Natural Resources and Wetland Determination Report for the Belfield Oil Pipeline, Billings and Stark Counties, North Dakota

Prepared for

Merjent Inc.

Prepared by

SWCA Environmental Consultants

June 2011

Natural Resources and Wetland Determination Report for the Belfield Oil Pipeline, Billings and Stark Counties, North Dakota

Prepared for:

Merjent Inc.
615 First Avenue NE
Suite 425
Minneapolis, MN 55413

Prepared by:

Jason Bivens
Environmental Specialist

Reviewed by:
Michael Cook
Natural Resources Lead

SWCA Environmental Consultants
116 N. 4th Street, Suite 200
Bismarck, ND 58501
(701) 258-6622, Fax (701) 258-5957

SWCA Project No. 20860

June 2011

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

Appendix

1.0 INTRODUCTION

1.1 BACKGROUND

Whiting Oil and Gas Corporation (Whiting) is proposing to construct an approximately 6.84-mile-long crude oil pipeline named the Belfield Oil Pipeline in Billings and Stark Counties, North Dakota (survey area). The proposed pipeline will be constructed within an 80-foot temporary construction right-of-way (ROW).

Whiting will be applying to the North Dakota Public Service Commission (ND PSC) for a certificate of corridor compatibility and route permit for the project. Whiting retained Merjent, Inc. (Merjent) to prepare the ND PSC application and SWCA Environmental Consultants (SWCA) was selected by Merjent to complete natural and cultural resource field surveys in order to identify exclusion and avoidance areas as specified in North Dakota Administrative Code (NDAC) 69-06-08-02.

SWCA conducted a field survey of a 120-foot-wide corridor on May 9, 2011, to determine the potential presence and extent of potential "waters of the U.S.," commonly referred to as a wetland determination, within the proposed survey area. Concurrently with the wetland determination, SWCA also conducted a cursory threatened and endangered species survey and habitat assessment; a tree, sapling, and shrub enumeration survey; and a noxious weed survey.

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 ND PSC 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 above grade 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

The proposed survey area trends north to south within Billings and Stark Counties, North Dakota, beginning at a point northeast of Belfield, North Dakota, in Section 16, Township (T) 141 North (N), Range (R) 98 West (W), of the 5th Prime Meridian. Moving south-southwest, the survey area first traverses Section 16, T141N, R98W, then continues to move south-southwest through the middle of Section 21, T141N, R98W, and the NW¼ of Section 28, T141N, R98W. After crossing into the NE¼ of Section 29, T141N, R98W, the survey area moves south across Section 29 and 32, T141N, R98W and back west in the SE¼ of Section 32, before again turning south and crossing the Billings/Stark County line into Section 2,

T140N, R99W. The survey area moves south across Sections 2, 11, and 14, T140N, R99W, then turns west and ends at a point in the NE¼ of Section 14, T140N, R99W. The study area is located in the Great Plains (Level I), West-Central Semi-Arid Prairies (Level II), Northwestern Great Plains (Level III), and the Missouri Plateau (Level IV) ecoregions. The Missouri Plateau is characterized by an average precipitation amount of 15 to 17 inches and mean July temperatures ranging from 55 degrees Fahrenheit (°F) to 83°F (U.S. Geological Survey [USGS] 2006).

2.2 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 *Interim Regional Supplement to the Corps of Engineers Wetlands Determination Manual: Great Plains Region Version 2.0* (Supplement) (USACE 2008). According to the Manual and Supplement, 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 Vegetation

SWCA taxonomically identified all plant species within each recorded wetland area. All species were recorded according to their respective vegetative stratum. A tree is defined by the Supplement to be a woody-stemmed plant with a trunk diameter at breast height (DBH) 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 ecologists noted each plant species' respective U.S. Fish and Wildlife Service (USFWS) indicator status (i.e., upland [UPL], facultative upland [FACU], facultative [FAC], facultative wetland [FACW], and obligate [OBL]). SWCA also noted all populations of North Dakota state or county listed noxious weeds identified within the survey area.

2.2.2 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 Soil

Soil data derived from on-site excavated soil pits, including the matrix value, hue, chroma, and color name. Additionally, redoximorphic features (i.e., reduced/oxidized iron or

manganese) and soil texture were noted at each location if observed. A Munsell soil color chart was used to determine the color of moist soil samples.

SWCA excavated 6 soil profiles during natural resource surveys on May 9, 2011. Four upland and 2 hydric soil pits were excavated. Hydric soils were assumed to be present within each area that exhibited greater than 50% hydrophytic vegetation and a positive indication of wetland hydrology. Additionally, the assumption of the presence of hydric soil was assumed predicated on the geomorphic position of each wetland area

2.3 WATERBODIES

Waterbodies (i.e., creeks, streams, rivers) were identified by the presence of an ordinary high water mark (OHWM). Common identifiable indicators of an OHWM include 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.

2.4 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 2010a). 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 conducted a cursory pedestrian survey concurrently with the wetland determination for all listed species that could be potentially impacted by construction activities.

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).

2.5 TREE, SAPLING, AND SHRUB COUNT

SWCA ecologists determined the total number of trees, saplings, and shrubs present by conducting a direct count of all woody stemmed individuals within the survey area. 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.

2.6 MAPPING

The boundaries of each wetland, waterbody, and woody vegetation habitat were geographically recorded using a Trimble GeoXT global positioning system (GPS) unit. The aforementioned GPS unit is capable of recording geographic data with sub-meter accuracy.

SWCA used Universal Transverse Mercator Zone 13N as the projected coordinate system and North American Datum 1983 as the datum. ArcGIS Version 9.3 (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

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

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 two assessed wetland criteria. Refer to Appendix B for photographs that depict representative vegetation at wetlands surveyed. Examples of common dominant species identified within each vegetative community are listed below.

Canada thistle (*Cirsium arvense*), a listed noxious weed species, was the only noxious weed observed within the surveyed area. Approximately 5% cover was observed within a 30-foot

herbaceous sub-plot at DP4 W. The percent of each habitat type present within the surveyed area is estimated based on field observations.

3.1.1 Herbaceous Upland

Approximately 23% of the survey area was comprised of herbaceous upland habitat. These communities consisted of non-wetland areas dominated by non-woody vegetation such as grasses and forbs. Common species found within these communities include crested wheatgrass (*Agropyron cristatum*), Pasque flower (*Anemone patens*), fringed sagewort (*Artemisia frigida*), cudweed sagewort (*A. ludoviciana*), standing milkvetch (*Astragalus adsurgens*), smooth bromegrass (*Bromus inermis*), Canada thistle, purple coneflower (*Echinacea angustifolia*), American licorice (*Glycyrrhiza lepidota*), alfalfa (*Medicago sativa*), sweetclover (*Melilotus sp.*), plains pricklypear (*Opuntia polyacantha*), Kentucky bluegrass (*Poa pratensis*), little bluestem (*Schizachyrium scoparium*), field pennycress (*Thlaspi arvense*), and goatsbeard (*Tragopogon dubius*).

3.1.2 Shrubland

Approximately 1% of the survey area was comprised of shrubland habitat. Observed shrubland communities with woody-stemmed vegetation included Russian olive (*Elaeagnus angustifolia*), Rocky Mountain juniper (*Juniperus scoparium*), honeysuckle (*Lonicera dioica*), Plains Cottonwood (*Populus deltoides*), and Siberian elm (*Ulmus pumila*).

3.1.3 Cropland

Approximately 75% of the survey corridor consisted of cropland vegetation which included unidentifiable stubble.

3.1.4 PEM Wetland

Approximately 1% of the survey area consisted of PEM wetland habitat. These PEM wetlands primarily consisted of herbaceous, non-woody vegetation such as sedges (*Carex* sp.), spike rushes (*Eleocharis* sp.), grasses, and forbs. Common species found within these communities include smooth brome, wooly sedge (*Carex lanuginose)*, Canada thistle, American licorice, Kentucky bluegrass, curly dock (*Rumex crispus)*, bulrush (*Scirpus* sp.), prairie cordgrass (*Spartina pectinata*), and narrow-leaf cattail (*Typha angustifolia*).

3.2 HYDROLOGY

According to National Weather Service preliminary climatological data for Dickinson, North Dakota, 3.21 inches of precipitation was recorded from March 1 through April 30, 2011 (Table 1). This amount is 0.06 inch above normal for this time period.

Table 1. Monthly Recorded Rainfall at Dickinson, North Dakota.

Month	Recorded Precipitation (inches)	Normal Precipitation (inches)	Difference (inches)
March 2011	0.61	0.69	-0.08
April 2011	2.17	1.76	0.41
Total	**2.78**	**2.45**	**0.33**

Source: National Oceanic and Atmospheric Administration (2011).

Wetland communities observed during the determination 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 requirement, as defined by the Manual and Supplement.

Common hydrologic indicators observed within the survey area included surface water, soil inundation and saturation, algal mats, and inundation visible on aerial imagery.

3.3 SOILS

SWCA assumed all wetland areas that exhibited a dominant hydrophytic vegetation community and wetland hydrology indicators also exhibited hydric soil characteristics. Soil data were derived from 6 excavations conducted in wetland and upland areas (Table 2). Table 3 summarizes the soil types present within the survey area. Please refer to Appendix C for Natural Resources Conservation Service (NRCS) soil series descriptions.

Table 2. Soil Data Derived from Excavation.

Feature	Depth (inches)	Soil Matrix Color (color name)	Redoximorphic Feature Color	Texture
DP1U	0–20	10YR 3/1 (very dark, gray)	None Observed	Clay
DP2 U	0–20	10YR 2/1 (black)	None Observed	Clay Loam
DP3 U	0–10	10YR 3/3 (dark brown)	None Observed	Clay Loam
	10–20	5Y 4/1 (dark gray)	None Observed	Clay
DP4 W	0–10	10YR 2/1 (black)	10YR 5/6 (yellowish brown)	Sandy Clay
	10–20	10YR 4/4 (dark yellowish brown)	10YR 5/6 (yellowish brown)	Clay Sand
DP5 W	0–5	10YR 4/2 (dark grayish brown)	10YR 4/6 (dark yellowish brown)	Clay Loam
	5–20	10YR 5/2 (grayish brown)	10YR 4/6 (dark yellowish brown)	Clay Loam
DP6 U	0–20	10YR 4/1 (dark gray)	None Observed	Clay

Table 3. NRCS-derived Soil Series Present within the ROW.

Soil Types	Acres within 100-foot ROW	Hydric Component Present	Component Name and % Within Map Unit
Arnegard loam, 0% to 2% slopes	1.65	No	N/A
Bowdle loam, 0% to 2% slopes	1.69	No	N/A
Farnuf loam, 0% to 2% slopes	22.0	No	N/A
Lehr loam, 2% to 6% slopes	0.40	No	N/A
Williams-Bowbells loams, 0% to 3% slopes	42.5	Yes	Tonka – 2% Heil – 1%
Williams-Bowbells loams, 3% to 6% slopes	76.1	Yes	Tonka – 1%
Williams-Zahl loams, 3% to 6% slopes	14.1	Yes	Tonka – 1%
Williams-Zahl loams, 6% to 9% slopes	49.2	No	N/A
Zahl-Williams loams, 9% to 15% slopes	11.6	No	N/A
Zahl-Williams loams, 15% to 60% slopes	9.73	No	N/A
Amor-Zahl-Cabba loams, 9% to 25% slopes	1.19	No	N/A
Cabba-Amor-Zahl loams, 25% to 60% slopes	1.11	No	N/A
Korchea-Divide loams, channeled 0% to 2% slopes	4.78	No	N/A
Lehr-Williams loams, 0% to 6% slopes	6.60	No	N/A
Wabek sandy loam, 6% to 25% slopes	2.76	No	N/A

Source: NRCS (2009).

3.4 WETLANDS

SWCA recorded three PEM wetlands within the survey area, totaling 1.67 acres. However, only approximately 0.54 acre of PEM wetland is anticipated to be temporarily impacted by the proposed 80-foot construction ROW on the proposed centerline (Table 4).

Table 4. PEM Wetland Acreage within the Survey Area.

Wetland ID	Total Wetland Area (acres)	Temporarily Impacted Wetland Area within 80-foot Construction ROW (acres)	Crossing Distance (feet)	USACE Jurisdictional Status[1]
WET 1	0.023	0	0	Jurisdictional
WET 2	0.463	0.221	115.2	Jurisdictional
WET 3	1.18	0.322	179.4	Jurisdictional
Total	**1.67**	**0.54**		

[1] The USACE has the final authority on the jurisdictional status of a waterbody

3.5 WATERBODIES

SWCA identified two unnamed intermittent streams in the study area (Table 5). The two streams are tributaries to the North Creek sub-watershed (hydrologic unit code [HUC] 101302020301). North Creek precipitation run-off travels southeast to its confluence with the Upper Heart River (HUC 10130202). (Appendix A).

Table 5. Waterbodies in the Study Area.

Waterbody ID	Waterbody Name	Classification	Determined Area (acres)	Estimated Maximum Crossing Distance (feet)	USACE Jurisdictional Status[1]
STR1	Unnamed	Intermittent Stream	N/A	8	Jurisdictional
STR2	Unnamed	Intermittent Stream	N/A	6	Jurisdictional

[1] The USACE has the final authority on the jurisdictional status of a waterbody.

3.6 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 (e.g., tracks, scat, fur) indication of the presence of threatened or endangered species. However, the survey area does contain suitable foraging and stopover habitat for the whooping crane (*Grus americana*) and foraging habitat for the gray wolf (*Canis lupus*).

3.6.1 Endangered Species Act

3.6.1.1 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). The species has been listed by the USFWS as endangered since 1967 and has been the object of extensive re-introduction programs (USFWS 2010b). 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 1988). 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.

3.6.1.2 Gray Wolf

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). 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 that have occurred 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 from the northeast corner of North Dakota.

The gray wolf uses a variety of habitats that support a large prey base, including mountain and low-elevation forests, grasslands, and desert scrub (USFWS 2010c). 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 Belfield Oil Pipeline project would have **no effect** on the gray wolf.

3.6.1.3 Whooping Crane (*Grus americana*)

Federal Status: Endangered
Affects Determination: 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 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 2010d). 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 2010d). Billings and Stark Counties, including the survey area, are 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 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.

3.6.1.4 Sprague's Pipit (*Anthus spragueii*)

Federal Status: Candidate
Affects Determination: Not Likely to Adversely Affect

The Sprague's pipit is a small passerine bird that is native to the North American grasslands. It is a ground nester that breeds and winters on open grasslands and feeds mostly on insects and spiders and some seeds. The Sprague's pipit is closely tied with native prairie habitat and breeds in the north-central United States in Minnesota, Montana, North Dakota, and South Dakota as well as south-central Canada (USFWS 2010e). Wintering occurs in the southern states of Arizona, Texas, Oklahoma, Arkansas, Mississippi, Louisiana, and New Mexico. Within the survey area, suitable habitat does occur. The proposed project **may affect, but is not likely to adversely affect** this species.

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

3.6.2.1 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: Not Likely to Adversely Affect

Suitable nesting or foraging habitat for bald eagles includes old growth trees relatively close (usually less than 1.24 miles [Hagen et al. 2005]) to perennial waterbodies. The survey area does not contain old growth trees. Therefore, no adverse effects are anticipated. However, the possibility of transient, flying bald eagle individuals traversing the survey area does exist.

3.6.2.2 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: Not Likely to Adversely Affect

One golden eagle adult (presumably transient) was observed during the field surveys on May 9, 2011. However, no nest was observed within or near the survey area during the field survey. The golden eagle prefers habitat characterized by open prairie, plains, and forested areas. Usually, golden eagles can be found in proximity to badland cliffs, which provide suitable nesting habitat. Therefore, the proposed project is unlikely to cause any adverse effects to golden eagles.

3.6.3 Wildlife Observed

During the field survey, SWCA ecologists observed different species of wildlife that utilize wetlands and other habitat within the survey area. Species observed include northern pintail (*Anas acuta*), northern shoveler (*A. clypeata*), blue-winged teal (*A. discors*), mallard (*A. platyrhynchos*), golden eagle, upland sandpiper (*Bartramia longicauda*), Swainson's hawk (*Buteo swainsoni*), sandpiper (*Calidris* sp.), willet (*Catoptrophorus semipalmatus*), killdeer (*Charadrius vociferous*), horned lark (*Eremophila alpestris*), short-billed dowitcher (*Limnodromus griseus*), brown-headed cowbird (*Molothrus ater*), savannah sparrow (*Passerculus sandwichensis*), wilson's phalarope (*Phalaropus tricolor*), ring-necked pheasant (*Phasianus colchicus*), western meadowlark (*Sturnella neglecta*), and mourning dove (*Zenaida macroura*). Three migratory bird nests found incidentally during the natural resource survey included a killdeer, mallard, and possibly a Swainson's hawk. A large stick nest was observed west of the survey corridor and two adult Swainson's hawks were observed in the survey corridor in the proximity of the stick nest. The location of each nest is shown on the site layout maps in Appendix A. SWCA did not actively search for avian nests during the natural resource survey.

3.7 TREE, SAPLING, AND SHRUB COUNT

During SWCA's field survey, one windbreak was recorded within the survey area. Table 6 lists the number of trees estimated to be impacted by the Belfield Oil Pipeline project as currently proposed. The ND PSC requires a 2:1 post- to pre-construction mitigation for all woody-stemmed vegetation impacted during the construction of the proposed pipeline. SWCA estimates that approximately 82 two-year-old sapling individuals would need to be replanted if construction requires the removal of all trees identified within the 80-foot construction ROW, in order to fulfill the 2:1 mitigation requirement.

Table 6. Tree, Sapling, and Shrub Count

Woody Vegetation (WV) ID	Species	Occurrence Type	Number of Trees		Estimated Mitigation Commitment
			120-foot Survey ROW	80-foot Construction ROW (estimated)	
WV1	*Elaeagnus angustifolia, Ulmus pumila, Juniperus scoparium, Lonicera dioica*	Windbreak	49	31	62
WV2	*Populus deltoides*	Natural	8	8	16
WV3	*Ulmus pumila*	Natural	2	2	4
		Total	**59**	**41**	**82**

4.0 CONCLUSIONS AND RECCOMENDATIONS

1. SWCA ecologists recorded approximately 1.67 acres of wetlands within the survey area.
2. In total, 0.54 acre of PEM wetland *may* be temporarily impacted by construction activities.
3. SWCA estimates 41 trees, saplings, and shrubs may be impacted. Therefore, approximately 82 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, 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, North Dakota Forest Service, and Michael Cook, Ecologist, SWCA, December 7, 2009).
5. According to the recommendations of the North Dakota Forest Service, 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, North Dakota Forest Service, and Michael Cook, Ecologist, SWCA, December 7, 2009).
6. No threatened or endangered species were observed during the field survey. The known species that occur in Billings and Stark Counties are not likely to be detrimentally impacted by construction activities.

5.0 LITERATURE CITED

Armbruster, M.J. 1990. Characterization of habitat used by whooping cranes during migration. *Biological Report* 90(4):1–16.

Canadian Wildlife Service and U.S. Fish and Wildlife Service. 2007. International recovery plan for the whooping crane. Ottawa: Recovery of Nationally Endangered Wildlife (RENEW), and U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Determination Manual.* Technical Report Y-87-1. Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station.

Hagen, S.K., P.T. Isakson, and S.R. Dyke. 2005. *North Dakota Comprehensive Wildlife Conservation Strategy*. Bismarck: North Dakota Game and Fish Department.

Howe, M.A. 1987. Habitat use by migrating whooping cranes in the Aransas-Wood Buffalo corridor. In *Proceedings of the 1985 Crane Workshop*, edited by C. Lewis and J.W. Ziewitz, pp. 303–311. Platte River Whooping Crane Habitat Maintenance Trust and USFWS, Grand Island, Nebraska.

———. 1989. *Migration of Radio-Marked Whooping Cranes from the Aransas-Wood Buffalo Population: Patterns of Habitat Use, Behavior, and Survival*. U.S. Fish and Wildlife Service Technical Report.

Kotliar, N.B., B.W. Baker, A.D. Whicker, and G. Plumb. 1999. A critical review of assumptions about the prairie dog as a keystone species. *Environmental Management* 24(2):177–192.

Licht, D.S., and S.H. Fritts. 1994. Gray wolf *(Canis lupus)* occurrences in the Dakotas. *American Midland Naturalist* 132:74–81.

Licht, D.S., and L.E. Huffman. 1996. Gray wolf status in North Dakota. *The Prairie Naturalist* 28(4):169–174.

National Oceanic and Atmospheric Administration. 2009. National Weather Service Office; Williston, ND. Archived Monthly Data. Last updated September 2009.

Natural Resources Conservation Service (NRCS). 2009. Web Soil Survey. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Available online at http://websoilsurvey.ncrs.usda.gov and http://soildatamart.ncrs.usda. Accessed October 7, 2009.

U.S. Army Corps of Engineers (USACE). 2008. *Interim Regional Supplement to the Corps of Engineers Wetland Determination Manual: Great Plains Region.* Edited by J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-12. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center.

U.S. Fish and Wildlife Service. 1988. Black-footed Ferret Recovery Plan. U.S. Fish and Wildlife Service, Denver, Colorado.

———. 1989. Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act. Denver and Albuquerque: U.S. Fish and Wildlife Service.

———. 2010a. County Occurrence of Endangered, Threatened, and Candidate Species and Designated Critical Habitat in North Dakota. Available online at http://www.fws.gov/northdakotafieldoffice/county_list.htm. Accessed May 14, 2010.

———. 2010b. Black-footed ferret. Available online at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A004. Accessed September 7, 2010.

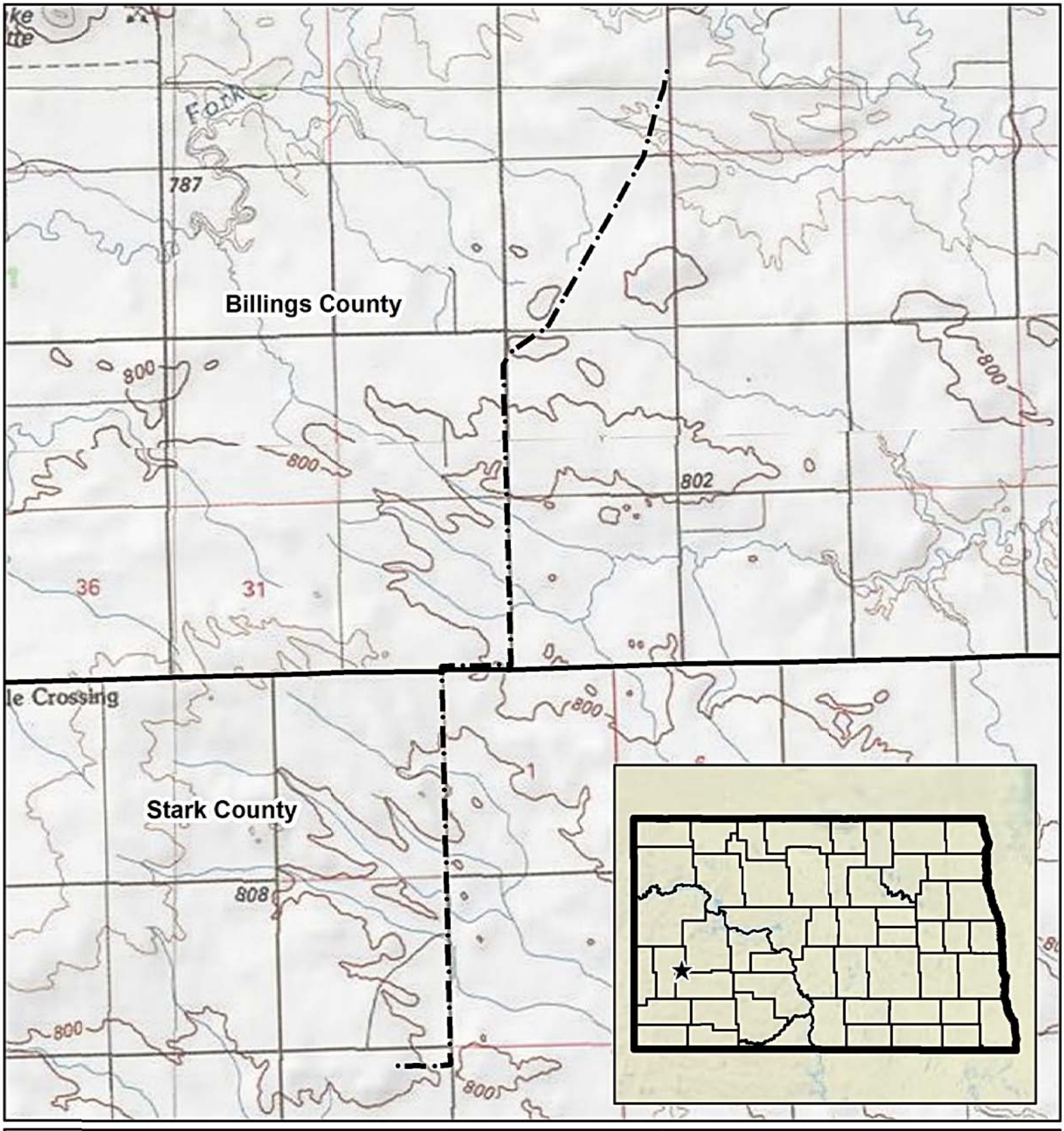
———. 2010c. Gray wolf. Available online at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A00D. Accessed September 7, 2010.

———. 2010d. Whooping crane. Available online at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B003. Accessed September 2, 2010.

———. 2010e. Endangered and threatened wildlife and plants; 12-month finding on a petition to list Sprague's pipit as endangered or threatened throughout its range. *Federal Register* 75(178):56028–56050.

U.S. Geological Survey (USGS). 2006. Ecoregions of North Dakota and South Dakota. Available at http://www.npwrc.usgs.gov/resource/habitat/ndsdeco/42c.htm. Last updated August 2006.

APPENDIX A
Vicinity Maps and Site Layout Maps



Belfield Oil Pipeline Project

Proposed Belfield Oil Pipeline

Project Location

SWCA®
ENVIRONMENTAL CONSULTANTS

116 North 4th Street
Suite 200
Bismarck, ND 58501

Phone: 701.258.6622
Fax: 701.258.5957

www.swca.com
June 1, 2011

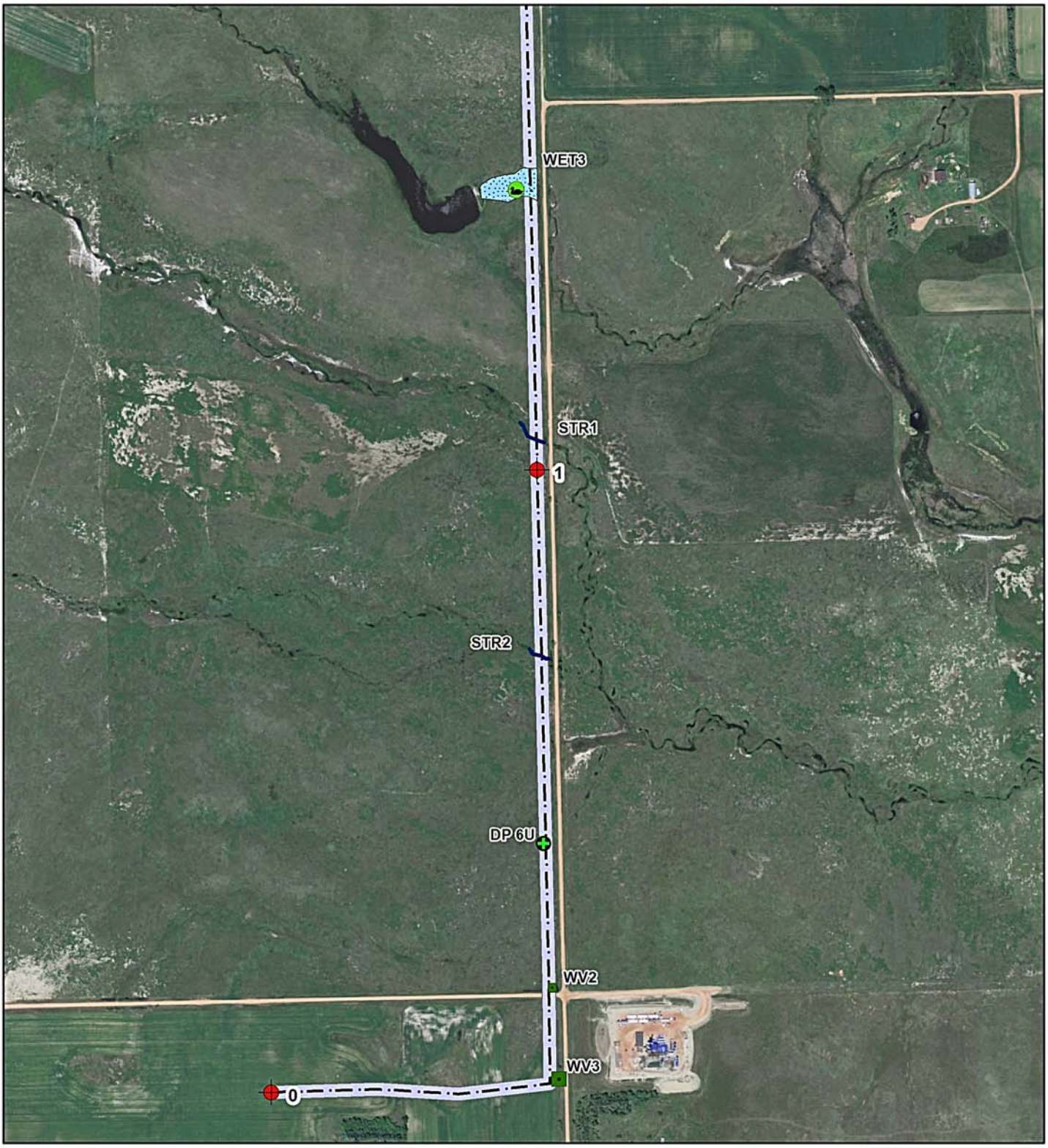
0 1.25 2.5 Kilometers

0 0.5 1 Miles

Project Area:
Base Map: USGS 7.5' Topographic Map
Quadrangles: Belfield, ND (1995);
Belfield NE, ND (1995);
Fairfield SE, ND (1978);
Rattlesnake Butte, ND (1978)
Township 140N Range 99W &
Township 141N Range 98W
Billings and Stark Counties, North Dakota

UTM Zone 13N, NAD 83, Meters

N



Legend - Map 1

- Milepost
- Upland Data Point
- Mallard Nest
- Woody Vegetation
- Stream
- Proposed Belfield Oil Pipeline
- Wetland
- Proposed Construction ROW

0 0.2 0.4 Miles

0 0.25 0.5 Kilometers

Scale: 1:10,000

Quadrangles: Belfield, ND (1995) &
Belfield NE, ND (1995)
Township 140N Range 99W
Stark County, North Dakota

UTM Zone 13N, NAD 83, Meters

N

SWCA®
ENVIRONMENTAL CONSULTANTS

295 Interlocken Blvd., Suite 300
Broomfield, CO 80021

Phone: 303.487.1183
Fax: 303.487.1245

www.swca.com

May 25, 2011

Legend - Map 2

- Milepost
- Upland Data Point
- Wetland Data Point
- Killdeer Nest
- Raptor Nest
- Woody Vegetation
- Proposed Belfield Oil Pipeline
- Wetland
- Proposed Construction ROW

0 0.2 0.4 Miles

0 0.25 0.5 Kilometers

Scale: 1:10,000

Quadrangles: Belfield, ND (1995) &
Belfield NE, ND (1995)
Township 140N Range 99W &
Township 141N Range 98W
Billings and Stark Counties, North Dakota

UTM Zone 13N, NAD 83, Meters

N

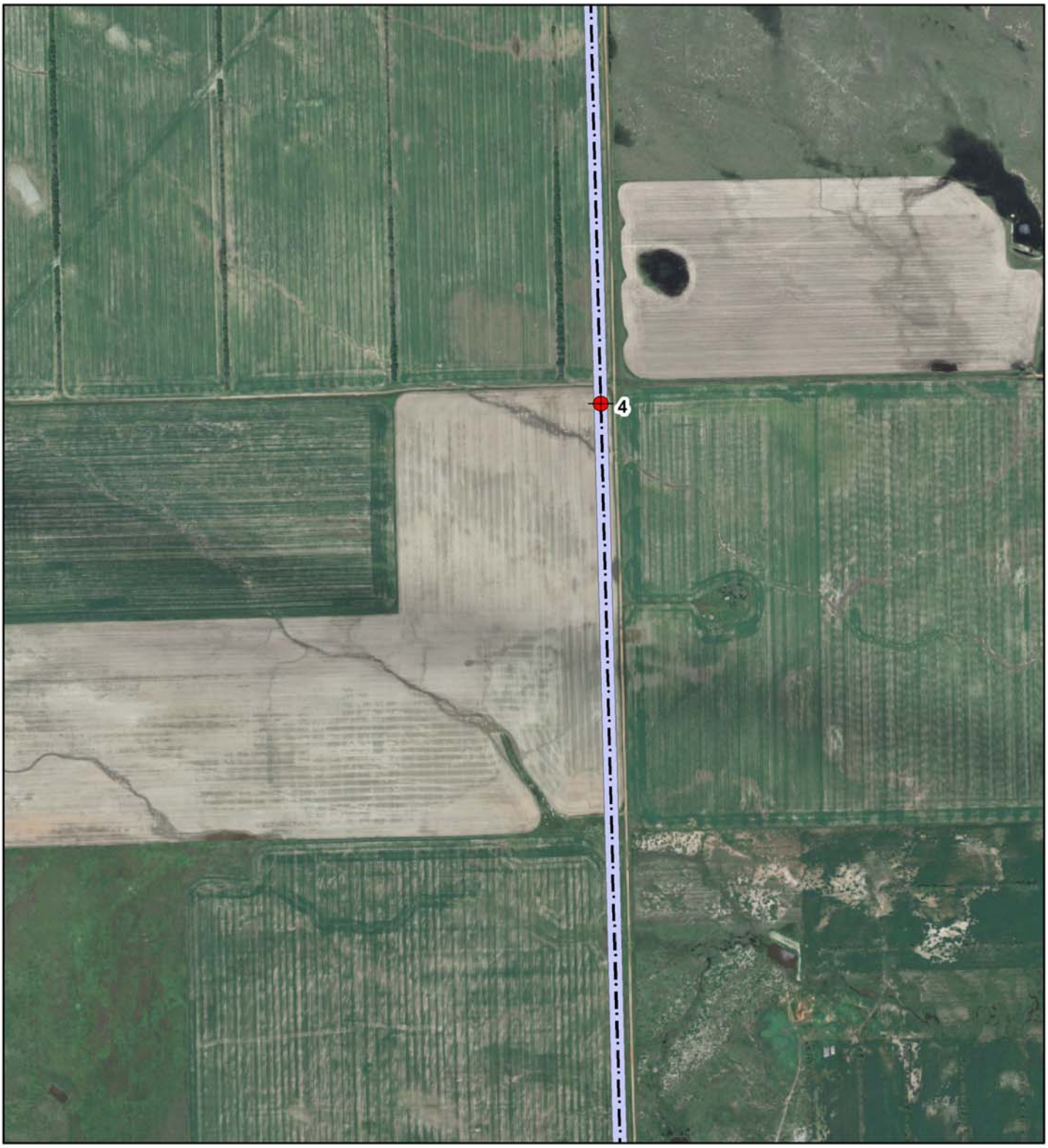
SWCA®
ENVIRONMENTAL CONSULTANTS

295 Interlocken Blvd., Suite 300
Broomfield, CO 80021

Phone: 303.487.1183
Fax: 303.487.1245

www.swca.com

May 25, 2011



Legend - Map 3

- Milepost
- Proposed Belfield Oil Pipeline
- Proposed Construction ROW

0 0.2 0.4 Miles

0 0.25 0.5 Kilometers

Scale: 1:10,000

Quadrangles: Belfield, ND (1995);
Belfield NE, ND (1995);
Fairfield SE, ND (1978); &
Rattlesnake Butte, ND (1978)
Township 141N Range 98W
Billings County, North Dakota

UTM Zone 13N, NAD 83, Meters

N

SWCA®
ENVIRONMENTAL CONSULTANTS

295 Interlocken Blvd., Suite 300
Broomfield, CO 80021

Phone: 303.487.1183
Fax: 303.487.1245

www.swca.com

May 25, 2011

Legend - Map 4

- Milepost
- Upland Data Point
- Proposed Belfield Oil Pipeline
- Proposed Construction ROW

0 0.2 0.4 Miles

0 0.25 0.5 Kilometers

Scale: 1:10,000

Quadrangle: Fairfield SE, ND (1978)
Township 141N Range 98W
Billings County, North Dakota

UTM Zone 13N, NAD 83, Meters

N

SWCA®
ENVIRONMENTAL CONSULTANTS

295 Interlocken Blvd., Suite 300
Broomfield, CO 80021

Phone: 303.487.1183
Fax: 303.487.1245

www.swca.com

May 25, 2011

Legend - Map 5

- Milepost
- Upland Data Point
- Proposed Belfield Oil Pipeline
- Proposed Construction ROW

0 0.2 0.4 Miles

0 0.25 0.5 Kilometers

Scale: 1:10,000

Quadrangle: Fairfield SE, ND (1978)
Township 141N Range 98W
Billings County, North Dakota

UTM Zone 13N, NAD 83, Meters

N

SWCA®
ENVIRONMENTAL CONSULTANTS

295 Interlocken Blvd., Suite 300
Broomfield, CO 80021

Phone: 303.487.1183
Fax: 303.487.1245

www.swca.com

May 25, 2011

APPENDIX B
Photographic Log

Photograph 1. Facing south from DP1 U.

Photograph 2. Facing south across wheat stubble field at DP3 U.

Photograph 3. Facing west from WET1.

Photograph 4. Facing west from WET2.

Photograph 5. Facing west from STR2.

Photograph 6. Mallard nest near WET3.

Photograph 7. Facing southeast toward WV1.

Photograph 8. Facing south along centerline at DP6 U.

APPENDIX C
NRCS Soil Unit Descriptions

AMOR
The Amor series consists of moderately deep, well-drained, moderately permeable soils found on sandstone bedrock uplands with slopes ranging from approximately 0% to 25%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches and mean annual air temperature is approximately 42°F. This soil type is largely used for cultivation of small grains, flax, and corn. Native vegetation species common to this soil type include needle and thread (*Hesperostipa comata*), western wheatgrass (*Pascopyrum smithii*), and blue grama (*Bouteloua gracilis*) (NRCS 2009).

ARNEGARD
The Arnegard series consists of very deep, well- or moderately well-drained soils that formed in calcareous loamy alluvium on upland swales, terraces, fans, and foot slopes. Permeability is moderate. Slopes range from 0% to 25%. Mean annual air temperature is 42°F, and mean annual precipitation is 14 inches. Most areas are cropped to spring wheat, oats, barley, and hay. Native vegetation is mid, tall, and short grasses such as western wheatgrass, green needlegrass (*Nasella viridula*), big bluestem (*Andropogon gerardii*), and blue grama (NRCS 2009).

BOWDLE
The Bowdle series consists of well-drained soils formed in loamy alluvium underlain by sand and gravel. The soils are moderately deep over sand and gravel and are on outwash plains and stream terraces. Permeability is moderate in the solum and rapid or very rapid in the underlying material. Slopes range from 0% to 15%. Mean annual precipitation is about 18 inches, and mean annual air temperature is about 44°F. This soil type is primarily cropped to small grain, alfalfa, and some flax and corn. Native vegetation is primarily western wheatgrass, blue grama, green needlegrass, needle and thread, forbs, and sedges (NRCS 2009).

CABBA
The Cabba series consists of shallow, well-drained, moderately permeable soils found on hills, escarpments, and sedimentary plains. The soil slopes broadly range between 2% and 70%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches and mean annual air temperature is approximately 43°F. The most common vegetation species found on this soil type are little bluestem (*Schizachyrium scoparium*), green needlegrass, and other various herbs, forbs, and shrub species (NRCS 2009).

FARNUF
The Farnuf series consists of very deep, well-drained soils that formed in alluvium, glaciolacustrine, or glaciofluvial deposits. These soils are on alluvial fans, stream terraces, hills, sedimentary plains, glacial lake plains, moraines, and outwash plains. Slopes are 0% to 35%. Mean annual precipitation is approximately 16 inches and mean annual air temperature is approximately 42°F. Farnuf soils are used mainly for irrigated and non-irrigated cropland. The potential native vegetation is primarily mid and short grasses such as western wheatgrass, prairie sandreed (*Calamovilfa longifolia*), green needlegrass, little bluestem, needle and thread, blue grama, shrubs, and forbs (NRCS 2009).

KORCHEA
The Korchea series consists of very deep, well-drained soils found on floodplains and low stream terraces. Permeability is moderate with slopes ranging from approximately 0% to 6%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches and mean annual air temperature is approximately 42°F. This soil type is used most often for cultivation of small grains, hay, and corn. Alternatively, this soil is used for rangeland foraging. Native vegetation species common to this soil type include needle and thread, green needlegrass, and western wheatgrass (NRCS 2009).

LEHR
The Lehr series consists of very deep, somewhat excessively drained shallow that formed in loamy alluvium over sand and gravel. Permeability is moderate or moderately rapid in the upper part and rapid or very rapid in the substratum. These soils are on outwash plains and stream valley terraces and have slopes ranging from 0% to 25%. Mean annual air temperature is 40°F, and mean annual precipitation is 14 inches. Where cultivated, small grains, corn, and hay are the principal crops. In pastures, the native vegetation consists of mid and short prairie grasses such as western wheatgrass, blue grama, and upland sedges (NRCS 2009).

WABEK
The Wabek series consists of very deep, excessively drained, rapidly and very rapidly permeable soils formed in sand and gravel glaciofluvial deposits. These soils are on outwash plains, beach ridges, terraces, and terrace escarpments and have slopes of 0% to 45%. Mean annual air temperature is 42°F, and mean annual precipitation is 16 inches. This series is used mainly for range and pasture. Native vegetation is blue grama, upland sedges, western wheatgrass, needle and thread, and forbs (NRCS 2009).

WILLIAMS
The Williams series consists of very deep, slowly permeable, well-drained soils found on glacial till plains and moraines with slopes at approximately 0% to 35%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches and mean annual air temperature is approximately 42°F. This soil type is largely used for cultivation. Native vegetation species common to this soil type include western wheatgrass, needle and thread, blue grama, and green needlegrass (NRCS 2009).

ZAHL
The Zahl series consists of very deep, slowly permeable, well-drained soils found on glacial till plains, moraines, and valley side slopes at approximately 1% to 60%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches and mean annual air temperature is approximately 40°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type include western wheatgrass, little bluestem, and needle and thread (NRCS 2009).