

Appendix D

Natural Resources Report

**Natural Resources and Wetland
Determination Report for the
RTF Tie-In Project,
Williams County, North Dakota**

Prepared for

Hess Corporation

Prepared by

SWCA Environmental Consultants

October 2012

**Natural Resources and Wetland Determination Report for the Hess
RTF Tie-In Project, Williams County, North Dakota**

Prepared for:

**Hess Corporation
6619 Highway 40
Tioga, ND 58852**

Prepared by:

Pete Christensen, Wildlife Biologist

Reviewed by:

Richard Wadleigh, 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. 20749

October 29, 2012

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
1.1 Background	1
1.2 Survey Area	1
2.0 METHODS	5
2.1 Pre-Field Review	5
2.2 Wetlands	5
2.2.1 Hydrophytic Vegetation	5
2.2.2 Wetland Hydrology	5
2.2.3 Hydric Soil	6
2.3 Waterbodies	6
2.4 Tree, Sapling, and Shrub Count	6
2.5 Wildlife Including Threatened and Endangered Species	7
2.6 Mapping	7
3.0 RESULTS	8
3.1 Vegetation	8
3.1.1 Herbaceous Upland	8
3.1.2 Shrubland and Forested Upland Communities	8
3.1.3 Cropland	8
3.1.4 PEM Wetland	8
3.2 Hydrology	9
3.3 Wetlands	10
3.4 Waterbodies	11
3.5 Tree, Sapling, and Shrub Count	11
3.6 Wildlife	12
3.6.1 Endangered Species Act	12
3.6.2 Migratory Bird Treaty Act / Bald and Golden Eagle Protection Act	17
3.6.3 Wildlife Observed	18
4.0 CONCLUSIONS	19
5.0 LITERATURE CITED	20

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1 Initial Survey - Monthly Recorded Rainfall at Williston, North Dakota.....	9
2 Reroute Survey - Monthly Recorded Rainfall at Williston, North Dakota.....	10
3 PEM Wetland Acreage within the Survey Area.	10
4 Tree, Sapling, and Shrub Count.	11
5 Wildlife Observed during Field Surveys at the Proposed Pipeline Route.	18

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1 Project area overview depicting general wetland topography in Segment C, facing west.	2
2 Project area overview depicting general topography in Segment B, facing south.....	3
3 General topography and woody vegetation in Segments A and B, facing west.	3

LIST OF APPENDICES

<u>Appendix</u>
A Vicinity Maps and Site Layout Maps
B Photographs of Project Area Corridor

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 Hess Corporation (Hess), for the proposed Hess Ramberg Truck Facility (RTF) Tie-In Project (pipeline). The pipeline is located near Tioga, Williams County, North Dakota, and consists of three existing segments, herein referred to as Segments B, and C, and Segment E. Segment E originates at the RTF and travels approximately 1.88 miles north and then west, until connecting with Segment B near an existing compressor station at the southern end of the project area. Segment B then trends north for approximately 6.09 miles before connecting with Segment C. Segment C trends west from the terminus of Segment B, then northwest for approximately 2.16 miles before connecting with existing Hess facilities in Section 33, Township (T) 157 North (N), Range (R) 95 West (W), Williams County, North Dakota. Segments B and C are existing working gathering pipelines that will be repurposed to transport crude oil from the RTF to the Tioga Rail Terminal.

Segment E is a newly proposed pipeline that would connect the RTF to Segment B. All new disturbance would be contained wholly within the existing RTF facility and no new surface disturbance is proposed.

SWCA conducted field surveys within a 350-foot-wide corridor for Segment C on June 10, June 20, July 1, and September 8, 2011 (Christensen and Cook 2011). SWCA conducted field surveys within a 350-foot-wide corridor for Segment B on March 16, 2012, and within a 200-foot-wide corridor for Segment E on August 16, 2012. All field surveys sought 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) determinations, within the survey areas. Concurrently with the wetland determination, 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.

1.2 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 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 proposed project is located in the Glaciated Dark Brown Prairie (level IV) ecoregion. 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 proposed project area is located on gently rolling plains (Figure 2) and active agricultural fields containing planted tree shelterbelts (Figure 3).



Figure 1. Project area overview depicting general wetland topography in Segment C, facing west.



Figure 2. Project area overview depicting general topography in Segment B, facing south.



Figure 3. General topography and woody vegetation in Segment B, facing west.

The survey area is situated on the U.S. Geological Survey Tioga (1979) quadrangle, as shown in Appendix A.

- **Segment E** – Segment E starts within the existing Hess RTF, in the SW¹/₄ SW¹/₄ Section 32, T156N, R95W, Williams County, North Dakota, traverses north and then west, and ends in the NE¹/₄ NW¹/₄ Section 31, T156N, R95W, Williams County, North Dakota.
- **Segment B** – Segment B starts in the NE¹/₄ NW¹/₄ Section 31, T156N, R95W, Williams County, North Dakota, traverses north-northeast through Sections 30, 19, 20, 17, 8, 5, T156N, R95W, and terminates in the NW¹/₄ SE¹/₄ Section 35, T157N, R95W, Williams County, North Dakota.
- **Segment C** – Segment C starts in the NW¹/₄ SE¹/₄ Section 35, T157N, R95W, traverses west-northwest through Section 34, and terminates in the NW¹/₄ NE¹/₄ Section 33, T157N, R95W, Williams County, North Dakota.

2.0 METHODS

2.1 PRE-FIELD REVIEW

Prior to conducting field surveys, SWCA reviewed the 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.

2.2 WETLANDS

SWCA ecologists conducted wetland determinations and delineations, 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 Delineation Manual: Great Plains Region Version 2.0* (Supplement) (U.S. Army Corps of Engineers [USACE] 2010). 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. The wetlands on Segment C were delineated during field surveys in 2011. Wetland determinations were conducted on Segment B in August 2012.

2.2.1 Hydrophytic Vegetation

Ecologists recorded all plants within the vegetative community based on the respective stratum 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

A wetland was determined to contain hydric soils if at least one hydric soil indicator, as defined by the Manual, was present during the field surveys completed on the newly proposed pipeline in the northwest portion. Ecologists did not evaluate soils for hydric soil indicators during field surveys on the middle portion starting at the south end and going north on the established pipeline scar. It was assumed that hydric soils would also be present in areas with hydrology and hydrophitic vegetation.

2.3 WATERBODIES

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

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 TREE, SAPLING, AND SHRUB COUNT

In Segment B, SWCA ecologists determined the total number of trees, saplings, and shrubs present within the survey area by employing several different techniques depending on the type of woody vegetation habitat (i.e., forested upland, shrubland, or planted windbreak) encountered and the overall extent of each habitat within the right-of-way (ROW). The boundary of all forested upland, shrubland, and shelterbelt habitat was geographically referenced using a handheld Trimble GeoXT series global positioning system (GPS) unit. In forested upland and shrubland habitat, SWCA counted or estimated the number of all naturally occurring woody stemmed vegetation with a DBH of 1 inch or greater. In shelterbelt areas, all woody stemmed vegetation was inventoried via direct count, regardless of trunk

DBH. Ecologists taxonomically identified all recorded individuals to the species level within each habitat type.

No tree, sapling, and shrub count was conducted in Segment C in 2012 predicated on the presence of equivalent survey coverage from 2011 (Christensen and Cook 2011). Tree, sapling, and shrub counts were conducted on the portions of Segment E outside of the RTF in August, 2012.

2.5 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 (e.g., actual sightings or auditory indicators) or secondary (e.g., scat, feathers, fur, etc.) 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).

2.6 MAPPING

The boundaries of each wetland, waterbody, woody vegetation habitat area, 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 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 and forested upland woody vegetation, cropland, and palustrine emergent (PEM) wetland. PEM wetlands are characterized by the presence of herbaceous hydrophytic and/or submerged aquatic macrophytes.

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

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. Common species encountered during the field surveys included smooth brome (*Bromus inermis*), western wheatgrass (*Pascopyrum smithii*), Kentucky bluegrass (*Poa pratensis*), prairie cordgrass (*Spartina pectinata*), common reed (*Phragmites australis*), cattail (*Typha* spp.), common yarrow (*Achillea millefolium*), and white sagebrush (*Artemisia ludoviciana*). During surveys in 2011, SWCA ecologists observed and recorded the presence of Canada thistle (*Cirsium arvense*) at one location within the surveyed area, and four patches of Canada thistle were newly recorded during SWCA's 2012 field survey (Appendix A). Canada thistle is listed as noxious weeds in the state of North Dakota and in Williams County (North Dakota Century Code 4.1-47-02).

3.1.2 Shrubland and Forested Upland Communities

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*).

Forested upland vegetation consisted of green ash (*Fraxinus pennsylvanica*), Siberian elm (*Ulmus pumila*), boxelder (*Acer negundo*), peachleaf willow (*Salix amygdaloides*), and ponderosa pine (*Pinus ponderosa*).

3.1.3 Cropland

Cultivated cropland land cover comprised approximately 335.92 acres or 90% of the surveyed area.

3.1.4 PEM Wetland

The field study confirmed the presence of six PEM wetlands totaling approximately 6.378 acres. The wetlands were found to 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 fringed brome (*Bromus ciliatus*), woolly sedge (*Carex pellita*), 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, and cattail.

3.2 HYDROLOGY

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 criterion. 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 preliminary climatological data for Williston, North Dakota, 27.40 inches of precipitation were recorded from May 2011 through August 2012 which is approximately 2.24 inches above average recorded precipitation for that time period.

Preliminary climatological data indicated that approximately 16.47 inches of precipitation were recorded between February 2011 and September 2011 during the initial surveys, which is approximately 4.62 inches above normal recorded precipitation levels (Table 1). Approximately 10.93 inches were recorded from October 2011 to August 2012 during the reroute surveys, which is 2.38 inches below normal precipitation levels (Table 2). The fluctuation in precipitation levels for these time periods may indicate the presence of abnormal hydrologic conditions during 2011 and 2012 surveys. Above normal precipitation during the initial surveys could have potentially led to larger wetland areas and conversely the below normal precipitation during the reroute surveys could have potentially led to smaller wetland areas.

Table 1. Initial Survey - Monthly Recorded Rainfall at Williston, North Dakota.

Month	Recorded Precipitation (inches)	Normal Precipitation Amount (inches)	Difference (inches)
February 2011	0.57	0.51	0.06
March 2011	1.56	0.85	0.71
April 2011	2.35	1.46	0.89
May 2011	5.28	1.88	3.40
June 2011	1.86	2.36	-0.50
July 2011	2.34	2.28	0.06
August 2011	1.65	1.45	0.20
September 2011	0.86	1.06	-0.20
TOTAL	16.47	11.85	4.62

Source: National Oceanic and Atmospheric Administration 2012

Table 2. Reroute Survey - Monthly Recorded Rainfall at Williston, North Dakota.

Month	Recorded Precipitation (inches)	Normal Precipitation Amount (inches)	Difference (inches)
October 2011	0.85	0.92	-0.07
November 2011	0.39	0.65	-0.26
December 2011	0.18	0.62	-0.44
January 2012	0.10	0.59	-0.49
February 2012	0.30	0.39	-0.09
March 2012	0.10	0.71	-0.61
April 2012	1.20	1.00	0.20
May 2012	2.46	1.92	0.54
June 2012	2.92	2.52	0.40
July 2012	1.89	2.54	-0.65
August 2012	0.54	1.45	-0.91
TOTAL	10.93	13.31	-2.38

Source: National Oceanic and Atmospheric Administration 2012

3.3 WETLANDS

SWCA recorded six PEM wetlands within the surveyed area, totaling approximately 6.378 acres (Table 3). However, because Segments B and C have been constructed, and Segment E is located wholly within the existing RTF, no impact is proposed or anticipated. See Appendix B for representative photographs of wetlands.

Table 3. PEM Wetland Acreage within the Survey Area.

Feature ID	USACE Jurisdiction*	Total PEM Size within Surveyed Area (acres)	Temporarily Impacted Area within 200-foot-wide ROW (acres)	Length of Required Crossing (feet)
NRWET1	Isolated	0.020	No Impact	N/A
NRWET2	Jurisdictional	3.150	No Impact	N/A
NRWET3	Jurisdictional	1.200	No Impact	N/A
NRWET4	Jurisdictional	1.660	No Impact	N/A
NRWET5	Jurisdictional	0.008	No Impact	N/A
NRWET6	Isolated	0.340	No Impact	N/A

* The USACE and U.S. Environmental Protection Agency have the final authority regarding the jurisdictional status of a waterbody.

PEM = palustrine emergent

ROW = right-of-way

USACE = U.S. Army Corps of Engineers

3.4 WATERBODIES

All of Segment E and portions of Segment B occur within the Upper Dry Fork Creek sub-watershed (Hydrologic unit code [HUC] 101101010904), which is within the Beaver Creek (HUC 1011010109) watershed. Portions of Segment B and all of Segment C occur within the Town of Tioga sub-watershed (HUC 10101011402), which is within the Paulson Creek watershed (HUC 101010114). Both the Paulson Creek and Beaver Creek watersheds are within the larger Lake Sakakawea drainage basin (HUC 1010101) (see Appendix A).

SWCA ecologist did not record any waterbodies during the field surveys.

3.5 TREE, SAPLING, AND SHRUB COUNT

In 2011, SWCA recorded seven woody vegetation assemblages on Segment C (NRWV9–NRWV15; Table 3) during the natural resources survey in support of the Hess TGP-TRT pipeline (Christensen and Cook 2011). SWCA did not revisit these assemblages in 2012. Based on information provided by Hess, it is likely that each woody vegetation assemblage was completely removed during the construction of Segment C prior to becoming regulated under the jurisdiction of the North Dakota Public Service Commission.

During the 2012 survey of Segments E and B, SWCA newly recorded three planted and four naturally occurring assemblages comprised of approximately 193 individuals (Table 4). Because all new construction (i.e., the portion of Segment E within the RTF) would be wholly contained within the boundaries of the existing RTF, no impact to the newly record woody vegetation assemblages would occur as a result of the construction of the new portion of Segment E, and repurposing of Segments E, B, and C.

Table 4. Tree, Sapling, and Shrub Count.

Woody Vegetation (WV) ID	Species	Type	Number of Trees		Estimated Mitigation Commitment
			350-foot-wide Survey Corridor	50-foot-wide Construction ROW	
NRWV1	<i>Crataegus mollis</i>	Natural	15	0	0
NRWV2	<i>Crataegus mollis</i>	Natural	12	0	0
NRWV3	<i>Crataegus mollis</i>	Natural	9	0	0
NRWV4	<i>Prunus virginiana</i>	Natural	30	0	0
NRWV5	<i>Ulmus pumila</i>	Planted	71	0	0
NRWV6	<i>Prunus virginiana</i>	Planted	14	0	0
NRWV7	<i>Caragana arborescens</i>	Planted	42	0	0
NRWV9*	<i>Salix</i> sp.	Natural	14	0	0
NRWV10*	<i>Lonicera</i> sp.	Planted	6	0	0
	<i>Ulmus pumila</i>	Planted	10		
	<i>Elaeagnus angustifolia</i>	Planted	14		
NRWV11*	<i>Caragana</i> sp.	Planted	14	0	0
	<i>Fraxinus pennsylvanica</i>	Planted	11		0

Woody Vegetation (WV) ID	Species	Type	Number of Trees		Estimated Mitigation Commitment
			350-foot-wide Survey Corridor	50-foot-wide Construction ROW	
NRWV12*	<i>Caragana</i> sp.	Planted	2	0	0
NRWV13*	<i>Acer negundo</i>	Natural	1	0	0
NRWV14*	<i>Shepherdia argentea</i>	Natural	51	0	0
NRWV15*	<i>Fraxinus pennsylvanica</i>	Planted	20	0	0
	<i>Ulmus pumila</i>	Planted	9	0	0
TOTAL			345	0	0

* Estimates are based on 2011 survey (Christensen and Cook 2011).
ROW = right-of-way

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 (tracks, scat, fur) indication of the presence of threatened or endangered species.

The project, as proposed, would have no effect on black-footed ferret (*Mustela nigripes*), gray wolf (*Canis lupus*), interior least tern (*Sterna antillarum*), piping plover (*Charadrius melodus*), whooping crane (*Grus americana*), designated critical habitat for piping plover (*Charadrius melodus*), and pallid sturgeon (*Scaphirhynchus albus*).

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). 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.

3.6.1.2 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.

3.6.1.3 Whooping Crane (*Grus americana*)

Federal Status: Endangered

Affect Determination: No Effect

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. However, the only new construction associated with this project would be contained wholly within the boundaries of the existing RTF. Therefore, due to pipeline construction limitations, the proposed project would have **no effect** on whooping crane.

3.6.1.4 Piping Plover (*Charadrius melodus*)

Federal Status: Threatened

Affect Determination: No Effect

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).

Suitable shoreline habitat for breeding and nesting plovers does not occur within the project area and the Missouri River is a minimum of 17.6 river miles away from the survey area. It is unlikely but possible that migrating plovers may traverse the survey area during their migration. However, predicated on the lack of construction outside of the boundaries of the existing RTF facility, the proposed project would have **no effect** on piping plovers.

3.6.1.5 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, as well as several wetlands to the north and

east of the Missouri River system (USFWS 2002). The nearest designated critical habitat to the survey area is approximately 14.57 miles away.

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.

3.6.1.6 Interior Least Tern (*Sterna antillarum*)

Federal Status: Endangered

Affect Determination: No Effect

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).

Suitable shoreline habitat for breeding and nesting terns does not occur within the project area and the Missouri River is a minimum of 17.6 river miles away from the survey area. However, predicated on the absence of construction outside of the boundaries of the existing RTF facility, the proposed project would have **no effect** on the interior population of the least tern.

3.6.1.7 Pallid Sturgeon (*Scaphirhynchus albus*)

Federal Status: Endangered

Affect Determination: No Effect

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 2007). This population consists of approximately 136 wild adult pallid sturgeon (USFWS 2007). 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 2007). 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, the North Dakota Game and Fish Department has 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 17.6 river miles away from the 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 would have **no effect** on pallid sturgeon.

3.6.1.8 Sprague's Pipit (*Anthus spragueii*)

Federal Status: Candidate

Affect Determination: No Impact

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 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 newly disturbed areas and absence of adequate patch sizes required by the Sprague's pipit for breeding grounds in the immediate project area. Therefore, the project, as currently proposed, would have **no impact** on Sprague's pipit.

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: No Impact

The bald eagle 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 may migrate through the grassland habitats; however, suitable nesting and roosting habitat is not available within the project area. The proposed project would have **no impact** on this species.

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: No Impact

Golden eagles nest on steep cliff faces and in large cottonwood trees along intermittent creeks. While potentially suitable habitat may be present nearby the project area, no individual or nesting golden eagles were observed during field surveys. The proposed project would have **no impact** on this species.

3.6.3 Wildlife Observed

During the field survey, SWCA ecologists observed various wildlife species which utilize wetlands and other habitat within the survey area (Table 5). Common wildlife species are not likely to be detrimentally effected due to the absence of new construction outside of the boundaries of the existing RTF facility.

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. As proposed, construction associated with Segment D and the repurposing of Segments A, B, and C would likely have no effect on active migratory bird nests.

Table 5. Wildlife Observed during Field Surveys at the Proposed Pipeline Route.

Common Name	Scientific Name	Observation Type	Comments
Gray partridge	<i>Perdix perdix</i>	Primary	
Killdeer	<i>Charadrius vociferus</i>	Primary	
Upland sandpiper	<i>Bartramia longicauda</i>	Primary	
Wilson’s phalarope	<i>Phalaropus tricolor</i>	Primary	
Mourning dove	<i>Zenaida macroura</i>	Primary	Nest observed
Least flycatcher	<i>Empidonax minimus</i>	Primary	
Western kingbird	<i>Tyrannus verticalis</i>	Primary	
Eastern kingbird	<i>Tyrannus tyrannus</i>	Primary	
Horned lark	<i>Eremophila alpestris</i>	Primary	
Yellow warbler	<i>Dendroica petechia</i>	Primary	
Clay colored sparrow	<i>Spizella pallida</i>	Primary	Nest observed
Song sparrow	<i>Melospiza melodia</i>	Primary	
Western meadowlark	<i>Sturnella neglecta</i>	Primary	
Red-winged blackbird	<i>Agelaius phoeniceus</i>	Primary	
Common grackle	<i>Quiscalus quiscula</i>	Primary	
Brown-headed cowbird	<i>Molothrus ater</i>	Primary	

4.0 CONCLUSIONS

1. SWCA ecologists recorded approximately 6.378 acres of wetlands within the surveyed area.
2. No PEM wetlands would be impacted by the proposed project, predicated on the absence of new construction outside of the boundaries of the existing Hess RTF facility.
3. No woody vegetation would be newly impacted as a result of the repurposing of Segments B and C and the construction of Segment E.
4. No threatened or endangered species were observed during the field survey. The project would have no effect on species listed as threatened and endangered in Williams County, North Dakota.

5.0 LITERATURE CITED

- Armbruster, M.J. 1990. Characterization of habitat used by whooping cranes during migration. *Biological Report* 90(4):1–16.
- Bramblett, R.G. 1996. Habitats and movements of pallid and shovelnose sturgeon in the Yellowstone and Missouri Rivers, Montana and North Dakota. Ph.D. dissertation, Montana State University, Bozeman.
- Bryce, S., J.M. Omernik, D.E. Pater, M. Ulmer, J. Schaar, J. Freeouf, R. Johnson, P. Kuck, and S.H. Azevedo. 1998. Ecoregions of North Dakota and South Dakota. Northern Prairie Wildlife Research Center Online. Available at: <http://www.npwrc.usgs.gov/resource/habitat/ndsdeco/index.htm> (Version 30NOV1998). Accessed June 22, 2011.
- 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 Albuquerque: U.S. Fish and Wildlife Service.
- Christensen, P., and M. Cook. 2011. Natural Resources and Wetland Determination Report for the Hess Tioga Gas Plant to Tioga Rail Terminal Gas Pipeline, Williams County, North Dakota. Prepared by SWCA Environmental Consultants, Bismarck, North Dakota.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Determination Manual. Technical Report Y-87-1. Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station.
- Gomes, S. n.d. Hawks, eagles, and falcons of North Dakota. North Dakota Game and Fish Department, Bismarck. Northern Prairie Wildlife Research Center Online. Available at: <http://www.npwrc.usgs.gov/resource/birds/hawks/index.htm>. Accessed July 16, 2009.
- 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. Grand Island, Nebraska: Platte River Whooping Crane Habitat Maintenance Trust and USFWS.
- . 1989. Migration of Radio-Marked Whooping Cranes from the Aransas-Wood Buffalo Population: Patterns of Habitat Use, Behavior, and Survival. USFWS 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. 2011. Williston, North Dakota Preliminary Monthly Climate Data Reports. Available at: <http://www.weather.gov/climate/index.php?wfo=bis>. Accessed June 21, 2011.
- Root, B.G., M.R. Ryan, and P.M. Mayer. 1992. Piping plover survival in the Great Plains. *Journal of Field Ornithology* 63(1):10–15.
- U.S. Army Corps of Engineers (USACE). 2010. Regional Supplement to the Corps of Engineers Wetland Determination Manual: Great Plains Region Version 2.0. 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 (USFWS). 1978. Reclassification of the gray wolf in the United States and Mexico, with determination of critical habitat in Michigan and Minnesota. *Federal Register* 43(47):9607–9615.
- . 1985a. Endangered and threatened wildlife and plants: determination of endangered and threatened status for the piping plover. *Federal Register* 50(238):50726–50734.
- . 1985b. Interior population of the least tern. *Federal Register* 50 FR 21784–21792. May 28, 1985.
- . 1988a. Black-footed Ferret Recovery Plan. Denver: U.S. Fish and Wildlife Service.
- . 1988b. Great Lakes and Northern Great Plains Piping Plover Recovery Plan. Twin Cities, Minnesota: U.S. Fish and Wildlife Service.
- . 1989. Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act. Denver and Albuquerque: U.S. Fish and Wildlife Service.
- . 1990a. Interior Population of the Least Tern Recovery Plan. Twin Cities, Minnesota: U.S. Fish and Wildlife Service.
- . 1990b. Endangered and threatened wildlife and plants; Determination of endangered status for the pallid sturgeon. *Federal Register* 55(173):36641–36647.
- . 2002. Designation of critical habitat for the northern Great Plains breeding population of the piping plover; final rule. *Federal Register* 67(176):57637–57717.
- . 2007. Pallid sturgeon (*Scaphirhynchus albus*) 5-year review summary and evaluation. Billings, Montana: U.S. Fish and Wildlife Service, Pallid Sturgeon Recovery Coordinator.

- . 2010a. Black-footed ferret. Available at:
<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=A004>.
Accessed September 7, 2010.

- . 2010b. Gray wolf. Available at:
<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=A00D>.
Accessed September 7, 2010.

- . 2010c. Whooping crane. Available at:
<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=B003>.
Accessed September 2, 2010.

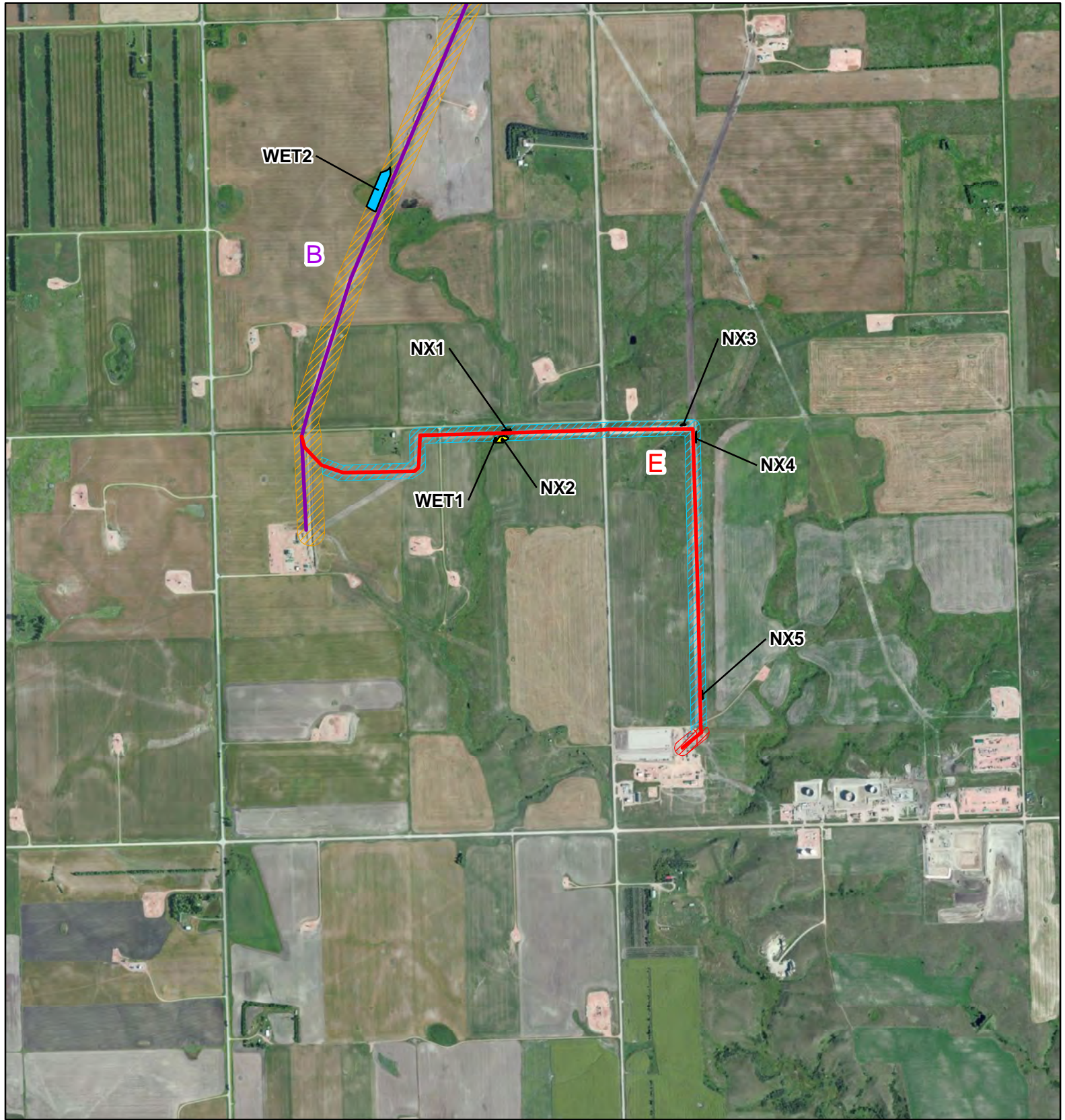
- . 2010d. Piping plover. Available at: <http://www.fws.gov/mountain-prairie/species/birds/pipingplover>. Accessed September 7, 2010.

- . 2010e. Least tern (interior population). Available at:
<http://www.fws.gov/southwest/es/oklahoma/lestern.htm>. Accessed September 7, 2010.

- . 2010f. 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.

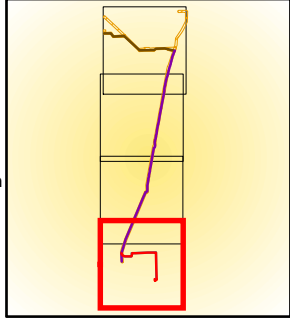
- . 2011. County occurrence of endangered, threatened, and candidate species and designated critical habitat in North Dakota. Available at:
http://www.fws.gov/northdakotafieldoffice/county_list.htm. Accessed April 10, 2011.

APPENDIX A
Vicinity Maps and Site Layout Maps



RTF-TRT Pipeline

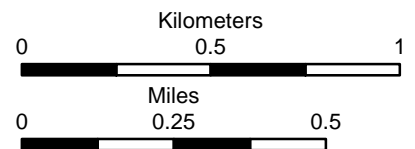
- Existing Pipeline (Segment E)
- Existing Pipeline (Segment B)
- Already Constructed Pipeline (Segment C)
- Noxious Weed
- Wetland
- Woody Vegetation
- Current Survey Area
- Excluded Survey Area
- Previous Survey Area (Christensen and Cook 2011)



116 North 4th Street
Suite 200
Bismarck, ND 58501

Phone: 701.258.6622
Fax: 701.258.5957

www.swca.com



Base Map: Aerial Imagery
Source: esri ArcGIS service
Quadrangle: Tioga SW (1979)

T. 156N, R. 95W
County: Williams, North Dakota

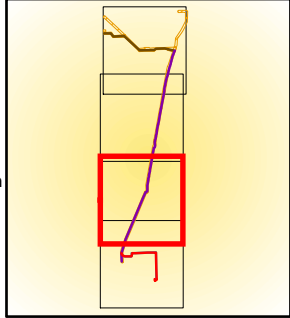
Scale: 1:20,000 NAD 1983 UTM Zone 13N





RTF-TRT Pipeline

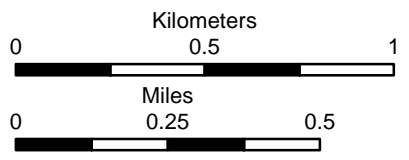
- Existing Pipeline (Segment E)
- Existing Pipeline (Segment B)
- Already Constructed Pipeline (Segment C)
- Noxious Weed
- Wetland
- Woody Vegetation
- Current Survey Area
- Excluded Survey Area
- Previous Survey Area (Christensen and Cook 2011)



116 North 4th Street
Suite 200
Bismarck, ND 58501

Phone: 701.258.6622
Fax: 701.258.5957

www.swca.com

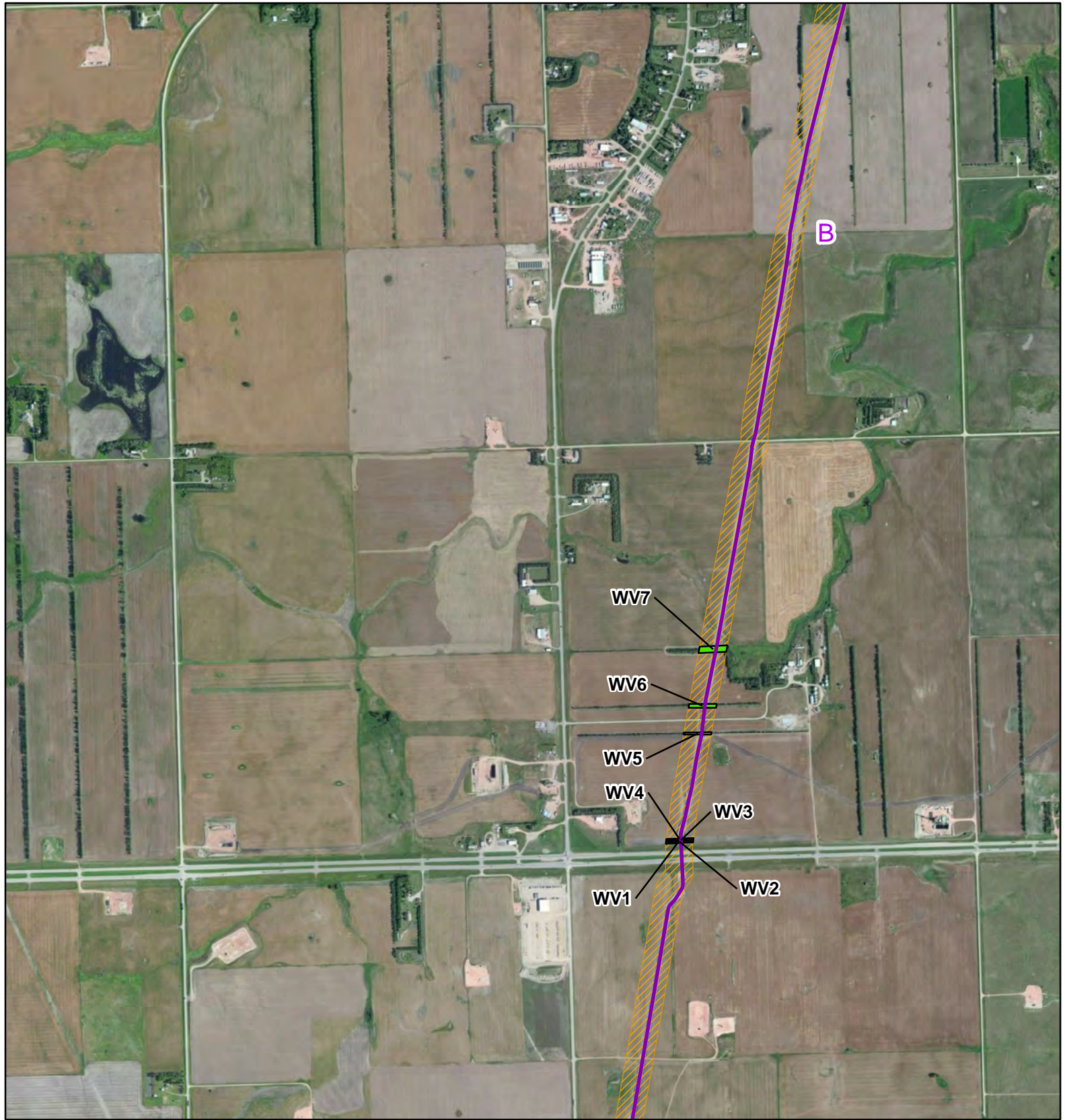


Base Map: Aerial Imagery
Source: esri ArcGIS service
Quadrangle: Tioga SW (1979)

T. 156N, R. 95W
County: Williams, North Dakota

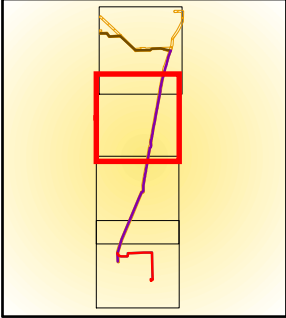
Scale: 1:20,000 NAD 1983 UTM Zone 13N





RTF-TRT Pipeline

- Existing Pipeline (Segment E)
- Existing Pipeline (Segment B)
- Already Constructed Pipeline (Segment C)
- Noxious Weed
- Wetland
- Woody Vegetation
- Current Survey Area
- Excluded Survey Area
- Previous Survey Area (Christensen and Cook 2011)

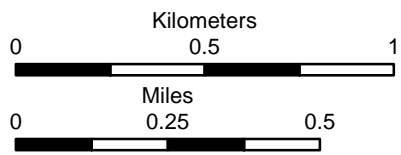


SWCA[®]
 ENVIRONMENTAL CONSULTANTS

116 North 4th Street
 Suite 200
 Bismarck, ND 58501

Phone: 701.258.6622
 Fax: 701.258.5957

www.swca.com

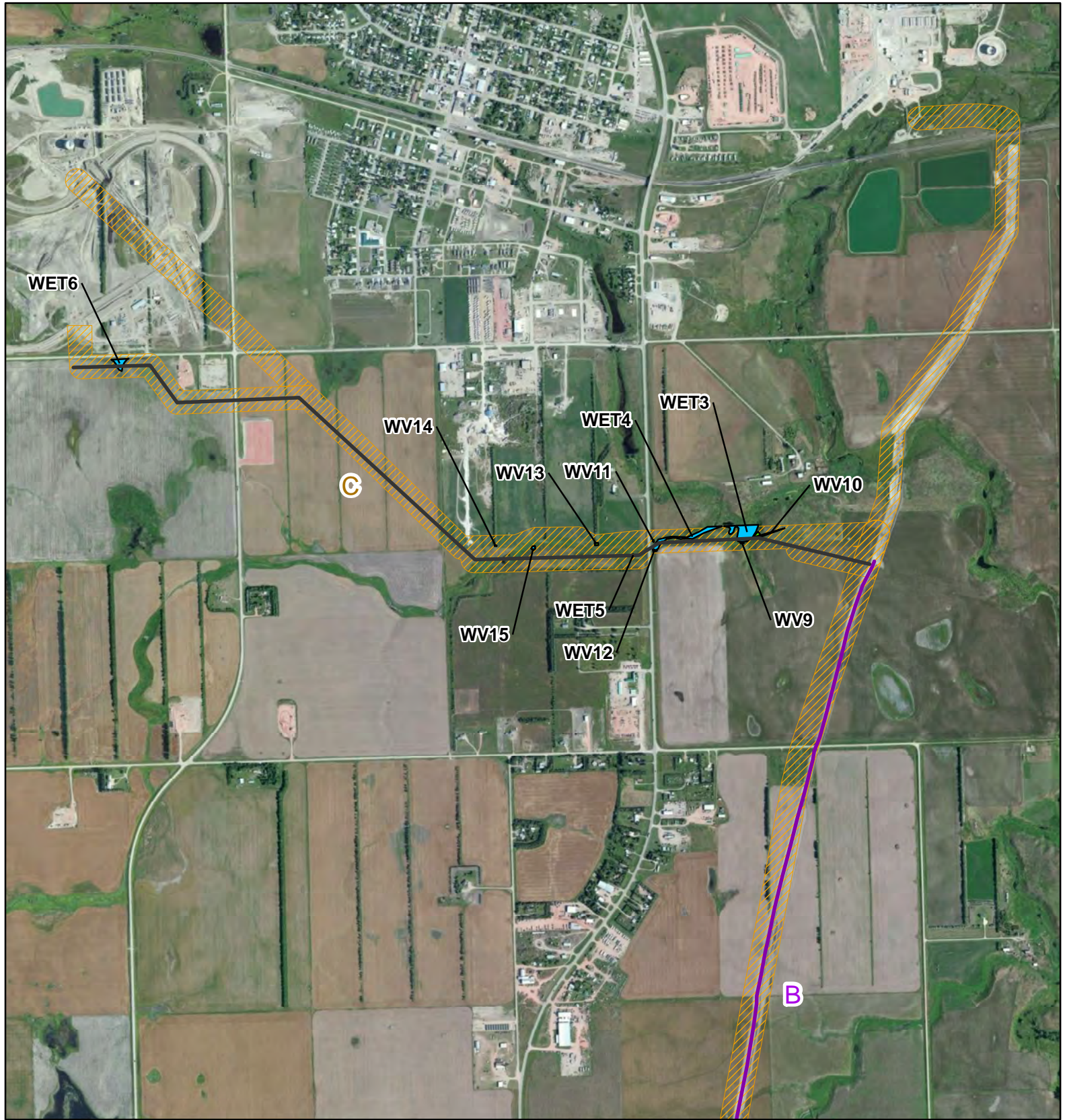


Base Map: Aerial Imagery
 Source: esri ArcGIS service
 Quadrangle: Tioga SW (1979)

T. 156N, R. 95W
 County: Williams, North Dakota

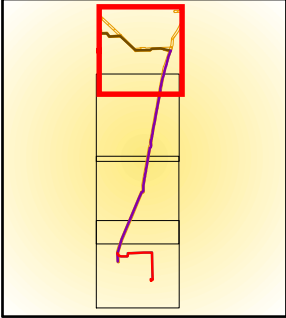
Scale: 1:20,000 NAD 1983 UTM Zone 13N





RTF-TRT Pipeline

- Existing Pipeline (Segment E)
- Existing Pipeline (Segment B)
- Already Constructed Pipeline (Segment C)
- Noxious Weed
- Wetland
- Woody Vegetation
- Current Survey Area
- Excluded Survey Area
- Previous Survey Area (Christensen and Cook 2011)

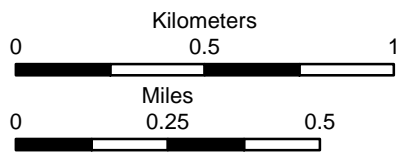


SWCA[®]
 ENVIRONMENTAL CONSULTANTS

116 North 4th Street
 Suite 200
 Bismarck, ND 58501

Phone: 701.258.6622
 Fax: 701.258.5957

www.swca.com



Base Map: Aerial Imagery
 Source: esri ArcGIS service
 Quadrangle: Tioga (1979)
 Tioga SW (1979)
 T. 157N, R. 95W & T. 156N, R. 95W
 County: Williams, North Dakota



Scale: 1:20,000 NAD 1983 UTM Zone 13N

APPENDIX B
Photographs of Project Area Corridor



Photo 1: View from NRAWET1, facing east.



Photo 2: View from NRAWET2, facing south.



Photo 3: View from NRAWET3, facing west.



Photo 4: View from NRAWET4, facing east.



Photo 5: Overview of NRAWET5, facing southeast.



Photo 6: Overview of NRAWET6, facing south.