Natural Resources and Wetland Delineation Report for the Bakken North Pipeline, Williams County, North Dakota

Prepared for

Plains All American Pipeline, L.P.

Prepared by

SWCA Environmental Consultants

July 2011

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1.0 INTRODUCTION

1.1 BACKGROUND

SWCA Environmental Consultants (SWCA) conducted natural resources field surveys in order to identify exclusion and avoidance areas as specified in North Dakota Administrative Code (NDAC) 69-06-08-02 on the behalf of Plains All American Pipeline, L.P. (PAA), for the proposed Bakken North crude oil pipeline (Bakken North) project. PAA proposes to construct a 12-inch-diameter crude oil pipeline connecting the proposed Trenton Station Expansion, located northeast of Trenton, North Dakota, to the Plains Wascana Pipeline, located northwest of Plentywood, Montana. Oil would be transported to Regina, Saskatchewan, Canada and returned to the United States through a separate pipeline and travel to a terminal in either Clearbrook, Minnesota or Patoka, Illinois

The Bakken North pipeline as proposed is approximately 78.4 miles long, spanning private and state lands in North Dakota, and private lands in Montana (see maps in Appendix A). Approximately 31.7 miles (non-contiguous) of pipe would cross private and state lands in Williams County, North Dakota, and the remaining 46.7 miles would cross private lands in Sheridan County, Montana. The portion of the pipeline crossing private lands in North Dakota falls under the jurisdiction of the North Dakota Public Service Commission (NDPSC). E3 Environmental (E3) is assisting PAA with their application to the NDPSC for a certificate of corridor compatibility and route permit for the project.

The proposed 12-inch pipeline would be constructed within a 70-foot-wide temporary construction right-of-way (ROW). The ROW would be slightly offset on the centerline, with 50 feet of construction ROW on one side of the centerline and 20 feet of temporary workspace on the other.

SWCA conducted field surveys, including re-routes, of a 140-foot-wide corridor between April 18–23, May 24–27, May 31–June 3, and June 14–16, 2011, to determine the potential presence and extent of wetlands and waterbodies, including jurisdictional waters of the U.S., commonly referred to as wetland and ordinary high water mark (OHWM) delineations, within the proposed survey area. Concurrently with the wetland delineation, SWCA conducted a cursory threatened and endangered species survey and habitat assessment; a tree, sapling, and shrub enumeration survey; and a noxious weed survey. Site layout maps of the survey area and natural resource features identified during the field surveys are provided in Appendix A.

This report outlines the methodology used by SWCA's ecologists to complete each of the aforementioned surveys. Additionally, this report presents the results of the completed field surveys and regulatory recommendations to ensure compliance with the NDPSC and the U.S. Army Corps of Engineers (USACE) Nationwide Permit 12.

1.2 REGULATORY BACKGROUND

1.2.1 Clean Water Act, Section 404

Section 404 of the Clean Water Act prohibits the discharge of fill material into waters of the U.S., also known as jurisdictional waters, without a permit from the USACE.

1.2.2 USACE Nationwide Permit 12

The USACE Nationwide Permit 12 authorizes the construction of utility lines and associated facilities in waters of the U.S., provided the activity does not result in the permanent loss of greater than 0.5 acre of waters of the U.S., including wetlands.

Nationwide Permit 12 also authorizes the construction of access roads for utility lines, provided that the access road:

- does not result in the permanent loss of greater than 0.5 acre of waters of the U.S.;
- is constructed to the minimum width necessary;
- is constructed so that the length of the road minimizes any adverse effects to waters of the U.S.;
- is as near as possible to pre-construction contours and elevations; and
- is properly bridged or culverted when constructed above pre-construction contours.

If the access roads are used exclusively for construction purposes, they must be temporary and removed upon project completion.

Nationwide Permit 12 requires that the permittee submit a pre-construction notification prior to commencing construction if any of the following criteria are met.

- The activity involves mechanized land clearing in a forested wetland.
- A Section 10 permit is required to cross a navigable waterbody (Rivers and Harbors Act).
- The utility line exceeds 500 feet in length through any single crossing of a water of the U.S.
- The utility line is placed within a jurisdictional area (i.e., water of the U.S.) and it runs parallel to a stream bed that is within that jurisdictional area.
- Discharges result in the permanent loss of greater than 0.1 acre of waters of the U.S.
- Permanent access roads are constructed abovegrade in waters of the U.S. for a distance of more than 500 feet.
- Permanent access roads are constructed in waters of the U.S. with impervious materials.

1.2.3 USACE Regional Conditions

The USACE has published several regional conditions for projects operating under Nationwide Permits in North Dakota. The regional conditions apply to wetlands classified as "fens," waters adjacent to natural springs, the Missouri River, historic properties, and fish spawning areas.

2.0 METHODS

2.1 SURVEY AREA

Overall, northwest North Dakota is characterized by a moderate to cool climate, with cold, dry winters and mild to warm summers. Mean annual precipitation for the area is 14 to 16 inches (Bryce et al. 1998).

The North Dakota portion of the proposed project is located in the Northwestern Glaciated Plains, which marks the westernmost extent of glacial activity (Bryce et al. 1998). The Northwestern Glaciated Plains have significant surface irregularity characteristic of a youthful morainal landscape, with hills and depressions and high concentrations of wetlands (Figure 1). Further, the North Dakota portion of the proposed project is located in the Glaciated Dark Brown Prairie (level IV ecoregion) region. This ecoregion has a well-defined drainage system and fewer wetlands compared to the more recently glaciated ecoregions to the east (Bryce et al. 1998).

The North Dakota portion of the proposed pipeline project area is located on gently rolling plains (Figure 2) and active agricultural fields (Figure 3). The elevation ranges from approximately 1,950 to 3,000 feet above sea level, with the highest elevations in the northern portion of the project area, and the lowest elevations in the southern portion of the project area.

Figure 1. Project area overview depicting general topography towards southern end of pipeline corridor, facing north.

Figure 2. Project area overview depicting general topography near the middle section of the pipeline corridor, facing west.

Figure 3. General topography and adjacent agricultural disturbance along the western portion of pipeline corridor, facing west.

The inventoried area for the North Dakota portion of the project area discussed herein is situated on the U.S. Geological Survey (USGS) Trenton (1971), Trenton NE (1977), Bonetrail SE (1977), West Bonetrail (1977), and Brush Mountain (1977), North Dakota, quadrangles, as shown in Appendix A. The inventoried area includes parcels in Sections 3, 10, 15, 22, 26, 27, and 35, Township (T) 154 North (N), Range (R) 102 West (W); Sections 3, 10, 15, 22, 27, and 34, T155N, R102W; Sections 5, 6, 8, 9, 16, 21, 28, 33, and 34, T156N, R102W; Sections 19, 28, 29, 30, 33, and 34, T157N, R102W; Sections 4, 5, 9, 10, 13, 14, 15, and 24, T157N, R103W; and Sections 30, 31, and 32, T158N, R103W (see Appendix A).

2.2 PRE-FIELD REVIEW

Prior to conducting field surveys, SWCA reviewed applicable U.S. Fish and Wildlife Service (USFWS) threatened and endangered species list for Williams County, North Dakota (USFWS 2011). Additionally, SWCA reviewed applicable National Wetland Inventory data as well as preliminary National Weather Service climatic data.

2.3 WETLANDS

SWCA ecologists conducted wetland determinations, within the survey area, based on the principles and guidelines provided in the 1987 Corps of Engineers Wetlands Delineation Manual (Manual) (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetlands Determination Manual: Great Plains Region Version 2.0* (Supplement) (USACE 2010). According to the Manual, an area is a wetland if three mandatory wetland indicators are present in a given area, with special exceptions. These criteria include the presence of hydrophytic vegetation, wetland hydrology, and hydric soils. All wetlands and waterbodies geographically referenced within the survey area during field survey are depicted on the site layout maps in Appendix A.

2.2.1 Hydrophytic Vegetation

Ecologists recorded all plants within the vegetative community based on the respective stratum in which each species occupied. A tree is defined by the Supplement to be a woody-stemmed plant with a trunk diameter at breast height (DBH) of equal to or greater than 3 inches, regardless of height. The sapling and shrub stratum is defined by the Supplement to be composed of woody-stemmed plants with a trunk DBH of less than 3 inches, regardless of height. The herbaceous stratum includes all non-woody-stemmed plants regardless of height. Finally, the woody vine stratum includes all woody-stemmed vines, regardless of diameter.

SWCA recorded the binomial scientific name and percent cover of all plants within a 30-foot radius for the tree stratum, a 15-foot radius for the sapling/shrub stratum, a 5-foot radius for the herbaceous stratum, and a 30-foot radius for the woody vine stratum. SWCA ecologists noted each plant species' respective USFWS indicator status (i.e., upland [UPL], facultative upland [FACU], facultative [FAC], facultative wetland [FACW], and obligate [OBL]). In some instances the size and shape of the vegetative sampling plot was manipulated to better encompass each wetland or upland area, though the overall area assessed remained unchanged. SWCA also noted and geospatially referenced all populations of North Dakota state- or county-listed noxious weeds identified within the survey area.

2.2.2 Wetland Hydrology

A wetland was determined to contain wetland hydrology if at least one primary indicator or at least two secondary indicators of wetland hydrology were present, as defined by the Manual and Supplement. Common hydrologic indicators include the presence of surface water, high water table, soil saturation, water marks on trees or other objects, sediment deposits, water-stained leaves, and oxidized rhizospheres on living roots.

2.2.3 Hydric Soil

Ecologists recorded detailed notes regarding soil profiles including the hue, value, and chroma (i.e., color) of the soil (using Munsell Soil Color Charts), the depth and extent of that soil color within the entire soil profile, the concentration of any redoximorphic concentrations or depletions, and the texture of the soil at each depth where a color change was observed. Soil pits were excavated to a depth of 18 inches at each data point. Common hydric soil indicators of the Northern Great Plains sub-region include the presence of hydrogen sulfide gas within the soil pit, redox depressions, and depleted matrix.

2.4 WATERBODIES

Waterbodies (i.e., ponds, creeks, streams, rivers) were identified by the presence of an ordinary high water mark (OHWM). Common identifiable indicators of an OHWM include open water or evidence of a clear, natural line visible on the bank; shelving; changes in soil characteristics; the destruction of terrestrial vegetation; the presence of litter and debris; and watermarks on structures that are inundated during normal high water conditions. The OHWM typically represents the potential limits of the USACE jurisdiction. Please note that the USACE has full discretion in determining the jurisdictional status of referenced wetlands and waterbodies.

SWCA classified streams as perennial, intermittent, or ephemeral based on field observations. During a typical year, a perennial stream contains flowing water year-round and the water table is located above the stream bed. Groundwater is the primary water source for stream flow while precipitation runoff is supplemental. Ecologists classified streams that showed significant flow during the field survey or were named or designated as solid blue lines on the USGS topographic maps as perennial.

An intermittent stream has flowing water for only portions of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

2.5 TREE, SAPLING, AND SHRUB COUNT

SWCA ecologists determined the total number of trees, saplings, and shrubs present within the surveyed 140-foot-wide ROW by employing several different techniques depending on the type of woody vegetation habitat (i.e., forested upland, shrubland, or shelterbelt) encountered and the overall extent of each habitat within the ROW. The boundary of all forested upland, shrubland, and shelterbelt habitat was geographically referenced using a Trimble GeoXT series handheld global positioning system (GPS) unit. In forested upland and shrubland habitat, SWCA counted or estimated the number of all woody stemmed vegetation regardless of DBH. In shelterbelt areas, all woody stemmed vegetation with a DBH of ≥1 inch was inventoried, regardless of height. Ecologists taxonomically identified all recorded individuals to the species level within each habitat type.

Linear Spacing Estimates: SWCA ecologists estimated the total number of individual trees or shrubs within each observed shelterbelt by calculating the total number of individuals, regardless of DBH, of each species within a set linear distance. This method assumes that spacing and species pattern between individuals is equal along the entire length of the shelterbelt. When a satisfactory number of replications was averaged (usually up to 50% of the total shelterbelt length), ecologists determined the total shelterbelt length and estimated the total number of individuals potentially present based on the average number of individuals per linear foot. Once the number of individuals per foot was estimated for each shelterbelt, SWCA used a shapefile depicting the width of the proposed disturbance area (i.e., 100 feet) to determine the linear length of each shelterbelt segment potentially impacted by construction activities. This linear length was then used to estimate the number of individual trees or shrubs potentially impacted through construction activities.

2.6 WILDLIFE INCLUDING THREATENED AND ENDANGERED SPECIES

Information regarding the presence of threatened or endangered species, which may occur within the survey area, was obtained from the USFWS list of threatened and endangered species by North Dakota county (USFWS 2011). This document does not represent a comprehensive survey, but rather acknowledges the past and/or current presence of listed species. The lack of discovery of threatened or endangered species does not signify their non-existence within the area, but only that no primary or secondary indications of these species were recorded.

SWCA completed a cursory survey for all listed species and suitable habitat potentially impacted by construction activities within survey area. A line-of-sight survey for raptor species was also conducted for a distance of approximately 0.5 mile with the aid of binoculars. Unique wildlife habitats were closely inspected on foot. Additionally, SWCA characterized suitable threatened and endangered species habitat encountered during the field survey.

SWCA ecologists noted all wildlife observed during the field survey. Wildlife sightings can involve primary observations (i.e., actual sighting of an animal) or secondary observations (i.e., observation of scat, tracks, or fur deposits).

2.7 MAPPING

The boundaries of each wetland, waterbody, woody vegetation habitat, and noxious weed assemblage were geographically recorded using a Trimble GeoXT GPS unit. The aforementioned GPS unit is capable of recording geographic data with sub-meter accuracy. SWCA used Universal Transverse Mercator Zone 13 North as the projected coordinate system and North American Datum 1983 as the datum. ArcGIS v10.0 (ESRI Redlands, California) was used to analyze collected features, calculate areas, and generate the maps provided in Appendix A. Please note that all data collected using the GPS unit, and displayed on the attached maps, are for review purposes only and do not represent a professional civil survey.

3.0 RESULTS

3.1 VEGETATION

During the field survey, SWCA ecologists identified four general types of vegetative communities within the survey area. These vegetative communities were classified as herbaceous upland, shrubland and upland woody vegetation, cropland, and palustrine emergent (PEM) wetland. PEM wetlands are characterized by the presence of herbaceous hydrophytic or submergent aquatic macrophytes.

Vegetation communities met the hydrophytic vegetation criterion for wetlands if greater than 50% of dominant species had an indicator status of FAC, FACW, or OBL. The upland communities failed to meet at least one of the three assessed wetland criteria.

SWCA ecologists also observed and recorded the presence of Canada thistle (*Cirsium arvense*) at 29 locations totaling approximately 1.403 acres within the surveyed area and 0.726 acre in the temporary construction ROW. Canada thistle is listed as a noxious weed in the state of North Dakota and Williams County (NDCC 4.1-47-02).

3.1.1 Herbaceous Upland

Herbaceous upland communities occurring throughout the survey area consisted of non-wetland areas dominated by non-woody vegetation such as grasses and forbs. The largest natural vegetation community within the construction corridor is Northwestern Great Plains Mixedgrass Prairie, accounting for approximately 24.5% of the entire North Dakota construction corridor (LANDFIRE 2006)

Species common to the Northwestern Great Plains Mixedgrass Prairie and confirmed during field surveys included western wheatgrass (*Agropyron smithii*), green needlegrass (*Nassella viridula*), needle and thread (*Hesperostipa comata*), prairie junegrass (*Koeleria macrantha*), and various fescue (*Festuca* spp.) species. Other common species found within these herbaceous upland communities include big bluestem (*Andropogon gerardii*), green sagewort (*Artemisia campestris*), cudweed sagewort (*Artemisia ludoviciana*), sideoats grama (*Bouteloua curtipendula*), blue grama (*Bouteloua gracilis*), smooth bromegrass (*Bromus inermis*), purple coneflower (*Echinacea angustifolia*), squirreltail (*Elymus elymoides*), American licorice (*Glycyrrhiza lepidota*), curlycup gumweed (*Grindelia squarrosa*), gayfeather (*Liatris puncata*), yellow sweetclover (*Melilotus officinalis*), bluegrass (*Poa pratensis*), prairie coneflower (*Ratibida columnifera*), prairie rose (*Rosa arkansana*), and little bluestem (*Schizachyrium scoparium*) (Montana Field Guide 2011; Natureserve 2011).

3.1.2 Shrubland and Woody Vegetation

Shrubland communities were indicated with LANDFIRE (2006) data and confirmed in the field. These included Northwestern Great Plains Shrubland, covering approximately 2.08 acres, with Intermountain Basins Greasewood Flats and Intermountain Big Sagebrush Shrubland and Steppe communities accounting for less than 1.00 acre of the construction ROW.

The field survey found shrubland communities occurring throughout the survey area consisted of upland areas dominated by woody-stemmed vegetation including downy hawthorn (*Crataegus mollis*), Russian olive (*Elaeagnus angustifolia*), silverberry (*Elaeagnus commutata*), chokecherry (*Prunus virginiana*), silver buffaloberry (*Shepherdia argentea*), and western snowberry (*Symphoricarpos occidentalis*). Shrub species found in low concentrations include silver sagebrush (*Artemisia cana*), soapweed yucca (*Yucca glauca*), and plains prickly pear cactus (*Opuntia polyacantha*).

Forested upland vegetation consisted of Western Great Plains Wooded Draw and Ravine vegetation type, which accounted for approximately 0.07% of the vegetative cover within the construction area. This vegetation type is dominated by green ash (*Fraxinus pennsylvanica*), Siberian elm (*Ulmus pumila*), boxelder (*Acer negundo*), chokecherry, and western snowberry (Montana Field Guide 2011; Natureserve 2011). A photograph of the woody draws community type is provided in Appendix B.

3.1.3 Cropland

LANDFIRE (2006) data confirmed by the field survey indicate several types of agricultural occupation within the proposed ROW, making up approximately 425.17 acres, or 60.79% of the land cover within the construction corridor. Cropland vegetation accounted for most of the land cover, and included canola (*Brassica napus*) and hard red spring wheat (*Triticum aestivum*). Developed open space (i.e. roads, section lines, etc.) accounted for an additional 57.1 acres (8.16%) of the land cover types quantified by LANDFIRE.

3.1.4 PEM Wetland

The field study confirmed the presence of 14 PEM wetlands totaling 5.001 acres, or approximately 1% of the surveyed area. The wetlands were found to mainly consist of herbaceous, non-woody vegetation such as sedges, spike-rushes, grasses, and forbs, although some woody vegetation was present but not dominant. Common species found within these communities include big bluestem, smooth brome, fringed brome (*Bromus ciliatus*), wooly sedge (*Carex lanuginosa*), creeping spikerush (*Eleocharis palustris*), foxtail barley (*Hordeum jubatum*), mountain rush (*Juncus arcticus*), wild mint (*Mentha arvensis*), Kentucky bluegrass, smartweed (*Polygonum* sp.), dock (*Rumex* sp.), bulrush (*Schoenoplectus* sp.), prairie cordgrass (*Spartina pectinata*), western snowberry, and cattail (*Typha* sp.).

3.2 HYDROLOGY

Wetland communities observed during the delineation effort displayed at least one primary or two secondary indicators of wetland hydrology, as defined by the Manual and Supplement. Upland communities either failed to display hydrologic indicators or failed to meet the hydrophytic vegetation criterion, as defined by the Manual and Supplement. In some instances the presence of above average precipitation obscured the wetland/waterbody boundary and OHWM usually present during normal hydrologic conditions. Common indicators of wetland hydrology observed during field surveys include: Surface Water (A1), Saturation (A3), Algal Mat or Crust (B4), and Inundation Visible on Aerial Imagery (B7).

According to National Weather Service (NWS) preliminary climatological data for Williston, North Dakota, 8.25 inches of precipitation was recorded from 18 April through 15 June 2011 (Table 1). This amount is 4.42 inches above normal for this time period.

Table 1. Monthly Recorded Rainfall at NWS Williston, ND.

Month	2011 Recorded Precipitation (inches)	Normal Precipitation (inches)	Difference (inches)
April 18–30, 2011	1.94	1.05	0.89
May 2011	5.28	1.88	3.40
June 1–15, 2011	1.03	0.90	0.13
Total	**8.25**	**3.83**	**4.42**

Source: National Oceanic and Atmospheric Administration 2011

3.3 WETLANDS

SWCA recorded 14 PEM wetlands within the 140-foot survey area, totaling approximately 5.001 acres. In total, approximately 1.779 acres of PEM wetland is proposed to be temporarily impacted in the 70-foot-wide construction ROW (Table 2). SWCA also delineated the boundary of two areas that met the hydrology and hydrophytic vegetation criteria but could not obtain soil data due to abnormally high water (see Table 1). SWCA assumes that these two areas, referred to as "AssumedWET1" and "AssumedWET2," contain hydric soils and are therefore wetlands. Although only the USACE has the final authority to determine if these PEM wetlands are jurisdictional, the field survey indicates that four wetlands may not be jurisdictional, based on their lack of a significant nexus to waters of the U.S. See Appendix B for representative photographs of wetlands.

Table 2. PEM Wetland Acreage within the Survey Area.

Feature ID	USACE Jurisdiction*	Temporarily Impacted Area within 70-foot-wide ROW (acres)	Total PEM Size (acres)	Length of Required Crossing (feet)
NRAWET1	Isolated	0.451	1.762	309.64
NRDWET1	Jurisdictional	0.051	0.072	68.66
NRAWET6	Isolated	0.015	0.090	53.21
NRDWET8	Isolated	0.027	0.057	47.00
NRDWET7	Isolated	0.100	0.340	90.67
NRAWET2	Isolated	0.059	0.062	87.98
NRDWET6	Isolated	0.055	0.188	132.06
NRAWET5	Isolated	0.445	1.332	380.98
NRAWET9	Jurisdictional	0.028	0.052	41.38
NRAWET10	Isolated	0.106	0.180	121.76
NREWET2	Jurisdictional	0.164	0.316	144.28
NREWET1	Jurisdictional	0.060	0.095	79.60
NRDWET3	Jurisdictional	0.170	0.361	245.36

Feature ID	USACE Jurisdiction*	Temporarily Impacted Area within 70-foot-wide ROW (acres)	Total PEM Size (acres)	Length of Required Crossing (feet)
NRDWET4	Jurisdictional	0.049	0.093	38.16
AssumedWET1	Isolated	0.030	0.180	81.70
AssumedWET2	Isolated	0.443	0.860	289.18

* The USACE has the final authority on the jurisdictional status of a waterbody.

3.4 WATERBODIES

SWCA identified eight waterbodies during the field survey: one perennial stream and seven intermittent streams (Table 3). Each intermittent and perennial waterbody is considered to be jurisdictional due to the presence of an OHWM. No hydrophytic vegetation was noted within the delineated streams. Representative photos of waterbodies delineated in the field are provided in Appendix B.

PAA is proposing to use an open-cut crossing method for installing the pipeline through perennial and intermittent streams. PAA will flume the stream crossing to allow water to flow continuously during construction to eliminate the impoundment of each stream.

Table 3. Waterbody ID, Name, Classification, Acreages, and Jurisdictional Status.

Waterbody ID	Waterbody Name	Classification	Temporarily Impacted Area within 70-foot-wide ROW (acres)	Length in Construction ROW (feet)	Average Width of OHWM (feet)	USACE Jurisdictional Status*
NRDSTR1	Cow Creek	Perennial	0.0330	95.7700	15.00	Jurisdictional
NRASTR1	Unnamed	Intermittent	0.0017	76.0327	1.00	Jurisdictional
NRASTR2	Unnamed	Intermittent	0.0002	4.9943	2.00	Jurisdictional
NRASTR5	Unnamed	Intermittent	0.0011	97.4974	0.50	Jurisdictional
NRASTR6	Unnamed	Intermittent	0.0036	78.2087	2.00	Jurisdictional
NRASTR7	Unnamed	Intermittent	0.0043	75.3316	2.50	Jurisdictional
NRASTR8	Unnamed	Intermittent	0.0038	82.5244	2.00	Jurisdictional
NRESTR1	Sand Creek	Intermittent	0.0039	83.9728	2.00	Jurisdictional

* The USACE has the final authority on the jurisdictional status of a waterbody.

3.5 SOILS

Sixty-six soil types are present in the project construction corridor, based on U.S. Department of Agriculture - Natural Resources Conservation Service mapping (NRCS 2011). The project area analyzed for soils covers the 70-foot-wide construction corridor. Table 4 lists all soil units within the project area. The following soil component descriptions represent the most prevalent soil series found within the survey area (NRCS 2011).

3.5.1 Williams

The Williams series consists of very deep, well-drained, moderately slow or slowly permeable soils formed in calcareous glacial till. These soils are on glacial till plains and moraines and have slopes of 0 to 35 percent. Mean annual air temperature is about 40 degrees Fahrenheit (°F), and mean annual precipitation is about 14 inches. Cultivated areas are used for growing small grains, flax, corn, hay, or pasture. Native vegetation species common to this soil type include western wheatgrass (*Agropyron smithii*), needle and thread (*Hesperostipa comata*), blue grama (*Bouteloua gracilis*), green needlegrass (*Nasella viridula*), and prairie junegrass (*Koeleria macrantha*) (NRCS 2011).

3.5.2 Bowbells

The Bowbells series consists of very deep, well- and moderately well-drained soils formed in glacial till and alluvium from glacial till on glacial till plains and moraines. These soils have moderate permeability in the upper part and moderately slow or slow in the substratum. Slopes range from 0 to 9 percent. Mean annual precipitation is about 14 inches, and mean annual air temperature is about 42°F. Soils are cropped to small grains. Some is used for hay and pasture. Native vegetation species common to this soil type include green needlegrass, western wheatgrass, porcupinegrass (*Heterostipa spartea*), and big bluestem (*Andropogon gerardii*) (NRCS 2011).

3.5.3 Zahl

The Zahl series consists of very deep, well-drained, moderately slow or slowly permeable soils that formed in calcareous glacial till. These soils are on glacial till plains, moraines, and valley side slopes and have slopes of 1 to 60 percent. Mean annual air temperature is 40°F, and mean annual precipitation is 14 inches. The native vegetation species most common to this soil type are little bluestem (*Schizachyrium scoparium*), western wheatgrass, and needle and thread (NRCS 2011).

3.5.4 Livona

The Livona series consists of very deep, well-drained, moderately slowly permeable soils that formed in moderately coarse textured eolian material overlying till. These soils are on upland plains and have sloped ranging from 0 to 15 percent. Mean annual temperature is 42°F, and mean annual precipitation is 16 inches. Common native vegetation is needle and thread, prairie sandreed (*Calamovilfa longifolia*), and western wheatgrass (NRCS 2011).

Table 4. NRCS Derived Soil Series Present within the ROW.

Soil Types	Slopes (%)	Acres within 70-foot-wide ROW	Percent within Map Unit
Williams-Bowbells loams	3 to 6	123.99	46.12%
Williams-Zahl loams	6 to 9	38.05	14.16%
Williams-Bowbells loams	0 to 3	36.01	13.40%
Zahl-Williams loams	9 to 15	16.18	6.02%
Zahl-Williams loams	15 to 60	11.17	4.15%
Livona-Zahl complex	6 to 9	9.61	3.57%
Livona fine sandy loam	0 to 6	4.28	1.59%
Arnegard-Shambo loams	2 to 6	4.08	1.52%
Arnegard loam	0 to 2	3.96	1.47%
Williams-Zahl loams	3 to 6	3.66	1.36%
Niobell-Williams loams	0 to 6	2.85	1.06%
Lehr-Williams loams	0 to 6	2.65	0.99%
Bowdle loam	0 to 2	2.37	0.88%
Appam sandy loam	0 to 6	2.02	0.75%
Farnuf loam	0 to 2	1.59	0.59%
Williams-Zahl Parnell complex	0 to 9	1.44	0.54%
Tally fine sandy loam	0 to 6	1.18	0.44%
Tonka silt loam	0 to 1	0.97	0.36%
Shambo loam	0 to 2	0.94	0.35%
Parnell silty clay loam	0 to 1	0.82	0.31%
Vallers loam, saline	0 to 1	0.45	0.17%
Wabek sandy loam	6 to 25	0.31	0.12%
Lehr loam	2 to 6	0.20	0.08%

Source: NRCS 2011.

3.6 TREE, SAPLING, AND SHRUB COUNT

During SWCA's field survey, approximately 7 tree rows and 25 naturally occurring forested upland and shrubland areas were geographically referenced within the survey area. Table 5 indicates the number of trees estimated to be impacted by the project as currently proposed. The NDPSC requires a 2:1 post- to pre-construction mitigation for all trees, saplings, and shrubs impacted during the construction of the proposed pipeline. Therefore, SWCA estimates approximately 878 two-year-old sapling individuals would need to be replanted in order to fulfill the 2:1 mitigation requirement.

Table 5. Tree, Sapling, and Shrub Count.

Woody Vegetation (WV) ID	Species	Type	Number of Trees*		Estimated Mitigation Commitment
			140-foot-wide Survey Corridor	70-foot-wide Construction ROW	
NRAWV7	*Populus deltoides*	Tree	1	1	2
NRAWV8	*Populus deltoides*	3 Tree 3 Sapling	3	3	6
NRAWV9	*Populus deltoides*	Tree	3	3	6
NRAWV10	*Populus deltoides*	Tree	97	90	180
NRAWV11	*Prunus virginiana*	Shrub	5	0	0
NRDWV1	*Prunus virginiana*	Shrub	50	0	0
NRAWV13	*Artemesia cana*	Shrub	2	0	0
NRAWV14	*Shepherdia argentea* *Prunus virginiana* *Lonicera* sp.	Shrub Shrub Shrub	225 50 16	137 31 10	274 62 20
NRAWV15	*Amelanchier alnifolia*	Shrub	75	38	76
NRAWV16	*Amelanchier alnifolia*	Shrub	65	8	16
NRAWV17	*Shepherdia argentia*	Shrub	1	0	0
NRAWV18	*Lonicera* sp. *Shepherdia argentia*	Shrub Shrub	1 20	0	0
NRAWV19	*Amelanchier alnifolia*	Shrub	55	55	110
NRAWV1	*Ulmus pumila*	Tree Row	1	0	0
NRDWV3	*Ulmus pumila*	Tree	1	0	0
NRDWV4	*Elaeagnus angustifolia*	Tree	1	1	2
NRAWV23	*Shepherdia argentea*	Shrub	14	14	28
NRAWV24	*Ulmus pumila*	Tree Row	5	3	6
NRAWV25	*Elaegnus angustifolia*	Tree Row	10	6	12
NRAWV26	*Ulmus pumila*	Tree Row	3	1	2
NRAWV2	*Populus deltoids*	Tree	1	0	0
NRAWV3	*Populus deltoids*	Tree	1	0	0
NRAWV4	*Prunus virginiana*	Shrub	3	0	0
NRDWV5	*Shepherdia argentia* *Amelanchier alnifolia*	Shrub Shrub	14 6	0	0
NRDWV6	*Crataegus mollis*	Shrub	42	7	14

Woody Vegetation (WV) ID	Species	Type	Number of Trees*		Estimated Mitigation Commitment
			140-foot-wide Survey Corridor	70-foot-wide Construction ROW	
NRDWV7	*Amelanchier alnifolia*	Shrub	10	0	0
NRDWV11	*Ulmus pumila*	Tree Row	6	3	6
NRDWV12	*Prunus virginiana*	Tree	6	6	12
NRDWV13	*Ulmus pumila*	Tree Row	6	4	8
NRDWV14	*Fraxis pennsylvanica*	Tree Row	9	1	2
NRAWV22	*Amelanchier alnifolia*	Tree	55	17	34
NRDWV9	*Prunus virginiana*	Tree Shrub	15 30	0	0
TOTAL			**908**	**439**	**878**

***** Estimated value based off of the observed density of trees.

3.7 WILDLIFE

SWCA conducted a cursory threatened and endangered species survey concurrently with the wetland determination. Ecologists did not observe any primary (i.e., actual sighting) or secondary (tracks, scat, fur) indication of the presence of threatened or endangered species. Sprague's pipit (*Anthus spragueii*), a candidate species, was observed during surveys. The survey area does contain suitable foraging and stopover habitat for the whooping crane (*Grus americana*). SWCA ecologists observed and marked three raptor nests during the field surveys. All three nests were categorized as inactive based on nest condition and the absence of individual raptors.

The proposed project would have no effect on black-footed ferret (*Mustela nigripes*), gray wolf (*Canis lupus*), or designated critical habitat for piping plover (*Charadrius melodus*). Interior least tern (*Sterna antillarum*), whooping crane, and piping plover have the potential to occur within the project area as migrants. As a result, these species may be, but are not likely to be adversely, affected by the proposed project. Additionally, due to the proximity of portions of the proposed project to suitable pallid sturgeon (*Scaphirhynchus albus*) habitat, the project may affect, but is not likely to adversely affect this species. Suitable habitat for Sprague's pipit was located within the project area; therefore, this species may be, but is not likely to be, adversely affected by the proposed project.

3.7.1 Endangered Species Act

3.7.1.1 Black-footed Ferret (*Mustela nigripes*)

Federal Status: Endangered
Affects Determination: No Effect

Black-footed ferrets are nocturnal, solitary carnivores of the weasel family that have been largely extirpated from the wild primarily due to range-wide decimation of the prairie dog (*Cynomys* sp.) ecosystem (Kotliar et al. 1999). They have been listed by the USFWS as

endangered since 1967, and have been the object of extensive re-introduction programs (USFWS 2010a). Ferrets inhabit extensive prairie dog complexes of the Great Plains, typically composed of several smaller colonies in proximity to one another that provide a sustainable prey base. The *Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act* (USFWS 1989) states that ferrets require black-tailed prairie dog (*Cynomys ludovicianus*) towns or complexes greater than 80 acres in size, and towns of this dimension may be important for ferret recovery efforts (USFWS 1988a). Prairie dog towns of this size were not observed during the field survey. In addition, this species has not been observed in the wild for more than 20 years. Therefore, the proposed project would have **no effect** on this species.

3.7.1.2 Gray Wolf (*Canis lupus*)

Federal Status: Endangered
Affects Determination: No Effect

The gray wolf, listed as endangered in the United States in 1978, was believed extirpated from North Dakota in the 1920s and 1930s, with only sporadic reports from the 1930s to present (Licht and Huffman 1996; USFWS 1978). The presence of wolves in most of North Dakota consists of occasional dispersing animals from Minnesota and Manitoba (Licht and Fritts 1994; Licht and Huffman 1996). Most documented gray wolf sightings within western North Dakota are believed to be young males seeking to establish territory (Hagen et al. 2005). The Turtle Mountain region of north-central North Dakota provides marginal habitat that may be able to support a very small population of wolves. The closest known pack of wolves is the Minnesota population located approximately 17 miles (28 kilometers [km]) from the northeast corner of North Dakota.

The gray wolf uses a variety of habitats that support a large prey base, including montane and low-elevation forests, grasslands, and desert scrub (USFWS 2010b). Due to a lack of forested habitat and distance from Minnesota and Manitoba populations, as well as the troubled relationship between humans and wolves and their vulnerability to being shot in open habitats (Licht and Huffman 1996), the re-establishment of gray wolf populations in North Dakota is unlikely. Additionally, habitat fragmentation may further act as a barrier against wolf recolonization in western North Dakota. Therefore, the proposed project would have **no effect** on the gray wolf.

3.7.1.3 Whooping Crane (*Grus americana*)

Federal Status: Endangered
Affect Determination: May Affect, Is Not Likely to Adversely Affect

The whooping crane was listed as endangered in 1970 in the United States by the USFWS and in 1978 in Canada. Historically, population declines were caused by shooting and destruction of nesting habitat in the prairies from agricultural development. Current threats to the species include habitat destruction, especially suitable wetland habitats that support breeding and nesting, as well as feeding and roosting during their fall and spring migration (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007).

The July 2010 total wild population was estimated at 383 (USFWS 2010c). There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, where approximately 83% of the wild nesting sites occur (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007; USFWS 2010c). Williams County, including the project area, is within the primary migratory flyway of whooping cranes.

Whooping cranes probe the soil subsurface with their bills for foods on the soil or vegetation substrate (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Whooping cranes are omnivores and foods typically include agricultural grains, as well as insects, frogs, rodents, small birds, minnows, berries, and plant tubers. The largest amount of time during migration is spent feeding in harvested grain fields (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Studies indicate that whooping cranes use a variety of habitats during migration, in addition to cultivated croplands, and generally roost in small palustrine (marshy) wetlands within 0.6 mile (1 km) of suitable feeding areas (Howe 1987, 1989). Whooping cranes have been recorded in riverine habitats during their migration, with eight sightings along the Missouri River in North Dakota (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007:18). In these cases, they roost on submerged sandbars in wide, unobstructed channels that are isolated from human disturbance (Armbruster 1990).

Suitable whooping crane foraging habitat (i.e., cultivated cropland) was observed within the survey area. Therefore, the proposed project **may affect, but is not likely to adversely affect** the endangered whooping crane.

3.7.1.4 Piping Plover (*Charadrius melodus*)

Federal Status: Threatened
Affect Determination: May Affect, Is Not Likely to Adversely Affect

The piping plover is a small shorebird which breeds only in three geographic regions of North America: the Atlantic Coast, the Northern Great Plains, and the Great Lakes. Piping plover populations were federally listed as threatened and endangered in 1985, with the Northern Great Plains and Atlantic Coast populations listed as threatened, and the Great Lakes population listed as endangered (USFWS 1985a).

Plovers in the Great Plains make their nests on open, sparsely vegetated sand or gravel beaches adjacent to alkali wetlands, and on beaches, sand bars, and dredged material islands of major river systems (USFWS 2002, 2010d). The shorelines of lakes of the Missouri River constitute significant nesting areas for the bird. Piping plovers nest on the ground, making shallow scrapes in the sand, which they line with small pebbles or rocks (USFWS 1988b). Anthropogenic alterations of the landscape along rivers and lakes where piping plover nest have increased the number and type of predators, subsequently decreasing nest success and chick survival (USFWS 2002, 2010d). The birds fly south by mid to late August to areas along the Texas coast and Mexico (USFWS 2002). The Northern Great Plains population has continued to decline despite federal listing, with population estimates of 1,500 breeding pairs in 1985 reduced to fewer than 1,100 in 1990. Low survival of adult birds has been identified as a factor (Root et al. 1992). Current conservation strategies include identification and

preservation of known nesting sites, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 1988b, 2010d).

A suitable shoreline habitat for breeding and nesting plovers does not occur within the project area and the Missouri River is a minimum of 1.9 miles (3.1 km) away from the proposed survey area. Suitable shoreline habitat may also occur along the Yellowstone River, which is approximately 22 river miles away from the project area. It is unlikely but possible that migrating plovers may traverse the project area during their migration. Therefore, the proposed project **may affect, but is not likely to adversely affect** piping plovers.

3.7.1.5 Designated Critical Habitat of Piping Plover

Affect Determination: No Effect

The USFWS has designated critical habitat for the Great Lakes and Northern Great Plains populations of piping plover (USFWS 2002). Designated critical habitat for the piping plover includes 183,422 acres and 1,207.5 river miles of habitat along the shoreline of Lake Sakakawea in Williams County, North Dakota (USFWS 2002).

The proposed pipeline crosses, from south to north, the following named waterways and their smaller unnamed intermittent tributaries: tributary to Painted Woods Creek, Sand Creek, Cow Creek, and a tributary to Brush Mountain Creek. The Painted Woods Creek drains into the Missouri River approximately 5.2 river miles (8.4 km) southwest of the southernmost extent of the project area. Since the proposed project would not modify, alter, disturb, or affect the shoreline of Lake Sakakawea or the Missouri River, **no effect** to designated critical habitat of the piping plover would occur.

3.7.1.6 Interior Least Tern (*Sterna antillarum*)

Federal Status: Endangered
Affect Determination: May Affect, Is Not Likely to Adversely Affect

The interior population of the least tern is listed as endangered by the USFWS (1985b). This bird is the smallest member of the gull and tern family, measuring approximately 9 inches in length. Terns remain near flowing water, where they feed by hovering over and diving into standing or flowing water to catch small fish (USFWS 2010e).

The interior population of least terns breeds in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande river systems, where they nest in small colonies. From late April to August, terns nest in a shallow hole scraped in an open sandy area, gravel patch, or exposed flat and bare sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. The adults continue to care for chicks after they hatch. Least terns in North Dakota will often be found sharing sandbars with the piping plover, a threatened species (USFWS 2010e).

Census data indicate over 8,000 least terns in the interior population. In North Dakota, the least tern is found mainly on the Missouri River from Garrison Dam south to Lake Oahe, and on the Missouri and Yellowstone rivers upstream of Lake Sakakawea (USFWS 1990a, 2010e). Approximately 100 pairs breed in North Dakota (USFWS 2010e). Details of their migration are not known, but their winter range is reported to include the Gulf of Mexico and Caribbean Islands (USFWS 1990a, 2010e).

Loss of suitable breeding and nesting habitat for terns has resulted from dam construction and river channelization on major rivers throughout the Mississippi, Missouri, and Rio Grande river systems. River and reservoir changes have led to reduced sandbar formation and other shoreline habitats for breeding, resulting in population declines. In addition, other human shoreline disturbances affect the species (USFWS 1990a). Critical habitat has not been designated for the species (USFWS 2010e). Current conservation strategies include identification and avoidance of known nesting areas, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 2010e).

A suitable shoreline habitat for breeding and nesting terns does not occur in the project area, and the Missouri River is a minimum of 1.9 miles (3.1 km) away from the survey area. It is unlikely that terns would visit the upland or wetland habitats present in the survey area. Therefore, the proposed project **may affect, but is not likely to adversely affect** endangered least terns.

3.7.1.7 Pallid Sturgeon (*Scaphirhynchus albus*)

Federal Status: Endangered
Affect Determination: May Affect, Is Not Likely to Adversely Affect

The pallid sturgeon was listed as endangered in 1990 in the United States by the USFWS (1990b). The primary factor leading to the decline of this species is the alteration of habitat through river channelization, creation of impoundments, and alteration of flow regimes (USFWS 1990b). These alterations within the Missouri River have blocked movements to spawning, feeding, and rearing areas; destroyed spawning habitat; altered flow conditions which can delay spawning cues; and reduced food sources by lowering productivity (USFWS 2007a). The fundamental elements of pallid sturgeon habitat are defined as the bottom of swift waters of large, turbid, free-flowing rivers with braided channels, dynamic flow patterns, flooding of terrestrial habitats, and extensive microhabitat diversity (USFWS 1990b).

The pallid sturgeon populations occur in the Missouri River below Fort Peck Dam to the headwaters of Lake Sakakawea and the lower Yellowstone River up the confluence of the Tongue River, Montana (USFWS 2007a). This population consists of approximately 136 wild adult pallid sturgeon (USFWS 2007a). Hatchery-reared sturgeon have also been stocked since 1998. The pallid sturgeon has been found to utilize the 15.5 miles (25 km) of riverine habitat that would be inundated by Lake Sakakawea at full pool (Bramblett 1996 per USFWS 2007a). Larval pallid sturgeons have also been found to drift into Lake Sakakawea. While the majority of pallid sturgeons are found in the headwaters of Lake Sakakawea, North Dakota Game and Fish have caught and released pallid sturgeon in nets set in 80 to 90 feet of water between the New Town and Van Hook area. Based on this information, pallid sturgeon could be found throughout Lake Sakakawea (personal communication, email from Steve Krentz, Pallid Sturgeon Project Lead, U.S. Fish and Wildlife Service, to Mike Cook, Aquatic Ecologist, SWCA Environmental Consultants, September 3, 2010).

Suitable habitat for pallid sturgeon is not present in the survey area in North Dakota, and Lake Sakakawea is a minimum of 1.9 miles (3.1 km) away from the project area. Pallid sturgeon are known to occur within the Yellowstone River, which is approximately 22 river miles away

from the North Dakota project area. However, tributaries to the Missouri River are found within the project area. Potential pollution occurring as a result of construction activities, hydrostatic testing, and pipeline operations are concerns for downstream populations of endangered pallid sturgeon. Activities associated with the proposed project are not anticipated to adversely affect water quality and subsequently the pallid sturgeon. Therefore, the proposed project **may effect, but is not likely to adversely affect** pallid sturgeon.

3.7.1.8 Sprague's Pipit (*Anthus spragueii*)

Federal Status: Candidate
Affect Determination: May Affect, Is Not Likely to Adversely Affect

The Sprague's pipit is a small passerine, 10 to 15 centimeters in length, endemic to the Northern Great Plains (USFWS 2010f). The Sprague's pipit requires large tracts of native prairie habitat, unplowed, throughout their life cycle. Because native grasslands are disturbance-dependent, Sprague's pipit prefers grassland habitats that are regularly disturbed. The frequency of disturbance required for habitat maintenance depends on how quickly grasses grow to an intermediate height (4 to 12 inches) following a disturbance event.

In North Dakota, Sprague's pipit has been found in areas of moderate grazing. Sprague's pipits are sensitive to patch size and avoid edges between grasslands and other habitat features (USFWS 2010f). They may avoid non-grassland features including roads, trails, oil wells, croplands, woody vegetation, and wetlands. The Sprague's pipit is reported to stay up to 350 m away from anthropogenic features such as roads, oil wells, and wind turbines (USFWS 2010f). The USFWS has estimated that each new oil well and associated road in North Dakota results in potential impacts to approximately 51 acres of pipit habitat due to avoidance and habitat fragmentation (USFWS 2010f). Because of increasing habitat fragmentation, especially by energy development, throughout the Sprague's pipit range, and the loss of native prairie habitat, the Sprague's pipit was listed as a Candidate Species under the Endangered Species Act (ESA) in 2010 (USFWS 2010f).

In North Dakota, Sprague's pipit breeds throughout the state except for the easternmost counties. During the breeding season they prefer large patches of well drained, open native grassland with a minimum size of 358.3 acres (range = 170 to 776 acres). They have not been observed in areas smaller than 71.6 acres on their breeding grounds (USFWS 2010f).

Native prairie habitat with grasses of intermediate height does occur within the project area. However, the habitat within and surrounding the project area has been previously disturbed by agriculture, roads, and oil and gas development. The proposed project is unlikely to directly affect habitat due to lack of adequate patch sizes required by the Sprague's pipit for breeding grounds in the immediate project area, but may indirectly contribute to reduced use of any nearby suitable grassland habitat patches within 350 m of the proposed project. Therefore, the proposed project **may affect, but is not likely to adversely affect** Sprague's pipit.

3.7.2 Migratory Bird Treaty Act / Bald and Golden Eagle Protection Act

3.7.2.1 Bald Eagle (*Haliaeetus leucocephalus*)

Federal Status: Delisted in 2007; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act
Effects of Project: No adverse effects anticipated

The bald eagle (*Haliaeetus leucocephalus*) feeds on fish and carrion and typically roosts in large trees near a water source. Bald eagle nesting habitat is typically any mature stands of conifer or cottonwood trees in association with rivers, streams, reservoirs, lakes, or any significant body of water. Bald eagles are uncommon in North Dakota and are usually observed along the Missouri River (Gomes n.d.) and Yellowstone River. Bald eagles frequently migrate through the grassland habitats; however, no bald eagles or nests were observed during the field surveys. Suitable nesting and roosting habitat is not available within the project area in North Dakota. The proposed project would have **no impact** on this species at this time.

3.7.2.2 Golden Eagle (*Aquila chrysaetos*)

Federal Status: Unlisted; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act
Effects of Project: No adverse effects anticipated

Golden eagles (*Aquila chrysaetos*) nest on steep cliff faces and in large cottonwood trees along intermittent creeks. Golden eagles have been documented near the project area year-round; however, the majority of golden eagles migrate. The breeding season for golden eagles is from mid-March through late July. A golden eagle was observed during the field surveys, soaring from west to east across Sections 15 and 22, T154N, R102W. No nesting golden eagles were observed. However, suitable nesting habitat does exist within the analysis area. Therefore, the proposed project **may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species**.

3.7.3 Wildlife Observed

During the field survey, SWCA ecologists observed various wildlife species which utilize wetlands and other habitat within the survey area (Table 6). Common wildlife species may be affected both directly via incidents with construction equipment or indirectly through the temporary fragmentation of habitat as a result of construction activities. Migratory birds are protected by the Migratory Bird Treaty Act (16 United States Code 703 et seq.) which prohibits the "take" of individuals and nests.

Table 6. Wildlife Observed during Field Surveys at the Proposed Pipeline Route.

Common Name	Scientific Name	Observation Type	Comments
Northern harrier	*Circus cyaneus*	Primary	
Sprague's pipit	*Anthus spragueii*	Primary	
Golden eagle	*Aquila chrysaetos*	Primary	

Common Name	Scientific Name	Observation Type	Comments
Ring-necked pheasant	*Phasianus colchicus*	Primary	
Killdeer	*Charadrius vociferus*	Primary	
Red-winged blackbird	*Agelaius phoeniceus*	Primary	
Western meadowlark	*Sturnella neglecta*	Primary	
Horned lark	*Eremophila alpestris*	Primary	
Savannah sparrow	*Passerculus sandwichensis*	Primary	
Mourning dove	*Zenaida macroura*	Primary	
Chestnut-collared longspur	*Calcarius ornatus*	Primary	
Bobolink	*Dolichonyx oryzivorus*	Primary	
Brewer's blackbird	*Euphagus cyanocephalus*	Primary	
Eastern kingbird	*Tyrannus tyrannus*	Primary	
Mallard	*Anas platyrhynchos*	Primary	
Gadwall	*Anas strepera*	Primary	
Northern pintail	*Anas acuta*	Primary	
Northern shoveler	*Anas clypeata*	Primary	
Blue-winged teal	*Anas discors*	Primary	
Canvasback	*Aythya valisineria*	Primary	
Redhead	*Aythya Americana*	Primary	
Ring-necked duck	*Aythya collaris*	Primary	
Eared grebe	*Podiceps nigricollis*	Primary	
Wilson's phalarope	*Phalaropus tricolor*	Primary	
Brown-headed cowbird	*Molothrus ater*	Primary	
Grasshopper sparrow	*Ammodramus savannarum*	Primary	
Upland sandpiper	*Bartramia longicauda*	Primary	
Clay colored sparrow	*Spizella pallid*	Primary	
Lark bunting	*Calamospiza melanocorys*	Primary	
Canada goose	*Branta canadensis*	Primary	
Vesper sparrow	*Pooecetes gramineus*	Primary	NRENST1
Baird's sparrow	*Ammodramus bairdii*	Primary	
Raccoon	*Procyon lotor*	Secondary	
Richardson's ground squirrel	*Spermophilus richardsonii*	Primary	
Northern leopard frog	*Rana pipiens*	Primary	
White-tailed deer	*Odocoileus virginianus*	Primary	
Pronghorn	*Antilocapra americana*	Primary	

4.0 CONCLUSIONS AND RECOMMENDATIONS

1. SWCA ecologists recorded approximately 5.001 acres of wetlands within the survey area.
2. In total, approximately 1.779 acres of PEM wetland *may* be temporarily impacted by construction activities.
3. SWCA estimates 439 trees, saplings, and shrubs may be impacted. Therefore, approximately 878 two-year-old saplings may need to be replanted to fulfill the 2:1 mitigation requirement.
4. According to the recommendations of the North Dakota Forest Service (NDFS), tree species selection for replacement should be accomplished through collaboration with a reputable area nursery. This will allow for species to be selected based on various factors including species hardiness and area soil type (personal communication, telephone conversation between Tom Claeys, Forestry and Fire Management Team Leader, NDFS, and Michael Cook, Ecologist, SWCA, December 7, 2009).
5. According to the recommendations of the USFS North Dakota Office, non-native species are permitted and to an extent recommended for planting as they may be more resistant to known tree pathogens in the area (personal communication, telephone conversation between Tom Claeys, Forestry and Fire Management Team Leader, NDFS, and Michael Cook, Ecologist, SWCA, December 7, 2009).
6. No threatened or endangered species were observed during the field survey. One candidate species, Sprague's pipit was observed during the surveys. The known species which occur in Williams County are not likely to be detrimentally impacted by construction activities.

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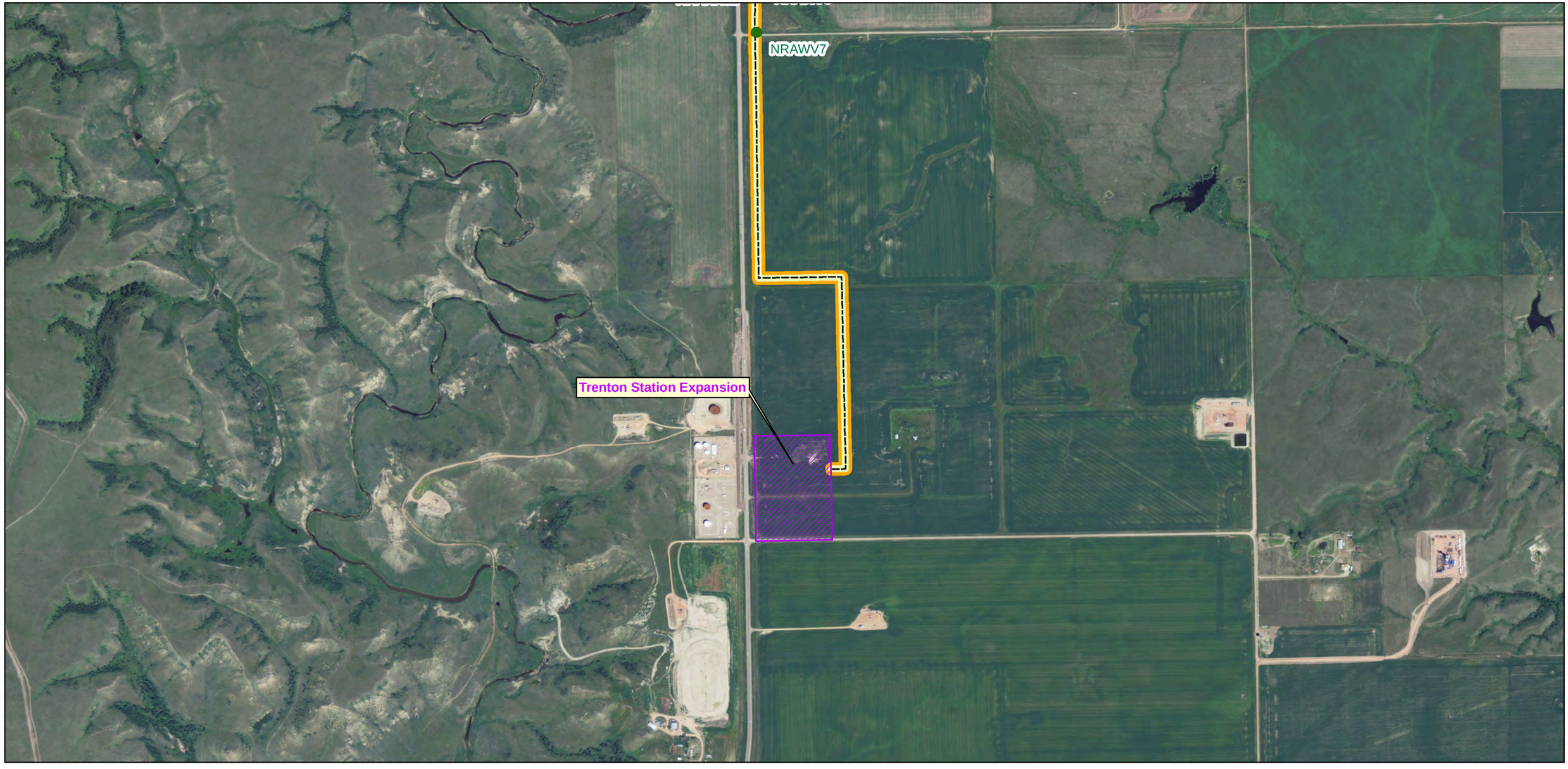
APPENDIX A

Vicinity Maps and Site Layout Maps



Legend

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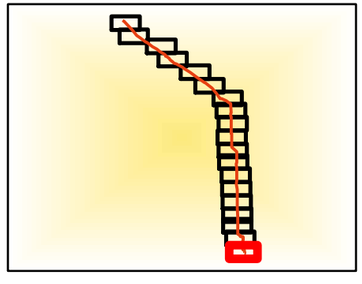

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Base Map: 2010 NAIP 1 meter Imagery
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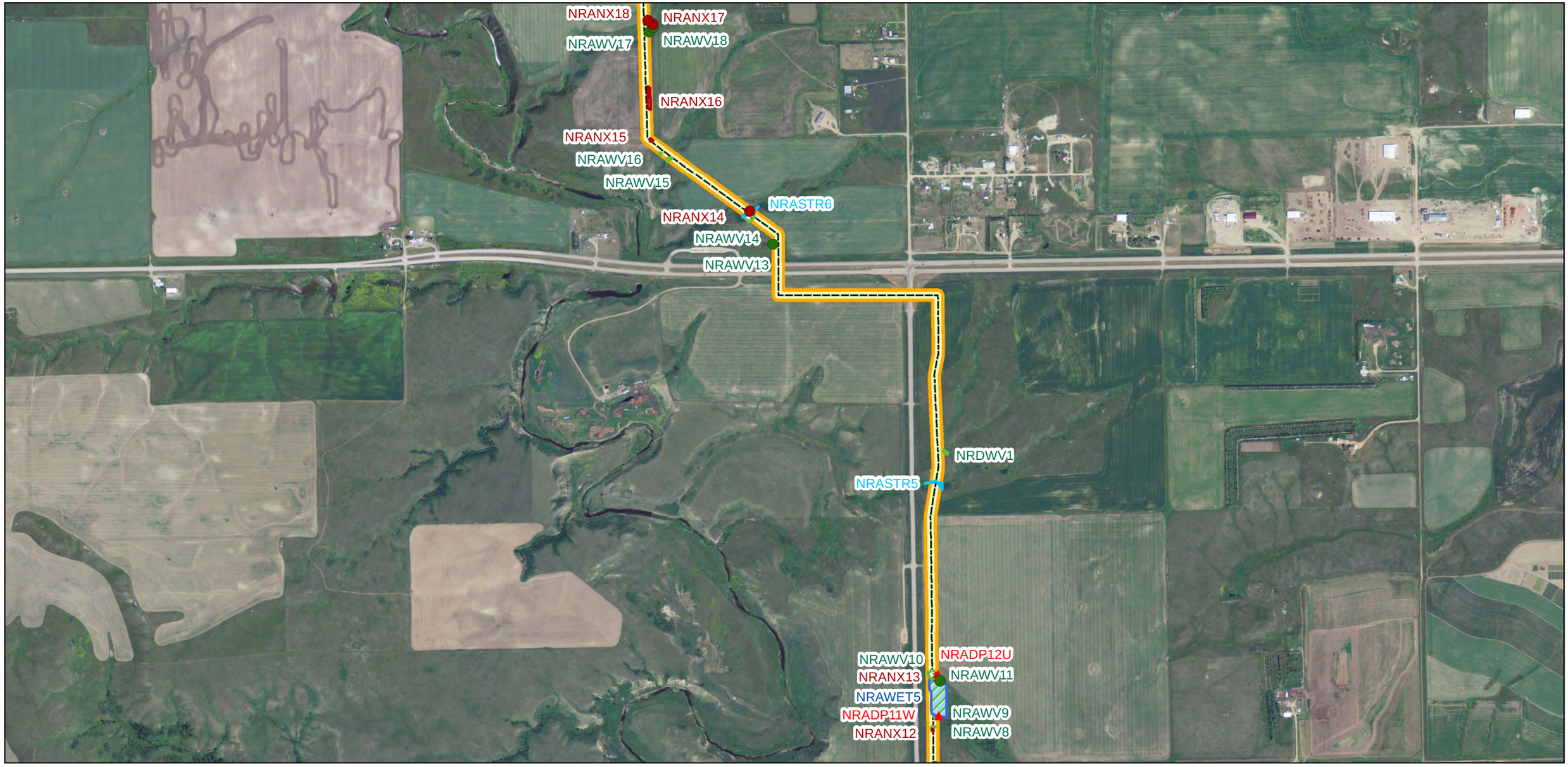
County: Williams

NAD 1983 UTM Zone 13N



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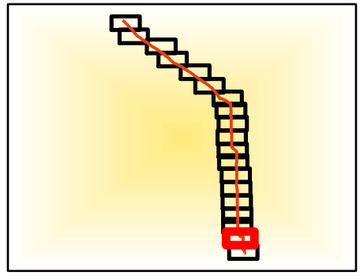

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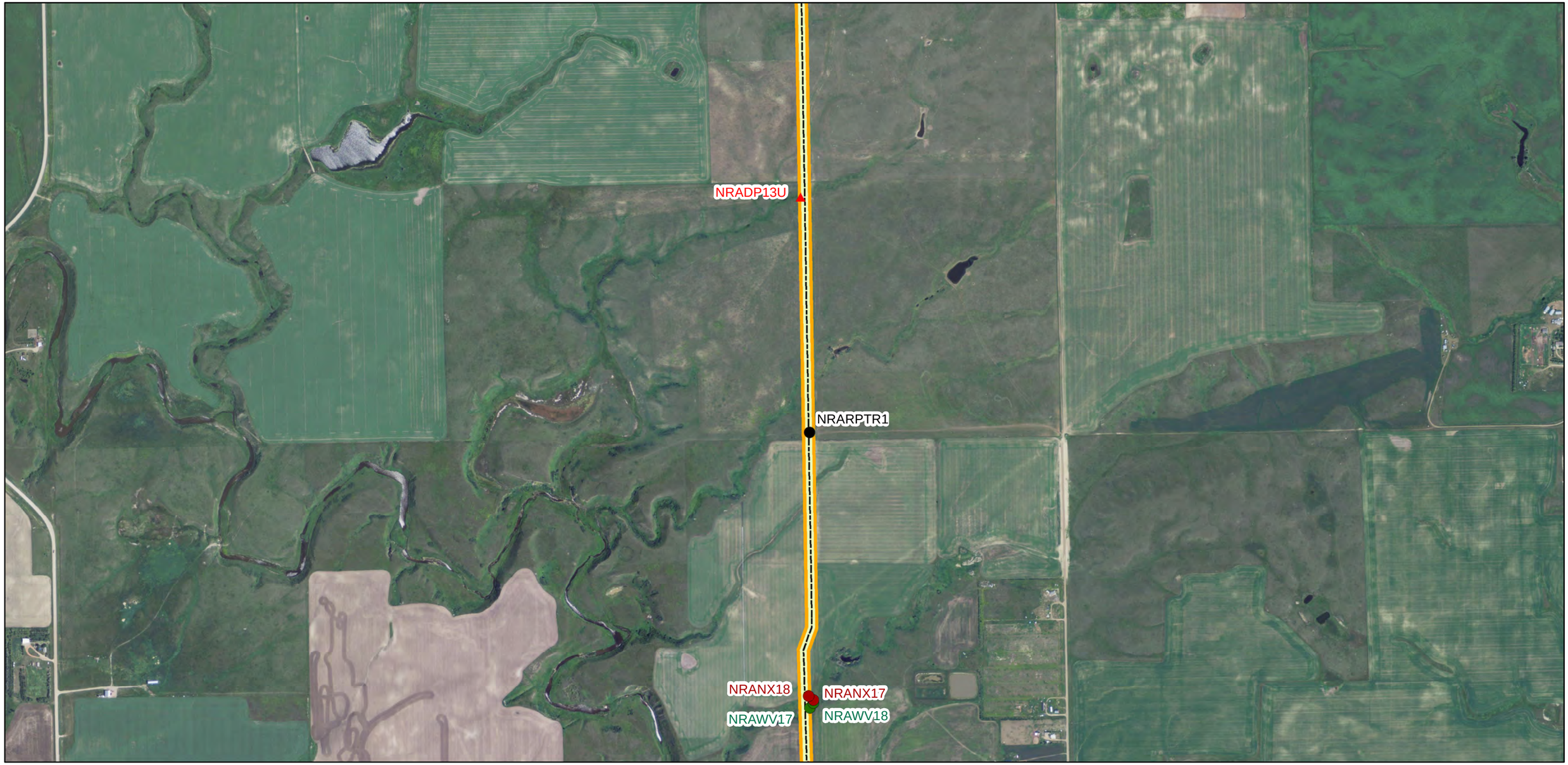

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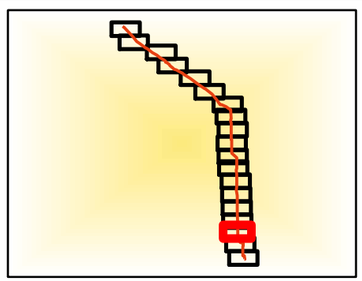

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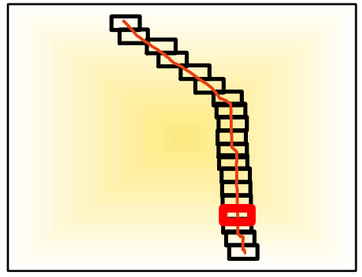

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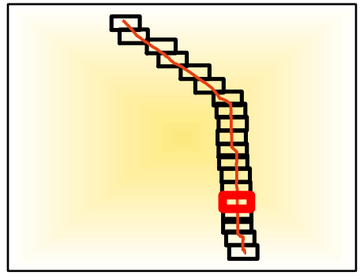

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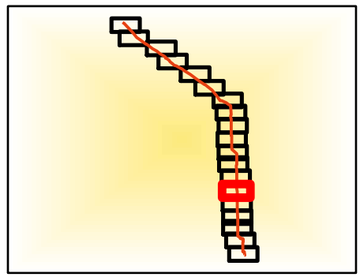

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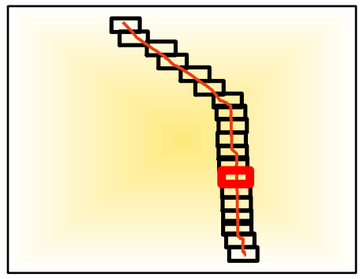

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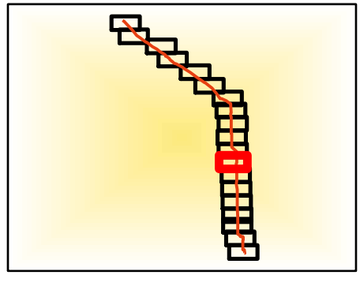

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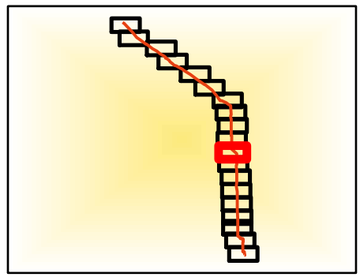

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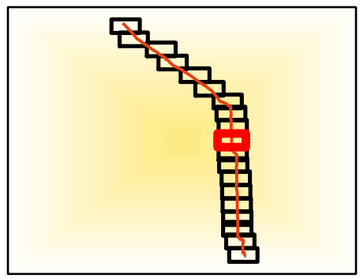

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NRADP7U
NRADP6U
NRADP5W
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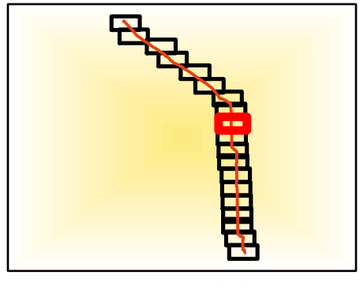

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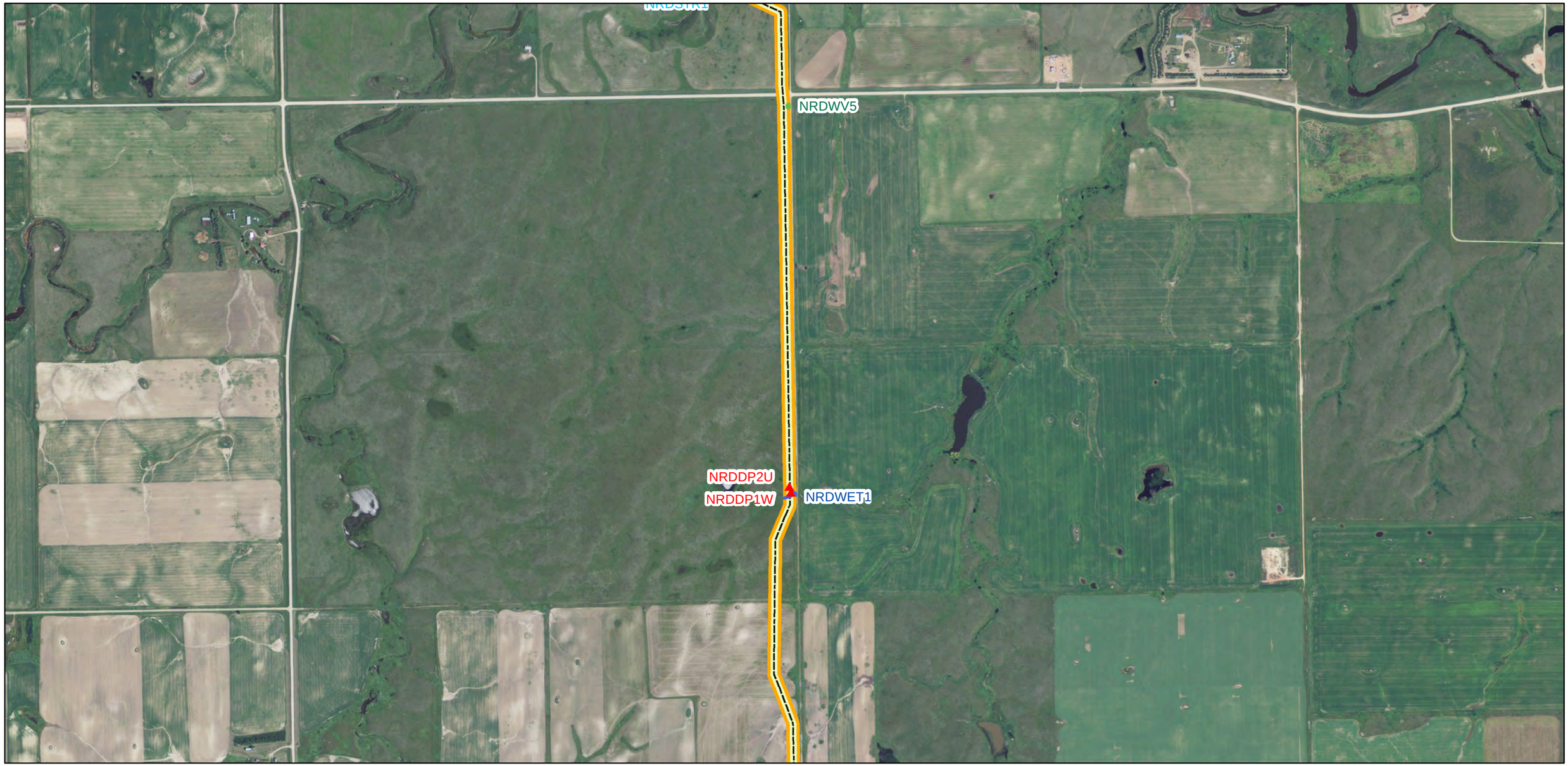

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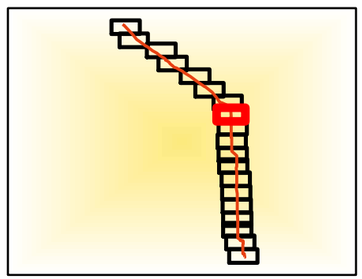

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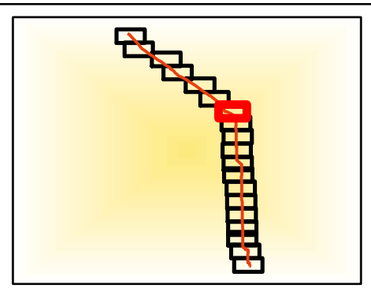

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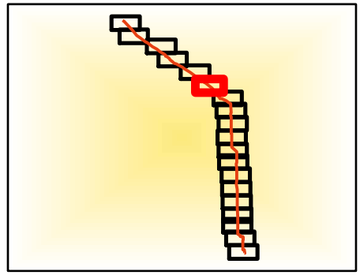

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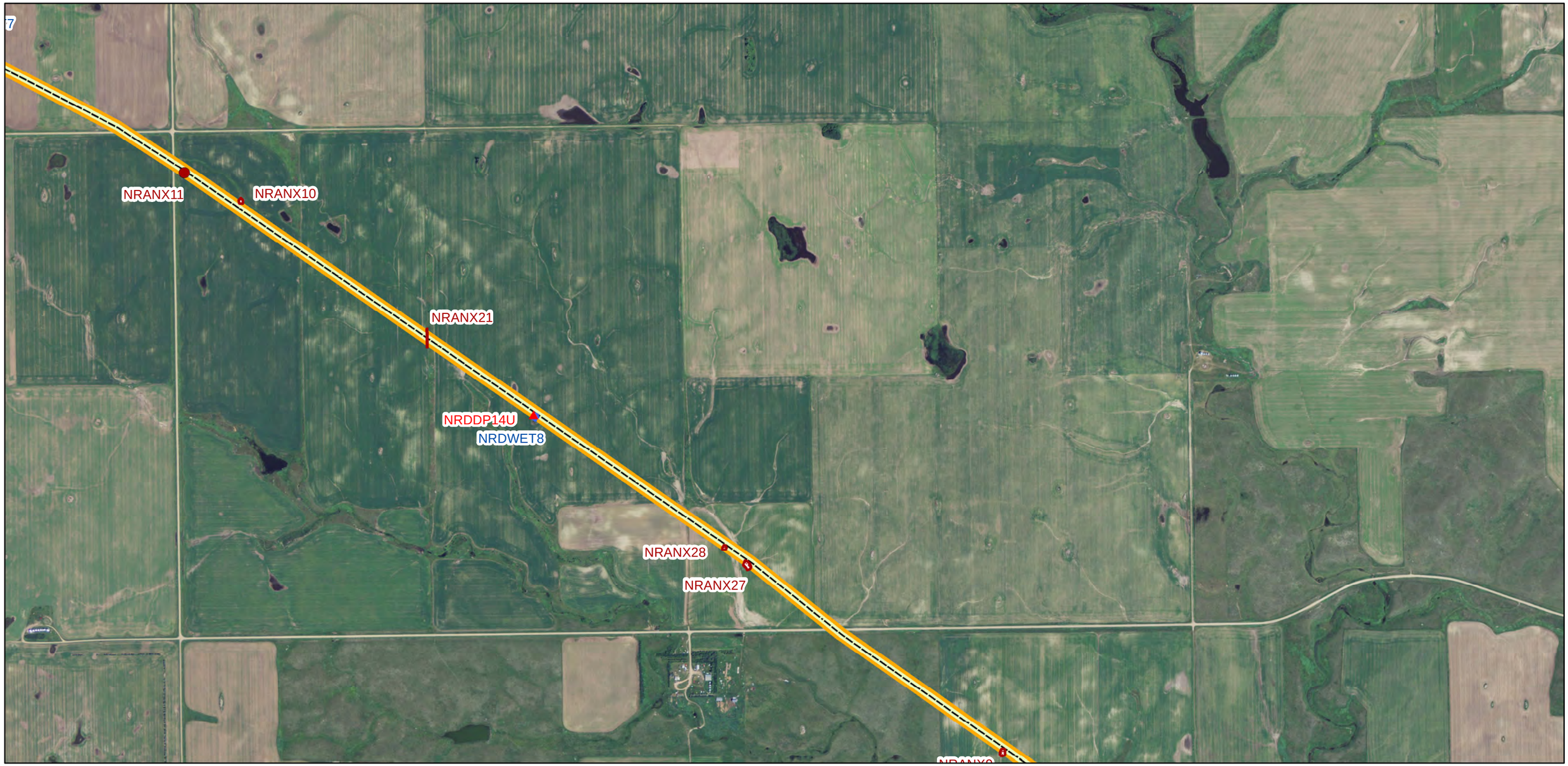

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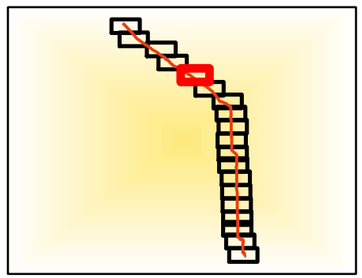

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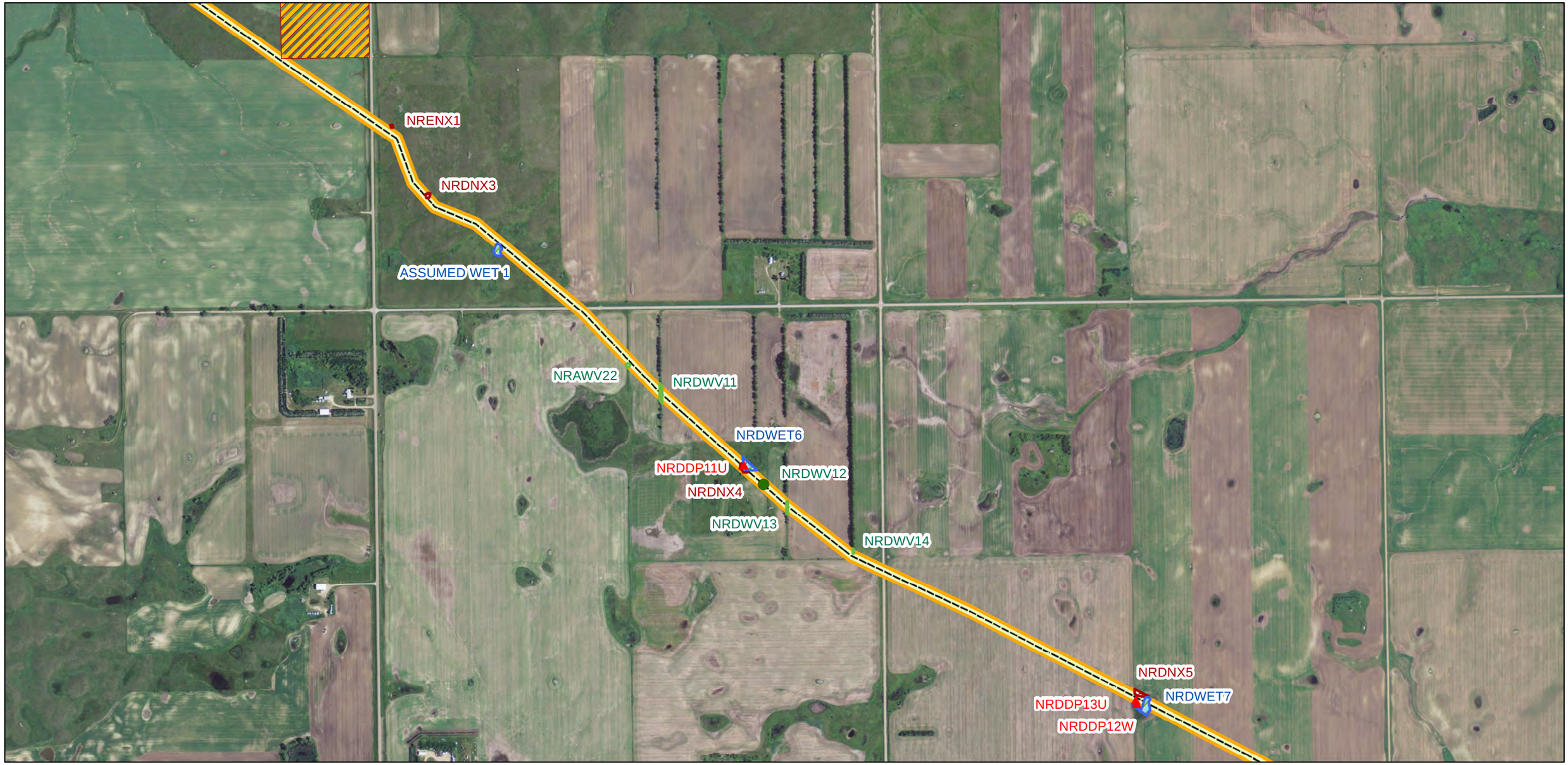

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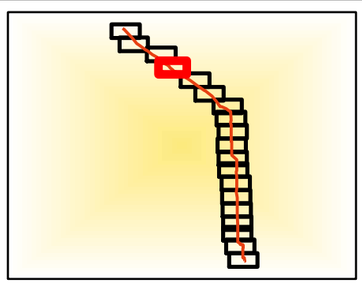

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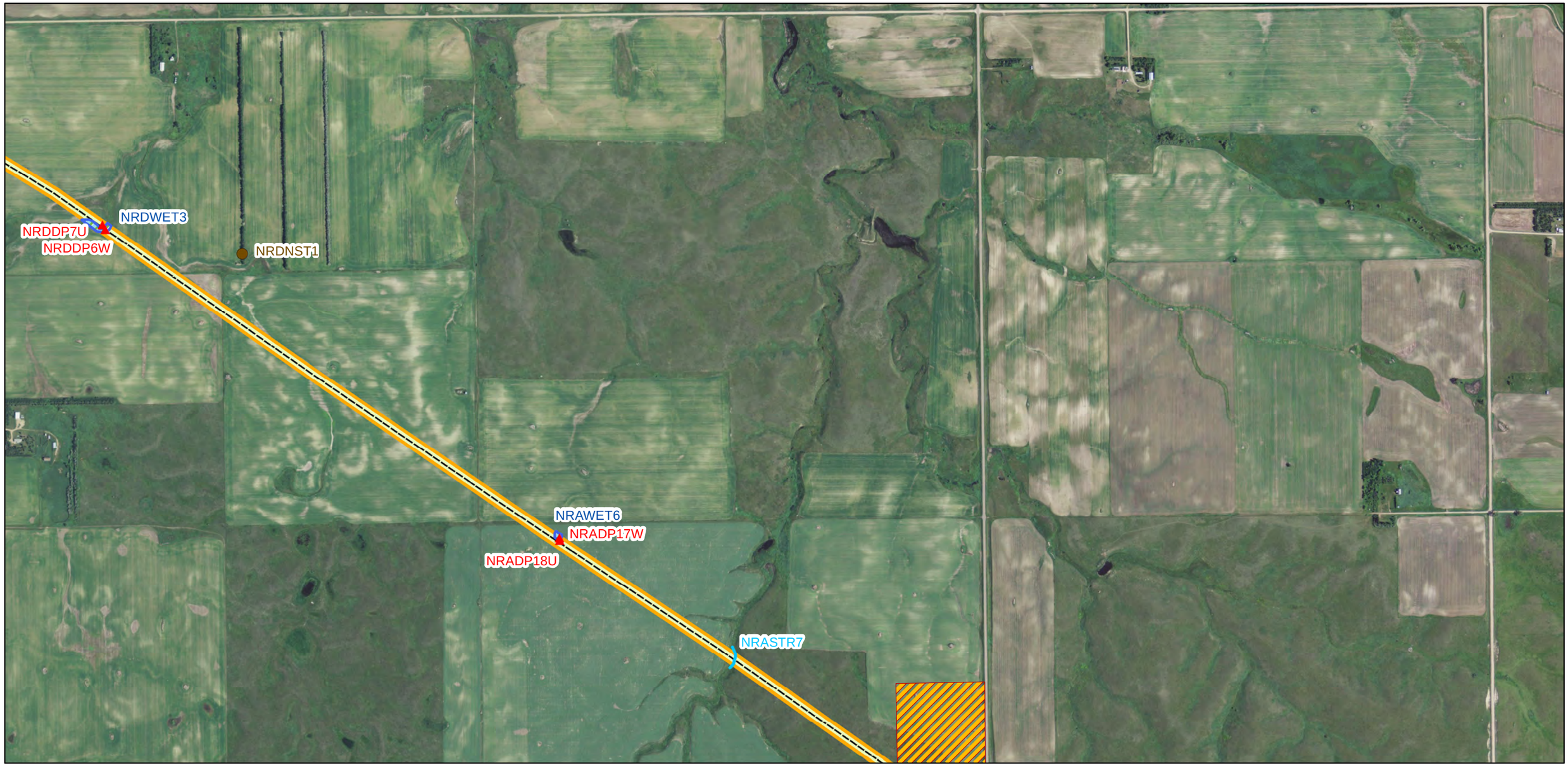
0 0.15 0.3 0.6 Miles

Base Map: 2010 NAIP 1 meter Imagery
Source: North Dakota GIS Hub
Quadrangle: West Bonetraill (1977)

N

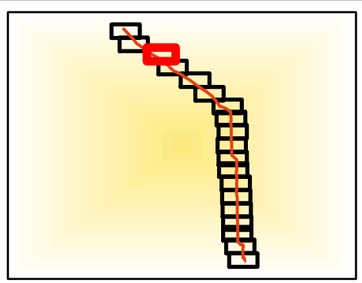
Township/Range: T157N R103W
County: Williams

NAD 1983 UTM Zone 13N



Legend

- Proposed Pipeline Centerline (ND)
- Origination Station
- Survey Area
- 70' Construction ROW
- Trenton Station Expansion
- Noxious Weeds
- Stream
- Woody Vegetation
- Data Point
- Nest
- Noxious Weeds
- Raptor
- Woody Vegetation
- Noxious Weeds
- Stream
- Waterbody
- Wetland
- Woody Vegetation



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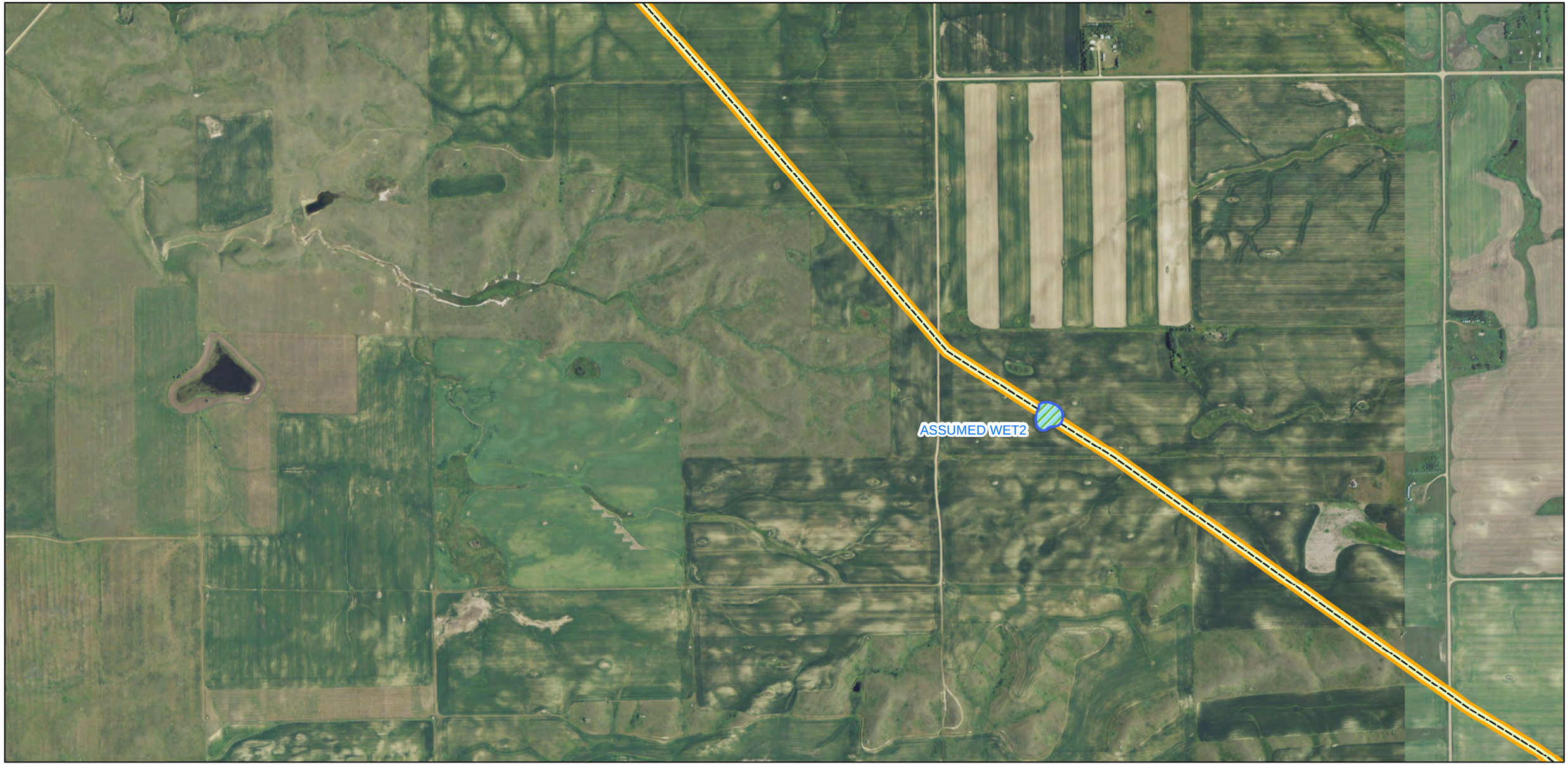

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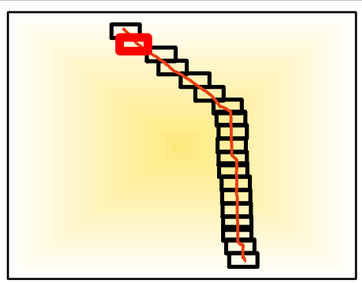

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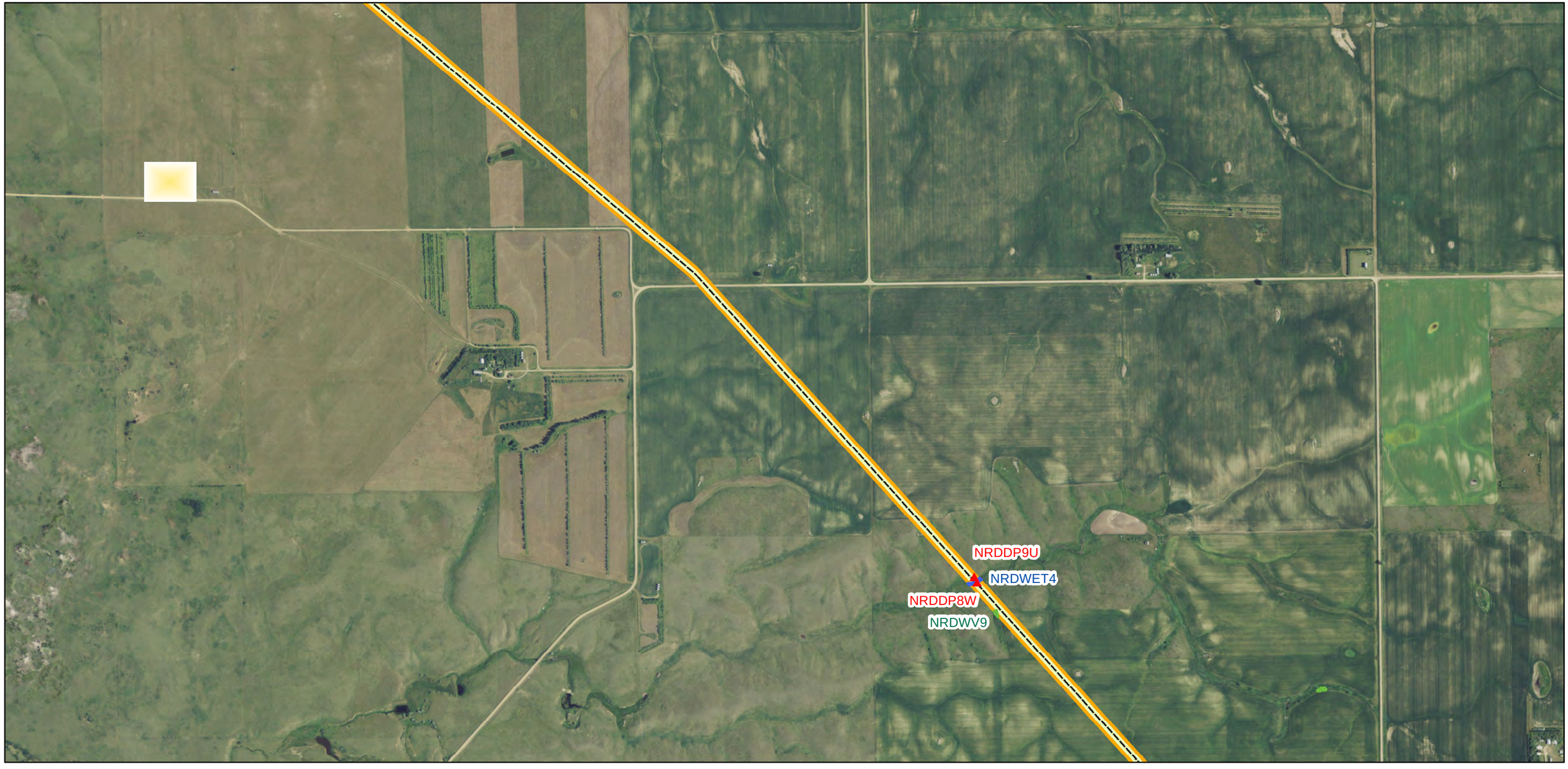

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APPENDIX B

Photographs of Project Area Corridor

Figure B.1. View of the project area. Note existing pipeline disturbance area within agricultural field.

Figure B.2. View of native prairie in project area.

Figure B.3. View of the NRDWET2, facing southeast.

Figure B.4. View of NRAWV1, facing northwest.

Figure B.5. View of NRDSTR1 (Cow Creek) crossing, facing west.

Figure B.6. View of the NRESTR1 crossing, facing southeast.

Figure B.7. View of NRDWET3, facing northwest.

Figure B.8. View of NRDWET8, facing south.

Figure B.9. View of NRDWV11, facing north.

Figure B.10. View of NRAWV19, facing north.

Figure B.11. View of NRDWV12, facing west.

Figure B.12. View of NRDNX1, facing south.

Figure B.13. View of NRENST1.