- Bird diverters spaced 100 feet apart across the middle 70 percent (700 feet) of each shield wire, with a staggered effect such that in viewing the transmission line from a horizontal plane the bird flight diverters appear 50 feet apart to make the shield wires more visible in a horizontal plane.
- Bird diverters mounted on OPGW and EHS shield wires per manufacturer's instruction

It is believed that this will provide adequate visibility enhancement on the shield wire to significantly reduce bird fatality due to collisions.

Additional details regarding line marking are provided in Section 5.0 (Conservation Measures and Line Marking Plan) of the *RUS Draft Biological Assessment developed for the Center to Grand Forks 345kV Transmission Line Project* (U.S. Department of Agriculture, Rural Utilities Service (RUS), 2011).

8.0 Consultation and Coordination

The RUS has completed a Project EA. As such, coordination with federal agencies has been conducted consistent with the NEPA process. The following provides a brief summary of the coordination completed, specifically with the USFWS.

- On April 27, 2009, Minnkota mailed the USFWS North Dakota Ecological Services Field Office a project notification letter.
- On May 6, 2009, a meeting was held in the USFWS office in Bismarck, North Dakota with Minnkota.
- On June 5, 2009, the USFWS replied to the initial consultation letter identifying federally-listed species that may be found within the Action Area.
- On September 24, 2009, a meeting with the USFWS took place to discuss the habitat and possible mitigation measures for each species of concern.
- On April 21, 2010, a Section 7 Consultation meeting was held with the USFWS, RUS, and Minnkota.
- On June 4, 2010, RUS mailed a letter to the USFWS North Dakota Ecological Services Field Office of their intended approach to consultation under Section 7(a) of the Endangered Species Act (ESA).
- On October 28, 2010, RUS emailed the Draft BA to the USFWS North Dakota Ecological Services Field Office for review.
- On December 29, 2010, the USFWS North Dakota Ecological Services Field Office provided comments to the RUS on the August 2010 Draft BA.
- On June 10, 2011, the RUS emailed a letter to the USFWS requesting to validate the federally-listed species list.
- On June 16, 2011, the USFWS replied to the June 10, 2011, RUS request to validate the federally-listed species list.
- On June 29, 2011, the RUS emailed the second Draft BA to the USFWS North Dakota Ecological Services Field Office for review.
- On July 18, 2011 the USFWS emailed the RUS and the RUS replied to set up a meeting and address cost and timing questions.
- On July 28, 2011, the RUS (via conference call) and Minnkota (in person) met with the USFWS North Dakota Ecological Services Field Office and Land Office to discuss the Project status, EA, BA, and grassland and wetland easements.
- On August 3, 2011, Minnkota emailed the Supplement to the Line Marking Plan to the USFWS North Dakota Ecological Services Field Office for review.

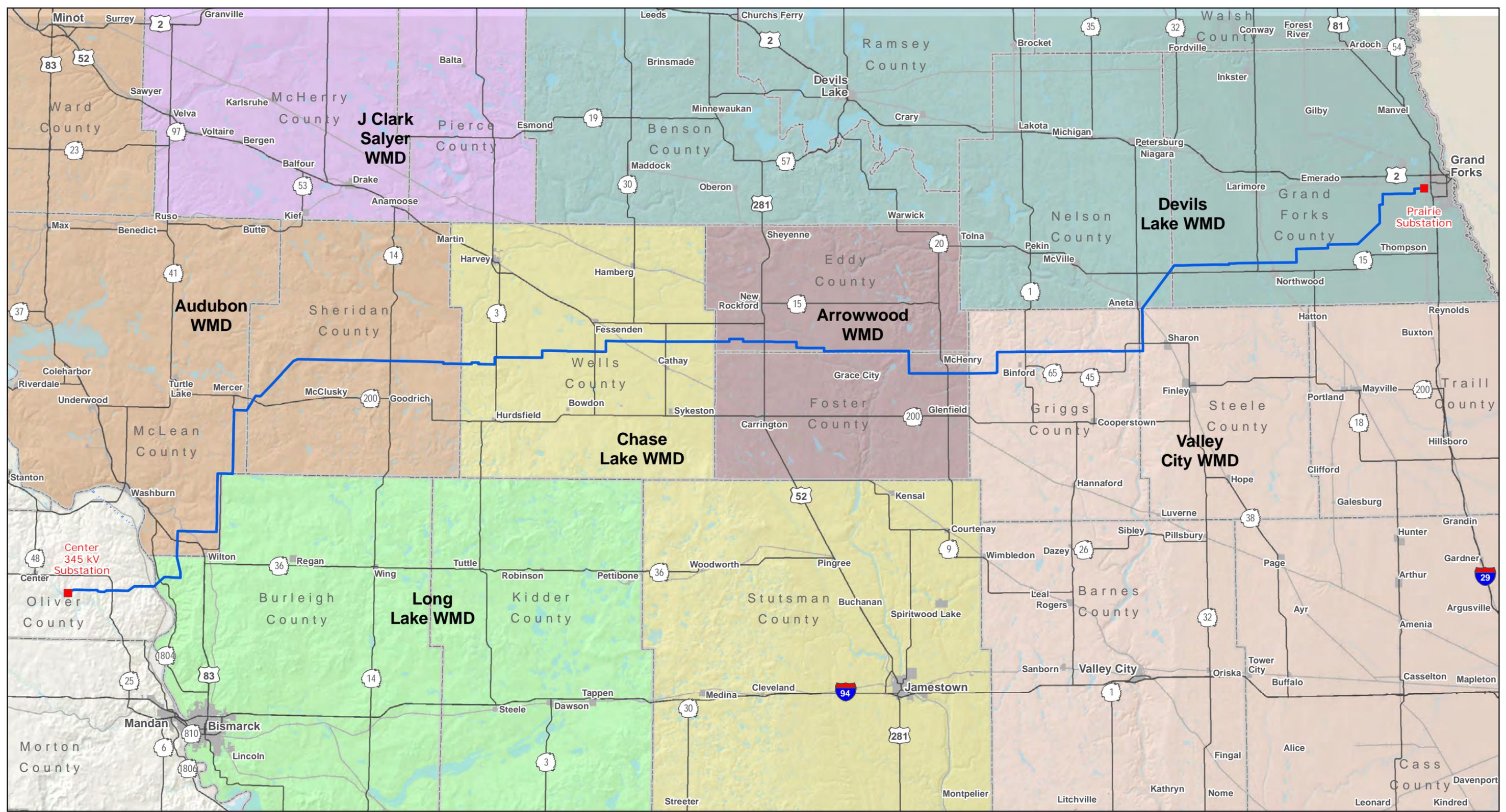
- On August 3, 2011, USFWS emailed acknowledging receipt of the Supplement to the Line Marking Plan
- On August 4, 2011, HDR phoned the USFWS inquiring if they had questions about the Supplement to the Line Marking Plan
- On August 5, 2011, USFWS emailed a response to the August 3 Supplement submittal.
- On August 21, 2011 the RUS emailed the USFWS the August 2011 Draft BA.
- On September 9, 2011, the USFWS provided interim comments on the August 2011 draft BA.
- On September 12-16, 2011, a field review of the Proposed Project structure locations occurring within the USFWS-managed grassland and wetland easements was conducted September 12-16, 2011.
- On September 11, 2011 RUS emailed the USFWS for further information on formal consultation and line marking recommendations.
- On September 22, 2011, RUS received a letter from USFWS regarding Section 7 consultation.
- On October 11, 2011, Minnkota provided USFWS with a draft of the USFWS EA along with structure locations.
- On November 22, 2011, Minnkota provided USFWS with the updated shape files showing structure locations.
- On December 13, 2011 the RUS emailed a letter to the USFWS requesting to validate the federally-listed species list.
- On December 30, 2011 the USFWS mailed a letter validating the federally-listed species list.

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Figures

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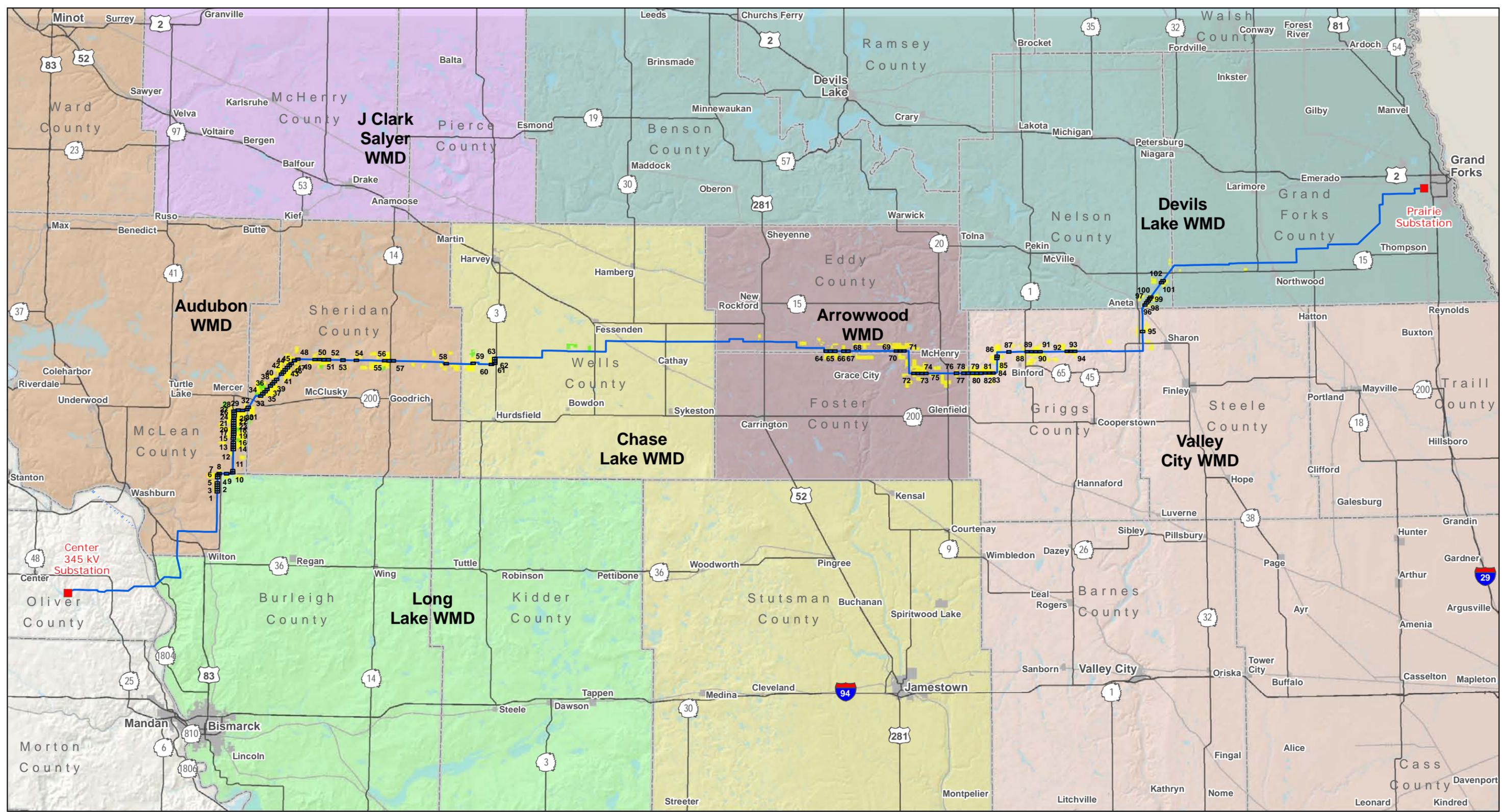


- Project Substation
- Project Route



Figure 1
Project Location
Center to Grand Forks Project

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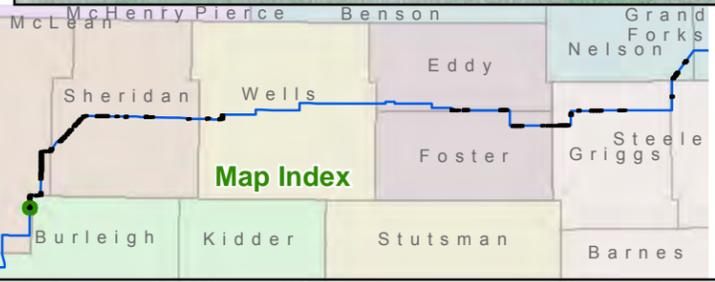
- Map Page
- Project Substation
- Project Route
- USFWS Wetland Easement
- USFWS Grassland Easement

Figure 2: Map Book Index
Project Route Along USFWS Easements
Center to Grand Forks Project





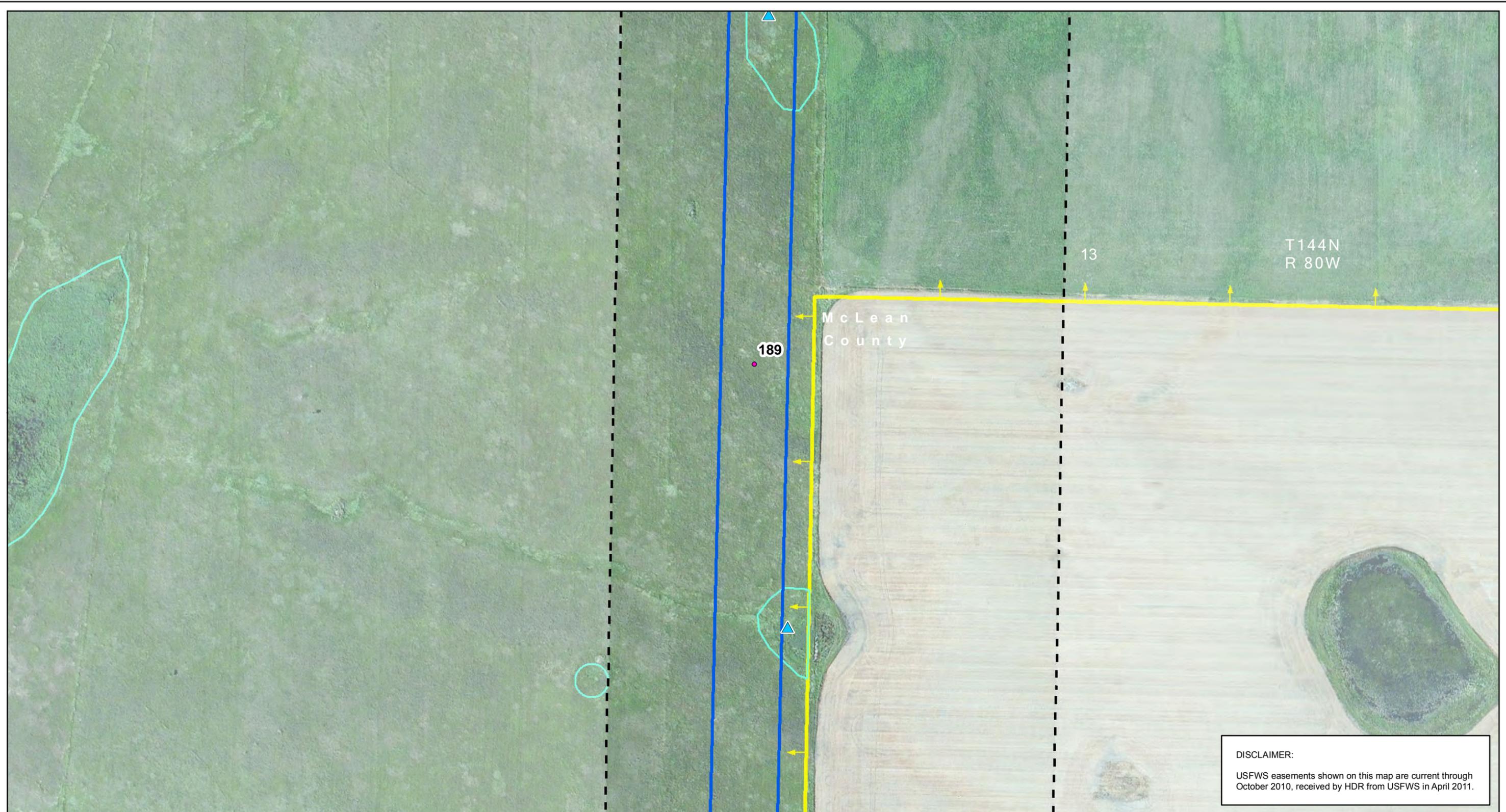
DISCLAIMER:
 USFWS easements shown on this map are current through October 2010, received by HDR from USFWS in April 2011.



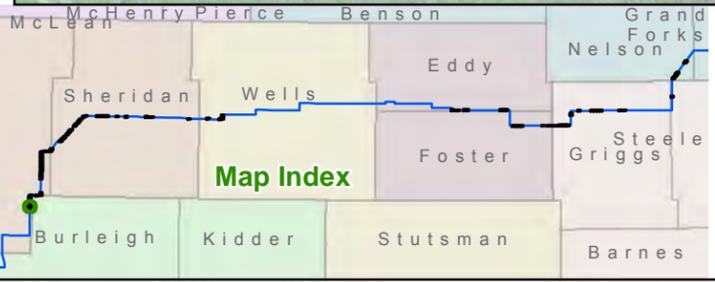
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- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
- Project ROW (150 ft wide) - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway
- 123 Structure Number

Figure 2: Page 1 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



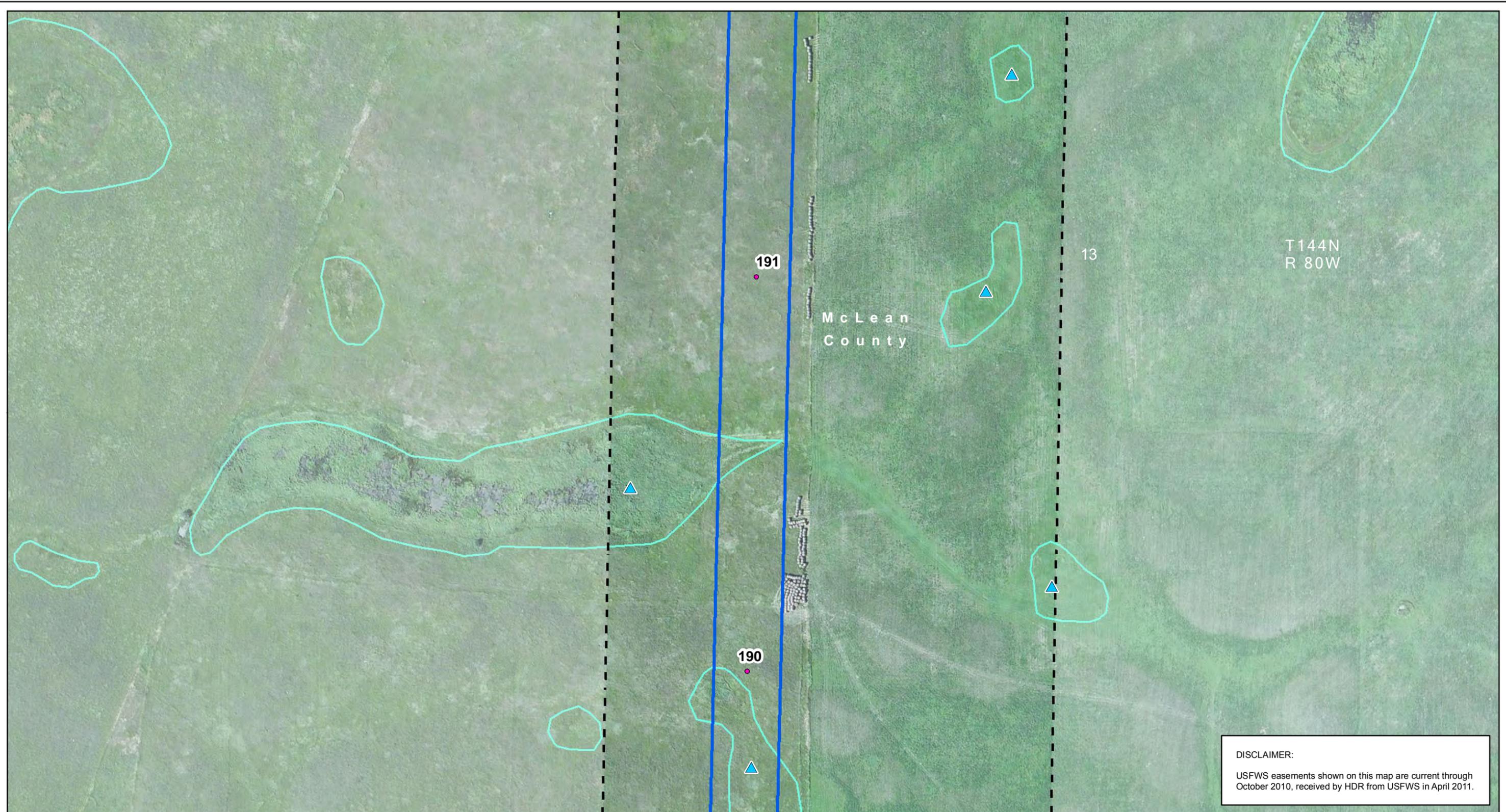
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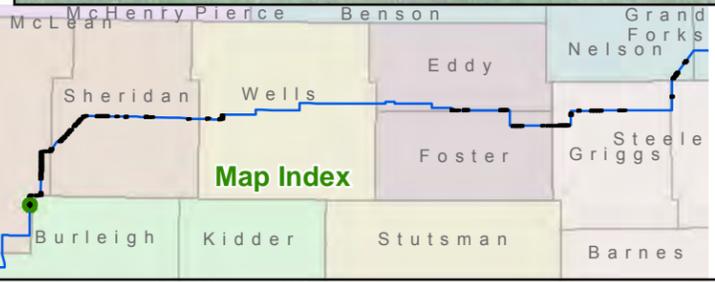
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- Temporary Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Approximate USACE Wetland Boundary
- Possible USFWS Easement Wetland within Project Corridor
- USGS Mapped Waterway

Figure 2: Page 2 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



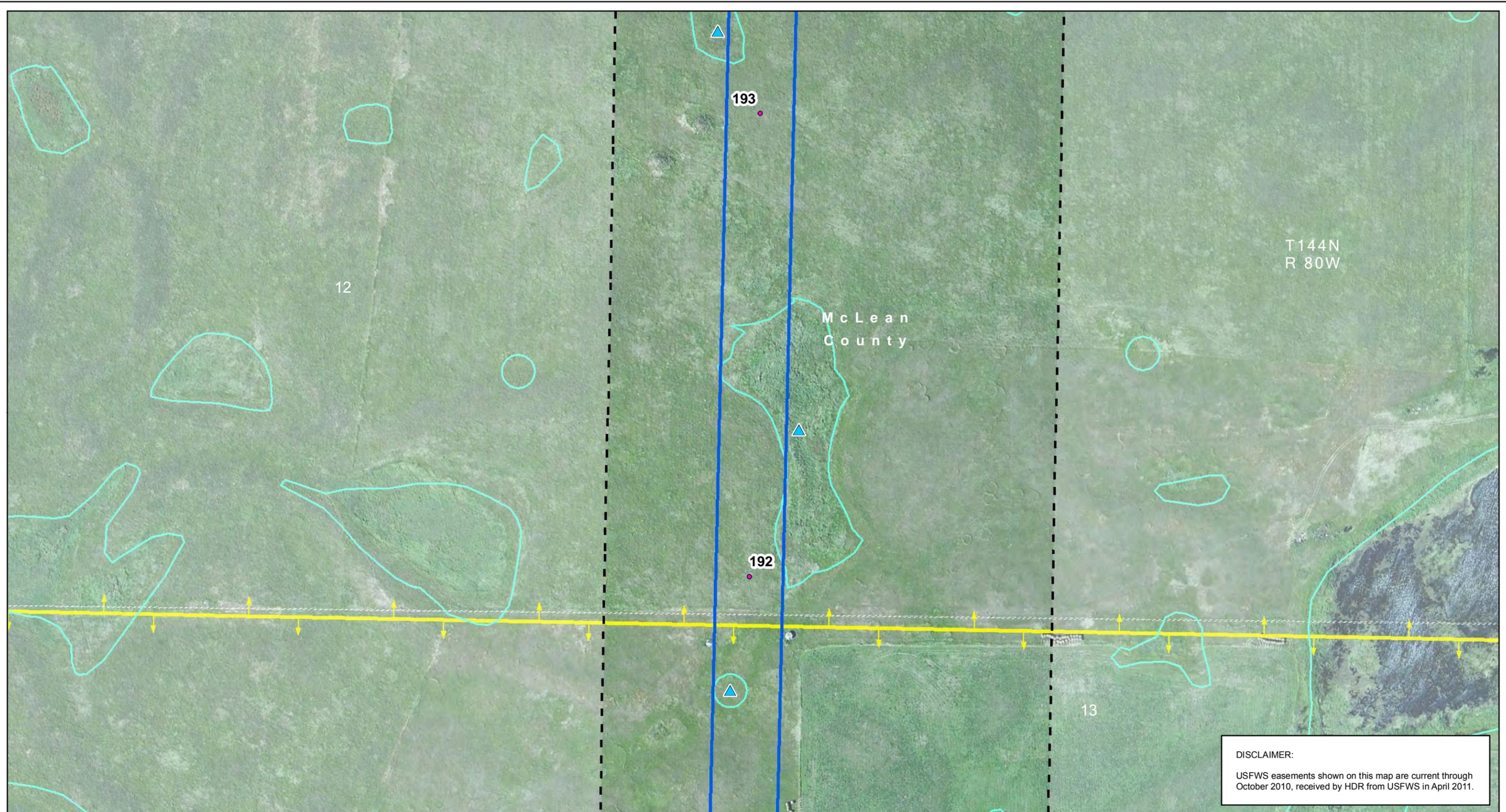
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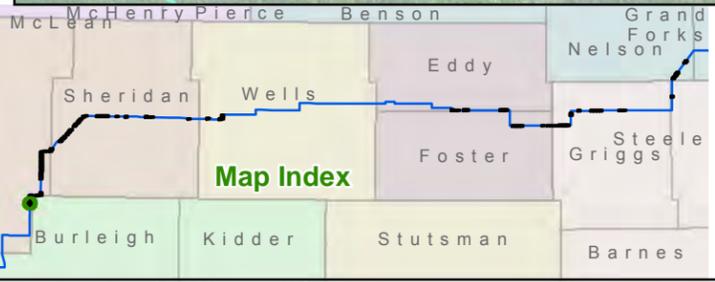
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 3 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



DISCLAIMER:
 USFWS easements shown on this map are current through October 2010, received by HDR from USFWS in April 2011.



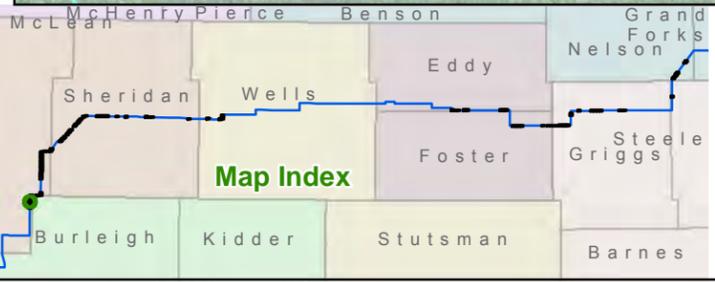
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- 123 Structure Number
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 4 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



DISCLAIMER:
 USFWS easements shown on this map are current through October 2010, received by HDR from USFWS in April 2011.



- Proposed Modified Corridor - November 18, 2011
- Permanent Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- Approximate USACE Wetland Boundary
- Project ROW (150 ft wide) - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- USGS Mapped Waterway
- 123 Structure Number

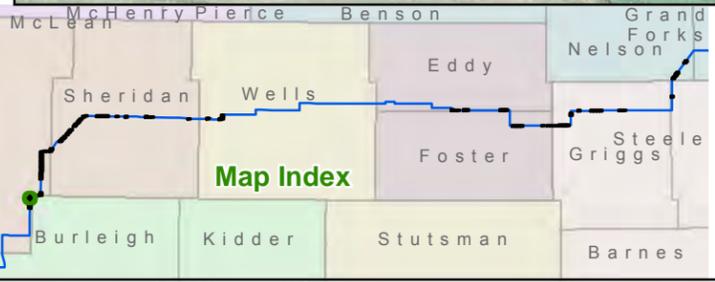
Figure 2: Page 5 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500

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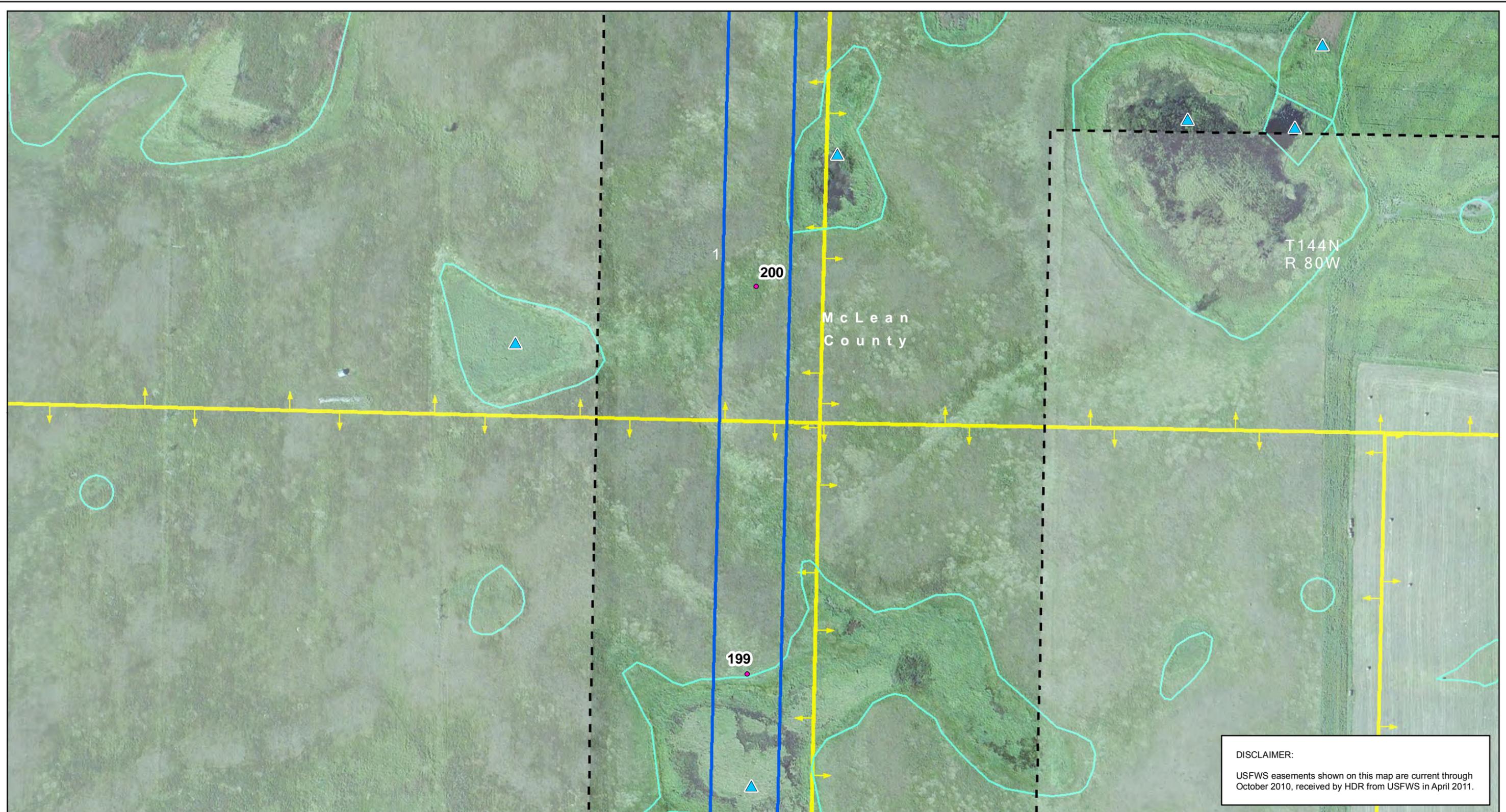
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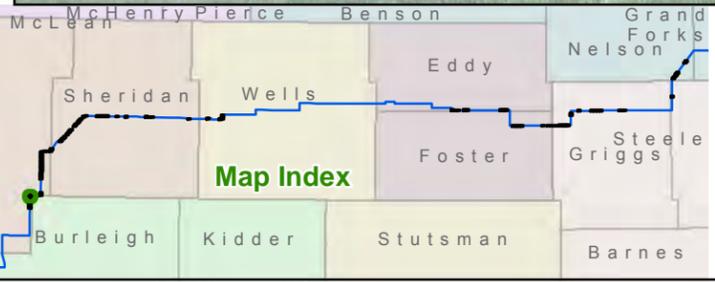
- Proposed Modified Corridor - November 18, 2011
- Project ROW (150 ft wide) - November 11, 2011
- 123 Structure Number
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 6 of 102
Project Route Along USFWS Easements
Center to Grand Forks Project

0 200 400 Feet
Scale 1:2,500



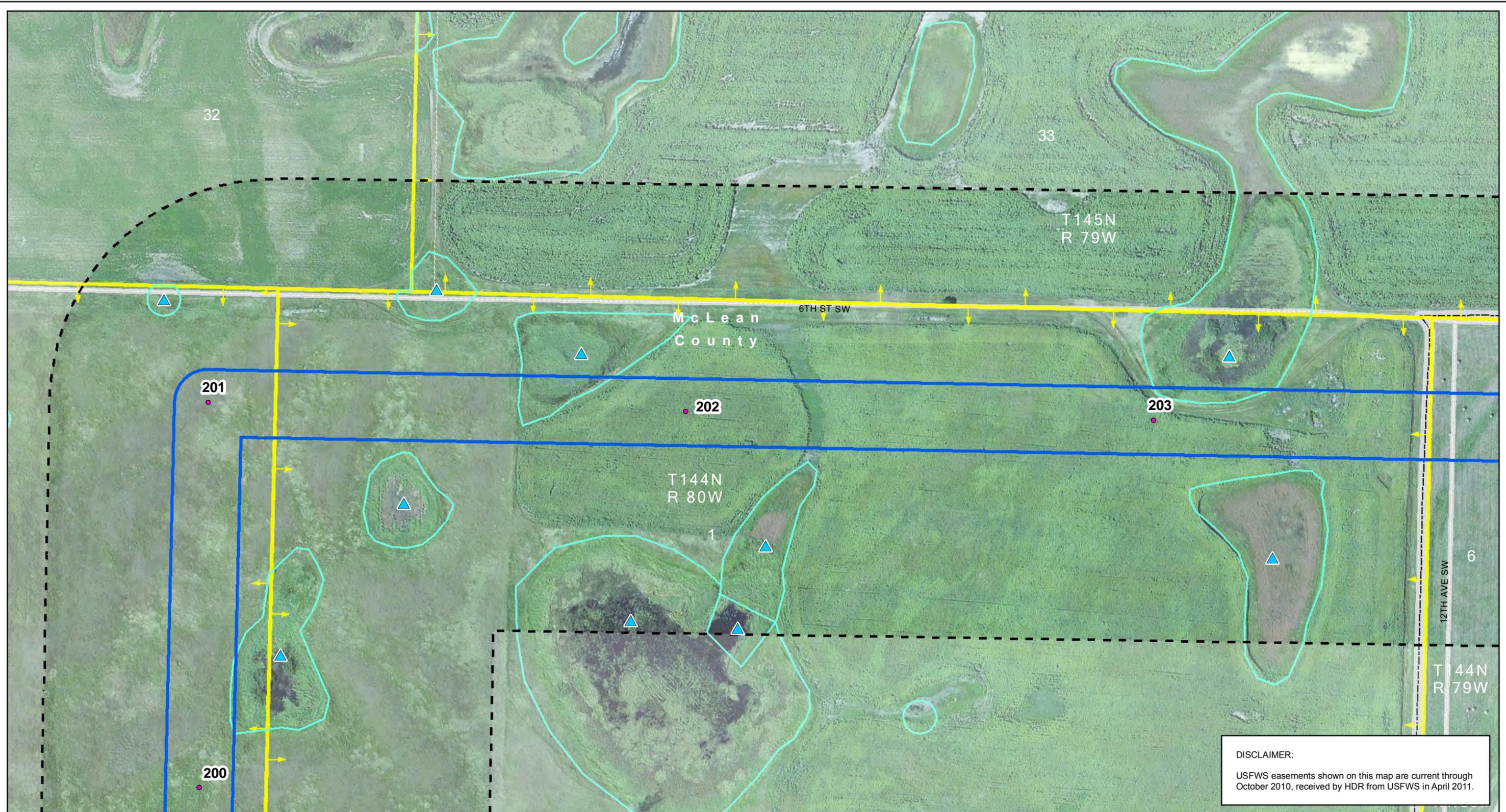
DISCLAIMER:
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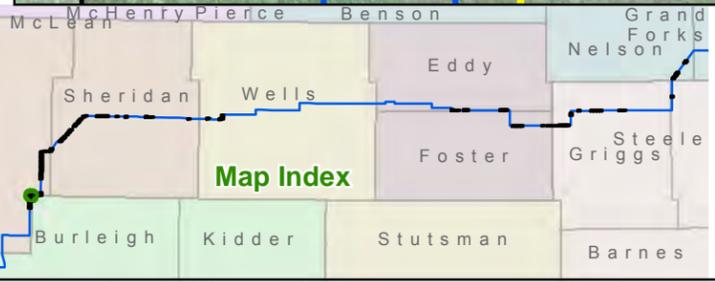
- Proposed Modified Corridor - November 18, 2011
- Permanent Impact Area - November 11, 2011
- Project ROW (150 ft wide) - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 7 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



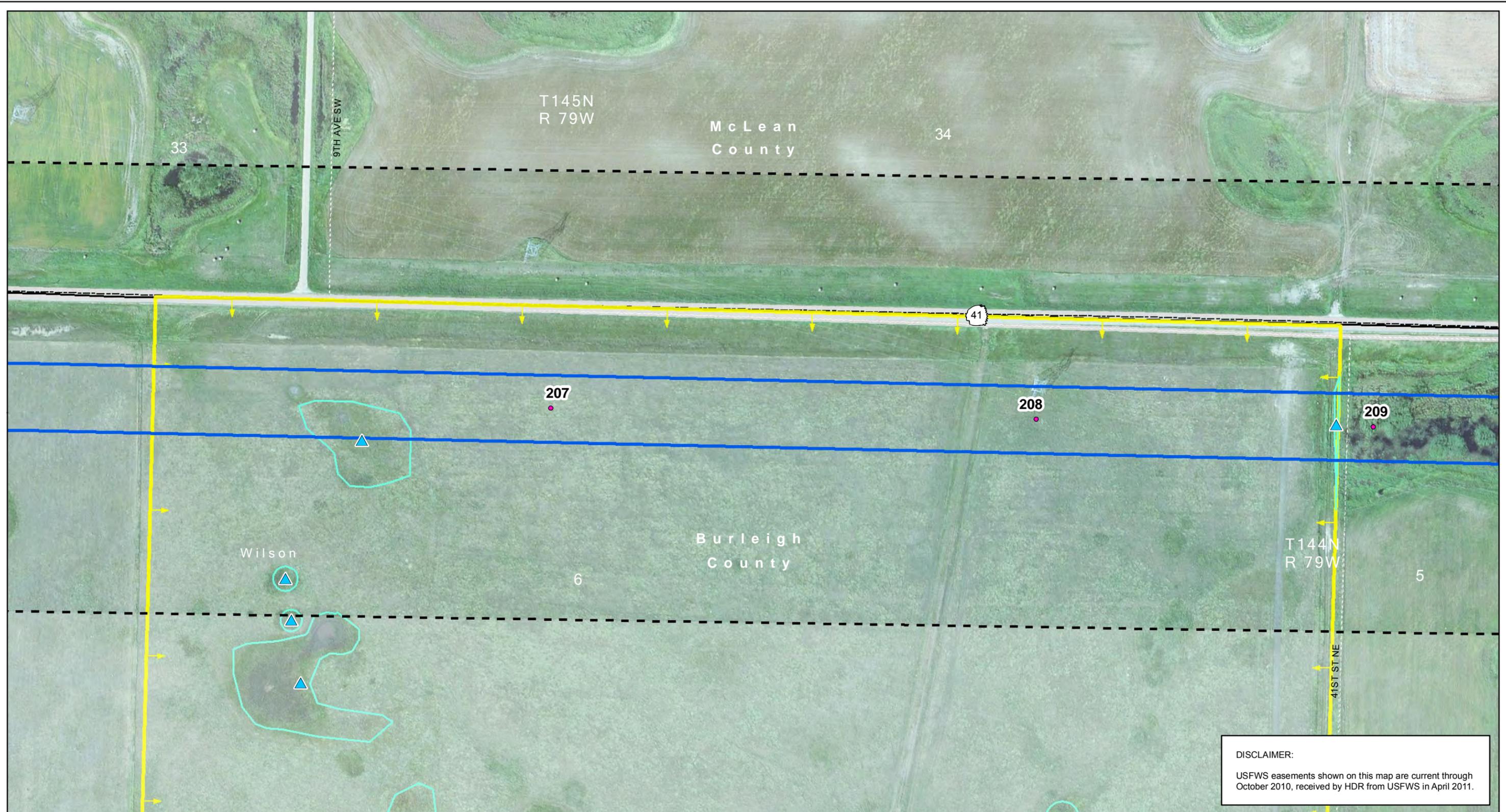
DISCLAIMER:
 USFWS easements shown on this map are current through October 2010, received by HDR from USFWS in April 2011.



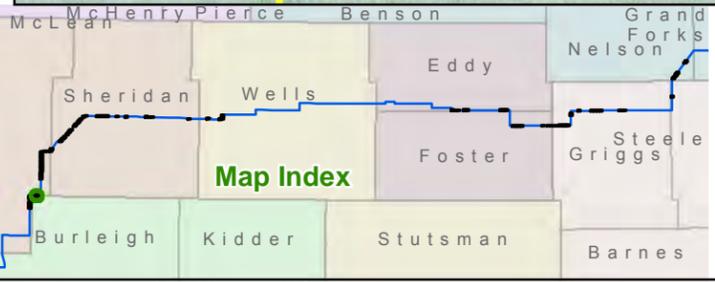
- Proposed Modified Corridor - November 18, 2011
- Project ROW (150 ft wide) - November 11, 2011
- 123 Structure Number
- Permanent Impact Area - November 11, 2011
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- USGS Mapped Waterway

Figure 2: Page 8 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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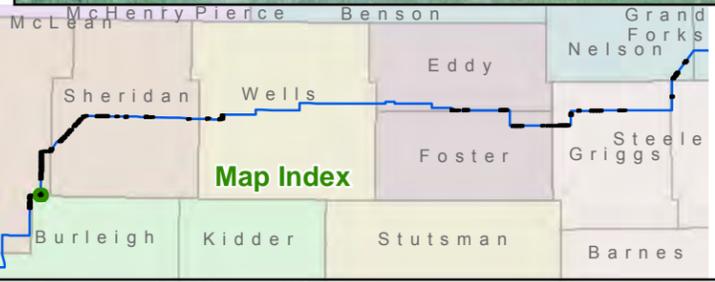
- Proposed Modified Corridor - November 18, 2011
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- Temporary Impact Area - November 11, 2011
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 9 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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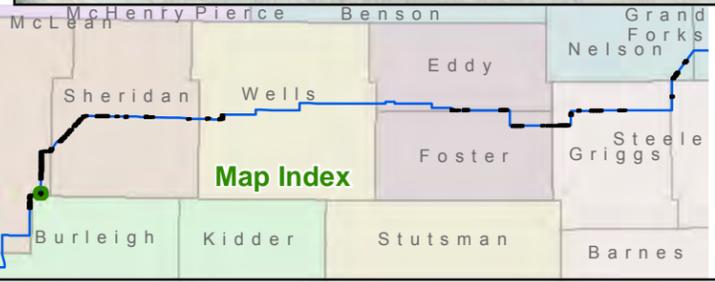
- Proposed Modified Corridor - November 18, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 10 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



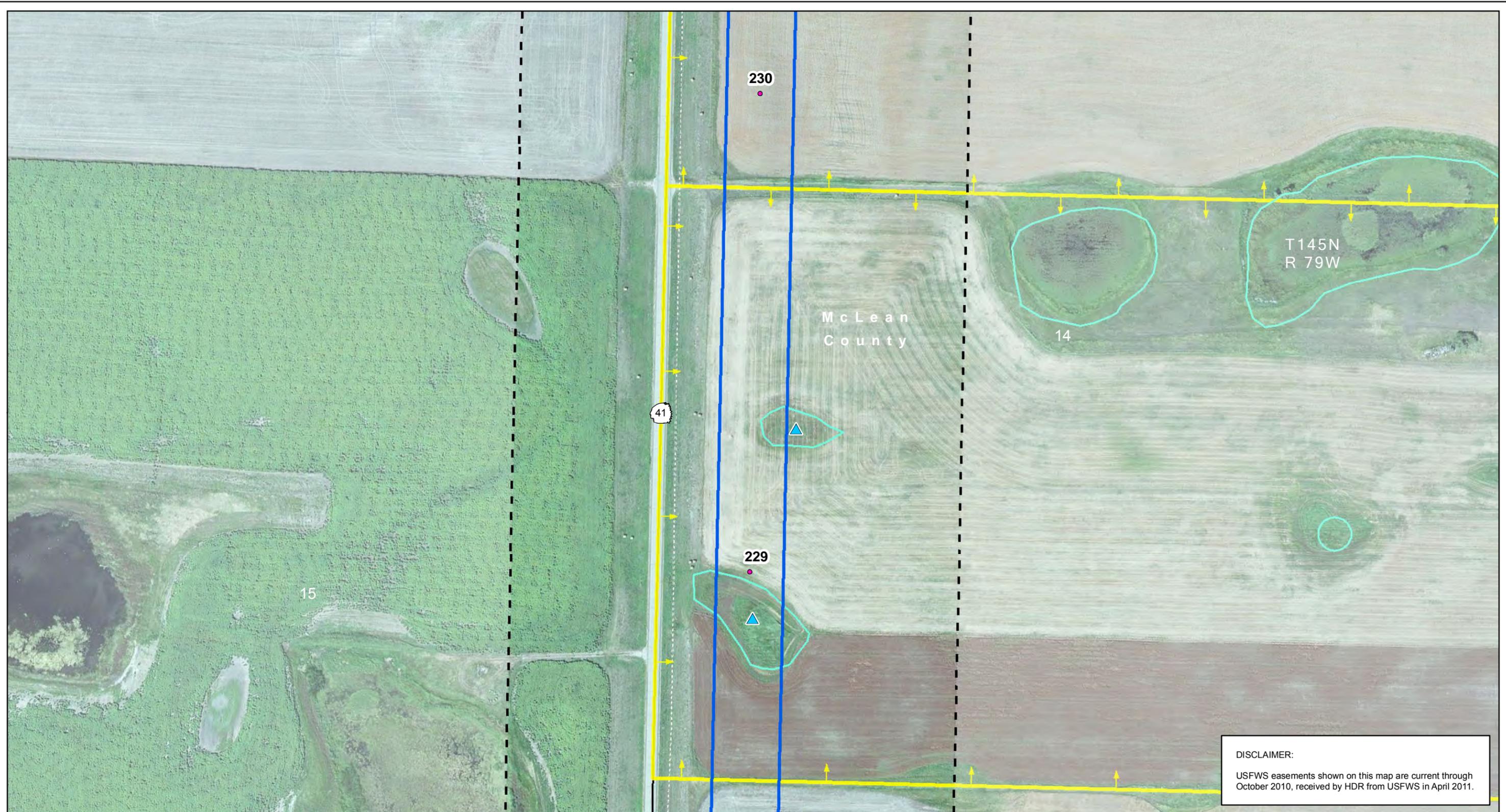
DISCLAIMER:
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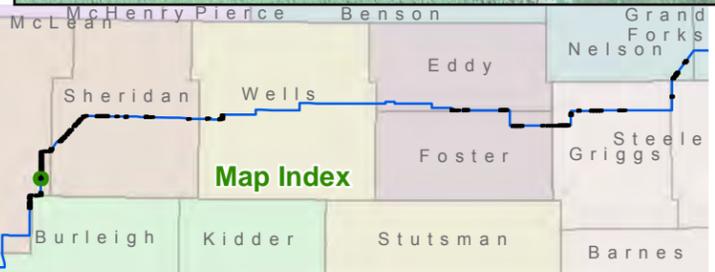
- Proposed Modified Corridor - November 18, 2011
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- 123 Structure Number
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- Temporary Impact Area - November 11, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 11 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



DISCLAIMER:
 USFWS easements shown on this map are current through October 2010, received by HDR from USFWS in April 2011.



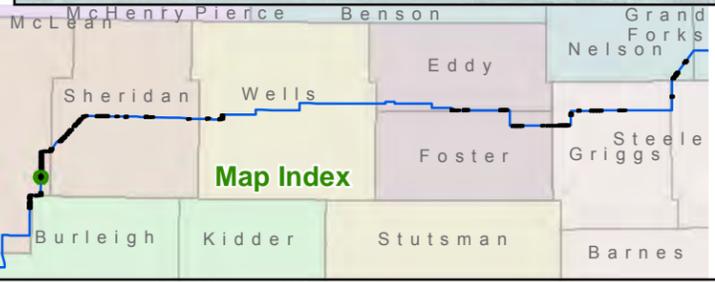
- Proposed Modified Corridor - November 18, 2011
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- USFWS Grassland Easement
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 12 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



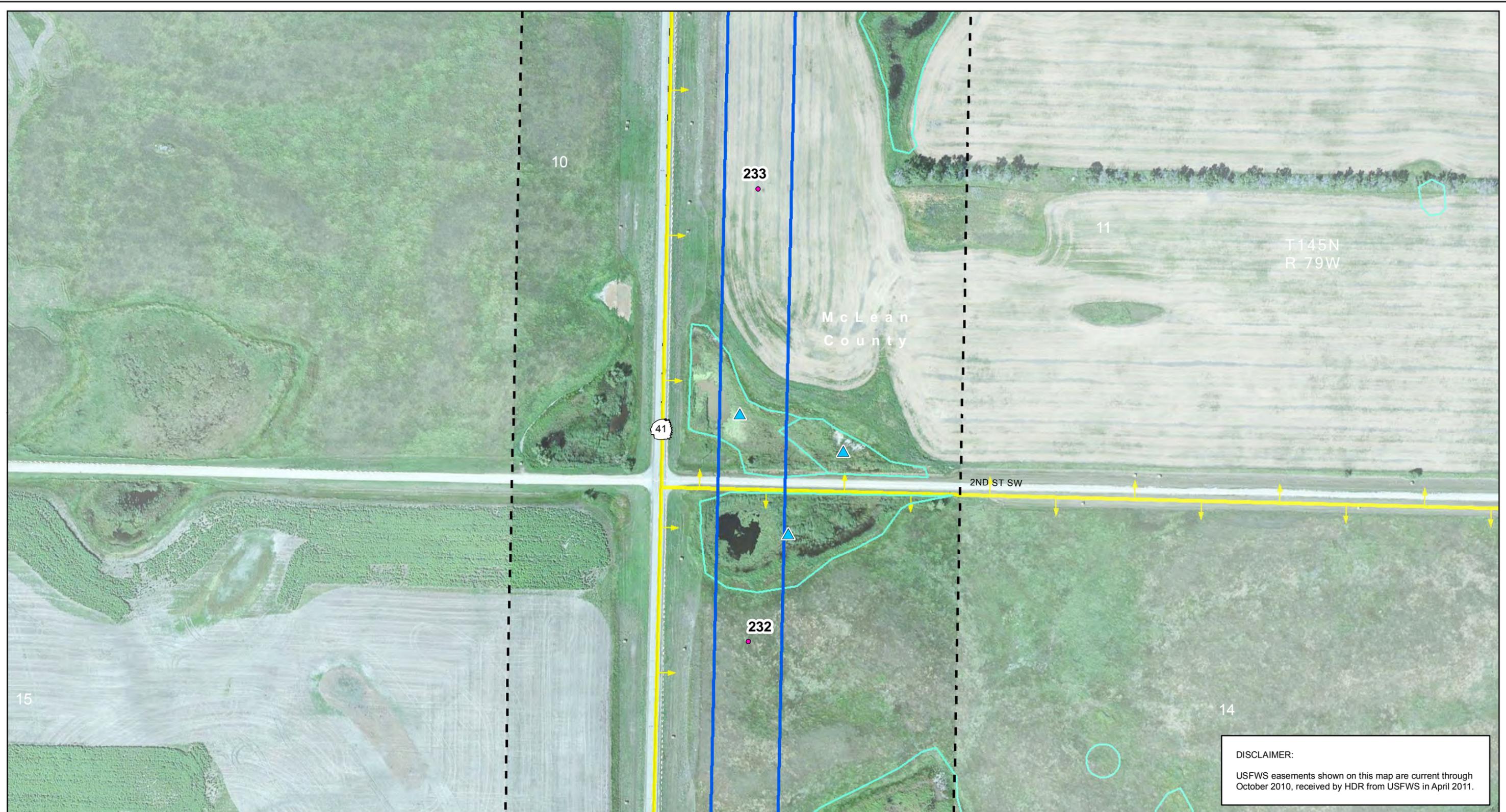
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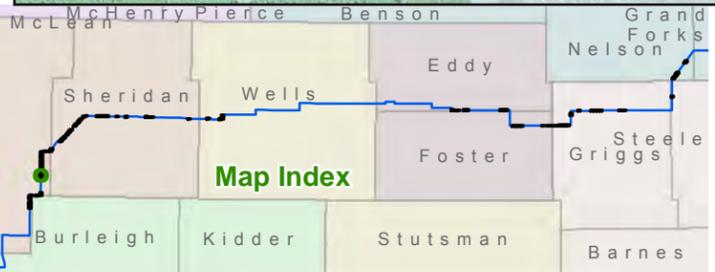
- Proposed Modified Corridor - November 18, 2011
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- USFWS Grassland Easement
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- USGS Mapped Waterway

Figure 2: Page 13 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



DISCLAIMER:
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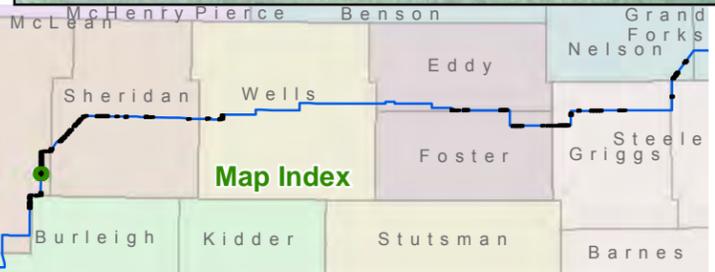
- Proposed Modified Corridor - November 18, 2011
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- 123 Structure Number
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 14 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

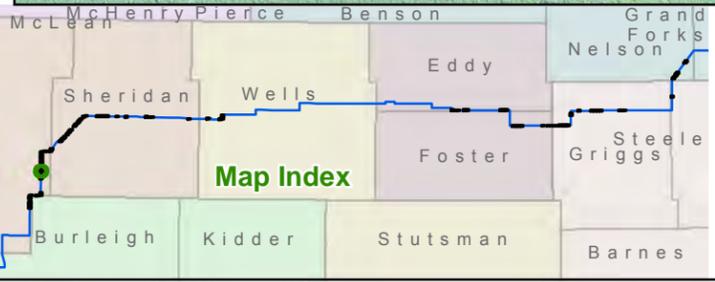
Figure 2: Page 15 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500

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DISCLAIMER:
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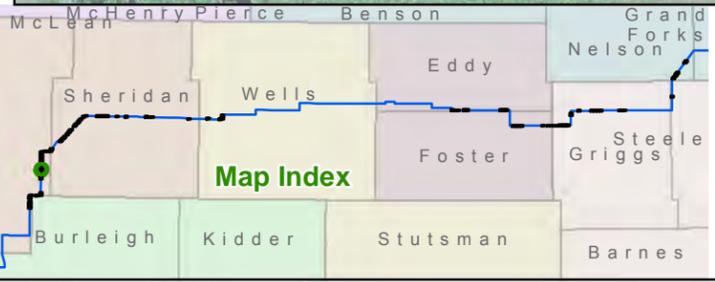
- Proposed Modified Corridor - November 18, 2011
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- USFWS Grassland Easement
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 16 of 102
Project Route Along USFWS Easements
Center to Grand Forks Project

Scale 1:2,500



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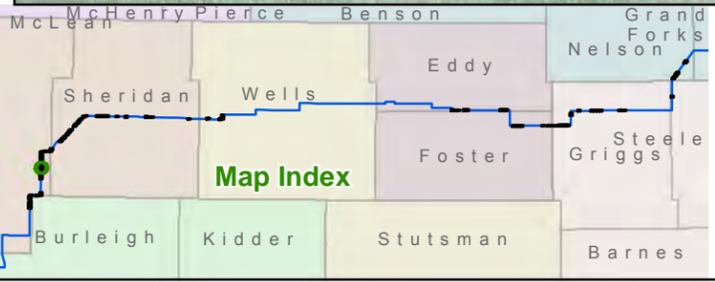
- Proposed Modified Corridor - November 18, 2011
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- 123 Structure Number
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 17 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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- Project ROW (150 ft wide) - November 11, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

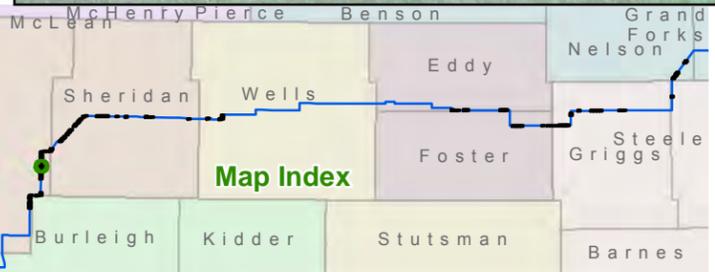
Figure 2: Page 18 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



Access path will extend from main road access to structure, and may not include entire area depicted.

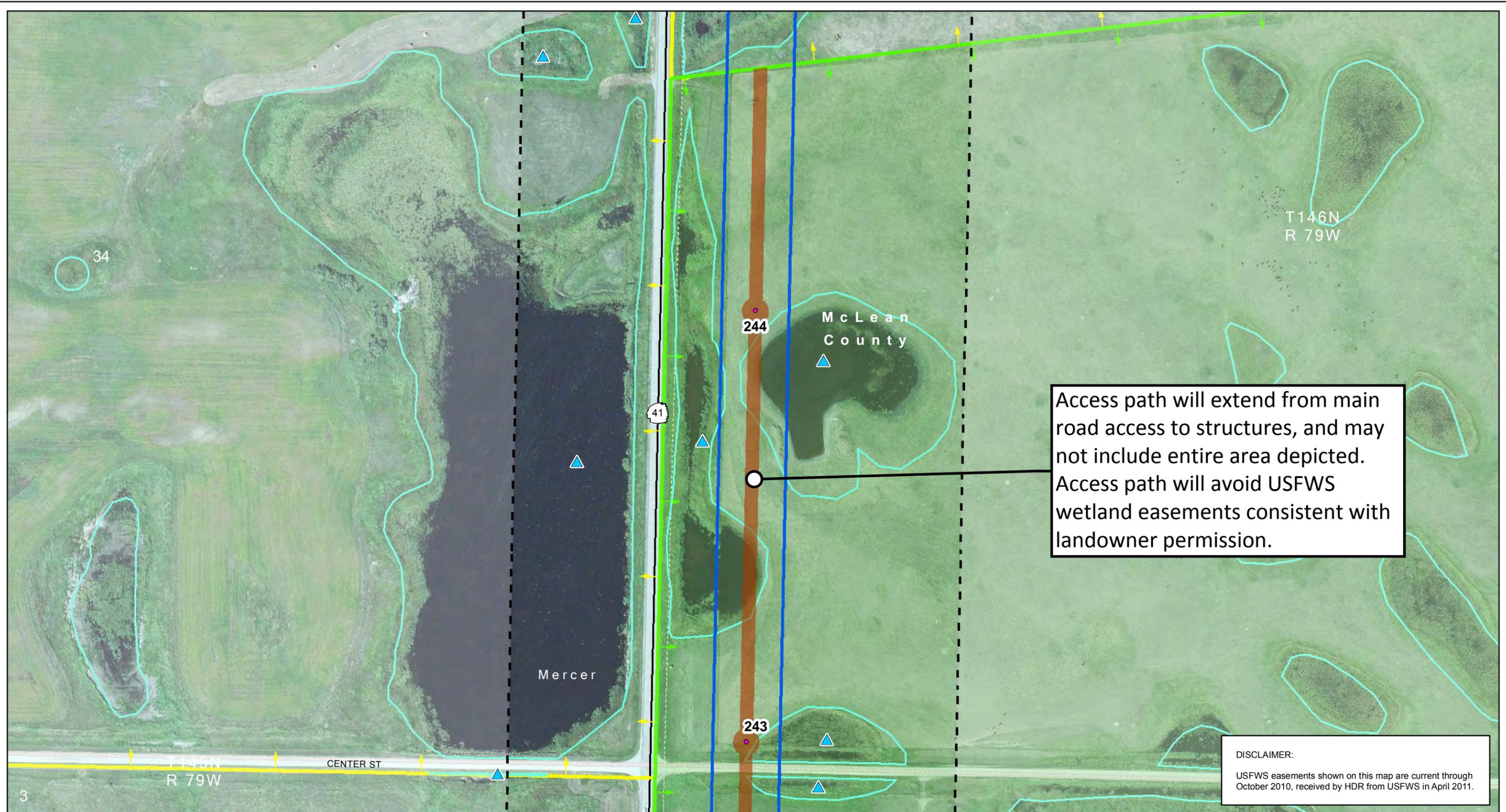
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- Proposed Modified Corridor - November 18, 2011
- Project ROW (150 ft wide) - November 11, 2011
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- Permanent Impact Area - November 11, 2011
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- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

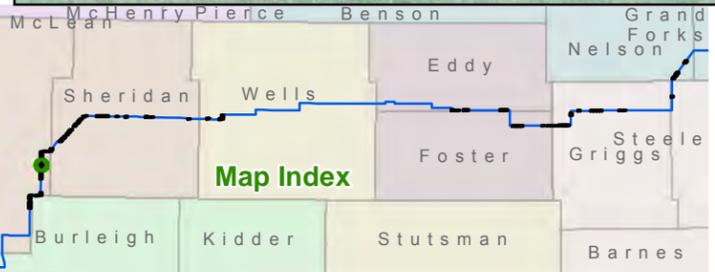
Figure 2: Page 19 of 102
Project Route Along USFWS Easements
Center to Grand Forks Project

0 200 400 Feet
Scale 1:2,500



Access path will extend from main road access to structures, and may not include entire area depicted. Access path will avoid USFWS wetland easements consistent with landowner permission.

DISCLAIMER:
USFWS easements shown on this map are current through October 2010, received by HDR from USFWS in April 2011.

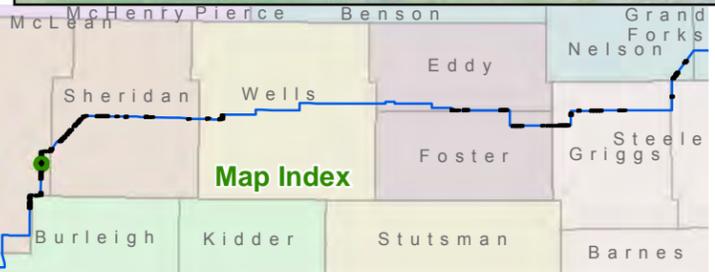


- Proposed Modified Corridor - November 18, 2011
- Project ROW (150 ft wide) - November 11, 2011
- 123 Structure Number
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 20 of 102
Project Route Along USFWS Easements
Center to Grand Forks Project



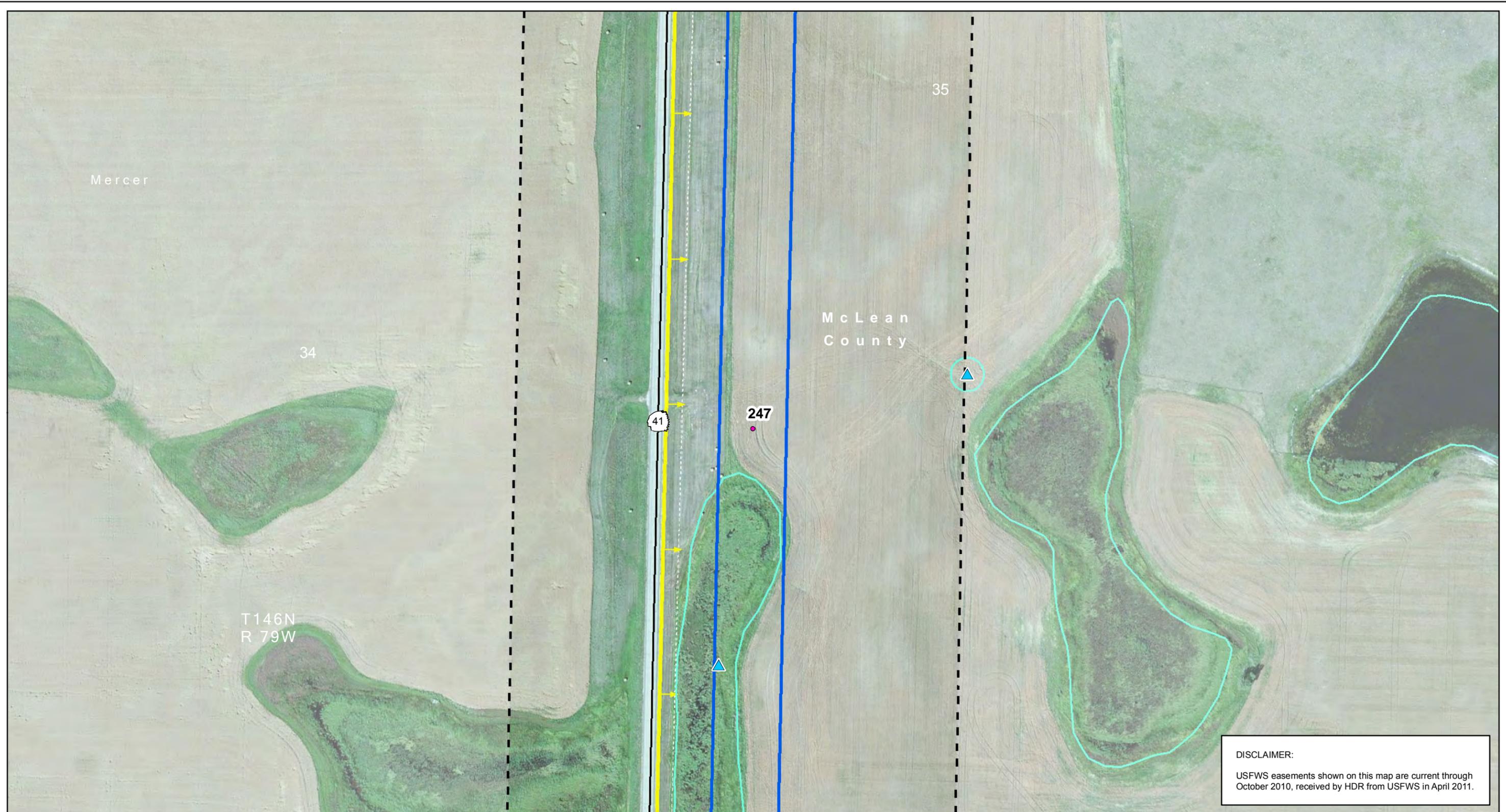
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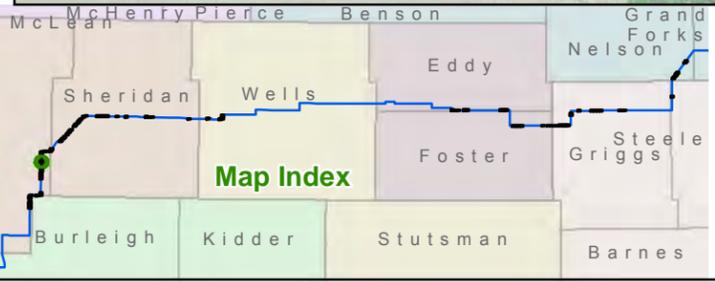
- Proposed Modified Corridor - November 18, 2011
- Project ROW (150 ft wide) - November 11, 2011
- 123 Structure Number
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 21 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



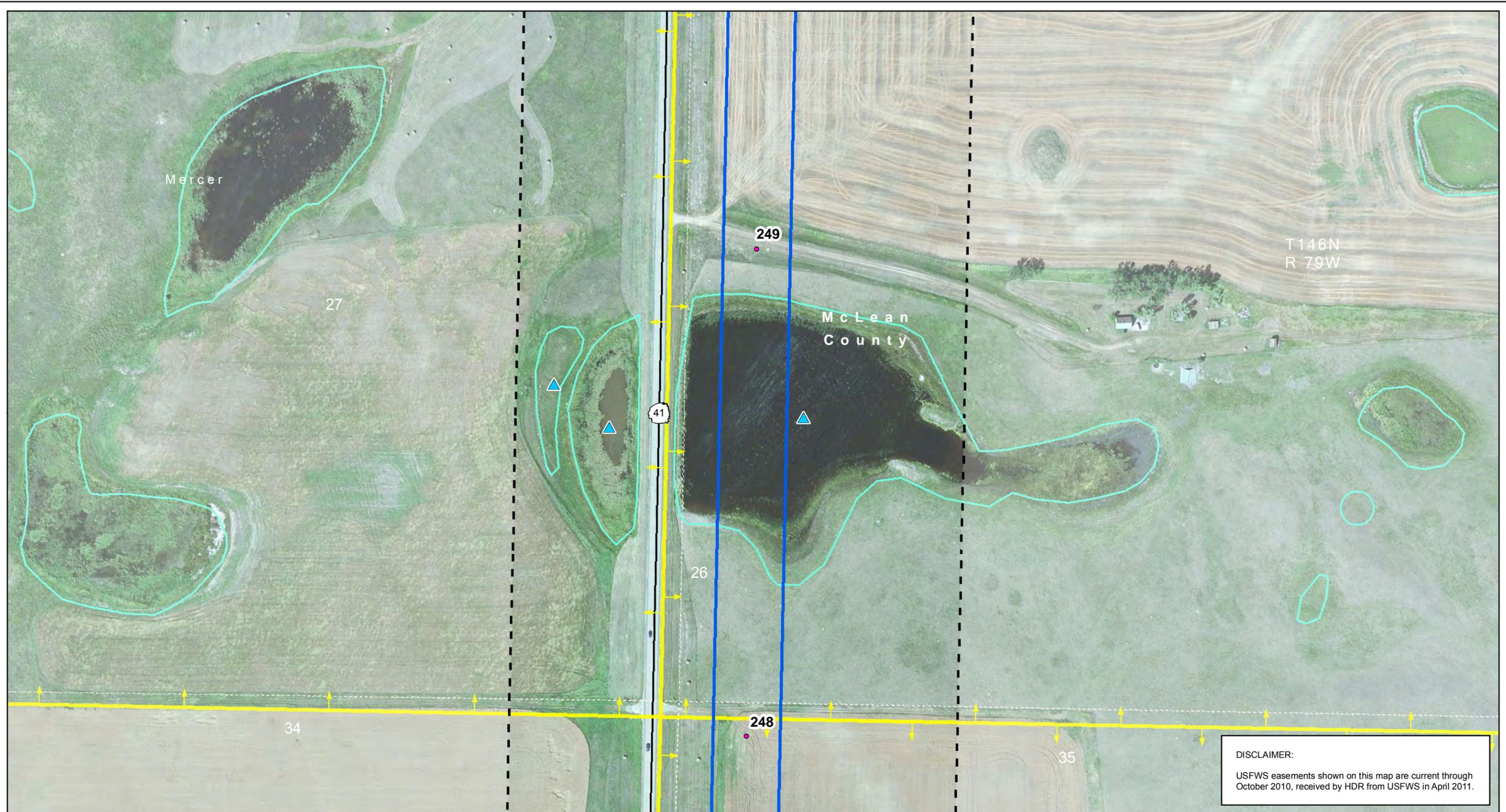
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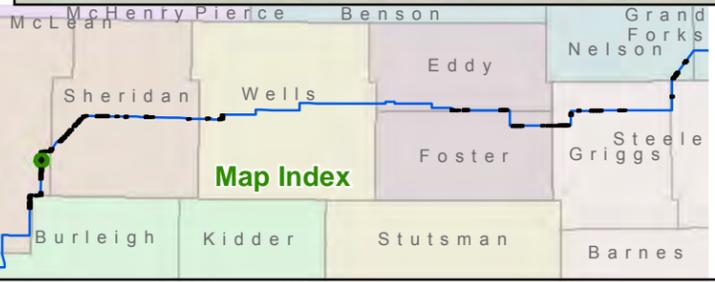
- Proposed Modified Corridor - November 18, 2011
- Project ROW (150 ft wide) - November 11, 2011
- 123 Structure Number
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 22 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



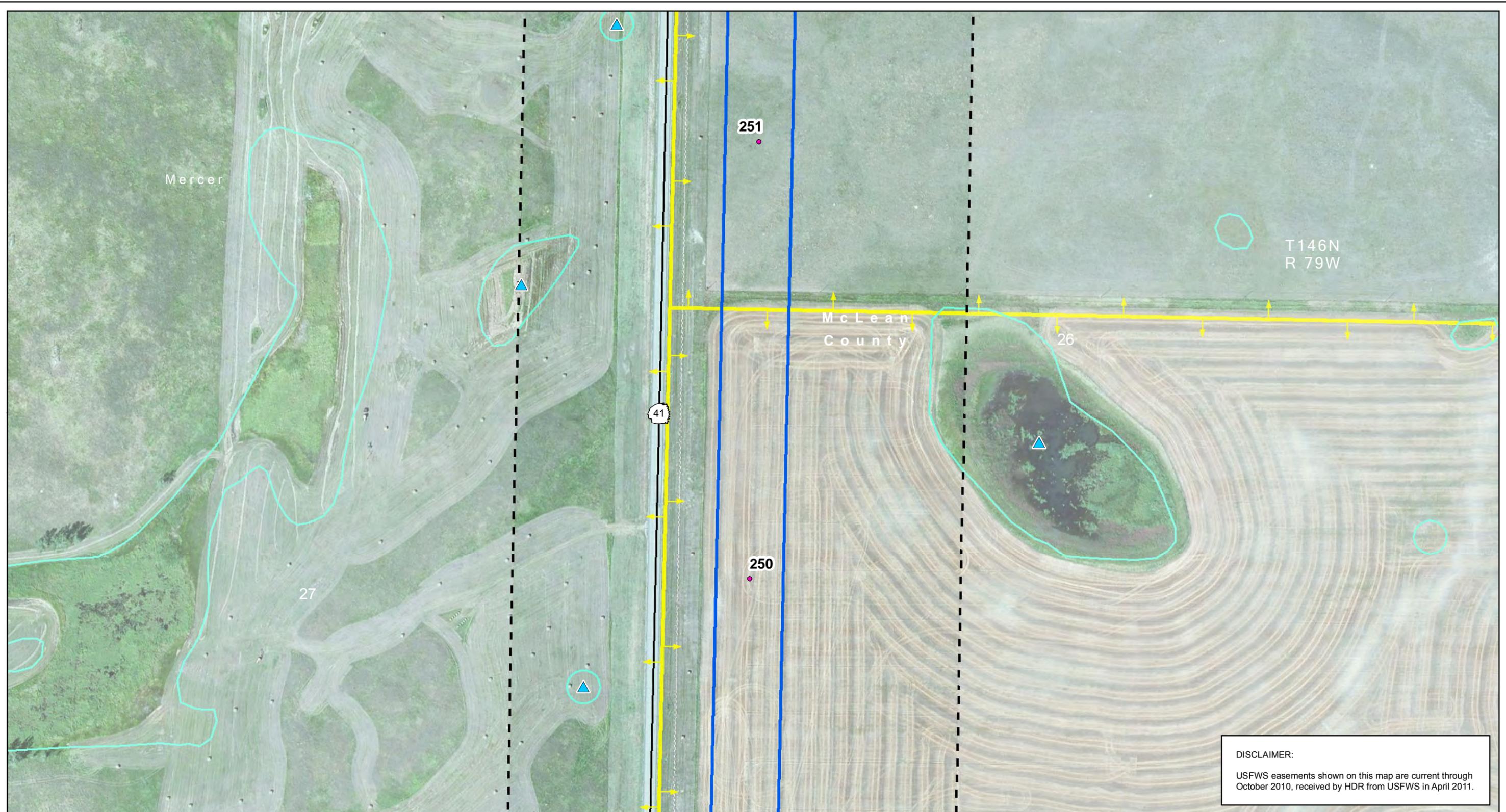
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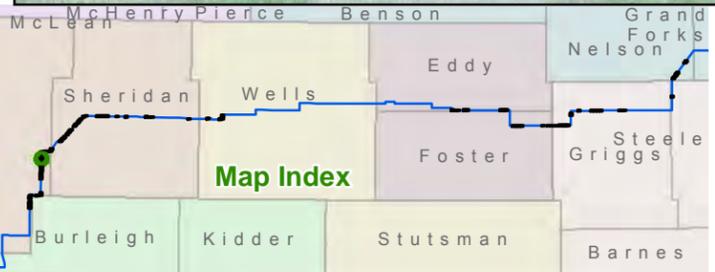
- Proposed Modified Corridor - November 18, 2011
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- USFWS Grassland Easement
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- USGS Mapped Waterway

Figure 2: Page 23 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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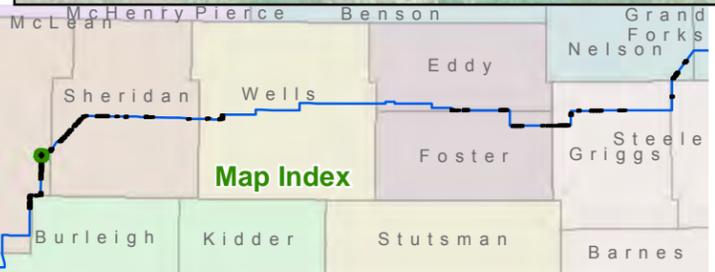
- Proposed Modified Corridor - November 18, 2011
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Project ROW (150 ft wide) - November 11, 2011
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway
- 123 Structure Number

Figure 2: Page 24 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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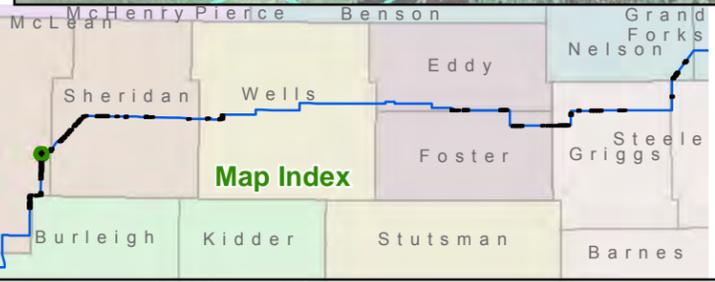
- Proposed Modified Corridor - November 18, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 26 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



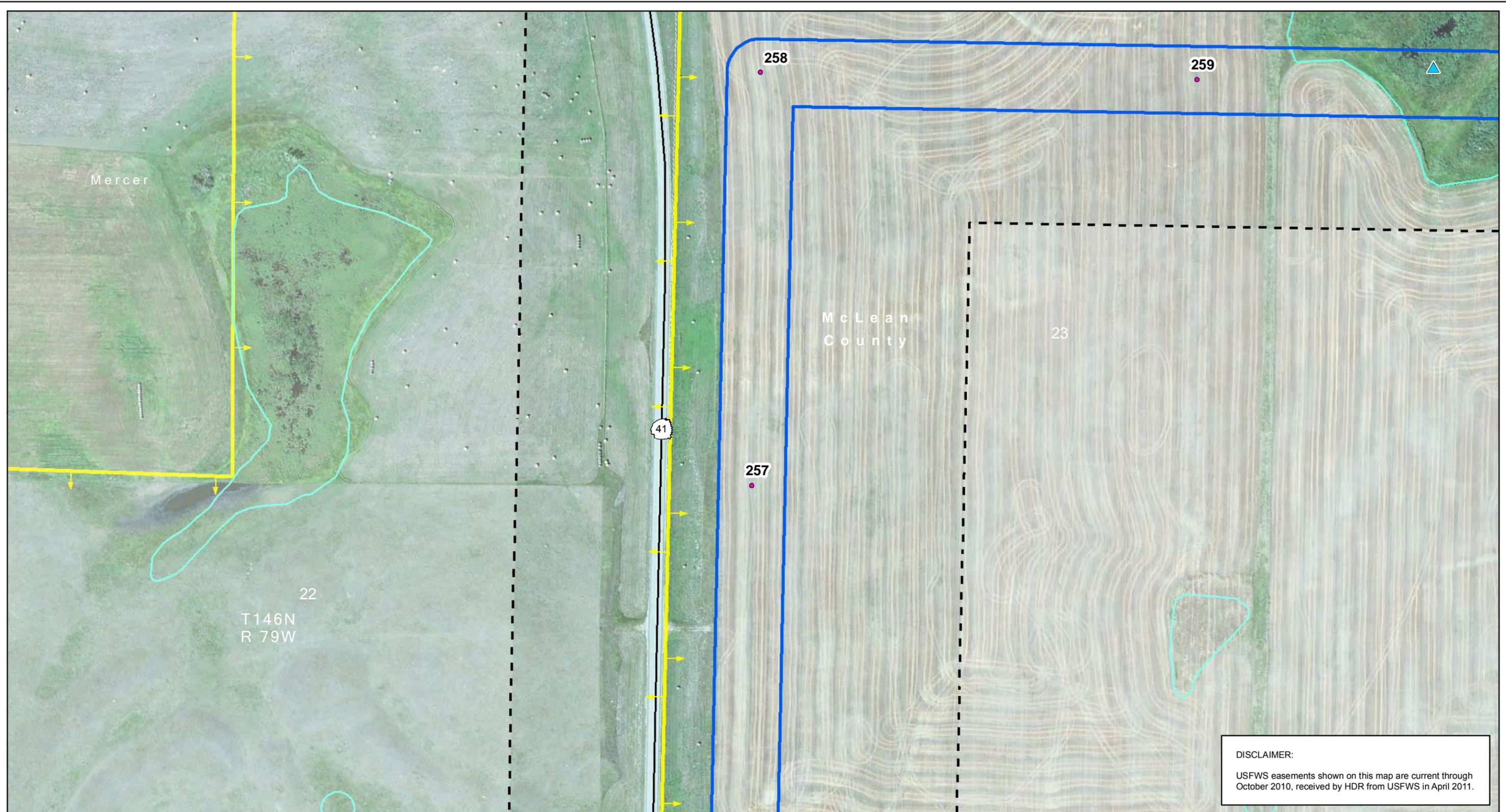
DISCLAIMER:
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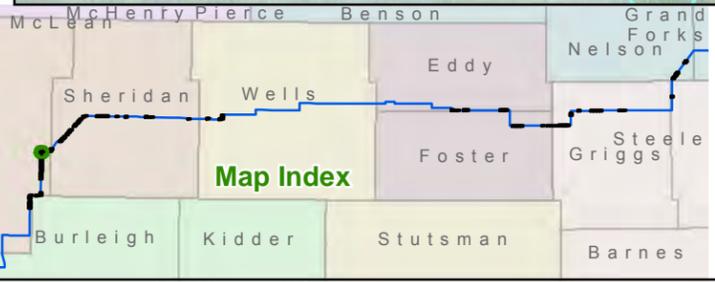
- Proposed Modified Corridor - November 18, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 27 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



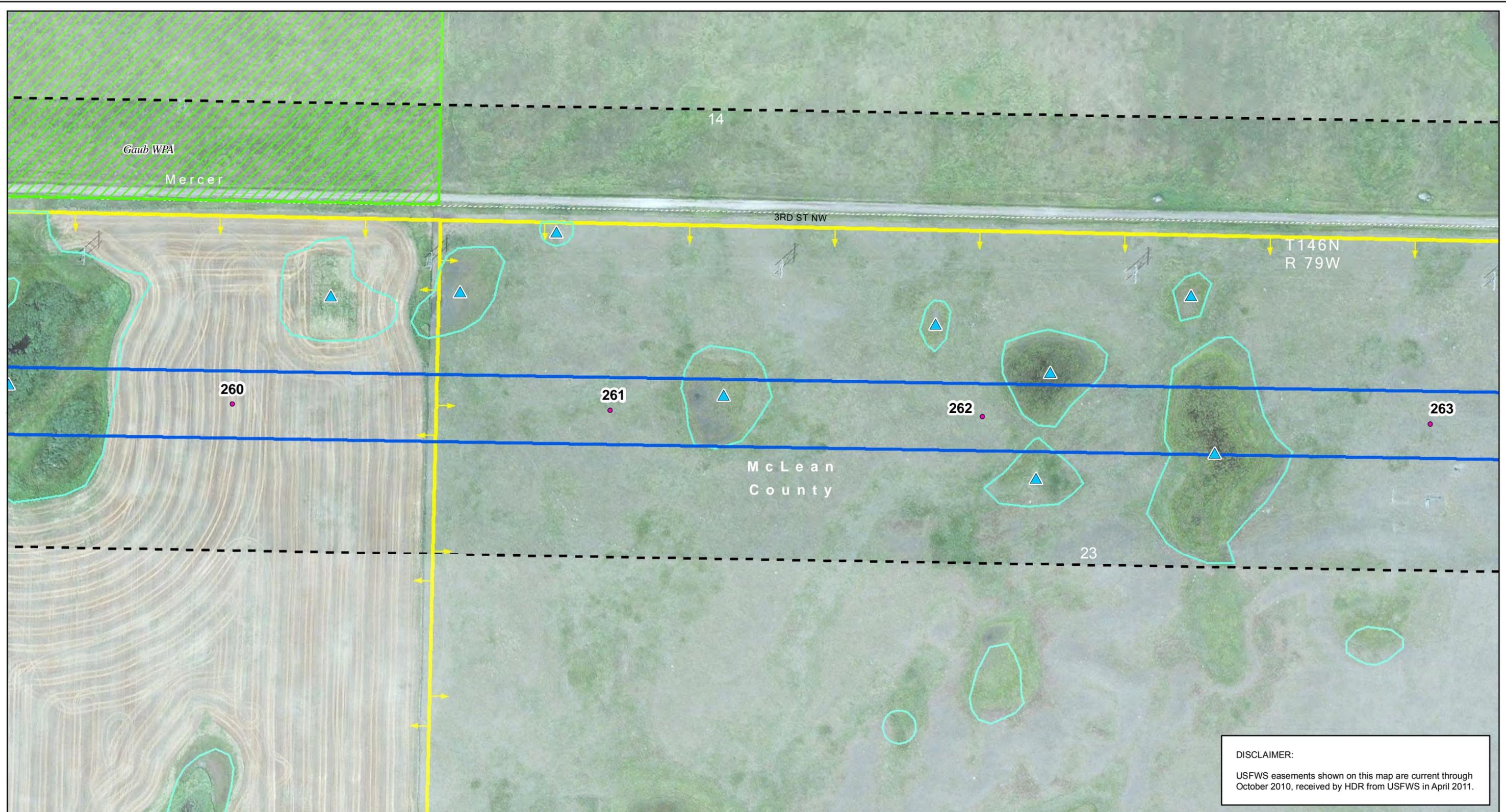
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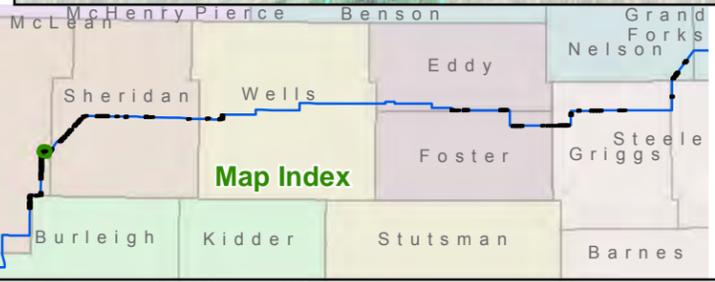
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 28 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



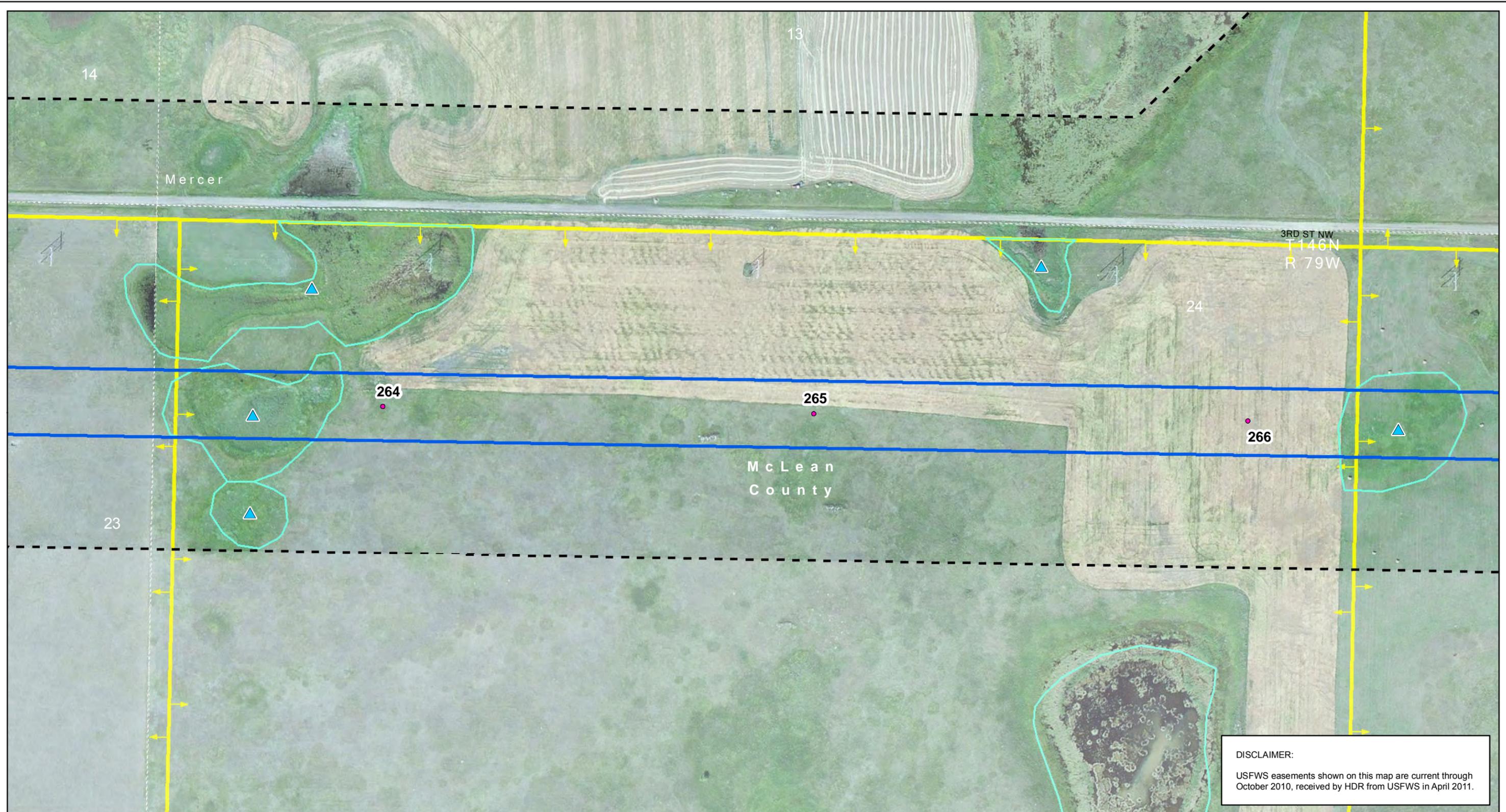
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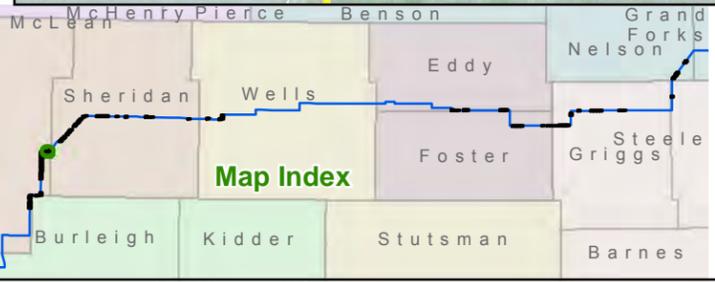
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- Temporary Impact Area - November 11, 2011
- USFWS Grassland Easement
- USGS Mapped Waterway
- 123 Structure Number
- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 29 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



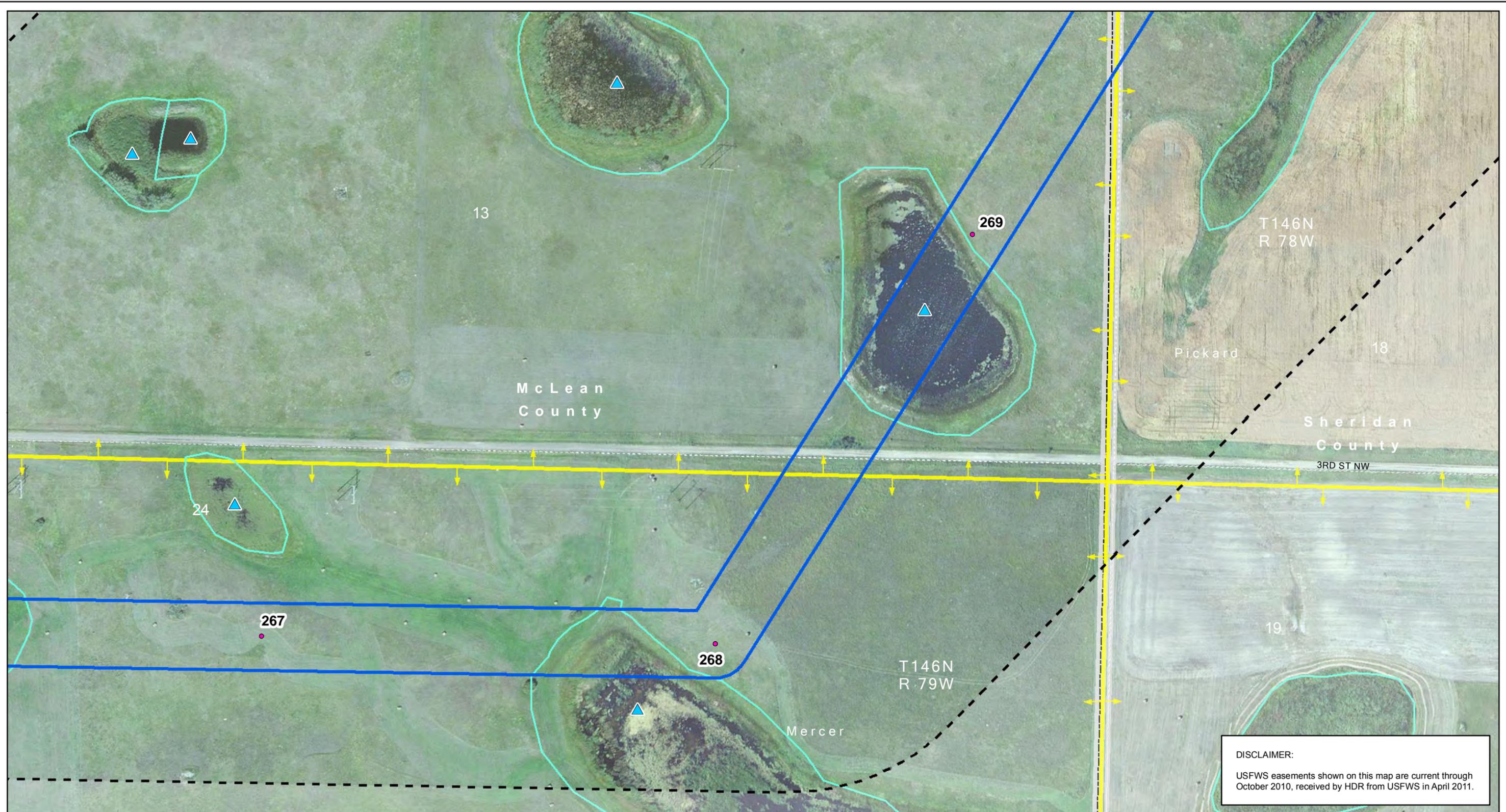
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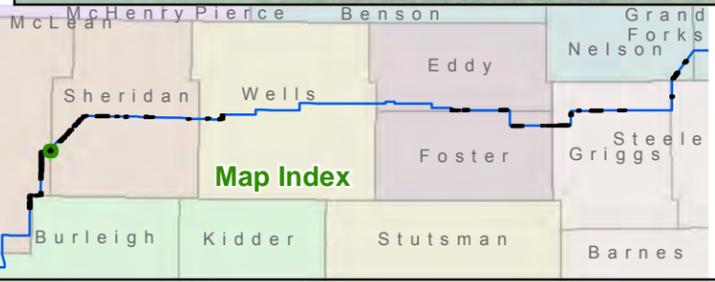
- Proposed Modified Corridor - November 18, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 30 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



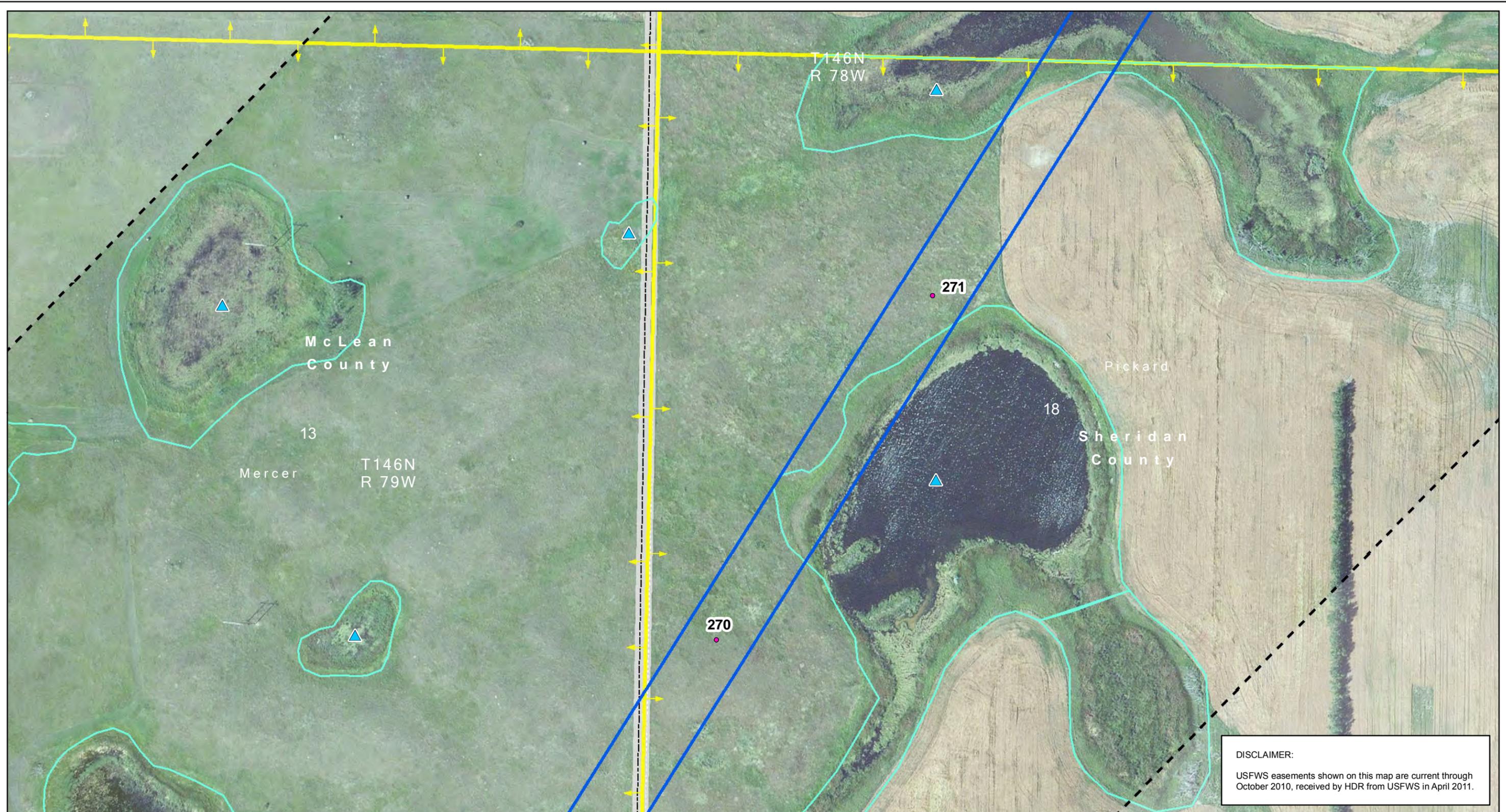
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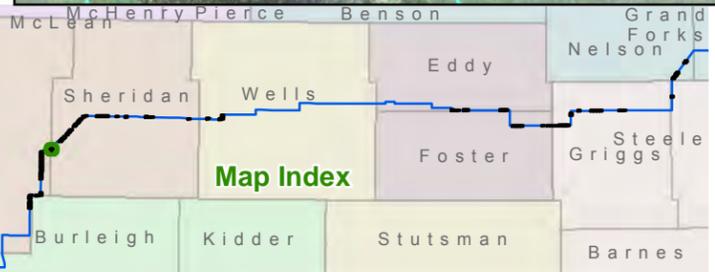
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- USGS Mapped Waterway

Figure 2: Page 31 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



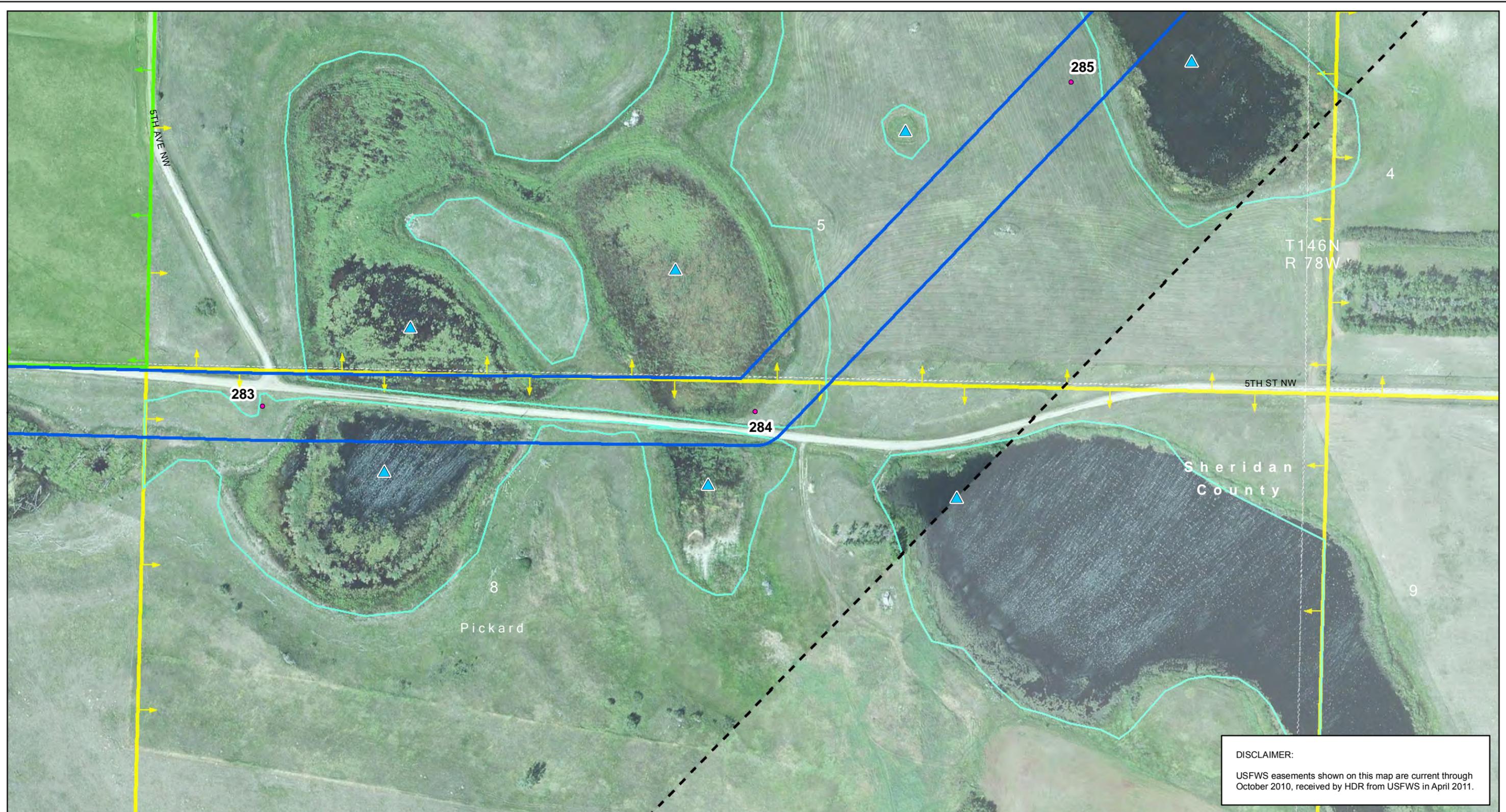
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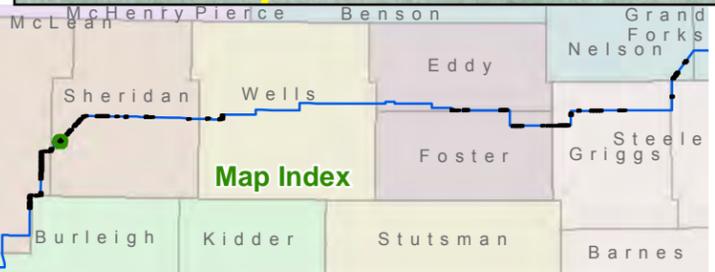
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- USGS Mapped Waterway

Figure 2: Page 32 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



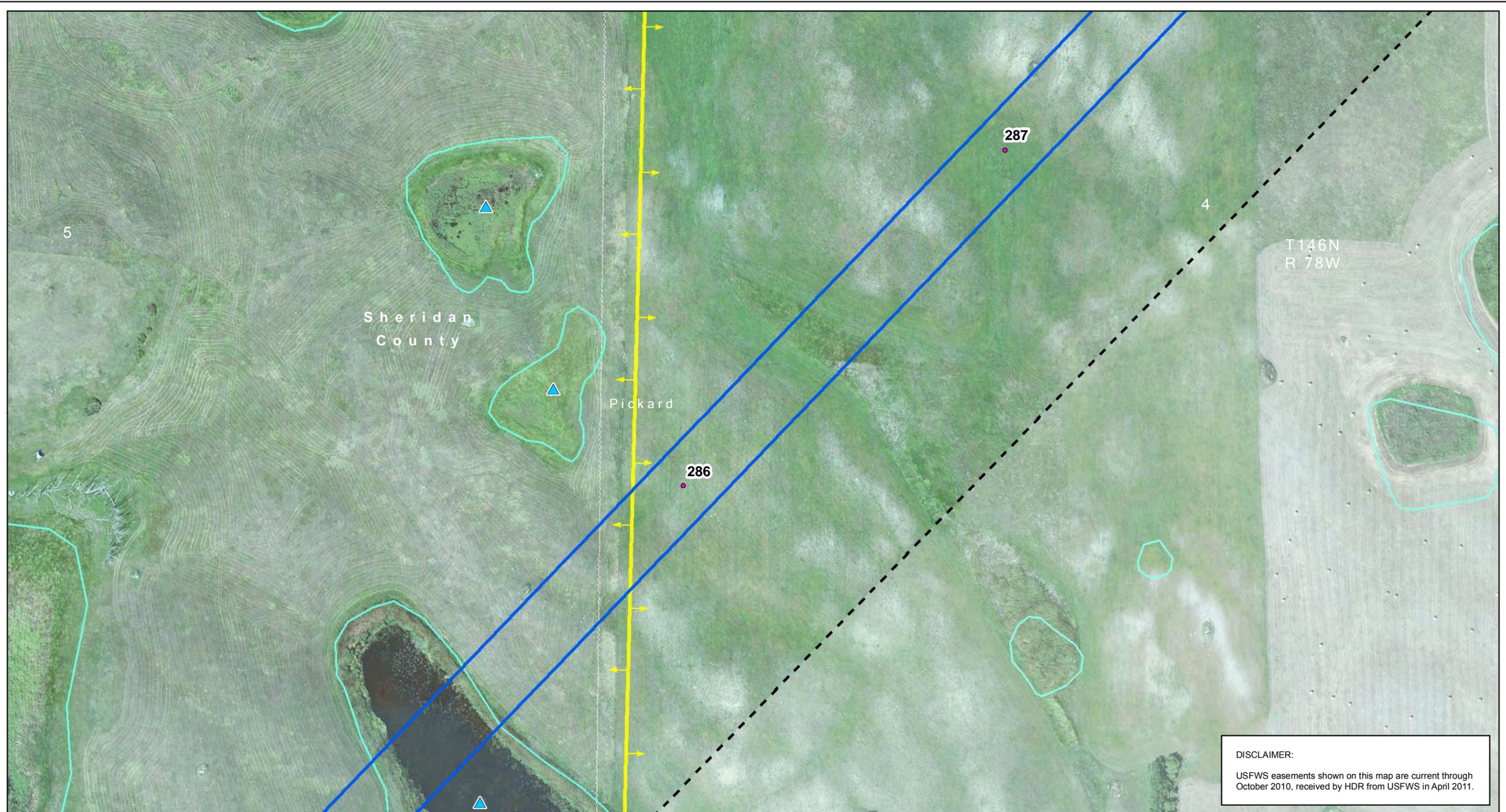
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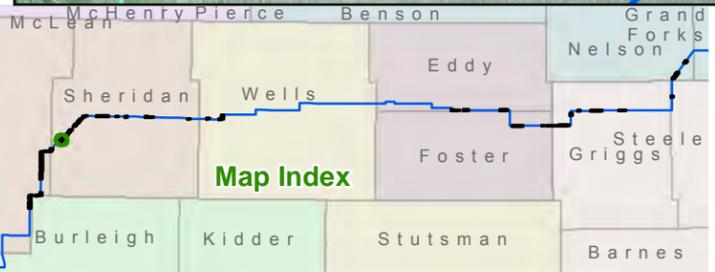
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Figure 2: Page 33 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



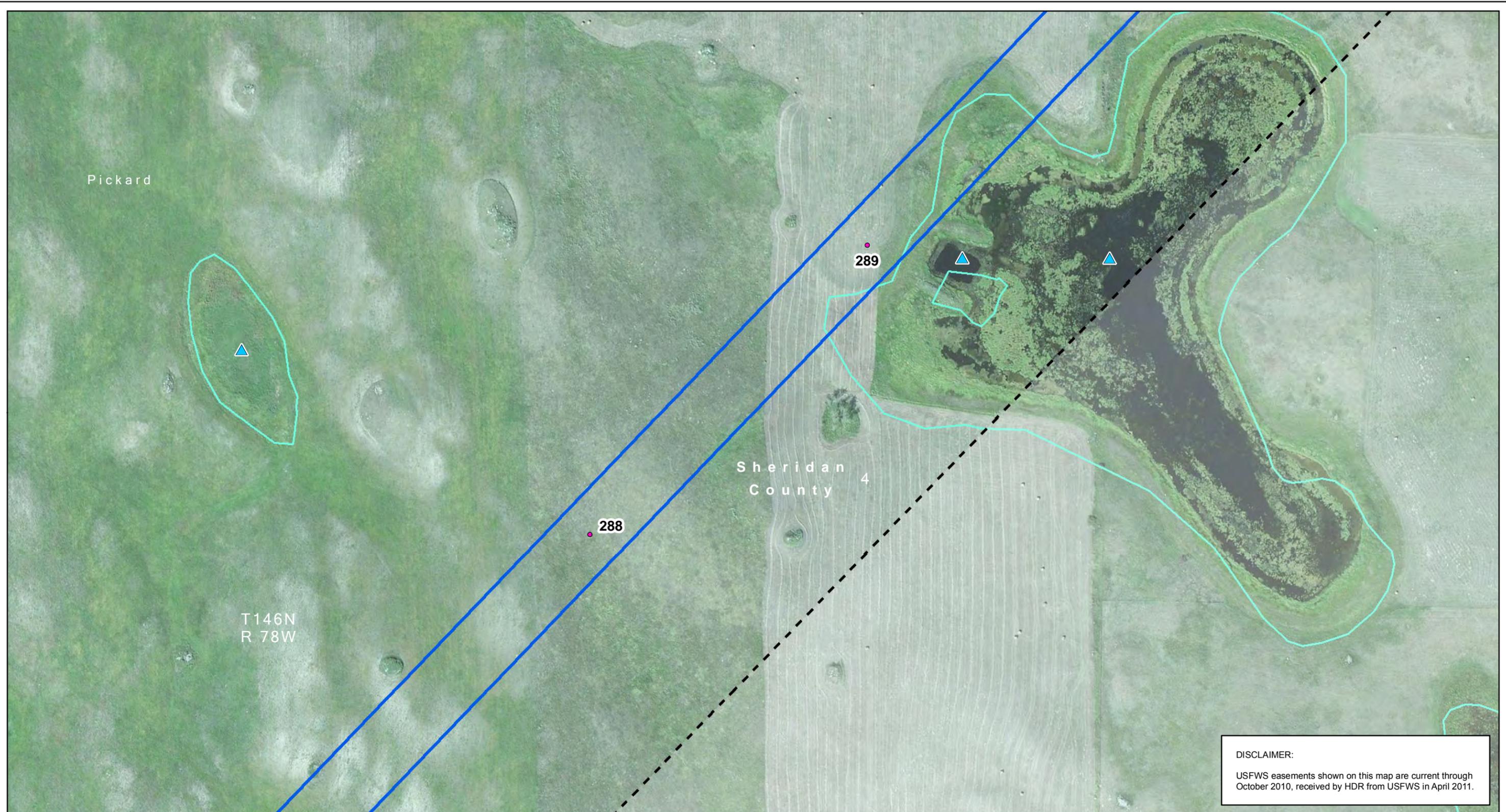
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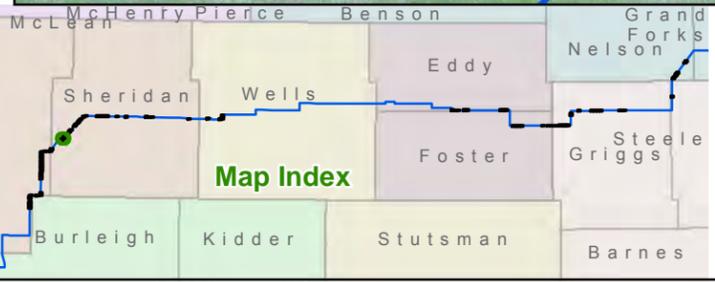
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Figure 2: Page 34 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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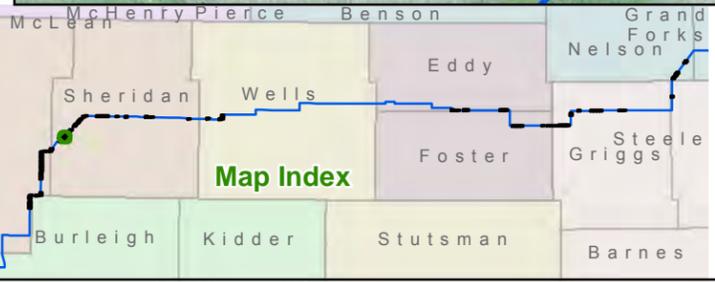
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- USGS Mapped Waterway

Figure 2: Page 35 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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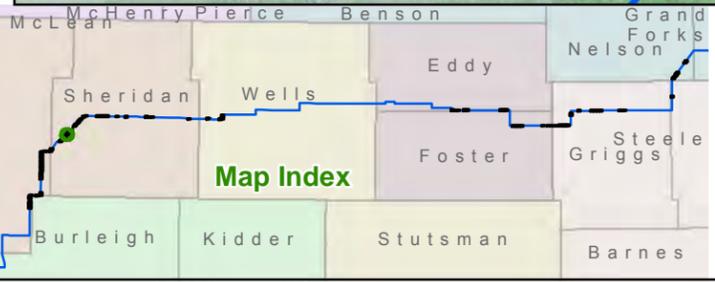
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 36 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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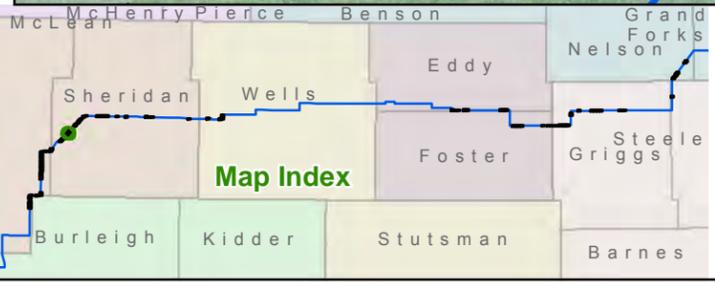
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- Possible USFWS Easement Wetland within Project Corridor
- Project ROW (150 ft wide) - November 11, 2011
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway
- 123 Structure Number

Figure 2: Page 37 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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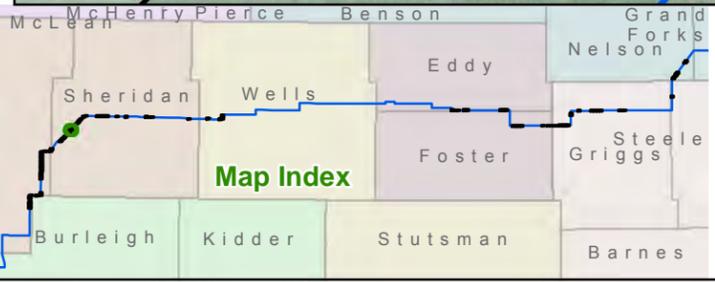
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- Possible USFS Easement Wetland within Project Corridor
- USGS Mapped Waterway

Figure 2: Page 38 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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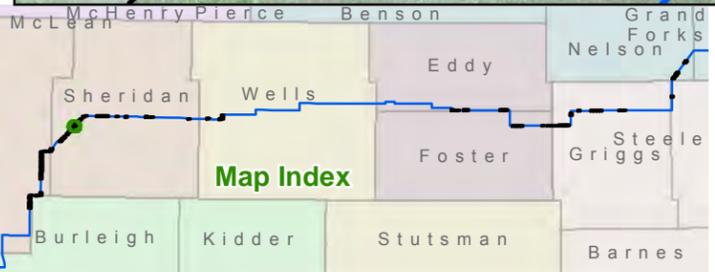
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- USGS Mapped Waterway

Figure 2: Page 40 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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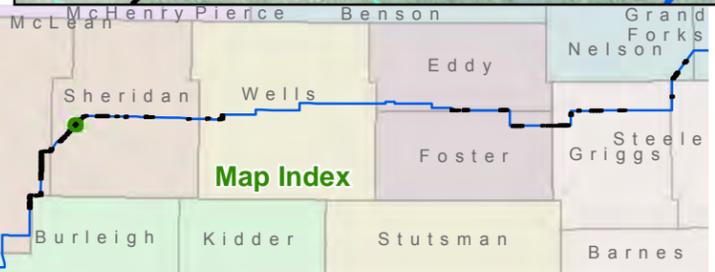
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- Possible USFWS Easement Wetland within Project Corridor
- USGS Mapped Waterway

Figure 2: Page 41 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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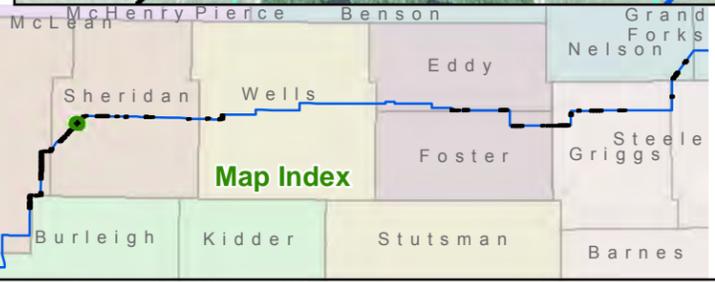
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 42 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



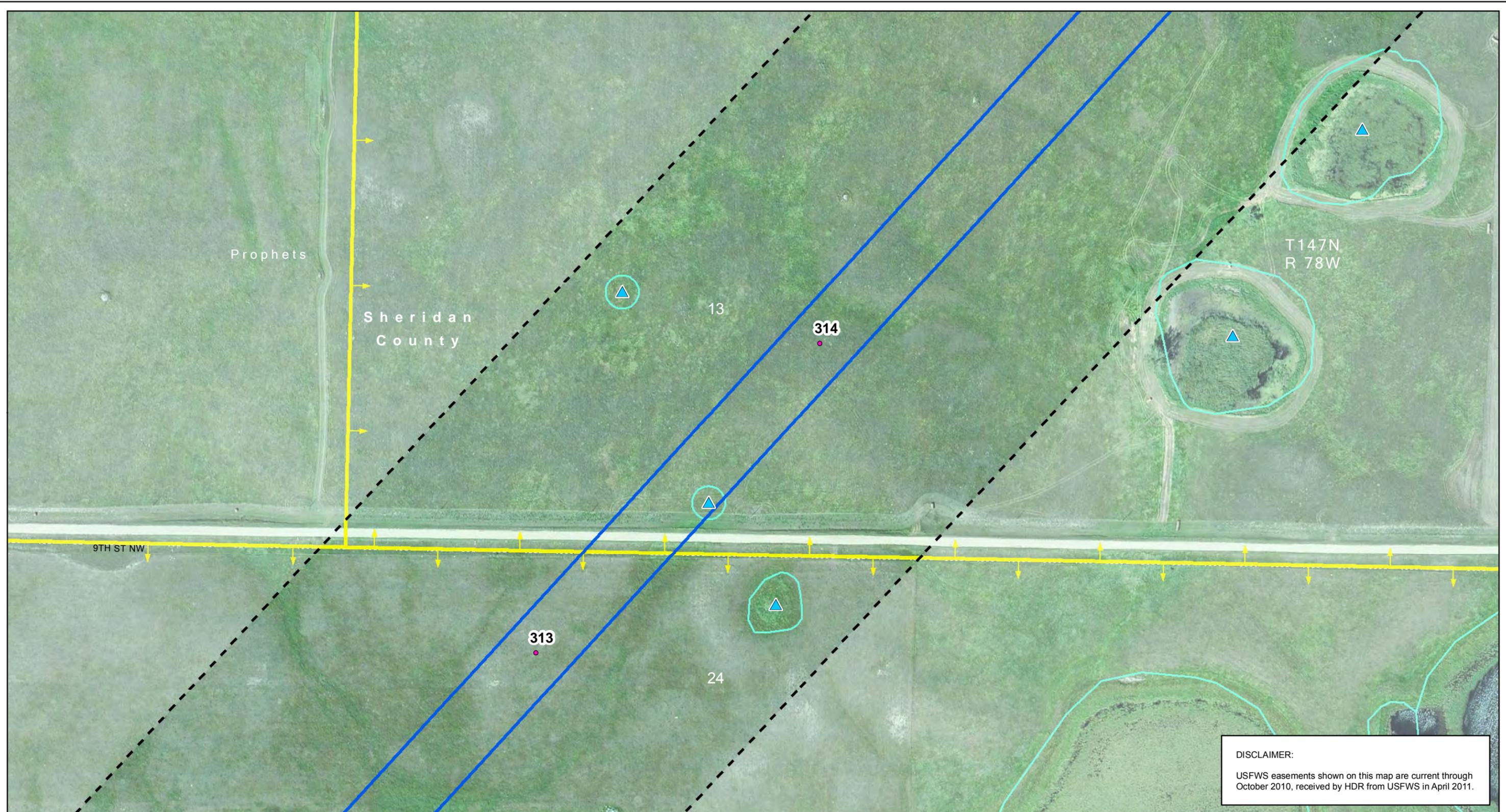
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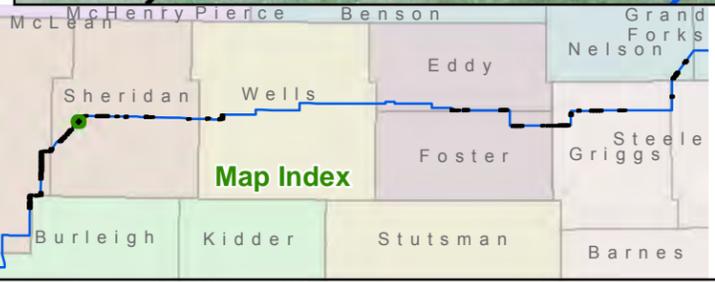
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- USGS Mapped Waterway

Figure 2: Page 43 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



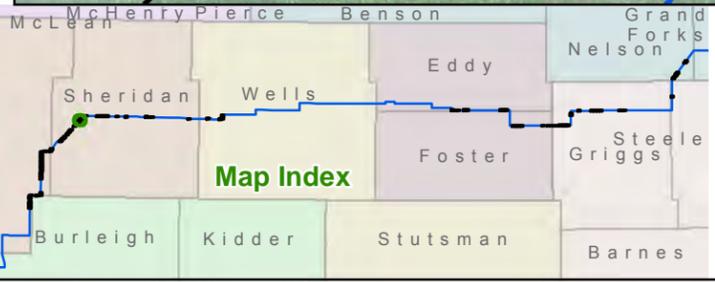
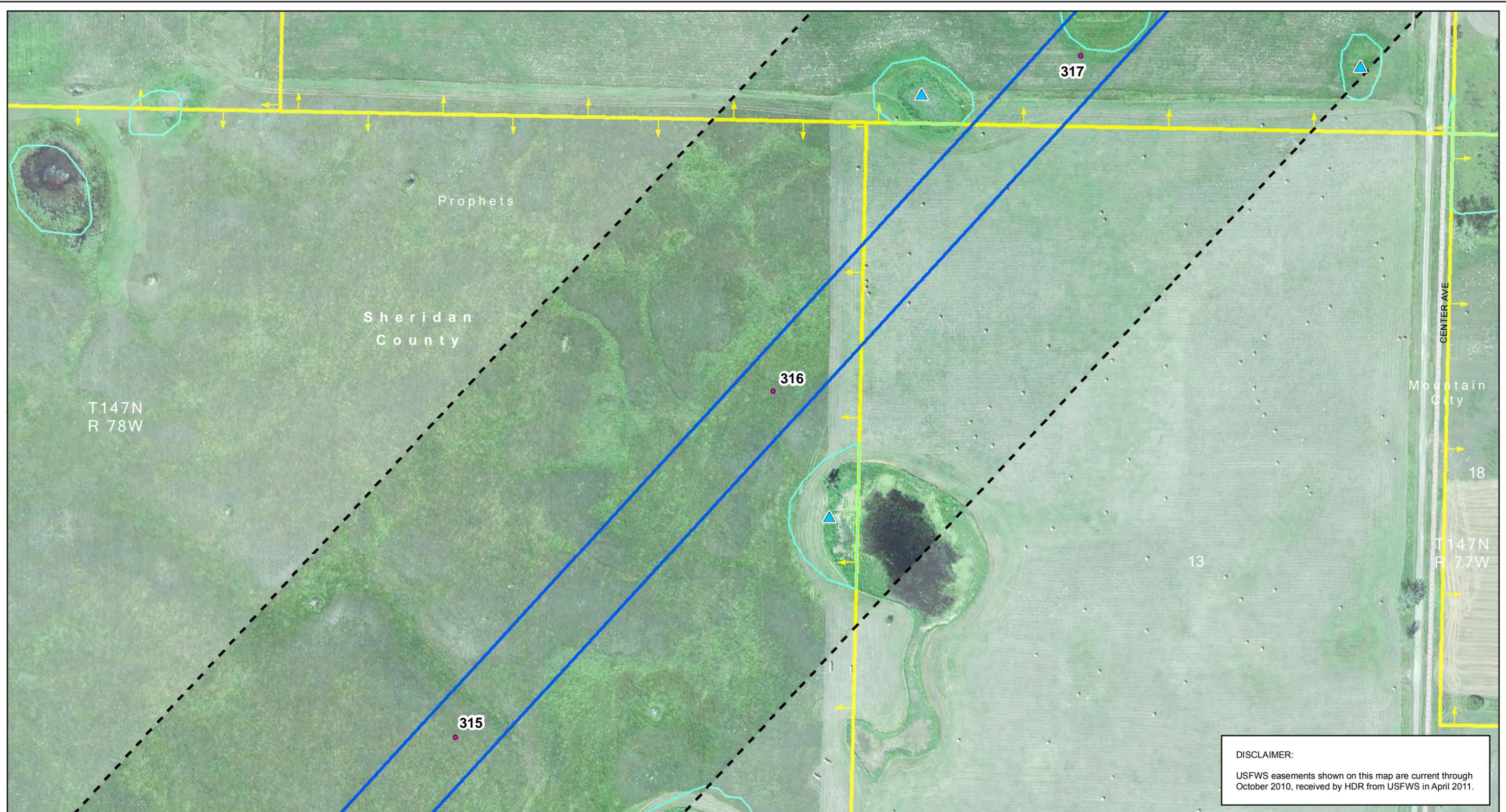
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Figure 2: Page 44 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500

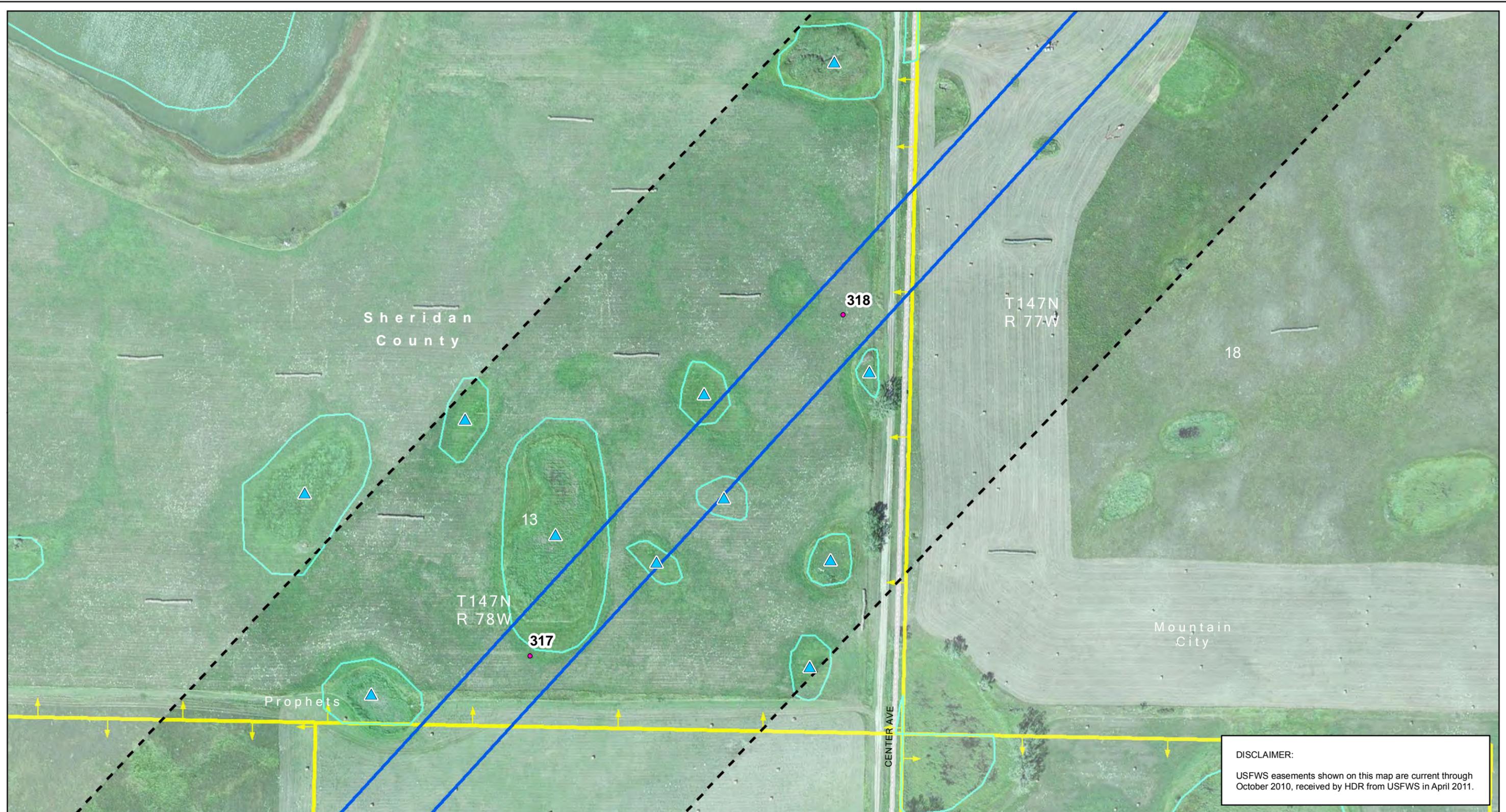


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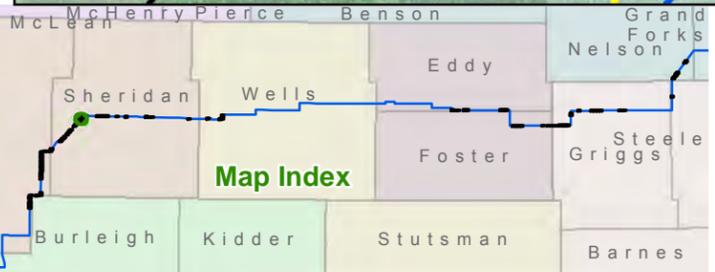
DISCLAIMER:
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Figure 2: Page 45 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



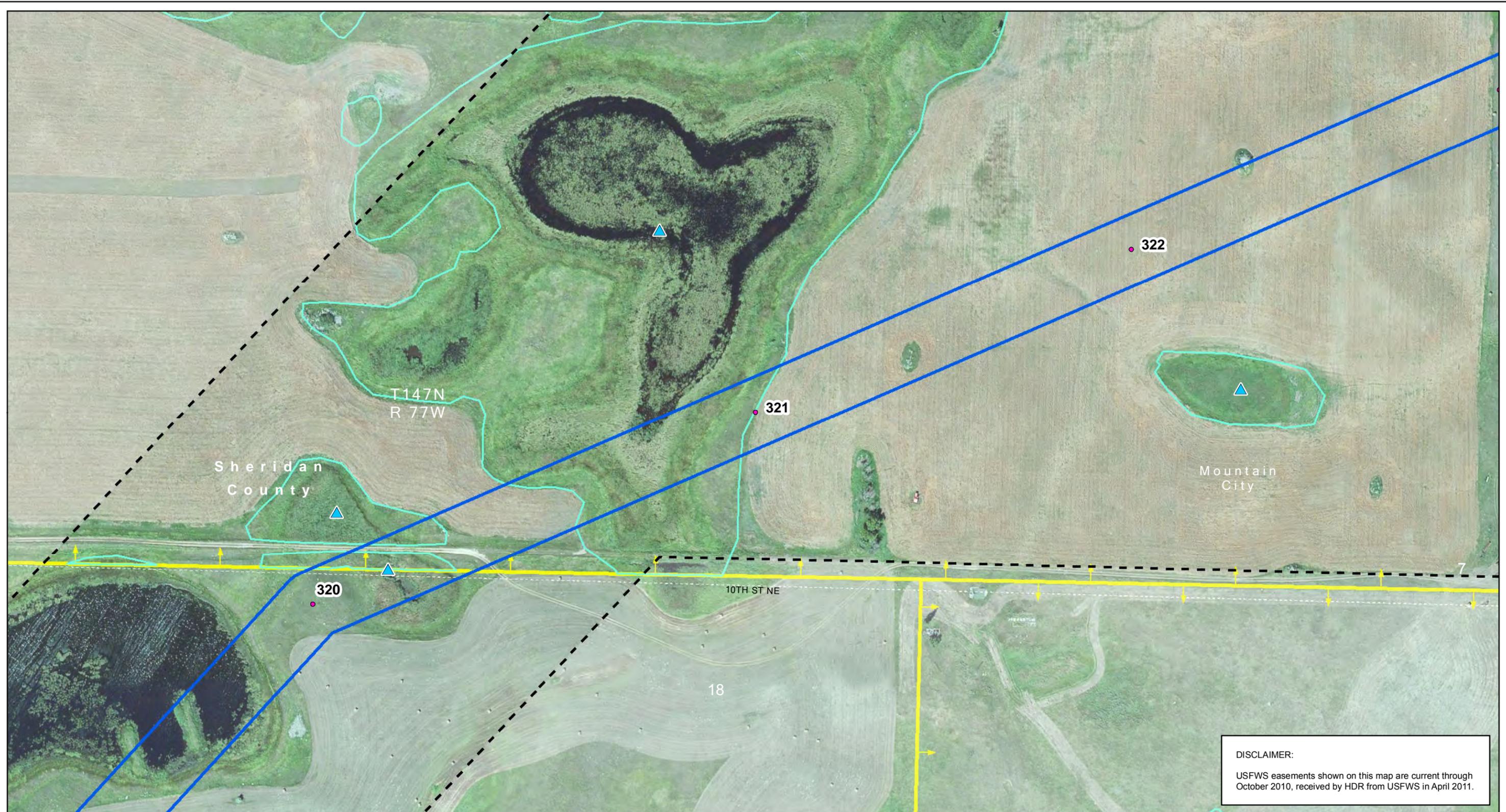
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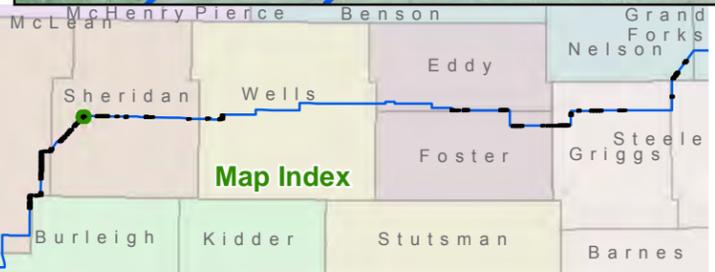
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- USGS Mapped Waterway

Figure 2: Page 46 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



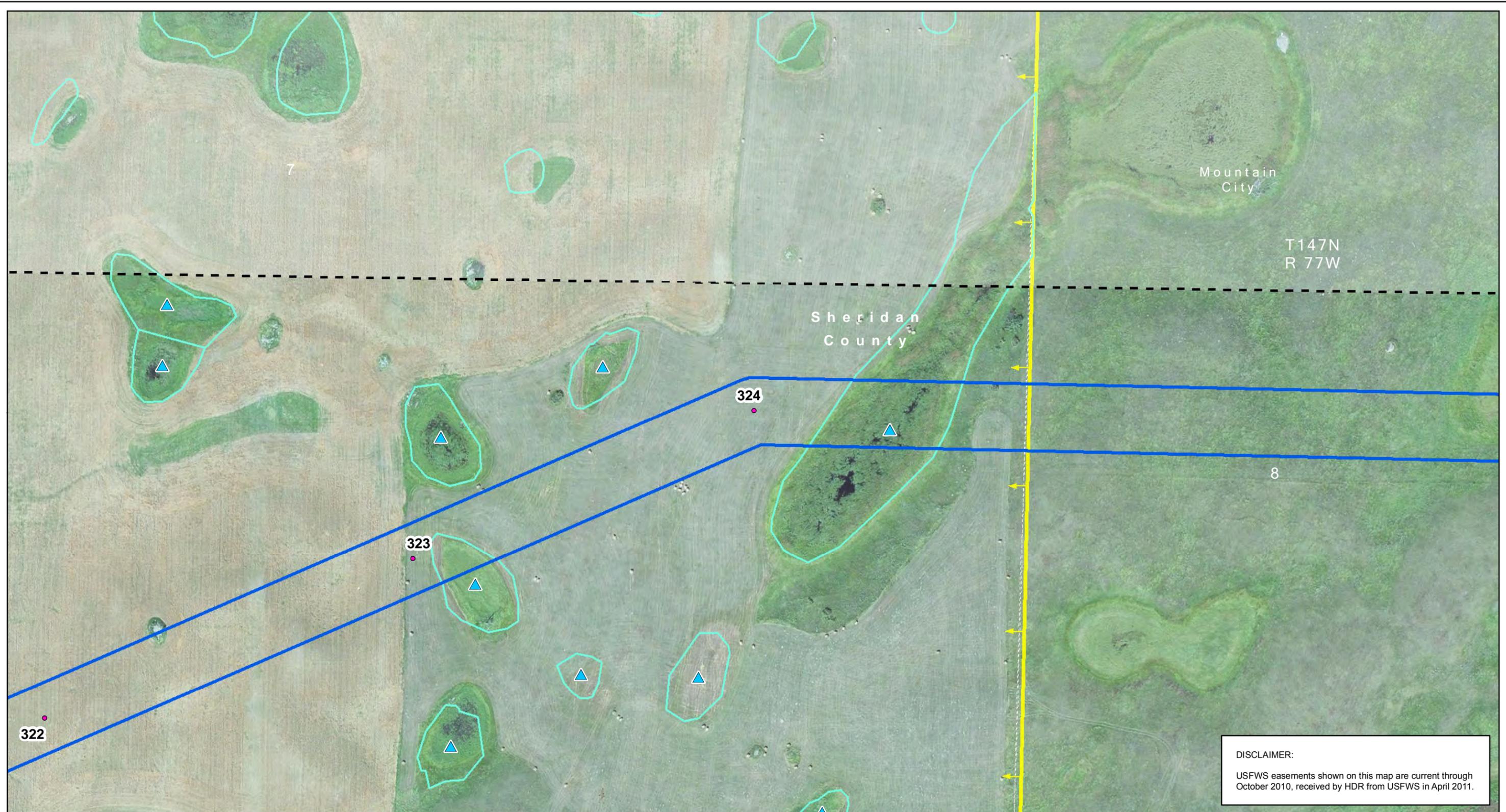
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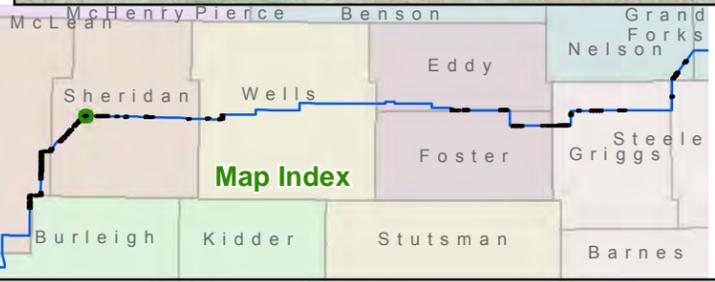
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- Temporary Impact Area - November 11, 2011
- USFWS Grassland Easement
- USGS Mapped Waterway
- 123 Structure Number
- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 47 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



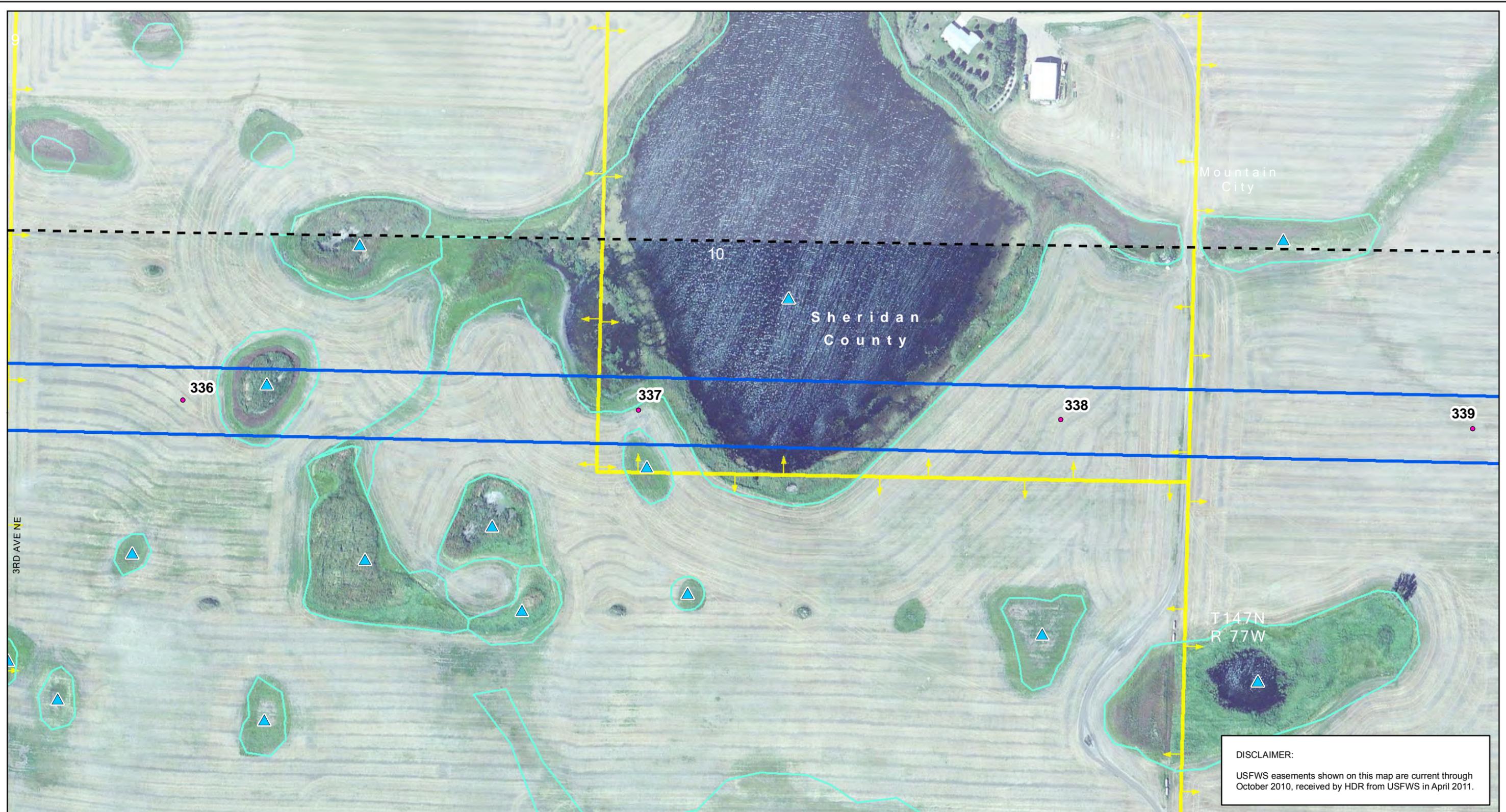
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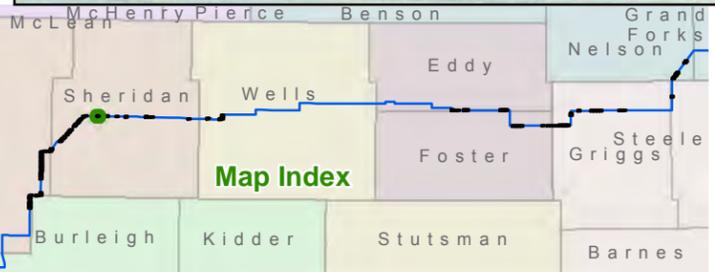
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- USFWS Grassland Easement
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Figure 2: Page 48 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



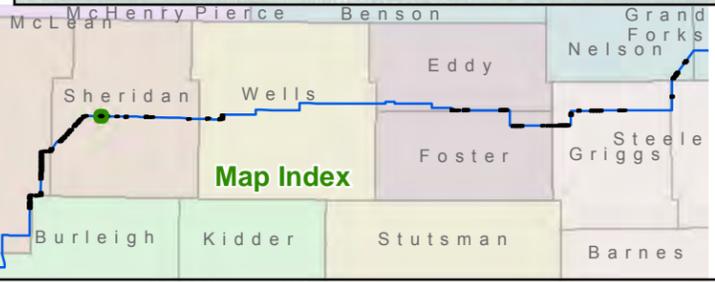
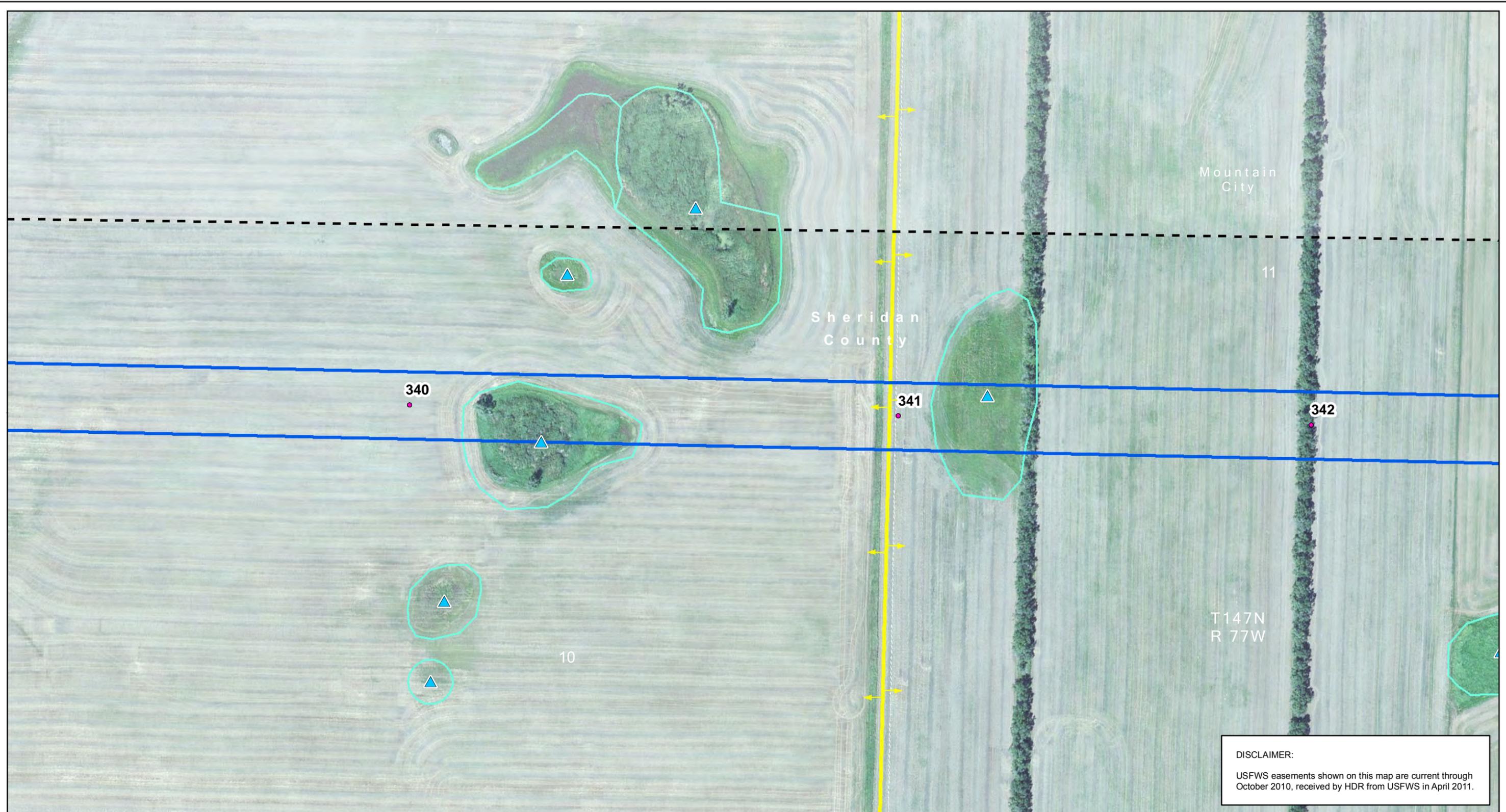
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Figure 2: Page 49 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



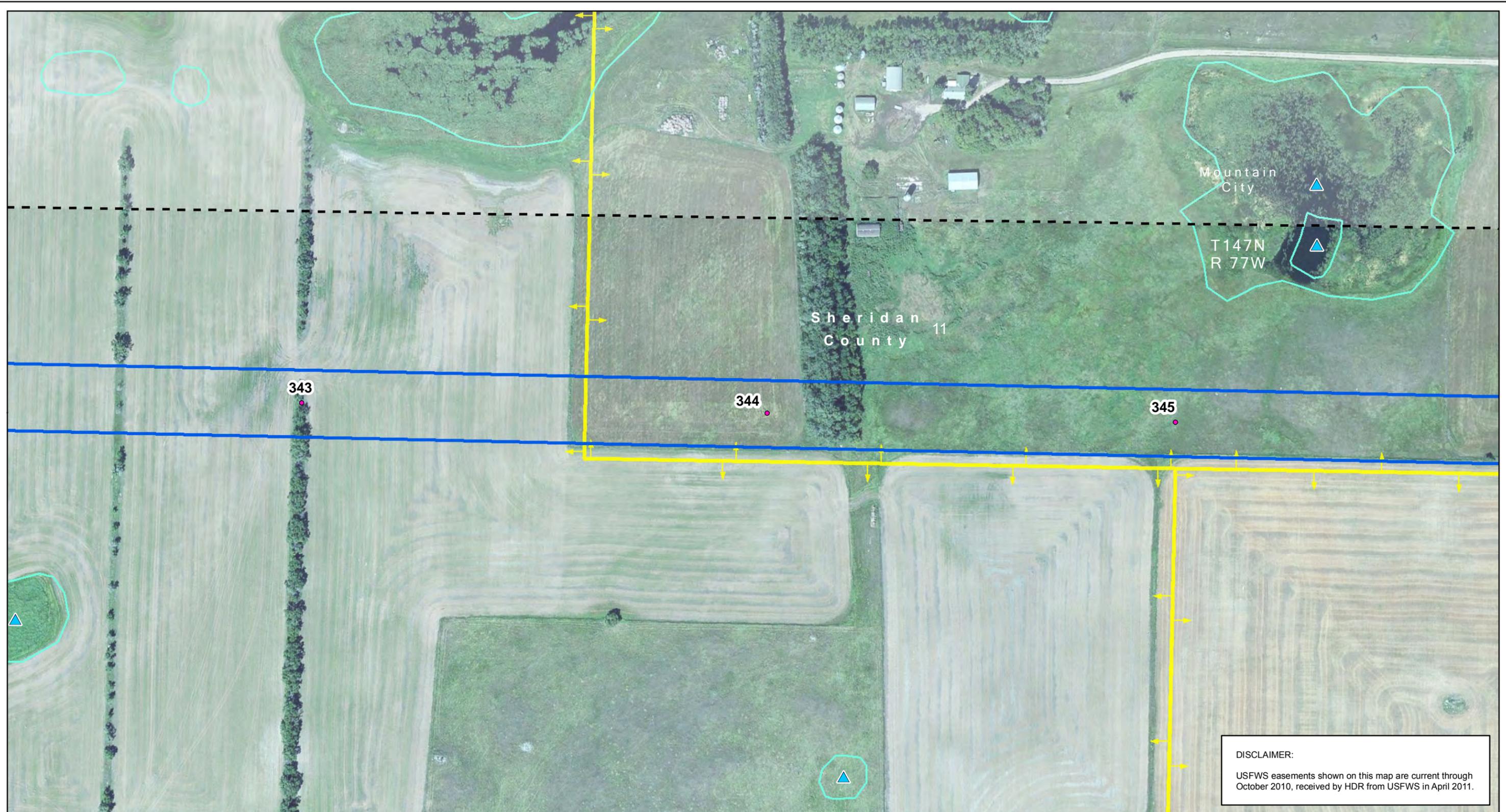
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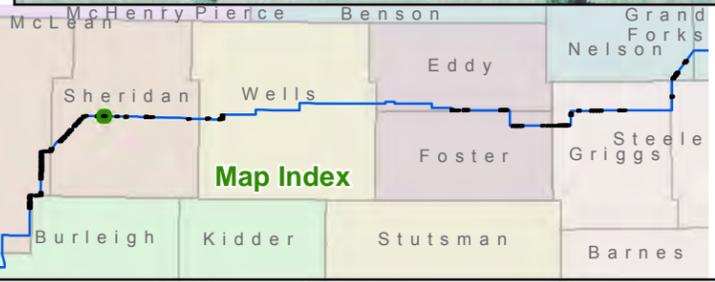
Figure 2: Page 50 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500

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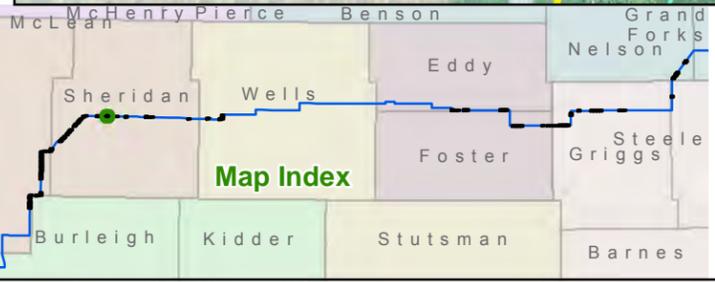
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- USFWS Grassland Easement
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 51 of 102
Project Route Along USFWS Easements
Center to Grand Forks Project

0 200 400 Feet
Scale 1:2,500



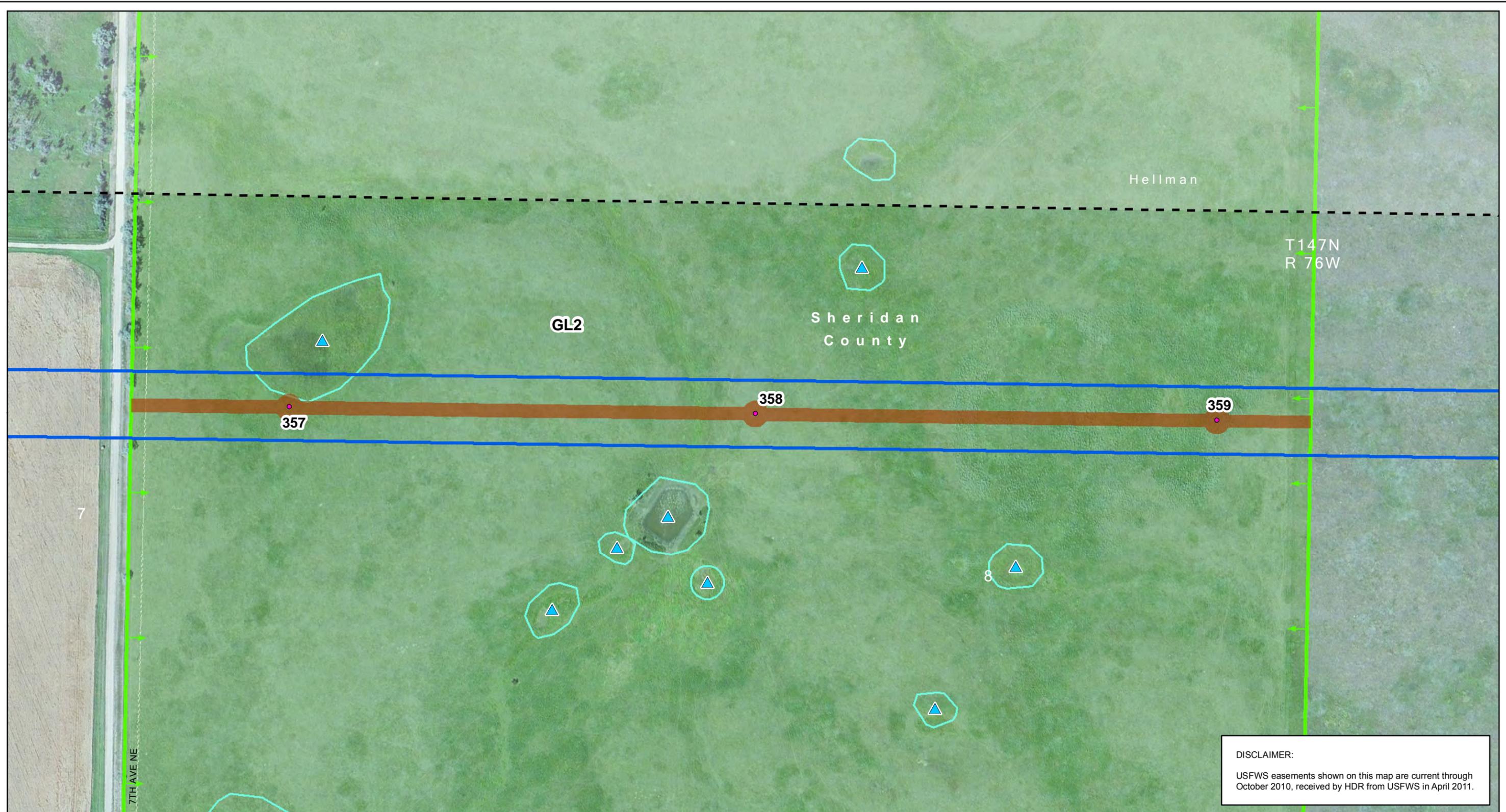
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- USGS Mapped Waterway

Figure 2: Page 52 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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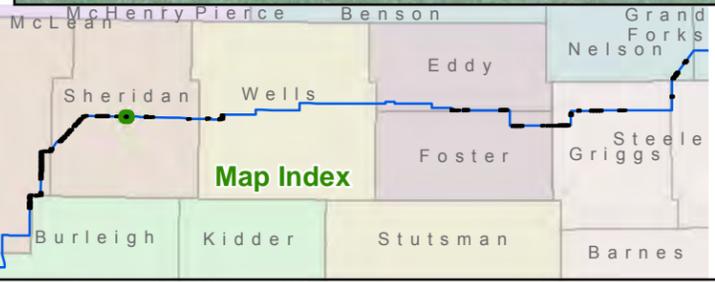
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway
- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 53 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



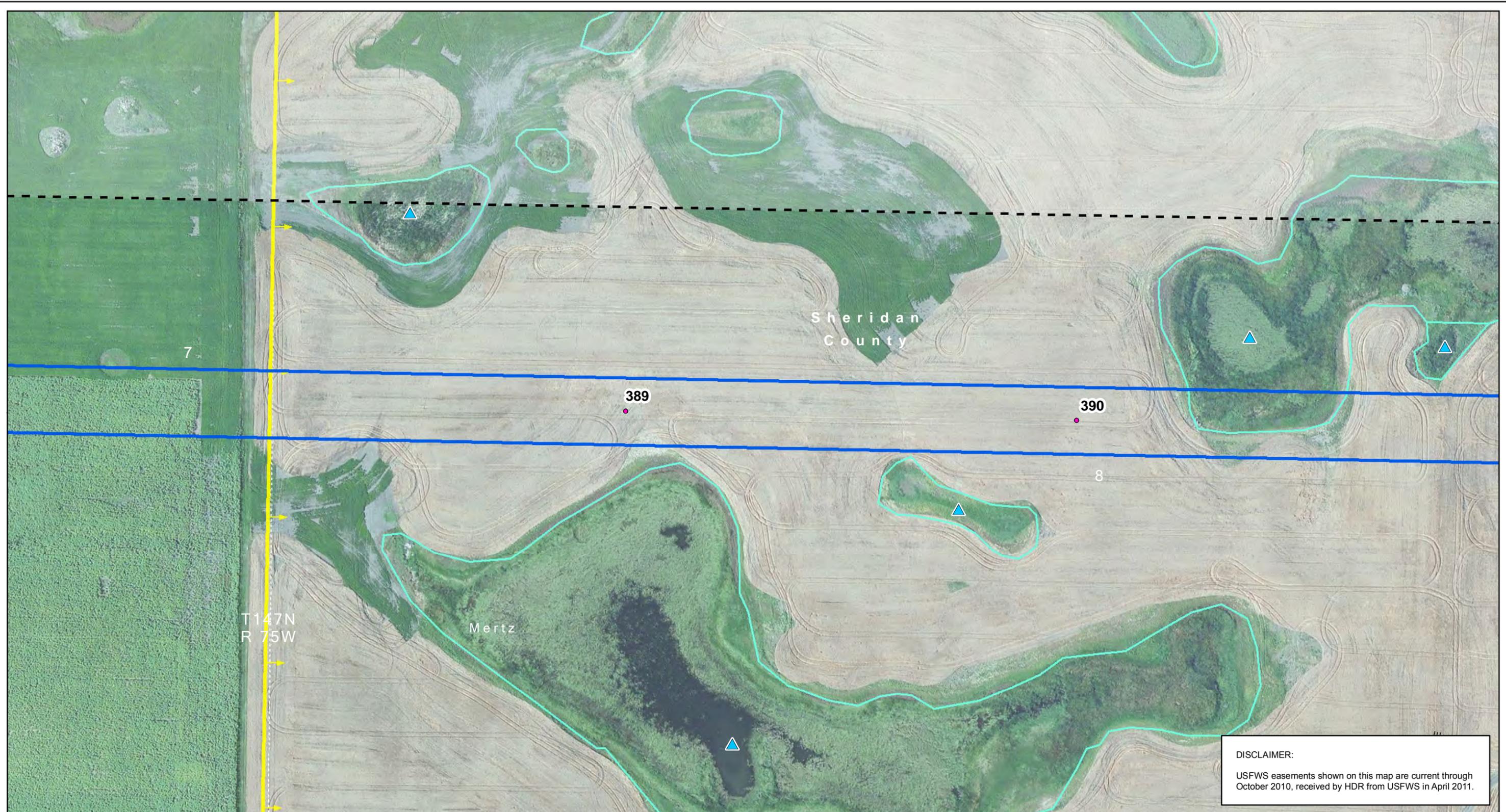
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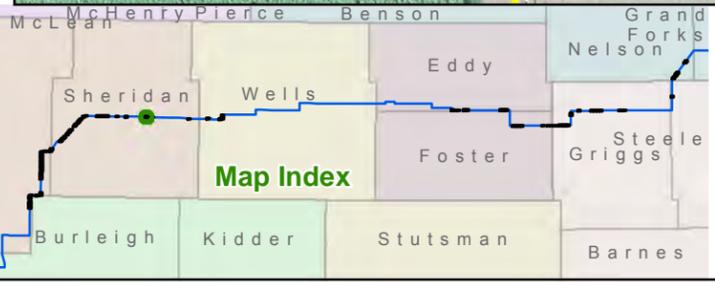
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Figure 2: Page 54 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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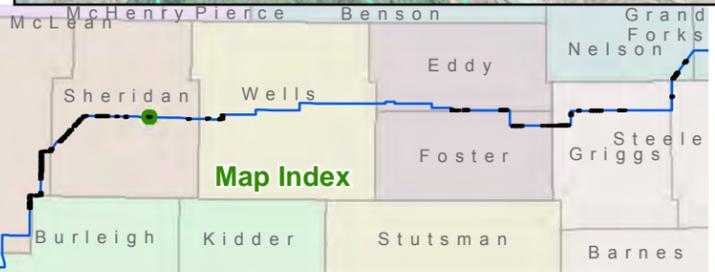
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- Temporary Impact Area - November 11, 2011
- USFWS Grassland Easement
- USGS Mapped Waterway
- 123 Structure Number
- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 55 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



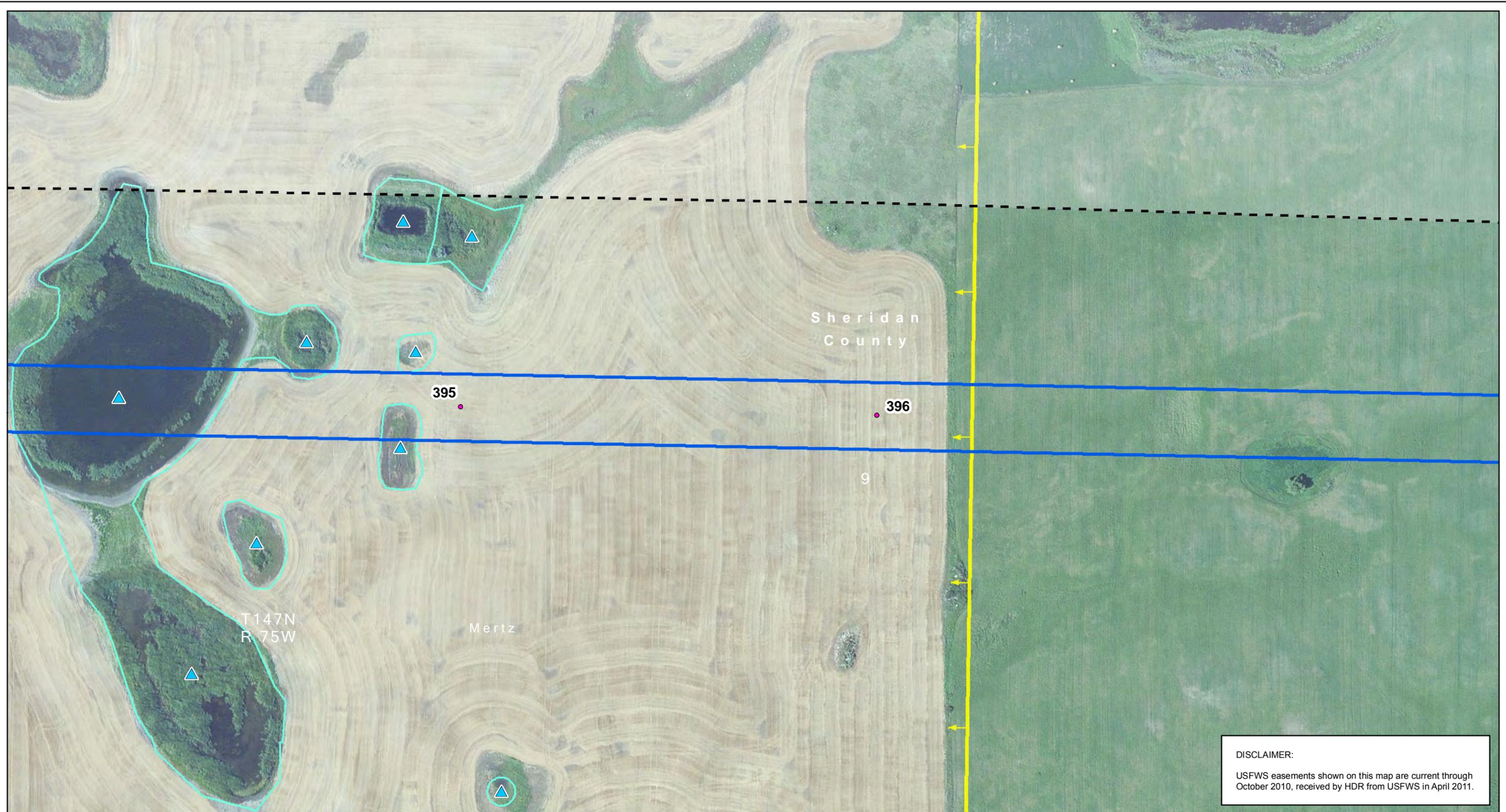
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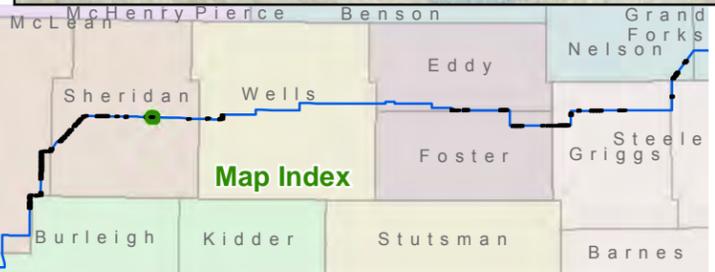
- Proposed Modified Corridor - November 18, 2011
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- USFWS Wetland Easement Parcel
- Approximate USACE Wetland Boundary
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- Temporary Impact Area - November 11, 2011
- USFWS Grassland Easement
- USGS Mapped Waterway
- 123 Structure Number
- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 56 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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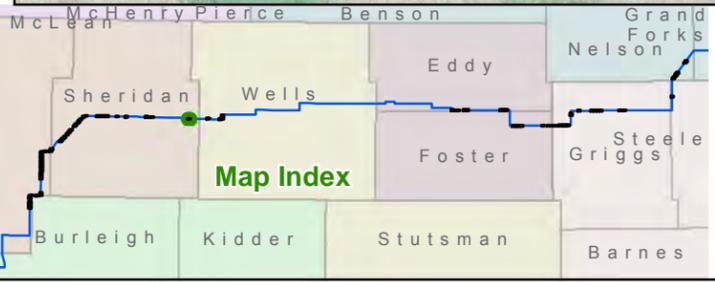
- Proposed Modified Corridor - November 18, 2011
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- 123 Structure Number
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- Temporary Impact Area - November 11, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 57 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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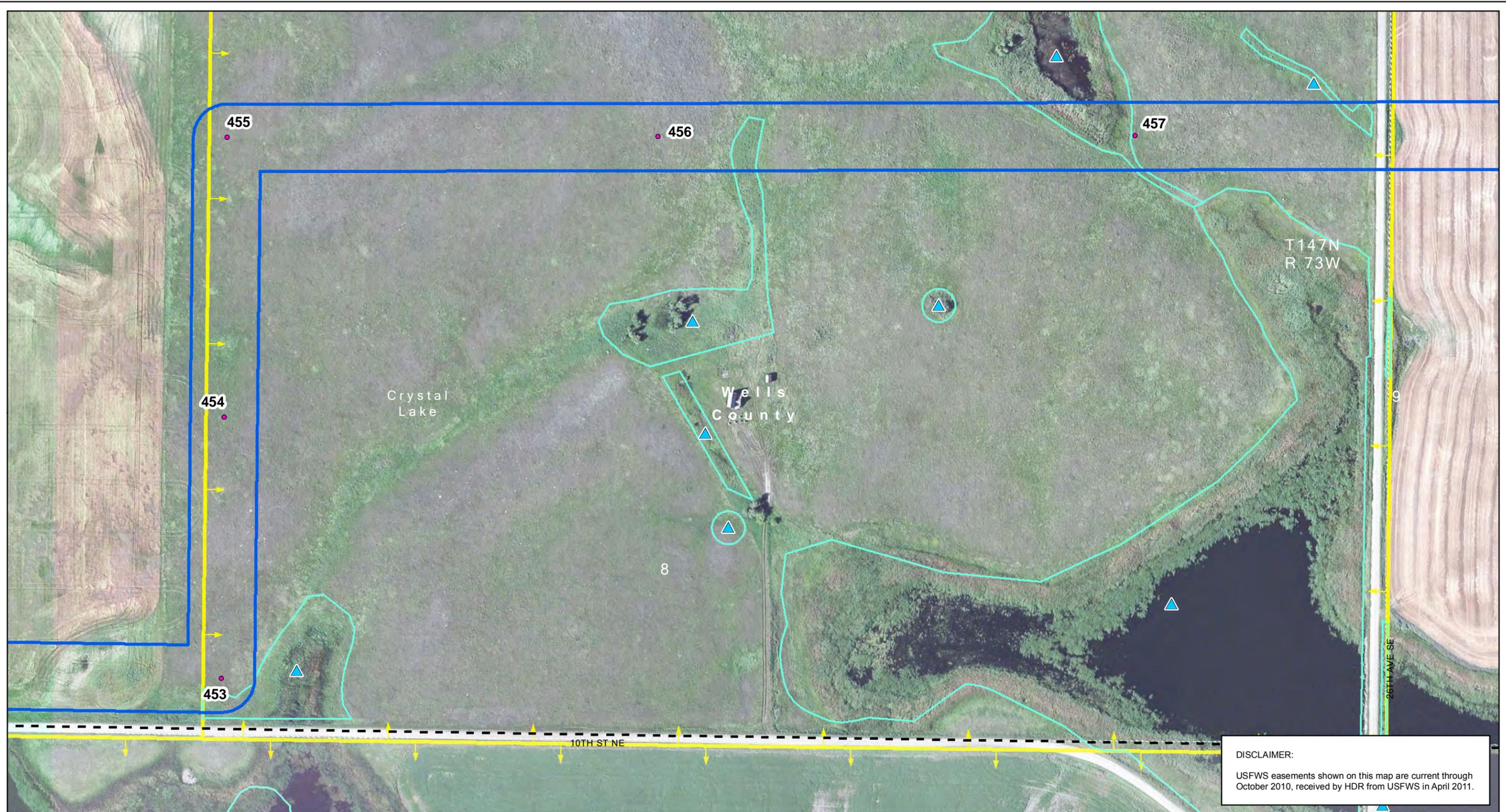


- Proposed Modified Corridor - November 18, 2011
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- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

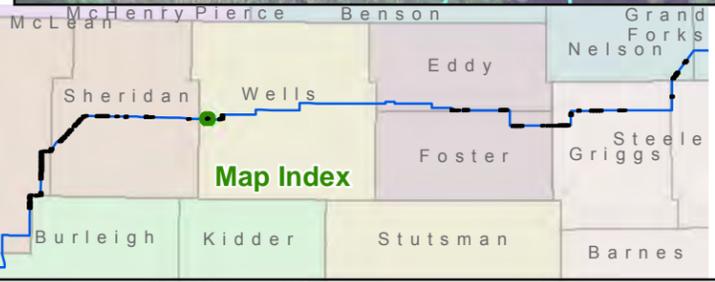
Figure 2: Page 58 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500

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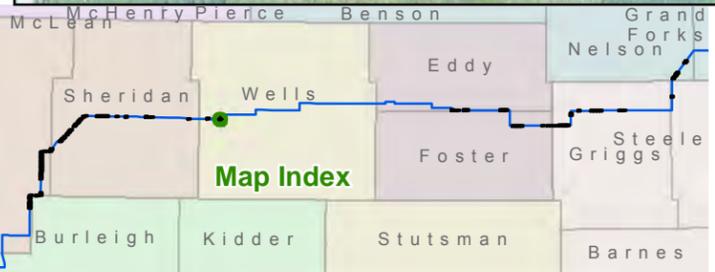
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- USGS Mapped Waterway

Figure 2: Page 59 of 102
Project Route Along USFWS Easements
Center to Grand Forks Project

0 200 400 Feet
Scale 1:2,500



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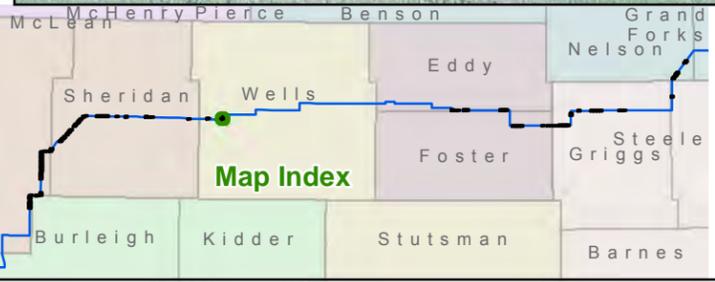
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 60 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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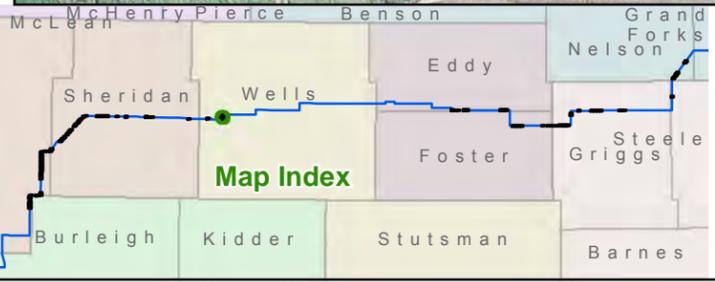
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 61 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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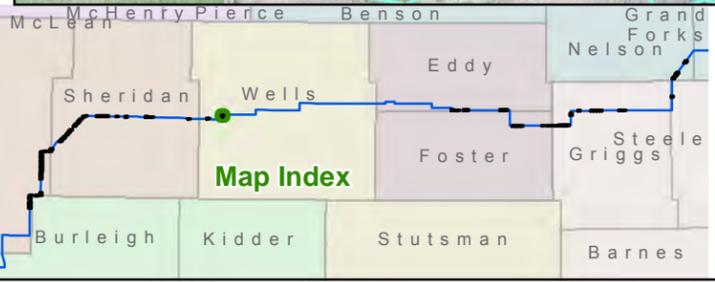
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- USGS Mapped Waterway

Figure 2: Page 62 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



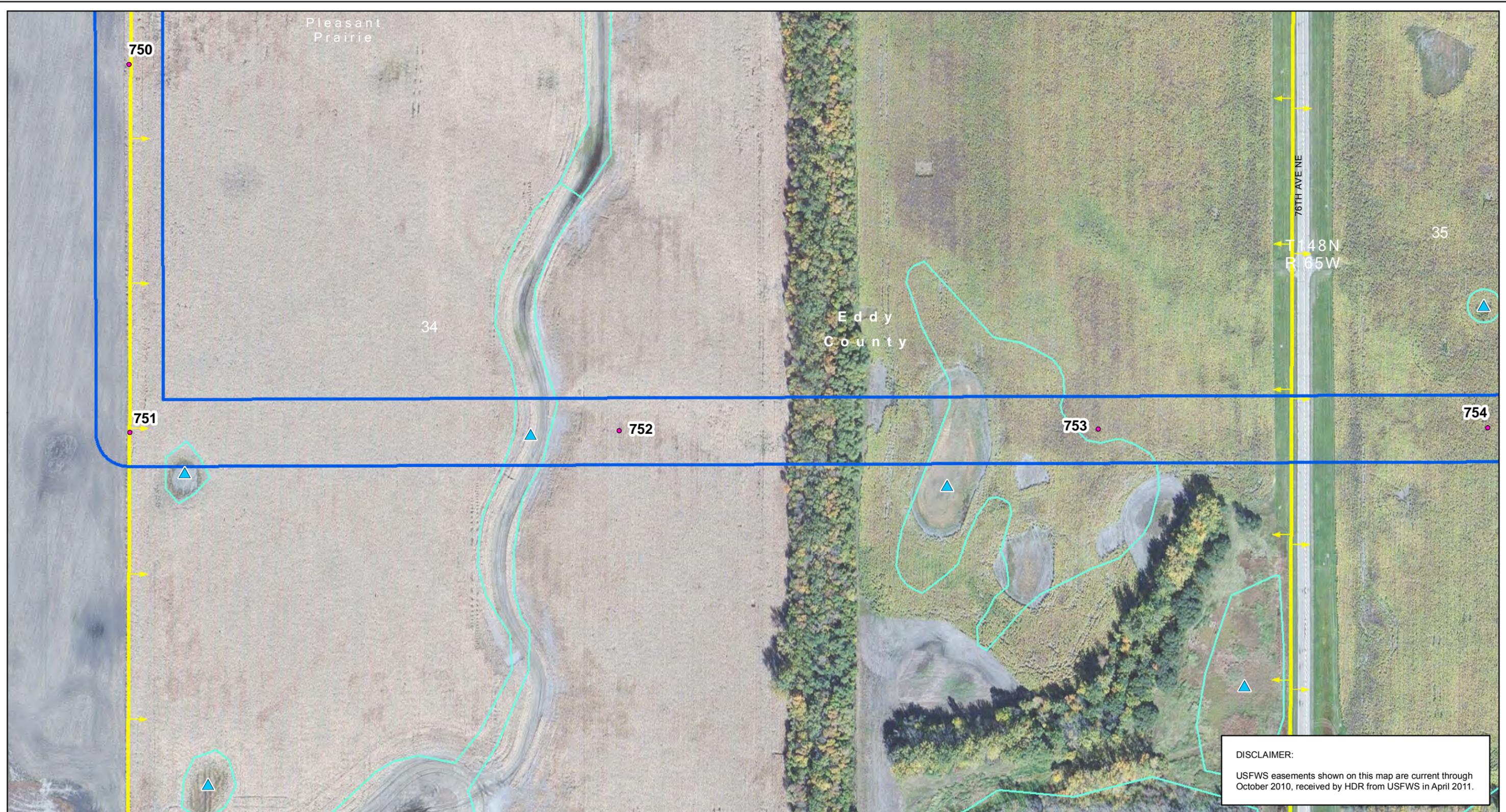
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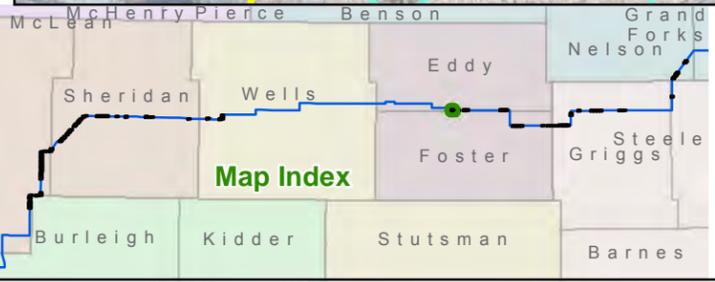
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- 123 Structure Number
- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 63 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



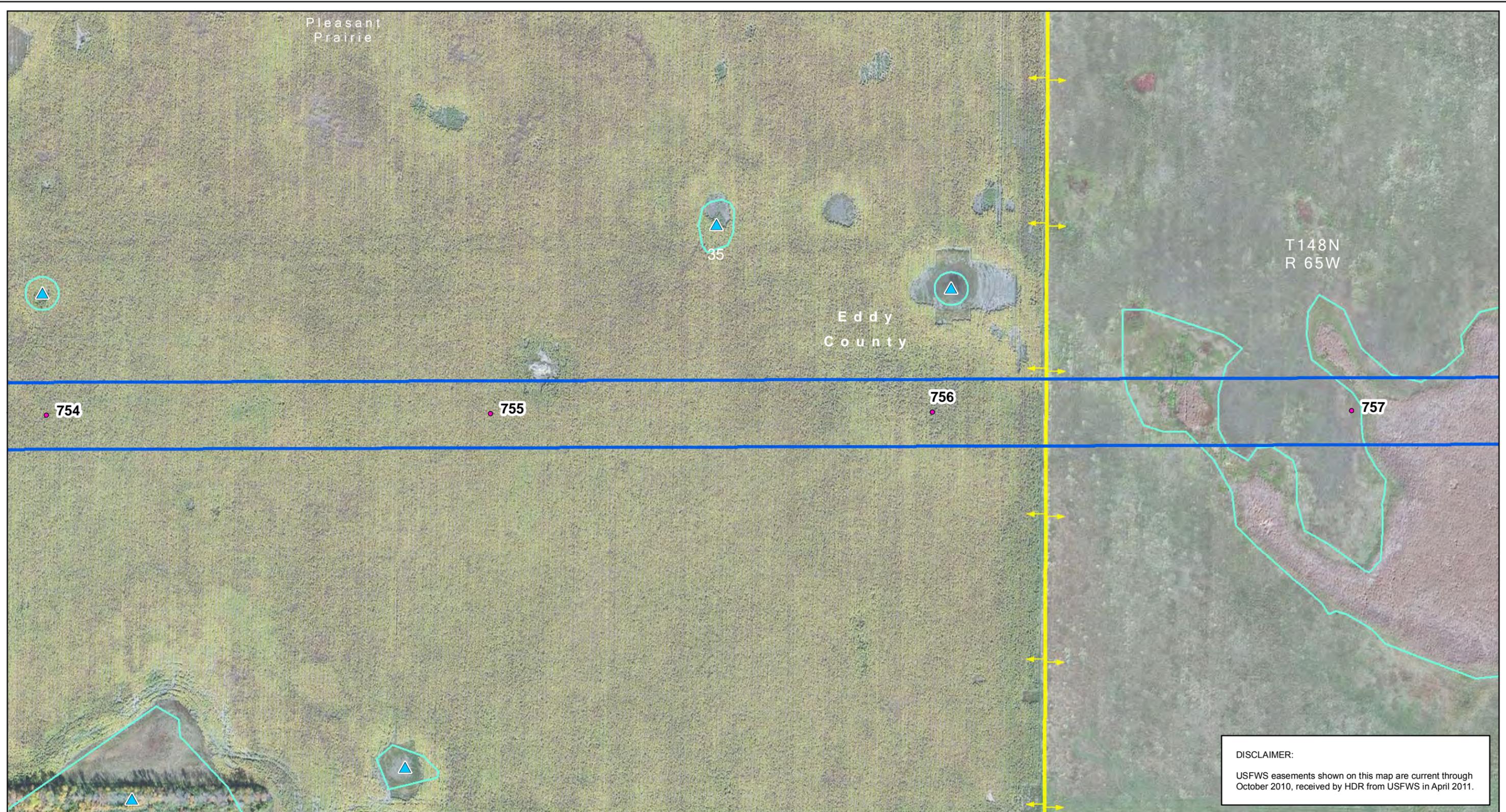
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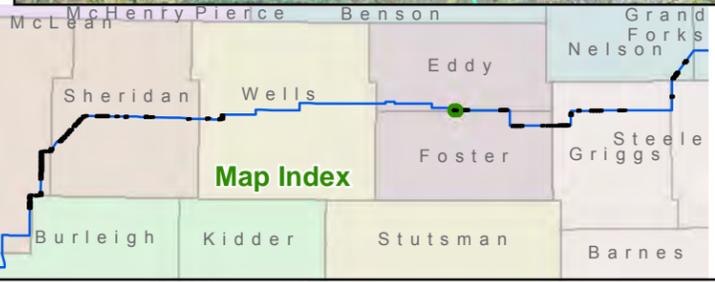
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Figure 2: Page 64 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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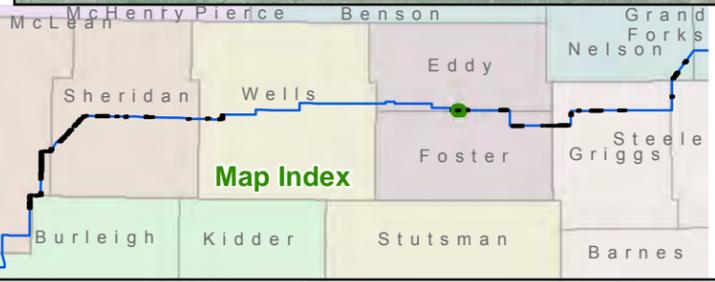
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- 123 Structure Number

Figure 2: Page 65 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



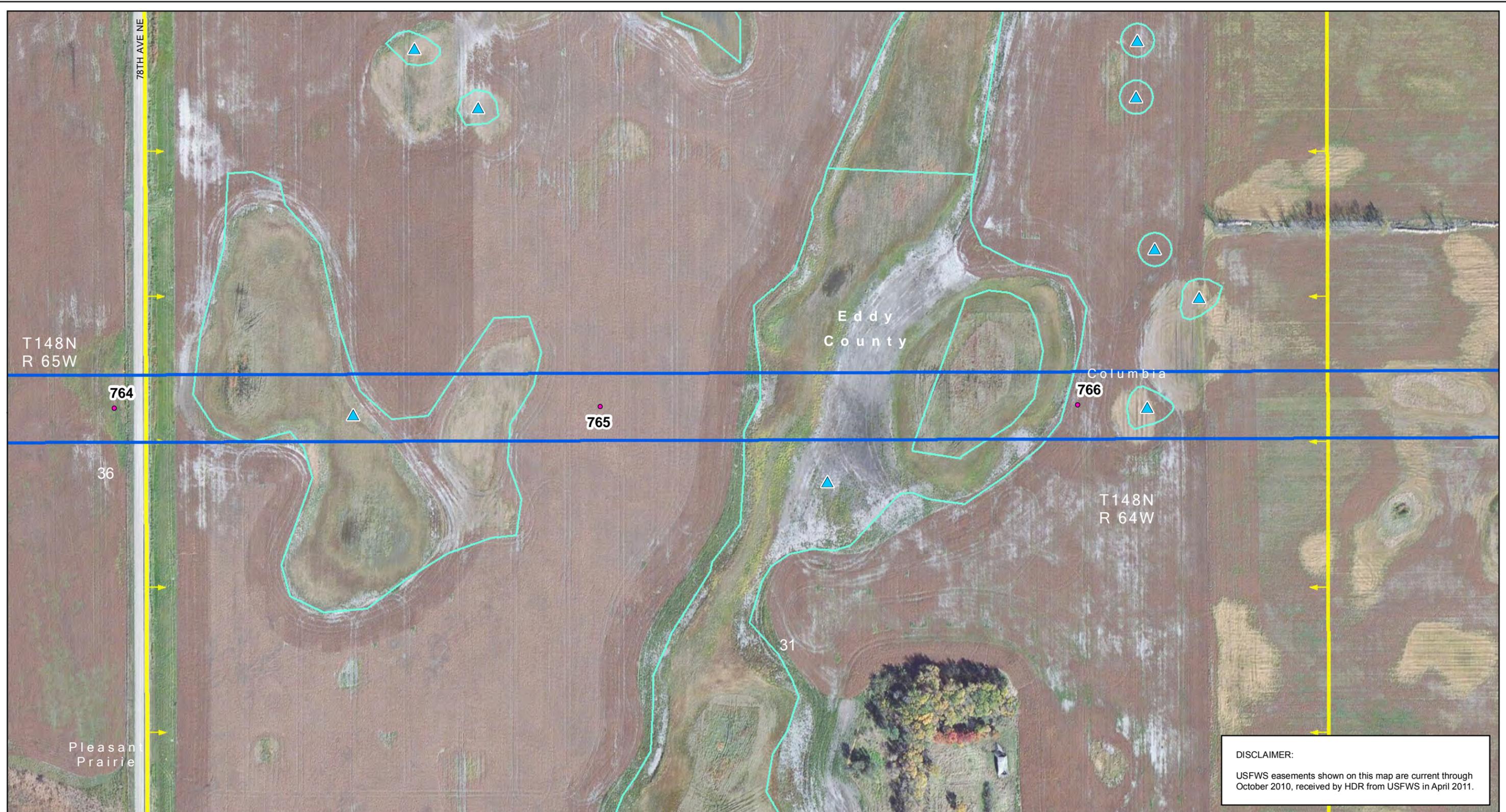
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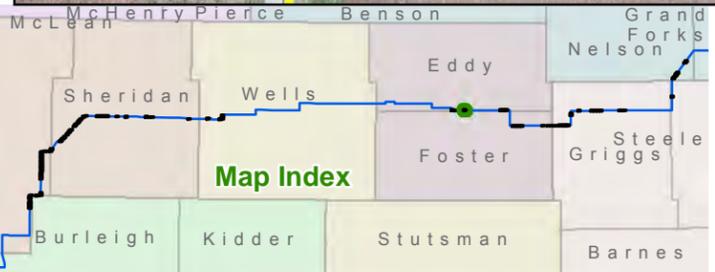
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- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 66 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



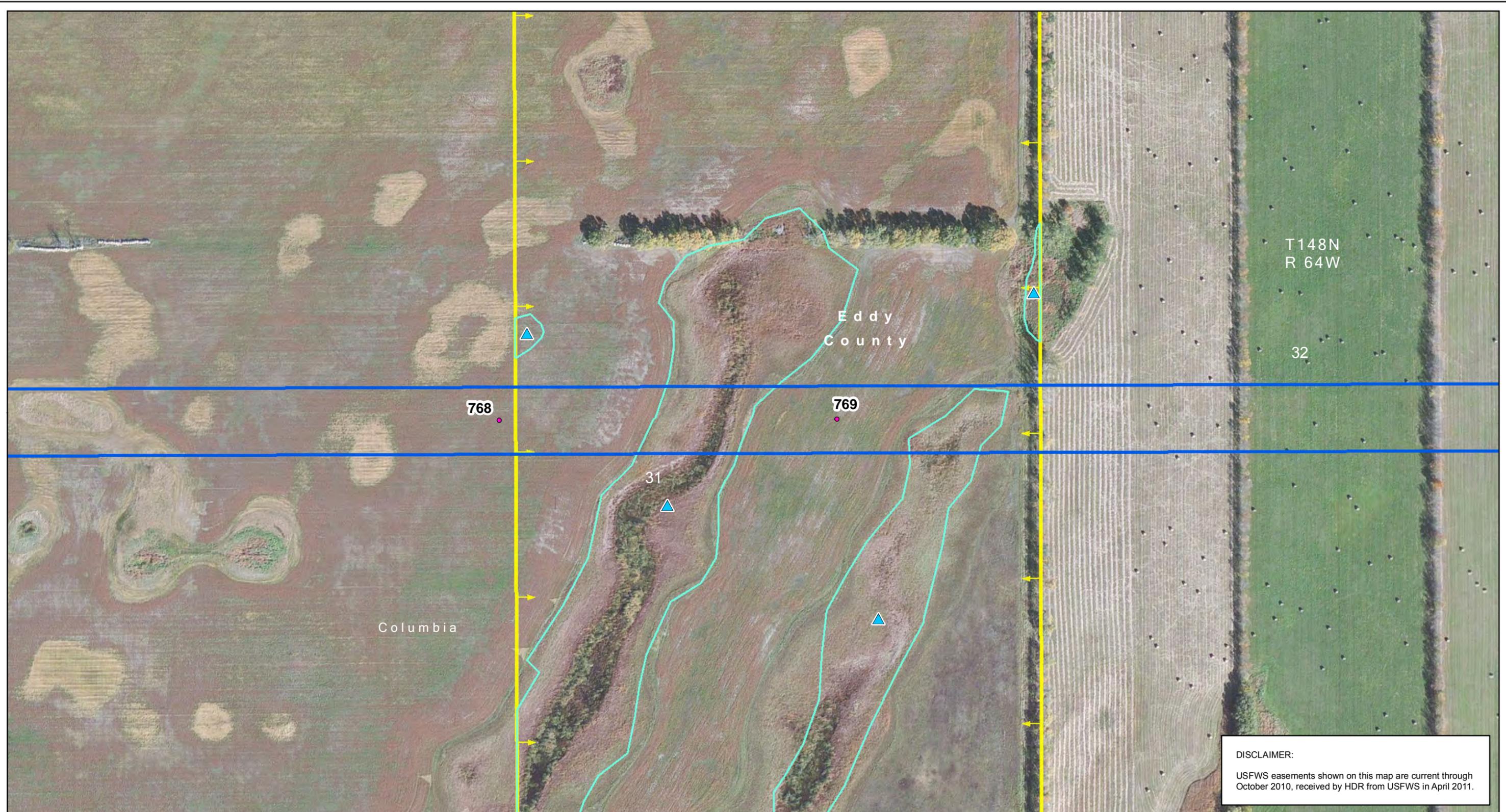
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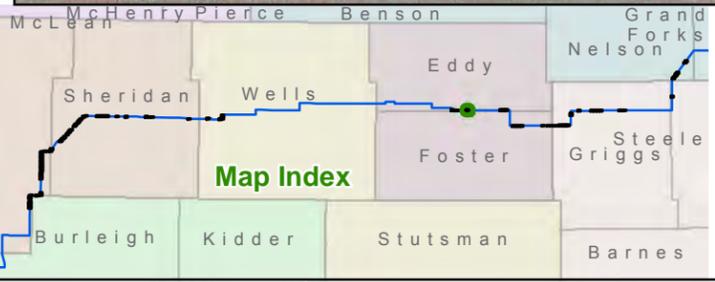
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- USFWS Grassland Easement
- USGS Mapped Waterway
- 123 Structure Number
- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 67 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



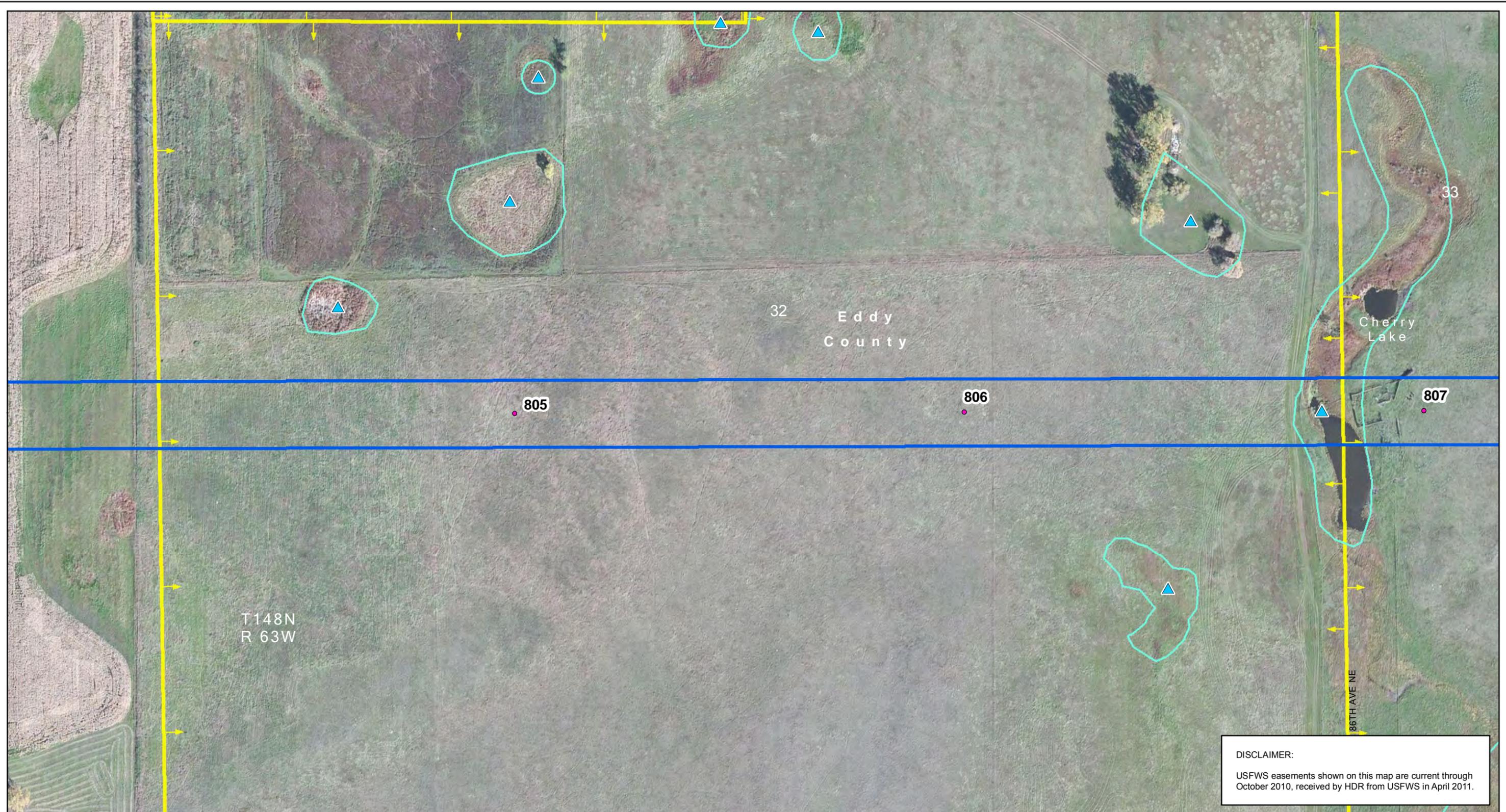
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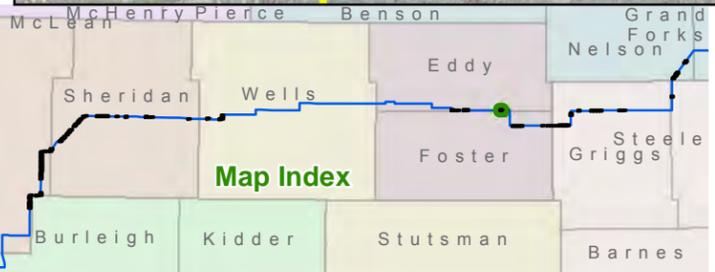
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Figure 2: Page 68 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



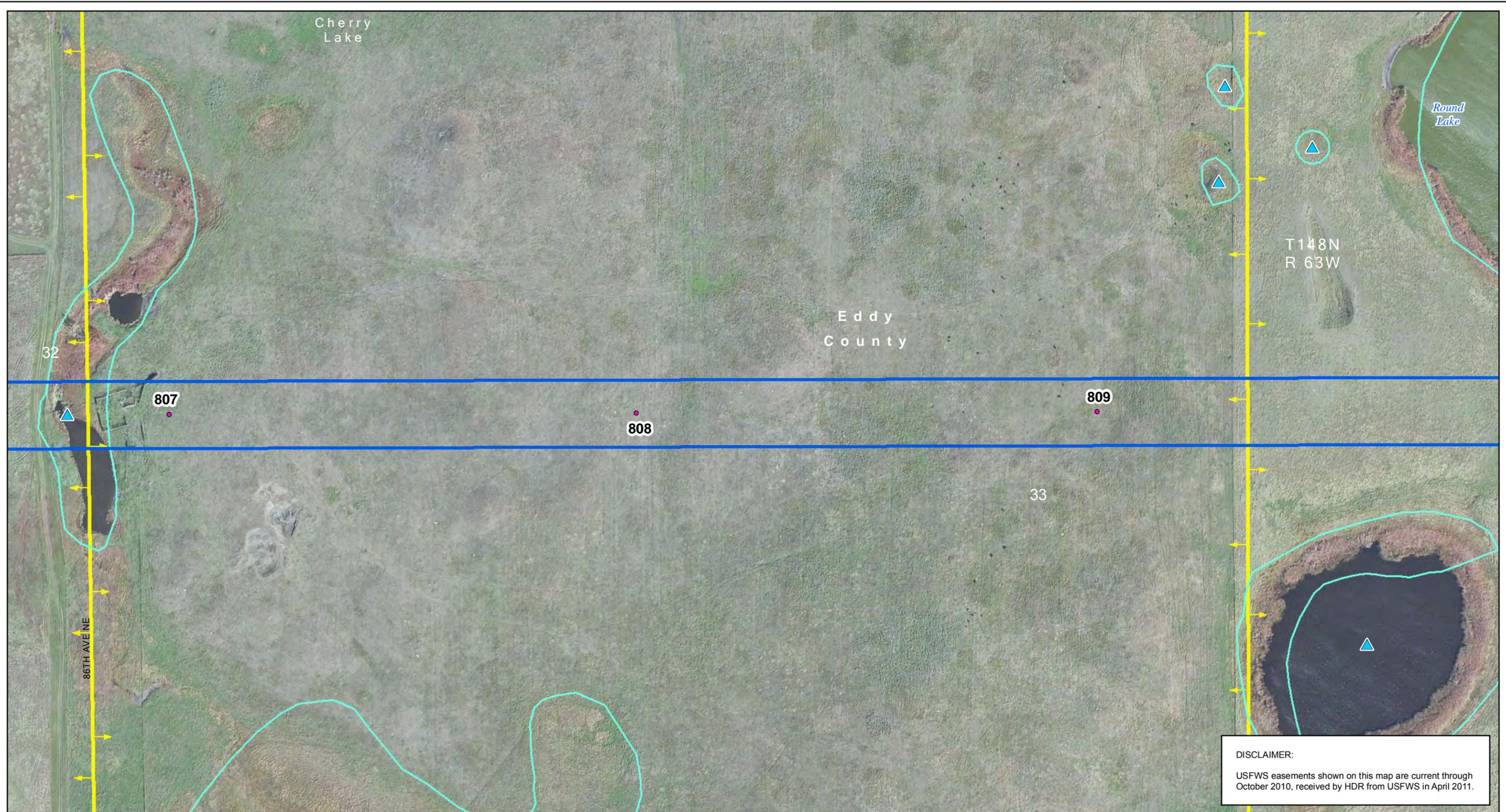
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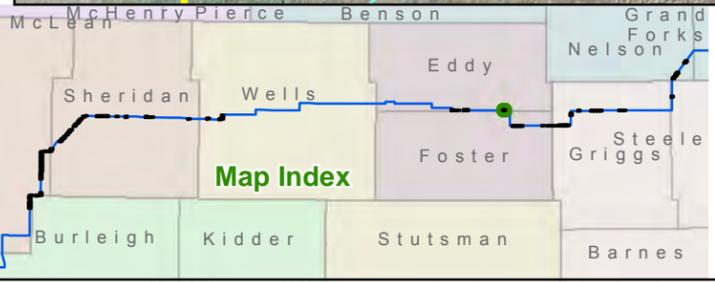
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- USFWS Grassland Easement
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 69 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



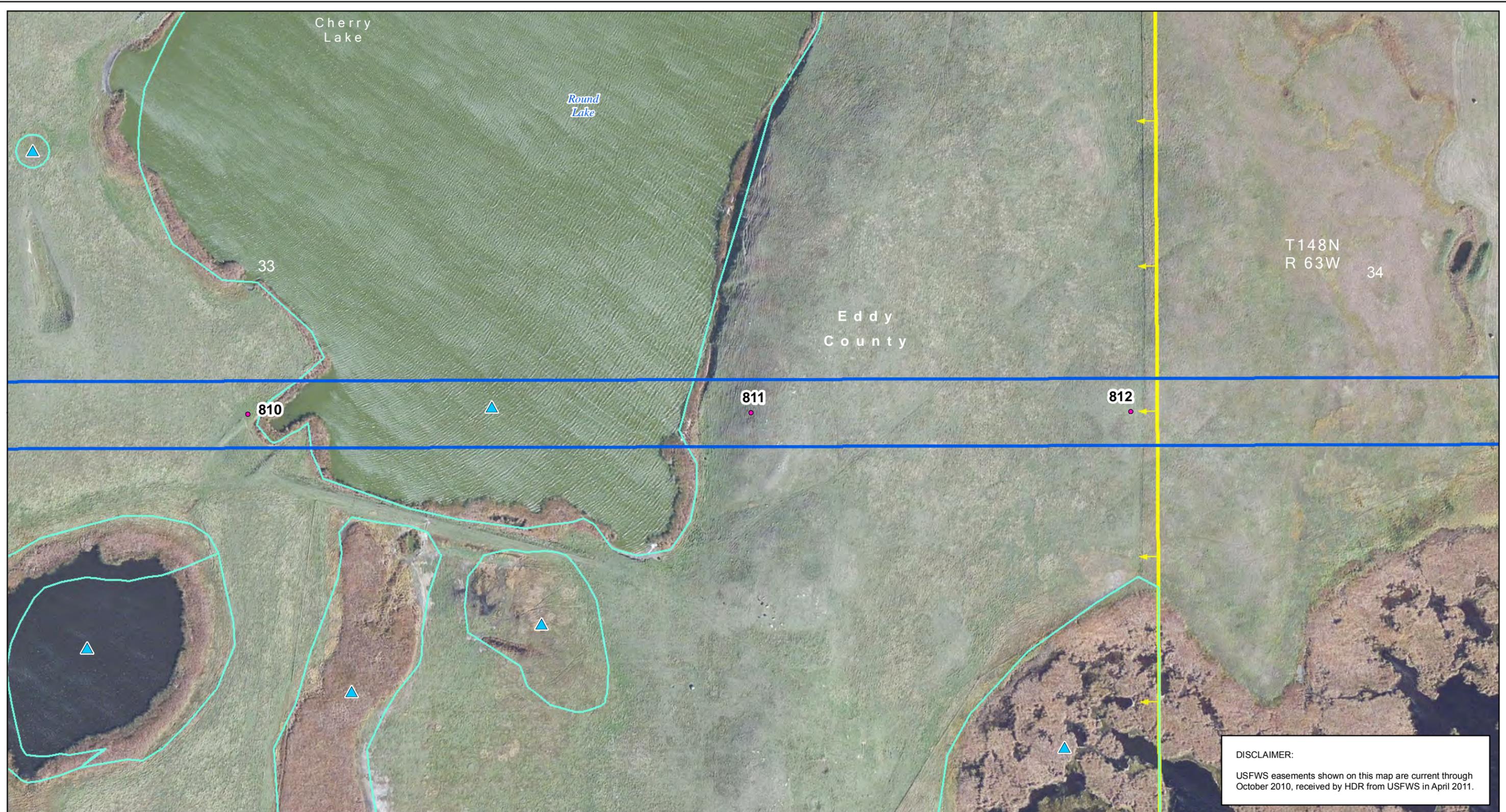
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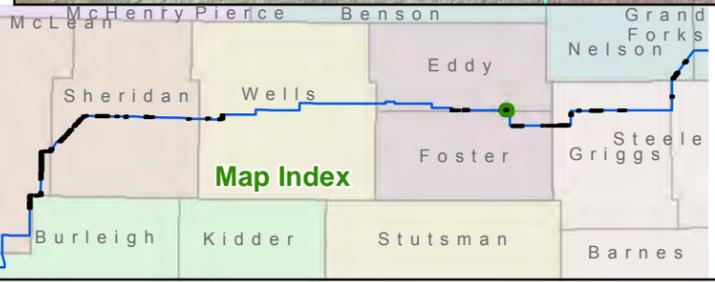
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway
- Project ROW (150 ft wide) - November 11, 2011
- Temporary Impact Area - November 11, 2011
- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 70 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



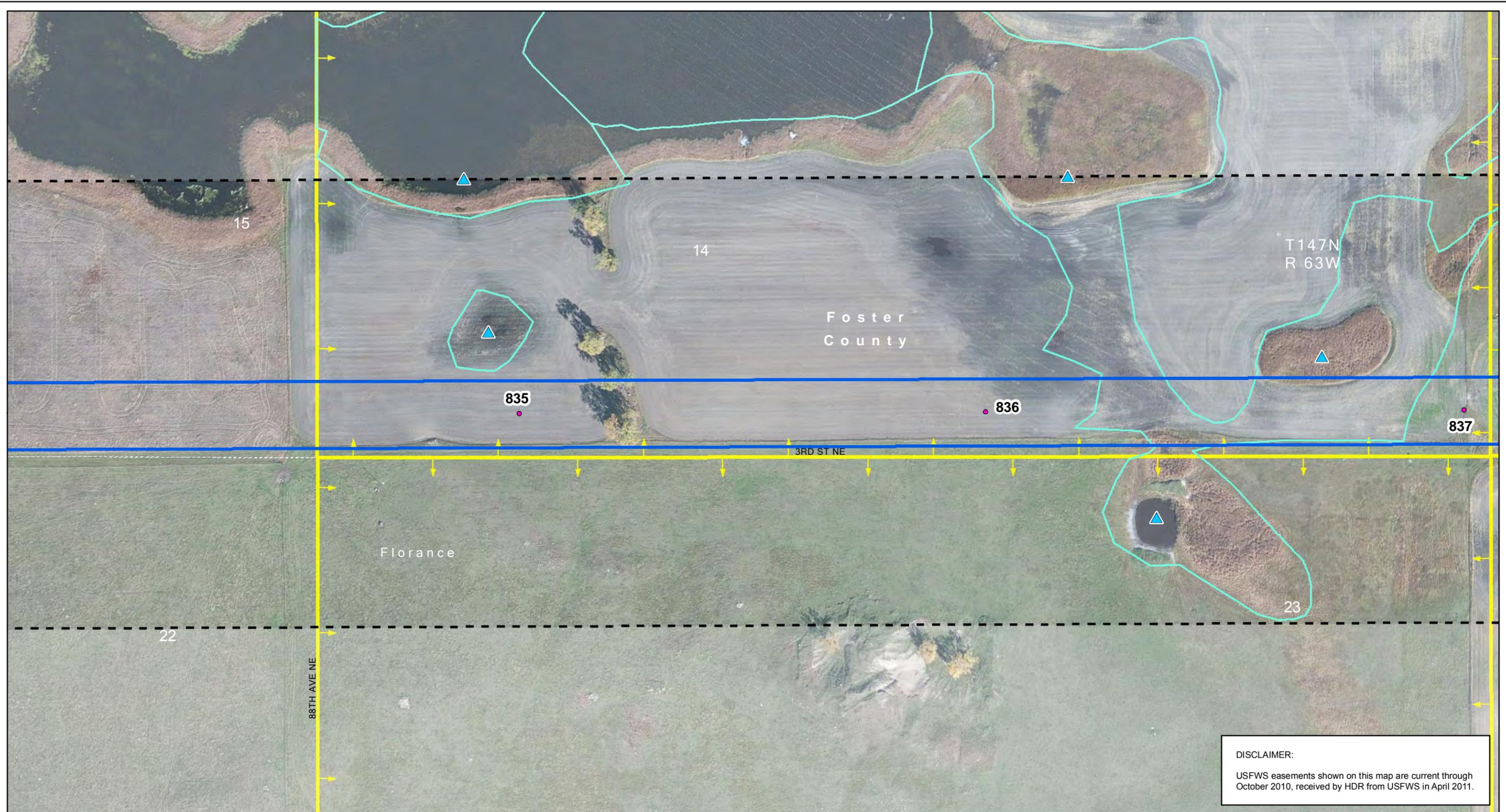
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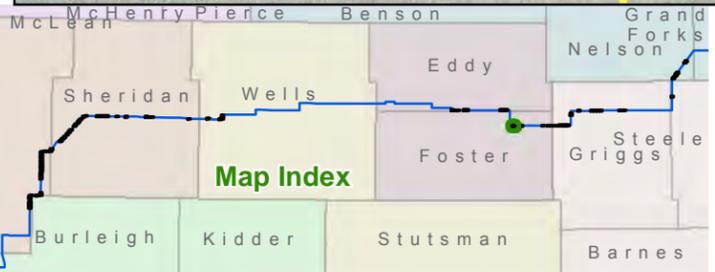
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- USGS Mapped Waterway

Figure 2: Page 71 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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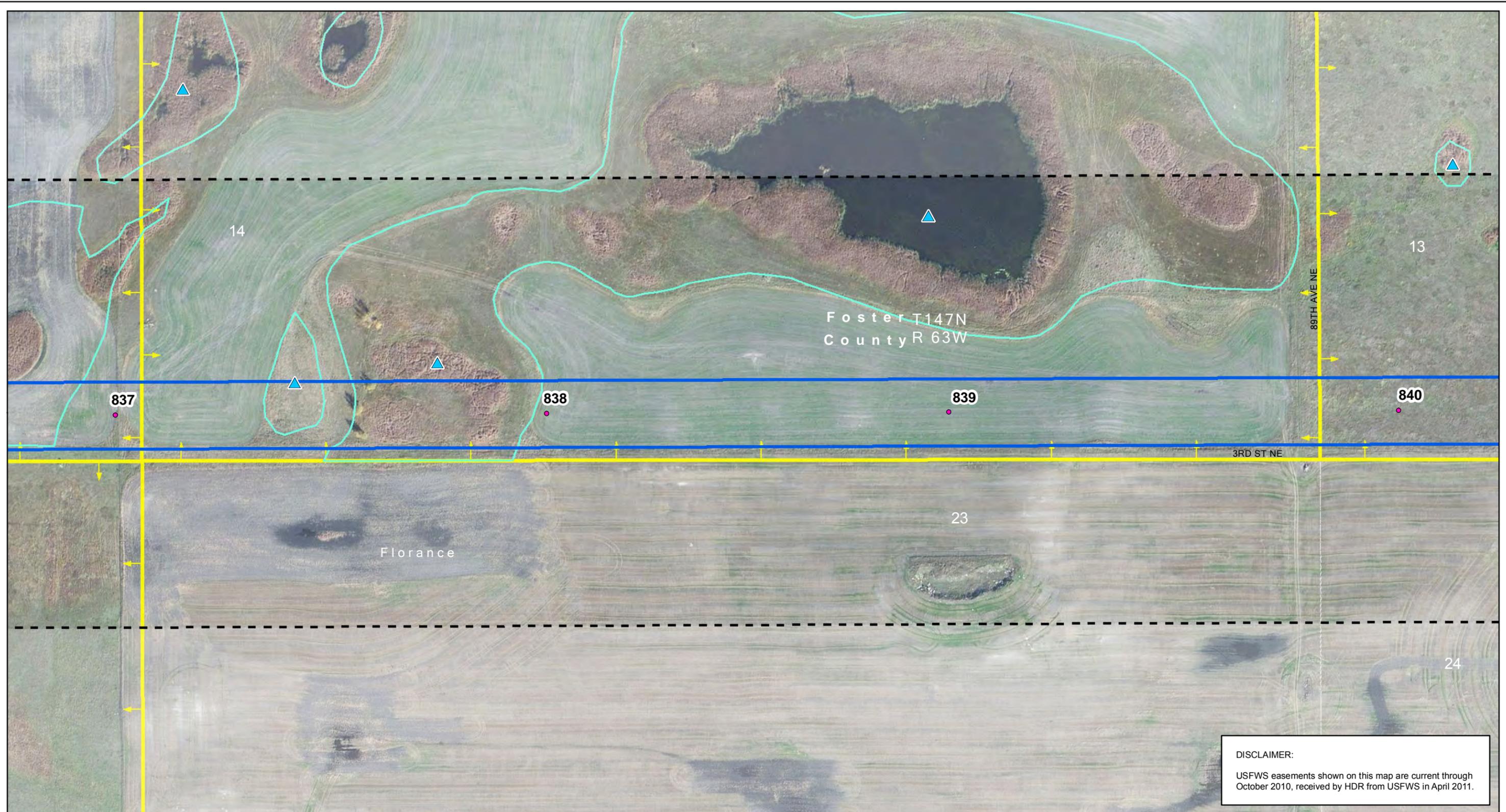


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- Possible USFWS Easement Wetland within Project Corridor
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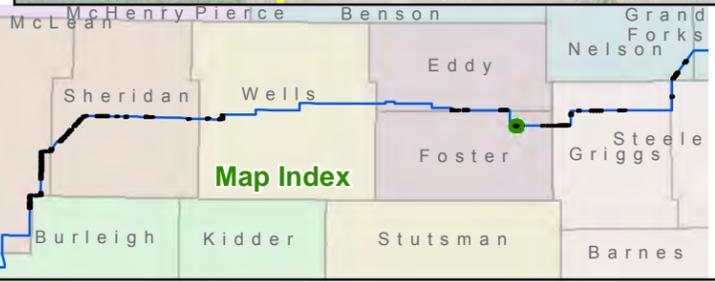
Figure 2: Page 72 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500

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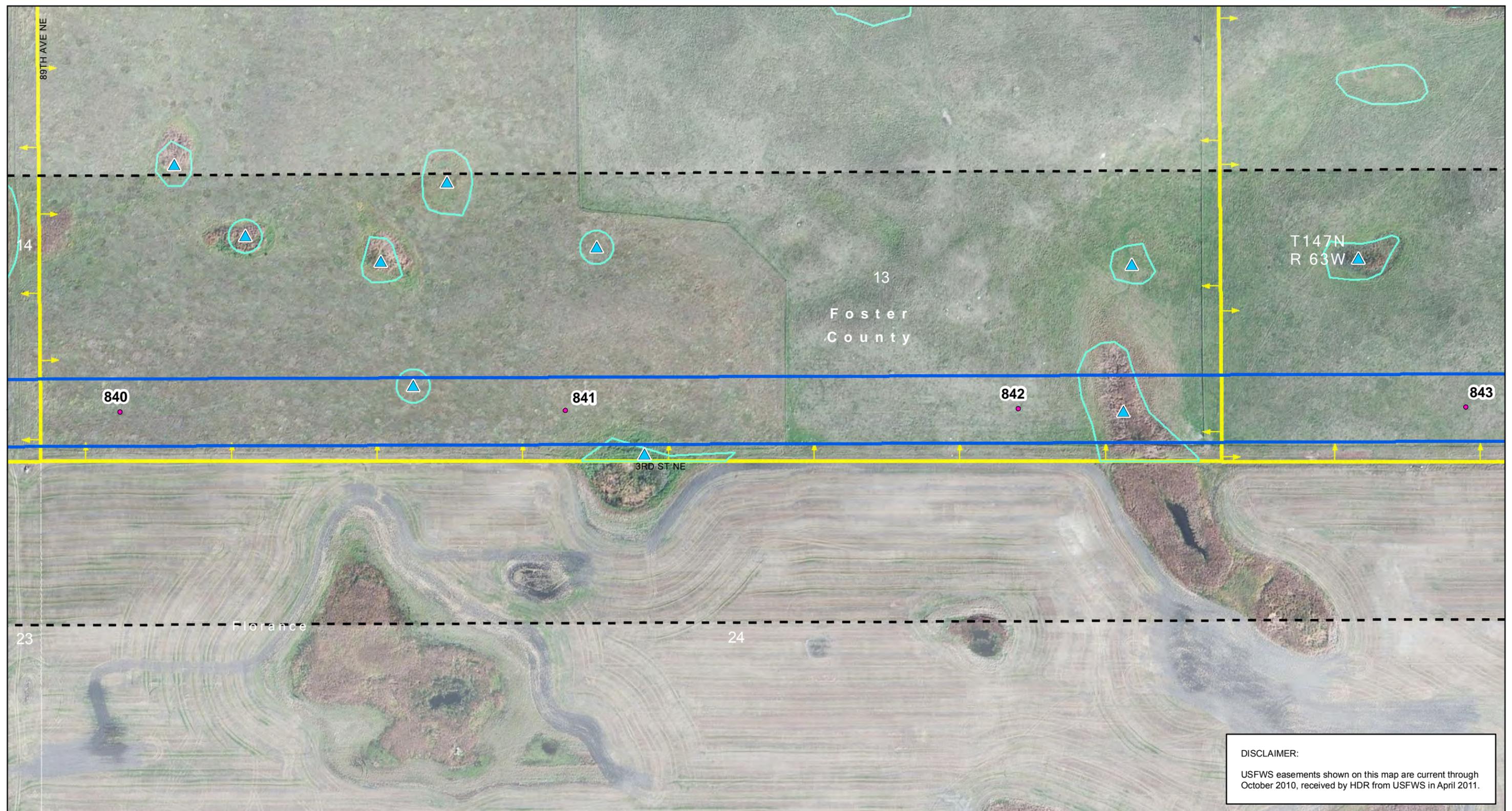
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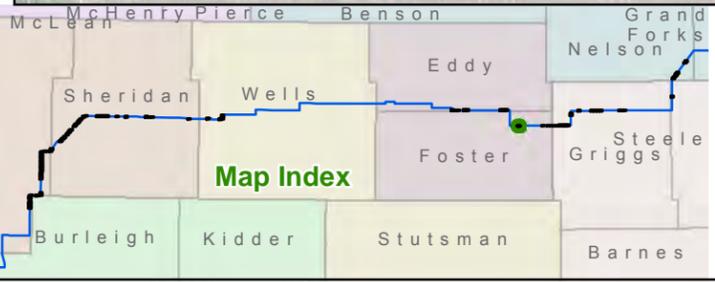
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Figure 2: Page 73 of 102
Project Route Along USFWS Easements
Center to Grand Forks Project

0 200 400 Feet
Scale 1:2,500



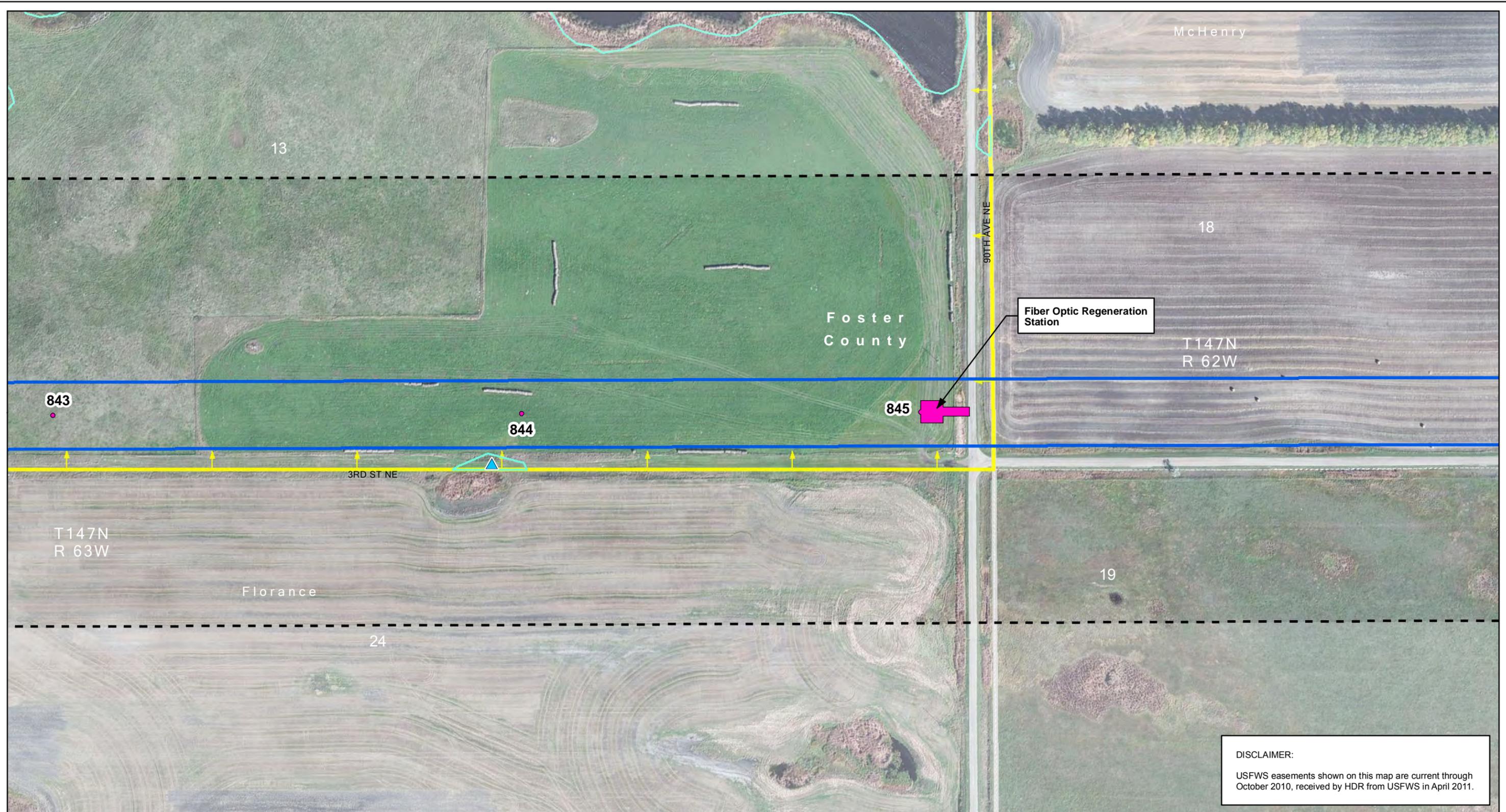
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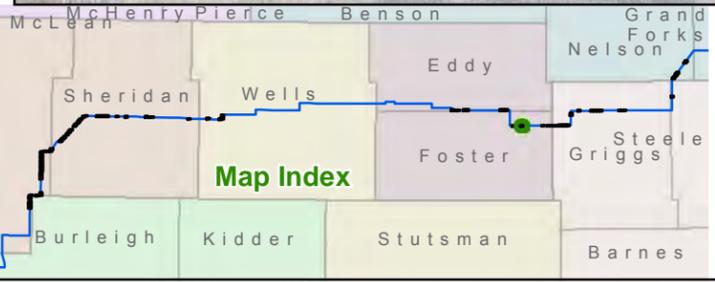
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Figure 2: Page 74 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



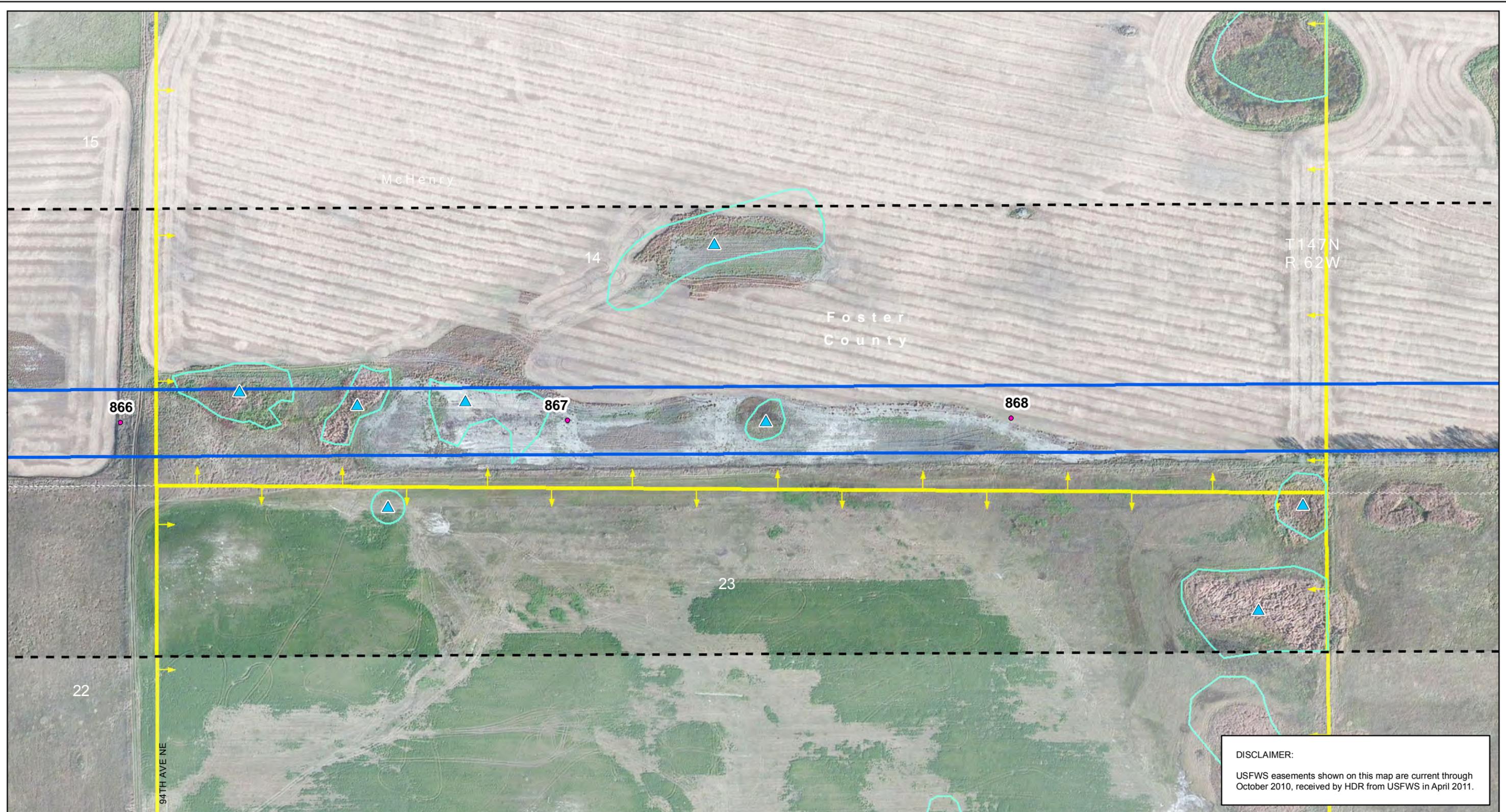
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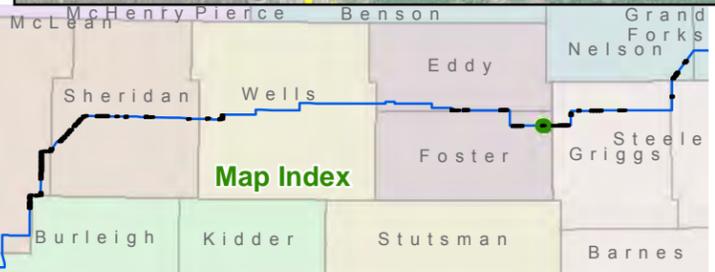
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
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Figure 2: Page 75 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



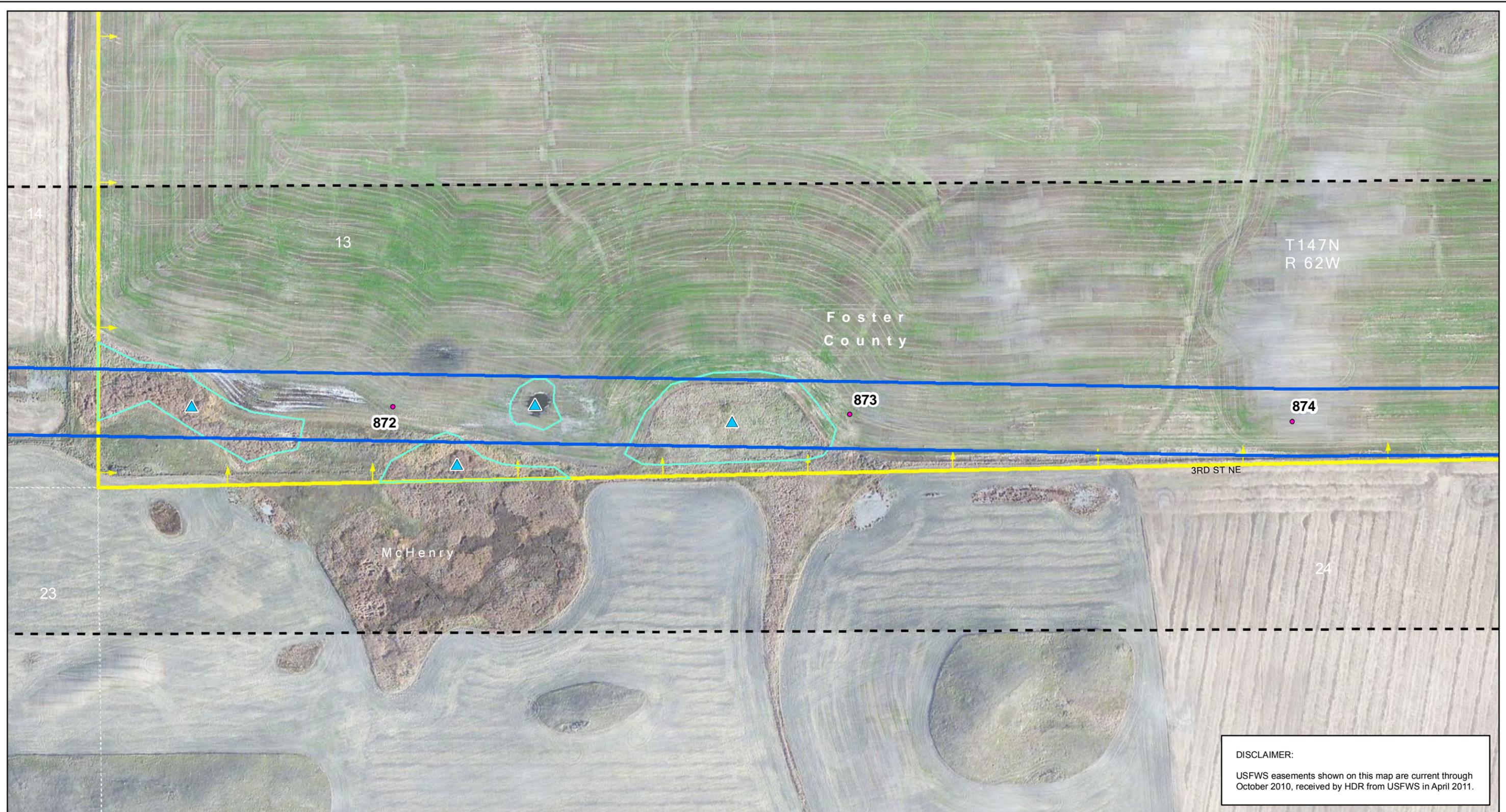
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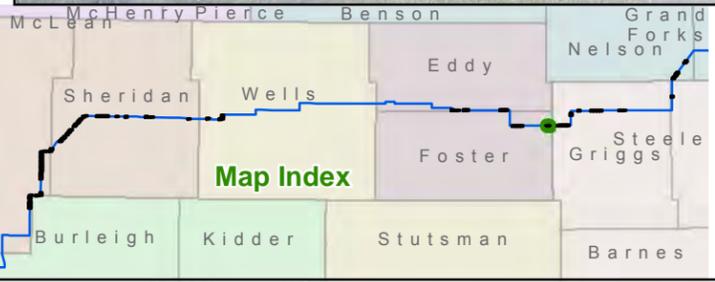
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Figure 2: Page 76 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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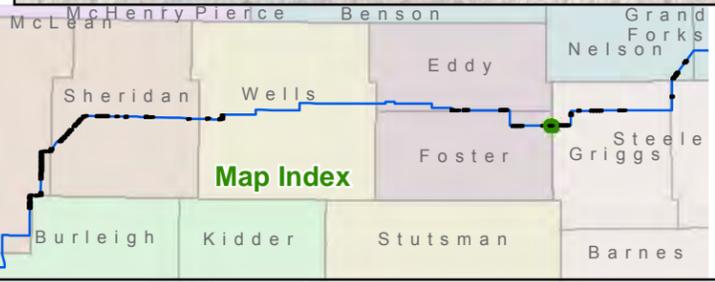
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Figure 2: Page 77 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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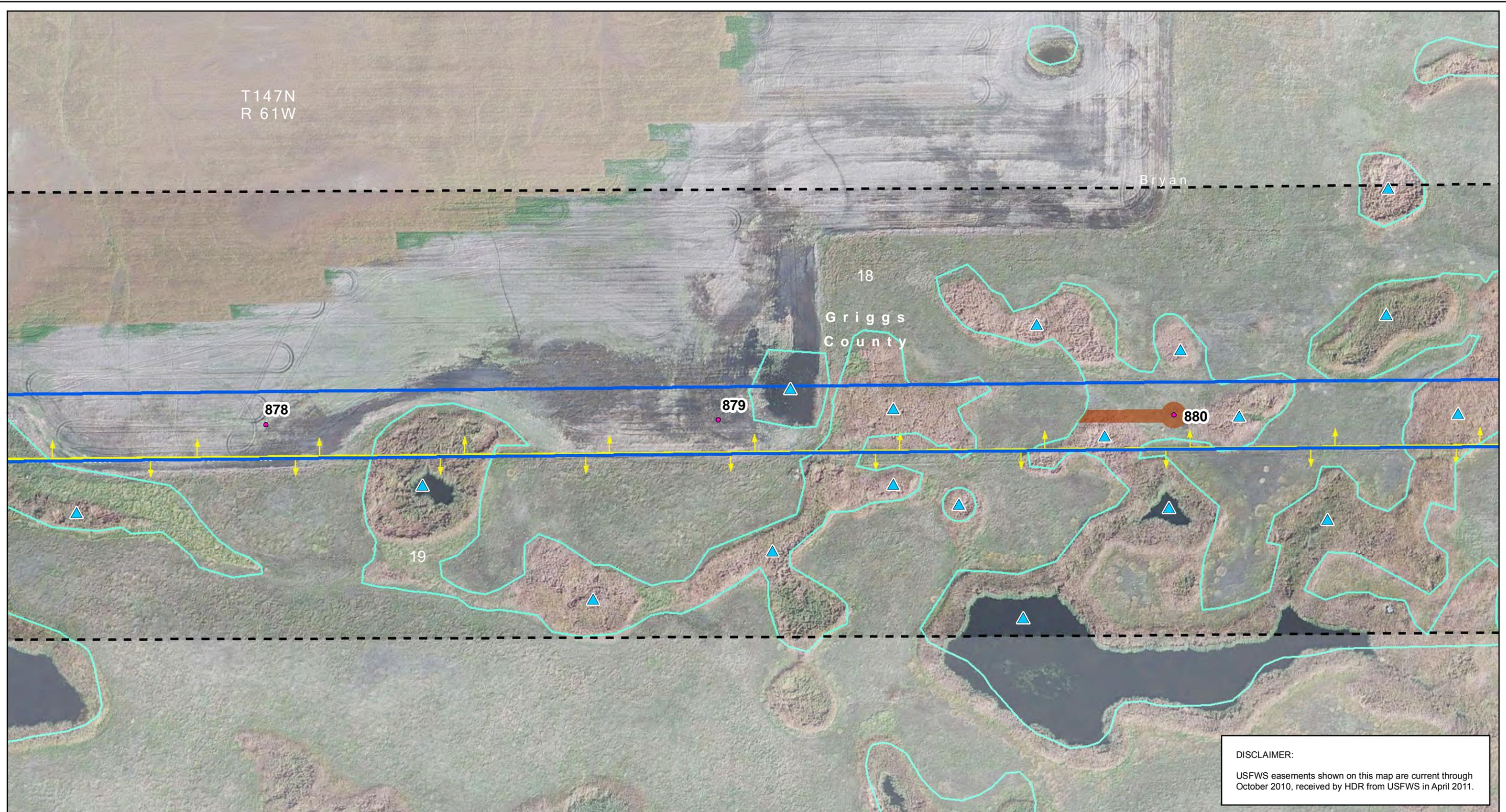


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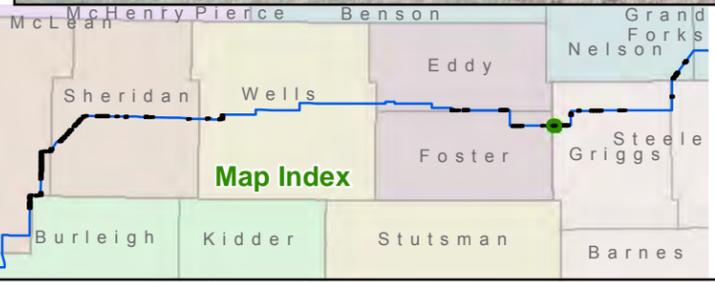
Figure 2: Page 78 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500

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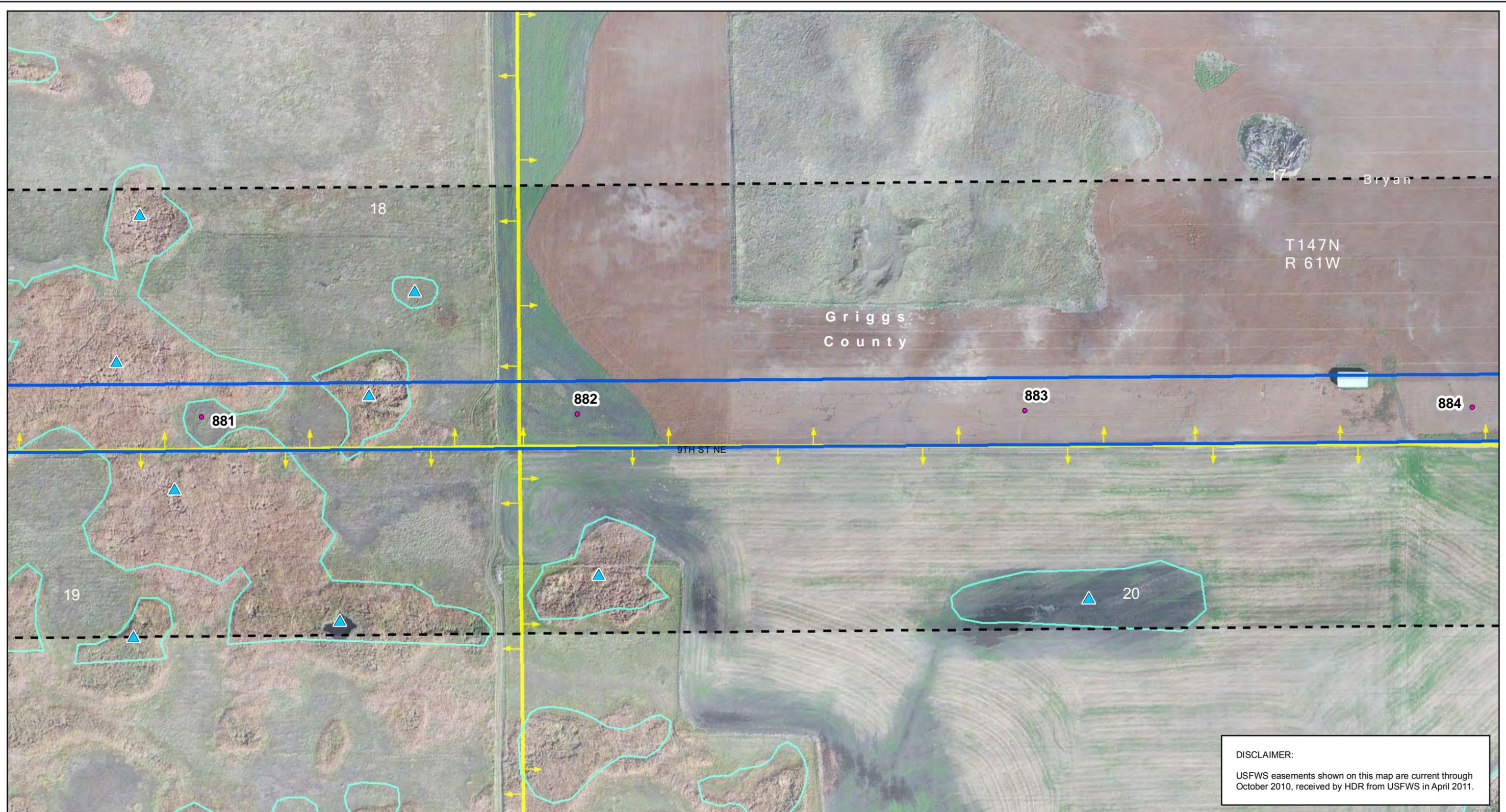


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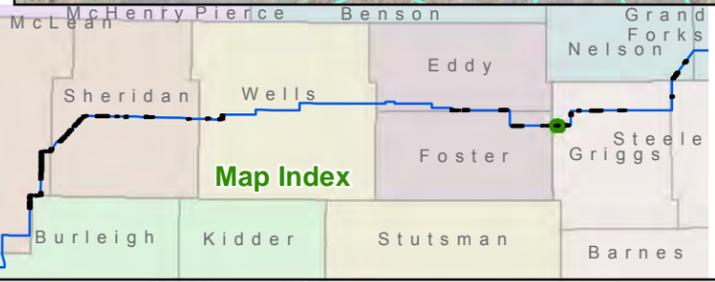
Figure 2: Page 79 of 102
Project Route Along USFWS Easements
Center to Grand Forks Project

Scale 1:2,500

Date: 12/6/2011
Path: \\mspc-cis-fs1\GIS\Projects\110900\map_docs\RU\SEWS_EACG\FWSEA_Fig_2500_11x17L_mh.mxd



DISCLAIMER:
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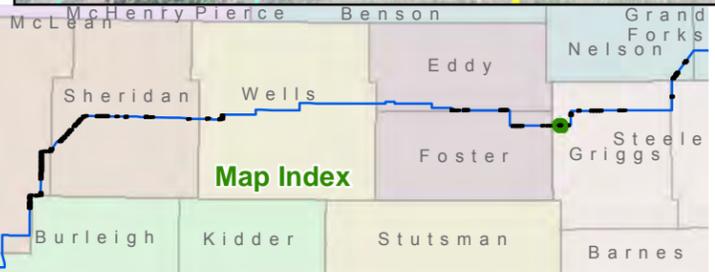
- Proposed Modified Corridor - November 18, 2011
- Project ROW (150 ft wide) - November 11, 2011
- 123 Structure Number
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 80 of 102
Project Route Along USFWS Easements
Center to Grand Forks Project

Scale 1:2,500



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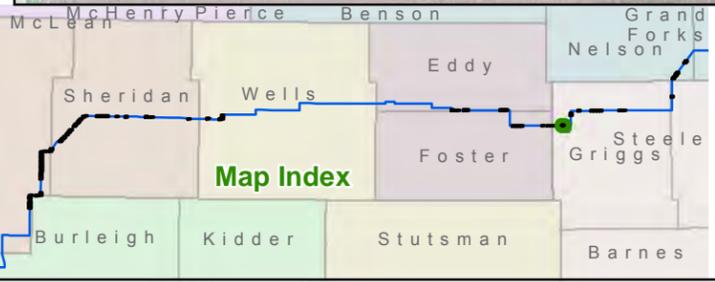
- Proposed Modified Corridor - November 18, 2011
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- 123 Structure Number
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
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- USFWS Grassland Easement
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- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 81 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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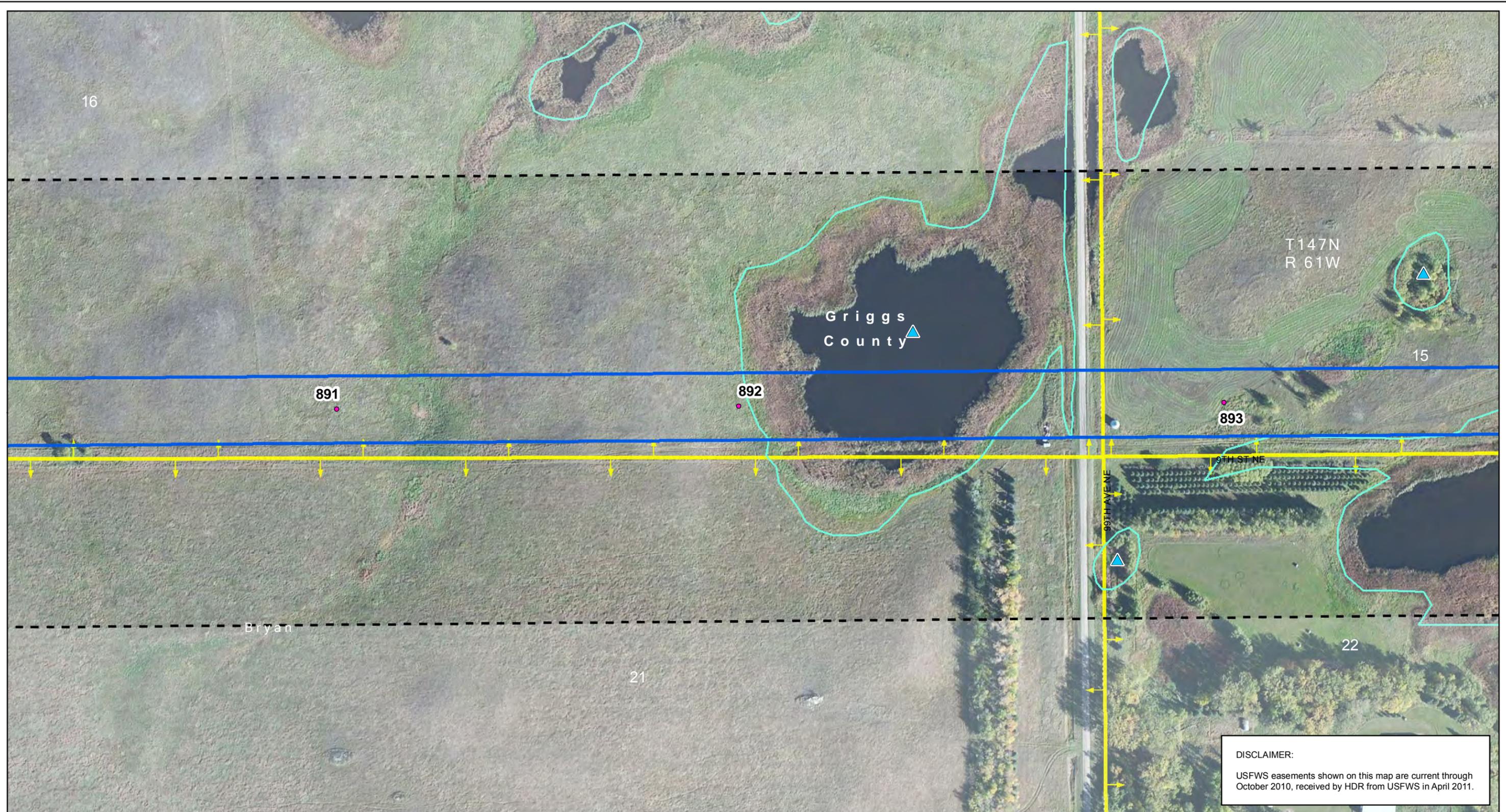


- Proposed Modified Corridor - November 18, 2011
- Project ROW (150 ft wide) - November 11, 2011
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Approximate USACE Wetland Boundary
- Possible USFWS Easement Wetland within Project Corridor
- USGS Mapped Waterway

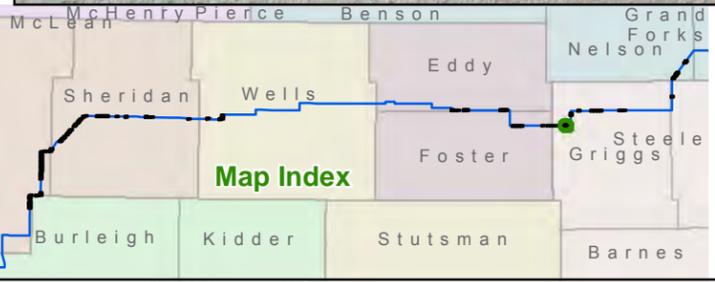
Figure 2: Page 82 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500

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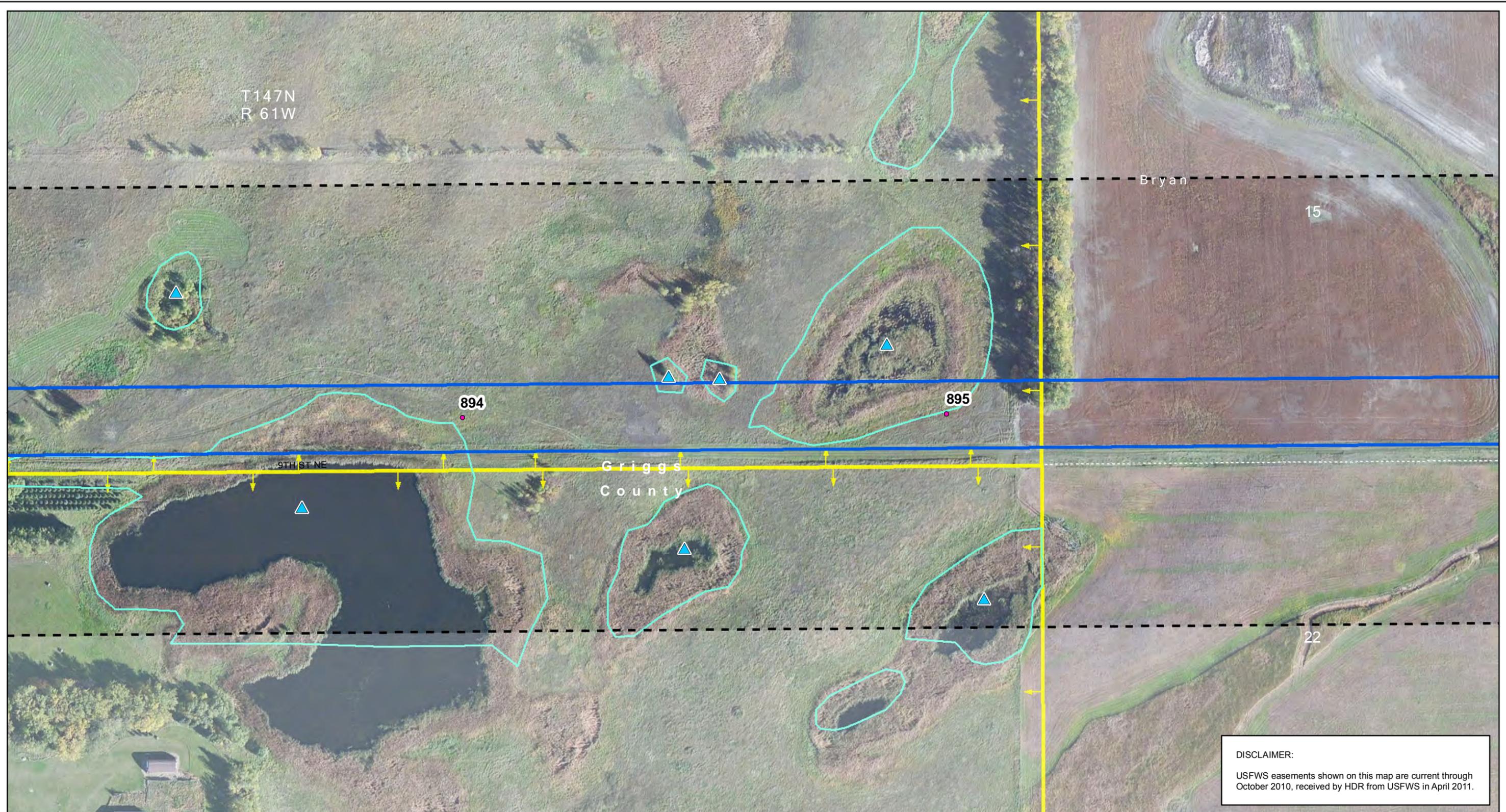
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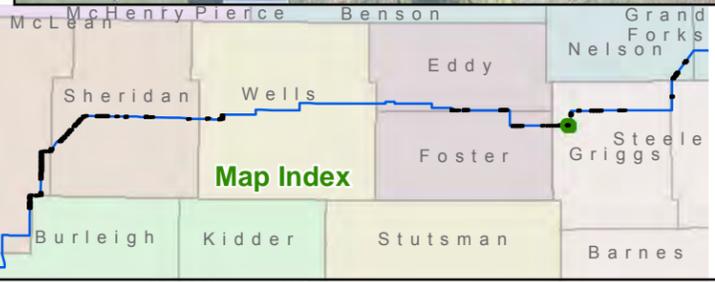
- Proposed Modified Corridor - November 18, 2011
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- 123 Structure Number
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 83 of 102
Project Route Along USFWS Easements
Center to Grand Forks Project

0 200 400 Feet
Scale 1:2,500



DISCLAIMER:
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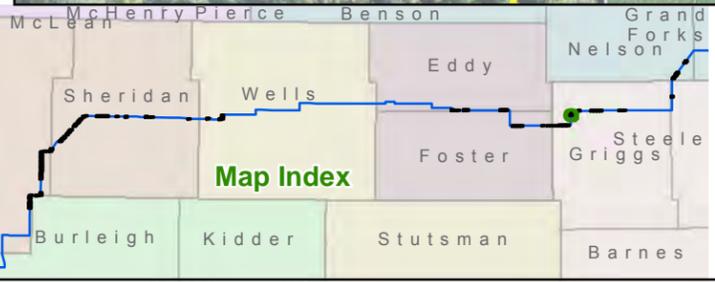
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- 123 Structure Number
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- Temporary Impact Area - November 11, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
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- USGS Mapped Waterway

Figure 2: Page 84 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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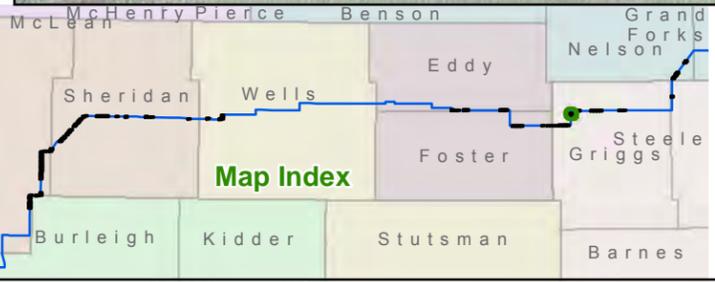
- Proposed Modified Corridor - November 18, 2011
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- Temporary Impact Area - November 11, 2011
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- USGS Mapped Waterway

Figure 2: Page 85 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



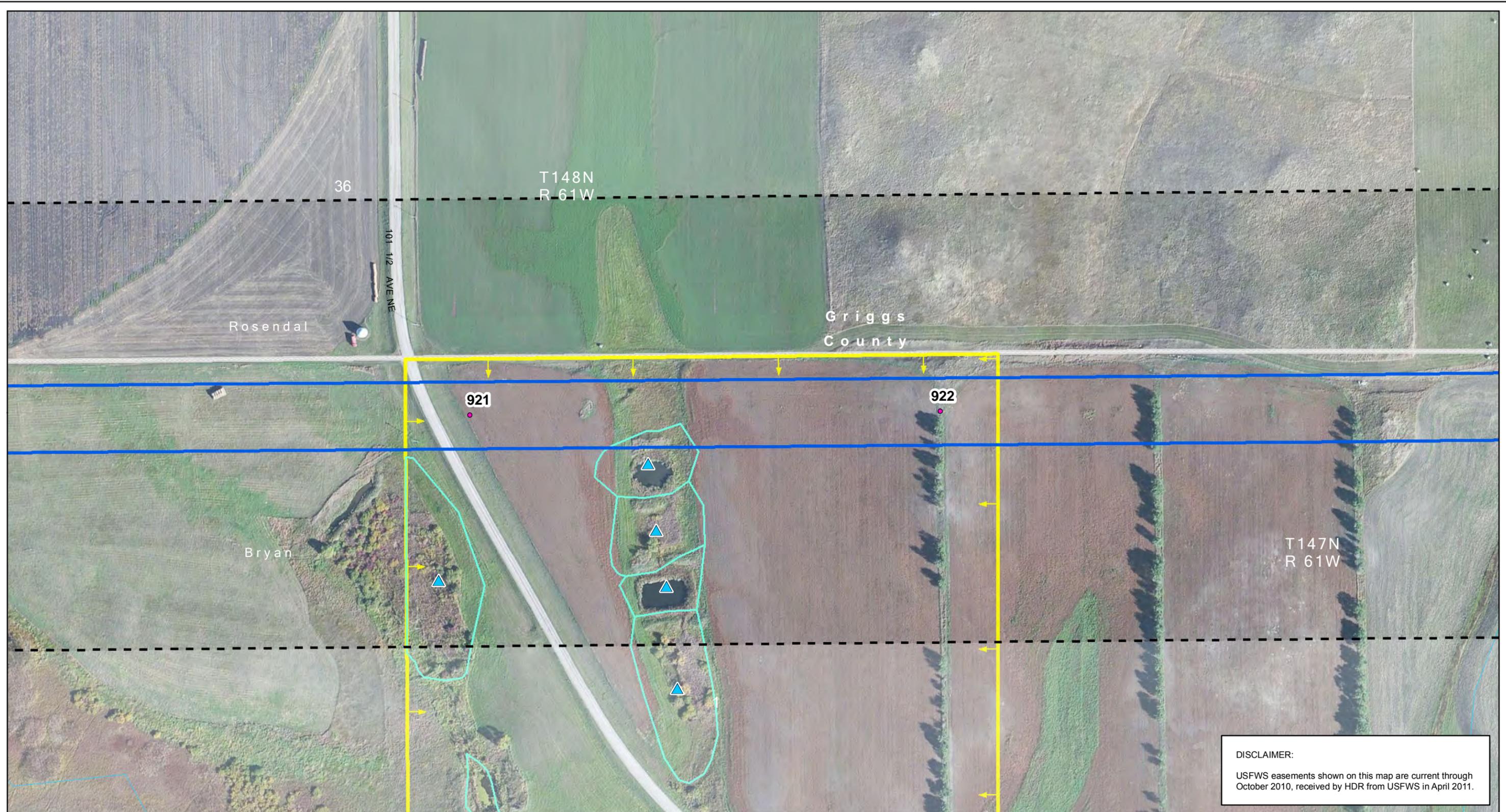
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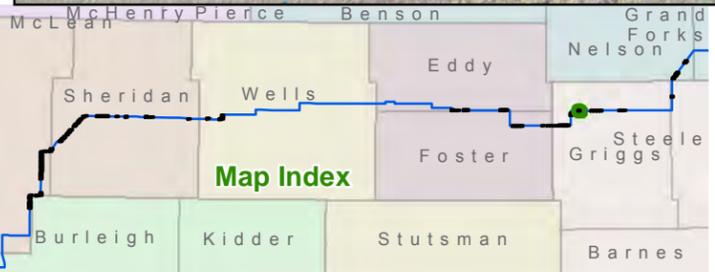
- Proposed Modified Corridor - November 18, 2011
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- USGS Mapped Waterway

Figure 2: Page 86 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



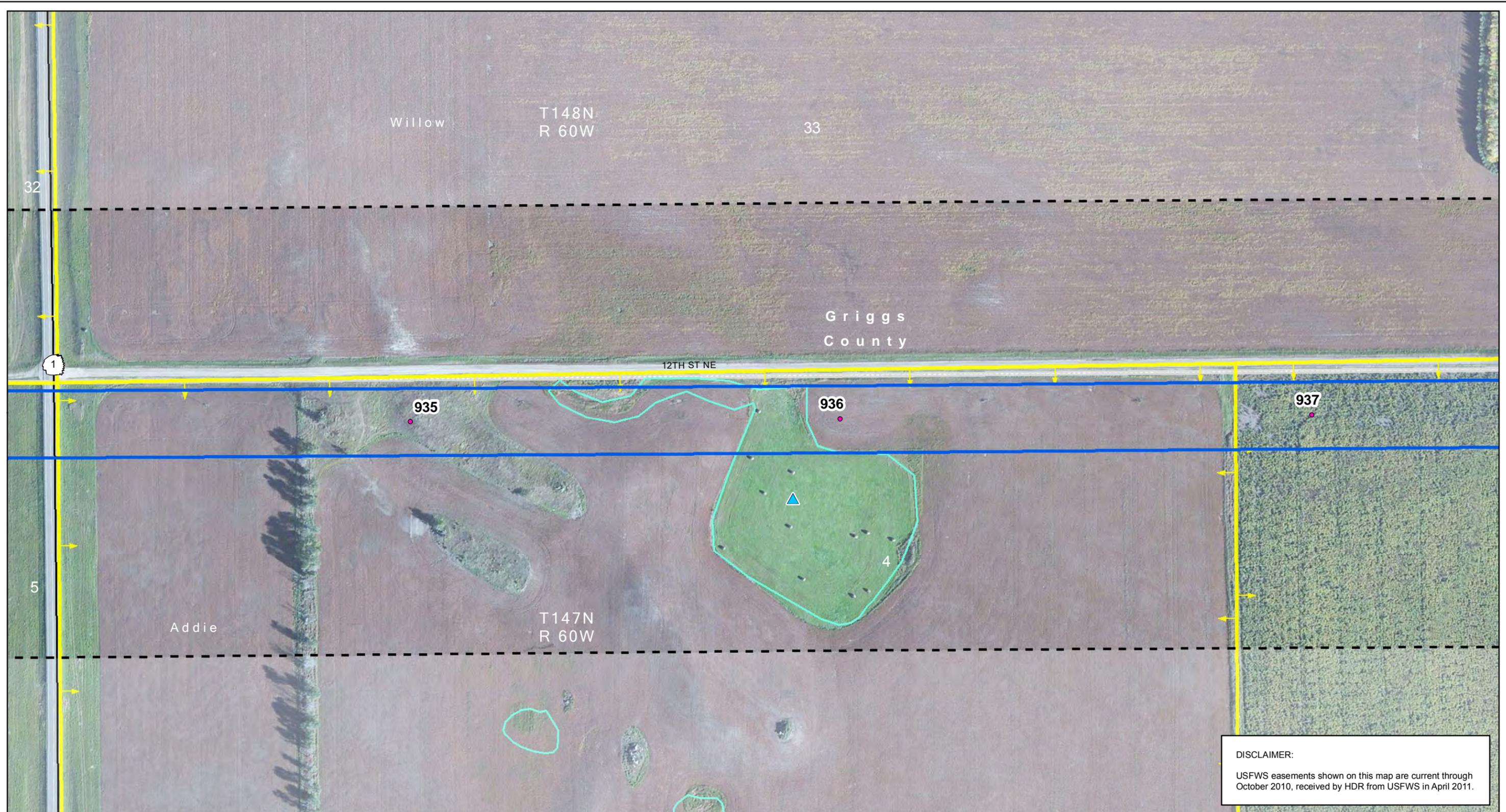
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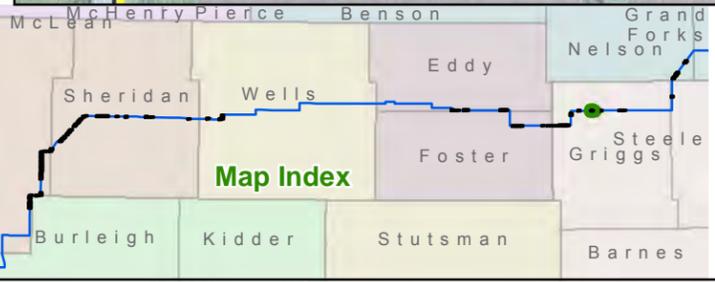
- Proposed Modified Corridor - November 18, 2011
- Permanent Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- Approximate USACE Wetland Boundary
- Project ROW (150 ft wide) - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Grassland Easement
- USGS Mapped Waterway
- Possible USFWS Easement Wetland within Project Corridor
- 123 Structure Number

Figure 2: Page 87 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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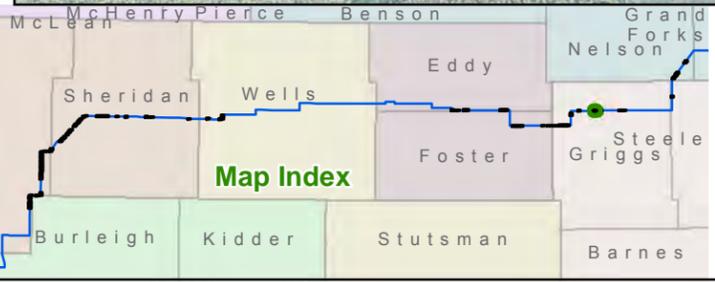
- Proposed Modified Corridor - November 18, 2011
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- 123 Structure Number
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- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 88 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



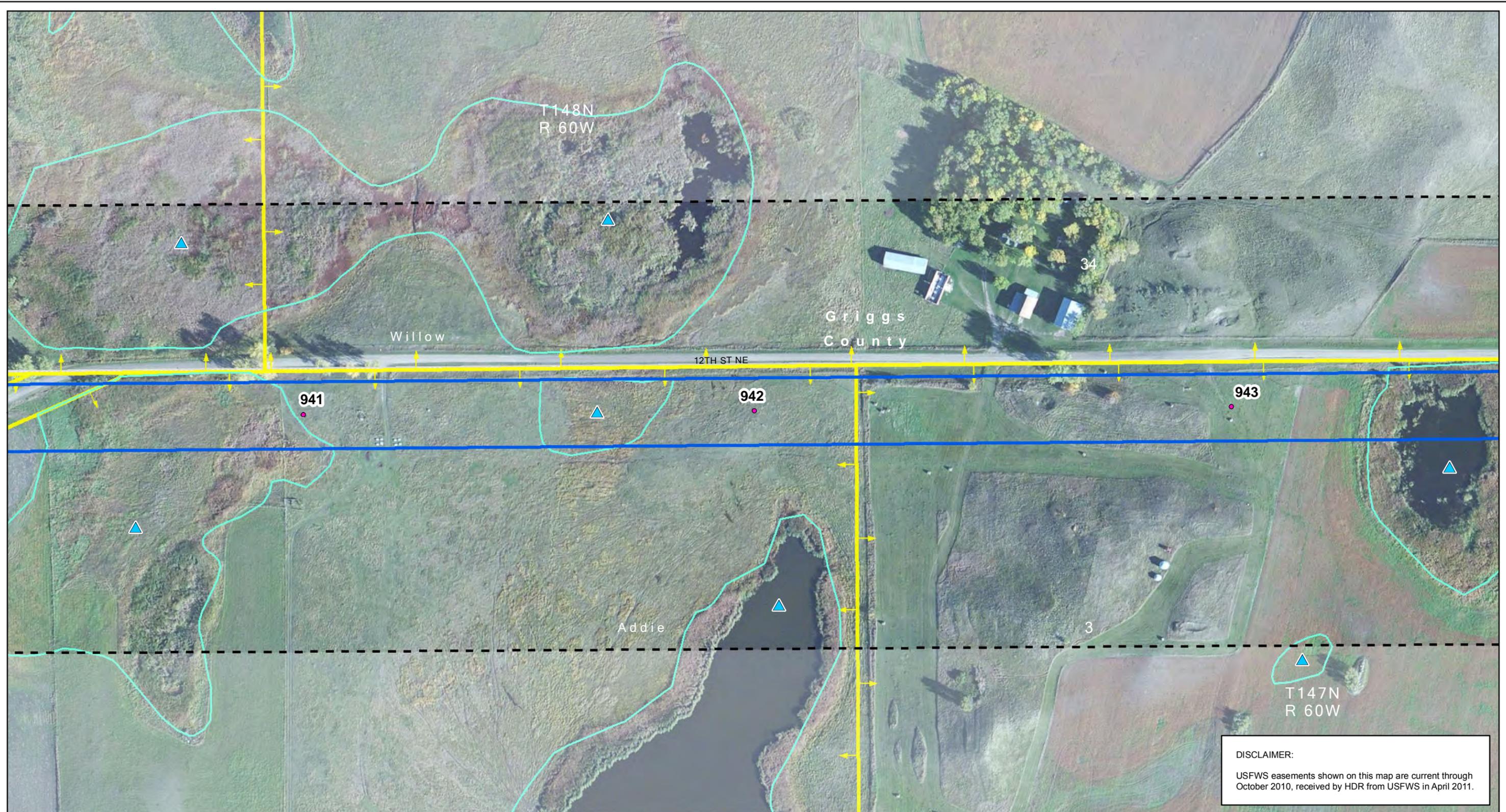
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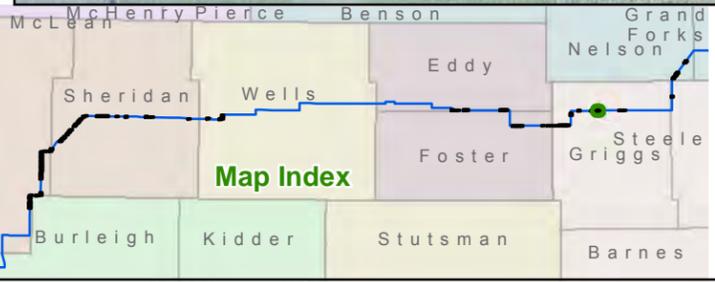
- Proposed Modified Corridor - November 18, 2011
- Permanent Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- Approximate USACE Wetland Boundary
- Project ROW (150 ft wide) - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Grassland Easement
- USGS Mapped Waterway
- 123 Structure Number
- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 89 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



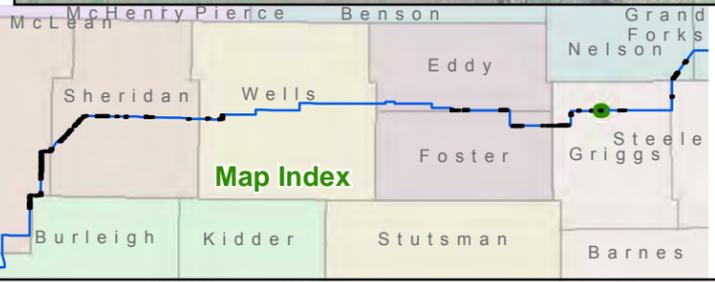
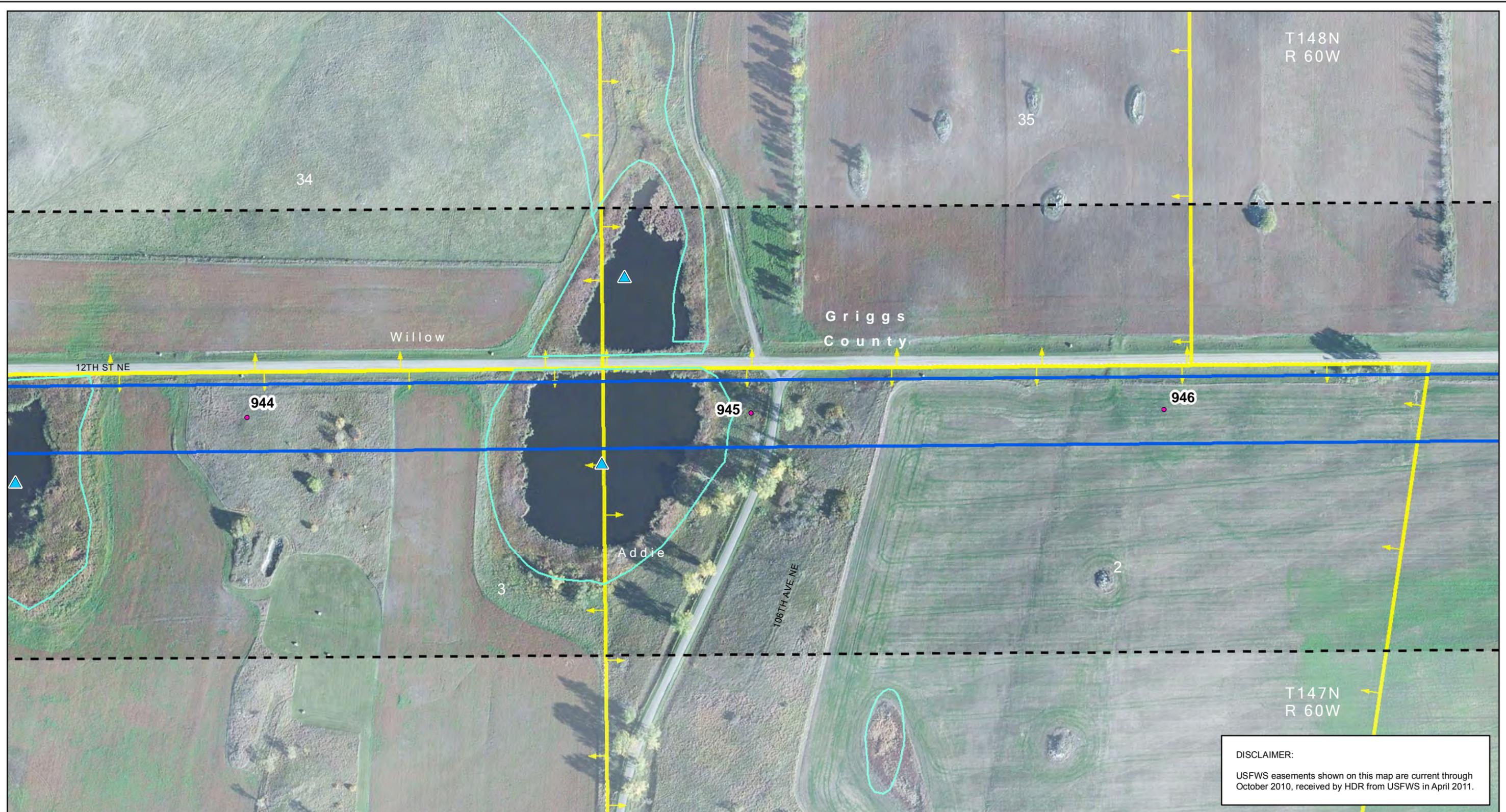
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- Proposed Modified Corridor - November 18, 2011
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Project ROW (150 ft wide) - November 11, 2011
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway
- 123 Structure Number

Figure 2: Page 90 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



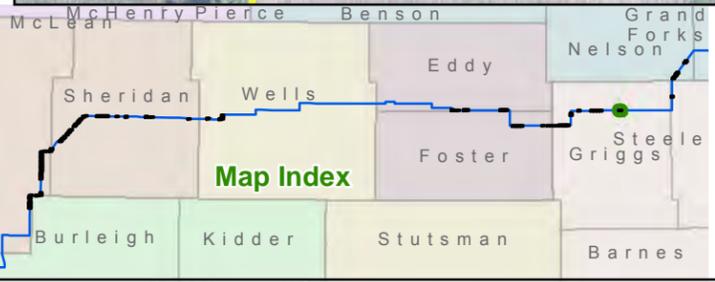
- Proposed Modified Corridor - November 18, 2011
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- 123 Structure Number
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- USFWS Grassland Easement
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- USGS Mapped Waterway

Figure 2: Page 91 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
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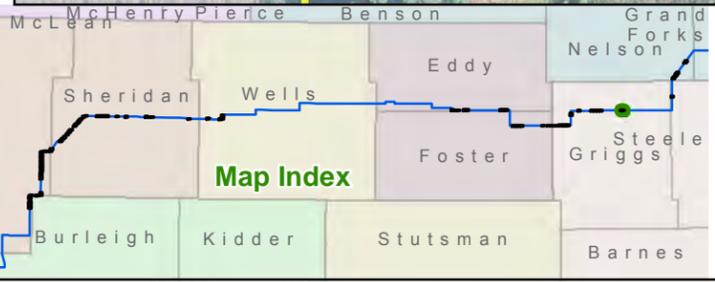
Figure 2: Page 92 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500

Date: 12/6/2011
Path: \\mspc-cis-fs1\GIS\Projects\110900\map_docs\TRUSSEVS_EA\CGFWSEA_Fig_2500_11x17L_mh.mxd



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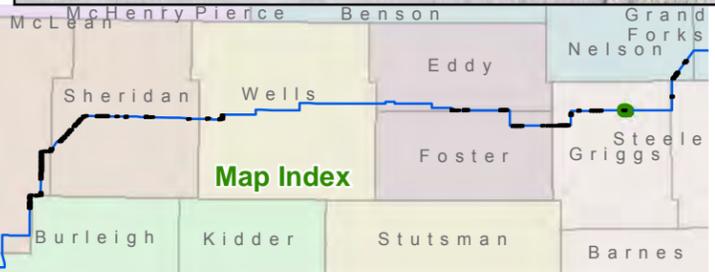
- Proposed Modified Corridor - November 18, 2011
- Project ROW (150 ft wide) - November 11, 2011
- 123 Structure Number
- Permanent Impact Area - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 2: Page 93 of 102
Project Route Along USFWS Easements
Center to Grand Forks Project

0 200 400 Feet
Scale 1:2,500



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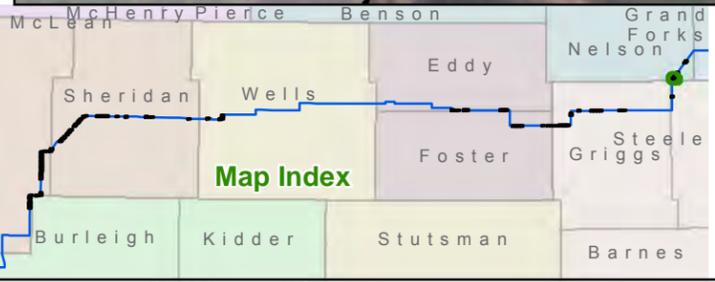
- Proposed Modified Corridor - November 18, 2011
- Permanent Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway
- Project ROW (150 ft wide) - November 11, 2011
- Temporary Impact Area - November 11, 2011
- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 94 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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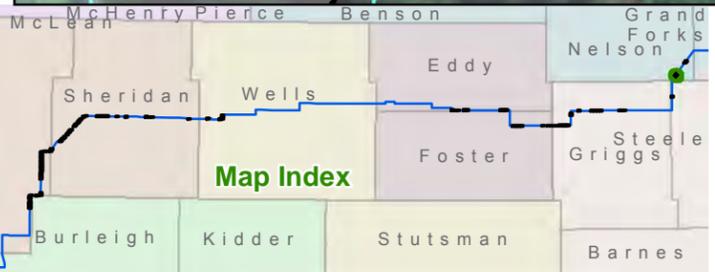
- Proposed Modified Corridor - November 18, 2011
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- Temporary Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Project ROW (150 ft wide) - November 11, 2011
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway
- 123 Structure Number

Figure 2: Page 96 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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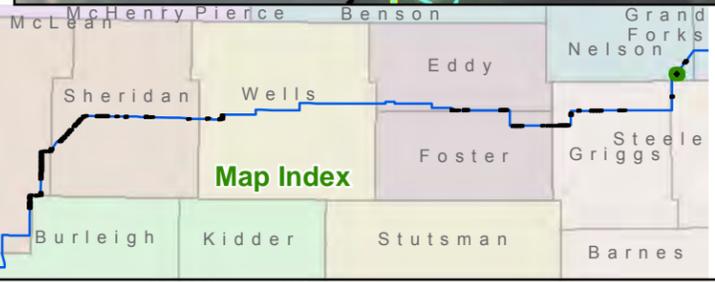
- Proposed Modified Corridor - November 18, 2011
- Permanent Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- Approximate USACE Wetland Boundary
- Project ROW (150 ft wide) - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Grassland Easement
- USGS Mapped Waterway
- 123 Structure Number
- Possible USFWS Easement Wetland within Project Corridor

Figure 2: Page 98 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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- Temporary Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

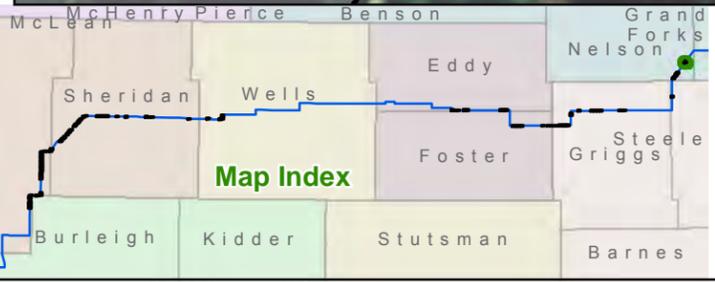
Figure 2: Page 99 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500

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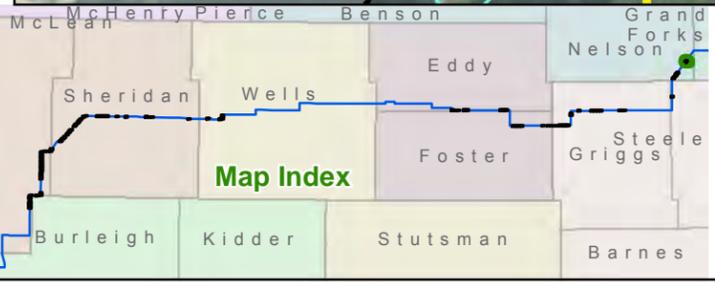
- Proposed Modified Corridor - November 18, 2011
- Permanent Impact Area - November 11, 2011
- USFWS Wetland Easement Parcel
- Approximate USACE Wetland Boundary
- Possible USFWS Easement Wetland within Project Corridor
- Project ROW (150 ft wide) - November 11, 2011
- Temporary Impact Area - November 11, 2011
- USFWS Grassland Easement
- USGS Mapped Waterway
- 123 Structure Number

Figure 2: Page 101 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



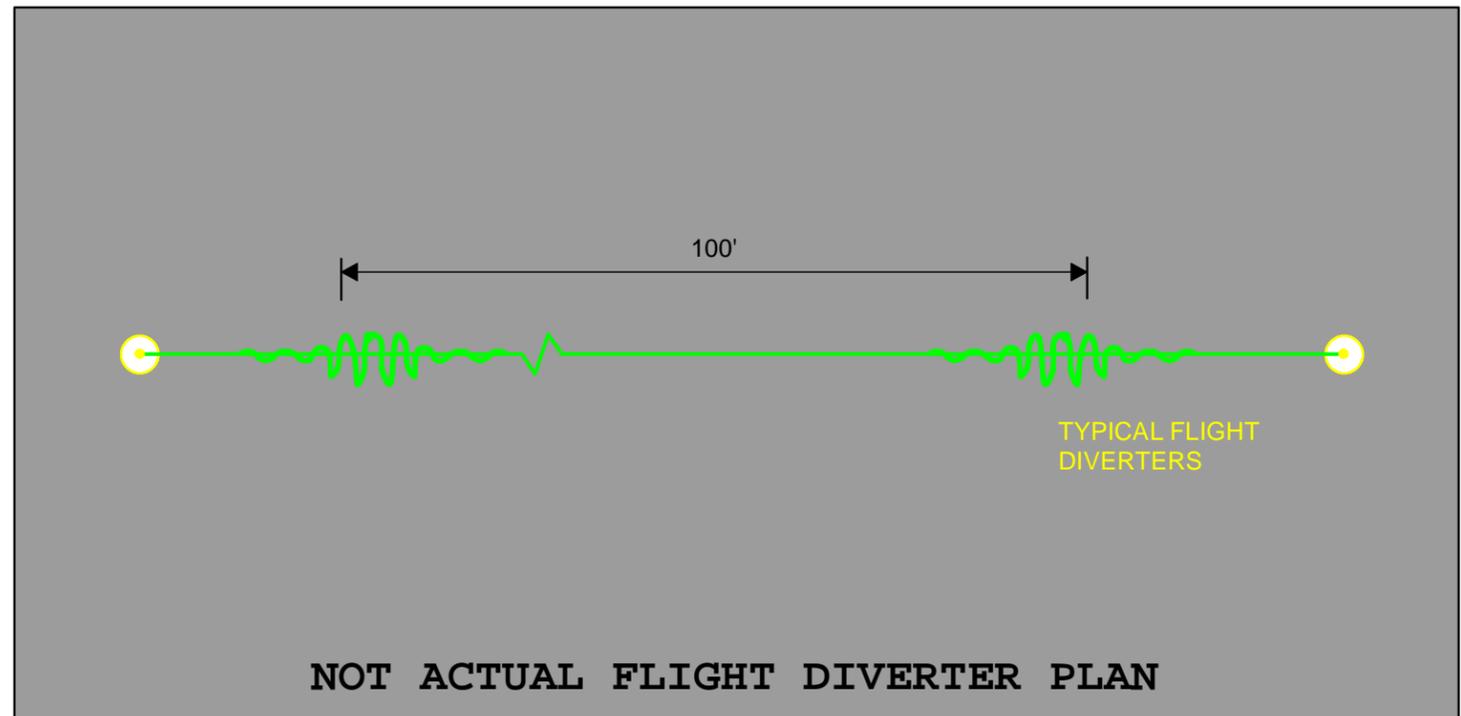
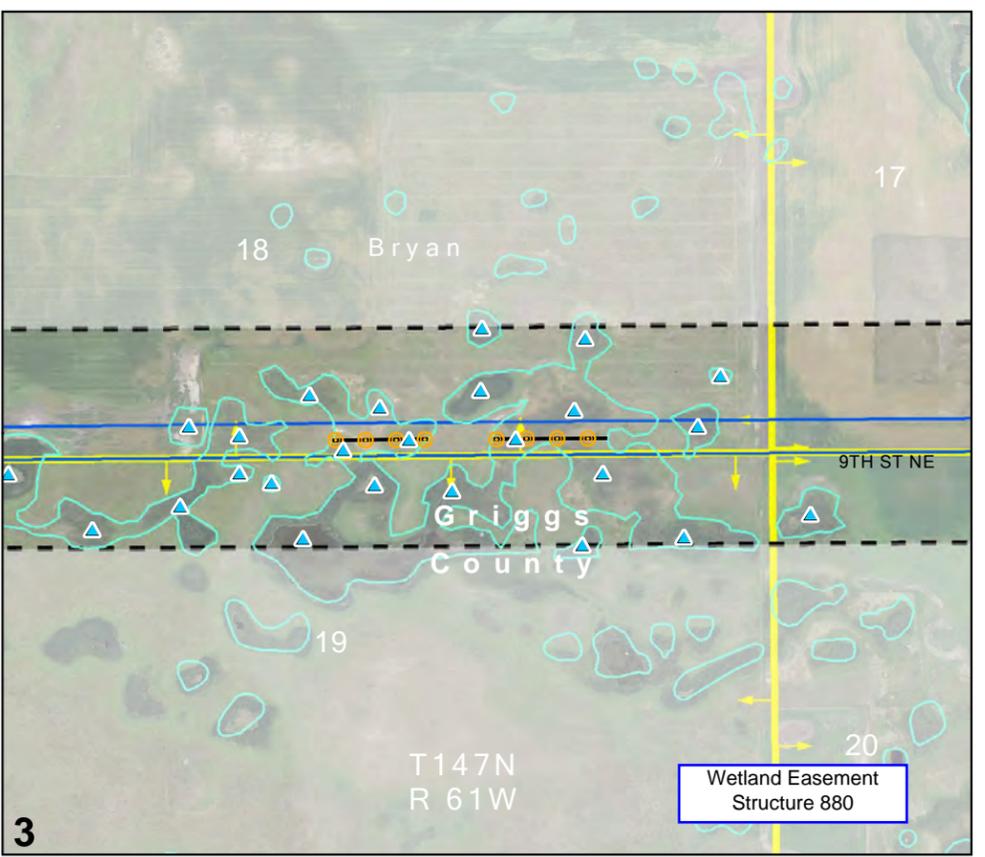
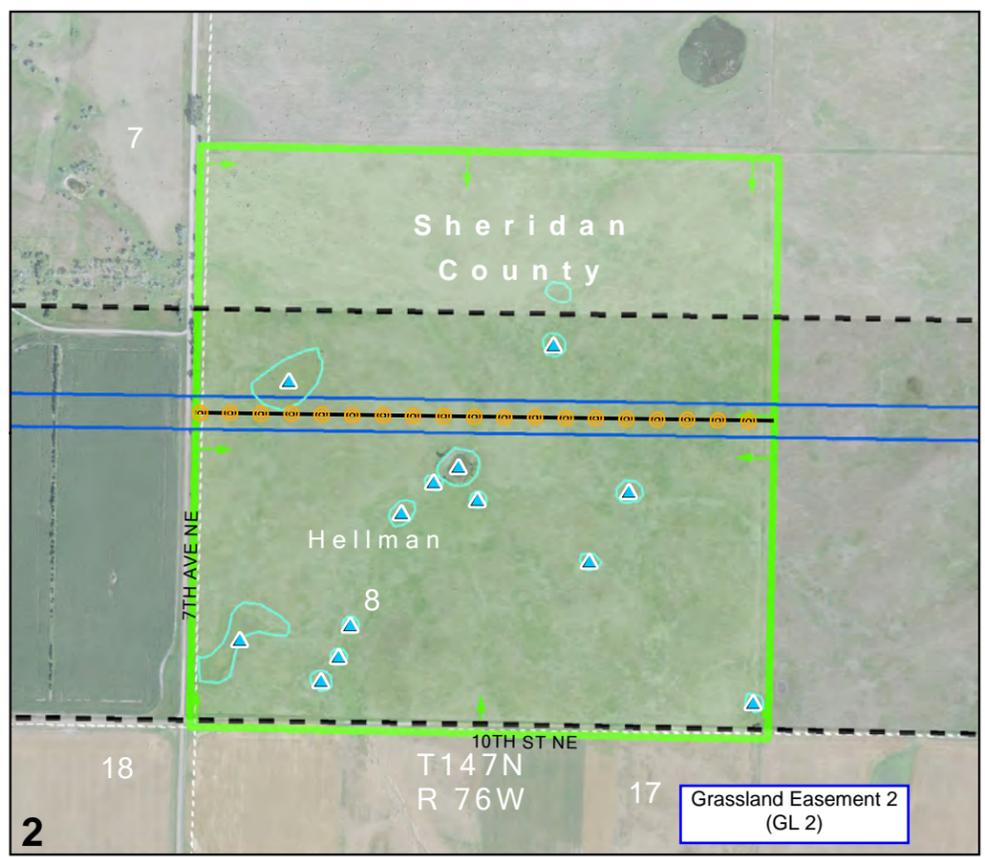
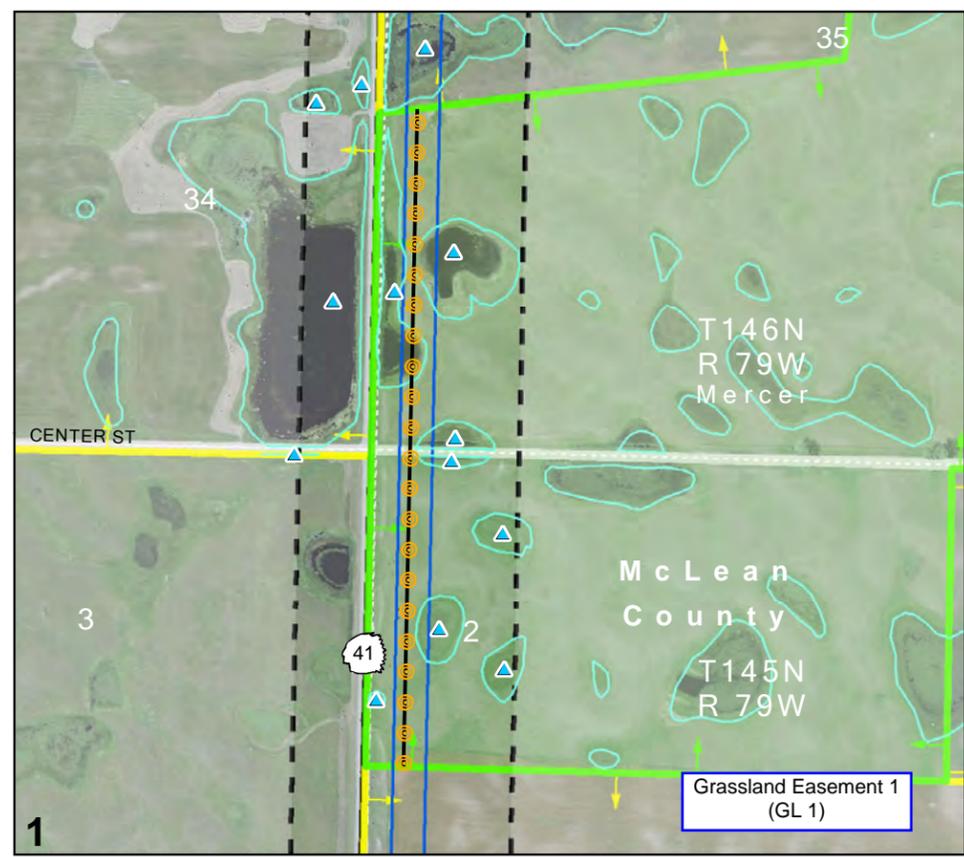
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- Project ROW (150 ft wide) - November 11, 2011
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- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
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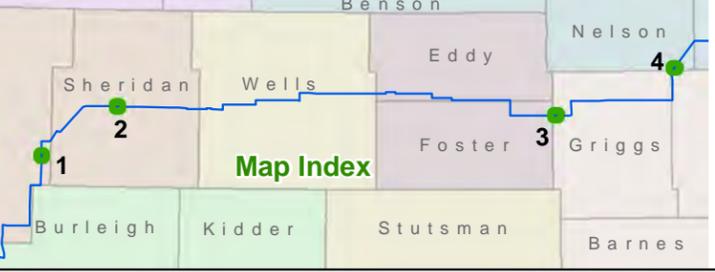
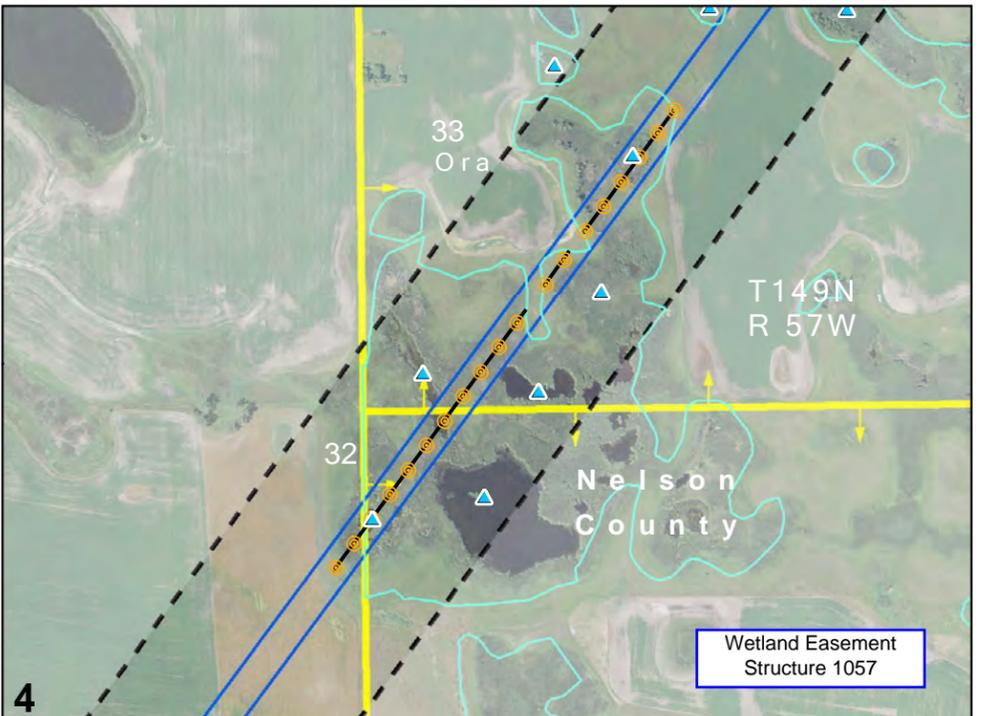
Figure 2: Page 102 of 102
 Project Route Along USFWS Easements
 Center to Grand Forks Project

0 200 400 Feet
 Scale 1:2,500



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Note: Diverters to be installed on top two shield wires, staggered so that they appear 50 feet apart.



- Proposed Modified Corridor - November 18, 2011
- Project ROW (150 ft wide) - November 11, 2011
- Marked New Transmission Line
- USFWS Wetland Easement
- USFWS Grassland Easement
- Possible USFWS Easement Wetland within Project Corridor
- Approximate USACE Wetland Boundary
- USGS Mapped Waterway

Figure 3
Transmission Line Marking Areas Along the Project Route Center to Grand Forks Project

