Thunder Butte Pipeline, LLC

Biological Habitat Assessment Report

Thunder Butte Pipeline Project
Ward and Mountrail Counties, North Dakota

October 2024

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October 14, 2024

Prepared By:
Arcadis U.S., Inc.
225 W. Wacker Drive, Suite 2015
Chicago, Illinois 60606

Prepared For:
Mr. Jake Richardson
Managing Partner, Project Execution
Gap Midstream, LLC
jake@gapmidstream.com

Our Ref:
30189594

Olivia Cacciatore, PWS
Environmental Scientist II

Katie Mageland, WPIT
Wetland Biologist

Kathryn Cloutier, M.S.
Senior Environmental Scientist

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Acronyms and Abbreviations

2018 Delineation	Wetland and Waterbody Report Thunder Butte Pipeline Project, Mountrail and Ward Counties, North Dakota (Arcadis 2018)
2024 Delineation	Thunder Butte Pipeline, LLC, Aquatic Resource Delineation Report, Thunder Butte Pipeline Project, Mountrail County, North Dakota (Arcadis 2024)
AGOL	ArcGIS Online
Arcadis	Arcadis U.S., Inc.
BABE	Biological and Biological Evaluation
BGEPA	Bald and Golden Eagle Protection Act
CPR	Canadian Pacific Railway
DBH	Diameter at Breast Height
E	Endangered
Enbridge Storage EPND	Enbridge Stanley Pump Station and Terminal Enbridge Pipelines North Dakota
ESRI	Environmental Systems Research Institute, Inc.
Existing Pipeline Facility	Existing 30.8-mile-long collector/gathering pipeline to be converted to a transmission pipeline
FBIR	Fort Berthold, Indian Reservation
Field Survey Area	Field Survey Area for the proposed pipeline is the 200-foot-wide area (100 feet on either side of the pipeline centerline), Field Survey Area for the existing pipeline is a 50-foot-wide area (10 feet on either side of the 30-foot permanent ROW), and 2-acre site for the proposed midline pump station
Gap	Gap Midstream, LLC
GPS	Global Positioning System
HDD	horizontal directional drilling
ID	Identification
IPaC	Information for Planning and Consultation
km	kilometers
MBTA	Migratory Bird Treaty Act
MHA Nation	Mandan, Hidatsa, and Arikara Nation
NDDA	North Dakota Department of Agriculture
NDGFD	North Dakota Game and Fish Department
New Pipeline	new 3.84-mile-long underground pipeline
NLEB	Northern Long-Eared Bat

PEM	Palustrine Emergent Wetland
Project Corridor	Project Corridor for the proposed pipeline is the 200-foot-wide area (100 feet on either side of the pipeline centerline). The Project Corridor/Field Survey Area for the existing pipeline is a 50-foot-wide area (10 feet on either side of the 30-foot permanent ROW).
Project	Thunder Butte Pipeline Project
ROW	right-of-way
Study Area	Buffer area 0.5 mile on either side of the centerlines of the proposed pipeline and existing pipelines
T	Threatened
TAT	Three Affiliated Tribes
TBPL	Thunder Butte Pipeline, LLC
TBPS Facility	TBPS Crude Storage and Loading Facility
TBPS	Thunder Butte Petroleum Services, Inc.
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WOUS	Waters of the U.S.

1 Introduction

This Biological Habitat Assessment Report summarizes the results of a natural resources survey and biological habitat survey conducted on August 5-8, 2024, by Arcadis U.S., Inc. (Arcadis) at the request of Thunder Butte Pipeline, LLC (TBPL) for the Thunder Butte Pipeline Project (Project). The Field Survey Area for the Project encompassed approximately 281-acres and include 104 parcels located in Ward and Mountrail counties, North Dakota (**Figures 1-1.1** through **1-1.8**). The Field Survey Area included three sub-areas:

- Project Corridor for a new 3.84-mile-long underground pipeline with a 200-foot-wide corridor in Ward and Mountrail counties (“Proposed Pipeline Project Corridor”),
- Project Corridor for an existing 30.8-mile-long underground pipeline with a 50-foot-wide corridor in Mountrail County (“Existing Pipeline Project Corridor”), and
- A 2-acre site for a proposed aboveground midline pump station immediately adjacent to the existing pipeline in Mountrail County (“Midline Pump Station” area).

These sub-areas are further described in **Section 1.1**. The Field Survey Area is further classified into 22 Arcadis Segments (A1 - A22), which contain multiple parcels and the three Project sub-areas (**Figures 1-2.1** through **1-2.8**). In addition to conducting a biological habitat survey within the Field Survey Area/Project Corridors and 2-acre Midline Pump Station area, Arcadis also completed a desktop review of resources within Study Area. The Study Area is defined as a one-mile-wide area (0.5 mile on either side of the pipeline centerlines). During the field survey, Arcadis also identified and recorded locations of the following: occupied residences, potential landslide areas, abandoned mines, and gravel pits within the 1,000-foot-wide buffer area (500 feet on either side of the pipeline centerlines). Resources identified during the desktop review were field verified during the field survey as feasible. The 1,000-foot-wide buffer area and the one-mile-wide Study Area are also depicted on **Figures 4-1** through **4-8**.

1.1 Background

TBPL proposes the Project to transport crude oil from the existing Thunder Butte Petroleum Services, Inc. (TBPS) Crude Storage and Loading Facility (TBPS Facility) within the Fort Berthold Indian Reservation (FBIR), approximately 2.6 miles northwest of Makoti, North Dakota, to the existing Enbridge Stanley Pump Station and Terminal (Enbridge Storage Facility) in Stanley, North Dakota. The Project is a joint venture between Gap Midstream, LLC (Gap) and the Mandan, Hidatsa, and Arikara Nation (MHA Nation)/Three Affiliated Tribes (TAT) doing business as TBPL. The MHA Nation/TAT owns the TBPS Facility, and Enbridge Pipelines North Dakota (EPND) owns the Enbridge Storage Facility. The overall Project consists of three primary components:

- Construction of a new 3.84-mile-long underground crude oil pipeline in Ward and Mountrail counties,
- Conversion of an existing 30.8-mile-long crude oil collector/gathering pipeline to a crude oil transmission pipeline in Mountrail County, and
- Construction of a new aboveground Midline Pump Station within a 2-acre site immediately adjacent to the existing pipeline in Mountrail County.

The new pipeline will commence at the TBPS Facility and terminate at the interconnection with the existing pipeline in Section 2, T152N, R88W. The existing pipeline was previously owned by EPND (Line 82-111). From the interconnection point with the existing pipeline approximately 2.1 miles southeast of Plaza, North Dakota, the

existing pipeline will transport crude oil to the Enbridge Facility. All but the southern 3.84 miles of the Project is an existing pipeline.

The Project Corridor for the proposed new pipeline was surveyed by Arcadis in 2018 (Arcadis 2018) as presented in the wetland and waterbody delineation entitled “Wetland and Waterbody Report Thunder Butte Pipeline Project, Mountrail and Ward Counties, North Dakota” (2018 delineation)”. The Project Corridor for the existing pipeline and the 2-acre site for the proposed Midline Pump Station were surveyed by Arcadis in 2024 (Arcadis 2024), and the aquatic resource delineation entitled “Thunder Butte Pipeline, LLC, Aquatic Resource Delineation Report, Thunder Butte Pipeline Project, Mountrail County, North Dakota (2024 delineation).” Arcadis conducted a baseline biological habitat survey in 2024 for all three sub-areas concurrently with the 2024 delineation (Arcadis 2024). Findings from the 2018 and 2024 delineations were used to supplement the findings of this report as needed.

The purpose of the biological habitat survey was to assess the presence or absence and extent of suitable habitat for federally listed threatened, endangered, or candidate species (federally listed species), to identify land cover types and state regulated noxious weed infestation areas, and to inventory tree and shrub areas within the Field Survey Area. Arcadis also completed a desktop review of the one-mile-wide Study Area (0.5 mile on either side of the pipeline centerlines), along with a desktop review and/or field survey of other resources within a 1,000-foot-wide buffer area (500 feet on with side of the pipeline centerlines). Resources identified during the desktop review were field verified during the biological habitat survey as feasible.

Habitats for the following federally listed species were surveyed within the Field Survey Area: northern long-eared bat (NLEB; *Myotis septentrionalis*), piping plover (*Charadrius melodus*), rufa red knot (*Calidris canutus rufa*), whooping crane (*Grus americana*), Dakota skipper (*Hesperia dacotae*), and monarch butterfly (*Danaus plexippus*). Land cover types identified included: cultivated crops, pasture, native prairie, wetlands, and other. In the 1,000 foot-wide buffer area, Arcadis also identified and recorded locations of the following features within 500 feet of the pipeline centerlines: occupied residences, businesses, schools, potential landslide areas, abandoned mines, and gravel pits. In the one-mile-wide Study Area (0.5 mile on either side of the pipeline centerlines), Arcadis completed visual surveys for bald eagle nests (*Haliaeetus leucocephalus*) and confirmed the location of one previously identified bald eagle nest.

2 Location

The Field Survey Area consists of three sub-areas:

- Pipeline Corridor for a new 3.84-mile-long underground pipeline with a 200-foot-wide corridor ("Proposed Pipeline Project Corridor"),
- Pipeline Corridor for an existing 30.8-mile-long underground pipeline with a 50-foot-wide corridor; ("Existing Pipeline Project Corridor"), and
- A 2-acre site for a proposed aboveground midline pump station immediately adjacent to the existing pipeline ("Midline Pump Station" area).

The northernmost portion of the Study Area is located at latitude 48.303936° and longitude -102.373165° (Arcadis Segment A1) to the east of Route 8 in Stanley, North Dakota. From the northern-most portion of the Study Area, the existing pipeline generally extends down to the southeast, traversing multiple municipalities including, Stanely, Palermo, and Plaza. The southernmost portion of the Study Area is located at latitude 48.010298° and longitude -101.914650° (Arcadis Segment A22) to the east of 67th Avenue Northwest and south of 247th Avenue Southwest (State Highway 23) in Plaza, North Dakota. The aboveground 2-acre midline pump station is located at latitude 48.108837° and longitude -102.073277° (Arcadis Segment A14), directly east of 67th Avenue Northwest in Plaza, North Dakota.

The Study Area is characterized by a rural landscape with gently sloping hills, open fields, and actively farmed/cultivated cropland; streams and other waters, including prairie pothole wetlands and linear wetland drainages, are common features observed throughout the Study Area. The existing Canadian Pacific Railway (CPR) right-of-way (ROW), developed/industrial areas, multiple roads, and residential parcels also intersect the Study Area. The Study Area consists of 104 parcels totaling approximately 281-acres in size.

The Study Area includes the following Project sub-area, segments, parcels, sections, townships, ranges, and acreages listed in **Table 1**. The Arcadis segments, Field Survey Area/Project Corridors, and Study Area are depicted in **Figures 1-2.1** through **1-2.8**.

Table 1 Study Area Location Details

Project Sub-Area	Arcadis Segment ID	Parcel ID	Approximate Acreage of Parcels within the Study Area[1]	Section	Township	Range
Existing Pipeline Project Corridor	A1	38061-180014305	0.002	26	156	91
		38061-180015100	1.587	27	156	91
		38061-180015300	1.563	27	156	91
		38061-180017002	0.717	27	156	91
		38061-610053550	0.799	27	156	91
		38061-610053551	0.954	27	156	91
Existing Pipeline Project Corridor	A2	38061-180014300	2.337	26	156	91
		38061-180014305	0.253	26	156	91
		38061-180022300	4.339	35	156	91
		38061-180022600	3.788	35	156	91

Table 1 Study Area Location Details

Project Sub-Area	Arcadis Segment ID	Parcel ID	Approximate Acreage of Parcels within the Study Area[1]	Section	Township	Range
		38061-250000600	0.336	2	155	91
Existing Pipeline Project Corridor	A3	38061-240002500	1.753	6	155	90
		38061-240003000	0.017	7	155	90
		38061-250000100	2.675	1	155	91
		38061-250000300	2.557	1	155	91
		38061-250000301	2.296	1	155	91
		38061-250000600	0.003	2	155	91
Existing Pipeline Project Corridor	A4	38061-240003000	3.185	7	155	90
		38061-240003200	1.998	7	155	90
		38061-240003300	2.424	7	155	90
		38061-240007100	0.002	17	155	90
		38061-240007500	0.248	18	155	90
Existing Pipeline Project Corridor	A5	38061-240007000	0.008	17	155	90
		38061-240007100	4.154	17	155	90
		38061-240007101	0.023	17	155	90
		38061-240007300	4.005	17	155	90
		38061-240008800	0.715	20	155	90
Existing Pipeline Project Corridor	A6	38061-240008800	0.019	20	155	90
		38061-240009000	4.011	21	155	90
		38061-240009100	0.023	21	155	90
		38061-240009300	4.141	21	155	90
		38061-240009500	0.024	21	155	90
		38061-240009800	0.456	22	155	90
		38061-240011800	0.069	27	155	90
Existing Pipeline Project Corridor	A7	38061-240011600	0.004	26	155	90
		38061-240011800	3.782	27	155	90
		38061-240011900	3.762	27	155	90
		38061-240012100	0.433	27	155	90
Existing Pipeline Project Corridor	A8	38061-240011600	0.385	26	155	90
		38061-240015400	3.996	35	155	90
		38061-240015700	3.628	35	155	90
		38061-240015800	0.164	35	155	90
		38061-310000700	2.02	2	154	90
Existing Pipeline Project Corridor	A9	38061-310000100	0.172	1	154	90
		38061-310000200	3.402	1	154	90
		38061-310000300	4.136	1	154	90
		38061-310000700	0.072	2	154	90

Table 1 Study Area Location Details

Project Sub-Area	Arcadis Segment ID	Parcel ID	Approximate Acreage of Parcels within the Study Area[1]	Section	Township	Range
Existing Pipeline Project Corridor	A10	38061-300002500	0.28	6	154	89
		38061-300002900	2.616	7	154	89
		38061-300003100	1.025	7	154	89
		38061-300003200	3.657	7	154	89
		38061-310000300	0	1	154	90
Existing Pipeline Project Corridor	A11	38061-300002900	0.007	7	154	89
		38061-300003500	2.16	8	154	89
		38061-300006700	3.123	17	154	89
		38061-300006800	3.772	17	154	89
		38061-300006900	0.413	17	154	89
		38061-300008200	0.741	20	154	89
Existing Pipeline Project Corridor	A12	38061-300008200	0	20	154	89
		38061-300008500	3.402	21	154	89
		38061-300008700	1.554	21	154	89
		38061-300008710	1.557	21	154	89
		38061-300011900	3.789	27	154	89
		38061-300012000	0.181	28	154	89
		38061-300012100	3.44	28	154	89
		38061-300012200	1.452	28	154	89
Existing Pipeline Project Corridor	A13	38061-300011900	0.02	27	154	89
		38061-300014500	0.955	34	154	89
		38061-300014900	3.251	34	154	89
		38061-300015000	2.799	35	154	89
		38061-300015100	0.302	35	154	89
		38061-300015200	1.736	35	154	89
		38061-300015400	2.019	35	154	89
		38061-370000500	0.652	2	153	89
Midline Pump Station Area / Existing Pipeline Project Corridor	A14	38061-360002500	3.207	7	153	88
		38061-360002600	2.388	7	153	88
		38061-360002800	1.09	7	153	88
		38061-370000100	4.92	1	153	89
		38061-370000200	2.537	1	153	89
		38061-370000400	1.336	1	153	89
		38061-370000500	0.11	2	153	89
		38061-370005300	3.236	12	153	89

Table 1 Study Area Location Details

Project Sub-Area	Arcadis Segment ID	Parcel ID	Approximate Acreage of Parcels within the Study Area[1]	Section	Township	Range
Existing Pipeline Project Corridor	A15	38061-360002500	0.005	7	153	88
		38061-360002900	0.001	8	153	88
		38061-360003000	3.168	8	153	88
		38061-360006400	0.004	16	153	88
		38061-360006600	0.049	17	153	88
		38061-360006800	3.761	17	153	88
		38061-360006900	1.258	17	153	88
Existing Pipeline Project Corridor	A16	38061-360006400	3.109	16	153	88
		38061-360008800	2.492	21	153	88
		38061-360008900	1.456	21	153	88
		38061-360009200	1.797	21	153	88
Existing Pipeline Project Corridor	A17	38061-360009200	0.006	21	153	88
		38061-360009400	3.665	22	153	88
		38061-360009500	0.007	22	153	88
		38061-360011300	4.189	27	153	88
		38061-360011600	0.031	27	153	88
Existing Pipeline Project Corridor	A18	38061-360010900	2.752	26	153	88
		38061-360011000	0.715	26	153	88
		38061-360011100	2.722	26	153	88
		38061-360011300	0.005	27	153	88
		38061-360015100	1.627	35	153	88
Existing Pipeline Project Corridor	A19	38061-360015100	0.006	35	153	88
		38061-360015400	3.523	36	153	88
		38061-360015500	2.111	36	153	88
		38061-420001100	2.27	3	152	88
		38061-420001200	3.106	3	152	88
		38061-420001400	2.088	3	152	88
Proposed Pipeline Project Corridor	A20	38061-420000900	8.167	2	152	88
		38061-420001400	0.005	3	152	88
		38061-420005000	13.074	11	152	88
		38061-420005200	10.654	11	152	88
		38061-420005300	3.487	11	152	88
		38061-420005450	0.025	11	152	88
		38061-420006400	7.475	14	152	88
		38061-420006450	0.198	14	152	88

Table 1 Study Area Location Details

Project Sub-Area	Arcadis Segment ID	Parcel ID	Approximate Acreage of Parcels within the Study Area[1]	Section	Township	Range
Proposed Pipeline Project Corridor	A21	38061-420006000	10.956	13	152	88
		38061-420006100	1.992	13	152	88
		38061-420006300	11.467	13	152	88
		38061-420006400	0.032	14	152	88
		38101-OR180030000000	7.261	18	152	87
Proposed Pipeline Project Corridor	A22	38101-OR180030000000	0.029	18	152	87
		38101-OR190010000000	1.199	19	152	87
		38101-OR190020000000	9.198	19	152	87

Notes:
1 Area was rounded to the nearest thousandth. Parcel acreages do not include ROW areas.

2.1 Desktop Assessment

Before initiating field surveys, Arcadis conducted an environmental desktop assessment to identify federally listed species and suitable habitat, vegetation and potential land cover types, state regulated noxious weeds, and tree and shrub areas with the potential to occur within the Study Area.

The United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation Tool (IPaC) was queried for listings of federally listed species with the potential to occur within the Study Area. The following species were identified: NLEB, piping plover, rufa red knot, whooping crane, Dakota skipper, and monarch butterfly; however, no designated critical habitat was identified within the Study Area (USFWS 2024a; **Appendix A**). Arcadis' ecologists referenced USFWS fact sheets (USFWS 2024b-g) for each listed species to identify suitable habitat, reviewed publicly available aerial imagery (Environmental Systems Research Institute, Inc. [ESRI] 2024), and the findings from other Arcadis aquatic resource surveys (Arcadis 2018; Arcadis 2024) to assess if these habitat characteristics are likely to occur within the Study Area. Land cover types and the locations of potential trees and shrubs were determined by reviewing publicly available aerial imagery (ESRI 2024) and the findings from two aquatic resource surveys conducted by Arcadis (Arcadis 2018; Arcadis 2024). Arcadis identified land cover types included cropland, pasture, native prairie, and other (such as wetlands, streams, railroad/road ROW, and developed areas). Potential federally listed species habitat areas, land cover type areas, and tree and shrub areas were identified to be field verified. Information from North Dakota Department of Agriculture (NDDA) noxious weed list was utilized to compile of list 15 noxious weeds (NDDA 2023). North Dakota has 13 state-listed noxious weeds. Two additional species are listed as invasive in either Ward or Mountrail Counties.

2.2 Landscape Setting

The Study Area is within the Level I Ecoregion 9 Great Plains, Level II Ecoregion 9.3 West Central Semi-Arid Prairies, and Level III Ecoregion 42 Northwestern Glaciated Plains (United States Environmental Protection Agency [USEPA] 2024). Ecoregion 42 is characterized as a transitional area that marks the western extent of glaciation across the country and the beginning of the expansive Great Plains region. Typically, the landscape ranges from hilly to level topography, with some irregularities, and a distinctively higher moisture content than neighboring regions. Prairie pothole wetlands frequent the landscape due to the wetter conditions and favorable topography (i.e., flat land or lower, depressional areas at the base of hills). Ranching and dry-land farming are common practices in the region (USEPA 2024).

3 Methodology

The USFWS North Dakota Ecological Services Field Office in Bismarck has primary oversight of federally protected plant and animal species. There are currently 12 species listed as threatened or endangered in North Dakota. North Dakota does not have a separate state endangered or threatened species list; only species listed by the Endangered Species Act of 1973 are considered threatened or endangered in the State of North Dakota (North Dakota Game and Fish Department [NDGFD] 2021). Under section 7(c) of the Endangered Species Act, coordination with the USFWS is required if the Project has a federal nexus. Observations from the desktop investigation and survey described below were required to determine if suitable habitat is present for any federally listed species and if coordination with federal agencies is required.

A survey was conducted within the Field Survey Area to identify potential habitat area for federally listed species, land cover types (cultivated crops, pasture, native prairie, and other), noxious weed infestation areas, trees and shrubs on August 5-8, 2024. Arcadis also identified and recorded locations of occupied residences, potential landslide areas, abandoned mines, and gravel pits within the 1,000-foot-wide buffer area (500 feet on either side of the pipeline centerlines). Arcadis completed visual surveys for bald eagle nests and confirmed the location of a previously identified bald eagle nest within 0.5-mile of the Project. Survey activities for the Biological Habitat Assessment Report were completed concurrently with the 2024 delineation (Arcadis 2024). Findings from the 2018 and 2024 delineation were used to supplement the findings of this report as needed.

During the survey, data was recorded using Juniper Geodes, Trimble® TDC650, and Trimble® R1 global positioning system (GPS) units capable of sub-meter accuracy and connected to tablets running ArcGIS Online (AGOL) ESRI Field Maps software. Data/location points and boundaries for federally listed T&E species, land cover types, and noxious weed infestation areas were recorded using Habitat or Noxious Weed points or polygons, as applicable. All trees with at least a 1-inch diameter at breast height (DBH) measurement and all individually growing shrubs or groups of shrubs (communities or colonies) were inventoried using Tree/ Shrub points and polygons. As trees and shrubs were inventoried, they were given a unique Feature Identification (ID) and information such as species, height, stem count, and planted versus natural growth was recorded. The location (coordinates) of individual trees and shrubs were recorded, as well as the boundary edge of any community/colony boundaries, where applicable. Representative photographs were taken of federally listed species habitat, land cover types (cultivated crops, pasture, native prairie, and other), noxious weed infestation areas, trees and shrubs, and are provided in **Appendix B**.

Access to portions of the Field Survey Area under active agriculture production was restricted. Surveys were restricted in these areas to avoid damaging existing crops at the request of landowners. Field observations were made at the closest point within the Field Survey Area. Any visible qualitative data (i.e., plant species) were documented and photographs were taken if feasible.

4 Survey Results

4.1 Delineated Wetlands

A total of 10 palustrine emergent wetlands (PEM) wetlands were identified within the Proposed Pipeline Project Corridor in 2018 (Arcadis Segments A20 through A22; Arcadis 2018). The previously delineated wetlands totaled a combined 8.47-acres. Out of the 10 PEM wetlands, only four were considered jurisdictional Waters of the U.S. (WOUS) to the U.S. Army Corps of Engineers (USACE; USACE 2024). A total of 34 PEM wetlands and 11 potential farmed wetlands were delineated within the Existing Pipeline Project Corridor in 2024 (Arcadis Segments A1 through A20; Arcadis 2024); these wetlands have not been reviewed or determined as WOUS by the USACE, and jurisdictional status is pending. No wetlands were identified within the Midline Pump Station area. The delineated wetlands within the Project Corridor for the existing pipeline totaled a combined 6.31-acres. The combined total from both surveys was 14.78 acres encompassing 44 PEM wetlands and 11 potential farmed wetlands; many of these wetlands appeared to be wetland drainage or prairie pothole wetlands.

4.2 Delineated Streams

One stream, East Fork Shell Creek, was identified within the Proposed Pipeline Project Corridor in 2018, totaling 246 linear feet (approximately 0.07 acre; Arcadis Segments A20 through A22; Arcadis 2018). This stream is considered jurisdictional WOUS to the USACE (USACE 2024). A total of three perennial streams spanning approximately 171 linear feet or 0.18 acres were delineated within the Existing Pipeline Project Corridor in 2024 (Arcadis Segments A1 through A20; Arcadis 2024); these streams have not been reviewed or confirmed by the USACE, and their jurisdictional status is pending. No streams were identified within the Midline Pump Station area. The combined stream area from all four delineated streams totaled 0.25-acre.

4.3 Land Cover

The Field Survey Area was classified into four distinct land cover types including cropland, native prairie, pasture, and other. Developed areas (railroad/road ROW, existing industrial/petroleum areas [TBPS Facility and Enbridge Storage Facility], etc.), and areas representing delineated aquatic features were designated as “other.” A summary of the land cover types is provided below:

- Cropland: fallow, harvested, or planted agricultural areas consisting of cultivated crops including peas (*Lathyrus oleraceus*), wheat (*Triticum* species), canola (*Brassica napus*), soybean (*Glycine max*), flaxseed (*Linum usitatissimum*), wheat barley (*Hordeum vulgare*), lentils (*Lens culinaris*), and hay (likely *Phleum pratense* or *Medicago sativa*).
- Native Prairie: naturalized areas characterized by the predominance of native species such as rough goldenrod (*Solidago rigida),* prairie coneflower (*Ratibida columnifera*), prairie sagewort (*Artemisia frigida*), hairy false goldenaster (*Heterotheca villosa*), Broom snakeweed (*Gutierrezia sarothrae*), lavender cotton (*Santolina chamaecyparissus*), purple coneflower (*Echinacea purpurea),* and purple prairie clover (*Dalea purpurea)*, and a lack of active farming or other development activities. Some noxious weeds or non-native species may be present in native prairie areas. Concentrations of purple coneflower and purple prairie clover are of particular interest as these species are indicative of suitable habitat for the Dakota skipper and monarch butterfly, as discussed further in **Section 4.5**.

- Pasture: agricultural areas characterized by grasses and other low-lying herbaceous vegetation suitable for grazing animals such as cattle or sheep.
- Other (Developed): areas where the natural or native ecosystem is removed and/or replaced by paved, gravel- or dirt-covered roads, parking areas, railroad, planted roadside areas within ROWs, or other maintained areas, existing industrial facilities containing petroleum extraction or storage and equipment. Developed sub-categories include railroad/road ROW, industrial/existing petroleum storage facilities, mowed fields, and railroad/road ROW.
- Other (Aquatic Resources): consist of previously delineated streams or wetlands

More information on land cover types within the Field Survey Area is described in **Table 2**.

Table 2 Land Cover Types Project Corridors

Land Cover Type	Coverage within Proposed Pipeline Project Corridor (acres)[1]	Coverage within Existing Pipeline Project Corridor (acres)[1]	Coverage within Midline Pump Station Area (acres)[1]	Overall Coverage (acres)[1]
Native Prairie	1	13	0	14
Cropland	67	148	2	217
Pasture	0	13	0	13
Other (Developed)	17	4	0	21
Other (Aquatic Resources)	9	6	0	15
Total	**84**	**184**	**2**	**270**

Notes:
1 Acreage was rounded to the nearest whole number and due to rounding, may not sum to the total acreage.

Approximately 9.32 acres of fallow fields, 11.65 acres of harvested crops, and 186.80 acres of planted crops were identified within the Field Survey Area. Of the planted crops, approximately 7.87 acres were peas, 34.56 acres were wheat, 100.11 acres were canola, 28.55 acres were soybean, 3.41 acres were flaxseed, 14.17 acres were wheat barley, 4.24 acres were lentils, and 3.01 acres were hay. Crop identification was completed during the survey and via aerial imagery review and is only an estimate of the planted crops present during the survey.

Approximately 3.55 acres of railroad/road ROW, 7.26 acres of industrial/existing petroleum storage facilities, 2.04 acres of mowed field, and 8.34 acres of railroad/road ROW were identified within the Field Survey Area as Other (Developed) land cover type areas.

As previously discussed in **Sections 4.1** and **4.2**, approximately 14.78 acres of wetlands (PEM and potential farmed wetlands) and 417 linear feet (approximately 0.25 acres) of stream were idented within the Field Survey Area as Other (Aquatic Resources) land cover type areas.

4.4 Federally Listed Species Habitat Assessment

Federally threatened, endangered, and candidate species with the potential to occur within the Field Survey Area are listed in **Table 3**, alongside their suitable habitat preferences (USFWS 2024b-g). No designated critical habitat was identified within the Survey Area (USFWS 2024a; **Appendix A**).

Habitat information gathered during the field survey is also summarized in **Table 3** and described in greater detail in **Sections 4.4.1** through **4.4.4**. One species observation of a monarch butterfly was recorded during the field survey in the Existing Pipeline Project Corridor (**Figure 2-25**). No other federally listed threatened, endangered, or candidate species were observed during the field survey.

Table 3 Federally Listed Species Habitat Information and Summary Survey Results[1]

Common Name (*Scientific Name*)	Federal Listing Status	Habitat Information[1]	Survey Results Summary[2,3]
Mammals			
NLEB *(Myotis septentrionalis)*	Endangered (E)	Typically overwinters in caves or mines and utilizes forest habitats in the rest of the year. Forested roosting habitat includes snags or mature trees with cavities or crevices and/or loose or exfoliating bark. Uncommonly may utilize abandoned structures, barns, or sheds.	**Proposed Pipeline Project Corridor** Land cover consists of developed, prairie, pasture, and agricultural cropland. There are no significant forested areas or abandoned mines or other structures which constitute suitable habitat for the NLEB. Suitable habitat for the NLEB is not present.
			Existing Pipeline Project Corridor Land cover consists of developed, prairie, pasture, and agricultural cropland. There are no significant forested areas or abandoned mines or other structures which constitute suitable habitat for the NLEB. Suitable habitat for the NLEB is not present. Two underground abandoned mine areas are located within the Study Area and constitute suitable overwintering habitat for the NLEB.
			Midline Pump Station Area Land cover consists of developed, prairie, pasture, and agricultural cropland. There are no significant forested areas or abandoned mines or other structures which constitute suitable habitat for the NLEB. Suitable habitat for the NLEB is not present.
Birds			
Piping Plover (*Charadrius melodus*)	Threatened (T)	In the Northern Great Plains, nest on the unvegetated shorelines of alkaline lakes, reservoirs, or river sandbars.	**Proposed Pipeline Project Corridor** There are no lakes, reservoirs, or rivers with unvegetated shorelines or sandbars within the Proposed Pipeline Project Corridor. Suitable habitat for the piping plover is not present.
			Existing Pipeline Project Corridor There are no lakes, reservoirs, or rivers with unvegetated shorelines or sandbars within the Existing Pipeline Project Corridor. Suitable habitat for the piping plover is not present.

Table 3 Federally Listed Species Habitat Information and Summary Survey Results[1]

Common Name (*Scientific Name*)	Federal Listing Status	Habitat Information[1]	Survey Results Summary[2,3]
			Midline Pump Station Area There are no wetland or stream features within the Midline Pump Station area. Suitable habitat for the piping plover is not present.
Rufa Red Knot (*Calidris canutus rufa)*	T	Utilize inland saline lakes as stopover habitat in the Northern Great Planes. May potentially utilize natural and manmade freshwater habitats along inland migration routes including impoundments, wetlands, and riverine sandbars.	**Proposed Pipeline Project Corridor** Approximately 9 acres of wetlands were identified within the Proposed Pipeline Project Corridor, which may constitute suitable stopover habitat for migratory bird species. Suitable stopover habitat for the rufa red knot is present.
			Existing Pipeline Project Corridor Approximately 6 acres of wetlands were identified within the Existing Pipeline Project Corridor, which may constitute suitable stopover habitat for migratory bird species. Suitable stopover habitat for the rufa red knot is present.
			Midline Pump Station Area There are no wetland or stream features within the Midline Pump Station area. Suitable stopover habitat for the rufa red knot is not present.
Whooping Crane (*Grus americana*)	E	Breeds, migrates, winters, and forages in varied habitats which may include lakes, open ponds, upland swales, wet meadows and rivers, pasture areas, and cropland.	**Proposed Pipeline Project Corridor** Approximately 9 acres of wetlands which may exhibit open ponded centers in wet portions of the year and 0.02 acres of perennial streams were identified within the Proposed Pipeline Project Corridor. Land cover types including pastures, native prairie, and cultivated crops are present within the Proposed Pipeline Project Corridor. Suitable habitat for the whooping crane is present.
			Existing Pipeline Project Corridor Approximately 6 acres of wetlands which may exhibit open ponded centers in wet portions of the year and 0.2 acres of perennial streams were identified within Existing Pipeline Project Corridor. Land cover types including pastures, native prairie, and cultivated crops are present within the Existing Pipeline Project Corridor. Suitable habitat for the whooping crane is present.
			Midline Pump Station Area The Midline Pump Station area consists of cropland area planted with soybean which may constitute suitable habitat for the whooping crane.

Table 3 Federally Listed Species Habitat Information and Summary Survey Results[1]

Common Name (*Scientific Name*)	Federal Listing Status	Habitat Information[1]	Survey Results Summary[2,3]
Insects			
Dakota Skipper (*Hesperia dacotae*)	T	Moist bluestem (*Andropogon* species) prairies including flowering wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camas (*Camassia* species) Upland prairie on ridges and hillsides dominated by bluestem and needlegrasses (*Nassella* species) and purple coneflower	**Proposed Pipeline Project Corridor** Approximately 1 acre of native prairie areas with the potential to contain preferred flowering species such as purple coneflower are present. An additional approximately 0.08-acre area dominated by purple coneflower was also identified within the Field Survey Area. Suitable habitat for the Dakota skipper is present.
			Existing Pipeline Project Corridor Approximately 13 acres of native prairie areas with the potential to contain preferred flowering species such as purple coneflower are present. Approximately 1.4 acres of areas dominated by purple coneflower, purple prairie clover, and/or blazing star (*liatris spicata*) were identified within the Existing Pipeline Project Corridor, 0.86-acre of which is overlapped by native prairie areas and 0.59-acre of which are independent of native prairie areas. Suitable habitat for the Dakota skipper is present.
			Midline Pump Station Area The Midline Pump Station area consists of monoculture cropland area which does not constitute suitable habitat for the Dakota skipper. Suitable habitat is not present.
Monarch Butterfly (*Danaus plexippus*)	Candidate	Fields, roadside areas, and wet or dry open areas with milkweed (*Asclepias syriaca*) and flowering plants	**Proposed Pipeline Project Corridor** Approximately 1 acre of native prairie areas with the potential to contain usable flowering species were identified within the Proposed Pipeline Project Corridor. Suitable habitat for the monarch butterfly is present. No areas dominated by milkweed were identified.
			Existing Pipeline Project Corridor Approximately 13 acres of native prairie areas with the potential to contain usable flowering species were identified within the Project Corridor. Suitable habitat for the monarch butterfly is present. One monarch butterfly was

Table 3 Federally Listed Species Habitat Information and Summary Survey Results[1]

Common Name (*Scientific Name*)	Federal Listing Status	Habitat Information[1]	Survey Results Summary[2,3]
			observed within the Existing Pipeline Project Corridor. No areas dominated by milkweed were identified.
			Midline Pump Station Area The Midline Pump Station area consists of cropland area which does not constitute suitable habitat for the monarch butterfly. Suitable habitat for the monarch butterfly is not present.

Notes:
1 Habitat information was derived from USFWS fact sheets (USFWS 2024b-g).
2 Data from previous field surveys were used to supplement the findings of this report as needed (Arcadis 2018, 2024).
3 Wetlands and streams identified in the 2024 delineation have not been confirmed as WOUS by a USACE Approved Jurisdictional Determination and may be subject to change.

4.4.1 Northern Long-Eared Bat

NLEBs overwinter in abandoned mines and utilize forested areas throughout the rest of the year. Land cover within the Field Survey Area consists of cropland, native prairie, pasture, wetlands, streams, railroad/road ROW, and developed areas (USFWS 2024b).

The NLEB was reclassified as endangered under the Endangered Species Act in 2022. As a result, the existing 4(d) rule will be replaced by an upcoming final rule. However, at the time that this report was written, a final rule and accompanying consultation tools have not yet been released. The current guidance from the USFWS is to utilize their Interim Consultation Framework until the final rule is published. The Interim Consultation Framework provides take authorization for the NLEB for federal projects in the interim period and is consistent with the 4(d) rule (USFWS 2024b). The 4(d) rule prohibits incidental take of the NLEB from areas affected by white-nose syndrome (the leading threat to the NLEB), if actions result in the incidental take of NLEBs in hibernacula, by altering a known hibernaculum entrance or interior environment in such a way that an essential behavior pattern is disrupted, or if take occurs within a hibernaculum or as the result of tree removal within 0.25-miles of a hibernaculum. It also prohibits incidental take from tree clearing within a 150-foot radius from maternity roosts between June 1 and July 31 (Federal Register 2016). Mountrail and Ward Counties are denoted within a white-nose syndrome zone (USFWS 2020).

According to the IPaC Official Species List (USFWS 2024a; **Appendix A**), the NLEB only needs to be considered if the project includes wind turbine operations. The Project does not include wind turbine operations. The following species effect determinations are considered preliminary until concurrence from the USFWS is obtained.

Proposed Pipeline Project Corridor: No Effect

There are no forested areas, trees, or shrubs identified with cavities, exfoliating bark, furrowed bark, or other crevices which would constitute suitable roosting habitat for the NLEB. No abandoned or dilapidated sheds or similar buildings were observed within the Proposed Pipeline Project Corridor (**Figures 2-1** through **2-40**). There is no suitable habitat for the NLEB within the Proposed Pipeline Project Corridor. Due to lack of suitable habitat, the Project is expected to have no effect to the NLEB in the Proposed Pipeline Project Corridor.

Existing Pipeline Project Corridor: No Effect

There are no forested areas, and identified individual trees and shrubs did not contain cavities, exfoliating bark, furrowed bark, or other crevices which would make them suitable roosting habitat for the NLEB. No abandoned or dilapidated sheds or similar buildings were observed within the Existing Pipeline Project Corridor (**Figures 2-1** through **2-40**). There is no suitable habitat for the NLEB within the Existing Pipeline Project Corridor. Due to lack of suitable habitat, the Project is expected to have no effect to the NLEB in the Existing Pipeline Project Corridor.

It should be noted that two underground abandoned mine areas, the Speigel and Mormon Coal Mines, are located within the 1.0-mile-wide Study Area (**Figures 4-1** through **4-8**). These abandoned mines constitute suitable overwintering habitat for the NLEB; however, there are not located within the Project Corridor. Given the mines' locations outside of the Field Survey Area, these features are not expected to be impacted by Project activities. However, their proximity to the Project indicates that the NLEB may be present in the vicinity. Ground disturbance is not proposed in the Existing Pipeline Project Corridor. No suitable habitat areas for the NPEB will be adversely affected by Project activities. The Project is expected to have no effect to the NLEB in the Existing Pipeline Project Corridor.

Midline Pump Station Area: No Effect

The Midline Pump Station area consisted of agricultural cropland without any tree or shrub species which would constitute suitable roosting habitat for the NLEB. No abandoned or dilapidated sheds or similar buildings were observed within the Midline Pump Station area (**Figures 2-1** through **2-40**). There is no suitable habitat for the NLEB within the Midline Pump Station area. Due to lack of suitable habitat, the Project is expected to have no effect to the NLEB in the Midline Pump Station area.

4.4.2 Piping Plover

Mountrail and Ward Counties are located within the Central Flyway zone for migratory birds in North America (NDGFD 2024). Piping plovers migrate through North Dakota from mid-April to August with peak breeding season between late May and mid-July (NDGFD 2019a). They utilize unvegetated, sandy areas associated with larger waterbodies (lakes and rivers) in the northern Great Plains area (USFWS 2024c). The following species effect determinations are considered preliminary until concurrence from the USFWS is obtained.

Proposed Pipeline Project Corridor: No Effect

There are no lakes or reservoirs with unvegetated shorelines identified within the Proposed Pipeline Project Corridor (**Figures 2-1** through **2-40**). Additionally, none of the delineated streams contain unvegetated sandbar areas or streambanks. Suitable habitat for the piping plover was not identified within the Proposed Pipeline Project Corridor. Due to lack of suitable habitat, the Project is expected to have no effect to the piping plover in the Proposed Pipeline Project Corridor.

Permanent impacts to piping plover habitat, such as wetlands and/or streams, determined by the USACE as WOUS will be avoided via the use of the horizontal directional drilling (HDD) method at the pipeline crossings during construction. Temporary impacts to wetlands and streams via log matting may occur for ease of construction equipment movement throughout the construction ROW for the proposed pipeline. Wetlands that were determined by the USACE as not jurisdictional WOUS may be permanently impacted. This species is highly mobile, and suitable habitat features such as prairie pothole wetlands are readily available in areas outside of the limits of the Project Corridor. Therefore, despite the potential for direct habitat loss, this habitat loss is not expected to significantly impact the piping plover within the Proposed Pipeline Project Corridor.

Existing Pipeline Project Corridor: No Effect

There are no lakes or reservoirs with unvegetated shorelines identified within the Existing Pipeline Project Corridor (**Figures 2-1** through **2-40**). Additionally, none of the delineated streams contain unvegetated sandbar areas or streambanks. Suitable habitat for the piping plover was not identified within the Existing Pipeline Project Corridor. Due to lack of suitable habitat, the Project is expected to have no effect to the piping plover in the Existing Pipeline Project Corridor. Ground disturbance is not proposed in the Existing Pipeline Project Corridor. No suitable habitat areas for the piping plover will be adversely affected by Project activities. The Project is expected to have no effect to the pipeline plover in the Existing Pipeline Project Corridor.

Midline Pump Station Area: No Effect

There are no lakes, reservoirs, wetland, or stream features within the Midline Pump Station area (**Figures 2-1** through **2-40**). The Midline Pump Sation Area consists entirely of cropland area which does not constitute suitable habitat for the piping plover. Due to lack of suitable habitat, the Project is expected to have no effect to the piping plover in the Midline Pump Station area.

4.4.3 Rufa Red Knot

Mountrail and Ward Counties are located within the Central Flyway zone for migratory birds in North America (NDGFD 2024). Rufa red knots migrate through North Dakota in mid-May and mid-September to October (NDGFD 2019b), utilizing saline and freshwater aquatic habitats as stopover habitat (USFWS 2024d). The following species effect determinations are considered preliminary until concurrence from the USFWS is obtained.

Proposed Pipeline Project Corridor: May Affect – Not Likely to Adversely Affect

There are 10 PEM or farmed wetlands totaling approximately 9 acres and one perennial stream totaling approximately 0.02-acre within the Proposed Pipeline Project Corridor (Arcadis 2018). Based on available aerial imagery, many of the PEM wetlands appear to often exhibit standing surface water, creating shallow ponded areas (**Figures 2-1** through **2-40**). The Project is located in an area characterized by prairie pothole formations, which are commonly utilized by migratory species as stopover habitat. Suitable habitat for the rufa red knot is present within the Proposed Pipeline Project Corridor. No species occurrences were observed during the field survey, which was conducted outside of the migratory window for these species in North Dakota. The Project may dispace rufa red knot habitat.

Permanent impacts to rufa red knot habitat such as wetlands and/or streams which have been determined by the USACE as WOUS will be avoided via the use of the HDD method at the pipeline crossings during construction. Temporary impacts to wetlands and streams via log matting may occur for ease of construction equipment movement throughout the construction ROW for the proposed pipeline. Wetlands that were determined by the USACE as not jurisdictional WOUS may be permanently impacted. Permanent impacts to wetlands may contribute to a direct loss of rufa red knot habitat. However, this species is highly mobile, and suitable habitat features such as prairie pothole wetlands are readily available in areas outside of the limits of the Project. Therefore, despite the potential for direct habitat loss, this habitat loss is not expected to significantly impact the rufa red knot within the Proposed Pipeline Project Corridor.

Construction noise and activity may divert any migratory species from the immediate Project vicinity, but this is not expected to contribute to any direct or indirect cause of fatalities to migratory bird species. Additionally, the Project's construction timeline is such that any ground disturbance will occur outside of the migratory window for the rufa red knot to be present in the vicinity of the Project. The construction effect to migratory bird species is therefore considered insignificant. The proposed Project would be in compliance with the Migratory Bird Treaty Act (MBTA) and the Bald and Golden eagle Protection Act (BGEPA) and would therefore result in minimal disturbances to avian species. See **Section 5** for Project recommendations to minimize potential effects to migratory bird species during construction. With implementation of these construction guidelines, it is reasonable to assume that the Project may affect but is not likely to adversely affect the rufa red knot or its habitat in the Proposed Pipeline Project Corridor. Species effect determinations are considered preliminary until concurrence from the USFWS is obtained.

Existing Pipeline Project Corridor: No Effect

There are 34 PEM wetlands and 11 potentially farmed wetlands totaling approximately 6 acres and 3 perennial streams totaling approximately 0.2-acres identified within the Existing Pipeline Project Corridor (Arcadis 2024). Based on available aerial imagery, many of the PEM wetlands appear to often exhibit standing surface water, creating shallow ponded areas (**Figures 2-1** through **2-40**). The Project is located in an area characterized by prairie pothole formations, which are commonly utilized by migratory species as stopover habitat. Suitable habitat for the rufa red knot is present within the Existing Pipeline Project Corridor.

Ground disturbance is not proposed in the Existing Pipeline Project Corridor. No suitable habitat areas for the rufa red knot will be adversely affected by Project activities. The Project is expected to have no effect to the rufa red knot or its habitat in the Existing Pipeline Project Corridor.

Midline Pump Station Area: No Effect.

There are no lakes, reservoirs, wetland, or stream features within the Midline Pump Station area (**Figures 2-1** through **2-40**). The Midline Pump Sation Area consists entirely of cropland area. Suitable habitat for the rufa red knot is not present within the Midline Pump Station area.

4.4.4 Whooping Crane

Mountrail and Ward Counties are located within the Central Flyway zone for migratory birds in North America (NDGFD 2024). Whooping cranes migrate through North Dakota from April to mid-May and September to early November (NDGFD 2019c), utilizing diverse land cover types for breeding, migration, and foraging including upland cropland and pasture areas, lakes, ponds, and rivers (USFWS 2024e).

Proposed Pipeline Project Corridor: May Affect – Not Likely to Adversely Affect

There are 10 PEM or farmed wetlands totaling approximately 9 acres and one perennial stream totaling approximately 0.02-acre within the Proposed Pipeline Project Corridor (Arcadis 2018). Based on available aerial imagery, many of the PEM wetlands appear to often exhibit standing surface water, creating shallow ponded areas (**Figures 2-1** through **2-40**). The Project is located in an area characterized by prairie pothole formations, which are commonly utilized by migratory species as stopover habitat. Approximately 81 percent of the Proposed Pipeline Project Corridor consists of pastures, cultivated crops, or native prairie areas (**Figures 2-1** through **2-40** and **Figures 3-1** through **3-29**). Suitable habitat for the whooping crane is present within the PEM wetlands, pastures, native prairie, and cropland in the Proposed Pipeline Project Corridor; therefore, the Project may affect whooping crane habitat in the Proposed Pipeline Project Corridor. No species occurrences were observed during the field survey, which was conducted outside of the migratory window for the whooping crane in North Dakota.

Permanent impacts to whooping crane habitat such as wetlands and/or streams which have been determined by the USACE as WOUS will be avoided of via the use of the HDD method at the pipeline crossings during construction. Temporary impacts to wetlands and streams via log matting may occur to facilitate construction equipment movement throughout the construction ROW of the proposed pipeline. Wetlands that were determined by the USACE as not jurisdictional WOUS may be permanently impacted. Permanent impacts to wetlands may contribute to a direct loss of whooping crane habitat. However, this species is highly mobile, and suitable habitat features such as prairie pothole wetlands and other streams, wetlands, and upland areas, are readily available in areas outside of the limits of the Proposed Pipeline Project Corridor. Therefore, despite the potential for direct habitat loss, the Project is not expected to significantly impact the availability of whooping crane habitat in the Proposed Pipeline Project Corridor.

Construction noise and activities during construction may divert any migratory species from the immediate Project vicinity, but this is not expected to contribute to any direct or indirect cause of fatalities to migratory bird species. Additionally, the Project's construction timeline is such that any ground disturbance will occur outside of the migratory window for the whooping crane to be present in the vicinity of the Project. See **Section 5** for recommendations to minimize potential effects to migratory bird species. The proposed Project would be in compliance with the MBTA and the BGEPA and would therefore result in minimal disturbances to avian species. With implementation of these construction guidelines, it is reasonable to assume that the Project may affect but is not likely to adversely affect the whooping crane in the Proposed Pipeline Project Corridor; therefore, effects to

migratory bird species are anticipated to be insignificant during construction and operations. Species effect determinations are considered preliminary until concurrence from the USFWS is obtained.

Existing Pipeline Project Corridor: No Effect

There are 34 PEM wetlands and 11 potentially farmed wetlands totaling approximately 6 acres and 3 perennial streams totaling approximately 0.2-acres identified within the Existing Pipeline Project Corridor (Arcadis 2024). Based on available aerial imagery, many of the PEM wetlands appear to often exhibit standing surface water, creating shallow ponded areas (**Figures 2-1** through **2-40**). The Project is located in an area characterized by prairie pothole formations, which are commonly utilized by migratory species as stopover habitat. Approximately 95 percent of the Existing Pipeline Project Corridor consists of pastures, cultivated crops, or native prairie areas (**Figures 2-1** through **2-40** and **Figures 3-1** through **3-29**). Suitable habitat for the whooping crane is present within the Existing Pipeline Project Corridor.

Ground disturbance is not proposed in the Existing Pipeline Project Corridor. No suitable habitat areas for the whooping crane will be adversely affected by Project activities. The Project is expected to have no effect to the whooping crane or its habitat in the Existing Pipeline Project Corridor.

Midline Pump Station Area: May Affect – Not Likely to Adversely Affect

The Midline Pump Sation Area consists entirely of cropland area which may constitute suitable habitat for the whooping crane. However, no species occurrences were observed during the field survey, which was conducted outside of the migratory window for the whooping crane in North Dakota. The Project therefore may affect the whooping crane in the Midline Pump Station area.

The whooping crane is highly mobile, and suitable habitat features such has prairie pothole wetlands and other streams, wetlands, and upland areas, are readily available in areas outside of the limits of the Midline Pump Station area. Therefore, despite the potential for direct habitat loss, the Project is not expected to significantly impact the whooping crane in the Midline Pump Station area.

Additionally, construction noise and activity during construction may divert any migratory species from the immediate Project vicinity, but this is not expected to contribute to any direct or indirect cause of fatalities to migratory bird species. The construction effect to migratory bird species is therefore considered insignificant. See **Section 5** for recommendations to minimize potential effects to migratory bird species. With implementation of these construction guidelines, it is reasonable to assume that the Project may affect but is not likely to adversely effect to the whooping crane or its habitat in the Midline Pump Station area.

4.4.5 Dakota Skipper

Dakota skippers utilize naturalized prairie areas including moist bluestem prairies with flowering species and upland prairie areas characterized by bluestem, needlegrasses, and purple coneflower (USFWS 2024f).

Proposed Pipeline Project Corridor: May Affect – Not Likely to Adversely Affect

Approximately 1 acre (0.01 percent) of the Proposed Pipeline Project Corridor consists of native prairie areas with flowering species (**Figures 3-1** through **3-29**) and an additional approximately 0.08-acre area dominated by purple coneflower was identified within the Proposed Pipeline Project Corridor (**Figures 2-1** through **2-40**). Suitable habitat for the Dakota skipper is present within the Proposed Pipeline Project Corridor.

Construction activities are proposed to occur over winter months when suitable flowering habitat areas are dormant and not utilized by the Dakota skipper. Any impacts to summer habitat areas are expected to fully recover in the interim period between construction and the emergence of flowering plants. Revegetation will be

conducted in compliance with landowner agreements. In areas with suitable habitat for Dakota skipper, temporary disturbance areas will be revegetated using seed mixtures that incorporate vegetation that supports prairie butterfly species, if practicable. Therefore, no direct effects to the Dakota skipper are anticipated. Additionally, there is alternative native prairie areas in the vicinity of the Project which will not be disturbed and will maintain suitable habitat for the species throughout construction, such that any temporary habitat loss which may result from the project is expected to be negligible. See **Section 5** for recommendations to minimize potential effects to Dakota skipper. With implementation of these construction guidelines, it is reasonable to assume that the Project may affect but is not likely to adversely affect the Dakota skipper or its habitat. Species effect determinations are considered preliminary until concurrence from the USFWS is obtained.

Existing Pipeline Project Corridor: No Effect

Approximately 13 acres of the Existing Pipeline Project Corridor consists of native prairie areas with flowering species (**Figures 3-1** through **3-29**) and approximately 1.4 acres of areas dominated by purple coneflower, purple prairie clover, and/or blazing star, 0.86-acre of which is overlapped by native prairie areas and 0.59-acre of which are independent of native prairie areas. were identified within the Existing Pipeline Project Corridor (**Figures 2-1** through **2-40**). Suitable habitat for the Dakota skipper is present within the Existing Pipeline Project Corridor.

Ground disturbance is not proposed in the Existing Pipeline Project Corridor. No suitable habitat areas for the Dakota skipper will be adversely affected by Project activities. The Project is expected to have no effect to the Dakota skipper in the Existing Pipeline Project Corridor.

Midline Pump Station Area: No Effect

The Midline Pump Station area consists of cropland area which does not constitute suitable habitat for the Dakota skipper. Suitable habitat is not present. The Project is expected to have no effect to the Dakota skipper in the Midline Pump Station area.

4.4.6 Monarch Butterfly

Monarch butterflies utilize a wide range of habitat types, both disturbed and natural, including open field areas, roadside areas, and wet or dry herbaceous areas (USFWS 2024g). It is imperative that milkweed be present for an area to qualify as suitable habitat, but flowering species are also required.

Proposed Pipeline Project Corridor: May Affect – Not Likely to Adversely Affect

While no areas of milkweed dominance were identified within the Field Survey Area, approximately 1-acre within the Proposed Pipeline Project Corridor consists of natural prairie areas (**Figures 3-1** through **3-29**) and other flowering species were present in these areas. Suitable habitat for the monarch butterfly is present within the Proposed Pipeline Project Corridor.

Construction activities are proposed to occur over winter months when suitable flowering habitat areas are dormant and not utilized by the monarch butterfly. Any impacts to summer habitat areas are expected to fully recover in the interim period between construction and the emergence of flowering plants. Therefore, no direct effects to the monarch butterfly are anticipated. Additionally, there are alternative native prairie areas in the vicinity of the Project which will not be disturbed and will maintain suitable habitat for the species throughout construction, such that any temporary habitat loss which may result from the project is expected to be negligible.

The Project is assumed not likely to adversely affect the monarch butterfly or its habitat. See **Section 5** for recommendations to minimize potential effects to monarch butterfly. With implementation of these construction guidelines, it is reasonable to assume that the Project may affect but is not likely to adversely affect the monarch butterfly.

It should be noted that the monarch butterfly is listed as a Candidate Species, and as such does not have designated critical habitat protections under Section 7 of the Endangered Species Act. Therefore, formal coordination with the USFWS for this species is not required. Species effect determinations are considered preliminary until concurrence from the USFWS is obtained.

Existing Pipeline Project Corridor: No Effect

While no areas of milkweed dominance were identified within the Field Survey Area, approximately 13 acres within the Existing Pipeline Project Corridor consist of natural prairie areas (**Figures 3-1** through **3-29**) and other flowering species were present in these native prairie areas. Additionally, there was one species occurrence of an observed monarch butterfly shown on **Figure 2-25.** Suitable habitat for the monarch butterfly is present within the Existing Pipeline Project Corridor.

Ground disturbance is not proposed in the Existing Pipeline Project Corridor. No suitable habitat areas for the monarch butterfly will be adversely affected by Project activities. The Project is expected to have no effect to the monarch butterfly or its habitat in the Existing Pipeline Project Corridor.

Midline Pump Station Area: No Effect

The Midline Pump Station area consists of monoculture cropland area which does not constitute suitable habitat for the monarch butterfly. Suitable habitat is not present. The Project is expected to have no effect to the monarch butterfly or its habitat in the Midline Pump Station area.

4.5 Woody Vegetation (Tree and Shrub) Inventory

No trees or shrubs were identified within the Proposed Pipeline Project Corridor or the Midline Pump Station area.

Within the Existing Pipeline Project Corridor, two individual trees and eight shrub areas, totaling 0.74 acre, were inventoried (**Figures 2-1** through **2-40**). Shrubs consisted of fireberry hawthorn (*Crataegus chrysocarpa*), western snowberry (*Symphoricarpos occidentalis*), and chokecherry (*Prunus virginiana*). The trees were identified as Russian olives (*Elaeagnus umbellata*). The trees and shrubs did not contain cavities, exfoliating bark, furrowed bark, or other crevices, and were not identified to be potential roosting habitat trees for the NLEB. Additional information on the collected tree and shrub data is provided in **Table 4**.

Table 4 Field Survey Area Tree and Shrub Inventory for Existing Pipeline Project Corridor

Feature ID	Location	Species	Height (feet)	Stem Count and/or DBH (inches)	Community/ Colony Area (acres)	Condition[1] and Natural or Planted
Tree 1	48.303965, -102.366901	Russian olive	12	20 DBH	N/A	Excellent and Natural
Tree 2	48.303934, -102.366887	Russian olive	12	15 DBH	N/A	Excellent and Natural
Shrub 1	48.303946, -102.366672	Chokeberry	12	16 stem count and 0.25 DBH	0.01	Fair and Natural
Shrub 2	48.132009, -102.121866	Fireberry hawthorne	3	211 stem count and 0.5 DBH	0.26	Fair and Natural
Shrub 3	48.131230, -102.119515	Western snowberry	1	200 stem count and 0.25 DBH	0.10	Fair and Natural
Shrub 4	48.130977, -102.118004	Western snowberry	1	100 stem count and 0.25 DBH	0.09	Fair and Natural

Table 4 Field Survey Area Tree and Shrub Inventory for Existing Pipeline Project Corridor

Feature ID	Location	Species	Height (feet)	Stem Count and/or DBH (inches)	Community/ Colony Area (acres)	Condition[1] and Natural or Planted
Shrub 5	48.130909, -102.117472	Western snowberry	1	200 stem count and 0.25 DBH	0.03	Fair and Natural
Shrub 6	48.130817, -102.116820	Western snowberry	1	300 stem count and 0.25 DBH	0.10	Fair and Natural
Shrub 7	48.129852, -102.113436	Western snowberry	1	100 stem count and 0.25 DBH	0.02	Fair and Natural
Shrub 8	48.095971, -102.059397	Russian olive	5-6	500 stem count and 1-2 DBH	0.15	Excellent and Natural

Proposed Pipeline Project Corridor:

No trees or shrubs were identified within the Proposed Pipeline Project Corridor.

Existing Pipeline Project Corridor:

All 10 identified trees and shrub areas were identified within the Existing Pipeline Project Corridor. The existing pipeline's 30-foot-wide permanent ROW was previously disturbed during installation of the pipeline in the 1960sand the majority of the ROW is vegetated. No trees or shrubs will be removed for the conversion of the existing pipeline.

Midline Pump Station Area:

No trees or shrubs were identified within the Midline Pump Station area.

4.6 Noxious Weed Infestation Inventory

North Dakota has 13 state-listed noxious weeds. Two additional species are listed as invasive in either Mountrail or Ward Counties. **Table 5** provides a list of state listed noxious and/or invasive species including species listed in Ward and Mountrail Counties (NDDA 2023).

Table 5 North Dakota State and Mountrail and Ward Counties Noxious and Invasive Weeds[1]

Common Name	Scientific Name
North Dakota State Listed Noxious Weeds	
Absinth Wormwood	*Aremisia absinthium*
Canada Thistle	*Cirsium arvense*
Dalmatian Toadflax	*Linaria genistifolia*
Diffuse Knapweed	*Centaurea diffusa*
Houndstongue	*Cynoglossum officinale*
Leafy Spurge	*Euphorbia esula*
Musk Thistle	*Carduus nutans*
Palmer Amaranth	*Amaranthus palmeri*
Purple Loosestrife	*Lythrum salicaria*

Table 5 North Dakota State and Mountrail and Ward Counties Noxious and Invasive Weeds[1]

Common Name	Scientific Name
Russian Knapweed	*Acroptilon repens*
Saltcedar	*Tamarix chinensis*
Spotted Knapweed	*Centaurea maculosa*
Yellow Toadflax	*Linaria vulgaris*
Mountrail County Listed Noxious Weeds	
Common Tansy	*Tanacetum vulgare*
Ward County Listed Noxious Weeds	
False Chamomile	*Anthems arvensis*

Source:
1 NDDA 2023.

There were 11 areas in which a concentrated presence of Canada thistle, a noxious weed, was identified (**Figures 2-1** through **2-40**). These areas total approximately 3.78 acres and the locations where they were identified are described below.

Proposed Pipeline Project Corridor:

Five noxious weed infestation areas were identified within the Proposed Pipeline Project Corridor totaling 0.76-acre.

Areas where vegetation will be removed during construction will be restored in accordance with the landowner agreements. For areas to be revegetated, seeding will comply with requirements specified by the landowners or the NRCS. A Weed Management Plan has been developed for the Project. BMPs will be implemented to prevent the spread of noxious weeds and to minimize the risk of importing or transporting any weed species. Equipment and tools will be cleaned of any plant debris before ingress and egress from the Project Corridor.

Existing Pipeline Project Corridor:

The existing pipeline's 30-foot-wide permanent ROW was previously disturbed during installation of the pipeline in the 1960s and the majority of the ROW is vegetated. Six noxious weed areas were identified within the Existing Pipeline Project Corridor totaling 3.02 acres.

Ground disturbance is not proposed in the Existing Pipeline Project Corridor. Vegetation, including trees and shrubs, will not be disturbed in the Existing Pipeline Project Corridor. In accordance with the landowner agreements, weed control measures will be implemented to control weed infestations within the Existing Pipeline Project Corridor, as described above.

Midline Pump Station Area:

No noxious weed infestation areas were identified within the Midline Pump Station area, which consisted entirely of cropland area.

Following the construction of the new midline pump station, any areas planned to be revegetated will be restored in accordance with the landowner agreements. For areas to be revegetated, seeding will comply with requirements specified by the landowners or the NRCS. A Weed Management Plan has been developed for the Project. BMPs will be implemented to prevent the spread of noxious weeds and to minimize the risk of importing

or transporting any weed species. Equipment and tools will be cleaned of any plant debris before ingress and egress from the Project Corridor.

4.7 1,000-Foot-Wide Buffer Area

No potential landslide areas, abandoned mines, or gravel pits were identified within the project corridors of the proposed or existing pipelines, or the within the 1,000-foot-wide buffer area surveyed. In addition, only one occupied residence was identified within 500 feet of the centerline of the existing pipeline. No additional occupied residences, businesses, or schools were identified within 500 feet of the centerlines of the proposed or existing pipelines.

4.8 1.0-Mile-Wide Study Area

One bald eagle nest was previously identified approximately 350 feet from the Existing Pipeline Project Corridor. Nest NA12SC01 has been confirmed and its position recorded. It is shown on **Figure 4-5**. No other raptor nests were identified within the 1.0-mile-wide buffer area and no occurrence reports of any raptor species including bald eagles were noted during the field survey. This nest was approximately 1.97 miles northwest of the 2-acre site for the proposed midline pump station.

5 Recommendations

The USFWS developed the avoidance and minimization measures as described in the Programmatic Biological Assessment and Biological Evaluation (BABE) for Fort Berthold Indian Reservation (FBIR) Oil and Gas Development (Cardno 2014) and subsequent Revised Addendum to Programmatic Biological Assessment and Biological Evaluation (BABE Addendum) for Fort Berthold Indian Reservation Oil and Gas Development (Trihydro Corporation 2015). The USFWS identified avoidance and minimization measures for the potentially affected species within the FBIR. Arcadis recommends that TBPL implement the USFWS recommendations which are applicable to this Project and the additional measures listed in the **Table 6** to minimize potential adverse effects to potentially affected federally listed species and migratory birds during construction and operation of the project.

Table 6 Avoidance and Minimization Measures for Potentially Affected Species

Common Name	Conservation Measure(s)
Northern long-eared bat	Not Applicable – Suitable habitat not found within the Project Corridors or the Midline Pump Station area. In addition, per the IPaC Official Species List (USFWS 2024a; Appendix A), the NLEB only needs to be considered if the project includes wind turbine operations.
Piping plover	During construction of the proposed pipeline, disturbances to wetland habitat will be minimized by the use of the HDD method for the crossings of WOUS.
	TBPL will provide an identification guide for on-site personnel and training on protocols to follow to minimize impacts in the event that this bird is seen within the active construction area.
Rufa red knot	During construction of the proposed pipeline, disturbances to wetland habitat will be minimized by the use of the HDD method for the crossings of WOUS.
	TBPL will provide an identification guide for on-site personnel and training on protocols to follow to minimize impacts in the event that this bird is seen within the active construction area.
	If piping plovers are sighted within active construction areas, all construction activities would be modified or curtailed until the bird(s) have left the area, USFWS would be contacted on how to proceed, and the TAT Fish and Wildlife Division would be notified.
Whooping crane	During construction of the proposed pipeline, disturbances to wetland habitat will be minimized by the use of the HDD method for the crossings of WOUS.
	TBPL will provide an identification guide for on-site personnel and training on protocols to follow to minimize impacts in the event that this bird is seen within the active construction area.
	If whooping cranes are sighted within 1-mile (2 kilometers [km]) radius of any work site, all construction activities would be modified or curtailed until the bird(s) have left the area, USFWS would be contacted on how to proceed, and the TAT Fish and Wildlife Division would be notified.
Dakota skipper	If Dakota skippers are sighted within active construction areas, all construction activities would be modified or curtailed until the butterfly(ies) have left the area, USFWS would be contacted on how to proceed, and the TAT Fish and Wildlife Division would be notified.
	TBPL will provide an identification guide for on-site personnel and training on protocols to follow to minimize impacts in the event that this butterfly is seen within the active construction area.
	In areas with suitable habitat for Dakota skipper, temporary disturbance areas will be revegetated using seed mixtures that incorporate vegetation that supports prairie butterfly species, if practicable.

Table 6 Avoidance and Minimization Measures for Potentially Affected Species

Common Name	Conservation Measure(s)
Monarch butterfly	TBPL will provide an identification guide for on-site personnel and training on protocols to follow to minimize impacts in the event that this butterfly is seen within the active construction area.
	In areas with suitable habitat for monarch butterfly, temporary disturbance areas will be revegetated using seed mixtures that incorporate vegetation that supports prairie butterfly species, if practicable.
Raptors/ Eagles	If construction will occur between February 1 and July 15, an aerial raptor surveys must be performed extending 0.5 mile from the construction ROW before construction begins.
	During construction, TBPL will implement a 0.5-mile buffer around active eagle nest sites (known occupied within the past 5 years).
	If eagles are observed within 1.0 mile of an active work area, all construction within 1.0 mile of the sighting will be modified or curtailed until the bird(s) have left the area, USFWS will be consulted on how to proceed, and the NDGF and the TAT Fish and Wildlife Division will be notified

During construction of the proposed pipeline, the HDD method will be used for the crossings of four wetlands and one stream determined by USACE as jurisdictional WOUS. Areas where vegetation will be removed during construction should be restored in accordance with the landowner agreements. In areas with suitable habitat for monarch butterfly, temporary disturbance areas will be revegetated using seed mixtures that incorporate vegetation that supports prairie butterfly species, if practicable. For areas to be revegetated, seeding must comply with requirements specified by the landowners or the NRCS.

A Weed Management Plan has been developed for the Project and BMPs should be implemented to prevent the spread of noxious weeds and to minimize the risk of importing or transporting any weed species. Equipment and tools should be cleaned of any plant debris before ingress and egress from the Project Corridor.

6 Conclusions

Desktop reviews and a field survey were conducted within the Field Survey Area on August 5-8, 2024, to identify potential habitat areas for federally listed species, land cover types (cropland, pasture, native prairie, and other), noxious weed infestation areas, trees and shrubs. The results of the field survey are provided for three corresponding sub-areas within the Field Survey Area: the Proposed Pipeline Project Corridor, the Existing Pipeline Project Corridor, and the Midline Pump Station area.

Arcadis also identified and recorded locations of occupied residences within 500 feet of the pipeline centerlines, potential landslide areas, abandoned mines, and gravel pits within the 1,000-foot-wide buffer area. Arcadis completed visual surveys for bald eagle nests and confirmed the location of a previously identified bald eagle nest within 0.5-mile of the Existing Pipeline Project Corridor. Survey activities for the Biological Habitat Assessment Report were completed concurrently with the 2024 wetland delineation field survey (Arcadis 2024). Findings from the 2018 and 2024 delineations (Arcadis 2018, 2024) were used to supplement the findings of this report as needed.

A total of 44 PEM wetlands and four streams were identified within the Field Survey Area, totaling approximately 14.78 acres and 0.25 acres, respectively (Arcadis 2018, 2024). Many of these wetlands are classified as prairie pothole wetlands which may exhibit suitable habitat characteristics for migratory birds such as the rufa red knot or stopover habitat for the whooping crane. Identified streams did not exhibit the sandy shorelines or unvegetated sandbars characteristic of suitable stopover habitat for the piping plover.

The Field Survey Area consisted of four primary land cover classifications including cropland, pasture, native prairie, and other. Developed areas (railroad/road ROW, industrial/existing petroleum storage facilities, etc.) and areas representing delineated aquatic features were designated as “other.” Approximately 14 acres were identified as native prairie, 217 acres as crops, 13 acres as pasture, 21 acres developed, and the remaining 15 acres as aquatic resources (wetland and streams). Additionally, approximately 1.48 acres of the Field Survey Area consists of areas dominated by purple coneflower, purple prairie clover, and/or blazing star. Concentrations of purple coneflower and purple prairie clover are of particular interest as these species are indicative of suitable habitat for the Dakota skipper and monarch butterfly. There were 11 areas where a concentrated presence of Canada thistle, a noxious weed, has been identified within the Field Survey Area. These areas total approximately 3.78 acres.

Eight shrub areas consisting of fireberry hawthorn, western snowberry, and chokecherry species and two Russian olive individual trees were inventoried within the Existing Pipeline Project Corridor. No potential landslide areas, abandoned mines, or gravel pits were identified within 500-feet of the Field Survey Area. The location of bald eagle nest NA12SC01 was confirmed. No additional raptor nests were recorded.

Following a review of federally listed species, their respective habitat requirements, and on-site conditions, Arcadis has made the following preliminary species affect determinations for the NLEB, whooping crane, Dakota skipper, piping plover, red knot, and monarch butterfly as shown in **Table 7**. These affect determinations are preliminary and have not been confirmed by the USFWS.

Construction recommendations for avoiding and minimizing adverse impacts to listed threatened and endangered species is provided in **Section 5**.

Table 7 Summary Conclusions and Species Affect Determinations

Species	Suitable Habitat Present? (Yes / No)	Identified Habitat	Preliminary Affect Determination
NLEB	No	N/A	Proposed Pipeline Project Corridor: **No Effect**
	No	N/A	Existing Pipeline Project Corridor: **No Effect**
	No	N/A	Midline Pump Station Area: **No Effect**
Piping plover	No	N/A	Proposed Pipeline Project Corridor: **No Effect**
	No	N/A	Existing Pipeline Project Corridor: **No Effect**
	No	N/A	Midline Pump Station Area: **No Effect**
Rufa red knot	Yes	9 acres of PEM/farmed wetlands	Proposed Pipeline Project Corridor: **May Affect – Not Likely to Adversely Affect**
	Yes	6 acres of PEM/farmed wetlands	Existing Pipeline Project Corridor: **No Effect**
	No	N/A	Midline Pump Station Area: **No Effect**
Whooping crane	Yes	• 9 acres of PEM/farmed wetlands • 0.02-acre of perennial stream • 1 acre of native prairie area • 67 acres of cropland	Proposed Pipeline Project Corridor: **May Affect – Not Likely to Adversely Affect**
	Yes	• 6 acres of PEM/farmed wetlands • 0.2-acre perennial stream • 13 acres of native prairie area • 148 acres of cropland • 13 acres of pasture area	Existing Pipeline Project Corridor: **No Effect**
	Yes	2 acres of cropland	Midline Pump Station Area: **May Affect – Not Likely to Adversely Affect**
Dakota skipper	Yes	• 1 acre of native prairie area • 0.08-acre of area dominated by purple coneflower	Proposed Pipeline Project Corridor: **May Affect – Not Likely to Adversely Affect**
	Yes	• 13 acres of native prairie area • 1.4 acres of area dominated by purple coneflower, purple prairie clover, and/or blazing star, 0.86-acre of which is overlapped by native prairie areas and 0.59-acre of which are independent of native prairie areas.	Existing Pipeline Project Corridor: **No Effect**
	No	N/A	Midline Pump Station Area: **No Effect**
Monarch butterfly	Yes	• 1 acre of native prairie area	Proposed Pipeline Project Corridor: **May Affect – Not Likely to Adversely Affect**
	Yes	• 13 acres of native prairie area	Existing Pipeline Project Corridor: **No Effect**
	No	N/A	Midline Pump Station Area: **No Effect**

7 References

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Figures

SURVEY SEGMENT A1

SURVEY SEGMENT A2

PROJECT CORRIDOR -
EXISTING PIPELINE

SURVEY SEGMENT A3

SURVEY SEGMENT A4

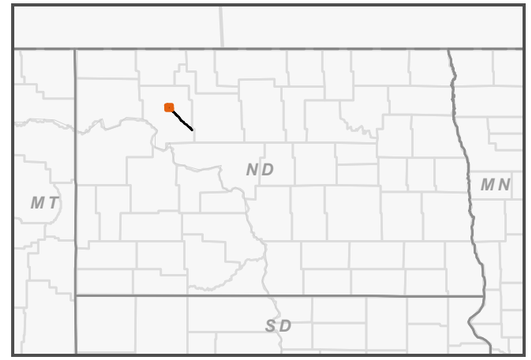

FIGURE 1-1.1
TOPOGRAPHIC MAP
Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

Project Corridor - Existing Pipeline
(50-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Stanley SE, Stanley obtained through ArcGIS Online streaming service.

0 1,000 2,000 4,000 ft
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ARCADIS

Creator: NCochran Last Saved: 9/27/2024 3:21 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR_NEC_rev2.aprx\BHAR_Figure 1-1 Topographic Map
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

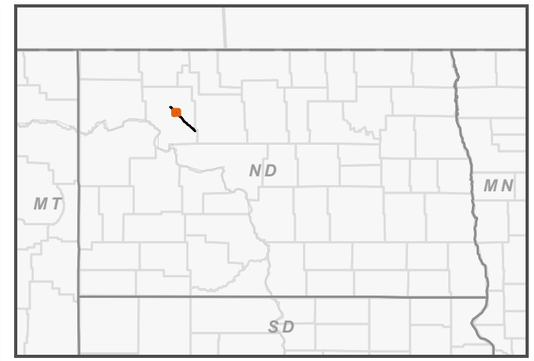

FIGURE 1-1.2
TOPOGRAPHIC MAP
Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

Project Corridor - Existing Pipeline (50-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Stanley SE, Belden, Epworth NW obtained through ArcGIS Online streaming service.

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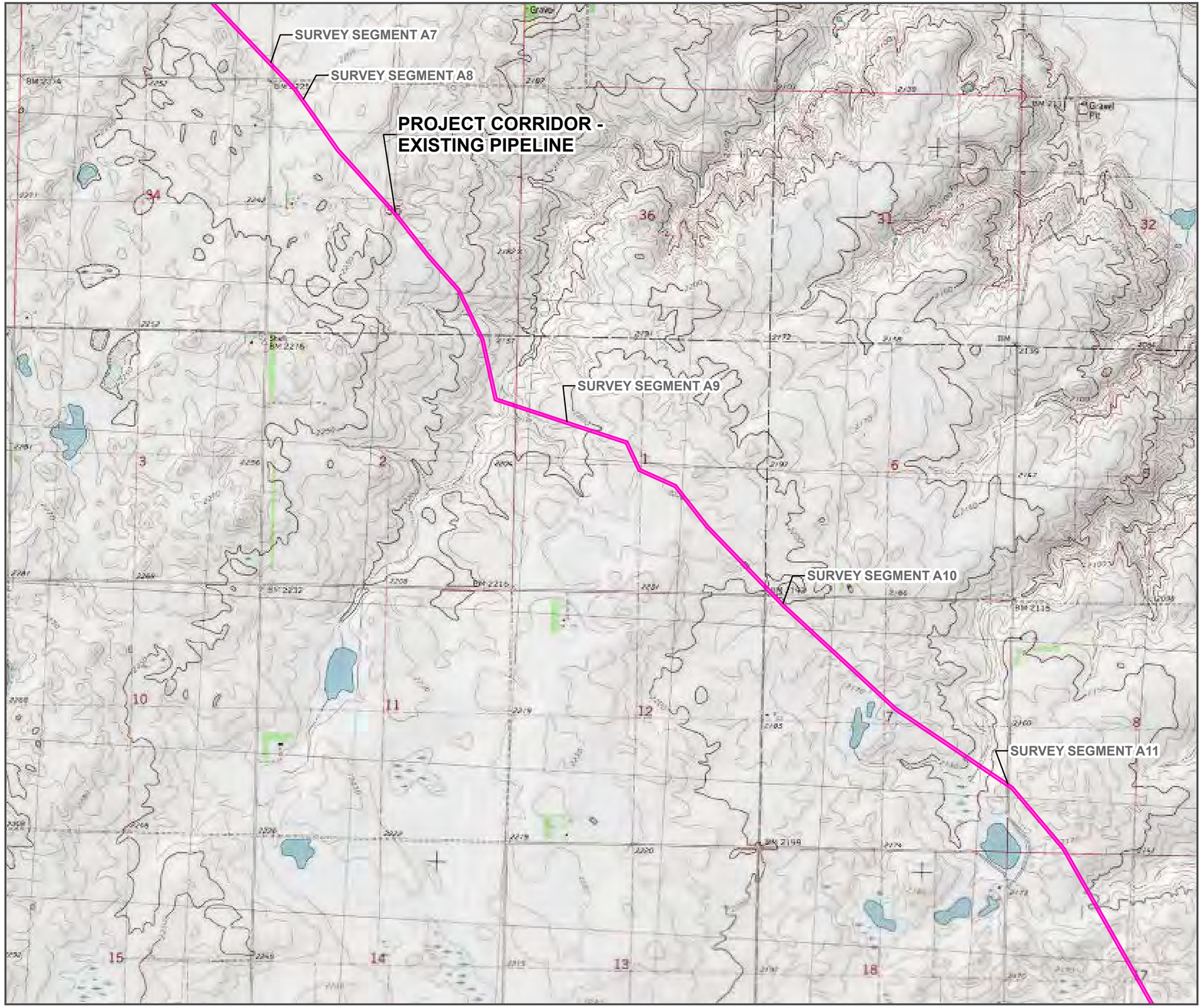

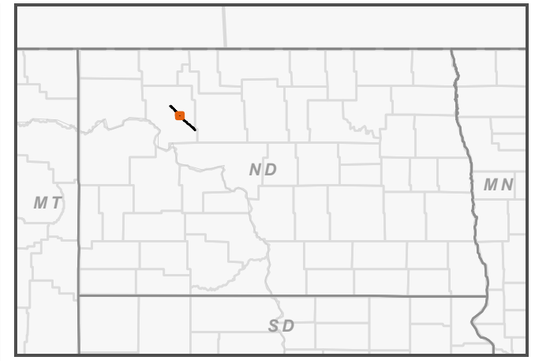

FIGURE 1-1.3
TOPOGRAPHIC MAP
Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

Project Corridor - Existing Pipeline (50-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Epworth NW obtained through ArcGIS Online streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS

SURVEY SEGMENT A10

SURVEY SEGMENT A11

SURVEY SEGMENT A12

PROJECT CORRIDOR - EXISTING PIPELINE

SURVEY SEGMENT A13

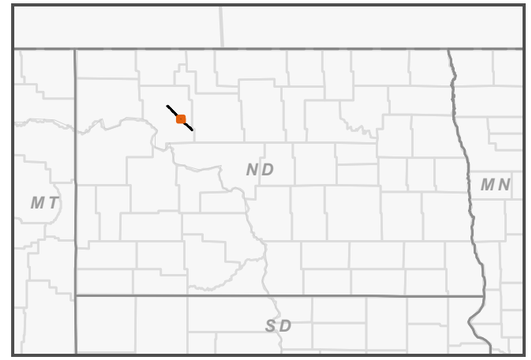

FIGURE 1-1.4
TOPOGRAPHIC MAP
Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

Project Corridor - Existing Pipeline (50-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Epworth NW, Shell Lake, Epworth SE obtained through ArcGIS Online streaming service.

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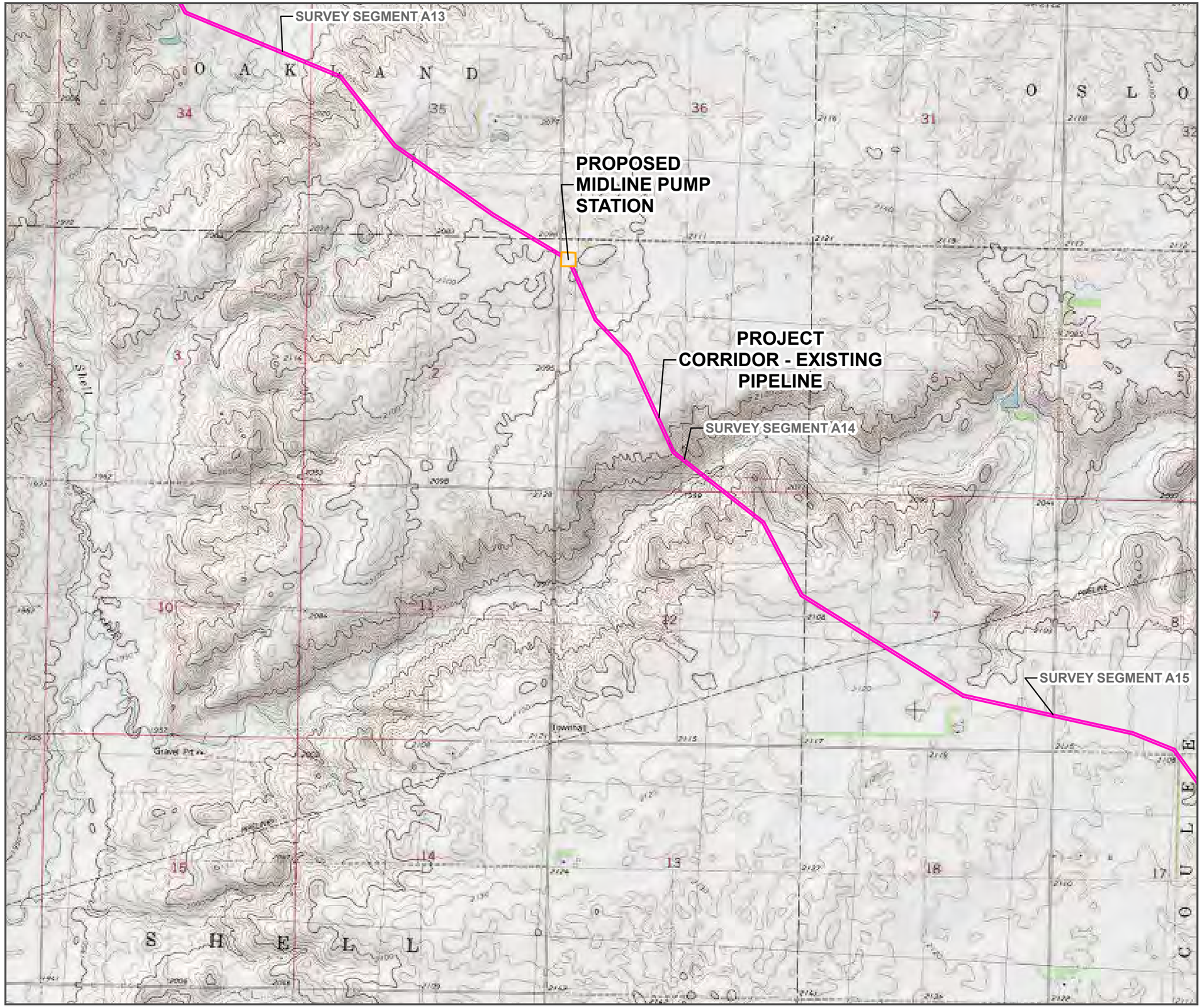

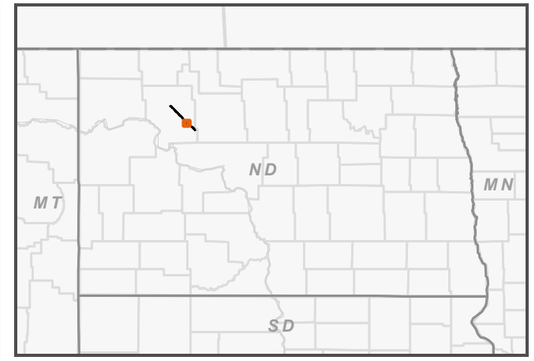

FIGURE 1-1.5
TOPOGRAPHIC MAP
Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Proposed Midline Pump Station

Notes:
1. USGS Topographic Quadrangle for Epworth SE, Shell Lake, Epworth NW obtained through ArcGIS Online streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

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Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR_NEC_rev2.aprx\BHAR_Figure 1-1 Topographic Map
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

SURVEY SEGMENT A14

SURVEY SEGMENT A15

SURVEY SEGMENT A16

PROJECT CORRIDOR -
EXISTING PIPELINE

SURVEY SEGMENT A17

SURVEY SEGMENT A18

COULEE

SPRING COULEE

Gravel Pits

First Lutheran Cem

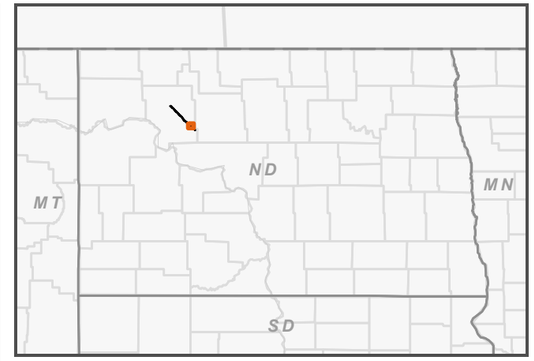


FIGURE 1-1.6
TOPOGRAPHIC MAP
Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

Project Corridor - Existing Pipeline (50-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Epworth SE obtained through ArcGIS Online streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS

Creator: NCochran Last Saved: 9/27/2024 3:21 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR_NEC_rev2.aprx\BHAR_Figure 1-1 Topographic Map
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

SURVEY SEGMENT A17

SURVEY SEGMENT A18

SURVEY SEGMENT A19

PROJECT CORRIDOR - EXISTING PIPELINE

SURVEY SEGMENT A20

PROJECT CORRIDOR - PROPOSED PIPELINE

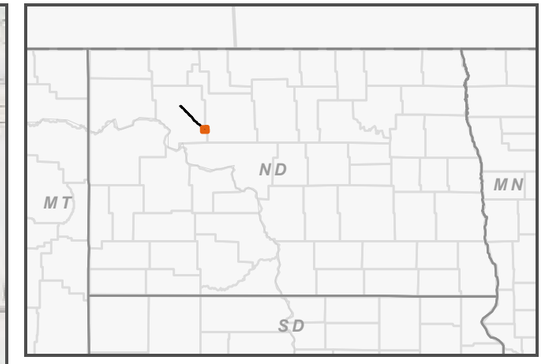


FIGURE 1-1.7

TOPOGRAPHIC MAP

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

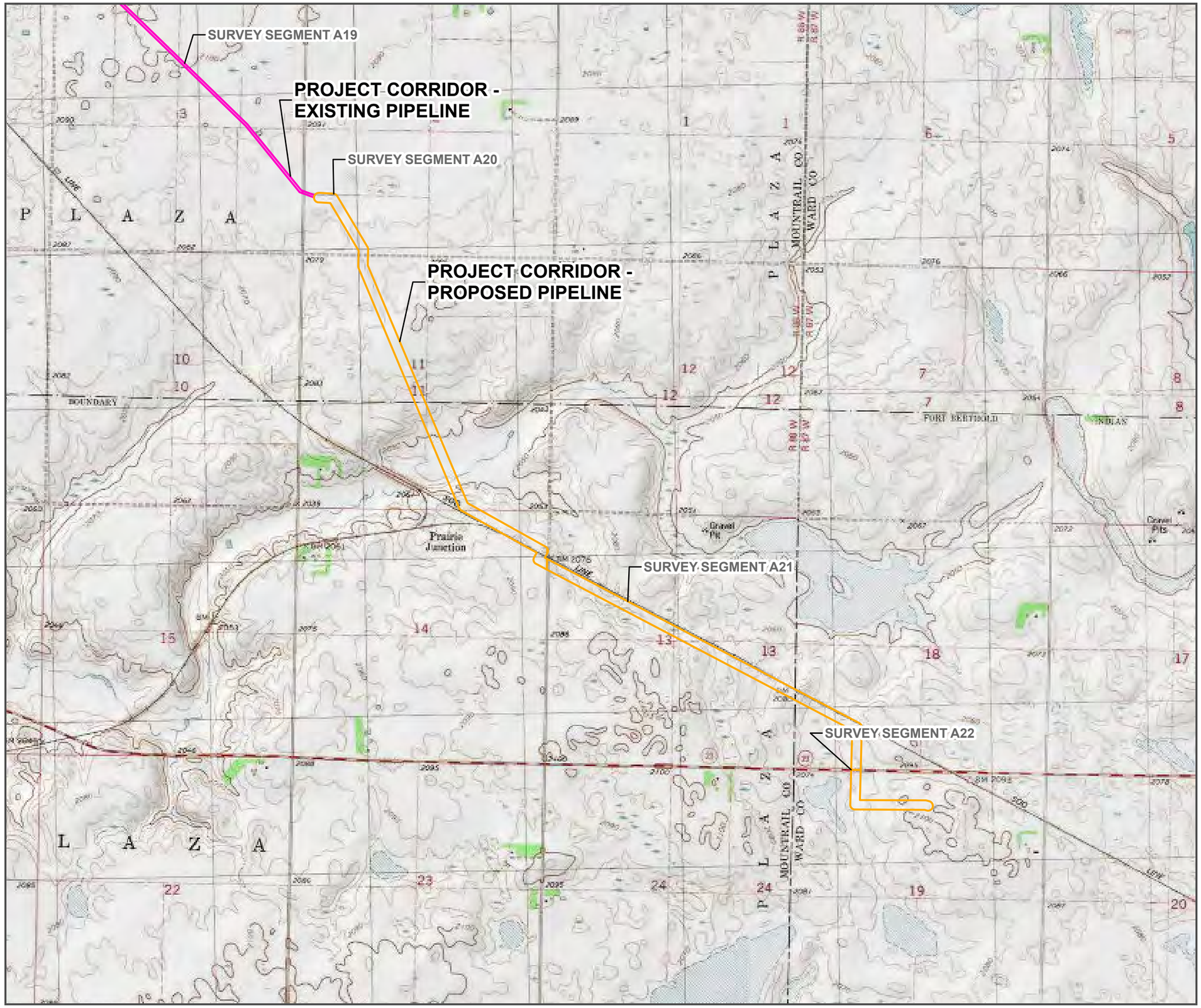
Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Project Corridor - Proposed Pipeline (200-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Plaza obtained through ArcGIS Online streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS



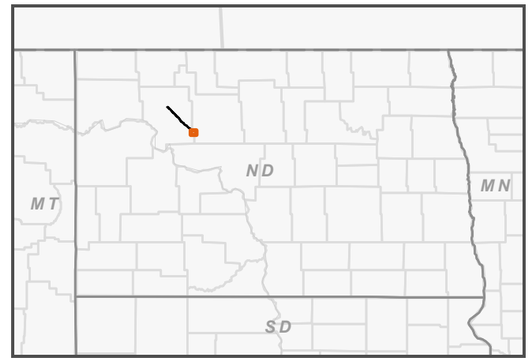


FIGURE 1-1.8
TOPOGRAPHIC MAP
Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

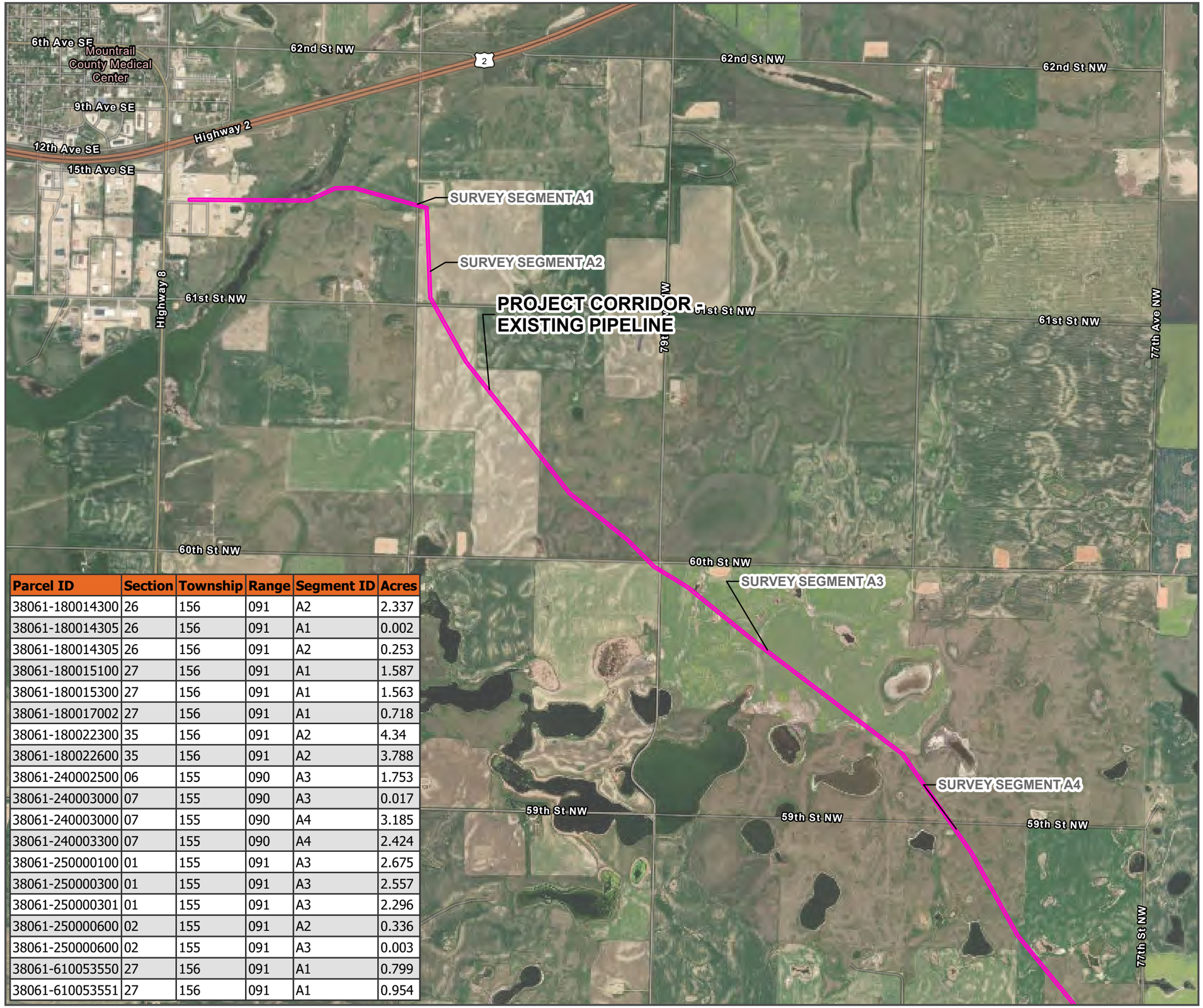
- Project Corridor - Existing Pipeline (50-foot-wide)
- Project Corridor - Proposed Pipeline (200-foot-wide)

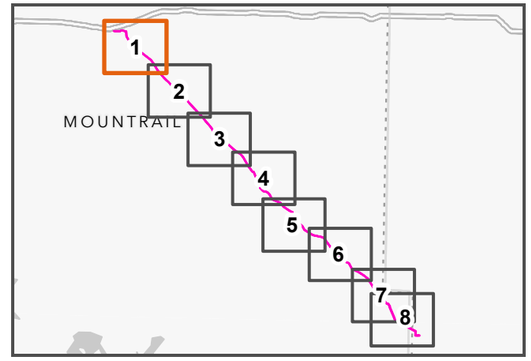
Notes:
1. USGS Topographic Quadrangle for Plaza, Wabek, Makoti obtained through ArcGIS Online streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS

Creator: NCochran Last Saved: 9/27/2024 3:21 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR_NEC_rev2.aprx\BHAR_Figure 1-1 Topographic Map
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.





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38061-180014305	26	156	091	A1	0.002
38061-180014305	26	156	091	A2	0.253
38061-180015100	27	156	091	A1	1.587
38061-180015300	27	156	091	A1	1.563
38061-180017002	27	156	091	A1	0.718
38061-180022300	35	156	091	A2	4.34
38061-180022600	35	156	091	A2	3.788
38061-240002500	06	155	090	A3	1.753
38061-240003000	07	155	090	A3	0.017
38061-240003000	07	155	090	A4	3.185
38061-240003300	07	155	090	A4	2.424
38061-250000100	01	155	091	A3	2.675
38061-250000300	01	155	091	A3	2.557
38061-250000301	01	155	091	A3	2.296
38061-250000600	02	155	091	A2	0.336
38061-250000600	02	155	091	A3	0.003
38061-610053550	27	156	091	A1	0.799
38061-610053551	27	156	091	A1	0.954

FIGURE 1-2.1

Arcadis Segments

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

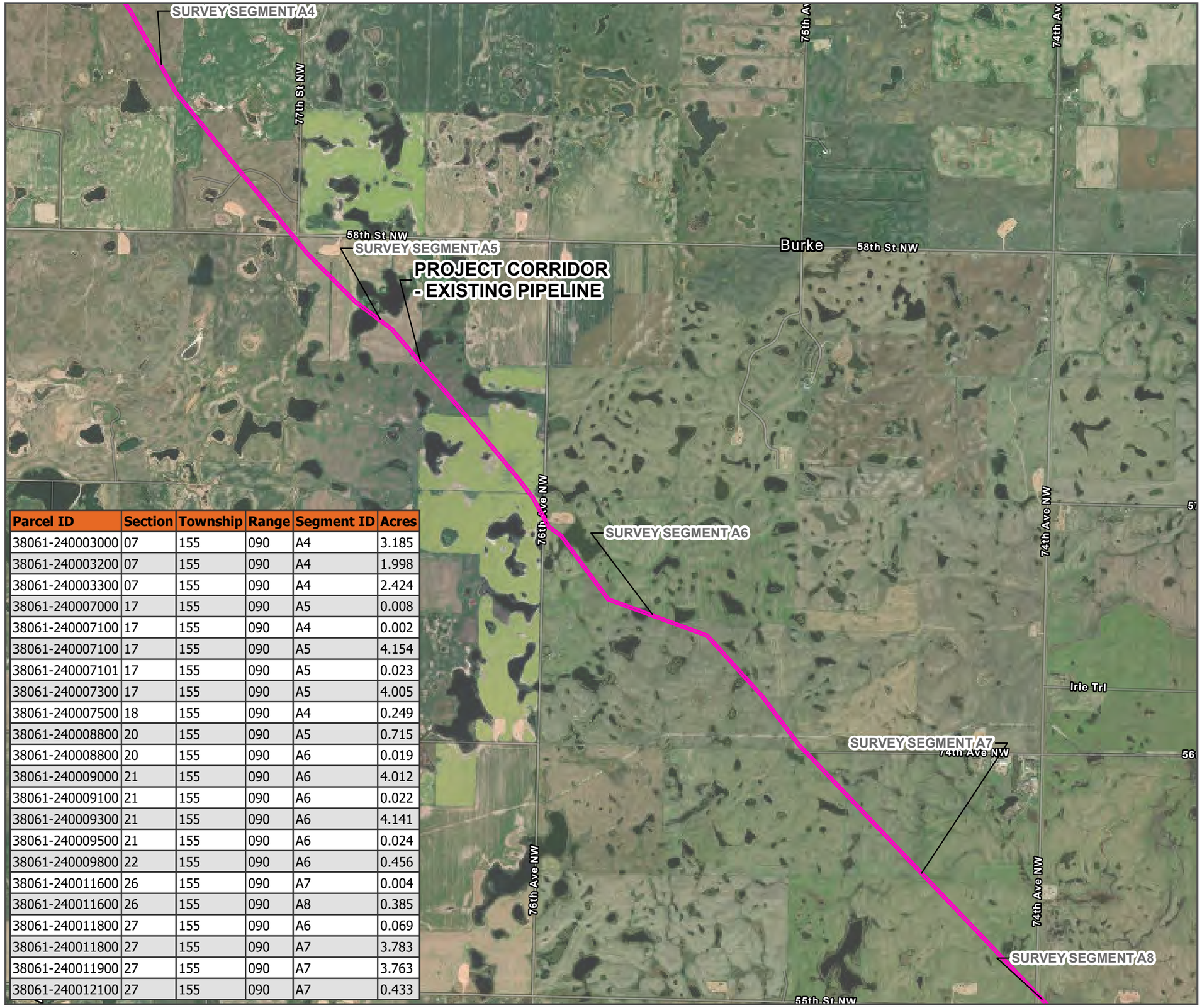
Legend

Project Corridor - Existing Pipeline (50-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Stanley SE, Stanley obtained through ArcGIS Online streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS



Parcel ID	Section	Township	Range	Segment ID	Acres
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38061-240003200	07	155	090	A4	1.998
38061-240003300	07	155	090	A4	2.424
38061-240007000	17	155	090	A5	0.008
38061-240007100	17	155	090	A4	0.002
38061-240007100	17	155	090	A5	4.154
38061-240007101	17	155	090	A5	0.023
38061-240007300	17	155	090	A5	4.005
38061-240007500	18	155	090	A4	0.249
38061-240008800	20	155	090	A5	0.715
38061-240008800	20	155	090	A6	0.019
38061-240009000	21	155	090	A6	4.012
38061-240009100	21	155	090	A6	0.022
38061-240009300	21	155	090	A6	4.141
38061-240009500	21	155	090	A6	0.024
38061-240009800	22	155	090	A6	0.456
38061-240011600	26	155	090	A7	0.004
38061-240011600	26	155	090	A8	0.385
38061-240011800	27	155	090	A6	0.069
38061-240011800	27	155	090	A7	3.783
38061-240011900	27	155	090	A7	3.763
38061-240012100	27	155	090	A7	0.433

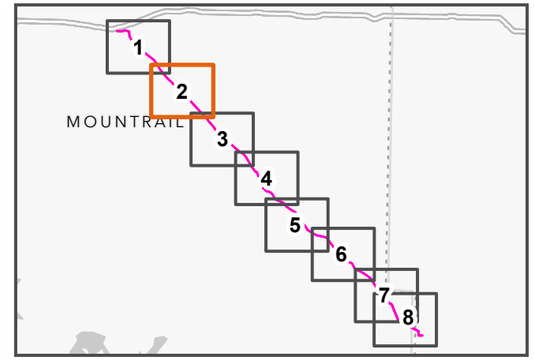


FIGURE 1-2.2

Arcadis Segments

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

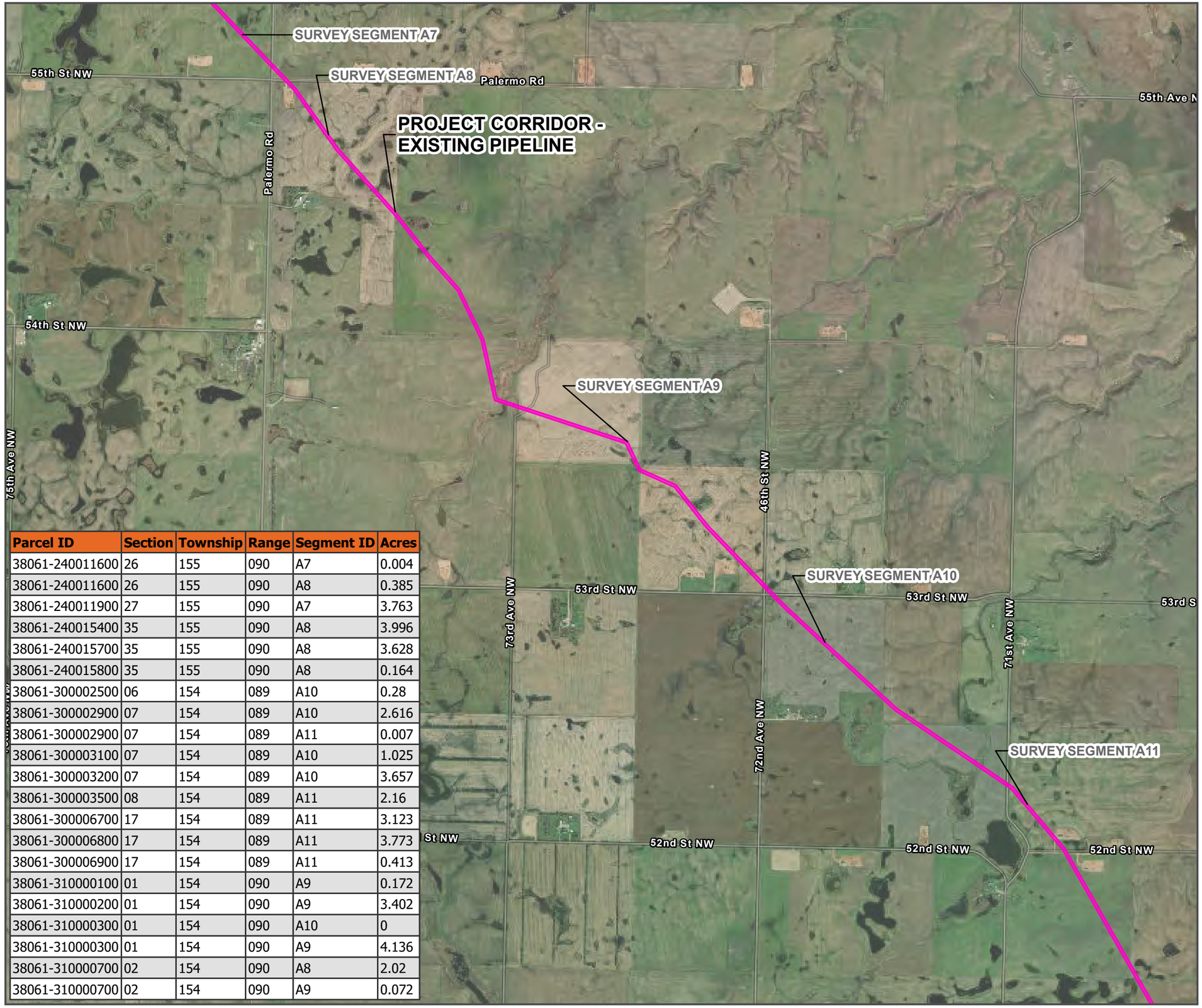
Legend

Project Corridor - Existing Pipeline (50-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Stanley SE, Belden, Epworth NW obtained through ArcGIS O streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS



Parcel ID	Section	Township	Range	Segment ID	Acres
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38061-240011600	26	155	090	A8	0.385
38061-240011900	27	155	090	A7	3.763
38061-240015400	35	155	090	A8	3.996
38061-240015700	35	155	090	A8	3.628
38061-240015800	35	155	090	A8	0.164
38061-300002500	06	154	089	A10	0.28
38061-300002900	07	154	089	A10	2.616
38061-300002900	07	154	089	A11	0.007
38061-300003100	07	154	089	A10	1.025
38061-300003200	07	154	089	A10	3.657
38061-300003500	08	154	089	A11	2.16
38061-300006700	17	154	089	A11	3.123
38061-300006800	17	154	089	A11	3.773
38061-300006900	17	154	089	A11	0.413
38061-310000100	01	154	090	A9	0.172
38061-310000200	01	154	090	A9	3.402
38061-310000300	01	154	090	A10	0
38061-310000300	01	154	090	A9	4.136
38061-310000700	02	154	090	A8	2.02
38061-310000700	02	154	090	A9	0.072

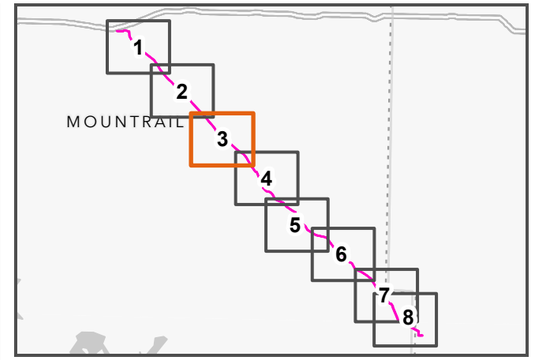


FIGURE 1-2.3

Arcadis Segments

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

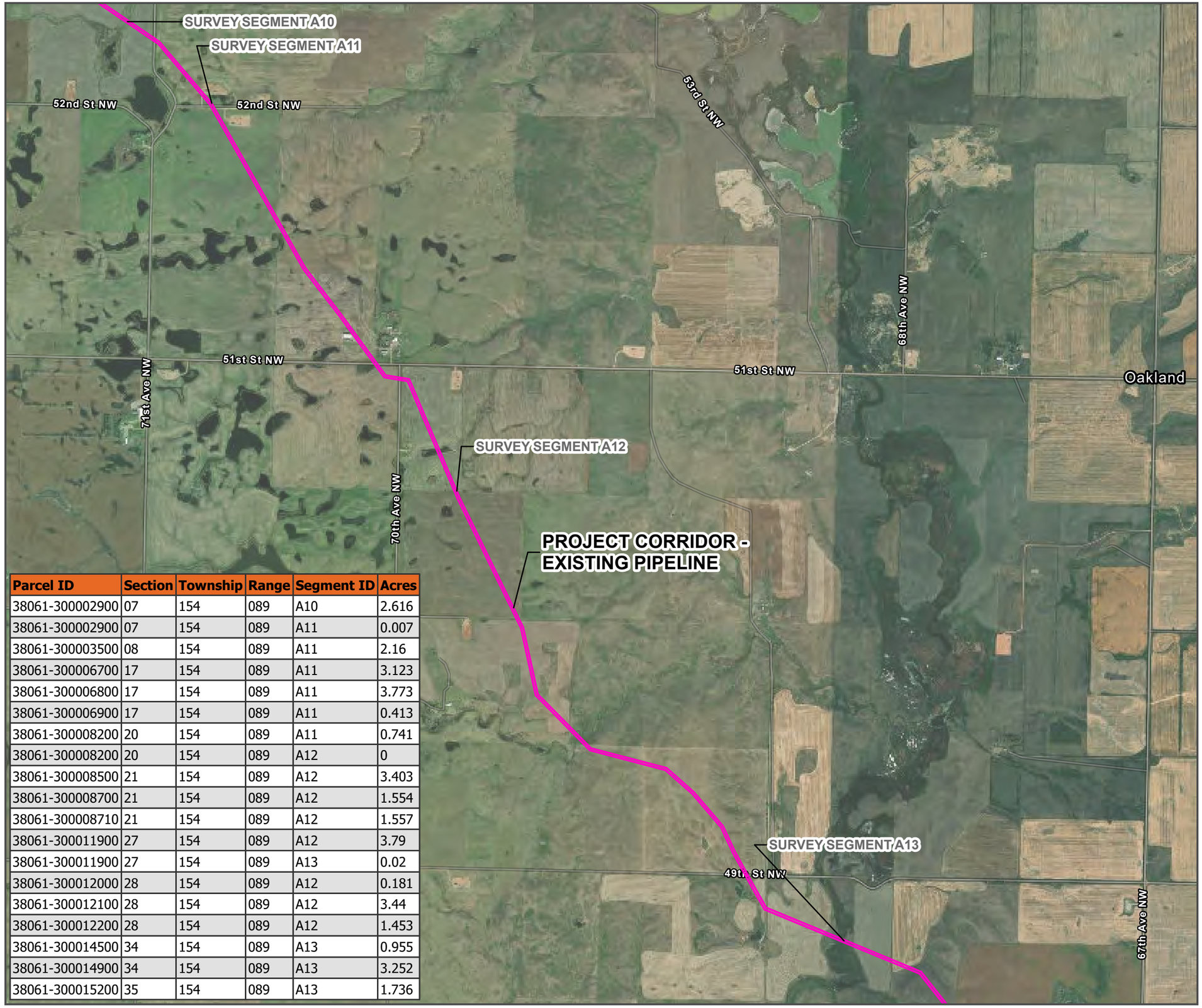
Legend

Project Corridor - Existing Pipeline (50-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Epworth NW obtained through ArcGIS Online streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS



Parcel ID	Section	Township	Range	Segment ID	Acres
38061-300002900	07	154	089	A10	2.616
38061-300002900	07	154	089	A11	0.007
38061-300003500	08	154	089	A11	2.16
38061-300006700	17	154	089	A11	3.123
38061-300006800	17	154	089	A11	3.773
38061-300006900	17	154	089	A11	0.413
38061-300008200	20	154	089	A11	0.741
38061-300008200	20	154	089	A12	0
38061-300008500	21	154	089	A12	3.403
38061-300008700	21	154	089	A12	1.554
38061-300008710	21	154	089	A12	1.557
38061-300011900	27	154	089	A12	3.79
38061-300011900	27	154	089	A13	0.02
38061-300012000	28	154	089	A12	0.181
38061-300012100	28	154	089	A12	3.44
38061-300012200	28	154	089	A12	1.453
38061-300014500	34	154	089	A13	0.955
38061-300014900	34	154	089	A13	3.252
38061-300015200	35	154	089	A13	1.736

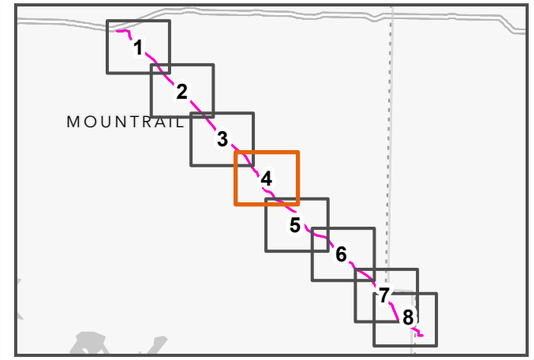


FIGURE 1-2.4

Arcadis Segments

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

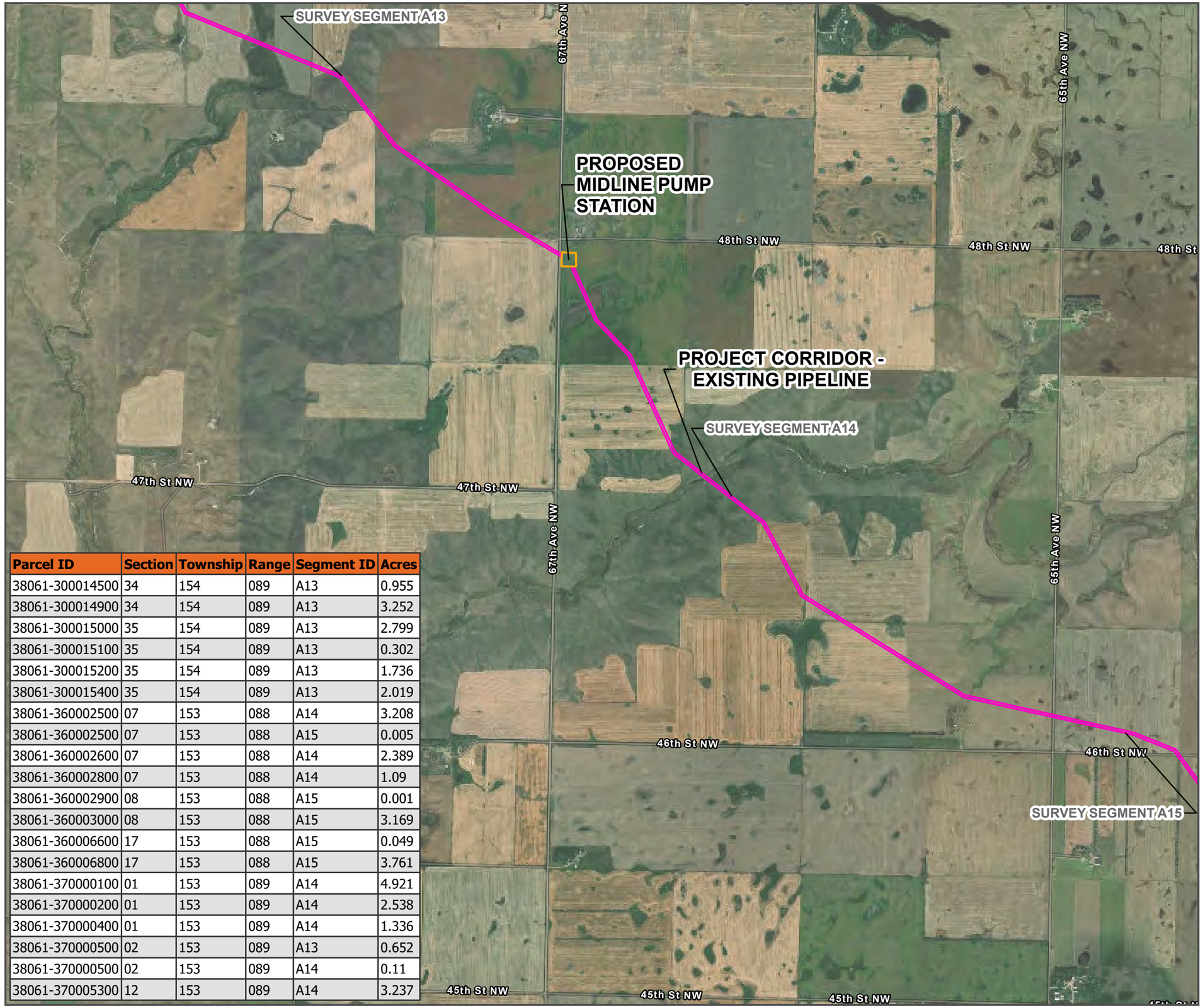
Legend

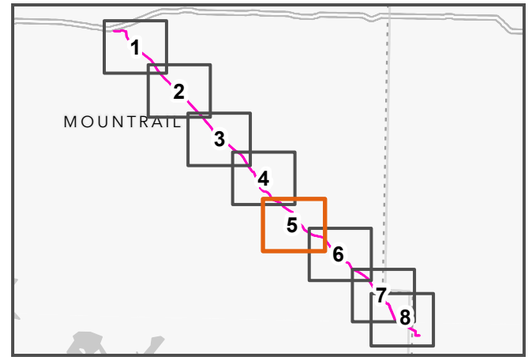
Project Corridor - Existing Pipeline (50-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Epworth NW, Shell Lake, Epworth SE obtained through ArcG
streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS





Parcel ID	Section	Township	Range	Segment ID	Acres
38061-300014500	34	154	089	A13	0.955
38061-300014900	34	154	089	A13	3.252
38061-300015000	35	154	089	A13	2.799
38061-300015100	35	154	089	A13	0.302
38061-300015200	35	154	089	A13	1.736
38061-300015400	35	154	089	A13	2.019
38061-360002500	07	153	088	A14	3.208
38061-360002500	07	153	088	A15	0.005
38061-360002600	07	153	088	A14	2.389
38061-360002800	07	153	088	A14	1.09
38061-360002900	08	153	088	A15	0.001
38061-360003000	08	153	088	A15	3.169
38061-360006600	17	153	088	A15	0.049
38061-360006800	17	153	088	A15	3.761
38061-370000100	01	153	089	A14	4.921
38061-370000200	01	153	089	A14	2.538
38061-370000400	01	153	089	A14	1.336
38061-370000500	02	153	089	A13	0.652
38061-370000500	02	153	089	A14	0.11
38061-370005300	12	153	089	A14	3.237

FIGURE 1-2.5
Arcadis Segments
Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Proposed Midline Pump Station

Notes:
1. USGS Topographic Quadrangle for Epworth SE, Shell Lake, Epworth NW obtained through ArcG streaming service.

0 1,000 2,000 4,000 ft
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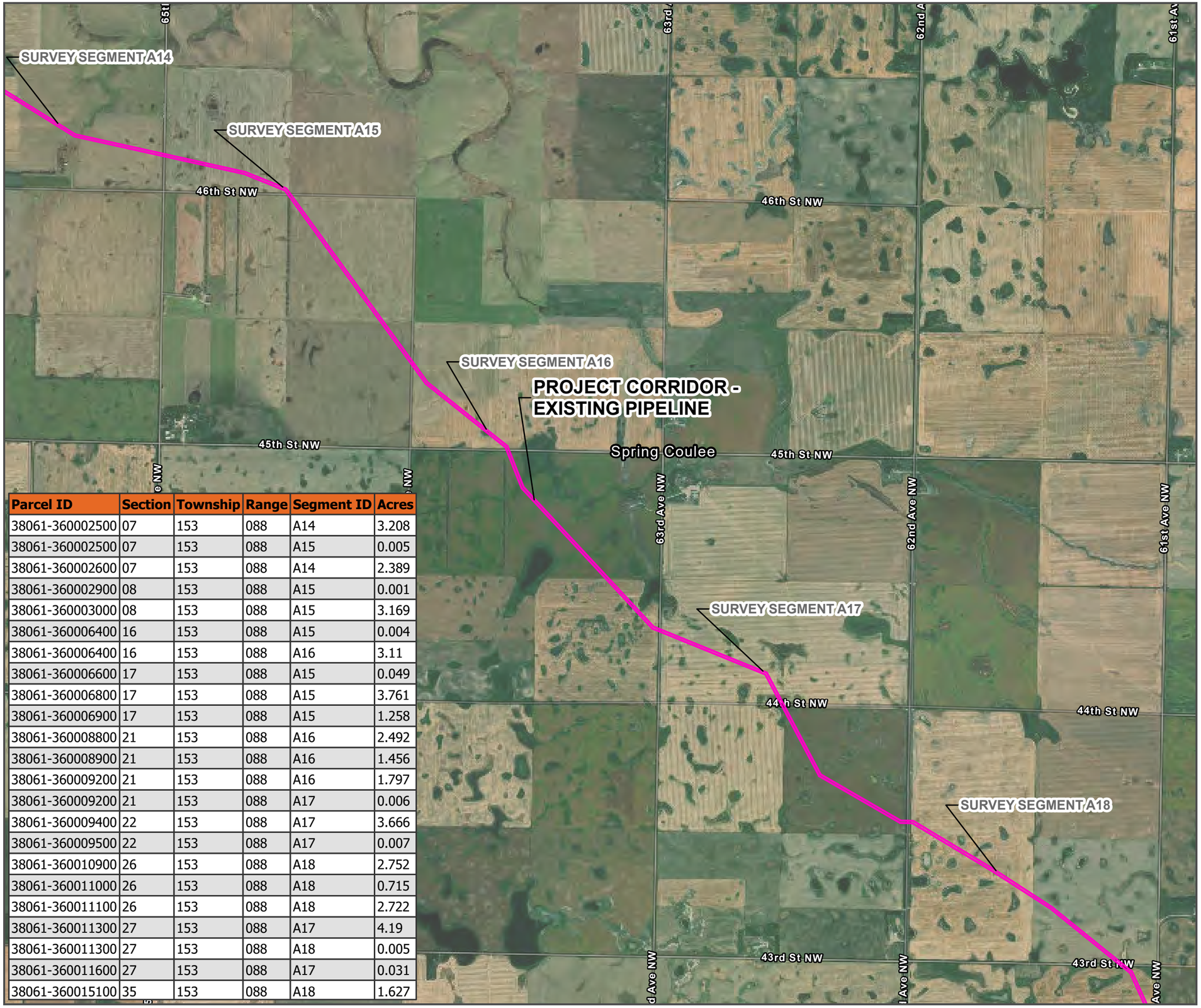
ARCADIS



Parcel ID	Section	Township	Range	Segment ID	Acres
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38061-360002500	07	153	088	A15	0.005
38061-360002600	07	153	088	A14	2.389
38061-360002900	08	153	088	A15	0.001
38061-360003000	08	153	088	A15	3.169
38061-360006400	16	153	088	A15	0.004
38061-360006400	16	153	088	A16	3.11
38061-360006600	17	153	088	A15	0.049
38061-360006800	17	153	088	A15	3.761
38061-360006900	17	153	088	A15	1.258
38061-360008800	21	153	088	A16	2.492
38061-360008900	21	153	088	A16	1.456
38061-360009200	21	153	088	A16	1.797
38061-360009200	21	153	088	A17	0.006
38061-360009400	22	153	088	A17	3.666
38061-360009500	22	153	088	A17	0.007
38061-360010900	26	153	088	A18	2.752
38061-360011000	26	153	088	A18	0.715
38061-360011100	26	153	088	A18	2.722
38061-360011300	27	153	088	A17	4.19
38061-360011300	27	153	088	A18	0.005
38061-360011600	27	153	088	A17	0.031
38061-360015100	35	153	088	A18	1.627

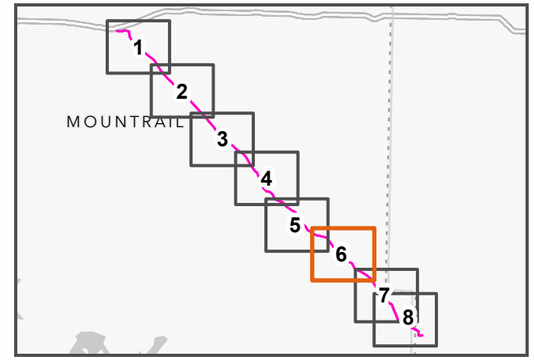


FIGURE 1-2.6
Arcadis Segments
Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

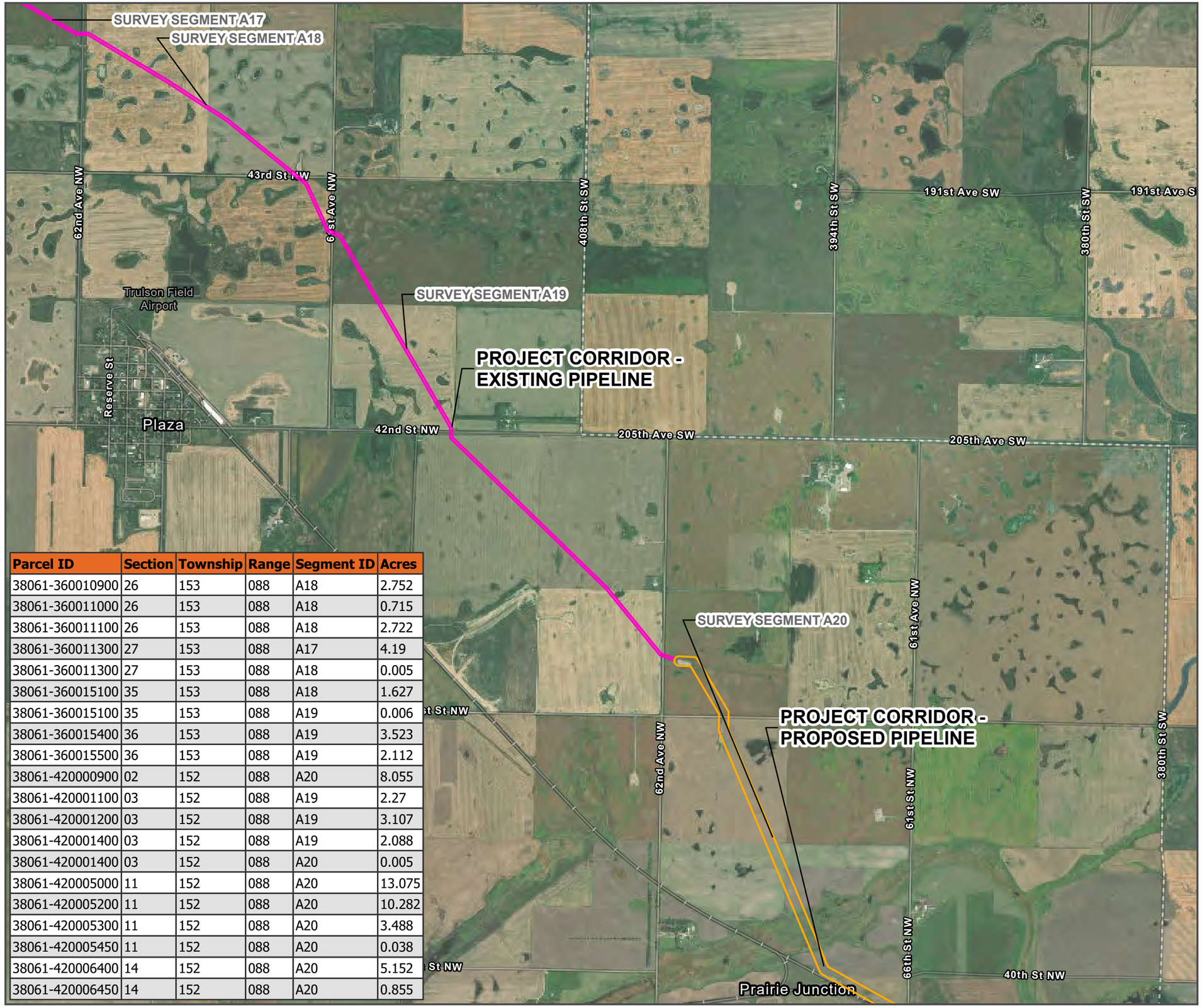
Legend

Project Corridor - Existing Pipeline (50-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Epworth SE obtained through ArcGIS Online streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS



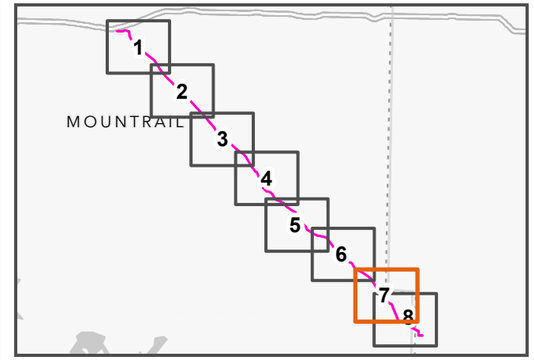


FIGURE 1-2.7

Arcadis Segments

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

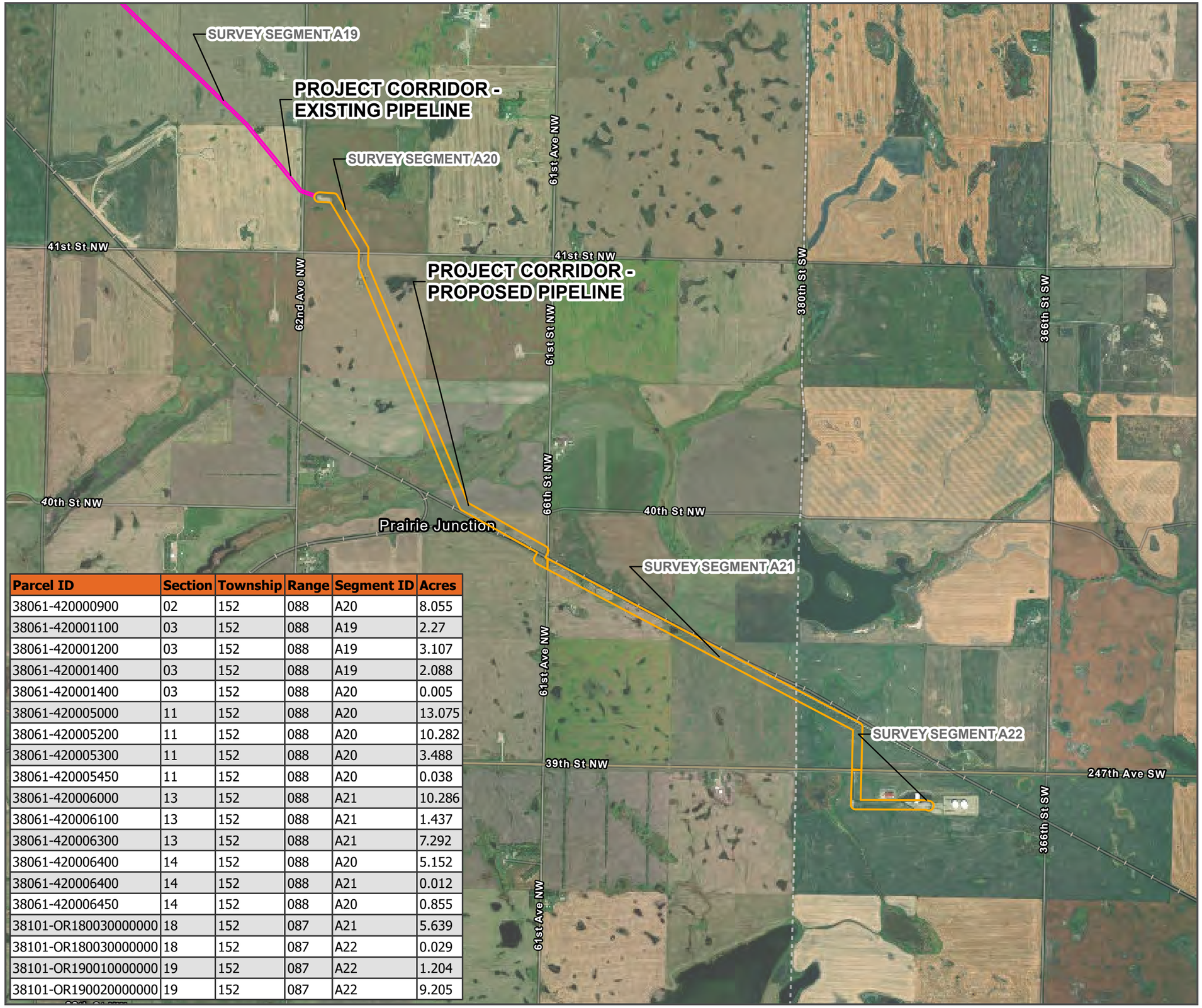
- Project Corridor - Existing Pipeline (50-foot-wide)
- Project Corridor - Proposed Pipeline (200-foot-wide)

Parcel ID	Section	Township	Range	Segment ID	Acres
38061-360010900	26	153	088	A18	2.752
38061-360011000	26	153	088	A18	0.715
38061-360011100	26	153	088	A18	2.722
38061-360011300	27	153	088	A17	4.19
38061-360011300	27	153	088	A18	0.005
38061-360015100	35	153	088	A18	1.627
38061-360015100	35	153	088	A19	0.006
38061-360015400	36	153	088	A19	3.523
38061-360015500	36	153	088	A19	2.112
38061-420000900	02	152	088	A20	8.055
38061-420001100	03	152	088	A19	2.27
38061-420001200	03	152	088	A19	3.107
38061-420001400	03	152	088	A19	2.088
38061-420001400	03	152	088	A20	0.005
38061-420005000	11	152	088	A20	13.075
38061-420005200	11	152	088	A20	10.282
38061-420005300	11	152	088	A20	3.488
38061-420005450	11	152	088	A20	0.038
38061-420006400	14	152	088	A20	5.152
38061-420006450	14	152	088	A20	0.855

Notes:
1. USGS Topographic Quadrangle for Plaza obtained through ArcGIS Online streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS



Parcel ID	Section	Township	Range	Segment ID	Acres
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38061-420001100	03	152	088	A19	2.27
38061-420001200	03	152	088	A19	3.107
38061-420001400	03	152	088	A19	2.088
38061-420001400	03	152	088	A20	0.005
38061-420005000	11	152	088	A20	13.075
38061-420005200	11	152	088	A20	10.282
38061-420005300	11	152	088	A20	3.488
38061-420005450	11	152	088	A20	0.038
38061-420006000	13	152	088	A21	10.286
38061-420006100	13	152	088	A21	1.437
38061-420006300	13	152	088	A21	7.292
38061-420006400	14	152	088	A20	5.152
38061-420006400	14	152	088	A21	0.012
38061-420006450	14	152	088	A20	0.855
38101-OR180030000000	18	152	087	A21	5.639
38101-OR180030000000	18	152	087	A22	0.029
38101-OR190010000000	19	152	087	A22	1.204
38101-OR190020000000	19	152	087	A22	9.205

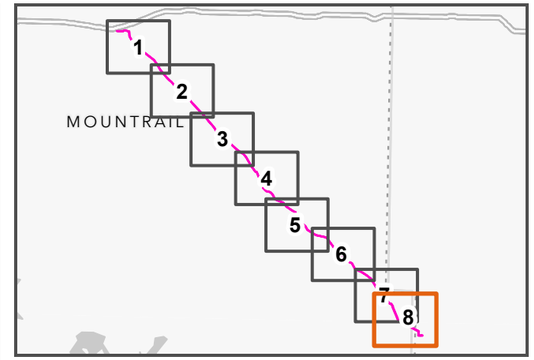


FIGURE 1-2.8

Arcadis Segments

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

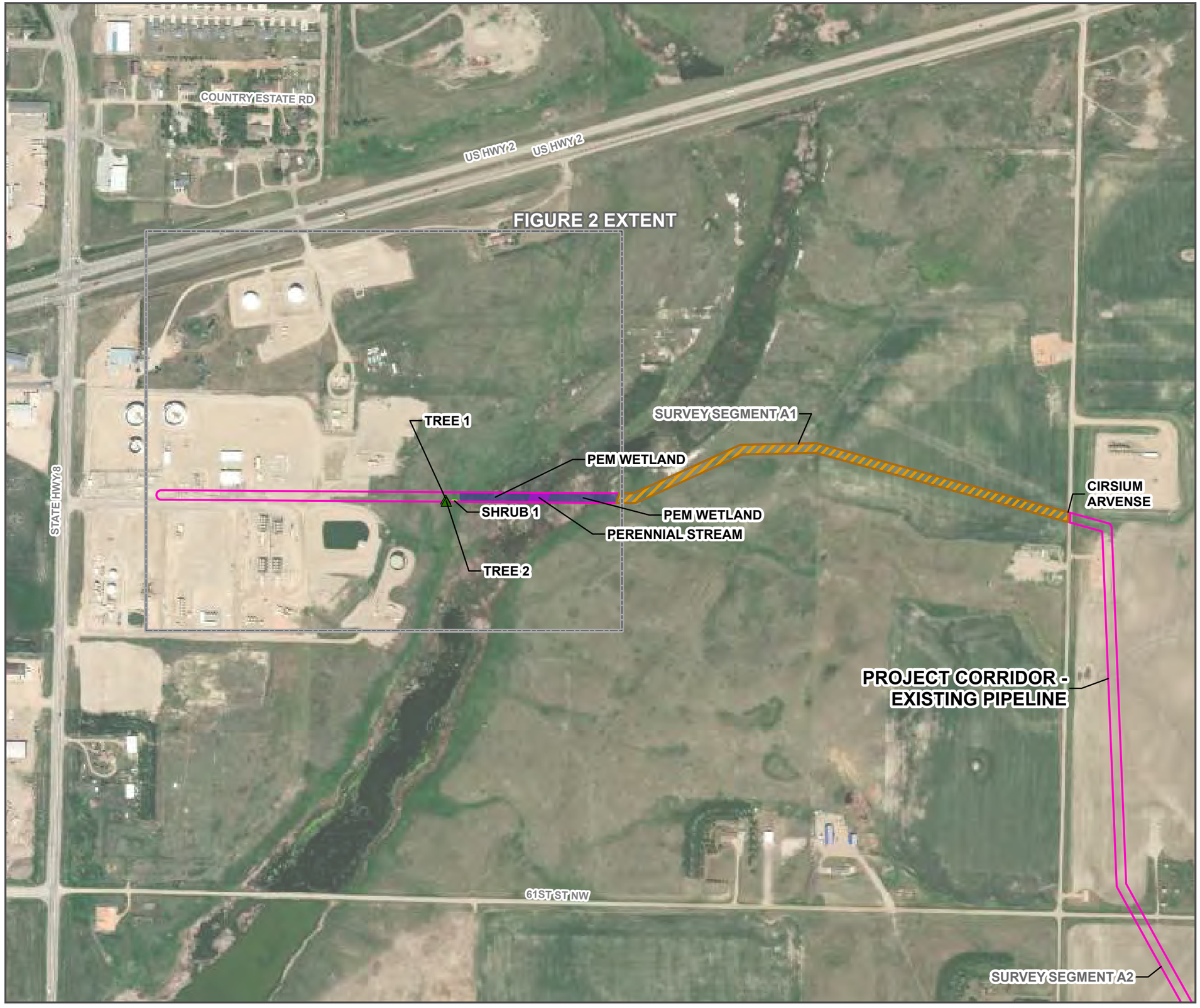
- Project Corridor - Existing Pipeline (50-foot-wide)
- Project Corridor - Proposed Pipeline (200-foot-wide)

Notes:
1. USGS Topographic Quadrangle for Plaza, Wabek, Makoti obtained through ArcGIS Online streaming service.

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS

Creator: NCochran Last Saved: 9/27/2024 3:21 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR_NEC_rev2.aprx\BHAR_Figure 1-2 Arcadis Segments
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



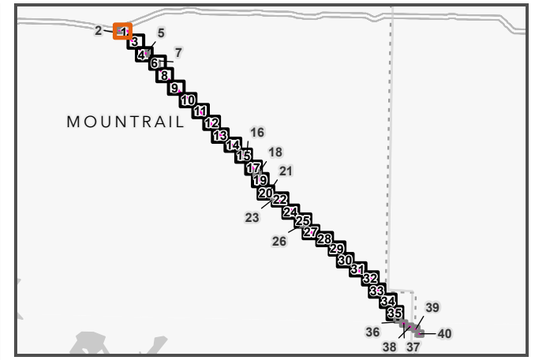


FIGURE 2-1

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Tree Location
- Project Corridor - Existing Pipeline (50-foot-wide)

Noxious Weed Area

- Cirsium arvense

Tree/Shrub Area

- Shrub Area

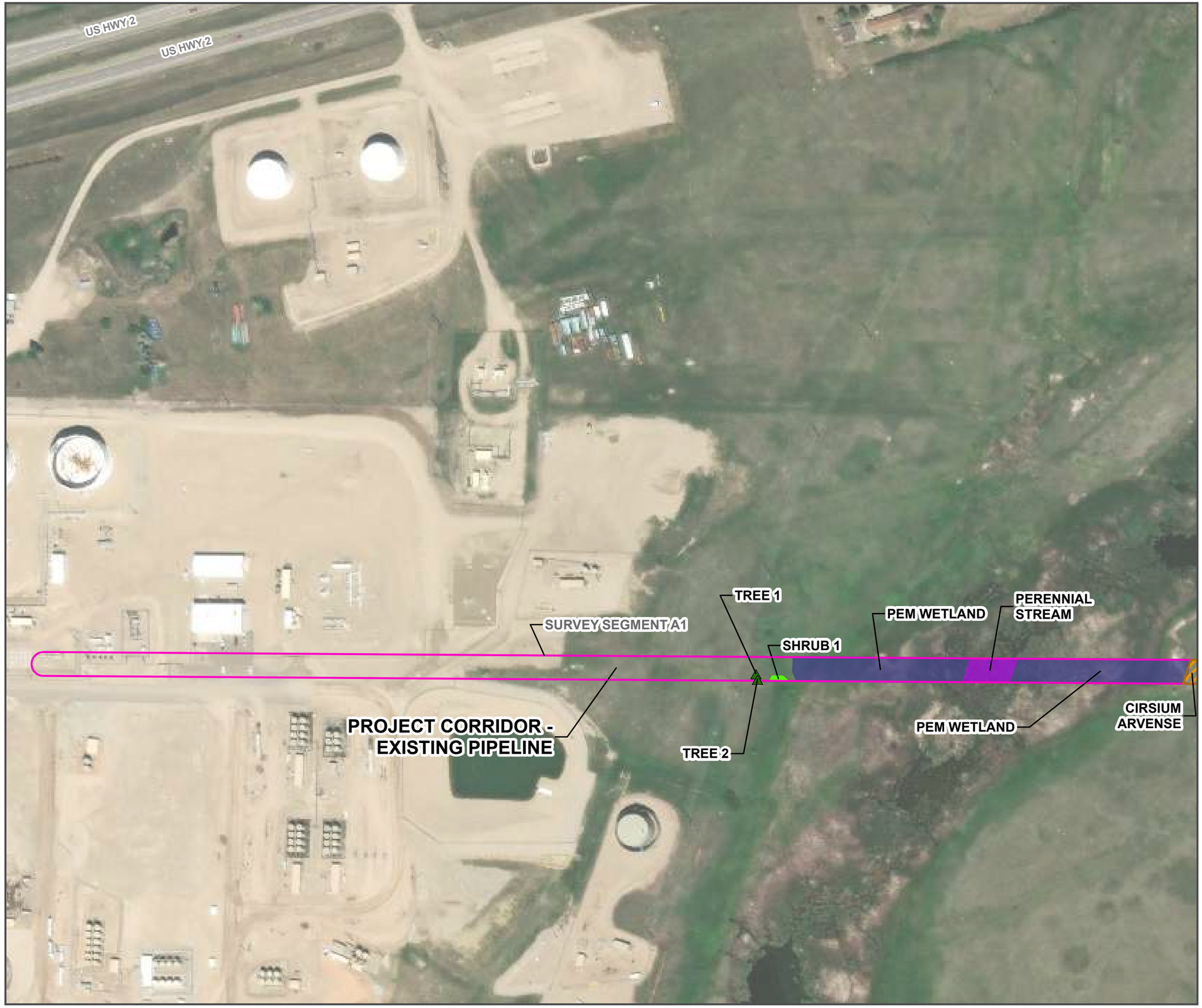
Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS



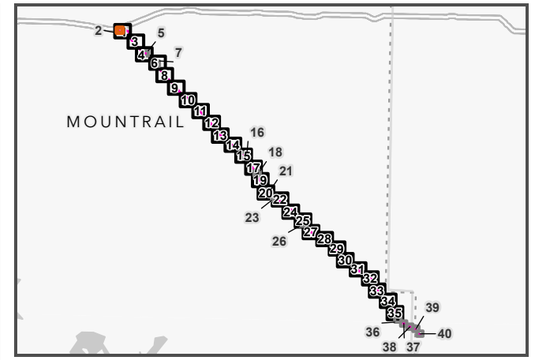


FIGURE 2-2

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Tree Location
- Project Corridor - Existing Pipeline (50-foot-wide)

Noxious Weed Area
- Cirsium arvense

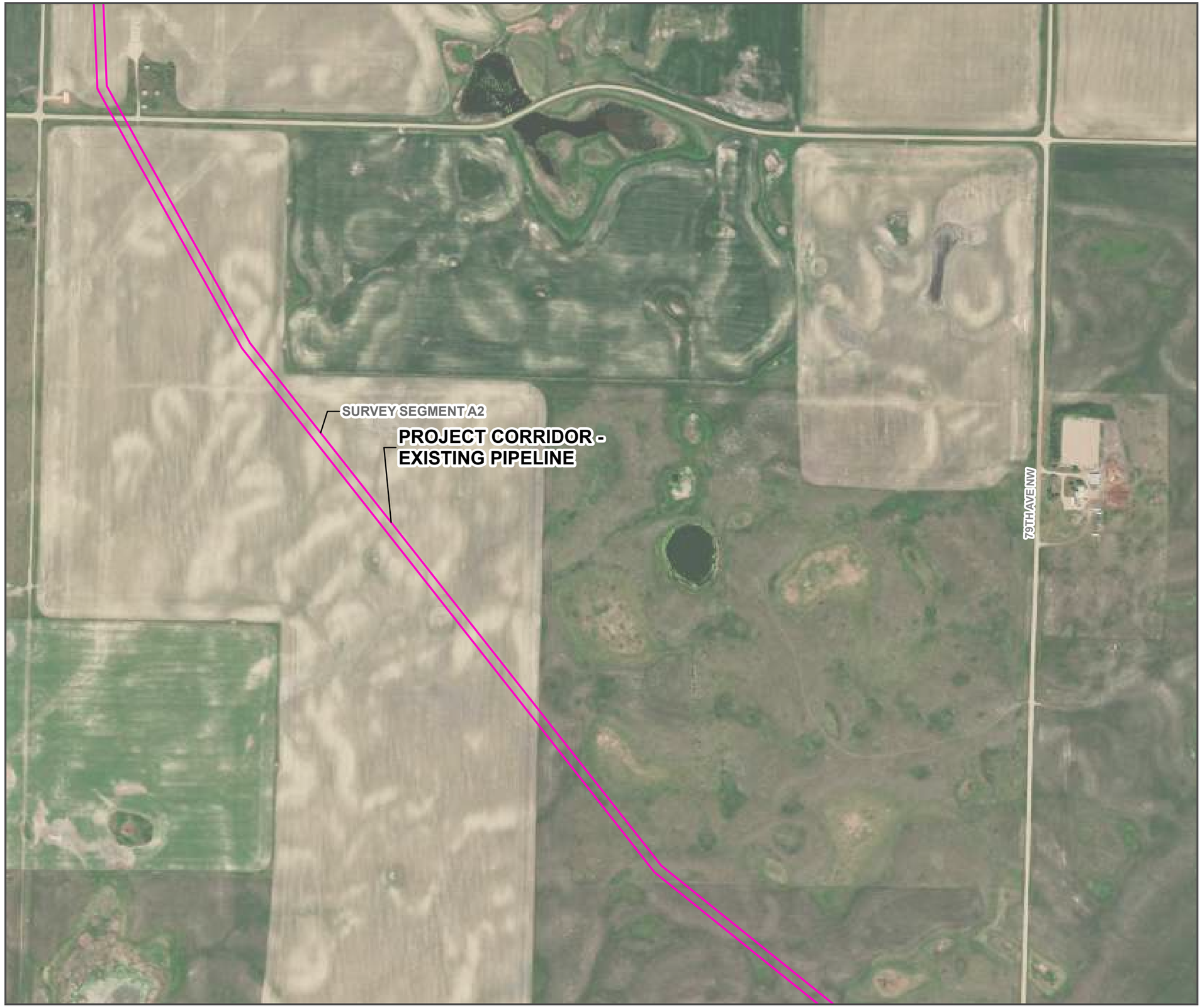
Tree/Shrub Area
- Shrub Area

Federally Listed Species Habitat
- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS



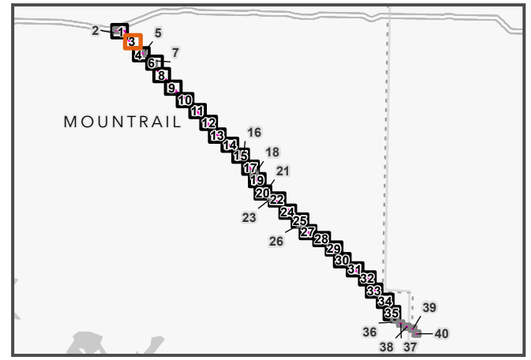


FIGURE 2-3

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

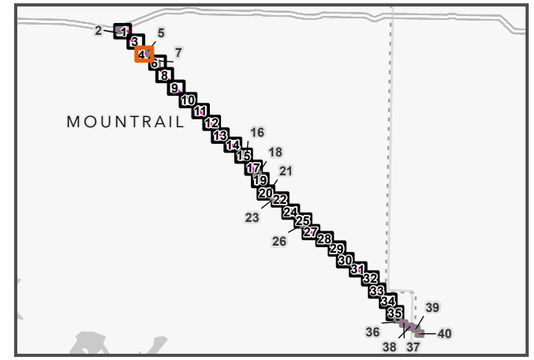


FIGURE 2-4

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Cluster: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

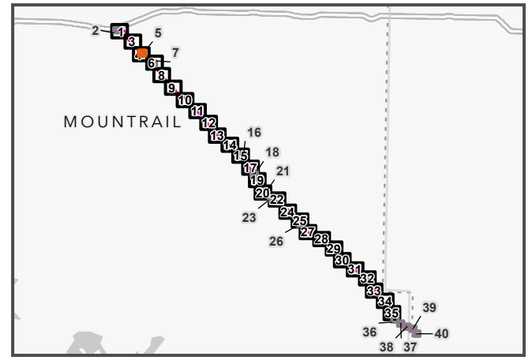


FIGURE 2-5

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

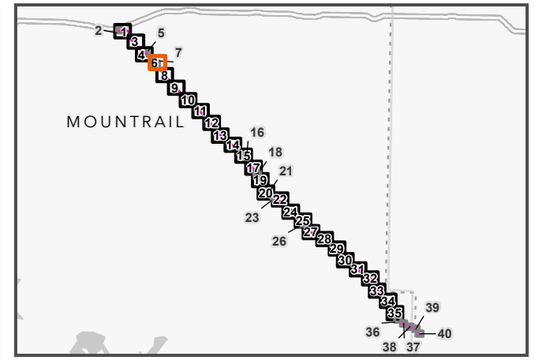


FIGURE 2-6

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Noxious Weed Area

- Cirsium arvense

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

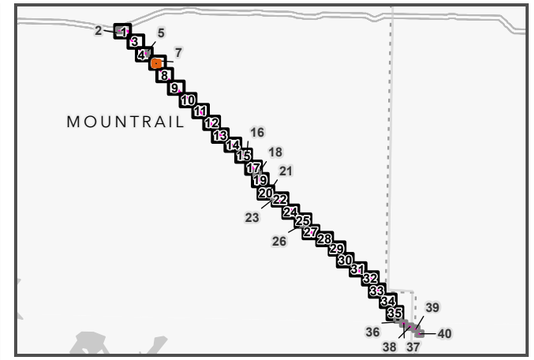


FIGURE 2-7

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Noxious Weed Area

- Cirsium arvense

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

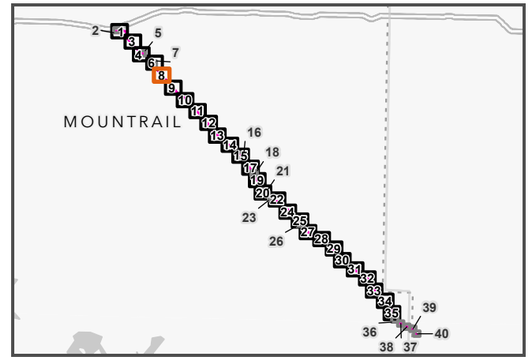


FIGURE 2-8

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

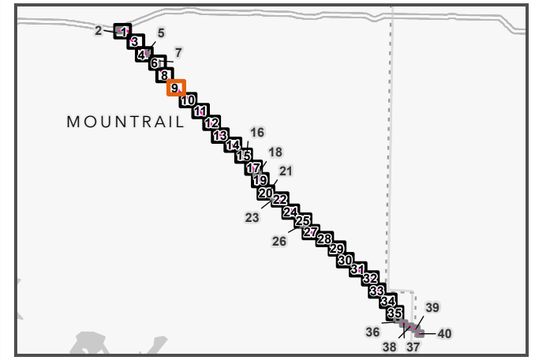


FIGURE 2-9

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Creator: NCochran Last Saved: 10/1/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_ Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

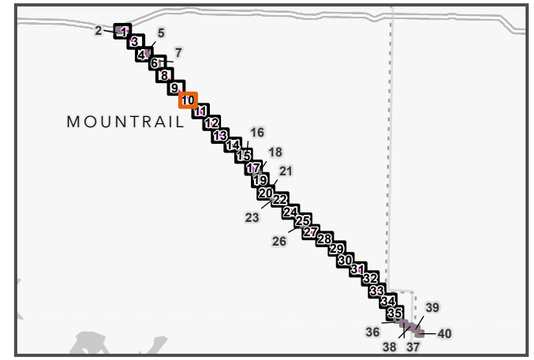


FIGURE 2-10

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

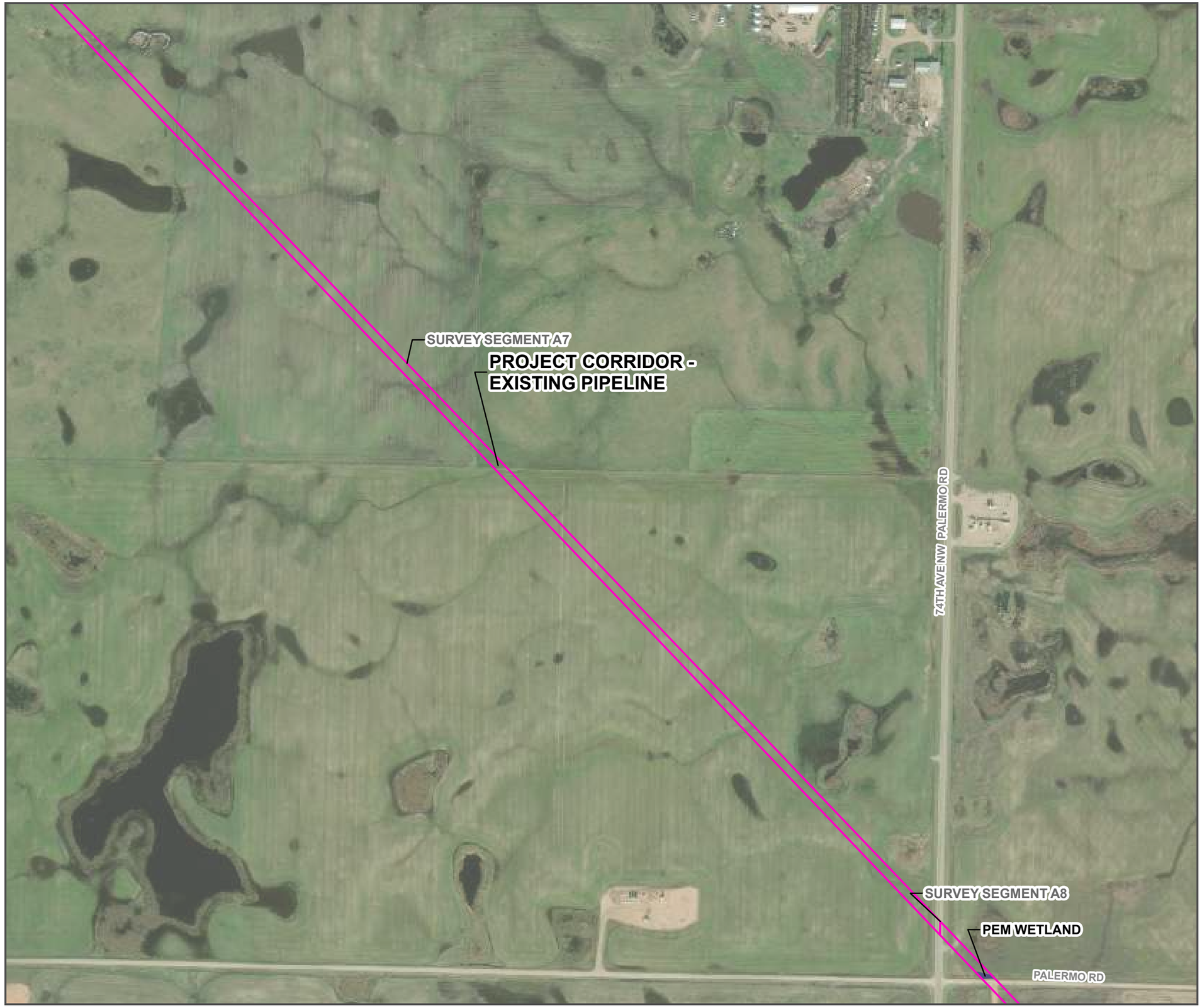
- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Creator: NCochran Last Saved: 10/1/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



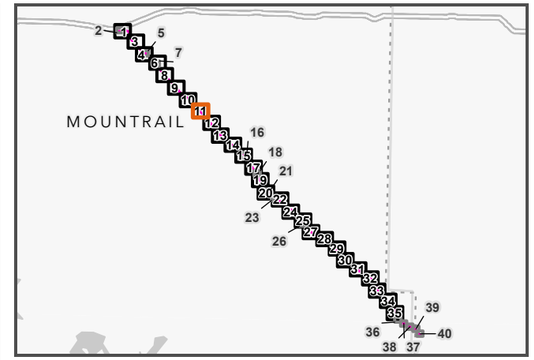


FIGURE 2-11

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

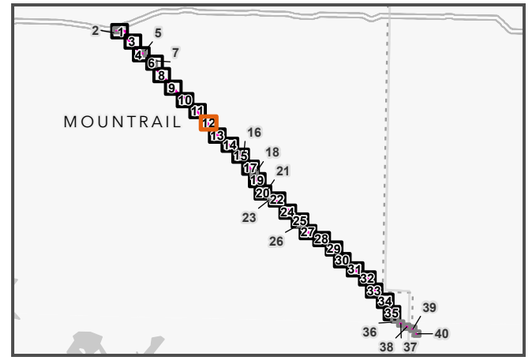


FIGURE 2-12

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

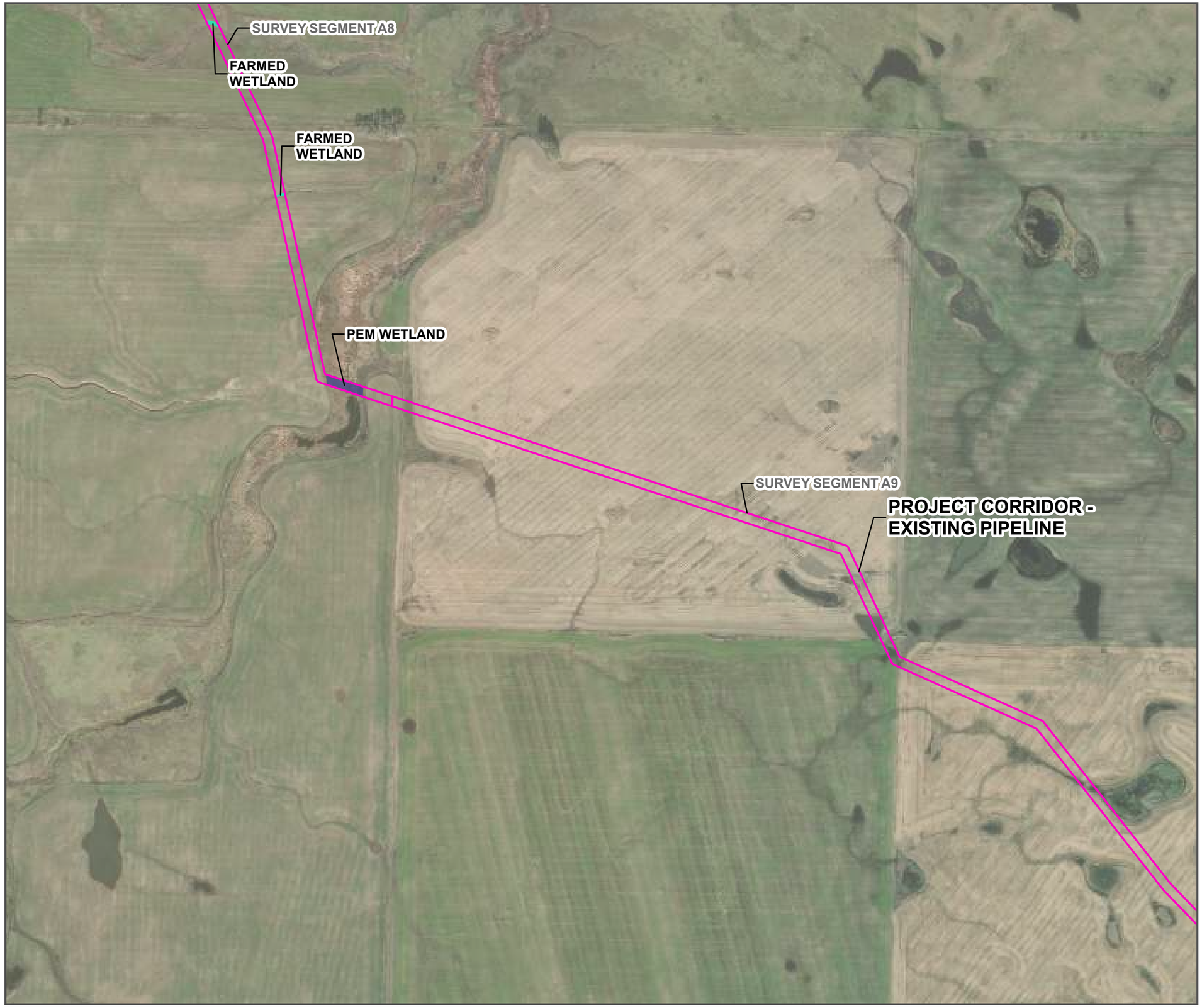
Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS



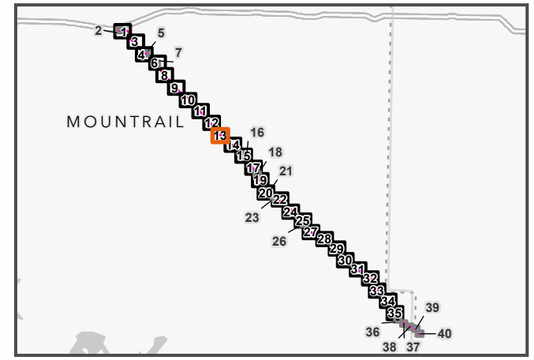


FIGURE 2-13

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

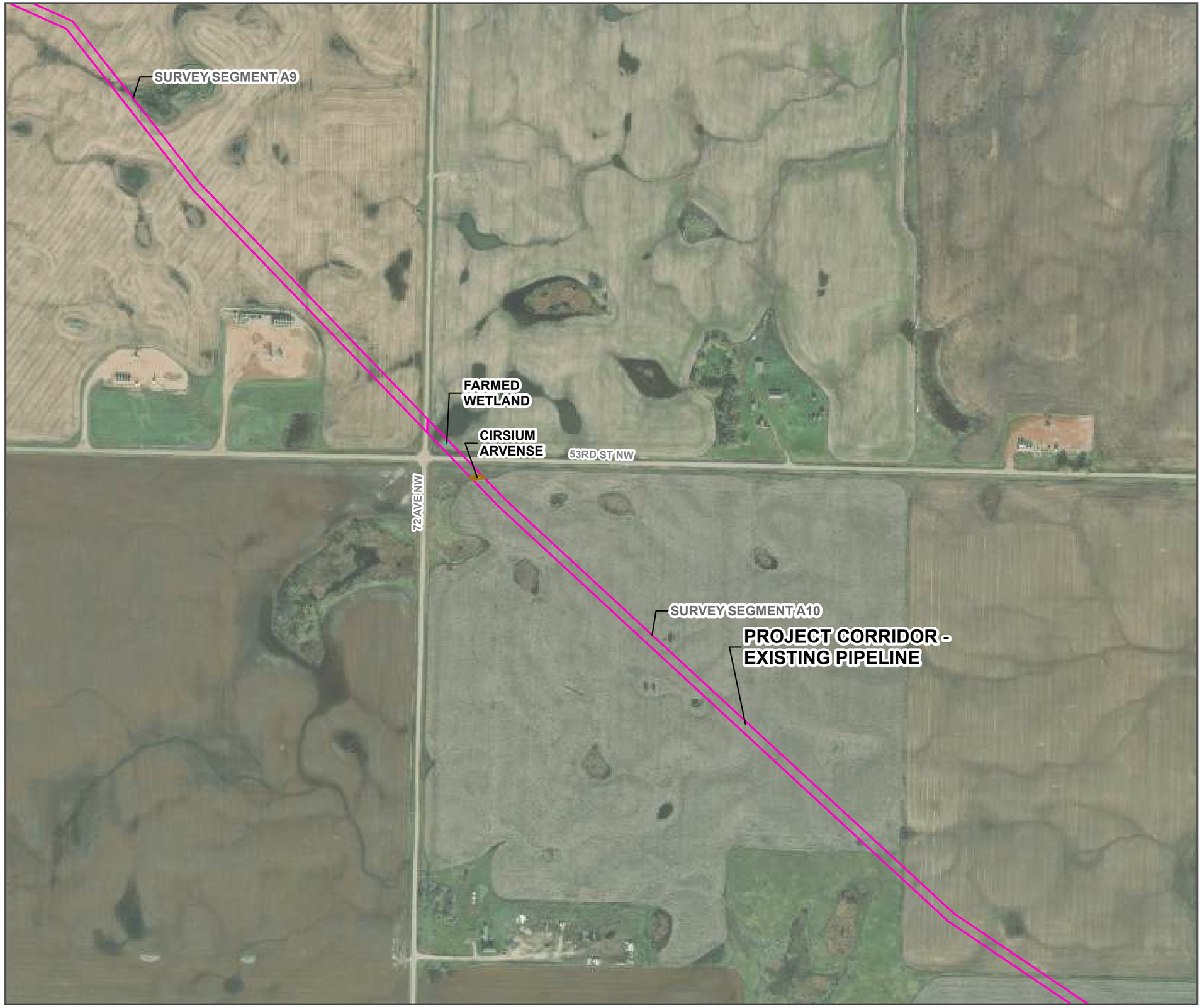
Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS



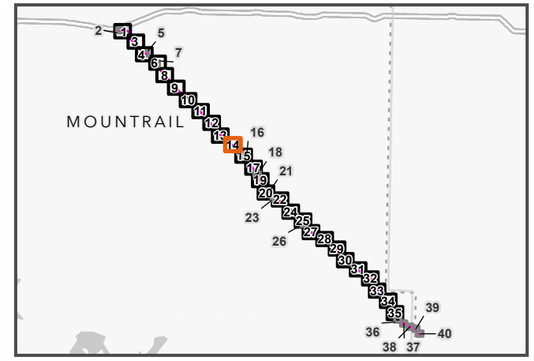


FIGURE 2-14

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Noxious Weed Area

- Cirsium arvense

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

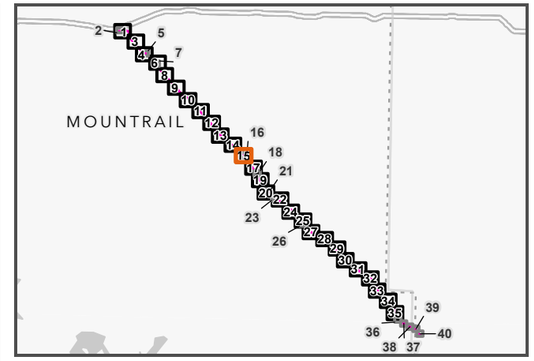


FIGURE 2-15

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Noxious Weed Area

- Cirsium arvense

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

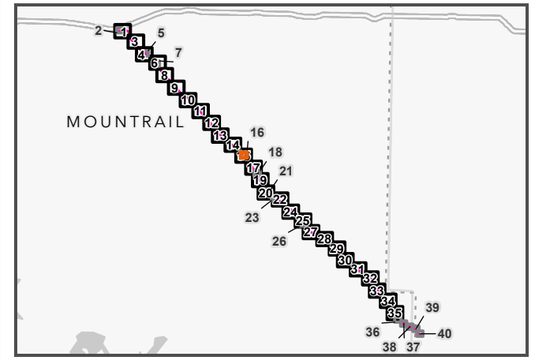


FIGURE 2-16

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Noxious Weed Area

- Cirsium arvense

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

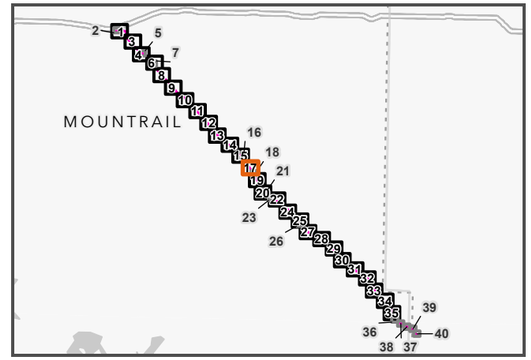


FIGURE 2-17

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

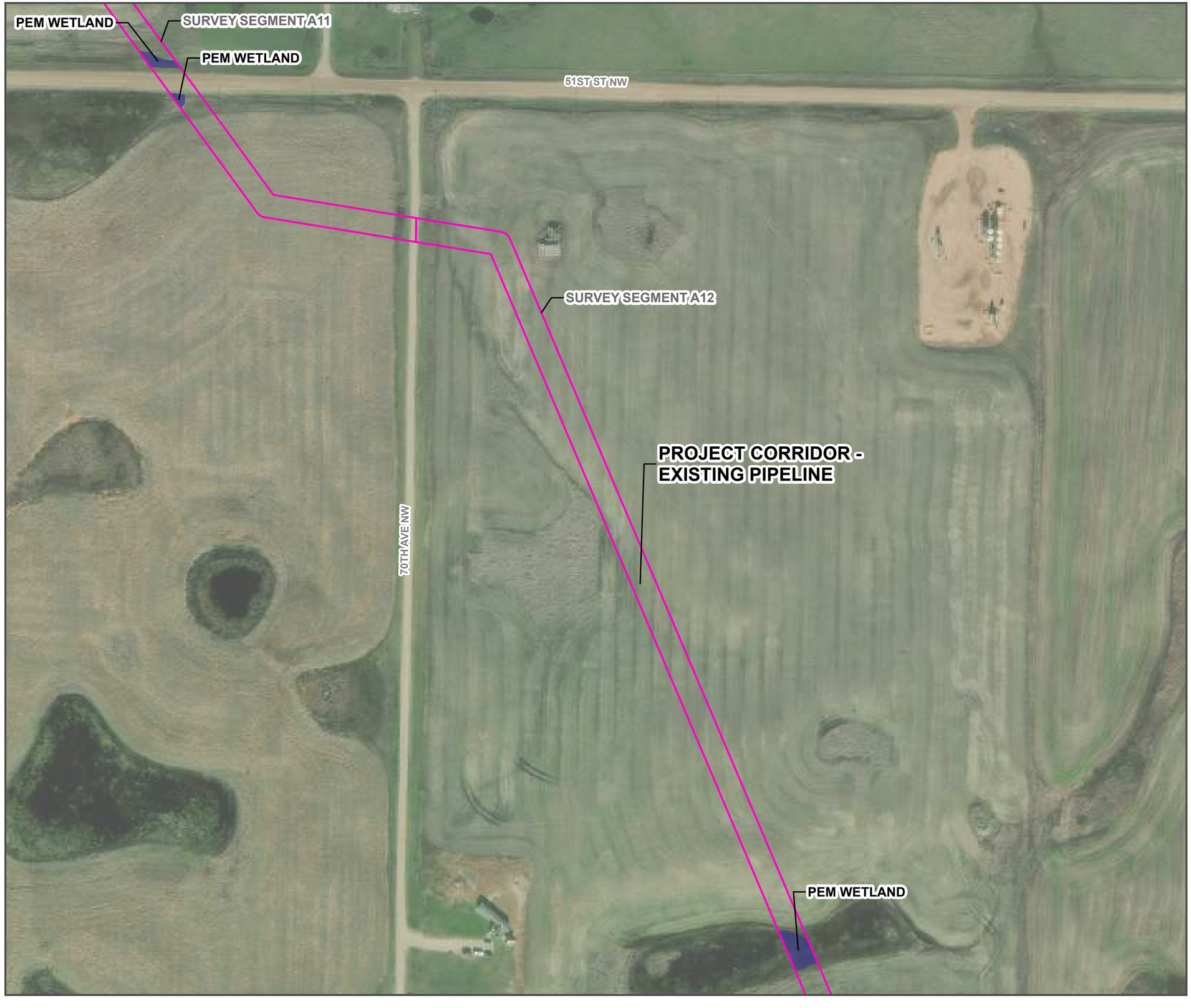
- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Cluster: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



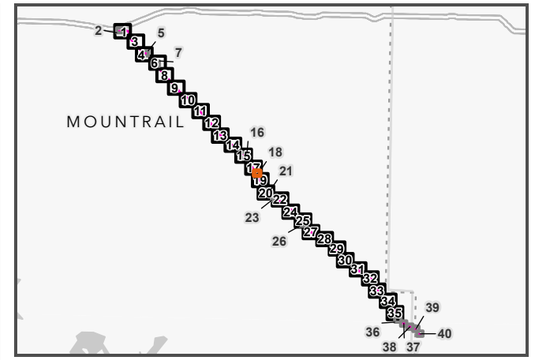


FIGURE 2-18

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

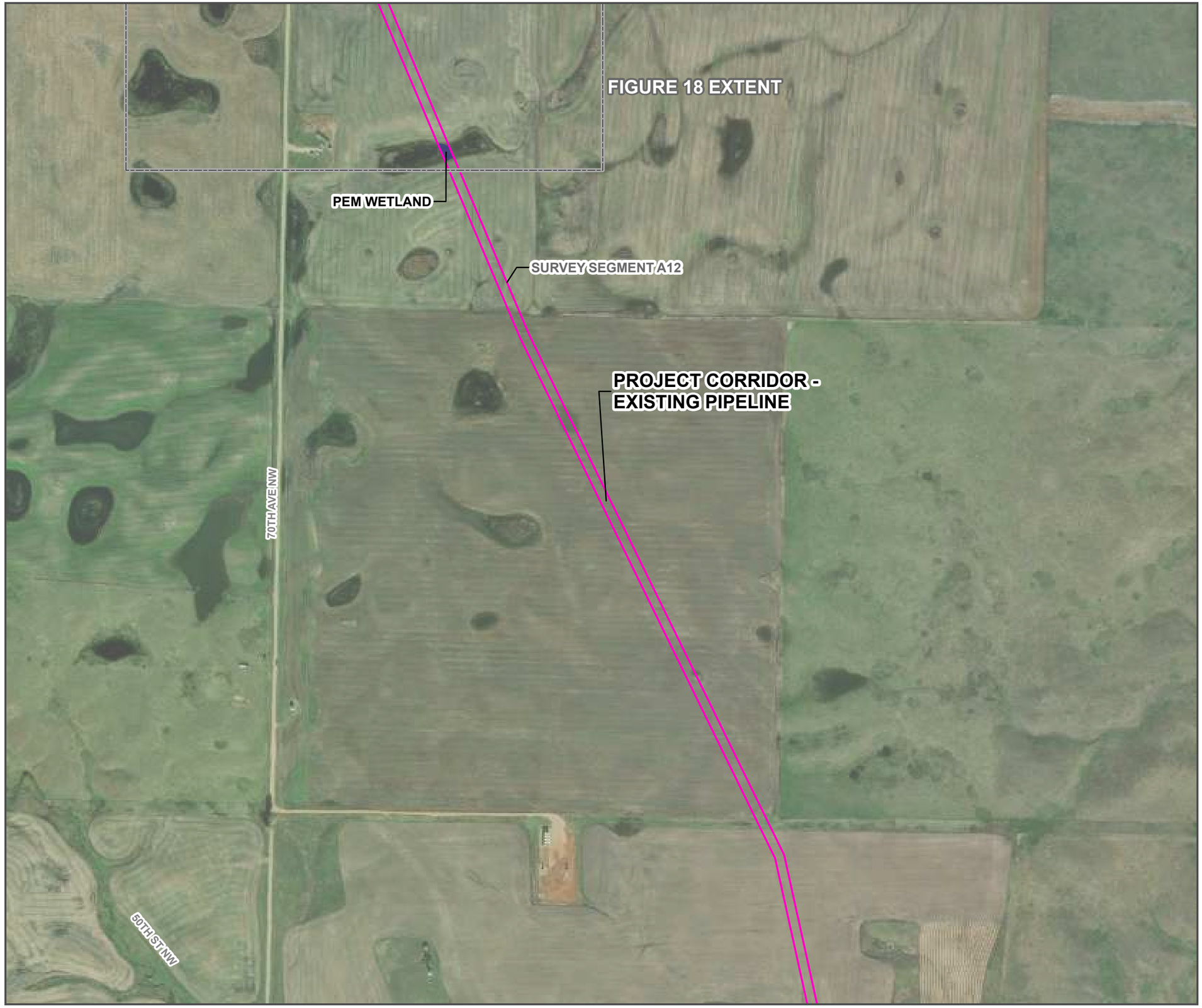
- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 TAE_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



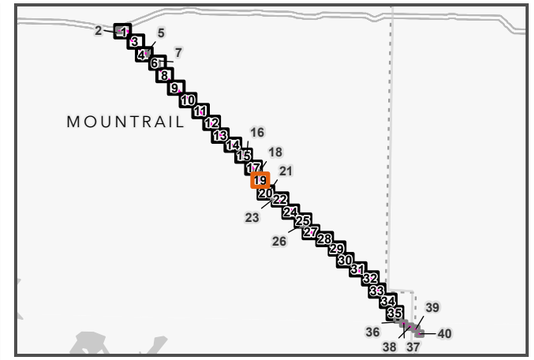


FIGURE 2-19

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Creator: NCochran Last Saved: 10/1/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

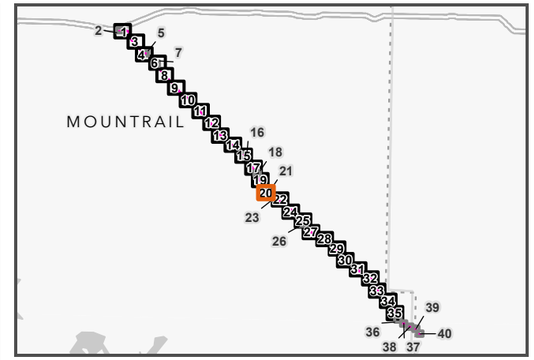


FIGURE 2-20

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Tree/Shrub Area

- Shrub Area

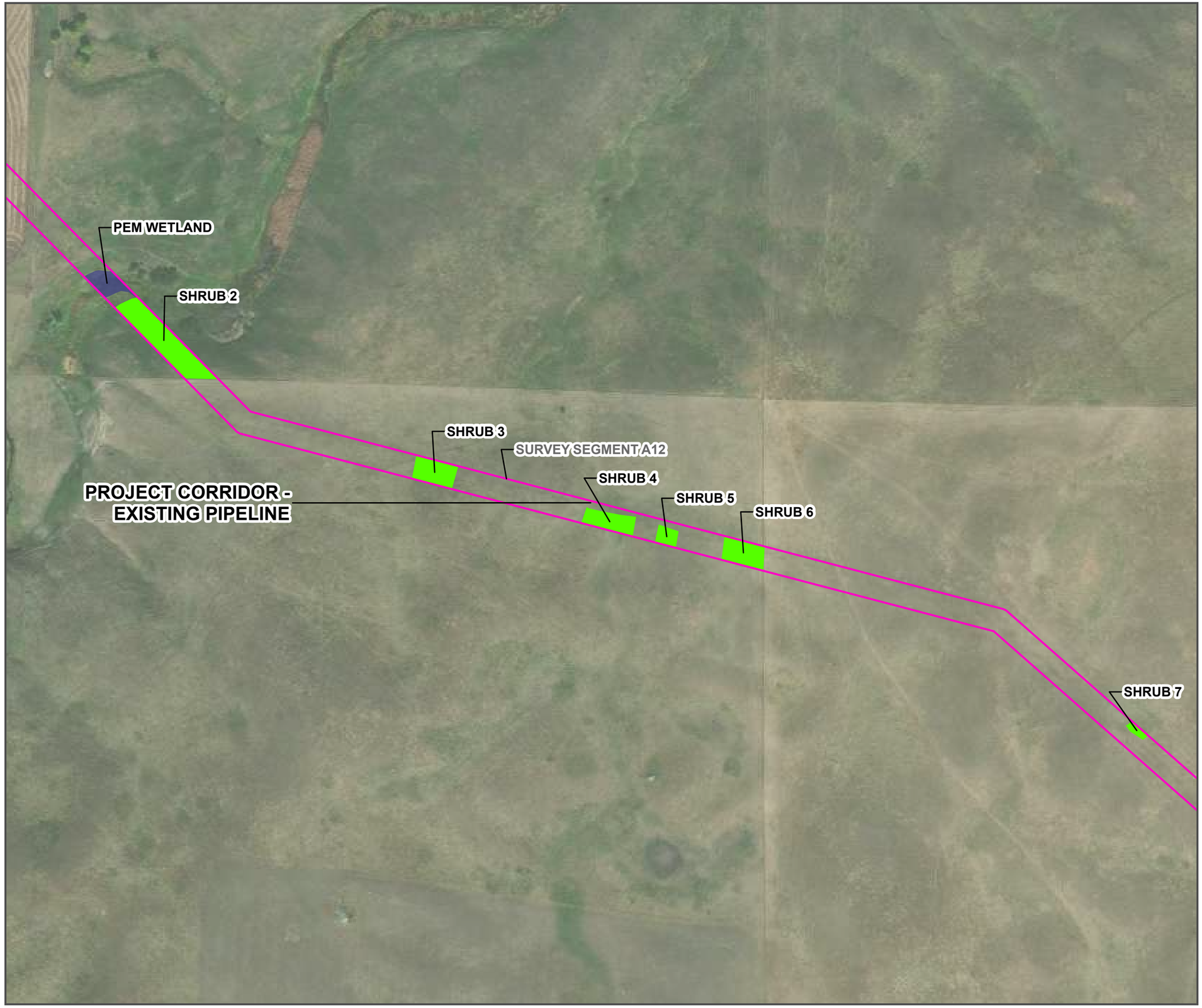
Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS



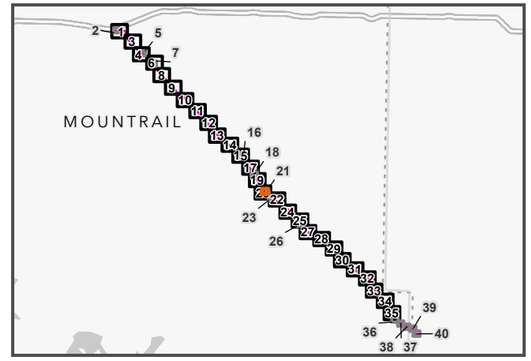


FIGURE 2-21

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Tree/Shrub Area

- Shrub Area

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata

- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

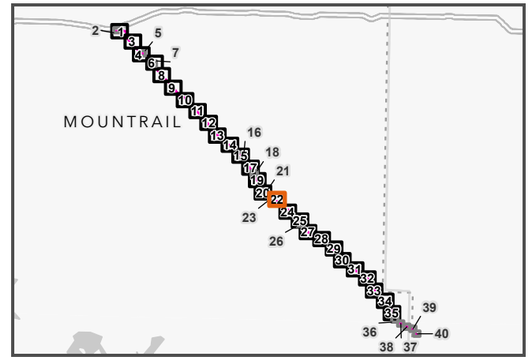


FIGURE 2-22

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Cluster: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

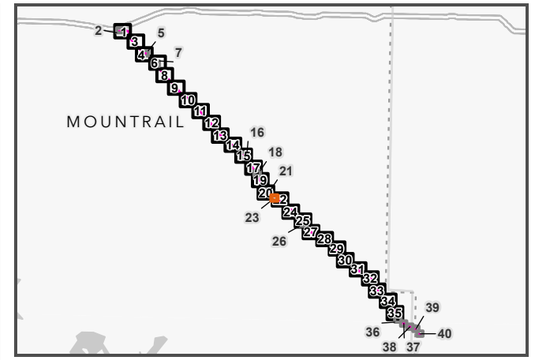


FIGURE 2-23

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

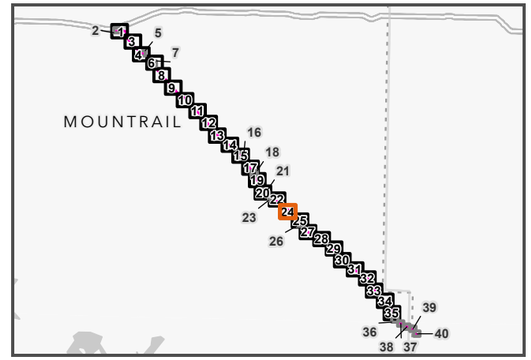


FIGURE 2-24

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Proposed Midline Pump Station

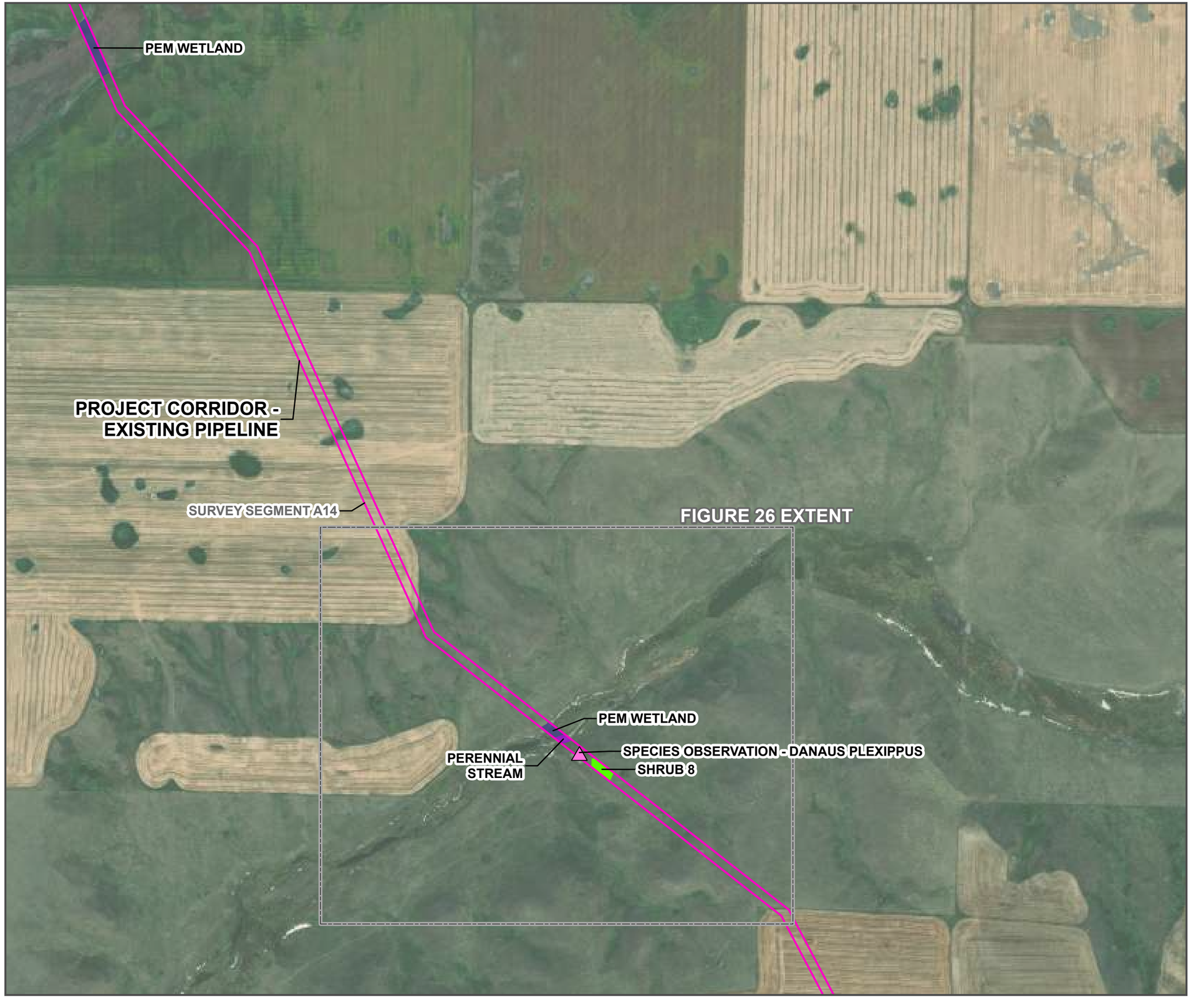
Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS



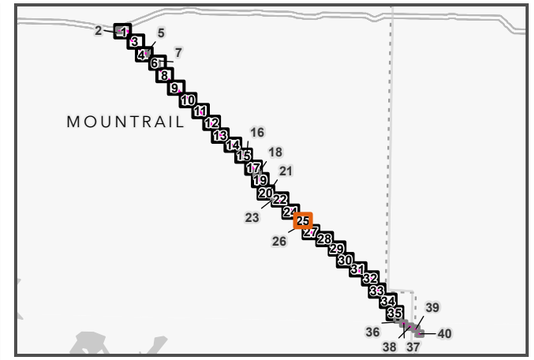


FIGURE 2-25

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Species Observation Location
- Project Corridor - Existing Pipeline (50-foot-wide)

Tree/Shrub Area

- Shrub Area

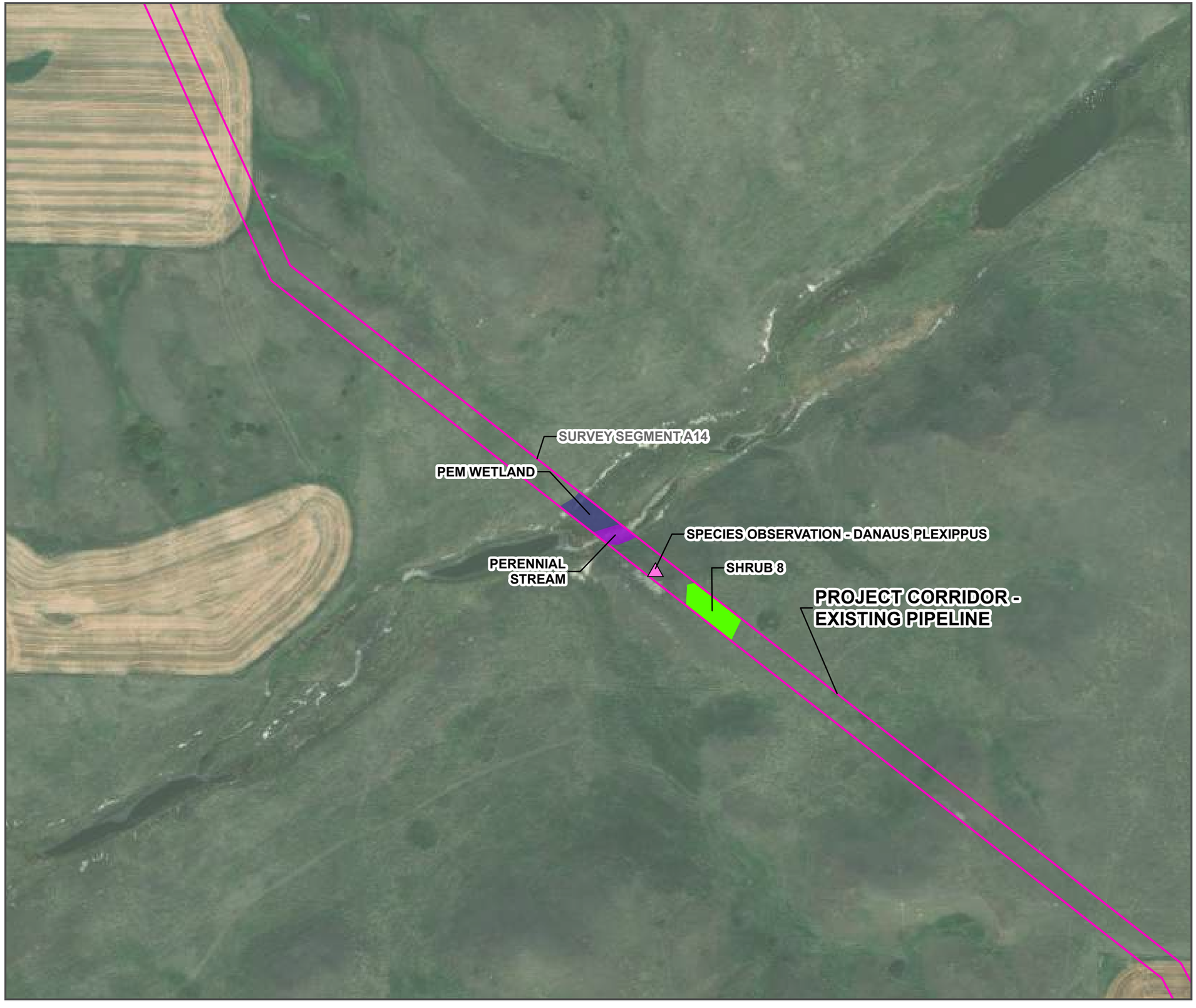
Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS



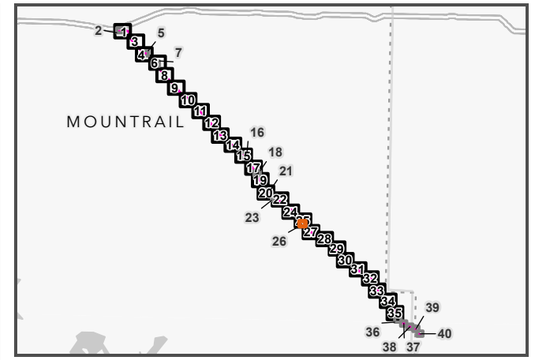


FIGURE 2-26

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Species Observation Location
- Project Corridor - Existing Pipeline (50-foot-wide)

Tree/Shrub Area

- Shrub Area

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

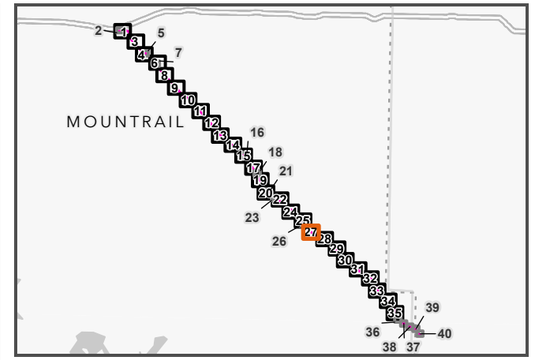


FIGURE 2-27

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

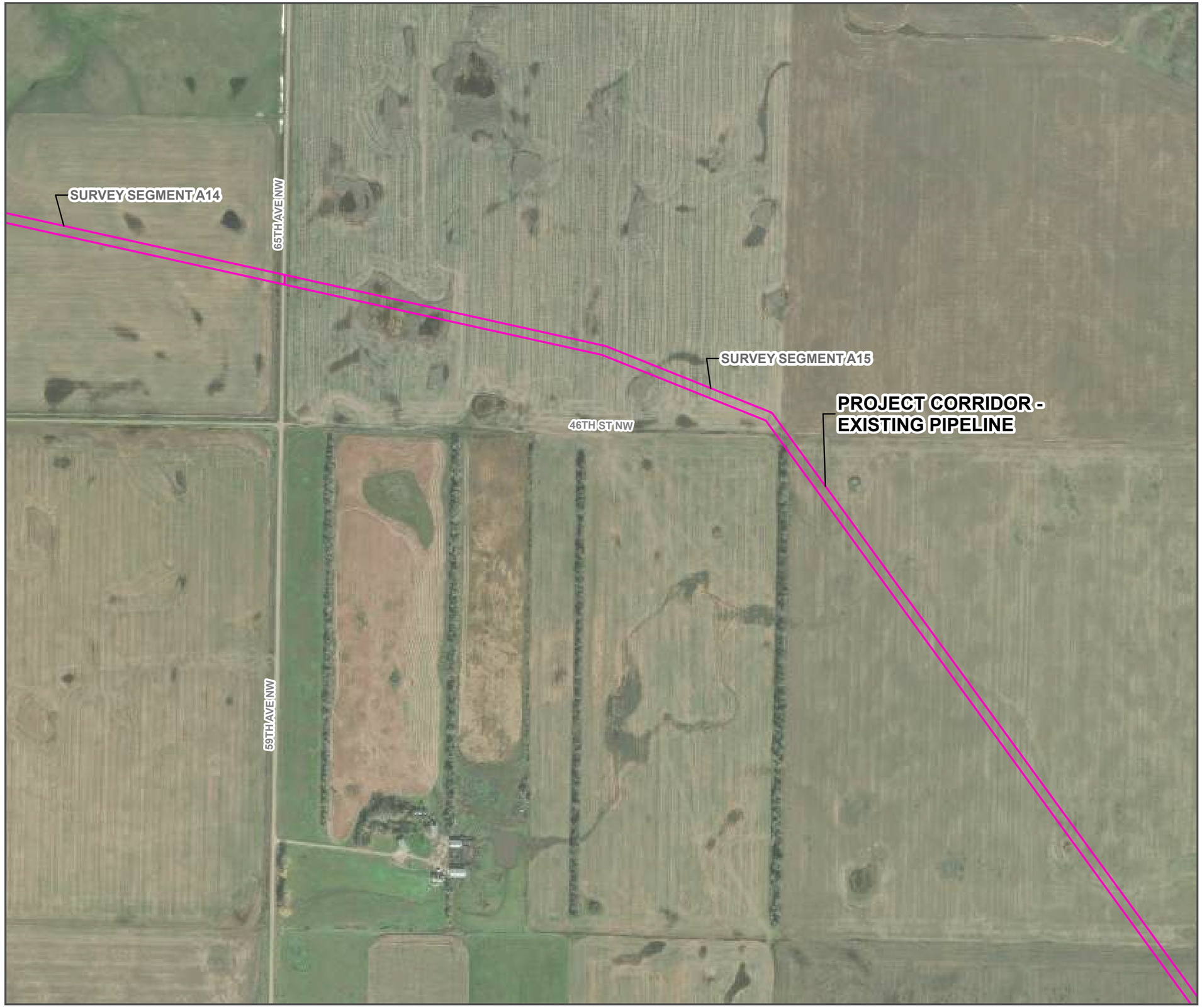
- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



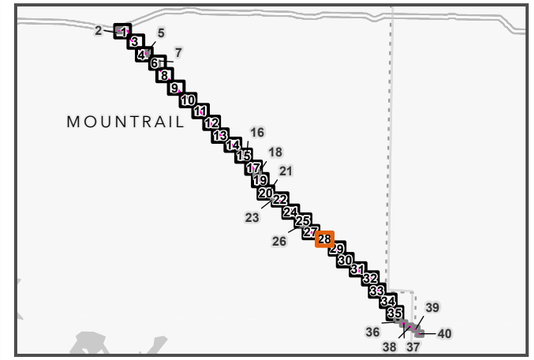


FIGURE 2-28

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

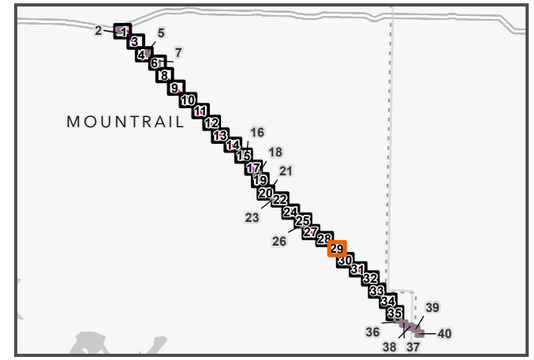


FIGURE 2-29

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Cluster: NC-pchran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: Ti_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

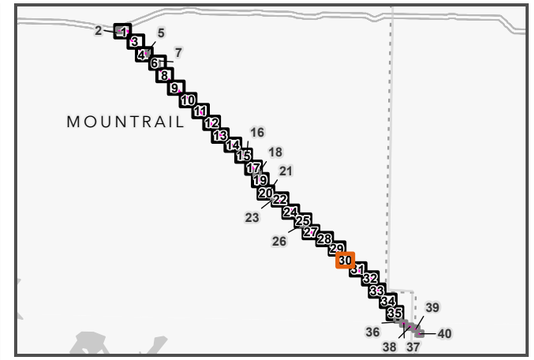


FIGURE 2-30

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

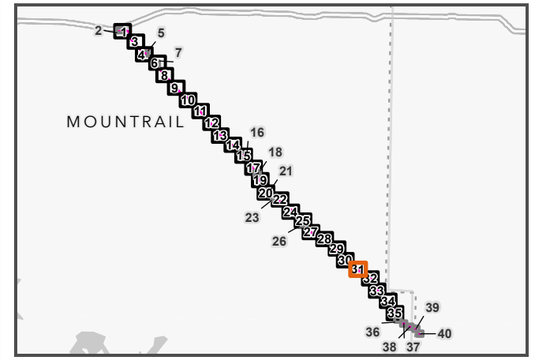


FIGURE 2-31

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

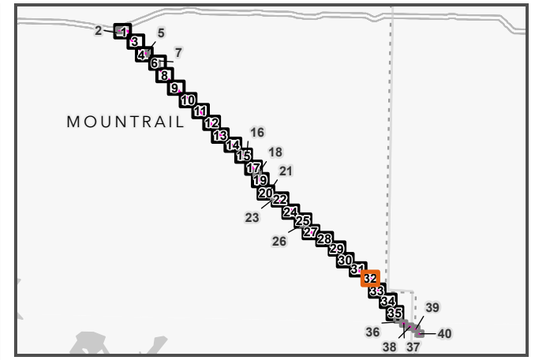


FIGURE 2-32

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Cluster: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: Ti_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

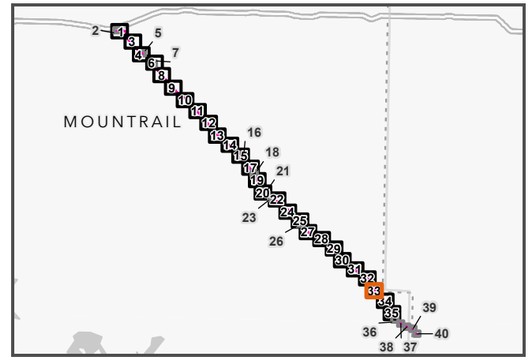


FIGURE 2-33

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Culvert
- Project Corridor - Existing Pipeline (50-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

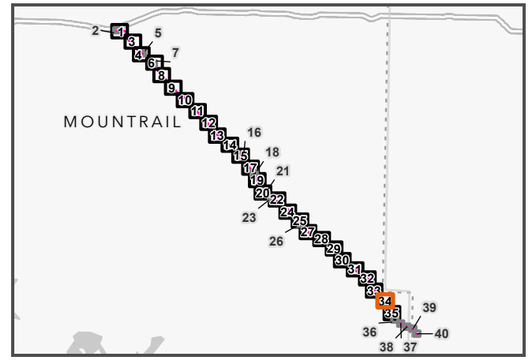


FIGURE 2-34

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Project Corridor - Proposed Pipeline (200-foot-wide)

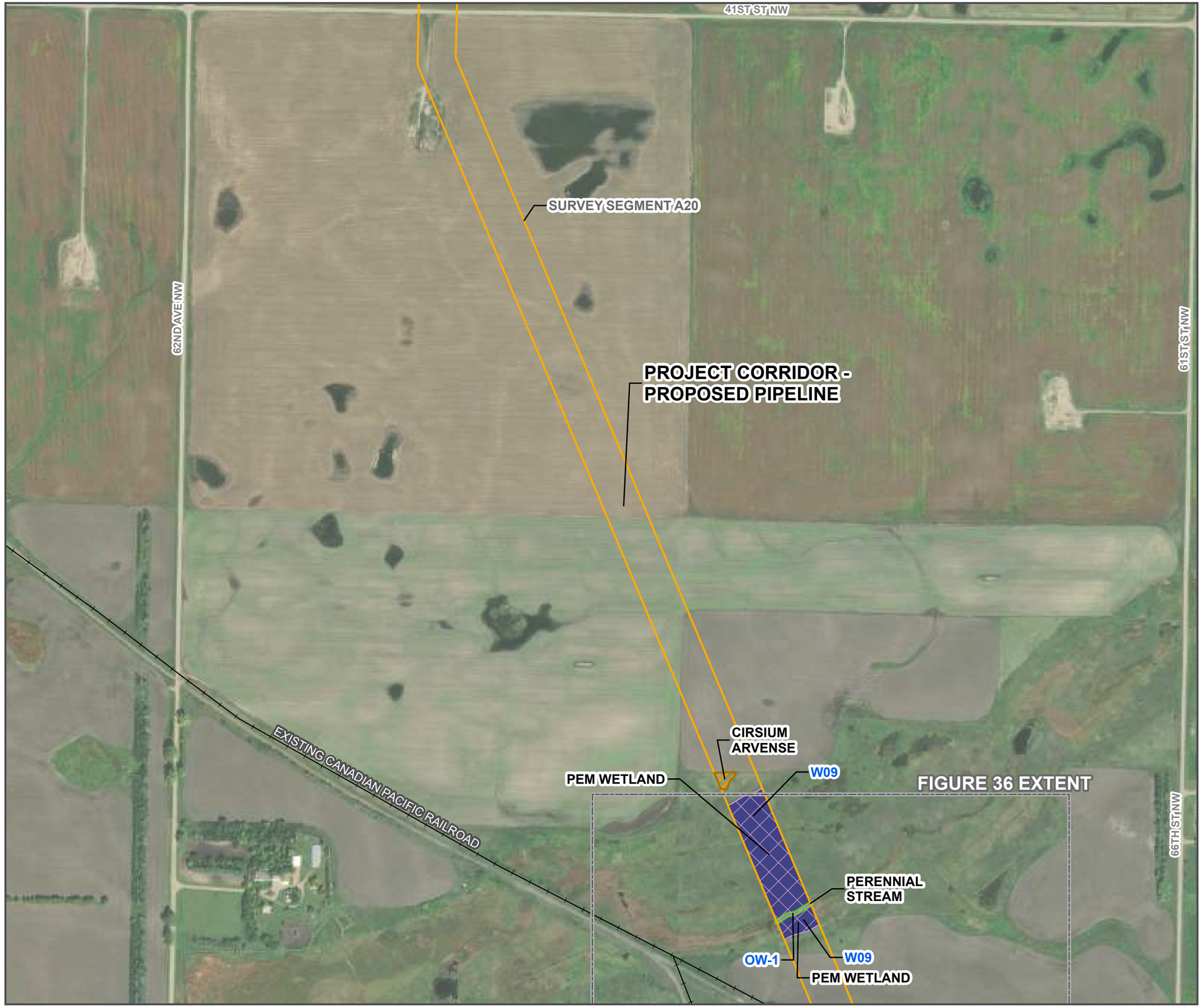
Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS



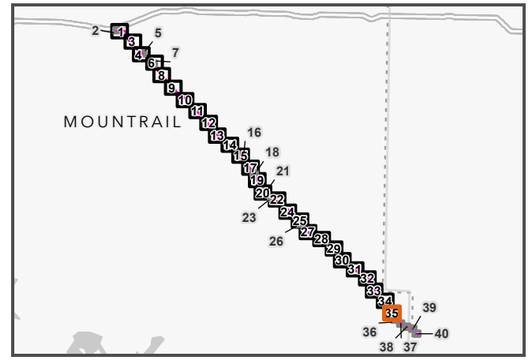


FIGURE 2-35

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Proposed Pipeline (200-foot-wide)

Noxious Weed Area

- Cirsium arvense

Federally Listed Species Habitat

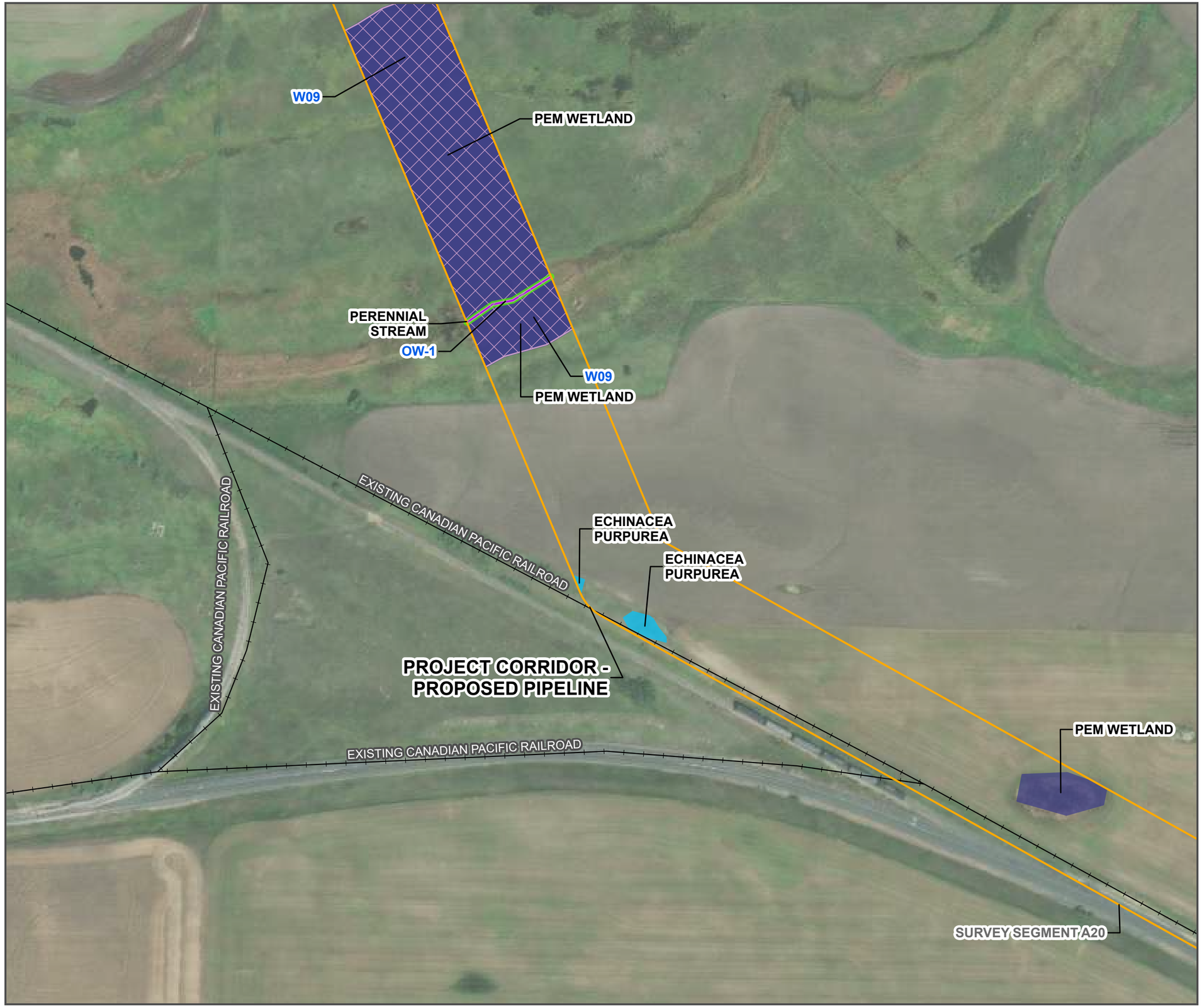
- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream
- Waters of the U.S. - Stream OW-1 (USACE 2024)
- Waters of the U.S. - Wetlands W1, W6, W7 and W9 (USACE 2024)

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: I:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



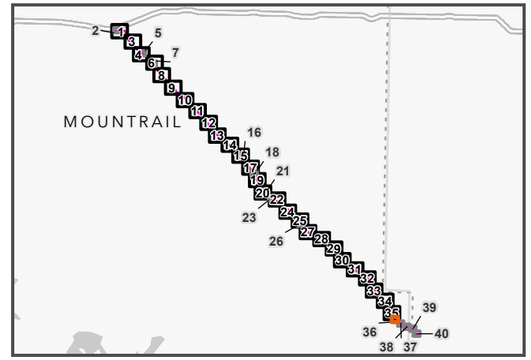


FIGURE 2-36

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Proposed Pipeline (200-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream
- Waters of the U.S. - Stream OW-1 (USACE 2024)
- Waters of the U.S. - Wetlands W1, W6, W7 and W9 (USACE 2024)

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

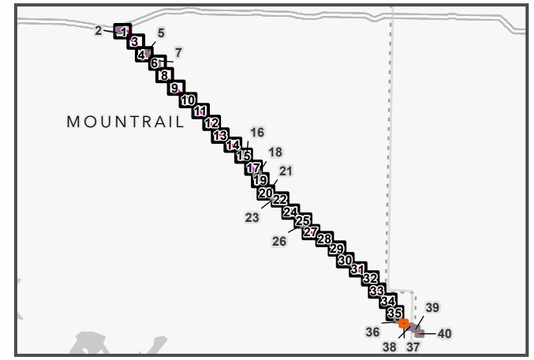


FIGURE 2-37

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Culvert
- Project Corridor - Proposed Pipeline (200-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream
- Waters of the U.S. - Wetlands W1, W6, W7 and W9 (USACE 2024)

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

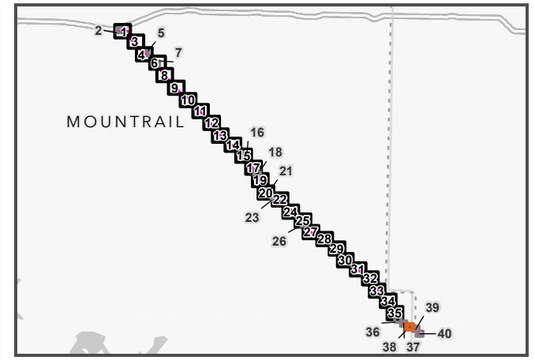


FIGURE 2-38

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Culvert
- Project Corridor - Proposed Pipeline (200-foot-wide)

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream
- Waters of the U.S. - Wetlands W1, W6, W7 and W9 (USACE 2024)

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

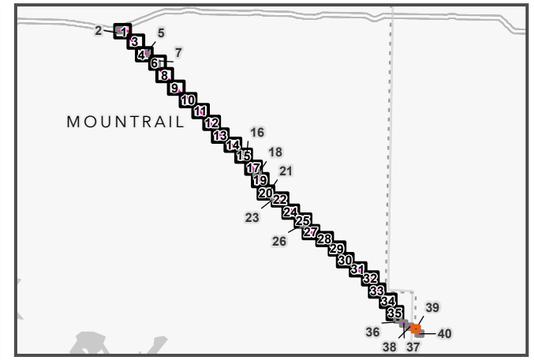


FIGURE 2-39

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Culvert
- Project Corridor - Proposed Pipeline (200-foot-wide)

Noxious Weed Area

- Cirsium arvense

Federally Listed Species Habitat

- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream
- Waters of the U.S. - Wetlands W1, W6, W7 and W9 (USACE 2024)

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

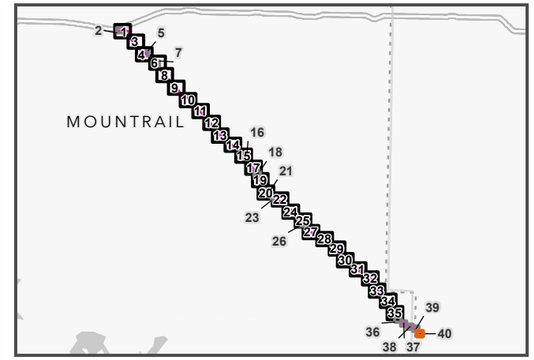


FIGURE 2-40

Federally Listed Species Habitat, Trees/ Shrubs, and Noxious Weed Infestation Areas Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project

Legend

- Project Corridor - Proposed Pipeline (200-foot-wide)

Federally Listed Species Habitat

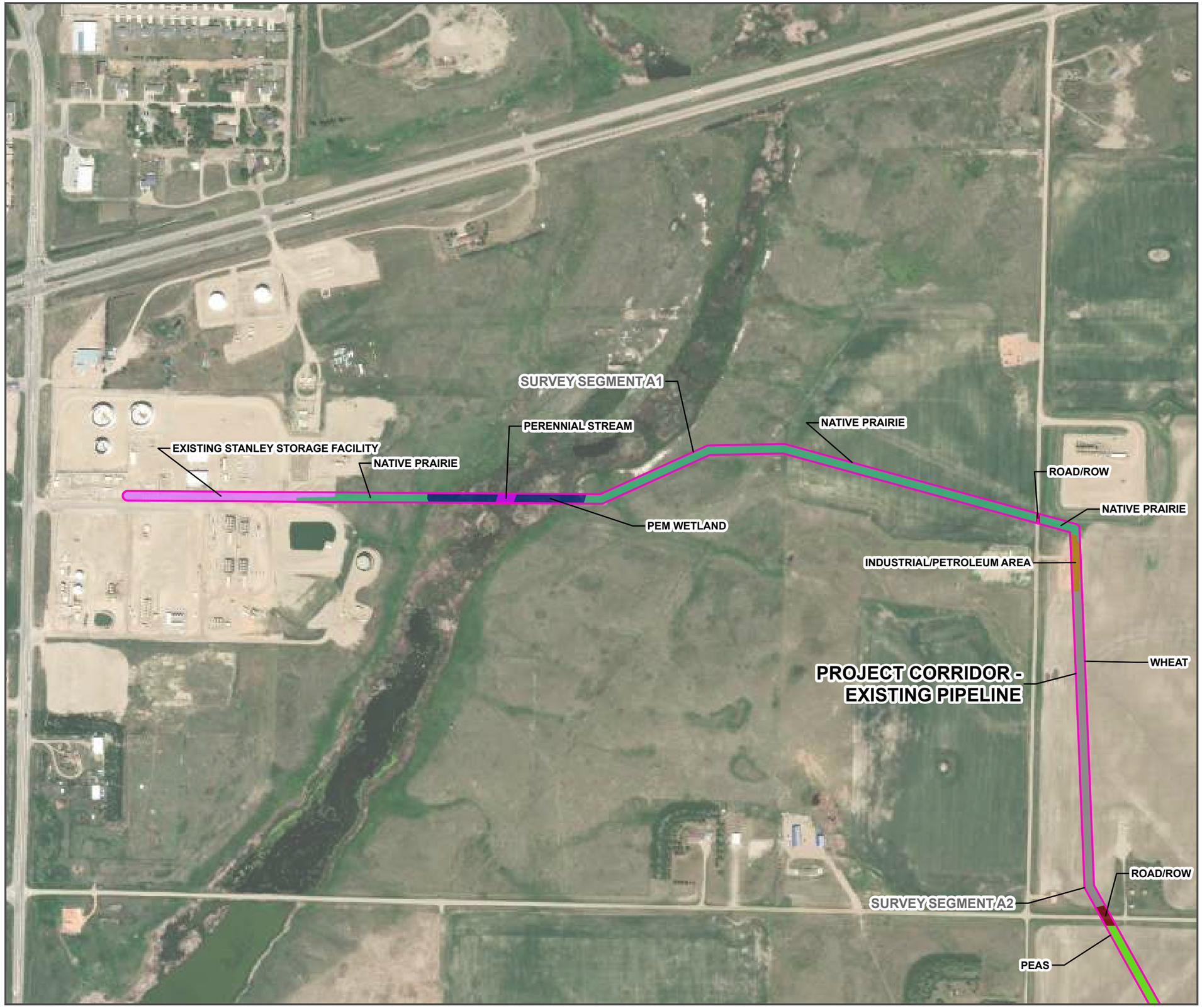
- Echinacea purpurea
- Echinacea purpurea and Dalea purpurea
- Echinacea purpurea and Liatris Spicata
- Farmed Wetland
- PEM Wetland
- Perennial Stream

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 125 250 500 ft
0 37.5 75 150 m

ARCADIS

Created: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 2 T&E_Trees_Weeds
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



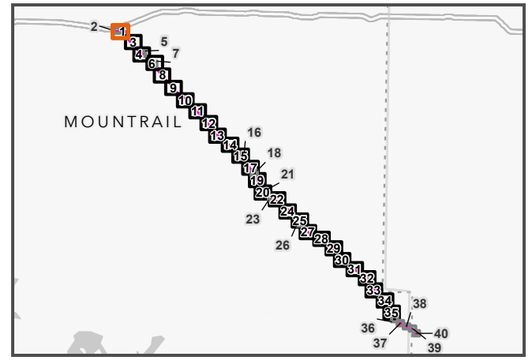


FIGURE 3-1

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

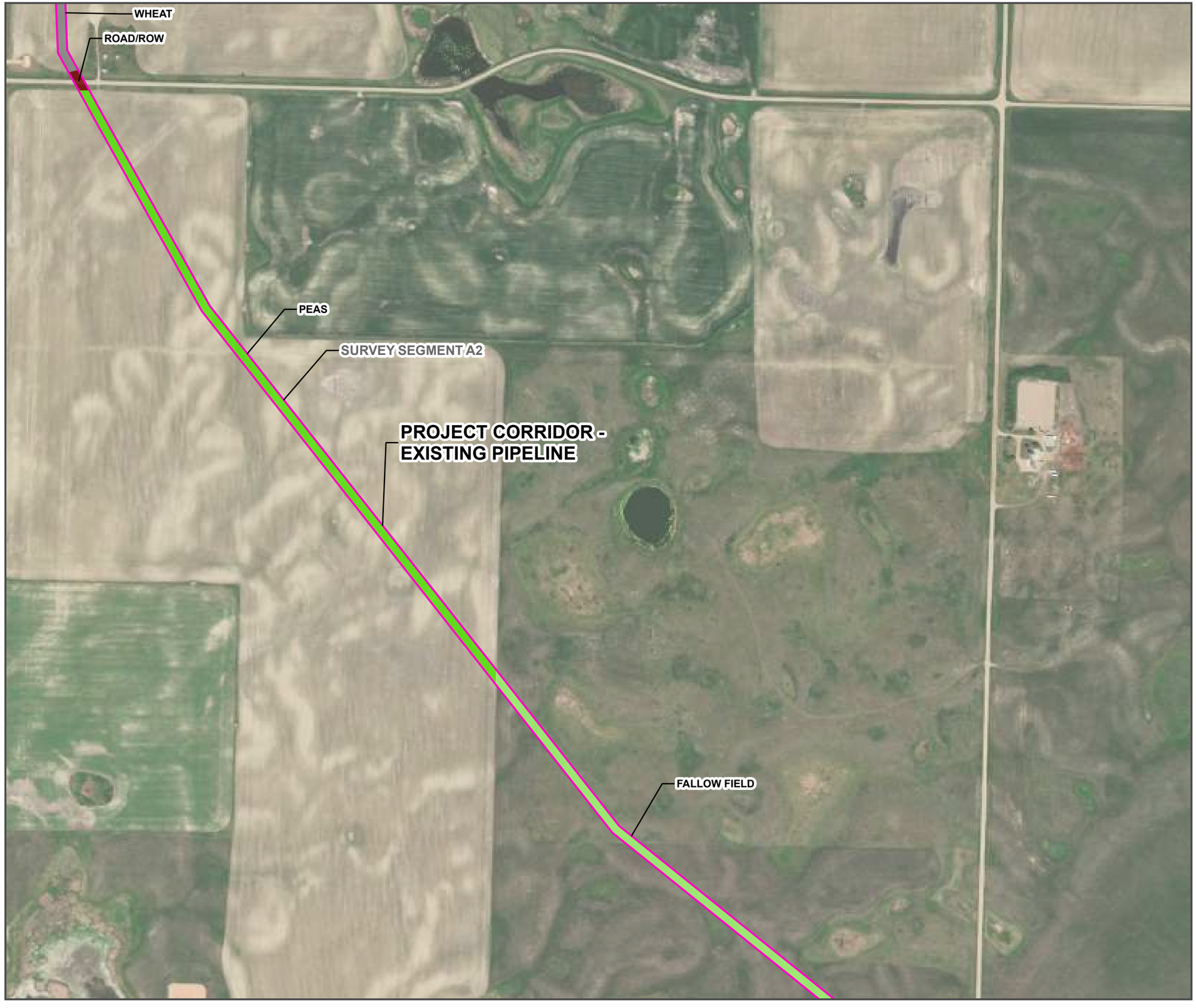
Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Perennial Stream
- Peas
- Wheat
- Industrial/Petroleum Area
- Road/ROW
- Existing Stanley Storage Facility
- Native Prairie

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS



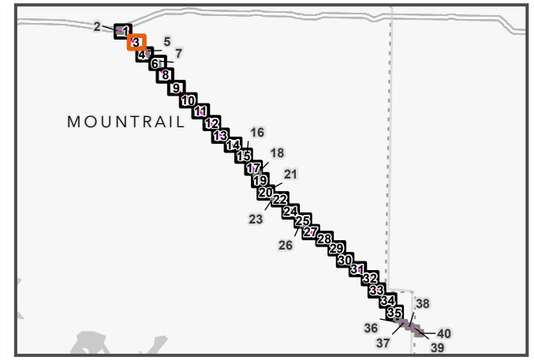


FIGURE 3-2

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Fallow Field
- Peas
- Wheat
- Road/ROW

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

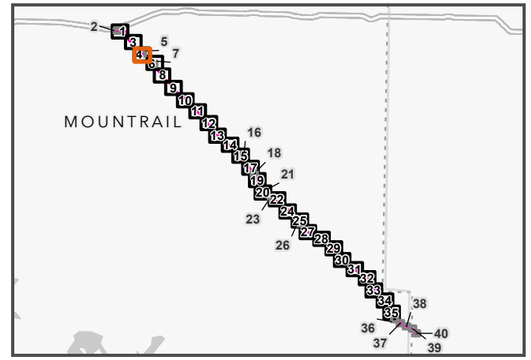


FIGURE 3-3

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

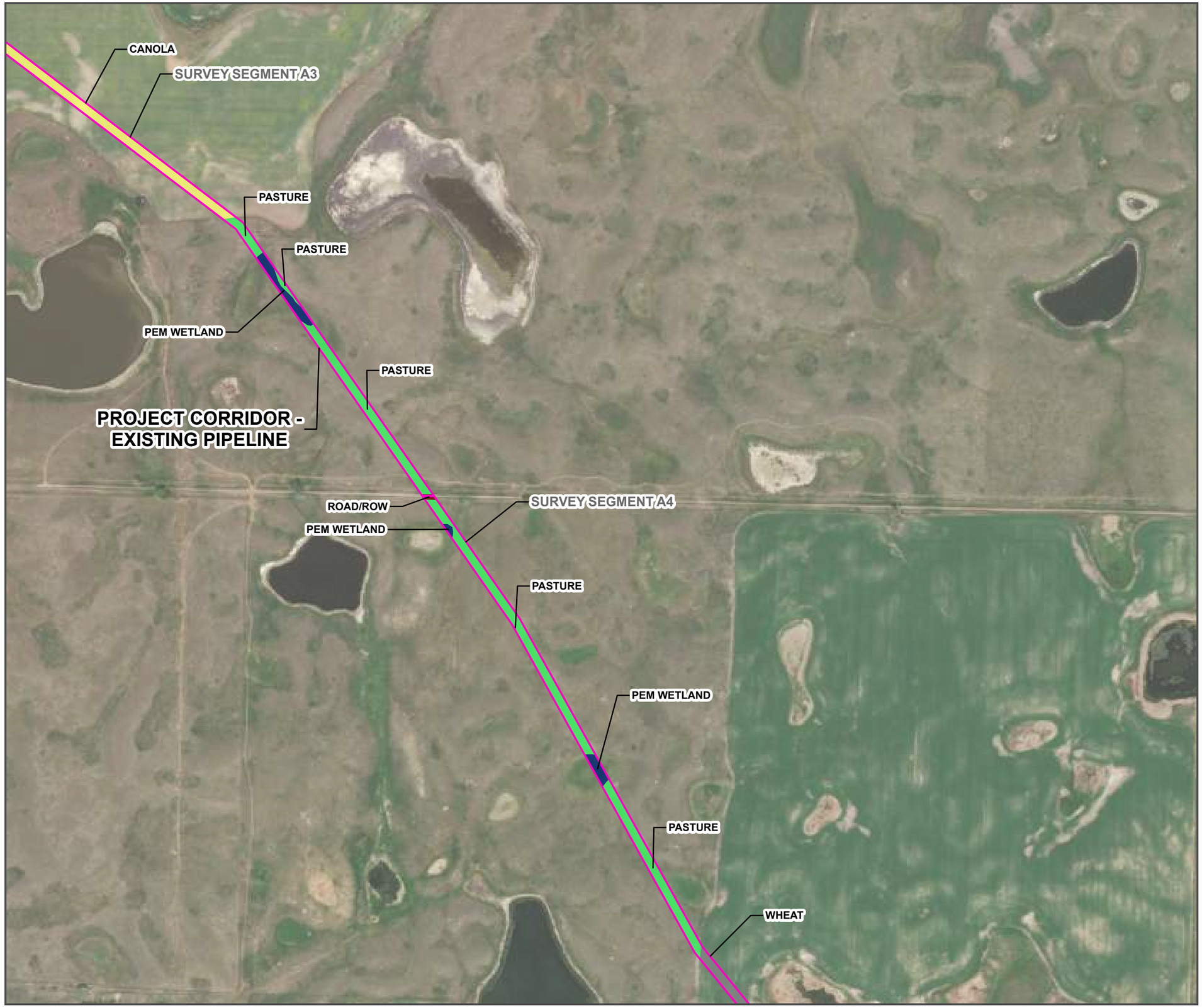
Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Farmed Wetland
- PEM Wetland
- Canola
- Fallow Field
- Wheat
- Road/ROW

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS



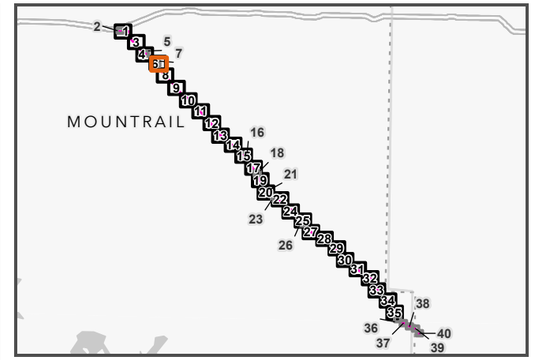


FIGURE 3-4

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Canola
- Wheat
- Road/ROW
- Pasture

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

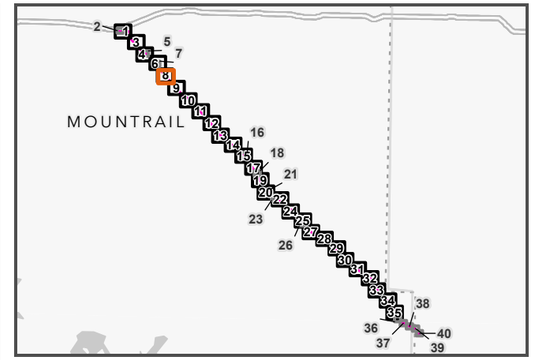


FIGURE 3-5

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Farmed Wetland
- PEM Wetland
- Canola
- Wheat
- Road/ROW
- Pasture

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

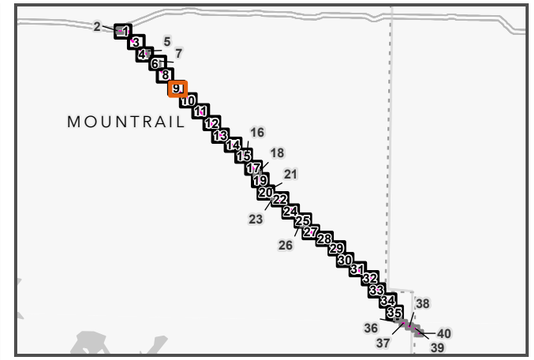


FIGURE 3-6

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Canola
- Peas
- Wheat
- Road/ROW
- Native Prairie

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

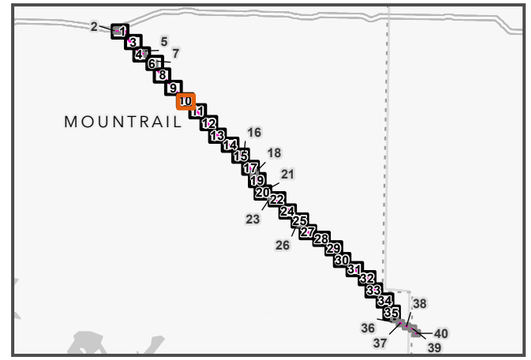


FIGURE 3-7

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

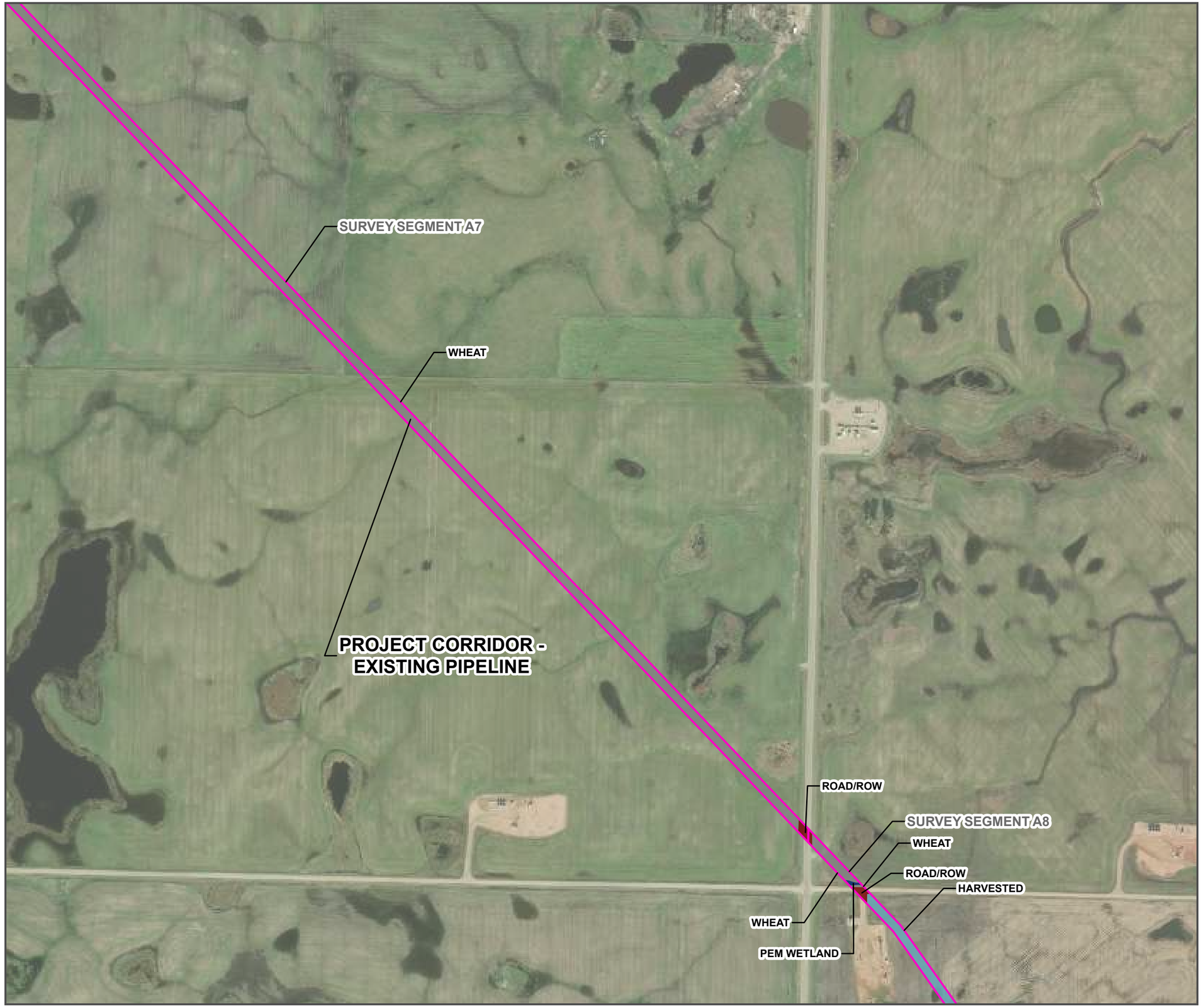
- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Peas
- Wheat

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 3 Land cover
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



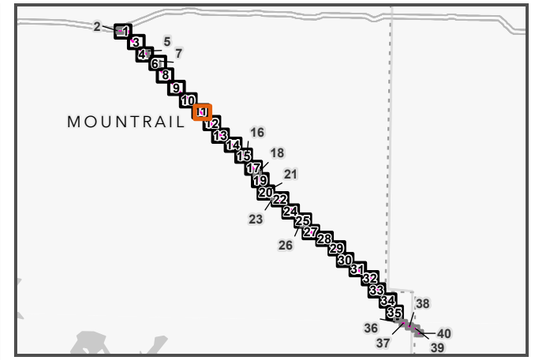


FIGURE 3-8

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Harvested
- Wheat
- Road/ROW

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

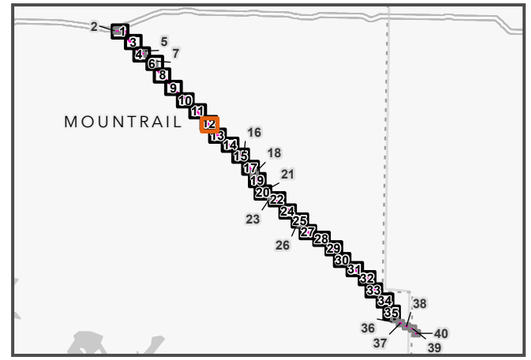


FIGURE 3-9

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

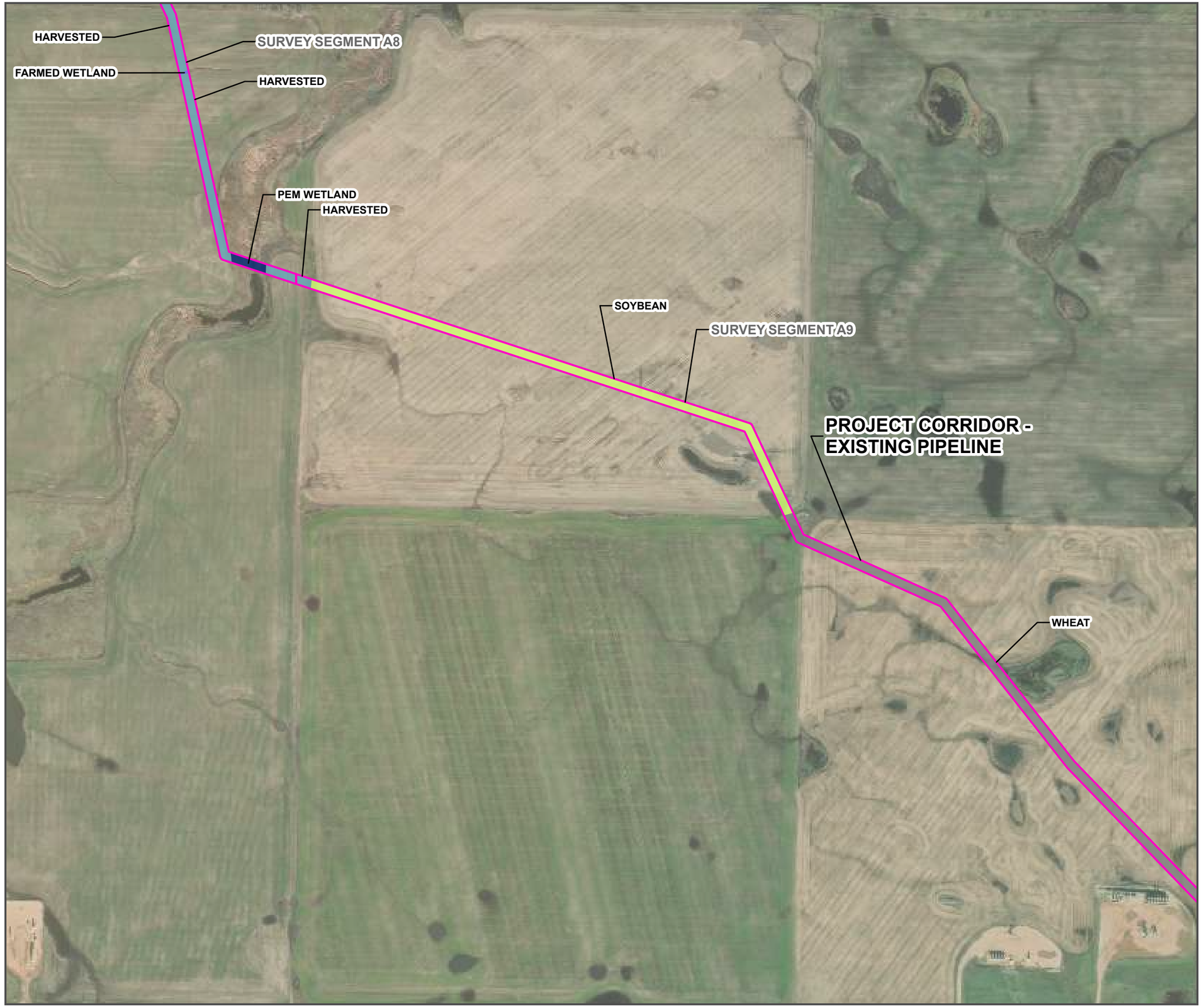
- Project Corridor - Existing Pipeline (50-foot-wide)
- Farmed Wetland
- PEM Wetland
- Harvested

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 3 Land cover
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



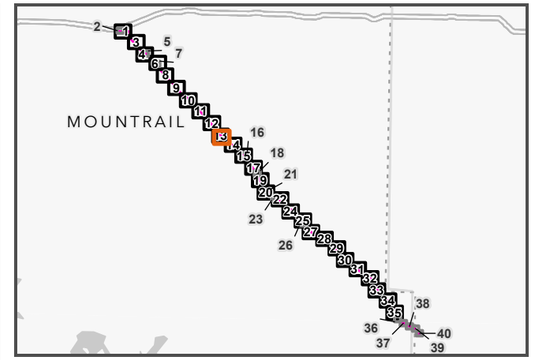


FIGURE 3-10

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Farmed Wetland
- PEM Wetland
- Harvested
- Soybean
- Wheat

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 3 Land cover
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

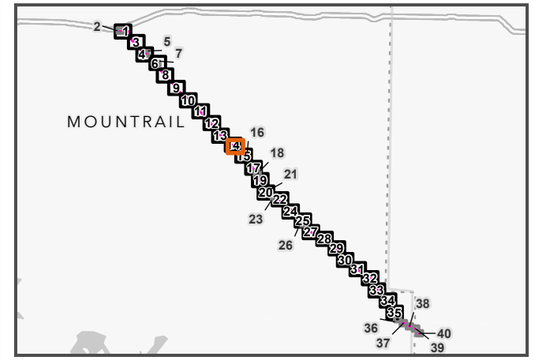


FIGURE 3-11

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Farmed Wetland
- Canola
- Soybean
- Wheat
- Road/ROW
- Native Prairie

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

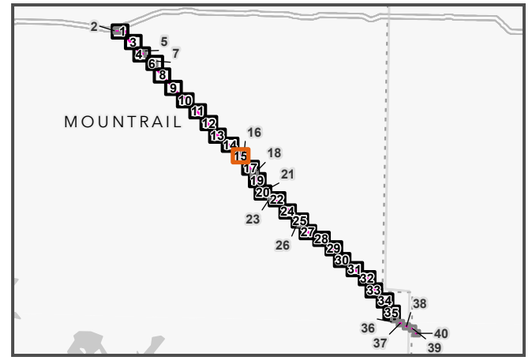


FIGURE 3-12

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Canola
- Soybean
- Wheat
- Industrial/Petroleum Area
- Road/ROW
- Native Prairie

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

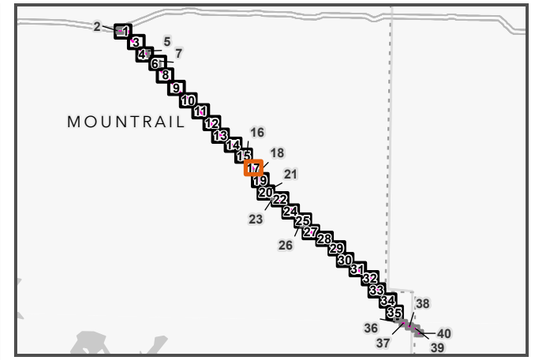


FIGURE 3-13

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Flaxseed
- Wheat
- Wheat Barley
- Road/ROW
- Native Prairie

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: I:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 3 Land cover
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

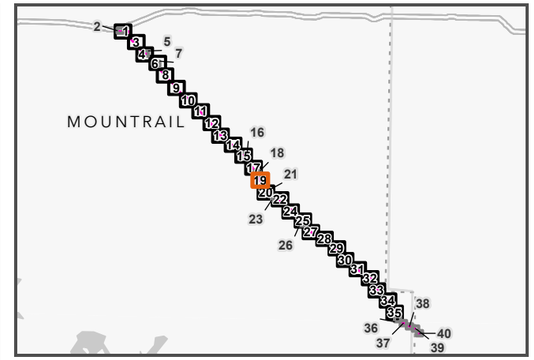


FIGURE 3-14

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Canola
- Flaxseed
- Wheat

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

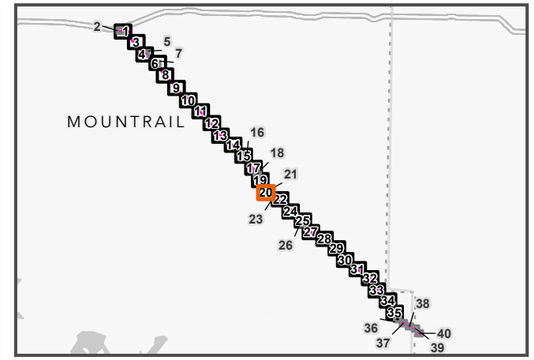


FIGURE 3-15

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Canola
- Native Prairie
- Pasture

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

Creator: NCochran Last Saved: 10/1/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 3 Land cover
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

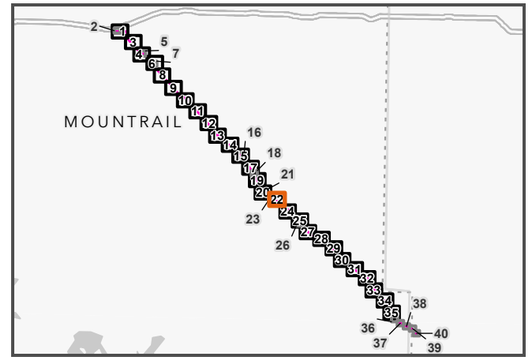


FIGURE 3-16

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Perennial Stream
- Canola
- Road/ROW
- Native Prairie
- Pasture

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: Ti_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_ProThunder_Butte_Makoti_WDR.aprx\BHAR_Figure 3 Land cover
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

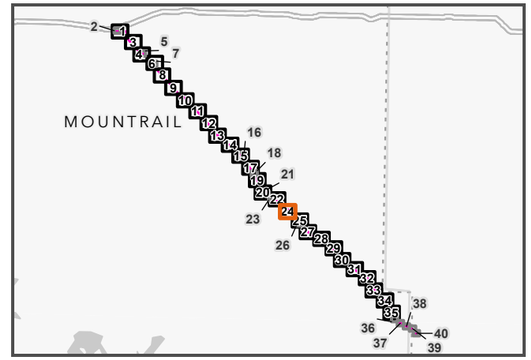


FIGURE 3-17

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Proposed Midline Pump Station
- PEM Wetland
- Canola
- Soybean
- Wheat
- Road/ROW

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

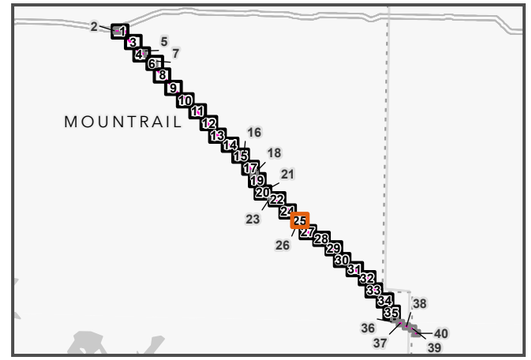


FIGURE 3-18

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Perennial Stream
- Soybean
- Wheat Barley
- Native Prairie

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

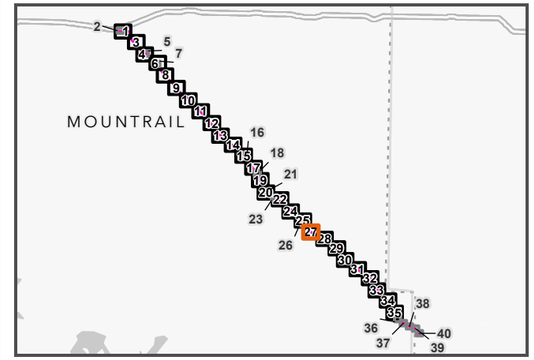


FIGURE 3-19

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

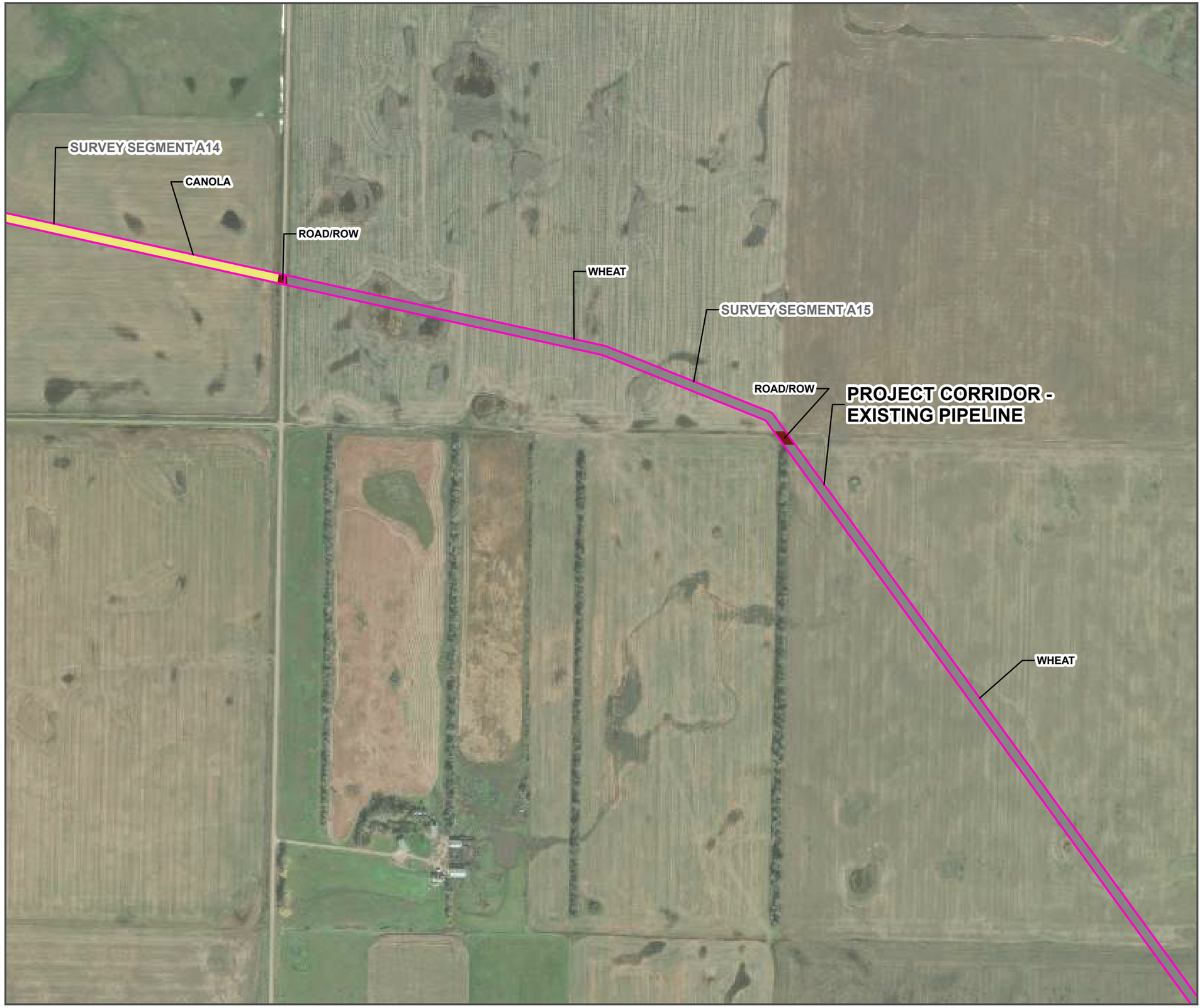
Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Canola
- Wheat Barley
- Native Prairie

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS



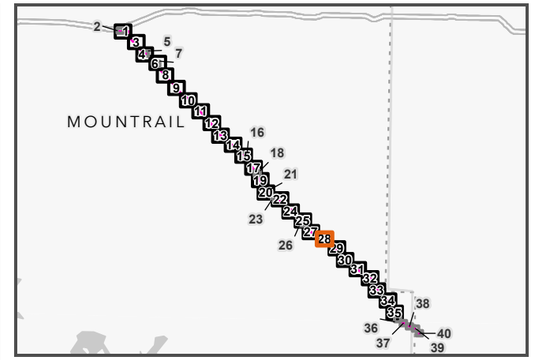


FIGURE 3-20

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Canola
- Wheat
- Road/ROW

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 3 Land cover
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

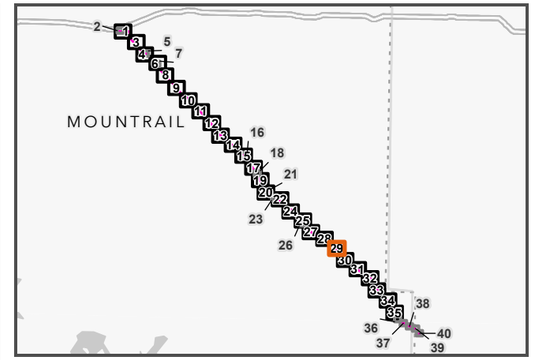


FIGURE 3-21

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Farmed Wetland
- Canola
- Soybean
- Wheat
- Road/ROW

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

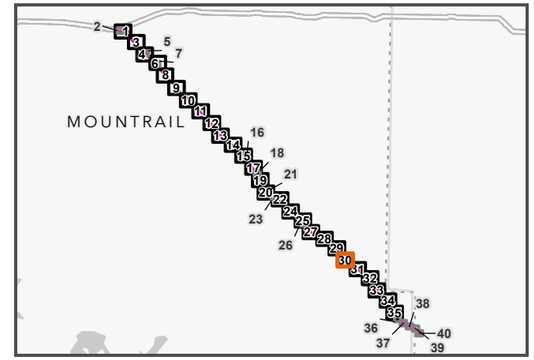


FIGURE 3-22

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

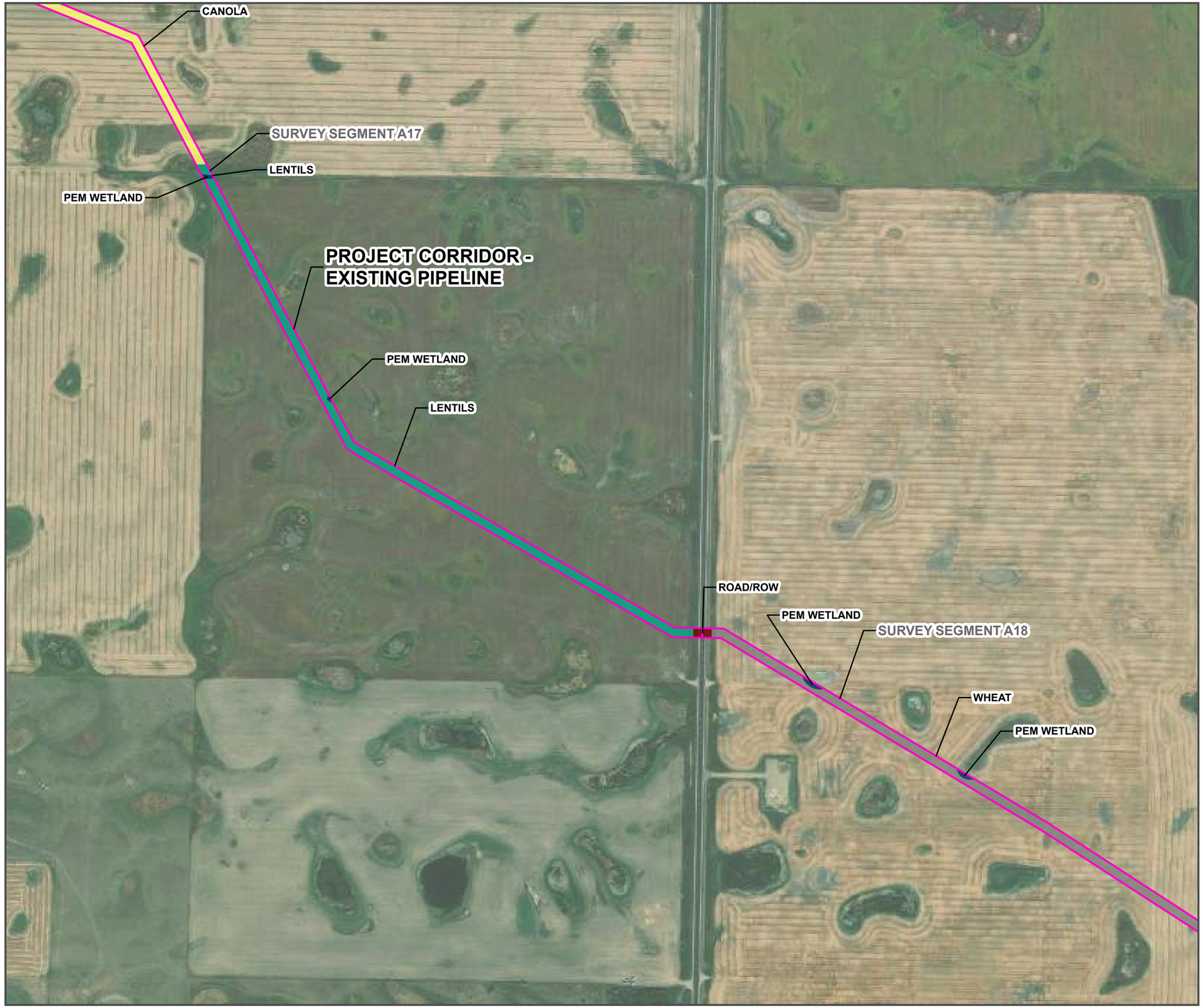
Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Farmed Wetland
- PEM Wetland
- Canola
- Lentils
- Road/ROW

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS



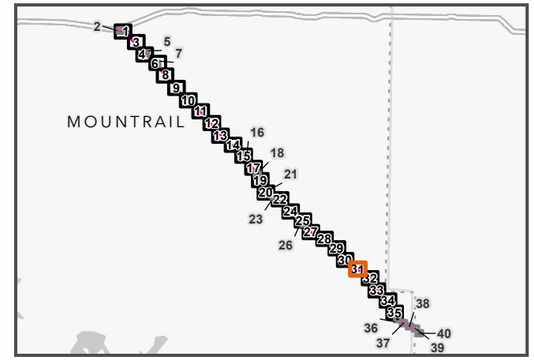


FIGURE 3-23

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- PEM Wetland
- Canola
- Lentils
- Wheat
- Road/ROW

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 3 Land cover
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

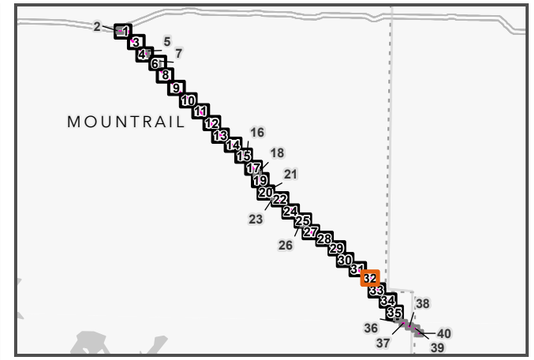


FIGURE 3-24

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Farmed Wetland
- PEM Wetland
- Canola
- Wheat
- Road/ROW

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

Creator: NCochran Last Saved: 10/11/2024 12:01 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 3 Land cover
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

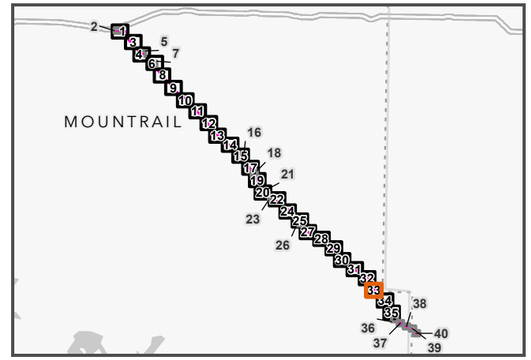


FIGURE 3-25

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Culvert
- Farmed Wetland
- Canola
- Road/ROW

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

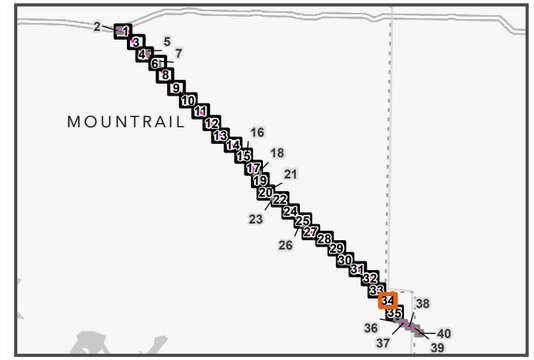


FIGURE 3-26

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Project Corridor - Proposed Pipeline (200-foot-wide)
- PEM Wetland
- Canola
- Fallow Field
- Wheat Barley
- Road/ROW
- Existing Plaza Station

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS

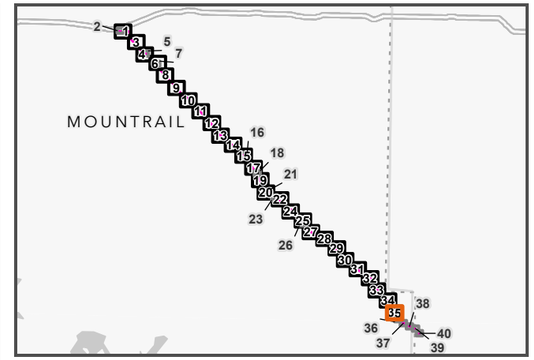


FIGURE 3-27

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

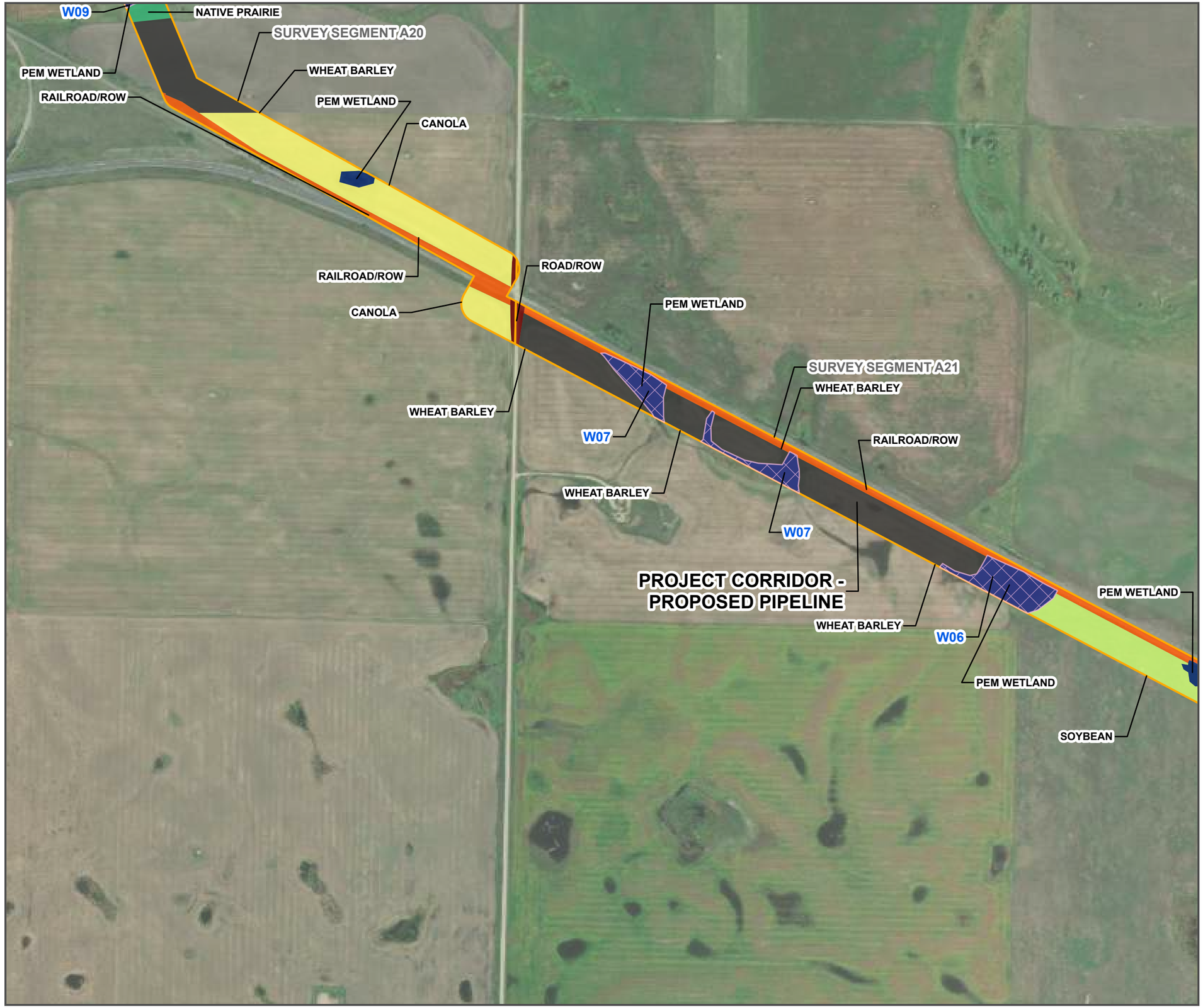
Legend

- Project Corridor - Proposed Pipeline (200-foot-wide)
- PEM Wetland
- Perennial Stream
- Soybean
- Wheat Barley
- Road/ROW
- Native Prairie
- Waters of the U.S. - Stream OW-1 (USACE 2024)
- Waters of the U.S. - Wetlands W1, W6, W7 and W9 (USACE 2024)

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS



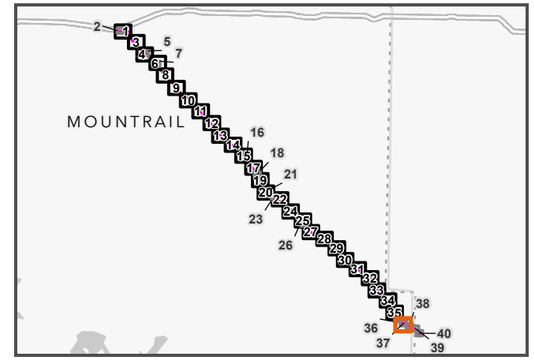


FIGURE 3-28

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

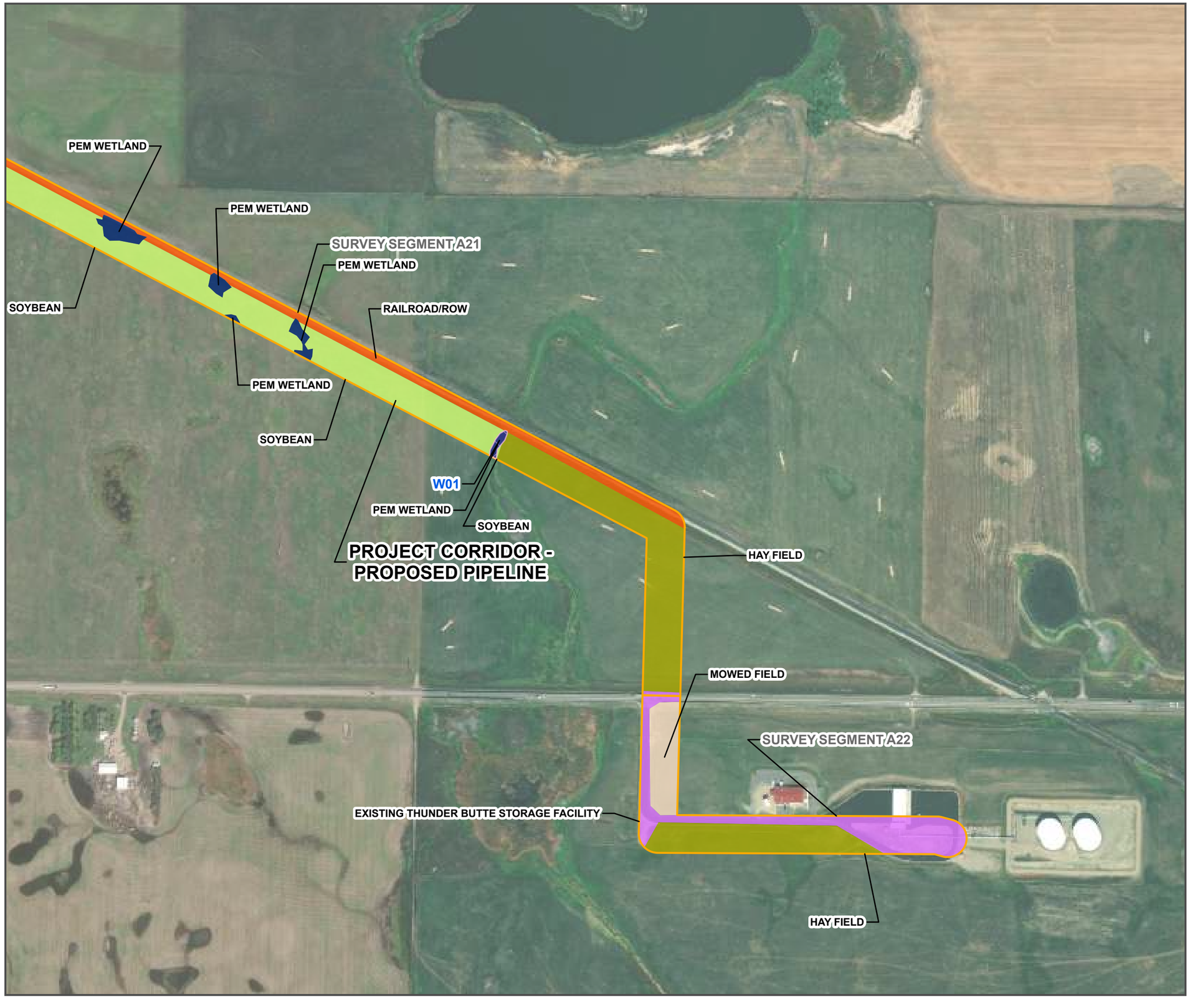
Legend

- Project Corridor - Proposed Pipeline (200-foot-wide)
- PEM Wetland
- Canola
- Soybean
- Wheat Barley
- Railroad/ROW
- Road/ROW
- Native Prairie
- Waters of the U.S. - Wetlands W1, W6, W7 and W9 (USACE 2024)

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS



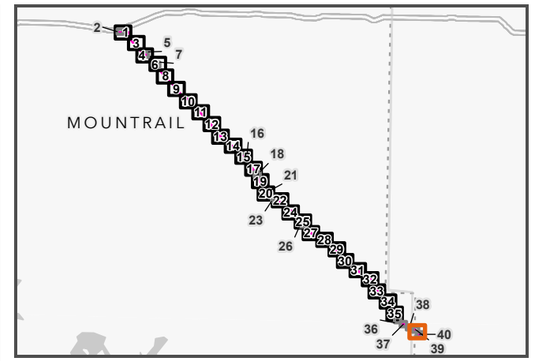


FIGURE 3-29

Land Cover Types Map

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

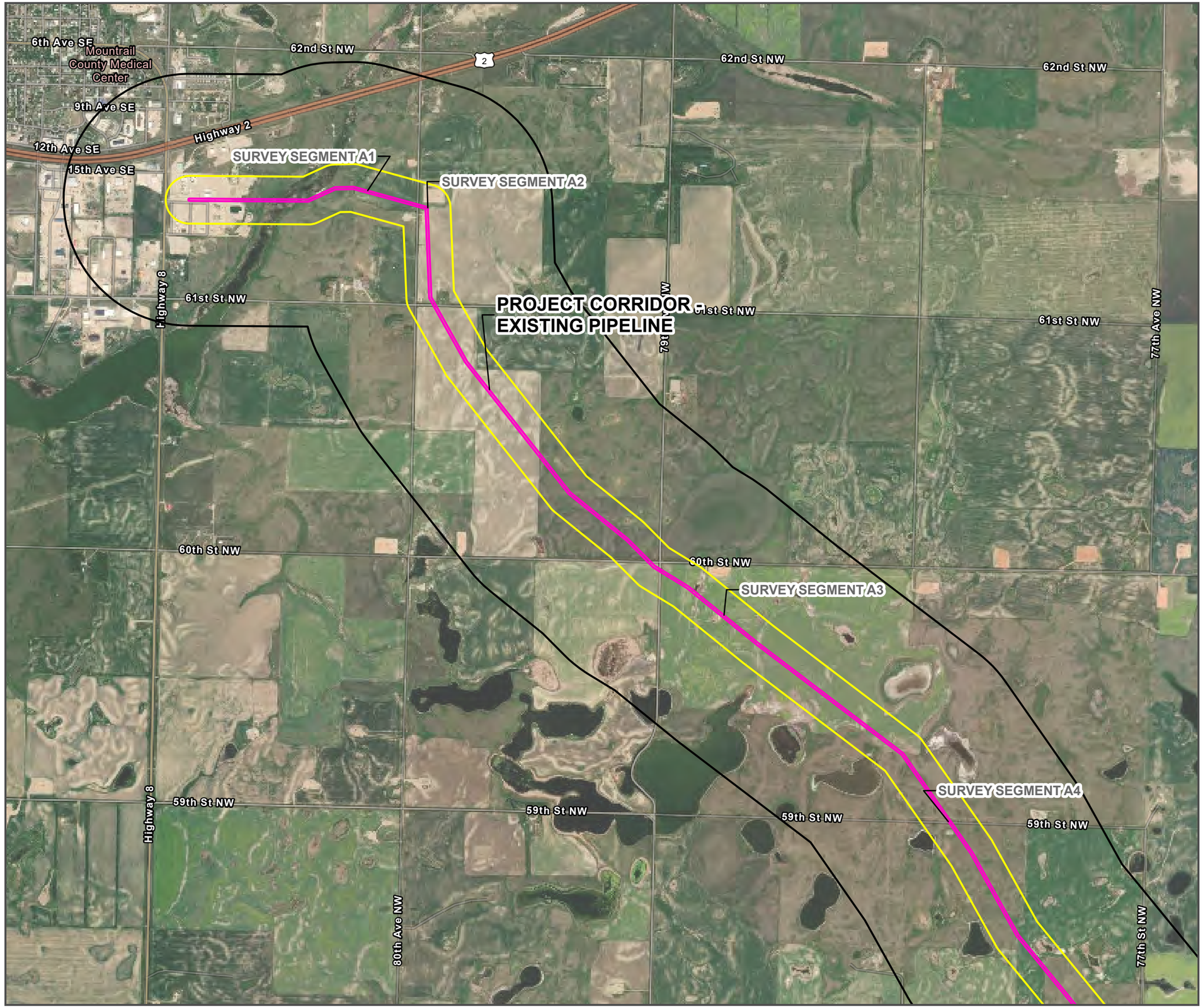
Legend

- Project Corridor - Proposed Pipeline (200-foot-wide)
- PEM Wetland
- Hay field
- Soybean
- Mowed field
- Railroad/ROW
- Existing Thunder Butte Storage Facility
- Waters of the U.S. - Wetlands W1, W6, W7 and W9 (USACE 2024)

Notes:
1. See Wetland and Waterbodies Report for map sources.
2. No FEMA FIRM data is mapped within the ESA.

0 250 500 1,000 ft
0 75 150 300 m

ARCADIS



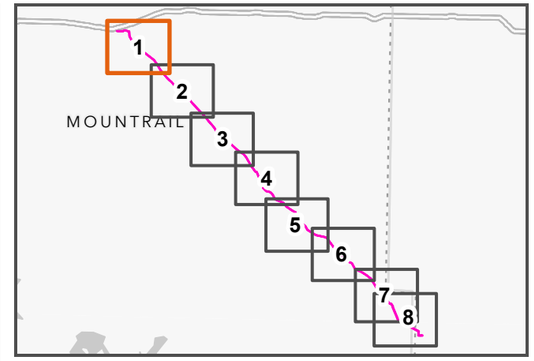


FIGURE 4-1

One-Mile-Wide Study Area and 1,000-Foot-Wide Buffer Area

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

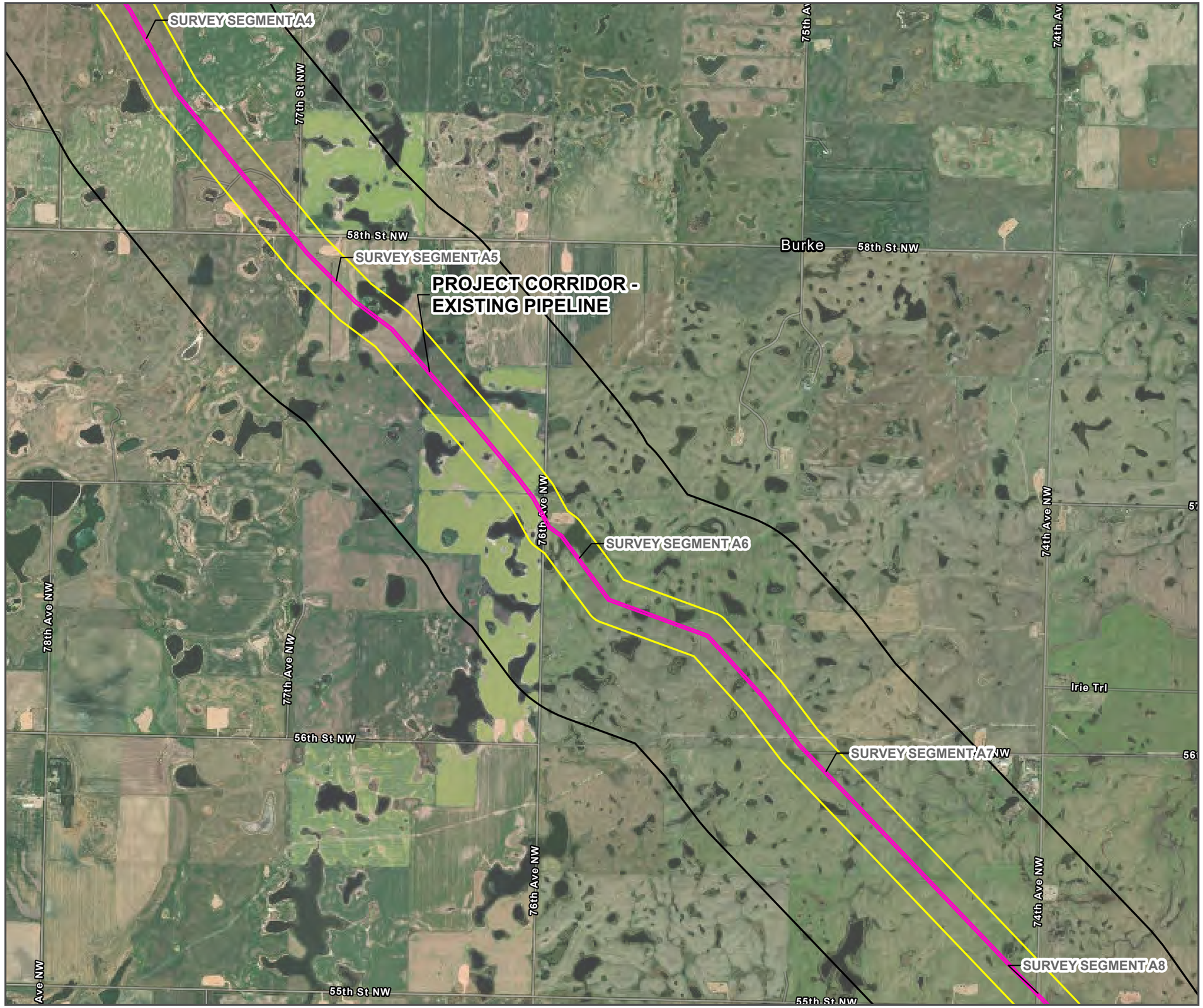
- Project Corridor - Existing Pipeline (50-foot-wide)
- Buffer Area (1,000-Foot-Wide)
- Study Area (One-Mile-Wide)

Notes:
1. USGS Topographic Quadrangle for Stanley SE, Stanley obtained through ArcGIS Online streaming service.
2. Study Area (One-Mile-Wide) = 0.5 mile on either side of the pipeline centerlines
3. Buffer Area (1,000-Foot-Wide) = 500 feet on either side of the pipeline centerlines

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS

Creator: NCochran Last Saved: 10/7/2024 9:50 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: Ti:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_VDR.aprx\BHAR_Figure 4 Buffers
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



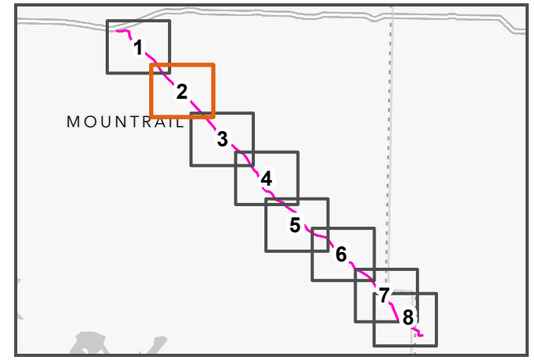


FIGURE 4-2

One-Mile-Wide Study Area and 1,000-Foot-Wide Buffer Area

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

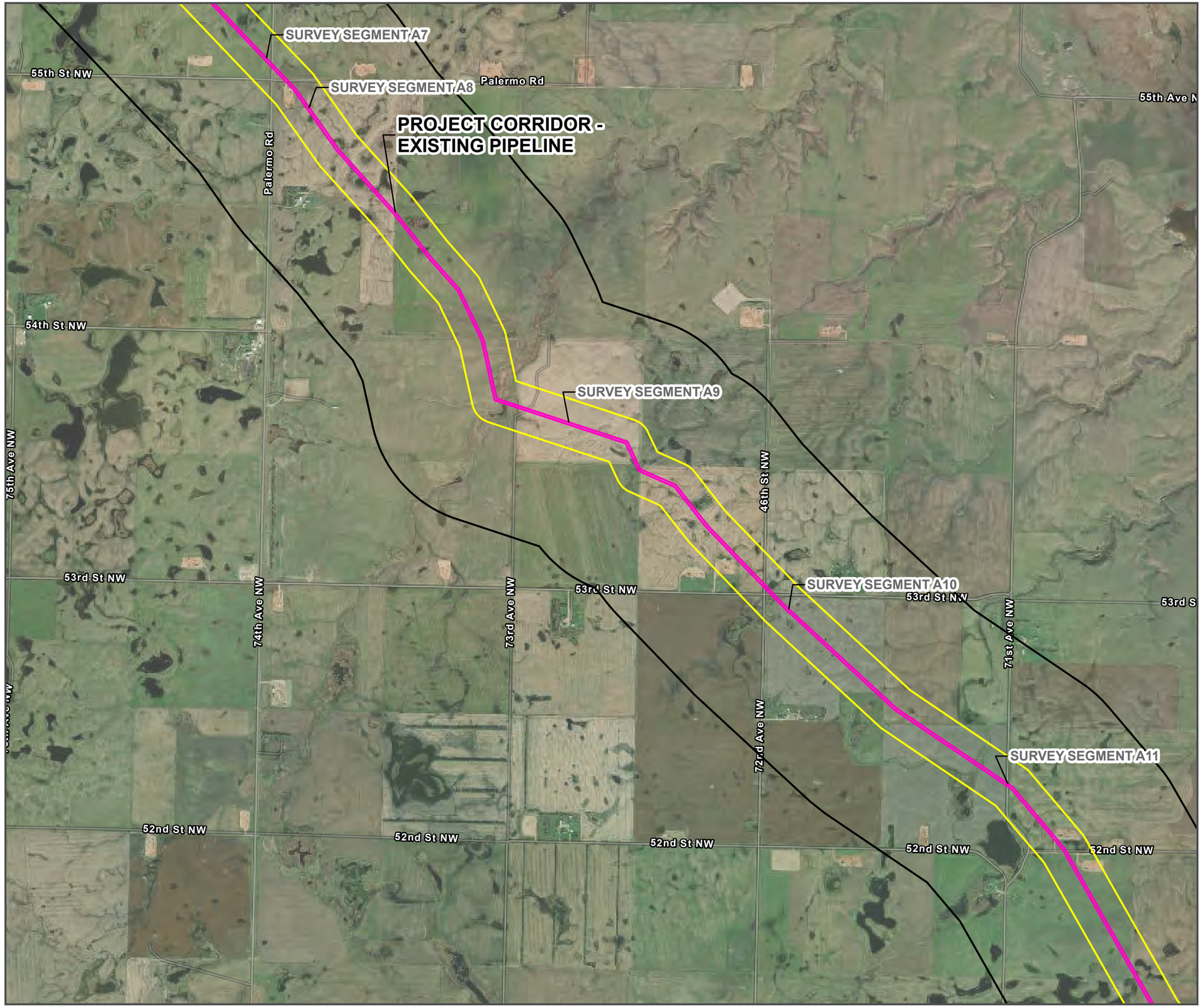
Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Buffer Area (1,000-Foot-Wide)
- Study Area (One-Mile-Wide)

Notes:
1. USGS Topographic Quadrangle for Stanley SE, Belden, Epworth NW obtained through ArcGIS Online streaming service.
2. Study Area (One-Mile-Wide) = 0.5 mile on either side of the pipeline centerlines
3. Buffer Area (1,000-Foot-Wide) = 500 feet on either side of the pipeline centerlines

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS



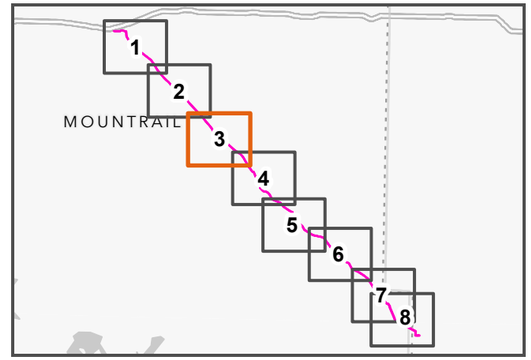


FIGURE 4-3

One-Mile-Wide Study Area and 1,000-Foot-Wide Buffer Area

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Buffer Area (1,000-Foot-Wide)
- Study Area (One-Mile-Wide)

Notes:
1. USGS Topographic Quadrangle for Epworth NW obtained through ArcGIS Online streaming service.
2. Study Area (One-Mile-Wide) = 0.5 mile on either side of the pipeline centerlines
3. Buffer Area (1,000-Foot-Wide) = 500 feet on either side of the pipeline centerlines

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS

Creator: NCochran Last Saved: 10/7/2024 9:50 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 4 Buffers
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

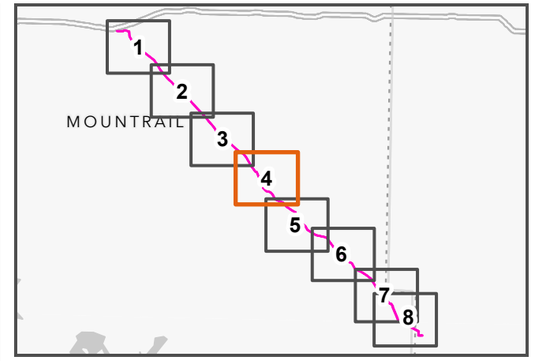


FIGURE 4-4

One-Mile-Wide Study Area and 1,000-Foot-Wide Buffer Area

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

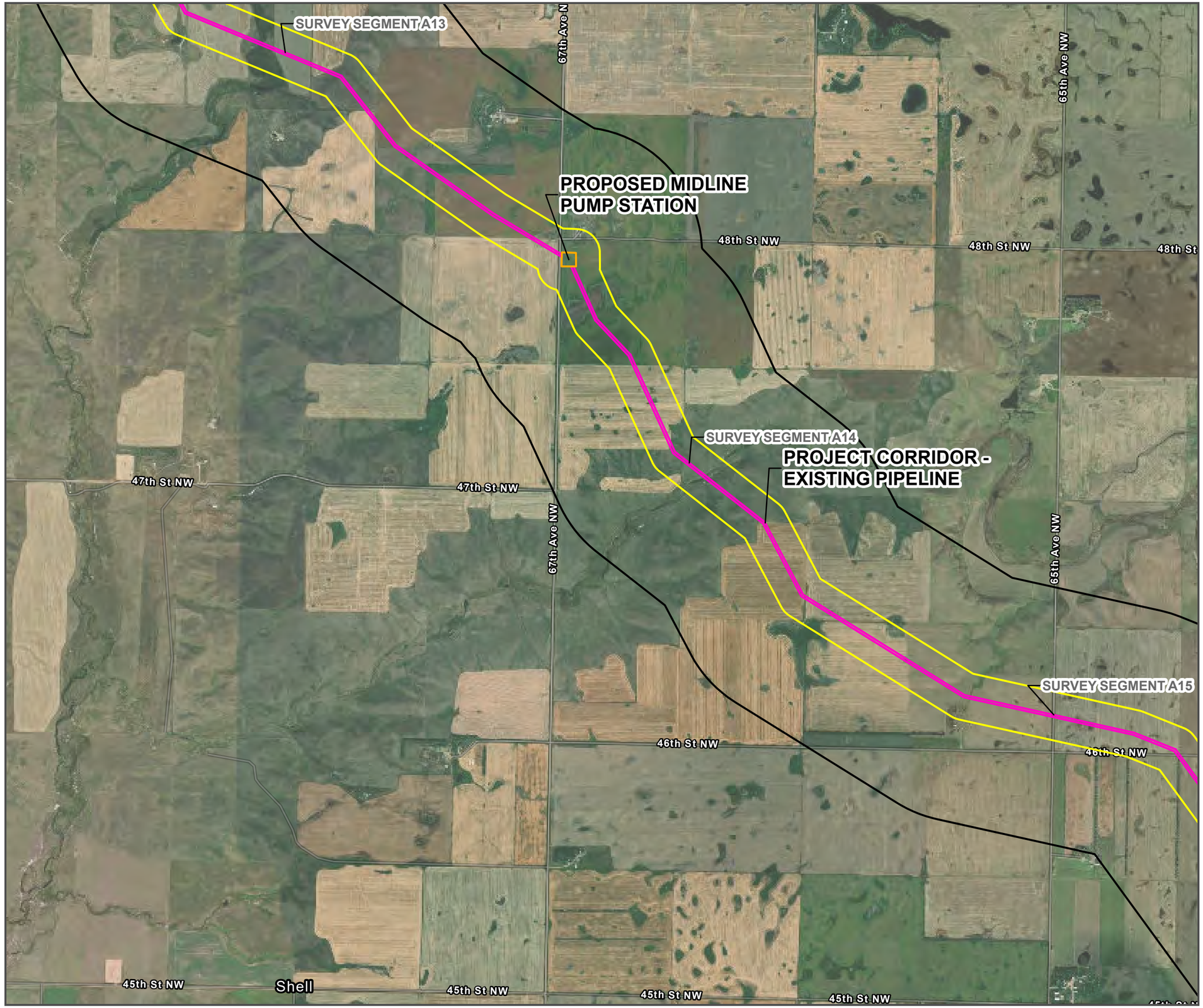
Legend

- Abandoned Mine
- Bald Eagle Nest Point
- Project Corridor - Existing Pipeline (50-foot-wide)
- Buffer Area (1,000-Foot-Wide)
- Study Area (One-Mile-Wide)

Notes:
1. USGS Topographic Quadrangle for Epworth NW, Shell Lake, Epworth SE obtained through ArcGIS Online streaming service.
2. Study Area (One-Mile-Wide) = 0.5 mile on either side of the pipeline centerlines
3. Buffer Area (1,000-Foot-Wide) = 500 feet on either side of the pipeline centerlines

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS



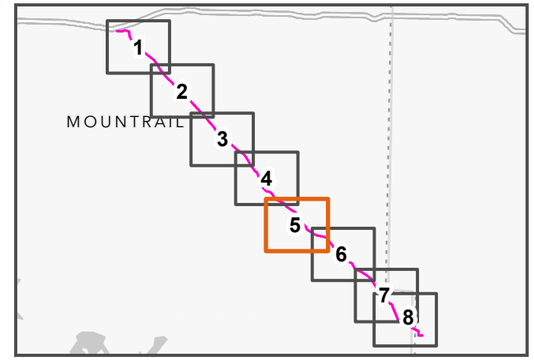


FIGURE 4-5

One-Mile-Wide Study Area and 1,000-Foot-Wide Buffer Area

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

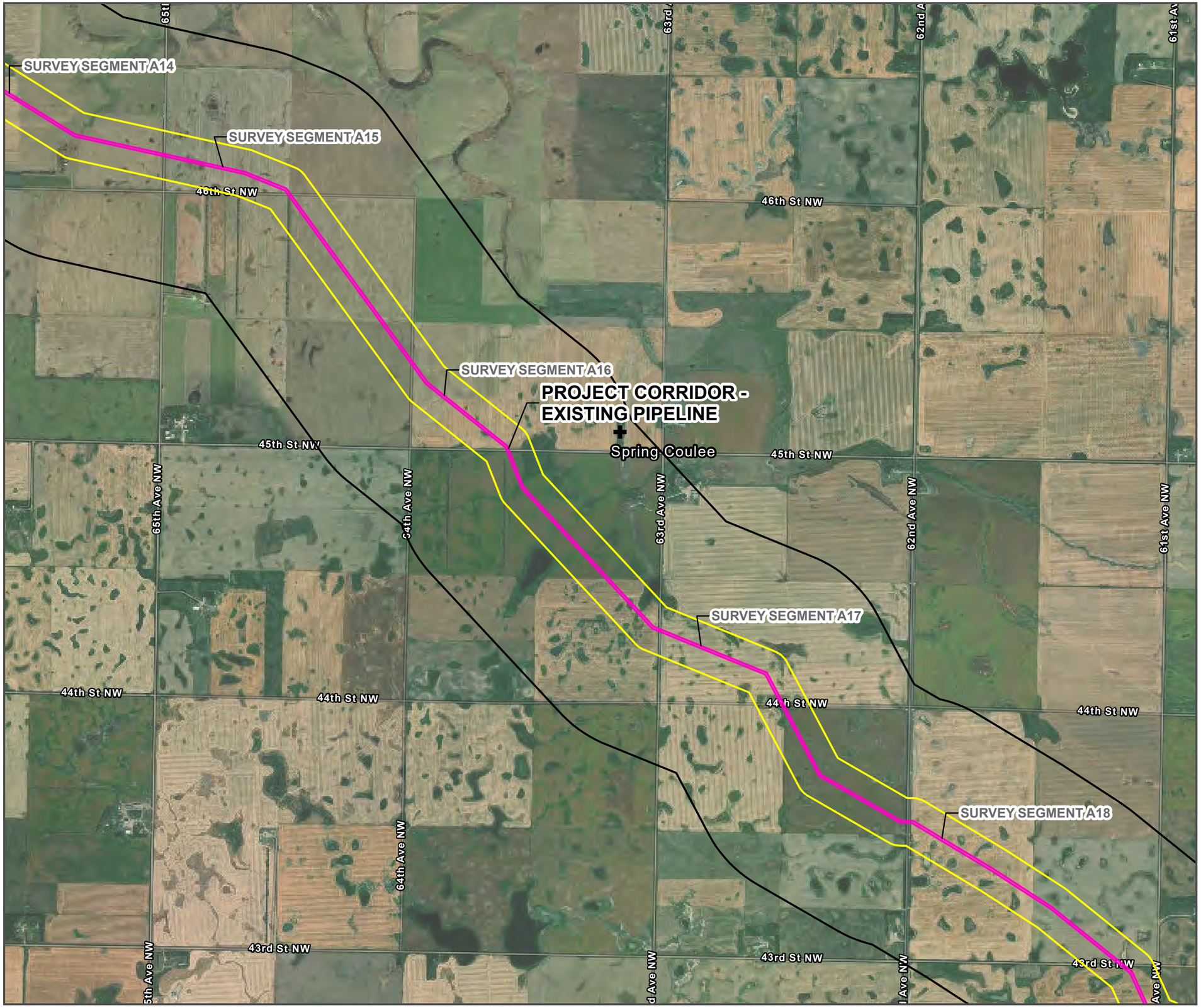
Legend

- Project Corridor - Existing Pipeline (50-foot-wide)
- Proposed Midline Pump Station
- Buffer Area (1,000-Foot-Wide)
- Study Area (One-Mile-Wide)

Notes:
1. USGS Topographic Quadrangle for Epworth SE, Shell Lake, Epworth NW obtained through ArcGIS Online streaming service.
2. Study Area (One-Mile-Wide) = 0.5 mile on either side of the pipeline centerlines
3. Buffer Area (1,000-Foot-Wide) = 500 feet on either side of the pipeline centerlines

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS



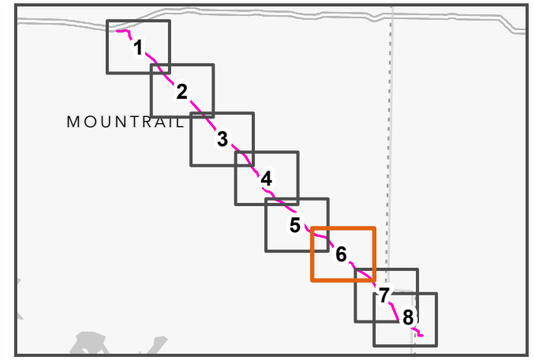


FIGURE 4-6

One-Mile-Wide Study Area and 1,000-Foot-Wide Buffer Area

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Abandoned Mine
- Project Corridor - Existing Pipeline (50-foot-wide)
- Buffer Area (1,000-Foot-Wide)
- Study Area (One-Mile-Wide)

Notes:
1. USGS Topographic Quadrangle for Epworth SE obtained through ArcGIS Online streaming service.
2. Study Area (One-Mile-Wide) = 0.5 mile on either side of the pipeline centerlines
3. Buffer Area (1,000-Foot-Wide) = 500 feet on either side of the pipeline centerlines

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS

Creator: NCochran Last Saved: 10/7/2024 9:50 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
Location: T:_EPP\Thunder_Butte_Petroleum\Makoti_Pipeline_Project\MXD_Pro\Thunder_Butte_Makoti_WDR.aprx\BHAR_Figure 4 Buffers
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

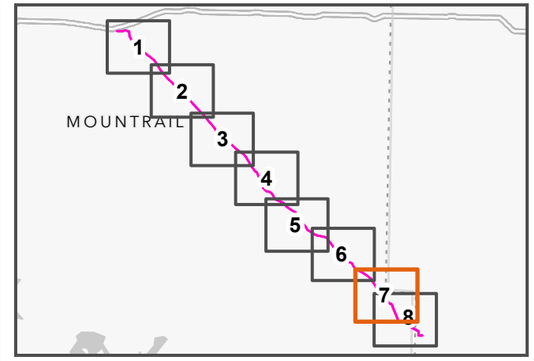


FIGURE 4-7

One-Mile-Wide Study Area and 1,000-Foot-Wide Buffer Area

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Culvert
- Project Corridor - Existing Pipeline (50-foot-wide)
- Project Corridor - Proposed Pipeline (200-foot-wide)
- Buffer Area (1,000-Foot-Wide)
- Study Area (One-Mile-Wide)

Notes:
1. USGS Topographic Quadrangle for Plaza obtained through ArcGIS Online streaming service.
2. Study Area (One-Mile-Wide) = 0.5 mile on either side of the pipeline centerlines
3. Buffer Area (1,000-Foot-Wide) = 500 feet on either side of the pipeline centerlines

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS

Creator: NCochran Last Saved: 10/7/2024 9:55 PM
Coordinate System: NAD 1983 StatePlane North Dakota North FIPS 3301 Feet
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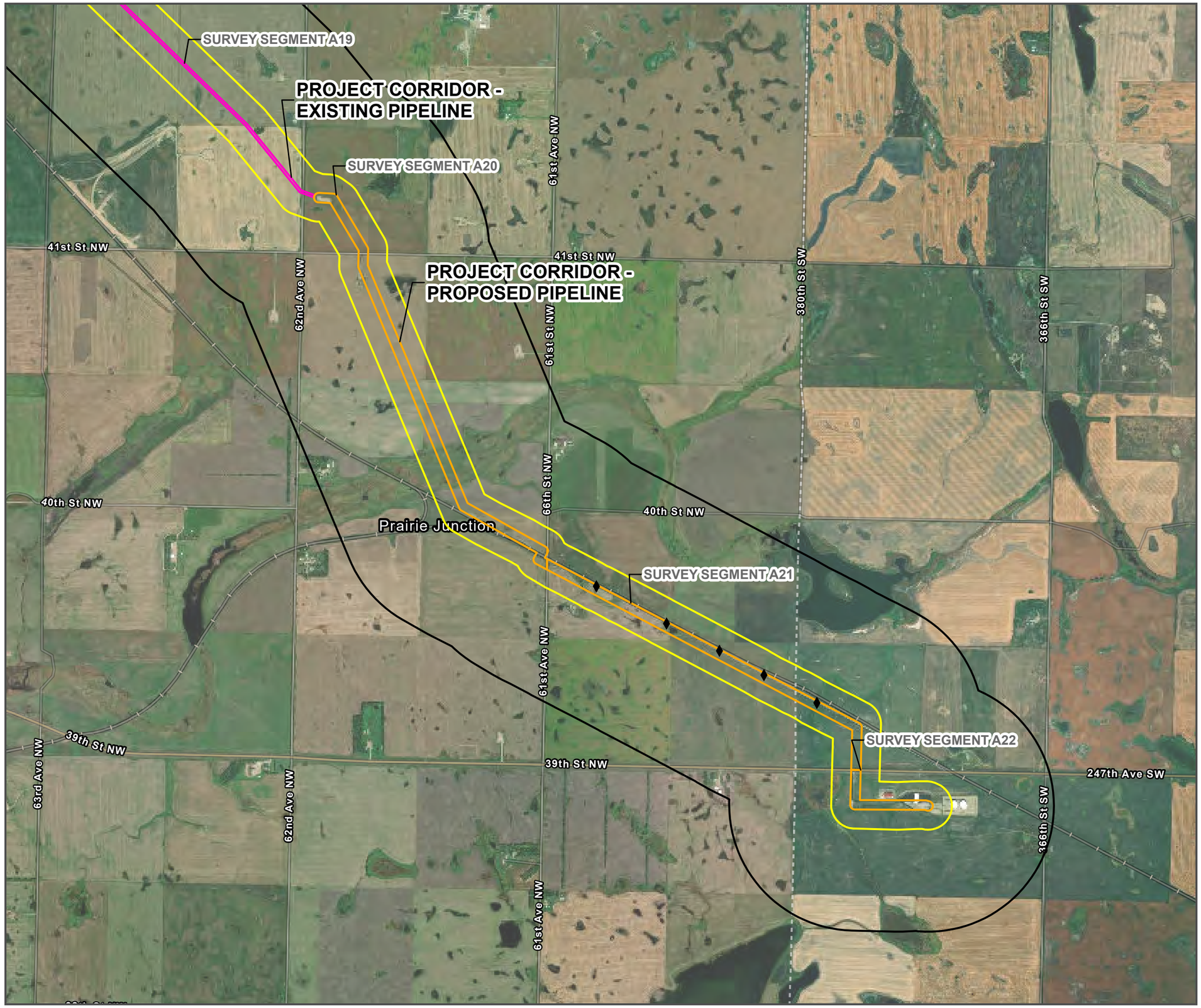
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



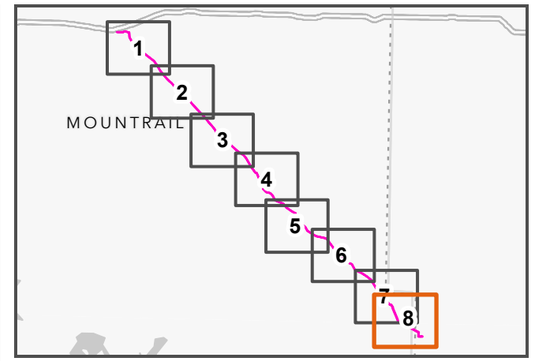


FIGURE 4-8

One-Mile-Wide Study Area and 1,000-Foot-Wide Buffer Area

Thunder Butte Pipeline, LLC
Thunder Butte Pipeline Project
Mountrail and Ward Counties, North Dakota

Legend

- Culvert
- Project Corridor - Existing Pipeline (50-foot-wide)
- Project Corridor - Proposed Pipeline (200-foot-wide)
- Buffer Area (1,000-Foot-Wide)
- Study Area (One-Mile-Wide)

Notes:
1. USGS Topographic Quadrangle for Plaza, Wabek, Makoti obtained through ArcGIS Online streaming service.
2. Study Area (One-Mile-Wide) = 0.5 mile on either side of the pipeline centerlines
3. Buffer Area (1,000-Foot-Wide) = 500 feet on either side of the pipeline centerlines

0 1,000 2,000 4,000 ft
0 250 500 1,000 m

ARCADIS

Appendix A

IPaC Official Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
North Dakota Ecological Services Field Office
3425 Miriam Avenue
Bismarck, ND 58501-7926
Phone: (701) 250-4481 Fax: (701) 355-8513

In Reply Refer To: 07/08/2024 20:36:30 UTC
Project Code: 2023-0132116
Project Name: Thunder Butte Pipeline Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through IPaC by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service (fws.gov).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

North Dakota Ecological Services Field Office
3425 Miriam Avenue
Bismarck, ND 58501-7926
(701) 250-4481

PROJECT SUMMARY

Project Code: 2023-0132116
Project Name: Thunder Butte Pipeline Project
Project Type: Pipeline - Onshore - New Constr - Below Ground
Project Description: Thunder Butte Pipeline, LLC (TBPL) is proposing the Thunder Butte Pipeline Project (Project) for transport of crude oil from the existing Thunder Butte Petroleum Services, Inc. (TBPS) Crude Storage and Loading Facility (TBPS Facility) within the Fort Berthold Indian Reservation (FBIR), near Plaza, ND to an existing Enbridge crude terminal in Stanley, ND. The project will include installation of a proposed 3.84-mile-long underground carbon steel pipeline with a 6.625-inch outer diameter (OD) originating at the existing TBPS Facility approximately 2.6 miles northwest of Makoti, ND and terminating at the interconnection with the existing 30.8-mile-long Enbridge pipeline approximately 2.1 miles southeast of Plaza, ND. The Project will also include conversion of the existing Enbridge 6.625-inch OD collector pipeline to a transmission pipeline within the existing 30-foot-wide permanent easement. From the interconnect point of the new pipeline, the existing Enbridge pipeline will transport crude oil to the existing Enbridge storage facility in Stanley, ND. Associated aboveground facilities will include a proposed 2.56-acre midline pump station adjacent to the existing Enbridge pipeline along with two associated permanent access roads, each 40-foot long, 30-foot wide. The TBPS Facility is owned by the Mandan, Hidatsa, and Arikara Nation (MHA Nation) doing business as TBPS and the Enbridge storage facility is owned by Enbridge Pipelines North Dakota. These two facilities are not part of the TBPL Project because they are owned by third-party entities.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@47.99300465,-101.90055074434673,14z

Counties: Mountrail and Ward counties, North Dakota

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis*	Endangered

No critical habitat has been designated for this species.
This species only needs to be considered under the following conditions:
- This species only needs to be considered if the project includes wind turbine operations.

Species profile: https://ecos.fws.gov/ecp/species/9045

BIRDS

NAME	STATUS
Piping Plover *Charadrius melodus*	Threatened

Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/6039

Rufa Red Knot *Calidris canutus rufa*	Threatened

There is **proposed** critical habitat for this species.
Species profile: https://ecos.fws.gov/ecp/species/1864

Whooping Crane *Grus americana*	Endangered

Population: Wherever found, except where listed as an experimental population
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/758

INSECTS

NAME	STATUS
Dakota Skipper *Hesperia dacotae*	Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/1028

Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Three Affiliated Tribes of the Fort Berthold Reservation, North Dakota
Name: Kathryn Cloutier
Address: 630 Plaza Drive
Address Line 2: Suite 200
City: Highlands Ranch
State: CO
Zip: 80129
Email kathryn.cloutier@arcadis.com
Phone: 3034713410

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Three Affiliated Tribes of the Fort Berthold Reservation, North Dakota

Appendix B

Representative Photographs

PROJECT PHOTOGRAPHS

Thunder Butte Petroleum Services, Inc.
Thunder Butte Pipeline Project: Biological Habitat Assessment Report

Photo: 1

Location:
A1

Description:
Representative View of the native prairie land cover type

Direction:
East

Coordinates:
48.3039283464335
-102.366533284393

Date: 08/06/2024

Taken By:
Kenzie Connolly

Photo: 2

Location:
A4

Description:
Representative view of pasture land cover type

Direction:
Northwest

Coordinates:
48.267663
-102.3040421

Date: 08/06/2024

Taken By:
Stuart Jennings

PROJECT PHOTOGRAPHS

Thunder Butte Petroleum Services, Inc.
Thunder Butte Pipeline Project: Biological Habitat Assessment Report

Photo: 3

Location:
A2

Description:
Representative view of agricultural cropland land use type

Direction:
North

Coordinates:
48.301557
-102.352542

Date: 08/06/2024

Taken By:
Kenzie Connolly

Photo: 4

Location:
A3

Description:
Representative view of prairie pothole wetland

Direction:
East

Coordinates:
48.282209
-102.329022

Date: 08/06/2024

Taken By:
Stu Jennings

PROJECT PHOTOGRAPHS

Thunder Butte Petroleum Services, Inc.
Thunder Butte Pipeline Project: Biological Habitat Assessment Report

Photo: 2

Location:
A1

Description:
Representative view of a PEM wetland alongside a linear, stream-like conveyance

Direction:
South

Coordinates:
48.303891
-102.363528

Date: 08/06/2024

Taken By:
Kenzie Connolly

Photo: 2

Location:
A13

Description:
Representative view of on-site perennial stream

Direction:
South

Coordinates:
48.120873
-102.099269

Date: 08/06/2024

Taken By:
Katherine Mageland

PROJECT PHOTOGRAPHS

Thunder Butte Petroleum Services, Inc.
Thunder Butte Pipeline Project: Biological Habitat Assessment Report

Photo: 2

Location:
A10

Description:
Representative view of a noxious weed area with Canada thistle

Direction:
North

Coordinates:
48.182360
-102.180073

Date: 08/06/2024

Taken By:
Christian Kammel

Arcadis U.S., Inc.
225 W. Wacker Drive, Suite 2015
Chicago, Illinois 60606
www.arcadis.com