The logo for SWCA (Soil Water Conservation Agency) is displayed vertically on the left side of the page. It consists of the letters 'S', 'W', 'C', and 'A' stacked vertically in a large, light blue, serif font. The letters are slightly overlapping and have a subtle shadow effect.

Natural Resources and Wetland Delineation Report for the Liberty Midstream Residue Pipeline Project, Mountrail and Williams Counties, North Dakota

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REVISED NOVEMBER 2019

PREPARED FOR

Liberty Midstream Solutions

PREPARED BY

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**NATURAL RESOURCES AND WETLAND DELINEATION
REPORT FOR THE
LIBERTY MIDSTREAM RESIDUE PIPELINE PROJECT,
MOUNTRAIL AND WILLIAMS COUNTIES, NORTH DAKOTA**

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1 INTRODUCTION

1.1 Background

Liberty Midstream Solutions (LMS) is proposing to construct and operate the Liberty Midstream Residue Pipeline system on privately owned lands in Mountrail and Williams County, North Dakota (project area). SWCA Environmental Consultants (SWCA) conducted natural resources field surveys to identify exclusion and avoidance areas as specified in North Dakota Administrative Code 69-06-08-02 for the proposed pipeline system.

As proposed, the pipeline will be used to transfer residue gas and natural gas liquid (NGL) to existing third-party transmission pipelines. Residue gas and NGL will be transferred through 10- and 8-inch-diameter welded steel pipelines, respectively. The project falls under the jurisdiction of the North Dakota Public Service Commission (NDPSC); therefore, SWCA was contracted to conduct natural resources field services.

SWCA conducted field surveys of a 200-foot-wide pipeline survey corridor (100-foot-wide right-of-way [ROW]) for the original proposed 4.72-mile pipeline alignment on October 2, 2018, to determine the potential presence and extent of wetlands and waterbodies that were within the survey and project area, not just those that are likely jurisdictional waters of the U.S., according to the U.S. Army Corps of Engineers (USACE) regulatory program. LMS provided SWCA a modified 4.76-mile alignment in October 2019; therefore, an additional field survey of the revised alignment was conducted on October 29, 2019. Concurrently with the wetland determinations, SWCA conducted a cursory threatened and endangered species survey and habitat assessment; a tree, sapling, and shrub enumeration survey; and a noxious weed survey. Site layout maps of the survey area and natural resource features identified during the field surveys are provided in Appendix A.

This report describes the methodology used by SWCA to complete each of the aforementioned surveys. Additionally, this report presents the results of the completed field surveys and provides regulatory recommendations to comply with the Clean Water Act of 1972 (33 United States Code [USC] 1251–1387). Lastly, this report ensures observance of and offers mitigation measures for resources protected by the Endangered Species Act of 1973 (ESA) (16 USC 1531–1544), Migratory Bird Treaty Act of 1918 (MBTA) (16 USC 703–712), and Bald and Golden Eagle Protection Act of 1940 (BGEPA) (16 USC 668).

1.2 Survey Area

The survey area for the project, a 200-foot-wide corridor for the planned 100-foot-wide-ROW, discussed herein (Figure 1) is situated on the U.S. Geological Survey (USGS) Tioga (1979), Mandaree NE (1970), Whiteearth (1991), North Dakota, quadrangles. The project corridor that was surveyed in October 2018 and October 2019 is located in Sections 24, 25, 29, 30, 32, and 33, Township (T) 158 North (N), Ranges (R) 94 and 95 West (W), Mountrail and Williams Counties, North Dakota.

Overall, northwest North Dakota is characterized by a moderate to cool climate, with cold, dry winters and mild to warm summers. Mean annual precipitation for the area is 14 to 16 inches. The project is located in the Northwestern Glaciated Plains (Level III ecoregion), which is a semiarid rolling plain of shale and sandstone-derived soils punctuated by occasional buttes and badlands (USGS 2014).



Figure 1. General topography within the project area.

1.3 Regulatory Background

1.3.1 North Dakota Administrative Code Section 69-06-08-02

In accordance with North Dakota Administrative Code Section 69-06-08-02, Transmission Facility Corridor and Route Criteria, certain geographical areas shall be either excluded or avoided from consideration for a transmission facility route.

1.3.1.1 EXCLUSION AREAS

Per North Dakota Century Code (NDCC) 69-06-08-02.1, the following geographical areas must be excluded in the consideration of a route for a transmission facility. A buffer zone of a reasonable width to protect the integrity of the area must be included.

- National: parks, memorial parks, historic sites and landmarks, natural landmarks, monuments, and wilderness areas.
- State: parks, historic sites, monuments, historical markers, archaeological sites, and nature preserves.
- County parks and recreational areas and municipal parks.
- Areas critical to life stages of threatened or endangered species.
- Areas where animal or plant species that are unique or rare to North Dakota would be irreversibly damaged.
- Areas within 1,200 feet of an intercontinental ballistic missile launch or control facility.

1.3.1.2 AVOIDANCE AREAS

Per NDCC 69-06-08-02.2 the following geographical areas may not be considered in routing of a transmission facility unless there is no reasonable alternative.

- Designated or registered national: historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.
- Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands.
- Historical resources not specifically designated as exclusion or avoidance areas.
- Areas that are geologically unstable.
- Areas within 500 feet of a residence, school, or place of business.
- Reservoirs and municipal water supplies.
- Water sources for rural water districts.
- Areas of recreational significance that are not designated as an exclusion area.

1.3.2 North Dakota Law Section 4.1-47-02

Per North Dakota Law Section 4.1-47-02, “each person shall do all things necessary and proper to control the spread of noxious weeds.”

1.3.3 Clean Water Act, Section 404

Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into waters of the U.S., including certain wetlands, also known as jurisdictional waters, without an authorization from the USACE.

1.3.3.1 USACE NATIONWIDE PERMIT 12

Nationwide Permit (NWP) 12 authorizes the construction of utility line projects in non-tidal waters of the U.S., provided the activity at each individual crossing does not result in the permanent loss of greater than 0.5 acre of waters of the U.S., including wetlands (Appendix B). In conjunction with NWP 12, Section 401 certification is required for all Section 404 permits that impact Waters of the State (i.e., NWP 12). Section 401 certification is mandated by the North Dakota Department of Health (NDDH) and requires all projects under this certification to follow their Standards of Quality for Waters of the State guidelines (Appendix C).

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

- The activity involves mechanized land clearing in a forested wetland.
- The utility line exceeds 500 feet in length through any single crossing of a water of the U.S.
- The utility line is placed within a jurisdictional area (i.e., water of the U.S.), and it runs parallel to a streambed that is within that jurisdictional area.
- Discharges result in the permanent loss of greater than 0.1 acre of waters of the U.S.
- Permanent access roads are constructed above grade in waters of the U.S. for a distance of more than 500 feet.
- Permanent access roads are constructed in waters of the U.S. with impervious materials.

1.3.3.2 USACE REGIONAL CONDITIONS

The USACE has published several regional conditions for projects operating under NWP in North Dakota (USACE 2010). The regional conditions apply to wetlands classified as “fens,” waters adjacent to natural springs, the Missouri River, historic properties, and fish-spawning areas.

1.3.4 Endangered Species Act

In the absence of a federal nexus (i.e., any action carried out, funded, or permitted by a federal agency), the ESA protects endangered and threatened species and their habitats by prohibiting the “take” of a listed animal, except as authorized by the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 10 of the ESA.

The lack of discovery of threatened or endangered species does not signify their non-existence within any particular area, but only that no primary or secondary indications of these species were recorded.

1.3.5 Migratory Bird Treaty Act

The MBTA provides that it is unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess, offer to sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. Oil and gas developments are advised to consider this federal act when considering seasonal timing, best management practices, and pre-construction survey requirements.

1.3.6 Bald and Golden Eagle Protection Act

The BGEPA prohibits anyone, without a take permit issued by the Secretary of the Interior, from “take” of an eagle. This may include 1) injury to an eagle; 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. Oil and gas developments in North Dakota are subject to compliance with the BGEPA and should consider this federal act when planning spatial and temporal aspects of construction or other disruptive activities, best management practices, and pre-construction survey requirements.

2 METHODS

2.1 Pre-Field Review

Prior to conducting field surveys, SWCA reviewed applicable National Wetlands Inventory (NWI) data (USFWS 2018a), National Hydrography Dataset (NHD) flowline data (USGS 2011), the threatened and endangered species list for Mountrail and Williams Counties (USFWS 2018b), as well as preliminary National Weather Service climatic data.

The NHD is a digital vector data set referred to by SWCA biologists in the field to confirm or disprove the existence of features such as lakes, ponds, streams, rivers, canals, dams, and stream gages (USGS 2011). NHD flowlines are features that contain flow direction and form a network (USGS 2011). In the field, SWCA can confirm or disprove NHD flowlines lines based on the presence of streams, ordinary high-water marks (OHWMs), hydrophytic vegetation, wetland hydrology, and hydric soils. A desktop analysis is then performed to determine if the confirmed waterbodies show significant nexus to waters as

described in Definition of Waters of the United States (Title 33 Code of Federal Regulations [CFR] Part 328.3 [a] [1]–[3]).

2.2 Wetlands

NWI mapping for the region indicates the presence of wetlands within the project area (USFWS 2018a). SWCA biologists conducted wetland delineations within the survey area based on the principles and guidelines provided in the Corps of Engineers Wetlands Determination Manual (Manual) (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Determination Manual: Great Plains Region Version 2.0 (Supplement) (USACE 2010). All wetlands and waterbodies geographically referenced within the survey area during the field surveys are depicted on the site layout maps in Appendix A. Wetland delineation data forms are provided in Appendix D.

Please note that the USACE has full discretion in determining the jurisdictional status of referenced wetlands and waterbodies.

2.2.1 Hydrophytic Vegetation

SWCA recorded all plants within the vegetative community of the data point survey area based on the respective stratum in which each species is located. SWCA recorded the binomial scientific name and percent cover of all plants within a 30-foot radius for the tree stratum, a 15-foot radius for the sapling/shrub stratum, a 5-foot radius for the herbaceous stratum, and a 30-foot radius for the woody vine stratum. SWCA noted each plant species' respective USFWS wetland indicator status (i.e., upland [UPL], facultative upland [FACU], facultative [FAC], facultative wetland [FACW], and obligate [OBL]). Common hydrophytic indicators include Rapid Test, for which all dominant species across all strata are rated OBL or FACW based on visual assessment; Dominance Test, for which using the “50/20 rule” greater than 50% of dominant species had an indicator status of FAC, FACW, or OBL; and Prevalence Index (PI), for which the PI is 3.0 or less.

2.2.2 Wetland Hydrology

A wetland was determined to contain wetland hydrology if at least one primary indicator or at least two secondary indicators of wetland hydrology were present, as defined by the Manual and Supplement.

2.2.3 Hydric Soil

Biologists recorded detailed notes regarding soil profiles including the hue, value, and chroma (i.e., color) of the soil (using Munsell Soil Color Charts); the depth and extent of that soil color within the entire soil profile; the concentration of any redoximorphic concentrations or depletions; and the texture of the soil at each depth where a color change was observed.

2.3 Waterbodies

The lateral extent of jurisdictional waterbodies (i.e., ponds, creeks, streams, lakes) was identified by the presence of an ordinary OHWM, if present. The OHWM typically represents the potential limits of USACE jurisdiction, unless there is a wetland adjacent to the waterbody (USACE 2008).

Please note that the USACE has full discretion in determining the jurisdictional status of referenced wetlands and waterbodies.

SWCA classified streams as perennial, intermittent, or ephemeral based on field observations. During a typical year, a perennial stream contains flowing water year-round and the water table is located above the streambed. Groundwater is the primary water source for stream flow, while precipitation runoff is supplemental. An intermittent stream has flowing water for only portions of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow. An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

2.4 Tree, Sapling, and Shrub Count

SWCA biologists determined the total number of trees, saplings, and shrubs present within the survey area by employing several different techniques depending on the type of woody vegetation habitat (i.e., forested upland, shrubland, or shelterbelt) encountered and the overall extent of each habitat within the ROW. The boundary of all forested upland, shrubland, and shelterbelt habitat were mapped using a Trimble GeoXT (Section 2.7). In forested upland and shrubland habitat, SWCA counted the number of all woody-stemmed vegetation with a diameter at breast height (DBH) of 3 inches or greater. In shelterbelt areas, all woody-stemmed vegetation, regardless of DBH, were inventoried via direct count. Vegetation with a DBH of at least 3 inches are used by bats, such as the northern long-eared bat (*Myotis septentrionalis*), as roosting locations, and larger trees are also used by raptors and other birds of prey. It is also important to count the number of individuals because of the North Dakota Public Service Commission regulation of a 2:1 mitigation replacement ratio. Biologists taxonomically identified all recorded individuals to the species level within each habitat type.

2.5 Noxious Weed Survey

“Noxious weeds” are plant species designated as state-listed or county-listed noxious weeds. They generally are not native to a given area, spread rapidly, and have adverse ecological and economic impacts. Noxious weed species may have high reproduction rates and are usually adapted to occupy a diverse range of habitats otherwise occupied by native species. These species may subsequently out-compete native plant species for resources, causing a reduction in native plant populations. Noxious weed communities (both alive and residual) were identified and mapped during field surveys by visual inspection of the survey corridor. Noxious weeds are included in surveying for county purposes and North Dakota Law § 4.1-47-02, which requires every person to do all things necessary and proper to control the spread of noxious weeds.

Noxious weeds have the potential to detrimentally affect public health, ecological stability, and agricultural practices. NDCC (Chapter 63-01.1) and the North Dakota Department of Agriculture (NDDA) recognize 11 species as noxious (NDDA 2017a). Individual counties have the authority to add additional species to their list of noxious weeds. Williams County added three additional species to its noxious weed list, and Mountrail added two additional species, with one being the same as Williams County (NDDA 2017b).

2.6 Wildlife Including Threatened and Endangered Species

Prior to conducting field surveys, SWCA reviewed information obtained from the USFWS list of threatened and endangered species by North Dakota county (USFWS 2018b) regarding the presence of threatened or endangered species that may occur within the project area. This document does not

represent a comprehensive survey but rather acknowledges the potential presence of listed species. Wildlife sightings can involve primary observations (i.e., actual sighting of an animal) or secondary observations (i.e., observation of scat, tracks, feathers, or fur deposits). SWCA completed surveys for suitable habitats that would have the potential to support any listed species. No occupancy or species-specific surveys were conducted.

A 0.5-mile line-of-sight binocular survey for raptor nests was conducted. SWCA noted all wildlife observed during the field surveys.

2.7 Mapping

The boundaries of each wetland, waterbody, and woody vegetation habitat were geographically recorded using a Trimble GeoXT global positioning system (GPS) unit. The GPS unit is capable of recording geographic data with submeter accuracy. SWCA used Universal Transverse Mercator Zone 13 North as the projected coordinate system and North American Datum 1983 as the datum. ArcGIS v10.3 (ESRI Redlands, California) was used to analyze recorded features, calculate areas, and generate the maps provided in Appendix A. Please note that all data recorded using the GPS unit and displayed on the maps in Appendix A are for review purposes only and do not represent a professional civil survey.

3 RESULTS

3.1 Wetland Delineation

3.1.1 Vegetation

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

Vegetation communities met the hydrophytic vegetation criterion for wetlands if any of the hydrophytic indicators described in the Supplement were met. The upland communities failed to meet at least one of the three assessed wetland criteria.

3.1.1.1 HERBACEOUS UPLAND

The herbaceous upland community identified in the survey area was dominated by non-woody vegetation such as grasses and forbs. The dominant herbaceous community within the proposed pipeline survey area includes native and nonnative grasses and forbs such as Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), and western wheatgrass (*Pascopyrum smithii*).

3.1.1.2 CROPLAND

The cropland identified in the survey area were small grains. Common crops in the area include durum wheat (*Triticum durum*), canola (*Brassica napus*), and soybean (*Glycine max*) (U.S. Department of Agriculture 2017).

3.1.1.3 HYDROPHYTIC VEGETATION

Aquatic vegetation species identified during the survey included broadleaf cattail (*Typha latifolia*), American sloughgrass (*Beckmannia syzigachne*), common rivergrass (*Scolochloa festucacea*), foxtail barley (*Hordeum jubatum*), reed canarygrass (*Phalaris arundinacea*), redtop (*Agrostis gigantea*), and curly dock (*Rumex crispus*).

3.1.2 Hydrology

Although precipitation data are not available for the exact site of the project, it is likely analogous to the precipitation data for Williston, Williams County, North Dakota, due to proximity of the Williston weather station to the project area (approximately 40.5 miles southwest).

According to National Weather Service preliminary climatological data for Williston, 8.14 inches of precipitation were recorded from June 1 through September 30, 2018 (Table 1) and 10.93 inches of precipitation were recorded from June 1 through September 30, 2019 (Table 2). In 2018, the amount was 0.57 inch above normal for that time period, and in 2019, the amount was 3.36 inch above normal, suggesting wetter than normal conditions.

Table 1. 2018 Monthly Recorded Rainfall at National Weather Service Station in Williston, North Dakota

Month	Recorded Precipitation (inches)	Normal Precipitation (inches)	Difference (inches)
June 2018	3.01	2.52	0.49
July 2018	3.00	2.54	0.46
August 2018	0.67	1.45	-0.78
September 2018	1.46	1.06	0.40
Total	8.14	7.57	0.57

Table 2. 2019 Monthly Recorded Rainfall at National Weather Service Station in Williston, North Dakota

Month	Recorded Precipitation (inches)	Normal Precipitation (inches)	Difference (inches)
June 2019	2.66	2.52	0.14
July 2019	3.23	2.54	0.69
August 2019	1.96	1.45	0.51
September 2019	3.08	1.06	2.02
Total	10.93	7.57	3.36

Source: National Oceanic and Atmospheric Administration 2018.

Wetland communities observed during the delineation effort displayed at least one primary or two secondary indicators of wetland hydrology, as defined by the Manual and Supplement. Upland communities either failed to display hydrologic indicators or failed to meet the hydrophytic vegetation and hydric soils criteria defined by the Manual and Supplement. Appendix D details indicators found at each sampling location.

3.1.3 Wetlands

SWCA recorded four PEM wetlands within the 200-foot-wide survey corridor, totaling approximately 1.72 acres (Table 3 and Appendix A). WET01 and WET02 are seasonal wetlands. WET03 and WET001B are semipermanent wetlands. SWCA’s preliminary determination is that WET01, WET02, and WET03 are isolated and likely non-jurisdictional. Due to the proximity of wetland WET001B to Paulsen Creek, which is a tributary of the Missouri River, SWCA believes that WET001B has the potential to be a jurisdictional waters of the U.S. However, the USACE has the final authority to determine jurisdictional status. Proposed impacts to WET01, WET02, WET03, and WET001B would be temporary, not resulting in loss, and fall under NWP 12 criteria (see Section 1.3.3).

Table 3. PEM Wetland Acreage within the Survey Area

Feature ID	Associated Sampling Point	Sampling Point Location		Total Size (acres)	Total Size within 100-foot Construction ROW (acres)
		Latitude	Longitude		
WET01	DP2U (2018)	48.482827	-102.900126	0.31	0.21
	DP3W (2018)	48.482622	-102.900157		
WET02	DP4W (2018)	48.478949	-102.897051	0.33	0.15
	DP5U (2018)	48.479168	-102.896918		
WET03	DP7U (2018)	48.476796	-102.892475	0.45	0.30
	DP8W (2018)	48.476732	-102.89223		
WET001B	DP01W (2019)	48.460038	-102.834263	0.62	0.43
	DP02U (2019)	48.460071	-102.834628		
Total				1.72	1.09

3.1.4 Waterbodies

SWCA did not identify any non-wetland waterbodies (streams, rivers, lakes, etc.) in the survey area; however, WET001B is associated with an NHD flowline and is adjacent to Paulsen Creek. Additionally, no Waters of the State are present in the survey area.

3.1.5 Soils

Based on Natural Resources Conservation Service (NRCS) mapping (NRCS 2019), 12 soil map units are present in the project corridor. The project area analyzed for soils covers the 200-foot-wide survey corridor. All soil map units within the survey area are listed in Table 4.

Table 4. Soil Map Units Present within the Survey Area

Soil Map Units	Map Unit Symbol	Hydric* (Yes/No)	% Slope	Area within 200-foot Survey Corridor (acres)	% of Total Area
Williams-Zahl loams	C132B	Yes	3 to 6	55.47	44.0
Williams-Zahl-Zahill complex	C132C	Yes	6 to 9	2.72	2.2
Zahl-Williams loams	C135D	Yes	9 to 15	5.08	4.0
Williams-Zahl-Parnell complex	C148C	Yes	0 to 9	24.94	19.8
Zahl-Williams-Bowbells loams	C154C	Yes	3 to 9	8.22	6.5
Zahl-Max-Bowbells loams	C156F	Yes	6 to 35	5.78	4.6
Bowbells loam	C201A	Yes	0 to 3	1.46	1.2

Soil Map Units	Map Unit Symbol	Hydric* (Yes/No)	% Slope	Area within 200-foot Survey Corridor (acres)	% of Total Area
Williams-Bowbells loams	C210A	Yes	0 to 3	18.67	14.8
Hamerly-Tonka complex	C272A	Yes	0 to 3	1.30	1.0
Tonka silt loam	C2A	Yes	0 to 1	0.30	0.2
Vallers loam, moderately saline	C75A	Yes	0 to 1	0.75	0.6
Divide loam	C825A	Yes	0 to 2	1.36	1.1

Source: NRCS 2019.

* A map unit component is classified as a "hydric soil" by NRCS, soils that are sufficiently wet in the upper part to develop anaerobic conditions during the growing season.

The soil series that are most prevalent within the survey area are described in Sections 3.1.5.1 through 3.1.5.5 (USDA 1999).

3.1.5.1 WILLIAMS

The Williams series consists of very deep, slowly permeable, well-drained soils found on glacial till plains and moraines with slopes at approximately 0 to 35 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches, and the mean annual air temperature is approximately 42 degrees Fahrenheit (°F). This soil type is largely used for cultivation. Native vegetation species common to this soil type include western wheatgrass, needle and thread (*Hesperostipa comata*), blue grama (*Bouteloua gracilis*), and green needlegrass (*Stipa viridula*) (USDA 1999).

3.1.5.2 ZAHL

The Zahl series consists of very deep, slowly permeable, well-drained soils found on glacial till plains, moraines, and valley side slopes at approximately 1 to 60 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches, and the mean annual air temperature is approximately 40°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type include western wheatgrass, little bluestem (*Schizachyrium scoparium*), and needle and thread (USDA 1999).

3.1.5.3 ZAHILL

The Zahill series consists of very deep, well-drained soils that formed in till. These soils can be found on till plains, hills, moraines, and escarpments at approximately 0 to 65 percent. The mean annual precipitation is about 13 inches and the mean annual air temperature is around 42°F. This soil type is well drained. Runoff is negligible to high depending on the slope, with moderately slow permeability above the till and slow permeability in the till. Zahill soils are used mainly in range and dryland crop areas. Native vegetation is mainly western wheatgrass, needle and thread, green needlegrass, little bluestem, prairie sandreed (*Calamovilfa longifolia*), bluebunch wheatgrass (*Pseudoroegneria spicata*), prairie Junegrass (*Koeleria macrantha*) blue grama, sedges, and other forbs (USDA 1999).

3.1.5.4 PARNELL

The Parnell series consists of very deep, very poorly drained and poorly drained soils that formed in water-sorted sediments from glacial drift in depressions, swales, and drainageways on glacial moraines. These soils have slow permeability. Slopes range from 0 to 3 percent. Mean annual precipitation is about 20 inches, and mean annual air temperature is about 41°F. Most undrained areas are in native vegetation

with some used for pasture or hayland. Drained areas are typically used to grow corn, soybeans, and small grains. Native vegetation is mostly marsh grasses, reeds, and sedges (*Carex* spp.) (USDA 1999).

3.1.5.5 BOWBELLS

The Bowbells series consists of very deep, well- and moderately well-drained soils found on glacial till plains and moraines. Permeability is moderate in the upper portions and moderately slow to slow in the substratum. Slopes range from approximately 0 to 9 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches, and the mean annual air temperature is approximately 42°F. This soil type is used for cultivation of small grains. Native vegetation species historically common to this soil type include western wheatgrass, green needlegrass, and big bluestem (*Andropogon gerardii*) (USDA 1999).

3.2 State Requirement Results

3.2.1 Exclusion Areas

No exclusion areas were encountered during pre-field review or during surveys.

3.2.2 Avoidance Areas

No avoidance areas were encountered during pre-field review or during surveys.

3.2.3 Tree, Sapling, and Shrub Count

Per the Tree and Shrub Mitigation Specifications by the North Dakota Public Service Commission (NDPSC), a 2:1 post- to pre-construction mitigation is typically required for all trees, saplings, and shrubs impacted during the construction of the proposed pipeline.

During SWCA’s field surveys, two tree and shrubland areas were identified within the survey area. The number of trees SWCA counted that may be impacted by the project as currently proposed for sample points WV1 and WV2 are summarized in Table 5 (see sample points locations on Appendix A figures). Therefore, SWCA estimates approximately 14 2-year-old sapling individuals would need to be replanted in order to fulfill the 2:1 mitigation requirement.

SWCA recommends that only native species of trees and shrubs be used and that they be planted in habitats where they are typically found on the landscape. Trees and shrubs should avoid being planted in native prairie.

Table 5. Tree, Sapling, and Shrub Counts

Woody Vegetation (WV) ID	Species	Type	Number of Trees		Estimated Mitigation Commitment
			Survey Corridor	100-foot-wide Construction ROW	
WV1	Quaking aspen (<i>Populus tremuloides</i>)	Planted	10	5	10
WV1	Russian olive (<i>Elaeagnus angustifolia</i>)	Planted	1	1	2
WV2	Siberian elm (<i>Ulmus pumila</i>)	Planted	5	1	2

Woody Vegetation (WV) ID	Species	Type	Number of Trees		Estimated Mitigation Commitment
			Survey Corridor	100-foot-wide Construction ROW	
Total			16	7	14

3.2.4 Noxious Weeds

In 2017, no state listed noxious weeds were found in Mountrail and Williams Counties (NDDA 2017). However, in that same year, Mountrail County found two species of county-listed noxious weeds on 3,600 and 1,600 acres, respectively, totaling 5,200 acres of known noxious weeds. Table 6 breaks down the state- and county-listed noxious weeds by acres covered in the county per species. SWCA did not identify any occurrences of state-listed or county-listed noxious weeds within the survey corridor.

Surveys were conducted outside of the optimal growing season; however, residual plant matter would have likely been observed if large stands of noxious weed(s) were present. The proponents of the proposed project will monitor and control noxious weeds within their ROW prior to and subsequent to construction.

Table 6. Noxious Weeds in Williams and Mountrail Counties, North Dakota (2017)

Common Name	Scientific Name	Williams County (acres)	Mountrail County (acres)
State-Listed Noxious Weeds			
Absinthium	<i>Artemisia absinthium</i>	0.0	0.0
Canada thistle	<i>Cirsium arvense</i>	0.0	0.0
Dalmatian toadflax	<i>Linaria dalmatica</i>	0.0	0.0
Diffuse knapweed	<i>Centaurea diffusa</i>	0.0	0.0
Leafy spurge	<i>Euphorbia esula</i>	0.0	0.0
Nodding plumeless thistle	<i>Carduus nutans</i>	0.0	0.0
Purple loosestrife	<i>Lythrum salicaria</i>	0.0	0.0
Russian knapweed	<i>Acroptilon repens</i>	0.0	0.0
Saltcedar	<i>Tamarix ramosissima</i>	0.0	0.0
Spotted knapweed	<i>Centaurea stoebe</i>	0.0	0.0
Yellow toadflax	<i>Linaria vulgaris</i>	0.0	0.0
County-Listed Noxious Weeds			
Common tansy	<i>Tanacetum vulgare</i>	--	1,600.0
Gypsyflower	<i>Cynoglossum officinale</i>	0.0	3,600.0
Narrowleaf hawksbeard	<i>Crepis tectorum</i>	0.0	--
Palmer amaranth	<i>Amaranthus palmeri</i>	0.0	--
Total		0.0	5,200.0

Sources: North Dakota Department of Agriculture (2017 and 2018)

3.3 Wildlife

Eight wildlife species listed as threatened or endangered under the ESA have potential to occur in Mountrail and Williams Counties (USFWS 2018b). The listed endangered species include the gray wolf (*Canis lupus*), whooping crane (*Grus americana*), interior least tern (*Sterna antillarum*), and pallid

sturgeon (*Scaphirhynchus albus*). The listed threatened species include the piping plover (*Charadrius melodus*) and its designated critical habitat, Dakota skipper (*Hesperia dacotae*) and its designated critical habitat, rufa red knot (*Calidris canutus rufa*), and northern long-eared bat. However, the pallid sturgeon has no potential habitat with the proposed project area.

SWCA conducted a threatened and endangered species suitable habitat survey concurrently with the wetland determinations. SWCA did not observe any primary (i.e., actual sighting) or secondary (i.e., tracks, scat, feather, or fur) indications of the presence of threatened or endangered species. However, the lack of discovery of threatened or endangered species does not signify their non-existence within the area, but only that no primary or secondary indications of these species were recorded.

3.3.1 Gray Wolf

Federal Status: Endangered

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

The gray wolf uses a variety of habitats that support a large prey base, including montane and low-elevation forests, grasslands, and desertscrub (USFWS 2018c). Due to a lack of forested habitat and the distance from Minnesota and Manitoba populations, as well as the troubled relationship between humans and wolves and their vulnerability to being shot in open habitats (Licht and Huffman 1996), the reestablishment of gray wolf populations in North Dakota is unlikely. Additionally, habitat fragmentation may further act as a barrier against wolf recolonization in western North Dakota. The gray wolf is not expected to be impacted by the proposed project.

3.3.2 Whooping Crane

Federal Status: Endangered

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

The winter 2015–2016 total wild population of the Wood Buffalo-Aransas population was estimated at 329 birds (USFWS 2016a). There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, where approximately 83% of the wild nesting sites occur (Canadian Wildlife Service and USFWS 2007; USFWS 2013a). Mountrail and Williams Counties, including the project area, are within the primary migratory flyway of whooping cranes.

Whooping cranes probe the soil subsurface with their bills for foods on the soil or vegetation substrate (Canadian Wildlife Service and USFWS 2007). Whooping cranes are omnivores, and foods typically include agricultural grains, as well as insects, frogs, rodents, small birds, minnows, berries, and plant tubers. The largest amount of time during migration is spent feeding in harvested grain fields (Canadian Wildlife Service and USFWS 2007). Studies indicate that whooping cranes use a variety of habitats during migration, in addition to cultivated croplands, and generally roost in small palustrine (marshy) wetlands within 0.62 mile of suitable feeding areas (Howe 1987, 1989). Whooping cranes have been recorded in riverine habitats during their migration, with eight sightings along the Missouri River in North Dakota (Canadian Wildlife Service and USFWS 2007:18). In these cases, they roost on submerged sandbars in wide, unobstructed channels that are isolated from human disturbance (Armbruster 1990).

It is well-documented that migrating whooping cranes use habitats in the vicinity of the project for roosting and feeding. The project area is located within the migratory corridor for the whooping crane, with the nearest sighting being approximately 4.7 miles west of the pipeline corridor (USFWS, M. Tacha, unpublished data). Suitable whooping crane foraging habitat (i.e., cultivated cropland) was observed within the survey area; however, high levels of disturbance near the project area from existing roads, agriculture production, oil and gas activity, etc., minimize the likelihood for cranes to use the area within or near the pipeline corridor. The whooping crane is not expected to be impacted by the proposed project.

3.3.3 Interior Least Tern

Federal Status: Endangered

The interior population of the least tern is listed as endangered by the USFWS (1985a). This bird is the smallest member of the gull and tern family, measuring approximately 9 inches in length. Terns remain near flowing water, where they feed by hovering over and diving into standing or flowing water to catch small fish (USFWS 2013b).

The interior population of least terns breeds in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande river systems, where they nest in small colonies. From late April to August, terns nest in a shallow hole scraped in an open sandy area, gravel patch, or exposed flat; and in bare sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. The adults continue to care for chicks after they hatch. Least terns in North Dakota often will be found sharing sandbars with the piping plover, a threatened species (USFWS 2013b).

Census data indicate over 8,000 least terns in the interior population. In North Dakota, the least tern is found mainly on the Missouri River from Garrison Dam south to Lake Oahe, and on the Missouri and Yellowstone Rivers upstream of Lake Sakakawea (USFWS 1990, 2013b). Approximately 100 pairs breed in North Dakota (USFWS 2013b). Details of their migration are not known, but their winter range is reported to include the Gulf of Mexico and Caribbean Islands (USFWS 1990, 2013b).

Loss of suitable breeding and nesting habitat for terns has resulted from dam construction and river channelization on major rivers throughout the Mississippi, Missouri, and Rio Grande river systems. River and reservoir changes have led to reduced sandbar formation and other shoreline habitats for breeding, resulting in population declines. In addition, other human shoreline disturbances affect the species (USFWS 1990). Critical habitat has not been designated for the species (USFWS 2013b). Current conservation strategies include identification and avoidance of known nesting areas, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 2013b).

Given the distance to suitable habitat, the likelihood of observing a tern in the project area is relatively low. The interior least tern is not expected to be impacted by the proposed project.

3.3.4 *Piping Plover*

Federal Status: Threatened

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

Plovers in the Great Plains make their nests on open, sparsely vegetated sand or gravel beaches adjacent to alkali wetlands and on beaches, sand bars, and dredged material islands of major river systems (USFWS 2002, 2018d). The shorelines of lakes of the Missouri River constitute significant nesting areas for the bird. Piping plover nest on the ground, making shallow scrapes in the sand, which they line with small pebbles or rocks (USFWS 1988). Anthropogenic alterations of the landscape along rivers and lakes where piping plover nest have increased the number and type of predators, subsequently decreasing nest success and chick survival (USFWS 2002, 2018d). The birds fly south by mid to late August to areas along the Texas coast and Mexico (USFWS 2002). The Northern Great Plains population has continued to decline despite federal listing, with population estimates of 1,500 breeding pairs in 1985 reduced to fewer than 1,100 in 1990. Low survival of adult birds has been identified as a factor (Root et al. 1992). Current conservation strategies include identification and preservation of known nesting sites, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 1988, 2018d).

The lack of alkali wetlands, minimal disturbance to foraging wetlands, and distance to critical habitat deem the likelihood of a piping plover occurring as relatively low. The piping plover is not expected to be impacted by the proposed project.

Desktop analysis concluded that designated critical habitat for the threatened piping plover is not present in the pipeline ROW. The nearest designated critical habitat for piping plovers is approximately 10.18 miles south of the proposed pipeline. The proposed pipeline would not modify, alter, disturb, or affect the shoreline within ND Unit 11 or the alkaline lakes and wetlands within ND Units 1 through 10. Designated critical habitat of the piping plover is not expected to be impacted by the proposed project.

3.3.5 *Dakota Skipper*

Federal Status: Threatened

The Dakota skipper is a small butterfly with a 1-inch wingspan. The male wing ranges from a tawny-orange to brown, and the female wing is darker brown with tawny-orange spots and faint white spots (USFWS 2014). On October 24, 2014, the USFWS determined a threatened species status for the Dakota skipper, and the final rule became effective November 24, 2014 (USFWS 2014). One unit of designated critical habitat—Unit 12 is located on the Little Missouri National Grassland.

The primary cause for the decline of this species includes the loss of high-quality native prairie habitat due to overgrazing, conversion to agriculture, and disruption of natural prairie fire cycles (USFWS 2014). ‘Type A’ habitat is low wet-mesic prairie with little topographic relief occurring in near-shore glacial lake deposits (Royer and Marrone 1992). Three plants species dominate ‘Type A’ habitat: wood lily (*Lilium philadelphicum*), bluebell bellflower (*Campanula rotundifolia*), and mountain deathcamas (*Zigadenus elegans*) (McCabe 1981). ‘Type B’ habitat of the Dakota skipper occurs on rolling terrain over gravelly glacial moraine deposits and is dominated by big bluestem, little bluestem, and needlegrasses (*Stipa* spp.), and may include bluebell bellflower and wood lily (USFWS 2016c). Additionally, ‘Type B’ habitat

supports extensive stands of blacksamson echinacea (*Echinacea angustifolia*), upright prairie coneflower (*Ratibida columnifera*), and blanketflower (*Gaillardia aristata*) (USFWS 2016c).

During the surveys, nonnative grasslands and cropland were dominant in the project area. Dominant species recorded during surveys included Kentucky bluegrass, smooth brome, intermediate wheatgrass (*Thinopyrum intermedium*), and western wheatgrass.

Dakota skippers are not known to occur in the project area. Adult Dakota skipper dispersal is limited due to a short adult life span of 3 weeks (Dana 1991) and one annual flight per year (USFWS 2016c). The Dakota skipper may disperse an average of 0.62 mile to an area that contains sufficient vegetative diversity and emigrants (Cochrane and Delphrey 2002). Unless a site is within about 0.62 mile of an area that generates a sufficient number of emigrants, the species' extirpation from the site is likely permanent.

Larval Dakota skipper habitat within dry-mesic habitat is associated with more gravelly glacial landscapes of relatively higher relief, more variable soil moisture, and somewhat higher soil temperatures (Royer et al. 2008). Soils in these habitats are classified predominantly as sandy loams and occasionally as loamy sands (Royer et al. 2008). Soil compaction and vegetation removal substantially alter soil water movement and evaporation, thereby altering near-surface humidity (Royer et al. 2008). Livestock grazing has been shown to increase bulk density and soil compaction, which are correlated with decreased soil water content and hydraulic conductivity (Royer et al. 2008). Dakota skippers will tolerate little to no grazing in mixed-grass prairie (Cochrane and Delphrey 2002; McCabe 1981). Grazing pressure within the pasture land found in the project area is categorized as moderate to severe based on visual observance by SWCA in the field.

The nearest designated USFWS critical habitat unit, Unit 11 in Mountrail County, is located 25.63 miles south of the project area. Additionally, Unit 12 in Williams County is located 25.98 miles south of the project area. Because of the lack of suitable habitat and the distance to the nearest known population, the Dakota skipper is not expected to be impacted by the proposed project.

3.3.6 Rufa Red Knot

Federal Status: Threatened

The rufa red knot is a medium-sized shorebird approximately 9 to 11 inches in height with breeding plumage consisting of red around the face and a prominent stripe above the eye, breast, and upper belly, and non-breeding plumage a dusky gray and white (USFWS 2013c). The USFWS published a proposal to list the rufa red knot as threatened under the ESA in the *Federal Register* in September 2013 (78 *Federal Register* 60023). On December 11, 2014, the USFWS determined a threatened species status for the rufa red knot, and the final rule became effective January 12, 2015 (79 *Federal Register* 73705).

The primary reason for the decline of this species includes reduced food supplies in Delaware Bay due to commercial harvest of horseshoe crabs, but also includes areas of range loss due to rising sea levels, shorelines project, and development (USFWS 2013c). The rufa red knot breeds in the Canadian Arctic and migrates 19,000 miles to winter on the U.S. Gulf Coast and in South America. The species generally occurs along the ocean coasts during migration, but a small number have been reported across the interior United States.

Suitable habitat along Lake Sakakawea is approximately 20.17 miles northwest of the project area. The likelihood of the rufa red knot occurring in the proposed pipeline ROW is very low due to the distance to Lake Sakakawea. The rufa red knot is not expected to be impacted by the proposed project.

3.3.7 Northern Long-Eared Bat

Federal Status: Threatened

On May 4, 2015, the USFWS listed the northern-long eared bat as threatened under the ESA (USFWS 2015b). The USFWS also issued an interim rule pursuant to Section 4(d) of the ESA in conjunction with the final rule (50 CFR Part 17). For areas within the species' range that are not affected by white-nose syndrome (i.e., areas outside the 150-mile white-nose syndrome buffer zone), including all of North Dakota, the interim 4(d) rule exempts incidental take from certain activities.

This medium-sized bat ranges across the eastern and north-central United States and all of the Canadian provinces (USFWS 2015b). Throughout most of this species' range, populations are patchily distributed. They emerge at dusk to fly through the understory of forested hillsides and ridges, feeding on moths, flies, leafhoppers, caddisflies, and beetles.

Most records of northern long-eared bats are from winter hibernacula surveys, with more than 780 hibernacula identified within the United States. No known hibernacula are located in North Dakota, due to either no suitable hibernacula present or a lack of survey effort (USFWS 2013d). This bat species occupies a wide range of rocky and forested habitats. Suitable winter habitat includes large caves and mines (USFWS 2015b). Summer day roosts include abandoned buildings, bridges, hollow trees, stumps, under loose bark, and rock fissures (Jones and Choate 1978). The summer roosting period is from May through October. Removal of any potential roost trees may impact the northern long-eared bat.

Suitable winter habitat for northern long-eared bats does not occur in the pipeline ROW. Nearby trees, including quaking aspen trees recorded at sample point WV1 (Appendix A), and rocky outcrops can act as suitable summer day roosts. Suitable habitat in the project area is minimal, and the 4(d) rule exempts incidental take for the proposed project; therefore, the northern long-eared bat is not expected to be impacted by the proposed project.

3.3.8 Migratory Birds

Status: Protected under the MBTA

Suitable habitat for migratory birds exists in the entire pipeline ROW. Specifically, grassland nesting birds have the potential to occur, feed, and nest in the project area, especially during the migratory bird breeding season, which generally occurs between February 1 and July 15. Suitable woodland nesting habitat occurs in the project area but it is minimal. All take of migratory birds, their parts, or their active nests, including eggs and young, must be avoided to prevent a violation of the MBTA.

3.3.9 Bald Eagle

Federal Status: Delisted in 2007; protected under the MBTA and the BGEPA

The bald eagle (*Haliaeetus leucocephalus*) feeds on fish and carrion and typically roosts in large trees near a water source. Bald eagle nesting habitat is typically any mature stands of conifer (*Pinophyta* sp.) or cottonwood (*Populus* sp.) trees in association with rivers, streams, reservoirs, lakes, or any significant body of water. Bald eagles in North Dakota are usually observed along the Missouri River (North Dakota Game and Fish Department 2016) and Yellowstone River. Bald eagles frequently migrate through the grassland habitats. The nearest known bald eagle nest is approximately 27.35 miles from the pipeline ROW (North Dakota Game and Fish Department 2015). The USFWS generally recommends a buffer of 0.5 mile from any eagle nest. If any active nests are discovered within 0.5 mile of the pipeline ROW,

construction should halt and the USFWS should be contacted for further direction. If these recommendations are followed, bald eagles are not expected to be impacted by the proposed project.

3.3.10 Golden Eagle

Federal Status: Unlisted; protected under the MBTA and the BGEPA

The golden eagle (*Aquila chrysaetos*) prefers habitat characterized by open prairie, plains, and forested areas. Usually, golden eagles can be found in proximity to badland cliffs, which provide suitable nesting habitat. The USFWS generally recommends a buffer of 0.5 mile from any eagle nest. If any active nests are discovered within 0.5 mile of the pipeline ROW, construction should halt and the USFWS should be contacted for further direction. If these recommendations are followed, golden eagles are not expected to be impacted by the proposed project.

3.3.11 Wildlife Observed

During the field surveys, SWCA observed various wildlife species within the survey area (Table 7). Common wildlife species may be affected both directly via death or injury from construction activities or indirectly through the temporary fragmentation of habitat as a result of construction activities and disturbance, which may disrupt normal activities such as breeding, feeding, and sheltering.

Table 7. Wildlife Observed during Field Surveys of the Pipeline Route

Common Name	Scientific Name
Ring-necked pheasant	<i>Phasianus colchicus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
Western meadowlark	<i>Sturnella neglecta</i>

4 CONCLUSIONS AND RECOMMENDATIONS

- SWCA biologists recorded three wetlands during the 2018 surveys and one additional wetland (WET001B) during 2019 surveys, totaling approximately 1.72 acres, within the 200-foot-wide survey area; 1.09 acres will be impacted by project construction. However, impacts to each individual wetland will be under 0.5 acre.
- SWCA did not record any waterbodies within the survey area.
- Each of the four wetland crossings should be considered a single and complete project as defined by the USACE and can be constructed under NWP 12. Following are the details on the use of NWP 12 for this project.
 - The impacts to the wetlands from the pipeline construction will be temporary, and no permanent loss of wetlands will occur.
 - A pre-construction notice will not be required for the use of NWP 12 due to it not meeting the notice requirements in the permit.
 - No USACE regional conditions are applicable to this project.
 - The guidelines for construction described in NWP 12 (Appendix B) will be followed; the temporary impact area must be revegetated, as applicable, and the bed returned to pre-disturbance elevation.

- The construction manager should keep a copy of NWP 12 onsite during construction of the three wetland crossings.
- In conjunction with NWP 12, Section 401 certification is required for impacts to Waters of the State. There are no Waters of the State present in the project area; therefore, no action is needed.
- SWCA counted seven tree, sapling, and shrub individuals that may be impacted by construction activities. Therefore, approximately fourteen 2-year-old saplings may need to be replanted to fulfill the NDPSC's 2:1 mitigation requirement. According to the recommendations of the North Dakota Forest Service, tree species selection for replacement should be accomplished through collaboration with a reputable area nursery. This will allow for species to be selected based on various factors, including species hardiness and area soil type.
- No threatened or endangered species or habitat were observed during the field surveys.
- Migratory birds and suitable nesting habitat were observed throughout the survey area. In order to avoid unauthorized take of migratory birds and active nests, SWCA recommends conducting construction outside of the migratory bird breeding season as practicable. If construction occurs during the bird breeding season (February 1–July 15), SWCA recommends to either mow, maintain, or completely remove vegetation within the project construction area outside the migratory bird nesting season; conduct migratory bird nesting surveys 5 days prior to construction; or prepare a habitat mitigation plan for approval by the USFWS that, once approved, would allow for clearing active nests and habitat during any time of year. If active nests (i.e., nests with eggs or young) are identified, the USFWS should be notified.
- No active raptor nests were observed within 0.5 mile of the project area. No bald or golden eagle nests were observed. No impacts to eagles are anticipated.

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APPENDIX A

Vicinity Site Layout and Soil Maps

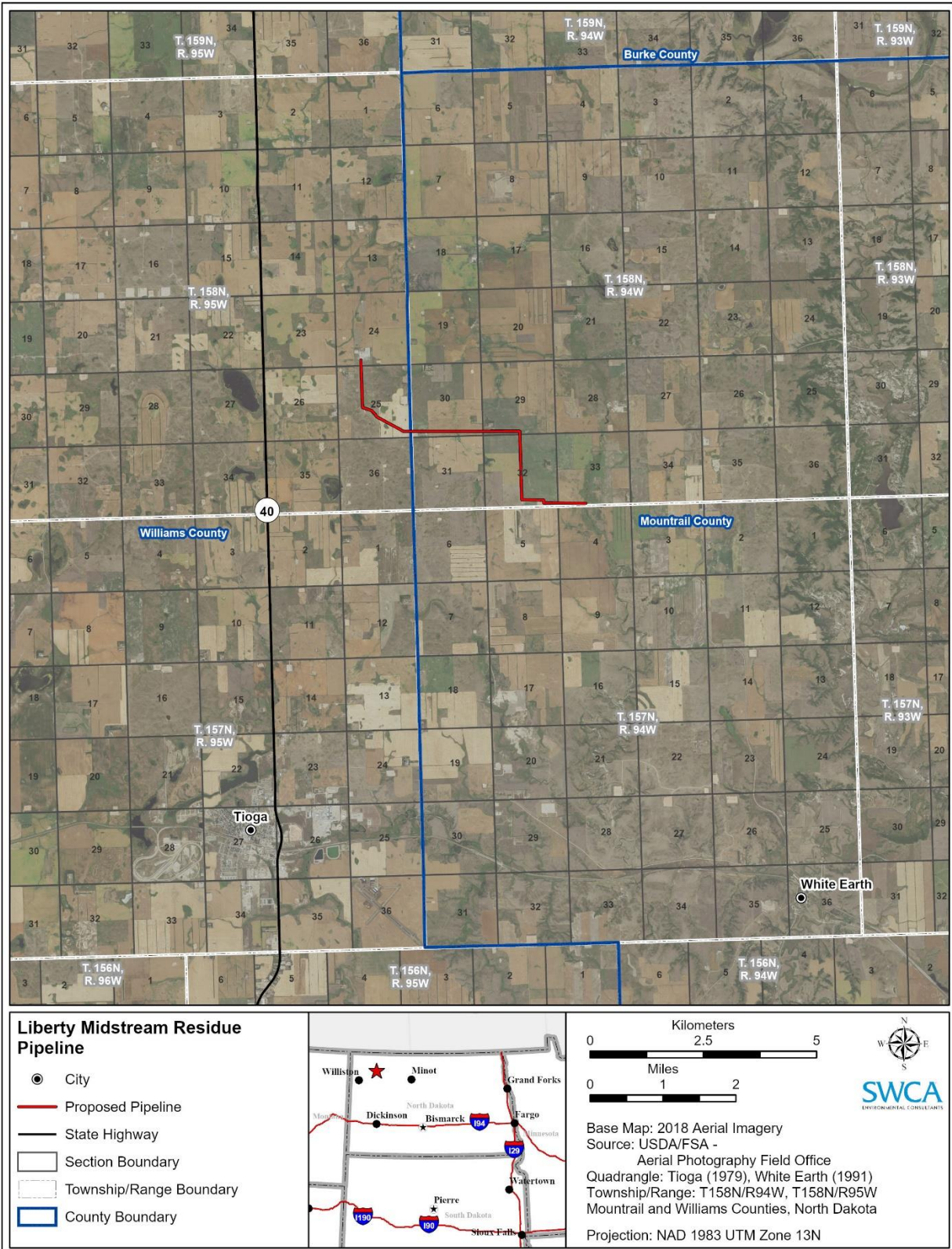


Figure A-1. General location of the Liberty Midstream Residue Pipeline.

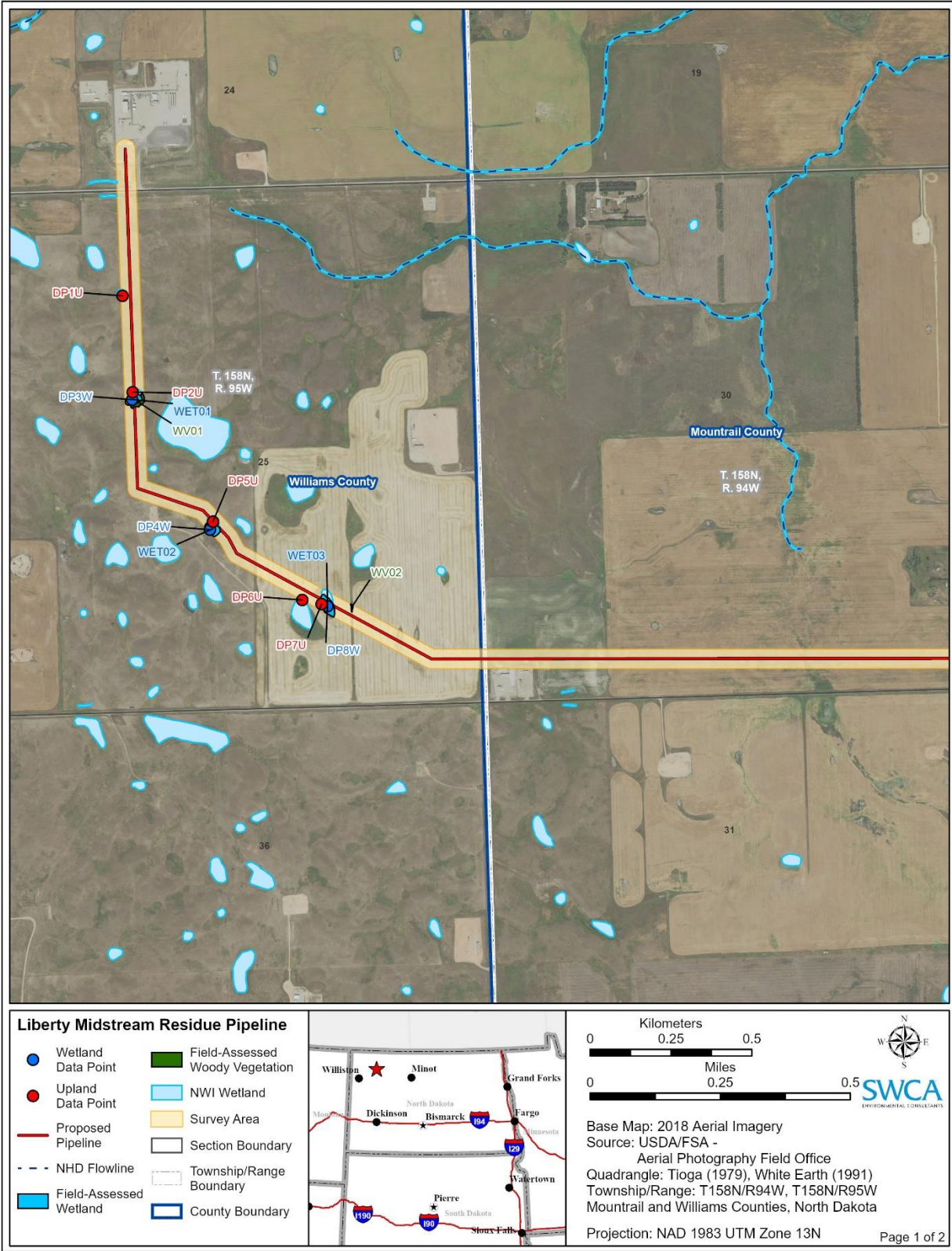


Figure A-2. Liberty Midstream Residue Pipeline project location (map 1 of 2).

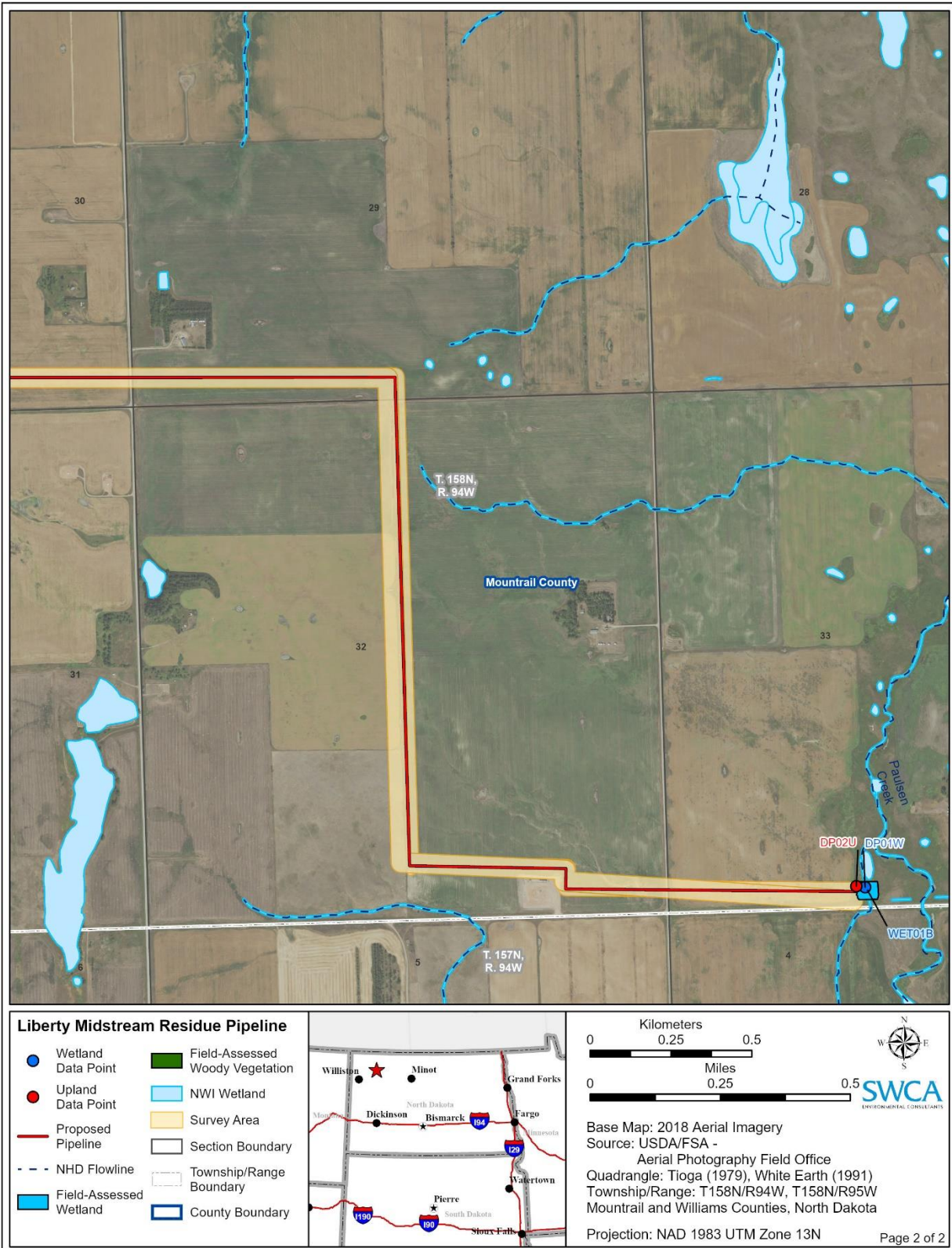


Figure A-3. Liberty Midstream Residue Pipeline project location (map 2 of 2).

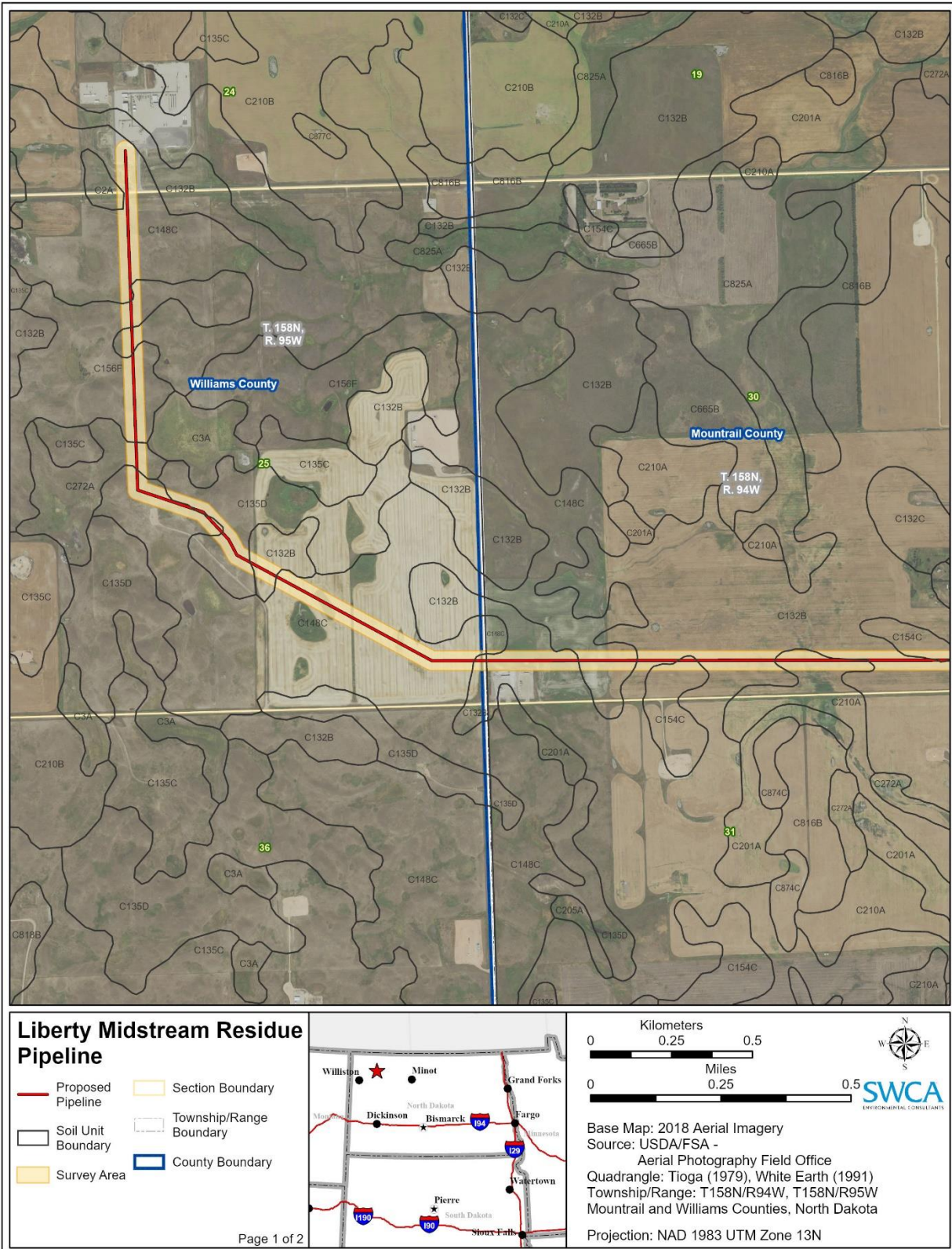


Figure A-4. Liberty Midstream Residue Pipeline project location soils (map 1 of 2).

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APPENDIX B

NWP 12 Summary

DECISION DOCUMENT NATIONWIDE PERMIT 12

This document discusses the factors considered by the Corps of Engineers (Corps) during the issuance process for this Nationwide Permit (NWP). This document contains: (1) the public interest review required by Corps regulations at 33 CFR 320.4(a)(1) and (2); (2) a discussion of the environmental considerations necessary to comply with the National Environmental Policy Act; and (3) the impact analysis specified in Subparts C through F of the 404(b)(1) Guidelines (40 CFR Part 230). This evaluation of the NWP includes a discussion of compliance with applicable laws, consideration of public comments, an alternatives analysis, and a general assessment of individual and cumulative effects, including the general potential effects on each of the public interest factors specified at 33 CFR 320.4(a).

1.0 Text of the Nationwide Permit

Utility Line Activities. Activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the United States, provided the activity does not result in the loss of greater than 1/2-acre of waters of the United States for each single and complete project.

Utility lines: This NWP authorizes discharges of dredged or fill material into waters of the United States and structures or work in navigable waters for crossings of those waters associated with the construction, maintenance, or repair of utility lines, including outfall and intake structures. There must be no change in pre-construction contours of waters of the United States. A “utility line” is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and internet, radio, and television communication. The term “utility line” does not include activities that drain a water of the United States, such as drainage tile or french drains, but it does apply to pipes conveying drainage from another area.

Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect). Any exposed slopes and stream banks must be stabilized immediately upon completion of the utility line crossing of each waterbody.

Utility line substations: This NWP authorizes the construction, maintenance, or expansion of substation facilities associated with a power line or utility line in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one

single and complete project, does not result in the loss of greater than 1/2-acre of waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters of the United States to construct, maintain, or expand substation facilities.

Foundations for overhead utility line towers, poles, and anchors: This NWP authorizes the construction or maintenance of foundations for overhead utility line towers, poles, and anchors in all waters of the United States, provided the foundations are the minimum size necessary and separate footings for each tower leg (rather than a larger single pad) are used where feasible.

Access roads: This NWP authorizes the construction of access roads for the construction and maintenance of utility lines, including overhead power lines and utility line substations, in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters for access roads. Access roads must be the minimum width necessary (see Note 2, below). Access roads must be constructed so that the length of the road minimizes any adverse effects on waters of the United States and must be as near as possible to pre-construction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above pre-construction contours and elevations in waters of the United States must be properly bridged or culverted to maintain surface flows.

This NWP may authorize utility lines in or affecting navigable waters of the United States even if there is no associated discharge of dredged or fill material (See 33 CFR part 322). Overhead utility lines constructed over section 10 waters and utility lines that are routed in or under section 10 waters without a discharge of dredged or fill material require a section 10 permit.

This NWP authorizes, to the extent that Department of the Army authorization is required, temporary structures, fills, and work necessary for the remediation of inadvertent returns of drilling fluids to waters of the United States through sub-soil fissures or fractures that might occur during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines. These remediation activities must be done as soon as practicable, to restore the affected waterbody. District engineers may add special conditions to this NWP to require a remediation plan for addressing inadvertent returns of drilling fluids to waters of the United States during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the utility line activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. After construction, temporary fills must be removed in their entirety

and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if any of the following criteria are met: (1) the activity involves mechanized land clearing in a forested wetland for the utility line right-of-way; (2) a section 10 permit is required; (3) the utility line in waters of the United States, excluding overhead lines, exceeds 500 feet; (4) the utility line is placed within a jurisdictional area (i.e., water of the United States), and it runs parallel to or along a stream bed that is within that jurisdictional area; (5) discharges that result in the loss of greater than 1/10-acre of waters of the United States; (6) permanent access roads are constructed above grade in waters of the United States for a distance of more than 500 feet; or (7) permanent access roads are constructed in waters of the United States with impervious materials. (See general condition 32.) (Authorities: Sections 10 and 404)

Note 1: Where the utility line is constructed or installed in navigable waters of the United States (i.e., section 10 waters) within the coastal United States, the Great Lakes, and United States territories, a copy of the NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), for charting the utility line to protect navigation.

Note 2: For utility line activities crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Utility line activities must comply with 33 CFR 330.6(d).

Note 3: Utility lines consisting of aerial electric power transmission lines crossing navigable waters of the United States (which are defined at 33 CFR part 329) must comply with the applicable minimum clearances specified in 33 CFR 322.5(i).

Note 4: Access roads used for both construction and maintenance may be authorized, provided they meet the terms and conditions of this NWP. Access roads used solely for construction of the utility line must be removed upon completion of the work, in accordance with the requirements for temporary fills.

Note 5: Pipes or pipelines used to transport gaseous, liquid, liquescent, or slurry substances over navigable waters of the United States are considered to be bridges, not utility lines, and may require a permit from the U.S. Coast Guard pursuant to section 9 of the Rivers and Harbors Act of 1899. However, any discharges of dredged or fill material into waters of the United States associated with such pipelines will require a section 404 permit (see NWP 15).

Note 6: This NWP authorizes utility line maintenance and repair activities that do not qualify for the Clean Water Act section 404(f) exemption for maintenance of currently serviceable fills or fill structures.

Note 7: For overhead utility lines authorized by this NWP, a copy of the PCN and NWP verification will be provided to the Department of Defense Siting Clearinghouse, which will evaluate potential effects on military activities.

Note 8: For NWP 12 activities that require pre-construction notification, the PCN must include any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings that require Department of the Army authorization but do not require pre-construction notification (see paragraph (b) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, “District Engineer’s Decision.” The district engineer may require mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see general condition 23).

1.1 Requirements

General conditions of the NWPs are in the Federal Register notice announcing the issuance of this NWP. Pre-construction notification requirements, additional conditions, limitations, and restrictions are in 33 CFR part 330.

1.2 Statutory Authorities

- Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)
- Section 404 of the Clean Water Act (33 U.S.C. 1344)

1.3 Compliance with Related Laws (33 CFR 320.3)

1.3.1 General

NWPs are a type of general permit designed to authorize certain activities that have no more than minimal individual and cumulative adverse environmental effects and generally comply with the related laws cited in 33 CFR 320.3. Activities that result in more than minimal individual and cumulative adverse environmental effects cannot be authorized by NWPs. Individual review of each activity authorized by an NWP will not normally be performed, except when pre-construction notification to the Corps is required or when an applicant requests verification that an activity complies with an NWP. Potential adverse impacts and compliance with the laws cited in 33 CFR 320.3 are controlled by the terms and conditions of each NWP, regional and case-specific conditions, and the review process that is undertaken prior to the issuance of NWPs.

The evaluation of this NWP, and related documentation, considers compliance with each of the following laws, where applicable: Sections 401, 402, and 404 of the Clean Water Act; Section 307(c) of the Coastal Zone Management Act of 1972, as amended; Section 302 of

the Marine Protection, Research and Sanctuaries Act of 1972, as amended; the National Environmental Policy Act of 1969; the Fish and Wildlife Act of 1956; the Migratory Marine Game-Fish Act; the Fish and Wildlife Coordination Act, the Federal Power Act of 1920, as amended; the National Historic Preservation Act of 1966; the Interstate Land Sales Full Disclosure Act; the Endangered Species Act; the Deepwater Port Act of 1974; the Marine Mammal Protection Act of 1972; Section 7(a) of the Wild and Scenic Rivers Act; the Ocean Thermal Energy Act of 1980; the National Fishing Enhancement Act of 1984; the Magnuson-Stevens Fishery and Conservation and Management Act, the Bald and Golden Eagle Protection Act; and the Migratory Bird Treaty Act. In addition, compliance of the NWP with other Federal requirements, such as Executive Orders and Federal regulations addressing issues such as floodplains, essential fish habitat, and critical resource waters is considered.

1.3.2 Terms and Conditions

Many NWPs have pre-construction notification requirements that trigger case-by-case review of certain activities. Two NWP general conditions require case-by-case review of all activities that may adversely affect Federally-listed endangered or threatened species or historic properties (i.e., general conditions 18 and 20, respectively). General condition 16 restricts the use of NWPs for activities that are located in Federally-designated wild and scenic rivers. None of the NWPs authorize the construction of artificial reefs. General condition 28 prohibits the use of an NWP with other NWPs, except when the acreage loss of waters of the United States does not exceed the highest specified acreage limit of the NWPs used to authorize the single and complete project.

In some cases, activities authorized by an NWP may require other federal, state, or local authorizations. Examples of such cases include, but are not limited to: activities that are in marine sanctuaries or affect marine sanctuaries or marine mammals; the ownership, construction, location, and operation of ocean thermal conversion facilities or deep water ports beyond the territorial seas; activities that result in discharges of dredged or fill material into waters of the United States and require Clean Water Act Section 401 water quality certification; or activities in a state operating under a coastal zone management program approved by the Secretary of Commerce under the Coastal Zone Management Act. In such cases, a provision of the NWPs states that an NWP does not obviate the need to obtain other authorizations required by law. [33 CFR 330.4(b)(2)]

Additional safeguards include provisions that allow the Chief of Engineers, division engineers, and/or district engineers to: assert discretionary authority and require an individual permit for a specific activity; modify NWPs for specific activities by adding special conditions on a case-by-case basis; add conditions on a regional or nationwide basis to certain NWPs; or take action to suspend or revoke an NWP or NWP authorization for activities within a region or state. Regional conditions are imposed to protect important regional concerns and resources. [33 CFR 330.4(e) and 330.5]

1.3.3 Review Process

APPENDIX C

Standards of Quality for Waters of the State

CHAPTER 33.1-16-02.1
STANDARDS OF QUALITY FOR WATERS OF THE STATE

Section

- 33.1-16-02.1-01 Authority
- 33.1-16-02.1-02 Purpose
- 33.1-16-02.1-03 Applicability
- 33.1-16-02.1-04 Definitions
- 33.1-16-02.1-05 Variances and Compliance Schedules
- 33.1-16-02.1-06 Severability
- 33.1-16-02.1-07 Classification of Waters of the State
- 33.1-16-02.1-08 General Water Quality Standards
- 33.1-16-02.1-09 Surface Water Classifications, Mixing Zones, and Numeric Standards
- 33.1-16-02.1-10 Ground Water Classifications and Standards
- 33.1-16-02.1-11 Discharge of Wastes

33.1-16-02.1-01. Authority.

These rules are promulgated pursuant to North Dakota Century Code chapters 61-28 and 23.1-11; specifically, sections 61-28-04 and 23.1-11-05, respectively.

History: Effective January 1, 2019.

General Authority: NDCC 61-28-04; S.L. 2017, ch. 199, § 1

Law Implemented: NDCC 23.1-11, 61-28; S.L. 2017, ch. 199, § 26

33.1-16-02.1-02. Purpose.

1. The purposes of this chapter are to establish a system for classifying waters of the state; provide standards of water quality for waters of the state; and protect existing and potential beneficial uses of waters of the state.
2. The state and public policy is to maintain or improve, or both, the quality of the waters of the state and to maintain and protect existing uses. Classifications and standards are established for the protection of public health and environmental resources and for the enjoyment of these waters, to ensure the propagation and well-being of resident fish, wildlife, and all biota associated with, or dependent upon, these waters; and to safeguard social, economical, and industrial development. Waters not being put to use shall be protected for all reasonable uses for which these waters are suitable. All known and reasonable methods to control and prevent pollution of the waters of this state are required, including improvement in quality of these waters, when feasible.
 - a. The "quality of the waters" shall be the quality of record existing at the time the first standards were established in 1967, or later records if these indicate an improved quality. Waters with existing quality that is higher than established standards will be maintained at the higher quality unless affirmatively demonstrated, after full satisfaction of the intergovernmental coordination and public participation provisions of the continuing planning process, that a change in quality is necessary to accommodate important social or economic development in the area in which the waters are located. In allowing the lowering of existing quality, the department shall assure that existing uses are fully protected and that the highest statutory and regulatory requirements for all point sources and cost-effective and reasonable best management practices for nonpoint sources are achieved.
 - b. Waters of the state having unique or high-quality characteristics that may constitute an outstanding state resource shall be maintained and protected.

- c. Any public or private project or development which constitutes a source of pollution shall provide the best degree of treatment as designated by the department in the North Dakota pollutant discharge elimination system. If review of data and public input indicates any detrimental water quality changes, appropriate actions will be taken by the department following procedures approved by the environmental protection agency. (North Dakota Antidegradation Implementation Procedure, Appendix IV.)

History: Effective January 1, 2019.

General Authority: NDCC 61-28-04, 61-28-05; S.L. 2017, ch. 199, § 1

Law Implemented: NDCC 23.1-11, 61-28-04; S.L. 2017, ch. 199, § 26

33.1-16-02.1-03. Applicability.

Nothing in this chapter may be construed to limit or interfere with the jurisdiction, duties, or authorities of other North Dakota state agencies.

History: Effective January 1, 2019.

General Authority: NDCC 61-28-04; S.L. 2017, ch. 199, § 1

Law Implemented: NDCC 23.1-11, 61-28; S.L. 2017, ch. 199, § 26

33.1-16-02.1-04. Definitions.

The terms used in this chapter have the same meaning as in North Dakota Century Code chapter 61-28, except:

1. "Acute standard" means the one-hour average concentration does not exceed the listed concentration more than once every three years.
2. "Best management practices" are methods, measures, or procedures selected by the department to control nonpoint source pollution. Best management practices include structural and nonstructural measures and operation and maintenance procedures.
3. "Chronic standard" means the four-day average concentration does not exceed the listed concentration more than once every three years.
4. "Consecutive thirty-day average" is the average of samples taken during any consecutive thirty-day period. It is not a requirement for thirty consecutive daily samples.
5. "Department" means the department of environmental quality.
6. A standard defined as "dissolved" means the total quantity of a given material present in a filtered water sample, regardless of the form or nature of its occurrence.
7. "Eutrophication" means the process of enrichment of rivers, streams, lakes, reservoirs, and wetlands with nutrients needed to maintain primary production.
8. "Nutrients" mean the chemical elements, primarily nitrogen and phosphorus, which are critical to the growth of aquatic plants and animals.
9. "Pollution" means such contamination, or other alteration of the physical, chemical, or biological properties, of any waters of the state, including change in temperature, taste, color, turbidity, or odor. Pollution includes discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state that will or is likely to create a nuisance or render such waters harmful, detrimental, or injurious to public health, safety, or welfare; domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or livestock, wild animals, birds, fish, or other aquatic biota.

10. "Site-specific standards" mean water quality criteria developed to reflect local environmental conditions to protect the uses of a specific water body.
11. A standard defined as "total" means the entire quantity of a given material present in an unfiltered water sample regardless of the form or nature of its occurrence. This includes both dissolved and suspended forms of a substance, including the entire amount of the substance present as a constituent of the particulate material. Total recoverable is the quantity of a given material in an unfiltered aqueous sample following digestion by refluxing with hot dilute mineral acid.
12. "Water usage". The best usage for the waters shall be those uses determined to be the most consistent with present and potential uses in accordance with the economic and social development of the area. Present principal best uses are those defined in subdivisions a, b, c, d, and e. These are not to be construed to be the only possible usages.
 - a. Municipal and domestic water. Waters suitable for use as a source of water supply for drinking and culinary purposes after treatment to a level approved by the department.
 - b. Fish and aquatic biota. Waters suitable for the propagation and support of fish and other aquatic biota and waters that will not adversely affect wildlife in the area. Low flows or natural physical and chemical conditions in some waters may limit their value for fish propagation or aquatic biota.
 - c. Recreation. Primary recreational waters are suitable for recreation where direct body contact is involved, such as bathing and swimming, and where secondary recreational activities such as boating, fishing, and wading are involved. Natural high turbidities in some waters and physical characteristics of banks and streambeds of many streams are factors that limit their value for bathing.
 - d. Agricultural uses. Waters suitable for irrigation, stock watering, and other agricultural uses, but not suitable for use as a source of domestic supply for the farm unless satisfactory treatment is provided.
 - e. Industrial water. Waters suitable for industrial purposes, including food processing, after treatment. Treatment may include that necessary for prevention of boiler scale and corrosion.

History: Effective January 1, 2019.

General Authority: NDCC 61-28-04, 61-28-05; S.L. 2017, ch. 199, § 1

Law Implemented: NDCC 23.1-11, 61-28; S.L. 2017, ch. 199, § 26

33.1-16-02.1-05. Variances and compliance schedules.

Upon written application by the responsible discharger, the department finds that by reason of substantial and widespread economic and social impacts the strict enforcement of state water quality criteria is not feasible, the department can permit a variance to the water quality standard for the affected segment. The department can set conditions and time limitations with the intent that progress toward improvements in water quality will be made. This can include interim criteria which must be reviewed at least once every three years. A variance will be granted only after fulfillment of the approved requirements at 40 CFR section 131.14, including public participation requirements and environmental protection agency approval. A variance will not preclude an existing use.

A North Dakota pollutant discharge elimination system permit may contain a schedule to return a permittee to compliance with water quality based effluent limits consistent with federal and state regulations. Compliance schedules in North Dakota pollutant discharge elimination system permits are subject to the requirements of section 33.1-16-01-15 and cannot be issued for new discharges or sources.

History: Effective January 1, 2019.

General Authority: NDCC 61-28-04, 61-28-05; S.L. 2017, ch. 199, § 1

Law Implemented: NDCC 23.1-11, 61-28; S.L. 2017, ch. 199, § 26

33.1-16-02.1-06. Severability.

The rules contained in this chapter are severable. If any rules, or part thereof, or the application of such rules to any person or circumstance are declared invalid, that invalidity does not affect the validity of any remaining portion of this chapter.

History: Effective January 1, 2019.

General Authority: NDCC 61-28-04; S.L. 2017, ch. 199, § 1

Law Implemented: NDCC 23.1-11, 61-28; S.L. 2017, ch. 199, § 26

33.1-16-02.1-07. Classification of waters of the state.

General. Classification of waters of the state shall be used to maintain and protect the present and future beneficial uses of these waters. Classification of waters of the state shall be made or changed whenever new or additional data warrant the classification or a change of an existing classification.

History: Effective January 1, 2019.

General Authority: NDCC 61-28-04; S.L. 2017, ch. 199, § 1

Law Implemented: NDCC 23.1-11, 61-28; S.L. 2017, ch. 199, § 26

33.1-16-02.1-08. General water quality standards.

1. Narrative standards.

- a. The following minimum conditions are applicable to all waters of the state except for class II ground waters. All waters of the state shall be:
 - (1) Free from substances attributable to municipal, industrial, or other discharges or agricultural practices that will cause the formation of putrescent or otherwise objectionable sludge deposits.
 - (2) Free from floating debris, oil, scum, and other floating materials attributable to municipal, industrial, or other discharges or agricultural practices in sufficient amounts to be unsightly or deleterious.
 - (3) Free from materials attributable to municipal, industrial, or other discharges or agricultural practices producing color, odor, or other conditions to such a degree as to create a nuisance or render any undesirable taste to fish flesh or, in any way, make fish inedible.
 - (4) Free from substances attributable to municipal, industrial, or other discharges or agricultural practices in concentrations or combinations which are toxic or harmful to humans, animals, plants, or resident aquatic biota. For surface water, this standard will be enforced in part through appropriate whole effluent toxicity requirements in North Dakota pollutant discharge elimination system permits.
 - (5) Free from oil or grease residue attributable to wastewater, which causes a visible film or sheen upon the waters or any discoloration of the surface of adjoining shoreline or causes a sludge or emulsion to be deposited beneath the surface of the water or upon the adjoining shorelines or prevents classified uses of such waters.
 - (6) Free from nutrients attributed to municipal, industrial, or other discharges or agricultural practices, in concentrations or loadings which will cause accelerated

eutrophication resulting in the objectionable growth of aquatic vegetation or algae or other impairments to the extent that it threatens public health or welfare or impairs present or future beneficial uses.

- b. There shall be no materials such as garbage, rubbish, offal, trash, cans, bottles, drums, or any unwanted or discarded material disposed of into the waters of the state.
- c. There shall be no disposal of livestock or domestic animals in waters of the state.
- d. The department shall propose and submit to the state engineer the minimum streamflows of major rivers in the state necessary to protect the public health and welfare. The department's determination shall address the present and prospective future use of the rivers for public water supplies, propagation of fish and aquatic life and wildlife, recreational purposes, and agricultural, industrial, and other legitimate uses.
- e. No discharge of pollutants, which alone or in combination with other substances, shall:
 - (1) Cause a public health hazard or injury to environmental resources;
 - (2) Impair existing or reasonable beneficial uses of the receiving waters; or
 - (3) Directly or indirectly cause concentrations of pollutants to exceed applicable standards of the receiving waters.
- f. If the department determines that site-specific criteria are necessary and appropriate for the protection of designated uses, procedures described in the environmental protection agency's Water Quality Standards Handbook 1994 or other defensible methods may be utilized to determine maximum limits. Where natural chemical, physical, and biological characteristics result in exceedences of the limits set forth in this section, the department may derive site-specific criteria based on the natural background level or condition. All available information shall be examined, and all possible sources of a contaminant will be identified in determining the naturally occurring concentration. All site-specific criteria shall be noticed for public comment and subjected to other applicable public participation requirements prior to being adopted.

2. **Narrative biological goal.**

- a. Goal. The biological condition of surface waters shall be similar to that of sites or water bodies determined by the department to be regional reference sites.
- b. Definitions.
 - (1) "Assemblage" means an association of aquatic organisms of similar taxonomic classification living in the same area. Examples of assemblages include fish, macroinvertebrates, algae, and vascular plants.
 - (2) "Aquatic organism" means any plant or animal which lives at least part of its life cycle in water.
 - (3) "Biological condition" means the taxonomic composition, richness, and functional organization of an assemblage of aquatic organisms at a site or within a water body.
 - (4) "Functional organization" means the number of species or abundance of organisms within an assemblage which perform the same or similar ecological functions.
 - (5) "Metric" means an expression of biological community composition, richness, or function which displays a predictable, measurable change in value along a gradient of pollution or other anthropogenic disturbance.

- (6) "Regional reference sites" are sites or water bodies which are determined by the department to be representative of sites or water bodies of similar type (e.g., hydrology and ecoregion) and are least impaired with respect to habitat, water quality, watershed land use, and riparian and biological condition.
 - (7) "Richness" means the absolute number of taxa in an assemblage at a site or within a water body.
 - (8) "Taxonomic composition" means the identity and abundance of species or taxonomic groupings within an assemblage at a site or within a water body.
- c. Implementation. The intent of the state in adopting a narrative biological goal is solely to provide an additional assessment method that can be used to identify impaired surface waters. Regulatory or enforcement actions based solely on a narrative biological goal, such as the development and enforcement of North Dakota pollutant discharge elimination system permit limits, are not authorized. However, adequate and representative biological assessment information may be used in combination with other information to assist in determining whether designated uses are attained and to assist in determining whether new or revised chemical-specific permit limitations may be needed. Implementation will be based on the comparison of current biological conditions at a particular site to the biological conditions deemed attainable based on regional reference sites. In implementing a narrative biological goal, biological condition may be expressed through an index composed of multiple metrics or through appropriate statistical procedures.

History: Effective January 1, 2019.

General Authority: NDCC 61-28-04; S.L. 2017, ch. 199, § 1

Law Implemented: NDCC 23.1-11, 61-28; S.L. 2017, ch. 199, § 26

33.1-16-02.1-09. Surface water classifications, mixing zones, and numeric standards.

1. **Surface water classifications.** Procedures for the classifications of streams and lakes of the state shall follow this subsection. Classifications of streams and lakes are listed in appendix I and appendix II, respectively.
 - a. Class I streams. The quality of the waters in this class shall be suitable for the propagation or protection, or both, of resident fish species and other aquatic biota and for swimming, boating, and other water recreation. The quality of the waters shall be suitable for irrigation, stock watering, and wildlife without injurious effects. After treatment consisting of coagulation, settling, filtration, and chlorination, or equivalent treatment processes, the water quality shall meet the bacteriological, physical, and chemical requirements of the department for municipal or domestic use.
 - b. Class IA streams. The quality of the waters in this class shall be the same as the quality of class I streams, except that where natural conditions exceed class I criteria for municipal and domestic use, the availability of softening or other treatment methods may be considered in determining whether ambient water quality meets the drinking water requirements of the department.

The Sheyenne River from its headwaters to one-tenth mile downstream from Baldhill Dam is not classified for municipal or domestic use.

- c. Class II streams. The quality of the waters in this class shall be the same as the quality of class I streams, except that additional treatment may be required to meet the drinking water requirements of the department. Streams in this classification may be intermittent

in nature which would make these waters of limited value for beneficial uses such as municipal water, fish life, irrigation, bathing, or swimming.

- d. Class III streams. The quality of the waters in this class shall be suitable for agricultural and industrial uses. Streams in this class generally have low average flows with prolonged periods of no flow. During periods of no flow, they are of limited value for recreation and fish and aquatic biota. The quality of these waters must be maintained to protect secondary contact recreation uses (e.g., wading), fish and aquatic biota, and wildlife uses.
- e. Wetlands. These water bodies, including isolated ponds, sloughs, and marshes, are to be considered waters of the state and will be protected under section 33.1-16-02.1-08.
- f. Lakes and reservoirs. The type of fishery a lake or reservoir may be capable of supporting is based on the lake's or reservoir's geophysical characteristics. The capability of a lake or reservoir to support a fishery may be affected by seasonal or climatic variability or other natural occurrences, which may alter the physical and chemical characteristics of the lake or reservoir.

Class	Characteristics
1	Cold water fishery. Waters capable of supporting growth of cold water fish species (e.g., salmonids) and associated aquatic biota.
2	Cool water fishery. Waters capable of supporting natural reproduction and growth of cool water fishes (e.g., northern pike and walleye) and associated aquatic biota. These waters are also capable of supporting the growth and marginal survival of cold water species and associated biota.
3	Warm water fishery. Waters capable of supporting natural reproduction and growth of warm water fishes (e.g., largemouth bass and bluegill) and associated aquatic biota. Some cool water species may also be present.
4	Marginal fishery. Waters capable of supporting a fishery on a short-term or seasonal basis (generally a "put and take" fishery).
5	Not capable of supporting a fishery due to high salinity.

2. **Mixing zones.** North Dakota mixing zone and dilution policy is contained in appendix III.

3. **Numeric standards.**

- a. Class I streams. The physical and chemical criteria for class I streams are listed in table 1 and table 2.
- b. Class IA streams. The physical and chemical criteria shall be those for class I streams, with the exceptions for chloride, percent sodium, and sulfate as listed in table 1.
- c. Site-specific sulfate standard. The physical and chemical criteria for the Sheyenne River from its headwaters to one-tenth of a mile downstream from Baldhill Dam shall be those for class IA streams, with the exception of sulfate as listed in table 1.
- d. Class II streams. The physical and chemical criteria shall be those for class IA, with the chloride and pH as listed in table 1.
- e. Class III streams. The physical and chemical criteria shall be those for class II, with the exceptions for sulfate as listed in table 1.

- f. Wetlands, including isolated ponds, class 4 lakes not listed in appendix II, sloughs and marshes. The physical and chemical criteria shall be those for class III streams, with exceptions for temperature, dissolved oxygen as listed in paragraph 6 of subdivision g, and other conditions not attributable to municipal, industrial, domestic, or agricultural sources.
- g. Lakes and reservoirs.
 - (1) The physical and chemical criteria for class I streams shall apply to all classified lakes or reservoirs listed in appendix II.
 - (2) In addition, a guideline for use as a goal in any lake or reservoir improvement or maintenance program is a growing season (April through November) average chlorophyll-a concentration of twenty µg/l.
 - (3) The temperature standard for class I streams does not apply to Nelson Lake in Oliver County. The temperature of any discharge to Nelson Lake shall not have an adverse effect on fish, aquatic biota, recreation, and wildlife.
 - (4) A numeric temperature standard of not greater than fifty-nine degrees Fahrenheit [15 degrees Celsius] shall be maintained in the hypolimnion of class I lakes and reservoirs during periods of thermal stratification.
 - (5) The numeric dissolved oxygen standard of five mg/l as a daily minimum does not apply to the hypolimnion of class III and IV lakes and reservoirs during periods of thermal stratification.
 - (6) The numeric dissolved oxygen standard of five mg/l as a daily minimum and the maximum temperature of eighty-five degrees Fahrenheit [29.44 degrees Celsius] shall not apply to wetlands and class 4 lakes.
 - (7) Lake Sakakawea must maintain a minimum volume of water of five hundred thousand-acre feet [61,674-hectare meters] that has a temperature of fifty-nine degrees Fahrenheit [15 degrees Celsius] or less and a dissolved oxygen concentration of not less than five mg/l.

History: Effective January 1, 2019.

General Authority: NDCC 61-28-04; S.L. 2017, ch. 199, § 1

Law Implemented: NDCC 23.1-11, 61-28; S.L. 2017, ch. 199, § 26

TABLE 1

MAXIMUM LIMITS FOR SUBSTANCES IN
OR CHARACTERISTICS OF CLASSES I, IA, II, AND III STREAMS

<u>CAS¹ No.</u>	<u>Substance or Characteristic (a = aquatic life) (b = municipal & domestic drinking water) (c = agricultural, irrigation, industrial) (d = recreation)</u>	<u>Maximum Limit</u>
7429905	Aluminum (a)	<p>Acute Standard 750 micrograms per liter (µg/l)</p> <p>Chronic Standard 87 µg/l Where the pH is equal to or greater than 7.0, and the hardness is equal to or greater than 50 mg/l as CaCO₃ in the receiving water after mixing, the 87 µg/l chronic total recoverable aluminum criterion will not apply, and aluminum will be regulated based on compliance with the 750 µg/l acute total recoverable aluminum criterion.</p>
7446-41-7	Ammonia (Total as N) (a)	<p>Acute Standard</p> <p>The one-hour average concentration of total ammonia (expressed as N in mg/l) does not exceed, more often than once every three years on the average, the numerical value given by the following formula:</p> $\frac{0.411}{1 + 10^{7.204 - pH}} + \frac{58.4}{1 + 10^{pH - 7.204}}$ <p>where salmonids are absent; or</p> $\frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}}$ <p>where salmonids are present.</p> <p>Chronic Standard</p> <p>The 30-day average concentration of total ammonia (expressed as N in mg/l) does not exceed, more often than once every three years on the average, the numerical value given by the following formula; and the highest 4-day average concentration of total ammonia within the 30-day averaging period does not exceed 2.5 times the numerical value given by the following formula:</p>

$$(CV) \left(\frac{0.0577}{1 + 10^{7.688 - pH}} \right) + \left(\frac{2.487}{1 + 10^{pH - 7.688}} \right)$$

where CV = 2.85, when temperature (T) is ≤ 14°C;

or

where:

$$(CV) = 1.45^{10^{0.028(25-T)}}$$

when T > 14°C

Site-Specific Chronic Standard

The following site-specific standard applies to the Red River of the North beginning at the 12th Avenue North bridge in Fargo, North Dakota, and extending approximately 32 miles downstream to its confluence with the Buffalo River, Minnesota. This site-specific standard applies only during the months of October, November, December, January, and February. During the months of March through September, the statewide chronic ammonia standard applies.

The 30-day average concentration of total ammonia (expressed as N in mg/l) does not exceed, more often than once every three years on the average, the numerical value given by the following formula; and the highest 4-day average concentration of total ammonia within the 30-day averaging period does not exceed 2.5 times the numerical value given by the following formula:

$$(CV) \left(\frac{0.0577}{1 + 10^{7.688 - pH}} \right) + \left(\frac{2.487}{1 + 10^{pH - 7.688}} \right)$$

where CV = 4.63, when T ≤ 7° C; or

or

where:

$$(CV) = 1.45^{10^{0.028(25-T)}}$$

when T > 7°C

7440-39-3	Barium (Total) (b)	1.0 mg/l (1-day arithmetic average)
7440-42-8	Boron (Total) (c)	0.75 mg/l (30-day arithmetic average)
16887-00-6	Chloride (Total) (a, b, c)	Class I: 100 mg/l (30-day arithmetic average) Class IA: 175 mg/l (30-day arithmetic average)

		Class II and Class III: 250 mg/l (30-day arithmetic average)
7782-50-5	Chlorine Residual (Total) (a)	Acute: 0.019 mg/l Chronic: 0.011 mg/l
7782-44-7	Dissolved Oxygen (a)	5 mg/l as a daily minimum (up to 10% of representative samples collected during any 3-year period may be less than this value provided that lethal conditions are avoided)
14797-55-8	Nitrate as N ² (a, b)	1.0 mg/l (up to 10% of samples may exceed)
14797-65-0	Nitrite as N (b)	1.0 mg/l
	E. coli ³ (d)	Not to exceed 126 organisms per 100 ml as a geometric mean of representative samples collected during any 30-day consecutive period, nor shall more than 10 percent of samples collected during any 30-day consecutive period individually exceed 409 organisms per 100 ml. For assessment purposes, the 30-day consecutive period shall follow the calendar month. This standard shall apply only during the recreation season May 1 to September 30.
	pH (a)	Class I and IA: 7.0 - 9.0 (up to 10% of representative samples collected during any 3-year period may exceed this range, provided that lethal conditions are avoided). Class II and Class III: 6.0 - 9.0 (up to 10% of representative samples collected during any 3-year period may exceed this range, provided that lethal conditions are avoided).
108-95-2	Phenols (Total) (b)	0.3 mg/l (organoleptic criterion) (one-day arithmetic average)
7440-23-5	Sodium (b, c)	Class I: 50 percent of total cations as milliequivalents per liter (mEq/l) Class IA, II, and III: 60 percent of total cations as mEq/l
18785-72-3	Sulfates (Total as SO ₄) (b)	Class I: 250 mg/l (30-day arithmetic average) Class IA and II: 450 mg/l (30-day arithmetic average) Class III: 750 mg/l (30-day arithmetic average)
	Sulfates (Total as SO ₄) (a, b)	Site Specific: 750 mg/l (maximum) applies to the Sheyenne River from its headwaters to 0.1 mile downstream from Baldhill Dam 131.10(b) requirement: The water quality standards for the Red River and the portions of the Sheyenne River located downstream from the segment of the Sheyenne River to which the site-specific sulfate standard applies must continue to be maintained. The Sheyenne River from 0.1 mile downstream from Baldhill Dam to the confluence with the Red River shall not exceed 450 mg/l sulfate (total) 30-day arithmetic average, and the Red River shall not exceed 250 mg/l sulfate (total) 30-day arithmetic average after mixing downstream from the confluence of the Sheyenne River. Regulated pollution control efforts must be developed to achieve compliance with these water quality standards.
	Temperature (a)	Eighty-five degrees Fahrenheit [29.44 degrees Celsius]. The maximum increase shall not be greater than five degrees

	Fahrenheit [2.78 degrees Celsius] above natural background conditions.
Combined radium 226 and radium 228 (Total) (b)	5 pCi/l (30-day arithmetic average)
Gross alpha particle activity, including radium 226, but excluding radon and uranium (b)	15 pCi/l (30-day arithmetic average)
<p>¹ CAS No. is the chemical abstract service registry number. The registry database contains records for specific substances identified by the chemical abstract service.</p> <p>² The standard for nitrates (N) is intended as benchmark concentration when stream or lake specific data is insufficient to determine the concentration that will cause excessive plant growth (eutrophication). However, in no case shall the concentration for nitrate plus nitrite N exceed 10 mg/l for any waters used as a municipal or domestic drinking water supply.</p> <p>³ Where the E. Coli criteria are exceeded and there are natural sources, the criteria may be considered attained, provided there is reasonable basis for concluding that the indicator bacteria density attributable to anthropogenic sources is consistent with the level of water quality required by the criteria. This may be the situation, for example, in headwater streams that are minimally affected by anthropogenic activities.</p>	

TABLE 2
WATER QUALITY CRITERIA¹
(MICROGRAMS PER LITER)

CAS No.	Pollutant (Compounds)	Aquatic Life Value Classes I, IA, II, III		Human Health Value	
		Acute	Chronic	Classes I, IA, II ²	Class III ³
71-55-6	1,1,1-Trichloroethane			10,000 ⁷	200,000
79-00-5	1,1,2-Trichloroethane ⁴			0.55	8.9
79-34-5	1,1,2,2-Tetrachloroethane ⁴			0.2	3
75-35-4	1,1-Dichloroethylene ⁴			300	20,000
156-60-5	1,2-trans-Dichloroethylene ⁷			100	4,000
120-82-1	1,2,4-Trichlorobenzene			0.071	0.076
95-50-1	1,2-Dichlorobenzene ⁷			1,000	3,000
541-73-1	1,3-Dichlorobenzene			7	10
106-46-7	1,4-Dichlorobenzene ⁷			300	900
107-06-2	1,2-Dichloroethane ⁴			9.9	650
78-87-5	1,2-Dichloropropane			0.90	31
542-75-6	1,3-Dichloropropylene (1,3-Dichloropropene) (cis and trans isomers)			0.27	12
122-66-7	1,2-Diphenylhydrazine ⁴			0.03	0.20
121-14-2	2,4-Dinitrotoluene ⁴			0.049	1.7
95-57-8	2-Chlorophenol			30	800
120-83-2	2,4-Dichlorophenol			10	60
88-06-2	2,4,6-Trichlorophenol ⁴			1.5	2.8
91-58-7	2-Chloronaphthalene			800	1,000
91-94-1	3,3'-Dichlorobenzidine ⁴			0.049	0.15
105-67-9	2,4-Dimethylphenol			100	3,000
51-28-5	2,4-Dinitrophenol			10	300
94-75-7	2,4-D			1,300	12,000
72-54-8	4,4'-DDD ⁴			0.00012	0.00012
75-55-9	4,4'-DDE ⁴			0.000018	0.000018
50-29-3	4,4'-DDT ⁴	0.55 ¹²	0.001 ¹²	0.000030	0.000030
534-52-1	2-Methyl-4,6-Dinitrophenol			2	30
59-50-7	3-Methyl-4-Chlorophenol			500	2,000
83-32-9	Acenaphthene			70	90
107-02-8	Acrolein	3	3	3	400
107-13-1	Acrylonitrile ⁴			0.061	7.0
15972-60-8	Alachlor			2 ⁷	
309-00-2	Aldrin ⁴	1.5		7.7E-07	7.7E-07
319-84-6	alpha-BHC ⁴ (Hexachlorocyclohexane-alpha)			0.00036	0.00039
319-85-7	beta-BHC ⁴ (Hexachlorocyclohexane-beta)			0.008	0.014
58-89-9	gamma-BHC (Lindane) ⁴ (Hexachlorocyclohexane-gamma)	0.95		4.2 ⁷	4.4
959-98-8	alpha-Endosulfan	0.11 ¹¹	0.056 ¹¹	20	30

33213-65-9	beta-Endosulfan	0.11 ¹¹	0.056 ¹¹	20	40
120-12-7	Anthracene (PAH) ⁵			300	400
1332-21-4	Asbestos ^{4,7}			7,000,000 f/l	7,000,000 f/l
1912-24-9	Atrazine			3 ⁷	
71-43-2	Benzene ⁴			2.1	58
92-87-5	Benzidine ⁴			0.00014	0.011
56-55-3	Benzo(a)anthracene (PAH) ⁴ (1,2-Benzanthracene)			0.0012	0.0013
50-32-8	Benzo(a)pyrene (PAH) ⁴ (3,4-Benzopyrene)			0.00012	0.00013
205-99-2	Benzo(b)fluoranthene (PAH) ⁴ (3,4-Benzofluoranthene)			0.0012	0.0013
207-08-9	Benzo(k)fluoranthene (PAH) ⁴ (11,12-Benzofluoranthene)			0.012	0.013
12587-47-2	Beta/photon emitters			4 mrem/yr ⁷	
111-44-4	Bis(2-chloroethyl) ether ⁴			0.030	2.2
108-60-1	Bis(2-chloro-1-Methylethyl) ether			200	4,000
117-81-7	Bis(2-ethylhexyl) phthalate ⁴			0.32	0.37
15541-45-4	Bromate			10 ⁷	
75-25-2	Bromoform (HM) ⁵ (Tribromomethane)			7.0	120
85-68-7	Butyl benzyl phthalate			0.10	0.10
63-25-2	Carbaryl (1-naphthyl-N-methylcarbamate)	2.1	2.1		
1563-66-2	Carbofuran			40 ⁷	
56-23-5	Carbon tetrachloride ⁴ (Tetrachloromethane)			0.40	5
57-74-9	Chlordane ⁴	1.2	0.0043	0.00031	0.00032
14998-27-7	Chlorite			1,000 ⁷	
108-90-7	Chlorobenzene (Monochlorobenzene)			100 ⁷	800
124-48-1	Chlorodibromomethane (HM) ⁵			0.80	21
67-66-3	Chloroform (HM) ⁴ (Trichloromethane)			60	2,000
2921-88-2	Chlorpyrifos	0.083	0.041		
218-01-9	Chrysene (PAH) ⁴			0.12	0.13
57-12-5	Cyanide (total)	22	5.2	4	400
75-99-0	Dalapon			200 ⁷	
103-23-1	Di(2-ethylhexyl)adipate			400 ⁷	
333-41-5	Diazinon	0.17	0.17		
53-70-3	Dibenzo(a,h)anthracene (PAH) ⁴ (1,2,5,6-Dibenzanthracene)			0.00012	0.00013
67708-83-2	Dibromochloropropane			0.2 ⁷	
75-27-4	Dichlorobromomethane (HM) ⁵			0.95	27
156-59-2	Dichloroethylene (cis-1,2-)			70 ⁷	
60-57-1	Dieldrin ⁴	0.24	0.056	1.2E-06	1.2E-06
84-66-2	Diethyl phthalate			600	600
131-11-3	Dimethyl phthalate			2,000	2,000
84-74-2	Di-n-butyl phthalate			20	30
88-85-7	Dinoseb			7 ⁷	
1746-01-6	Dioxin (2,3,7,8-TCDD) ⁴			5.00E-09	5.10E-09

85-00-7	Diquat			20 ⁷	
1031-07-8	Endosulfan sulfate			20	40
145-73-3	Endothall			100 ⁷	
72-20-8	Endrin	0.086	0.036	0.03	0.03
7421-93-4	Endrin aldehyde			1	1
100-41-4	Ethylbenzene ⁷			68	130
106-93-4	Ethylene dibromide (EDB)			0.05 ⁷	
206-44-0	Fluoranthene			20	20
86-73-7	Fluorene (PAH) ⁵			50	70
1071-83-6	Glyphosate			700 ⁷	
	Halocetic acids ¹⁴			60 ⁷	
1024-57-3	Heptachlor epoxide ⁴	0.26	0.0038	0.000032	0.000032
76-44-8	Heptachlor ⁴	0.26	0.0038	0.0000059	0.0000059
118-74-1	Hexachlorobenzene ⁴			0.000079	0.000079
87-68-3	Hexachlorobutadiene ⁴			0.01	0.01
77-47-4	Hexachlorocyclopentadiene			4	4
67-72-1	Hexachloroethane ⁴			0.10	0.10
193-39-5	Indeno(1,2,3-cd) pyrene (PAH) ⁴			0.0012	0.0013
78-59-1	Isophorone ⁴			34	1,800
72-43-5	Methoxychlor			0.02	0.02
74-83-9	Methyl bromide (HM) (Bromomethane)			100	10,000
75-09-2	Methylene chloride (HM) ⁴ (Dichloromethane)			20	1,000
98-95-3	Nitrobenzene			10	600
62-75-9	N-Nitrosodimethylamine ⁴			0.00069	3
621-64-7	N-Nitrosodi-n-propylamine ⁴			0.005	0.51
86-30-6	N-Nitrosodiphenylamine ⁴			3.3	6
84852-15-3	Nonylphenol (Isomer mixture) ¹³	28	6.6		
23135-22-0	Oxamyl (Vydate)			200 ⁷	
56-38-2	Parathion	0.065	0.013		
53469-21-9	PCB-1242 (Arochlor 1242) ⁴		0.014 ¹⁰	0.000064 ¹⁰	0.000064 ¹⁰
126764-11-2	PCB-1016 (Arochlor 1016) ⁴		0.014 ¹⁰	0.000064 ¹⁰	0.000064 ¹⁰
11104-28-2	PCB-1221 (Arochlor 1221) ⁴		0.014 ¹⁰	0.000064 ¹⁰	0.000064 ¹⁰
11141-16-5	PCB-1232 (Arochlor 1232) ⁴		0.014 ¹⁰	0.000064 ¹⁰	0.000064 ¹⁰
12672-29-6	PCB-1248 (Arochlor 1248) ⁴		0.014 ¹⁰	0.000064 ¹⁰	0.000064 ¹⁰
11097-69-1	PCB-1254 (Arochlor 1254) ⁴		0.014 ¹⁰	0.000064 ¹⁰	0.000064 ¹⁰
11096-82-5	PCB-1260 (Arochlor 1260) ⁴		0.014 ¹⁰	0.000064 ¹⁰	0.000064 ¹⁰
87-86-5	Pentachlorophenol	19 ⁸	15 ⁸	0.03	0.04
108-95-2	Phenol			4,000	300,000
1918-02-1	Picloram			500 ⁷	
129-00-0	Pyrene (PAH) ⁵			20	30
122-34-9	Simazine			4 ⁷	
100-42-5	Styrene			100 ⁷	
127-18-4	Tetrachloroethylene ⁴			10	29
108-88-3	Toluene			57	520

8001-35-2	Toxaphene ⁴	0.73	0.0002	0.0007	0.00071
688-73-3	Tributyltin	0.46	0.072		
79-01-6	Trichloroethylene ⁴			0.60	7
75-01-4	Vinyl chloride ⁴ (Chloroethylene)			0.022	1.6
1330-20-7	Xylenes			10,000 ⁷	
		Aquatic Life Value Classes I, IA, II, III		Human Health Value	
CAS No.	Pollutant (Elements)	Acute	Chronic	Classes I, IA, II ²	Class III ³
7440-36-0	Antimony			5.6	640
7440-38-2	Arsenic ⁷	340 ⁹	150 ⁹	10 ⁷	
7440-41-7	Beryllium ⁴			4 ⁷	
7440-43-9	Cadmium	1.8 ^{6,15}	0.72 ^{6,15}	5 ⁷	
16065-83-1	Chromium (III)	1,800 ^{6,15}	86 ^{6,15}	100(total) ⁷	
18540-29-9	Chromium (VI)	16	11	100(total) ⁷	
7440-50-8	Copper	14.0 ^{6,15,16}	9.3 ^{6,15,16}	1000	
7782-41-4	Fluoride			4,000 ⁷	
7439-92-1	Lead	82 ⁶	3.2 ⁶	15 ⁷	
7439-97-6	Mercury	1.7	0.012	0.050	0.051
7440-02-0	Nickel	470 ^{6,15}	52 ^{6,15}	100 ⁷	4,200
7782-49-2	Selenium	20	5	50 ⁷	
7440-22-4	Silver	3.8 ^{6,15}			
7440-28-0	Thallium			0.24	0.47
7440-61-1	Uranium			30 ⁷	
7440-66-6	Zinc	120 ^{6,15}	120 ^{6,15}	7,400	26,000

¹ Except for the aquatic life values for metals, the values given in this appendix refer to the total (dissolved plus suspended) amount of each substance. For the aquatic life values for metals, the values refer to the total recoverable method for ambient metals analyses.

² Based on two routes of exposure - ingestion of contaminated aquatic organisms and drinking water.

³ Based on one route of exposure - ingestion of contaminated aquatic organisms only.

⁴ Substance classified as a carcinogen, with the value based on an incremental risk of one additional instance of cancer in one million persons.

⁵ Chemicals which are not individually classified as carcinogens but which are contained within a class of chemicals, with carcinogenicity as the basis for the criteria derivation for that class of chemicals; an individual carcinogenicity assessment for these chemicals is pending.

⁶ Hardness dependent criteria. Value given is an example only and is based on a CaCO₃ hardness of 100 mg/l. Criteria for each case must be calculated using the following formula:

For the Criterion Maximum Concentration (CMC):

$$\text{Cadmium} \quad \text{CMC} = e^{0.9789[\ln(\text{hardness})] - 3.866}$$

$$\text{Chromium (III)} \quad \text{CMC} = e^{0.8190[\ln(\text{hardness})] + 3.7256}$$

$$\text{Copper} \quad \text{CMC} = e^{0.9422[\ln(\text{hardness})] - 1.7000}$$

$$\text{Lead} \quad \text{CMC} = e^{1.2730[\ln(\text{hardness})] - 1.4600}$$

$$\text{Nickel} \quad \text{CMC} = e^{0.8460[\ln(\text{hardness})] + 2.2550}$$

$$\text{Silver} \quad \text{CMC} = e^{1.7200[\ln(\text{hardness})] - 6.5900}$$

$$\text{Zinc} \quad \text{CMC} = e^{0.8473[\ln(\text{hardness})] + 0.8840}$$

CMC = Criterion Maximum Concentration (acute exposure value)

The threshold value at or below which there should be no unacceptable effects to freshwater aquatic organisms and

their uses if the one-hour concentration does not exceed that CMC value more than once every three years on the average.

For the Criterion Continuous Concentration (CCC):

Cadmium	$CCC = e^{0.7977[\ln(\text{hardness})] - 3.909}$
Chromium (III)	$CCC = e^{0.8190[\ln(\text{hardness})] + 0.6848}$
Copper	$CCC = e^{0.8545[\ln(\text{hardness})] - 1.7020}$
Lead	$CCC = e^{1.2730[\ln(\text{hardness})] - 4.7050}$
Nickel	$CCC = e^{0.8460[\ln(\text{hardness})] + 0.0584}$
Silver	No CCC criterion for silver
Zinc	$CCC = e^{0.8473[\ln(\text{hardness})] + 0.8840}$

CCC = Criterion Continuous Concentration (chronic exposure value)

The threshold value at or below which there should be no unacceptable effects to freshwater aquatic organisms and their uses if the four-day concentration does not exceed that CCC value more than once every three years on the average.

⁷ Safe Drinking Water Act (MCL).

⁸ Freshwater aquatic life criteria for pentachlorophenol are expressed as a function of pH. Values displayed in the table correspond to a pH of 7.8 and are calculated as follows:

$$CMC = \exp [1.005 (\text{pH}) - 4.869]$$

$$CCC = \exp [1.005 (\text{pH}) - 5.134]$$

⁹ This criterion applies to total arsenic.

¹⁰ This criterion applies to total PCBs (i.e., the sum of all congener or all isomer or homolog or Arochlor analyses).

¹¹ This criterion applies to the sum of alpha-endosulfan and beta-endosulfan.

¹² This criterion applies to DDT and its metabolites (i.e., the total concentration of DDT and its metabolites should not exceed this value).

¹³ The nonylphenol criteria address CAS numbers 84852-15-3 and 25154-52-3.

¹⁴ The criterion is for a total measurement of 5 haloacetic acids, dichloroacetic acid, trichloroacetic acid, monochloroacetic acid, bromoacetic acid, and dibromoacetic acid.

¹⁵ Hardness values shall be no greater than 400 mg/l. For waters with hardness concentrations greater than 400 mg/l, the actual ambient hardness may be used where a site-specific water effect ratio has been determined consistent with the environmental protection agency's water effect ratio procedure.

¹⁶ The department will recognize the biotic ligand model as an appropriate tool for developing site-specific limits for copper as well as the water-effects ratio (WER) method.

33.1-16-02.1-10. Ground water classifications and standards.

1. Class I ground waters. Class I ground waters are those with a total dissolved solids concentration of less than 10,000 mg/l. The minimum conditions described in subsection 1 of section 33.1-16-02.1-08 apply. Class I ground waters are not exempt under the North Dakota underground injection control program in section 33.1-25-01-05.
2. Class II ground waters. Class II ground waters are those with a total dissolved solids concentration of 10,000 mg/l or greater. Class II ground waters are exempt under the North Dakota underground injection control program in section 33.1-25-01-05.

History: Effective January 1, 2019.

General Authority: NDCC 61-28-04, 61-28-05; S.L. 2017, ch. 199, § 1

Law Implemented: NDCC 61-28-04

33.1-16-02.1-11. Discharge of wastes.

On-surface discharges. The following are general requirements for all waste discharges or chemical additions:

1. No untreated domestic sewage shall be discharged into the waters of the state.
2. No untreated industrial wastes or other wastes which contain substances or organisms which may endanger public health or degrade the water quality of water usage shall be discharged into the waters of the state.
3. The department must be notified at least twenty days prior to the application of any herbicide or pesticide to surface waters of the state for control of aquatic pests. Only certified applicators are allowed to apply chemicals. The notification must include the following information:
 - a. Chemical name and composition.
 - b. Map which identifies the area of application and aerial extent (e.g., acres or square feet).
 - c. A list of target species of aquatic biota the applicant desires to control.
 - d. The calculated concentration of the active ingredient in surface waters immediately after application.
 - e. Name, address, and telephone number of the certified applicator.
4. Any spill or discharge of waste which causes or is likely to cause pollution of waters of the state must be reported immediately. The owner, operator, or person responsible for a spill or discharge must notify the department as soon as possible (701-328-5210) or the North Dakota hazardous materials emergency assistance and spill reporting number (1-800-472-2121) and provide all relevant information about the spill. Depending on the severity of the spill or accidental discharge, the department may require the owner or operator to:
 - a. Take immediate remedial measures;
 - b. Determine the extent of pollution to waters of the state;
 - c. Provide alternate water sources to water users impacted by the spill or accidental discharge; or
 - d. Any other actions necessary to comply with this chapter.

History: Effective January 1, 2019.

General Authority: NDCC 61-28-04; S.L. 2017, ch. 199, § 1

Law Implemented: NDCC 23.1-11, 61-28; S.L. 2017, ch. 199, § 26

APPENDIX I

STREAM CLASSIFICATIONS

The following intrastate and interstate streams are classified as the class of water quality which is to be maintained in the specified stream or segments noted. All tributaries, minor or intermittently flowing watercourse, unnamed creeks, or draws not specifically mentioned are classified as class III streams.

<u>RIVER BASINS, SUBBASINS, AND TRIBUTARIES</u>	<u>CLASSIFICATION</u>
Missouri River, including Lake Sakakawea and Oahe Reservoir	I
Yellowstone	I
Little Muddy Creek near Williston	II
White Earth River	II
Little Missouri River	II
Knife River	II
Spring Creek	IA
Square Butte Creek below Nelson Lake	IA
Heart River	IA
Green River	IA
Antelope Creek	II
Muddy Creek	II
Apple Creek	II
Cannonball River	II
Cedar Creek	II
Beaver Creek near Linton	II
Grand River	IA
Spring Creek	II
Souris River	IA
Des Lacs River	II
Willow Creek	II
Deep River	III
Mauvais Coulee	I
James River	IA
Pipestem	IA
Cottonwood Creek	II
Beaver Creek	II
Elm River	II
Maple River	II
Bois de Sioux	I
Red River	I

RIVER BASINS, SUBBASINS, AND TRIBUTARIES	CLASSIFICATION
Wild Rice River	II
Antelope Creek	III
Sheyenne River (except as noted below)	IA
Baldhill Creek	II
Maple River	II
Rush River	III
Elm River	II
Goose River	IA
Turtle River	II
Forest River	II
North Branch	III
Park River	II
North Branch	III
South Branch	II
Middle Branch	III
Cart Creek	III
Pembina River	IA
Tongue River	II

The Sheyenne River from its headwaters to 0.1 mile downstream from Baldhill Dam is not classified for municipal or domestic use.

APPENDIX II

LAKE AND RESERVOIR CLASSIFICATION

Lakes and reservoirs are classified according to the water characteristics which are to be maintained in the specified lakes and reservoirs. The physical and chemical criteria for class I streams shall apply to all classified lakes and reservoirs listed. For lakes and other lentic water bodies not listed, the physical and chemical criteria designated for class III streams shall apply.

<u>COUNTY</u>	<u>LAKE</u>	<u>CLASSIFICATION</u>
Adams	Mirror Lake	3
Adams	N. Lemmon Lake	1
Barnes	Lake Ashtabula	3
Barnes	Moon Lake	2
Barnes	Clausen Springs	3
Benson	Wood Lake	2
Benson	Graves	3
Benson	Reeves	3
Bottineau	Lake Metigoshe	2
Bottineau	Long Lake	2
Bottineau	Pelican Lake	3
Bottineau	Carbury Dam	2
Bottineau	Cassidy Lake	4
Bottineau	Strawberry Lake	2
Bowman	Bowman-Haley Dam	3

COUNTY	LAKE	CLASSIFICATION
Bowman	Gascoyne Lake	3
Bowman	Kalina Dam	3
Bowman	Lutz Dam	2
Bowman	Spring Lake	3
Burke	Powers Lake	3
Burke	Short Creek Dam	2
Burke	Smishek Dam	2
Burke	Northgate Dam	2
Burleigh	McDowell Dam	3
Burleigh	Mitchell Lake	3
Burleigh	New Johns Lake	2
Cass	Casselton Reservoir	3
Cass	Brewer Lake	2
Cavalier	Mt. Carmel Dam	2
Dickey	Moores Lake	3
Dickey	Pheasant Lake	3
Dickey	Wilson Dam	3
Divide	Baukol-Noonan Dam	2

COUNTY	LAKE	CLASSIFICATION
Divide	Baukol-Noonan East Mine Pond	2
Divide	Skjermo Dam	2
Dunn	Lake Ilo	3
Eddy	Battle Lake	3
Eddy	Warsing Dam	3
Emmons	Braddock Dam	3
Emmons	Nieuwsma Dam	2
Emmons	Rice Lake	3
Foster	Juanita Lake	3
Golden Valley	South Buffalo Gap Dam	4
Golden Valley	Camel Hump Dam	1
Golden Valley	Odland Dam	3
Grand Forks	Fordville Dam	2
Grand Forks	Kolding Dam	3
Grand Forks	Larimore Dam	2
Grand Forks	Niagara Dam	3
Grant	Heart Butte Dam (Lake Tschida)	2
Grant	Niagara Dam	3

COUNTY	LAKE	CLASSIFICATION
Grant	Raleigh Reservoir	2
Grant	Sheep Creek Dam	2
Griggs	Carlson-Tande Dam	3
Griggs	Red Willow Lake	2
Hettinger	Blickensderfer Dam	2
Hettinger	Castle Rock Dam	4
Hettinger	Indian Creek	2
Hettinger	Larson Lake	3
Hettinger	Mott Watershed Dam	3
Kidder	Alkaline Lake	2
Kidder	Cherry Lake	3
Kidder	Crystal Springs	3
Kidder	Frettim Lake	2
Kidder	George Lake	5
Kidder	Horsehead Lake	2
Kidder	Lake Isabel	3
Kidder	Lake Josephine	2
Kidder	Lake Williams	3

COUNTY	LAKE	CLASSIFICATION
Kidder	Round Lake	2
LaMoure	Heinrich-Martin Dam	3
LaMoure	Kalmbach Lake	3
LaMoure	Kulm-Edgeley Dam	3
LaMoure	Lake LaMoure	3
LaMoure	Lehr Dam	3
LaMoure	Limesand-Seefeldt Dam	3
LaMoure	Schlecht-Thom Dam	3
LaMoure	Schlecht-Weix Dam	3
Logan	Beaver Lake	3
Logan	Mundt Lake	3
Logan	Rudolph Lake	3
McHenry	Cottonwood Lake	3
McHenry	George Lake	3
McHenry	Round Lake	3
McHenry	Buffalo Lodge Lake	3
McIntosh	Blumhardt Dam	2
McIntosh	Clear Lake	3

COUNTY	LAKE	CLASSIFICATION
McIntosh	Coldwater Lake	3
McIntosh	Dry Lake	2
McIntosh	Green Lake	2
McIntosh	Lake Hoskins	3
McKenzie	Arnegard Dam	4
McKenzie	Leland Dam	2
McKenzie	Sather Dam	2
McLean	Brush Lake	3
McLean	Crooked Lake	3
McLean	Custer Mine Pond	2
McLean	East Park Lake	2
McLean	Lake Audubon	2
McLean	Lake Brekken	2
McLean	Lake Holmes	2
McLean	Lightning Lake	1
McLean	Long Lake	4
McLean	Riverdale Spillway Lake	1
McLean	Strawberry Lake	3

COUNTY	LAKE	CLASSIFICATION
McLean	West Park Lake	2
Mercer	Harmony Lake	3
Morton	Crown Butte Dam	3
Morton	Danzig Dam	3
Morton	Fish Creek Dam	1
Morton	Harmon Lake	3
Morton	Nygren Dam	2
Morton	Sweetbriar Dam	2
Mountrail	Clearwater Lake	3
Mountrail	Stanley City Pond	3
Mountrail	Stanley Reservoir	3
Mountrail	White Earth Dam	2
Nelson	McVille Dam	2
Nelson	Tolna Dam	2
Nelson	Whitman Dam	2
Oliver	East Arroda Lake	2
Oliver	Nelson Lake	3
Oliver	West Arroda Lake	2

COUNTY	LAKE	CLASSIFICATION
Pembina	Renwick Dam	3
Pierce	Balta Dam	3
Pierce	Buffalo Lake	3
Ramsey	Cavanaugh Lake	3
Ramsey	Devils Lake	2
Ransom	Dead Colt Creek Dam	3
Renville	Lake Darling	2
Richland	Lake Elsie	3
Richland	Mooreton Pond	3
Rolette	Belcourt Lake	2
Rolette	Carpenter Lake	2
Rolette	Dion Lake	2
Rolette	Gordon Lake	2
Rolette	Gravel Lake	2
Rolette	Hooker Lake	2
Rolette	Island Lake	3
Rolette	Jensen Lake	3
Rolette	School Section Lake	2

COUNTY	LAKE	CLASSIFICATION
Rolette	Upsilon Lake	2
Rolette	Shutte Lake	2
Sargent	Alkali Lake	3
Sargent	Buffalo Lake	3
Sargent	Lake Tewaukon	3
Sargent	Silver Lake	3
Sargent	Sprague Lake	3
Sheridan	Hecker Lake	2
Sheridan	South McClusky Lake (Hoffer Lake)	2
Sioux	Froelich Dam	2
Slope	Cedar Lake	3
Slope	Davis Dam	2
Slope	Stewart Lake	3
Stark	Belfield Pond	1
Stark	Dickinson Dike	1
Stark	Patterson Lake	3
Steele	North Golden Lake	3
Steele	North Tobiason Lake	3

COUNTY	LAKE	CLASSIFICATION
Steele	South Golden Lake	3
Stutsman	Arrowwood Lake	4
Stutsman	Bader Lake	3
Stutsman	Barnes Lake	3
Stutsman	Clark Lake	3
Stutsman	Crystal Springs	3
Stutsman	Hehn-Schaffer Lake	3
Stutsman	Jamestown Reservoir	3
Stutsman	Jim Lake	4
Stutsman	Spiritwood Lake	3
Stutsman	Pipestem Reservoir	3
Towner	Armourdale Dam	2
Towner	Bisbee Dam	2
Walsh	Bylin Dam	3
Walsh	Homme Dam	3
Walsh	Matejcek Dam	3
Ward	Hiddenwood Lake	3
Ward	Makoti Lake	4

COUNTY	LAKE	CLASSIFICATION
Ward	North-Carlson Lake	3
Ward	Rice Lake	3
Ward	Velva Sportsmans Pond	1
Wells	Harvey Dam	3
Wells	Lake Hiawatha (Sykeston Dam)	4
Williams	Blacktail Dam	3
Williams	Cottonwood Lake	3
Williams	East Spring Lake Pond	3
Williams	Epping-Springbrook Dam	3
Williams	Iverson Dam	2
Williams	Kettle Lake	2
Williams	Kota-Ray Dam	1
Williams	McCleod (Ray) Reservoir	3
Williams	McGregor Dam	1
Williams	Tioga Dam	3
Williams	Trenton Lake	2
Williams	West Spring Lake Pond	3
	Lake Oahe	1

COUNTY

LAKE

CLASSIFICATION

Lake Sakakawea

1

APPENDIX III

MIXING ZONE AND DILUTION POLICY AND IMPLEMENTATION PROCEDURE

PURPOSE

This policy addresses how mixing and dilution of point source discharges with receiving waters will be addressed in developing chemical-specific and whole effluent toxicity discharge limitations for point source discharges. Depending upon site-specific mixing patterns and environmental concerns, some pollutants/criteria may be allowed a mixing zone or dilution while others may not. In all cases, mixing zone and dilution allowances shall be limited, as necessary, to protect the integrity of the receiving water's ecosystem and designated uses.

MIXING ZONES

Where dilution is available and the discharge does not mix at a near instantaneous and complete rate with the receiving water (incomplete mixing), an appropriate mixing zone may be designated. In addition, a mixing zone may only be designated if it is not possible to achieve chemical-specific standards and whole effluent toxicity objectives at the end-of-pipe with no allowance for dilution. The size and shape of a mixing zone will be determined on a case-by-case basis. At a maximum, mixing zones for streams and rivers shall not exceed one-half the cross-sectional area or a length ten times the stream width at critical low flows, whichever is more limiting. Also, at a maximum, mixing zones in lakes shall not exceed five percent of lake surface area or two hundred feet in radius, whichever is more limiting. Individual mixing zones may be limited or denied in consideration of designated beneficial uses or presence of the following concerns in the area affected by the discharge:

1. There is the potential for bioaccumulation in fish tissues or wildlife.
2. The area is biologically important, such as fish spawning/nursery areas.
3. The pollutant of concern exhibits a low acute to chronic ratio.
4. There is a potential for human exposure to pollutants resulting from drinking water use or recreational activities.
5. The effluent and resultant mixing zone results in an attraction of aquatic life to the effluent plume.
6. The pollutant of concern is extremely toxic and persistent in the environment.
7. The mixing zone would prohibit a zone of passage for migrating fish or other species (including access to tributaries).
8. There are cumulative effects of multiple discharges and their mixing zones.

Within the mixing zone designated for a particular pollutant, certain numeric water quality criteria for that substance may not apply. However, all mixing zones shall meet the general conditions set forth in section 33-16-02-08 of the state water quality standards.

While exceedences of acute chemical specific numeric standards are not allowed within the entire mixing zone, a portion of the mixing zone (the zone of initial dilution or ZID) may exceed acute chemical-specific numeric standards established for the protection of aquatic life. The ZID shall be determined on a case-by-case basis where the statement of basis for the discharge permit includes a rationale for concluding that a zone of initial dilution poses no unacceptable risks to aquatic life. Acute whole effluent toxicity (WET) limits shall be achieved at the end-of-pipe with no allowance for a ZID.

DILUTION ALLOWANCES

An appropriate dilution allowance may be provided in calculating chemical-specific acute and chronic and WET discharge limitations where: 1) the discharge is to a river or stream, 2) dilution is available at low-flow conditions, and 3) available information is sufficient to reasonably conclude that there is near instantaneous and complete mixing of the discharge with the receiving water (complete mixing). The basis for concluding that such near instantaneous and complete mixing is occurring shall be documented in the statement of basis for the North Dakota pollutant discharge elimination system permit. In the case of field studies, the dilution allowance for continuous dischargers shall be based on the critical low flow (or some portion of the critical low flow). The requirements and environmental concerns identified in the paragraphs above may be considered in deciding the portion of the critical low flow to provide as dilution. The following critical low flows shall be used for streams and effluents:

Stream Flows

Aquatic life, chronic	4-day, 3-year flow (biologically based)**
Aquatic life, acute	1-day, 3-year flow (biologically based)
Human health (carcinogens)	Harmonic mean flow
Human health (noncarcinogens)	4-day, 3-year flow (biologically based) or 1-day, 3-year flow (biologically based)

Effluent Flows

Aquatic life, chronic	Mean daily flow
Aquatic life, acute	Maximum daily flow
Human health (all)	Mean daily flow

* Biologically based refers to the biologically based design flow method developed by the environmental protection agency. It differs from the hydrologically based design flow method in that it directly uses the averaging periods and frequencies specified in the aquatic life water quality criteria for individual pollutants and whole effluents for determining design flows.

** A 30-day, 10-year flow (biologically based) can be used for ammonia or other chronic standard with a 30-day averaging period.

For chemical-specific and chronic WET limits, an appropriate dilution allowance may also be provided for certain minor publicly owned treatment works where allowing such dilution will pose insignificant environmental risks. For acute WET limits, an allowance for dilution is authorized only where dilution is available and mixing is complete.

For controlled discharges, such as lagoon facilities that discharge during high ambient flows, the stream flow to be used in the mixing zone analysis should be the lowest statistical flow expected to occur during the period of discharge.

Where a discharger has installed a diffuser in the receiving water, all or a portion of the critical low stream flow may be provided as a dilution allowance. The determination shall depend on the diffuser design and on the requirements and potential environmental concerns identified in the above paragraphs. Where a diffuser is installed across the entire river/stream width (at critical low flow), it will generally be presumed that near instantaneous and complete mixing is achieved and that providing the entire critical low flow as dilution is appropriate.

OTHER CONSIDERATIONS

Where dilution flow is not available at critical conditions (i.e., the water body is dry), the discharge limits will be based on achieving applicable water quality criteria (i.e., narrative and numeric, chronic and acute) at the end-of-pipe; neither a mixing zone or an allowance for dilution will be provided.

All mixing zone dilution assumptions are subject to review and revision as information on the nature and impacts of the discharge becomes available (e.g., chemical or biological monitoring at the mixing zone boundary). At a minimum, mixing zone and dilution decisions are subject to review and revision, along with all other aspects of the discharge permit upon expiration of the permit.

For certain pollutants (e.g., ammonia, dissolved oxygen, metals) that may exhibit increased toxicity or other effects on water quality after dilution and complete mixing is achieved, the waste load allocation shall address such effects on water quality, as necessary, to fully protect designated and existing uses. In other words, the point of compliance may be something other than the mixing zone boundary or the point where complete mixing is achieved.

The discharge will be consistent with the Antidegradation Procedure.

IMPLEMENTATION PROCEDURE

This procedure describes how dilution and mixing of point source discharges with receiving waters will be addressed in developing discharge limitations for point source discharges. For the purposes of this procedure, a mixing zone is defined as a designated area or volume of water surrounding or downstream of a point source discharge where the discharge is progressively diluted by the receiving water and numerical water quality criteria may not apply. Based on site-specific considerations, such a mixing zone may be designated in the context of an individual permit decision. Discharges may also be provided an allowance for dilution where it is determined that the discharge mixes with the receiving water in near instantaneous and complete fashion. Such mixing zones and allowances for dilution will be granted on a parameter-by-parameter and criterion-by-criterion basis as necessary to fully protect existing and designated uses.

The procedure to be followed is composed of six individual elements or steps. The relationship of the six steps and an overview of the mixing zone/dilution procedure is shown in figure 1.

Step 1 - No dilution available during critical conditions

Where dilution flow is not available at critical low-flow conditions, discharge limitations will be based on achieving applicable narrative and numeric water quality criteria at the end-of-pipe.

Step 2 - Dilution categorically prohibited for wetland discharges

Permit limitations for discharges to a wetland shall be based on achieving all applicable water quality criteria (i.e., narrative and numeric, chronic and acute) at end-of-pipe.

Step 3 - Procedure for certain minor publicly owned treatment works

Minor publicly owned treatment works that discharge to a lake or to a river/stream at a dilution greater than a 50-to-1 ratio qualify for this procedure. Minor publicly owned treatment works with dilution ratios less than a 50-to-1 ratio may also qualify (at the discretion of the permit writer) where it can be adequately demonstrated that this procedure poses insignificant environmental risks. For the purposes of this procedure, the river/stream dilution ratio is defined as the chronic low flow of the segment upstream of the publicly owned treatment works discharge divided by the mean daily flow of the publicly owned treatment works. For controlled discharges from lagoon facilities (discharging during high flows), the river/stream dilution ratio is defined as the lowest upstream flow expected during the period of discharge divided by the mean daily flow of the discharge.

For minor publicly owned treatment works that qualify for this procedure and discharge to lakes, the allowance for dilution for chemical-specific and chronic WET limits will be determined on a case-by-case basis. Dilution up to a 19-to-1 ratio (five percent effluent) may be provided.

For minor publicly owned treatment works that qualify for this procedure and discharge to a river/stream segment, dilution up to the full chronic aquatic life, acute aquatic life, and human health critical flows may be provided.

Step 4 - Site-specific risk considerations

Where allowing a mixing zone or a dilution allowance would pose unacceptable environmental risks, the discharge limitations will be based on achieving applicable narrative and numeric water quality criteria at the end-of-pipe. The existence of environmental risks may also be the basis for a site-specific mixing zone or dilution allowance. Such risk determinations will be made on a case-by-case and parameter-by-parameter basis. These decisions will take into account the designated and existing uses and all relevant site-specific environmental concerns, including the following:

1. Bioaccumulation in fish tissues or wildlife.
2. Biologically important areas such as fish spawning areas.
3. Low acute to chronic ratio.
4. Potential human exposure to pollutants resulting from drinking water or recreational areas.
5. Attraction of aquatic life to the effluent plume.
6. Toxicity/persistence of the substance discharged.
7. Zone of passage for migrating fish or other species (including access to tributaries).
8. Cumulative effects of multiple discharges and mixing zones.

Step 5 - Complete mix procedures

For point source discharges to rivers/streams where available data are adequate to support a conclusion that there is near instantaneous and complete mixing of the discharge with the receiving water (complete mix) the full critical low flow or a portion thereof may be provided as dilution for chemical-specific and WET limitations. Such determinations of complete mixing will be made on a case-by-case basis using best professional judgement. Presence of an effluent diffuser that covers the entire river/stream width at critical low flow will generally be assumed to provide complete mixing. Also, where the mean daily flow of the discharge exceeds the chronic low stream flow of the receiving water, complete mixing will generally be assumed. In addition, where the mean daily flow of the discharge is less than or equal to the chronic low flow of the receiving water, it will generally be assumed that complete mixing does not occur unless otherwise demonstrated by the permittee. Demonstrations for complete mixing should be consistent with the study plan developed in cooperation with the states/tribes and environmental protection agency region VIII. Near instantaneous and complete mixing is defined as no more than a ten percent difference in bank-to-bank concentrations within a longitudinal distance not greater than two river/stream widths. For controlled discharges (lagoon facilities), the test of near instantaneous and complete mixing will be made using the expected rate of effluent discharge and the lowest upstream flow expected to occur during the period of discharge.

The following critical low flows shall be applied for streams and effluents:

Stream Flows

Aquatic life, chronic	4-day, 3-year flow (biologically based)**
Aquatic life, acute	1-day, 3-year flow (biologically based)

Human health (carcinogens)	Harmonic mean flow
Human health (noncarcinogens)	4-day, 3-year flow (biologically based) or 1-day, 3-year flow (biologically based)

Effluent Flows

Aquatic life, chronic	Mean daily flow
Aquatic life, acute	Maximum daily flow
Human health (all)	Mean daily flow

* Biologically based refers to the biologically based design flow method developed by the environmental protection agency. It differs from the hydrologically based design flow method in that it directly uses the averaging periods and frequencies specified in the aquatic life water quality criteria for individual pollutants and whole effluents for determining design flows.

** A 30-day, 10-year flow (biologically based) can be used for ammonia or other chronic standard with a 30-day averaging period.

Where complete mixing can be concluded and the environmental concerns identified in step 4 do not justify denying dilution, but are nevertheless significant, some portion of the critical low flows identified above may be provided as dilution. Such decisions will take site-specific environmental concerns into account as necessary to ensure adequate protection of designated and existing uses.

Step 6 - Incomplete mix procedures

This step addresses point source discharges that exhibit incomplete mixing. Because acute WET limits are achieved at the end-of-pipe in incomplete mix situations, this step provides mixing zone procedures for chronic aquatic life, human health, and WET limits, and ZID procedures for acute chemical-specific limits. Where a ZID is allowed for chemical limits, the size of the ZID shall be limited as follows:

- Lakes: The ZID volume shall not exceed ten percent of the volume of the chronic mixing zone.
- Rivers and Streams: The ZID shall not exceed ten percent of the chronic mixing zone volume or flow, nor shall the ZID exceed a maximum downstream length of one hundred feet, whichever is more restrictive.

The following provides guidelines for determining the amount of dilution available for dischargers that exhibit incomplete mixing.

Default Method

This method addresses situations where information needed for modeling is not available or there are concerns about potential environmental impacts of allowing a mixing zone. The default method provides a conservative dilution allowance.

Stream/river dischargers: Dilution calculation which uses up to ten percent of the critical low flow for chronic aquatic life limits or human health limits. However, this allowance may be adjusted downward on a case-by-case basis depending upon relevant site-specific information, designed and existing uses of the segment, and especially the uses of the segment portion affected by the discharge.

Lake/reservoir dischargers: Dilution up to a 4-to-1 ratio (twenty percent effluent) may be provided for chronic aquatic life analyses or human health analyses. However, this allowance may be adjusted downward on a case-by-case basis depending upon discharge flow, lake size, lake

flushing potential, designated and existing uses of the lake, and uses of the lake portion affected by the discharge.

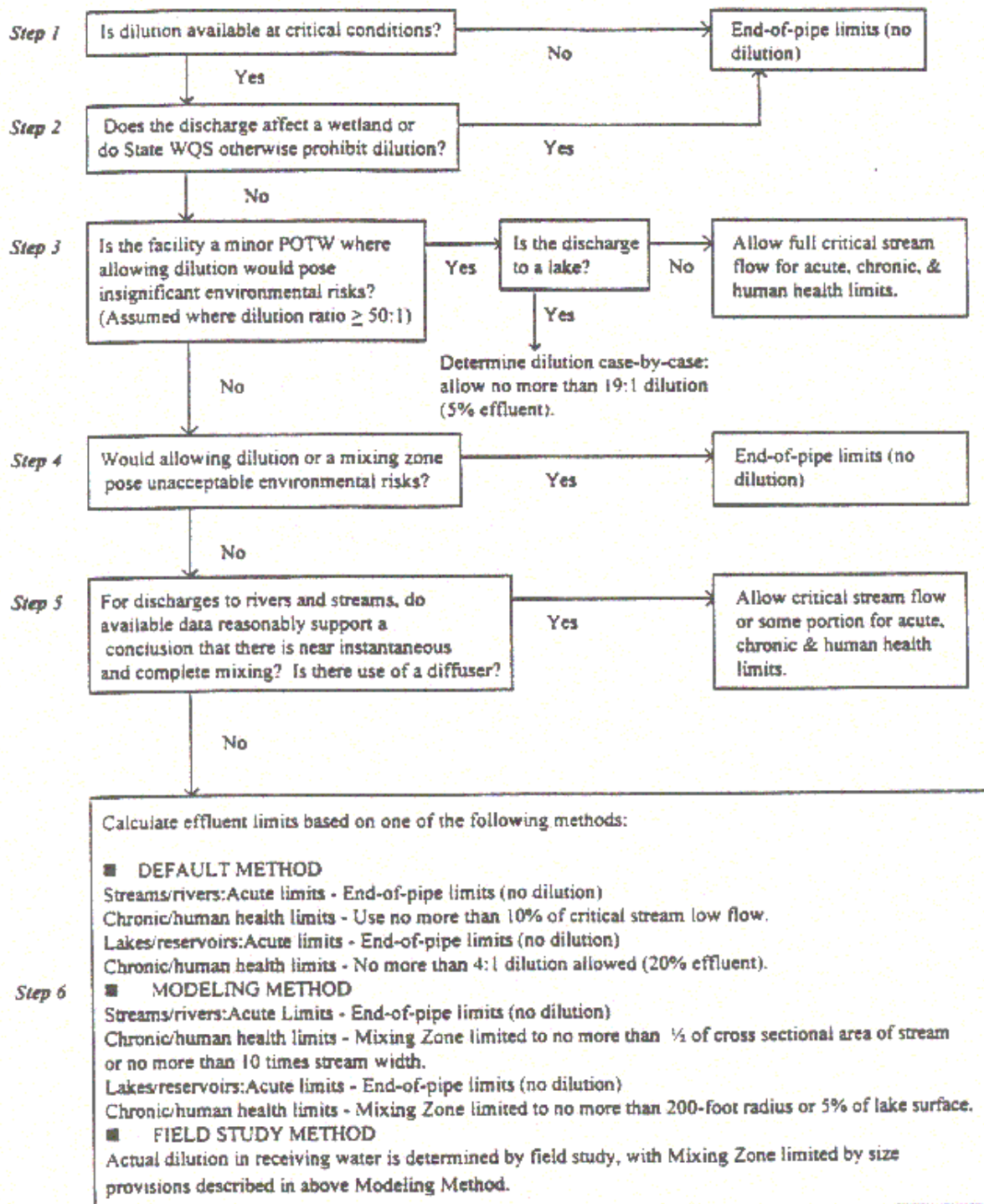
Modeling Method

An appropriate mixing zone model is used to calculate the dilution flow that will allow mixing zone limits to be achieved at the critical low flow. Prior to initiating modeling studies, it should be determined that compliance with criteria at the end-of-pipe is not practicable.

Field Study Method

Field studies which document the actual mixing characteristics in the receiving water are used to determine the dilution flow that will allow mixing zone size limits to be achieved at the critical low flow. For the purposes of field studies, "near instantaneous and complete mixing" is operationally defined as no more than a ten percent difference in bank-to-bank concentrations within a longitudinal distance not greater than two stream/river widths.

FIGURE 1
NORTH DAKOTA MODEL MIXING ZONE/DILUTION PROCEDURE*



* This procedure is applied to both chemical-specific and WET limits. In the case of complex discharges, the dilution or mixing zone may vary parameter-by-parameter.

APPENDIX IV

NORTH DAKOTA ANTIDegradation PROCEDURE

I. INTRODUCTION

This antidegradation implementation procedure delineates the process that will be followed by the department of environmental quality for implementing the antidegradation policy found in Standards of Quality for Waters of the State, chapter 33.1-16-02.1.

Under this implementation procedure, all waters of the state are afforded one of three different levels of antidegradation protection. All existing uses, and the water quality necessary for those uses, shall be maintained and protected. Antidegradation requirements are necessary whenever a regulated activity is proposed that may have some effect on water quality. Regulated actions include permits issued under sections 402 (North Dakota pollutant discharge elimination system) and 404 (dredge and fill) of the Clean Water Act, and any other activity requiring section 401 water quality certification. Nonpoint sources of pollution are not included. When reviewing section 404 nationwide permits, the department will issue section 401 certifications only where it determines that the conditions imposed by such permits are expected to result in attainment of the applicable water quality standards, including the antidegradation requirements. However, it is anticipated that the department will exclude certain nationwide permits from the antidegradation procedures for category 1 waters on the basis that the category of activities covered by the permit is not expected to have significant permanent effects on the quality and beneficial uses of those waters, or the effects will be appropriately minimized and temporary.

II. EXISTING USE PROTECTION FOR CATEGORY 1, 2, AND 3 WATERS

Existing use means a use that was actually attained in the water body on or after 1967, whether or not it is included in the water quality standards. This procedure presumes that attainment of the criteria assigned to protect the current water body classification will serve to maintain and protect all existing uses. However, where an existing use has water quality requirements that are clearly defined, but are not addressed by the current classification and criteria, the department will ensure that such existing uses are protected fully, based on implementation of appropriate numeric or narrative water quality criteria or criteria guidance. In some cases, water quality may have improved in the segment since the classification was assigned, resulting in attainment of a higher use. In other cases, the classification may have been assigned based on inadequate information, resulting in a classification that does not describe or adequately protect actual uses of the segment. In such cases, the department will develop requirements necessary to protect the existing uses and, where appropriate, recommend reclassification of the segment.

III. ANTIDegradation REVIEW PROCEDURE

The department will complete an antidegradation review for all proposed regulated activities. The findings of these reviews will be summarized using an antidegradation worksheet. A statement of basis for all conclusions will be attached to the completed worksheet. The level of detail of the review will depend upon the antidegradation protection applicable to the various classes of water.

In conducting an antidegradation review, the division of water quality will sequentially apply the following steps:

- A. Determine which level of antidegradation applies.

- B. Determine whether authorizing the proposed regulated activity is consistent with antidegradation requirements.
- C. Review existing water quality data and other information submitted by the project applicant.
- D. Determine if additional information or assessment is necessary to make a decision.
- E. A preliminary decision is made by the department and subsequently distributed for public participation and intergovernmental coordination.
 - The content of public notices will be determined case by case. In preparing a public notice, the department may address: a) the department's preliminary antidegradation review conclusions; b) a request for public input on particular aspects of the antidegradation review that might be improved based on public input (e.g., existing uses of a segment that needs to be protected); c) notice of the availability of the antidegradation review worksheet; d) notice of the availability of general information regarding the state antidegradation program; and e) a reference to the state antidegradation policy.
 - The antidegradation review findings will be available for public comment; however, publication of a separate notice for purposes of antidegradation is not necessary. For example, the antidegradation preliminary findings may be included in the public notice issued for purposes of a North Dakota pollutant discharge elimination system permit or Clean Water Act section 401 certification.

The department will ensure appropriate intergovernmental coordination on all antidegradation reviews. At a minimum, the department will provide copies of the completed antidegradation review worksheet and/or the public notice to appropriate local, state, and federal government agencies, along with a written request to provide comments by the public comment deadline.

- F. Comments are considered.
- G. The department determines if the change in quality is necessary to accommodate important economic or social development.
- H. The department makes a final decision.

The level of antidegradation protection afforded each water body in the state is consistent with beneficial uses of those water bodies. Appendix I and appendix II of the Standards of Quality for Waters of the State identify rivers, streams, and lakes in the state with their classification. The classification shall be consistent with the following categories:

Category 1: Very high level of protection that automatically applies to class I and class IA streams and class I, II, and III lakes, and wetlands that are functioning at their optimal level. In addition, category 1 is presumed to apply to class II and class III streams. Particular class II and class III streams may be excluded from category 1 if, at the time of the antidegradation review, it is determined that one or both of the following criteria are applicable: 1) there is no remaining assimilative capacity for any of the parameters that may potentially be affected by the proposed regulated activity in the segment in question, or 2) an evaluation submitted by the project applicant demonstrates (based on adequate and representative chemical, physical, and biological data) that aquatic life and primary contact recreation uses are not currently being attained because of stressors that will require a long-term effort to remedy. Evaluations in response to criterion #2 must include more than an identification of current water quality levels. They must include evidence of the current status of the aquatic life and primary contact recreation uses of the segment.

Category 2: Class 4 and class 5 lakes and particular wetlands after antidegradation review. In addition, class II and class III streams or wetlands meeting one of the criteria identified above at the time of the antidegradation review shall be included in category 2.

Category 3: Highest level of protection; outstanding state resource waters.

Procedures for Category 1 Waters

Regulated activities that result in a new or expanded source of pollutants to this category of water are subject to the review process, unless the source would have no significant permanent effect on the quality and beneficial uses of those waters, or if the effects will be appropriately minimized and temporary.

- Proposed activities that would lower the ambient quality in a water body of any parameter by more than fifteen percent, reduce the available assimilative capacity by more than fifteen percent, or increase permitted pollutant loadings to a water body by more than fifteen percent will be deemed to have significant effects.
- The department will identify and eliminate from further review those proposed activities that will have no significant effect on water quality or beneficial uses. Category 1 reviews will be conducted where significant effects are projected for one or more water quality parameters. Findings of significant effects may be based on the following factors: a) percent change in ambient concentrations predicted at the appropriate conditions; b) percent change in loadings for the individual discharge or to the segment from all discharges; c) reduction in available assimilative capacity; d) nature, persistence, and potential effects of the parameter; e) potential for cumulative effects; f) predicted impacts to aquatic biota; and g) degree of confidence in any modeling techniques utilized.
- The applicant may be required to provide available monitoring data or other information about the affected water body and/or proposed activity to help determine the significance of the proposed degradation for specific parameters. The information includes recent ambient chemical, physical, or biological monitoring data sufficient to characterize, during the appropriate conditions, the spatial and temporal variability of existing background quality of the segment for the parameters that would be affected by the proposed activity. The information would also describe the water quality that would result if the proposed activity were authorized.

The project applicant is required to provide an evaluation of the water quality effects of the project. This evaluation may consist of the following components:

1. Pollution prevention measures.
2. Reduction in scale of the project.
3. Water recycle or reuse.
4. Process changes.
5. Alternative treatment technology.
6. Advanced treatment technology.
7. Seasonal or controlled discharge options to avoid critical water quality periods.
8. Improved operation and maintenance of existing facilities.
9. Alternative discharge locations.

The primary emphasis of the category 1 reviews will be to determine whether reasonable nondegrading or less-degrading alternatives to the proposed degradation are available. The department will first evaluate any alternatives analysis submitted by the applicant for adherence to the minimum requirements described below. If an acceptable analysis of alternatives was completed and submitted to the department as part of the initial project proposal, no further evaluation of alternatives will be required of the applicant. If an acceptable alternatives analysis has not been completed, the department will work with the project applicant to ensure that an acceptable alternatives analysis is developed.

Once the department has determined that feasible alternatives to allowing the degradation have been adequately evaluated, the department shall make a preliminary determination regarding whether reasonable nondegrading or less-degrading alternatives are available. This determination will be based primarily on the alternatives analysis developed by the project applicant, but may be supplemented with other information or data. As a rule-of-thumb, nondegrading or less-degrading pollution control alternatives with costs that are similar to the costs of the applicant's favored alternative shall be considered reasonable. If the department determines that reasonable alternatives to allowing the degradation do not exist, the department shall continue with the antidegradation review and document the basis for the preliminary determination.

If the department makes a preliminary determination that one or more reasonable alternatives exist, the department will work with the applicant to revise the project design. If a mutually acceptable resolution cannot be reached, the department will document the alternative analysis findings and provide public notice of a preliminary decision to deny the activity.

Although it is recognized that any activity resulting in a discharge to surface waters may have positive and negative aspects, the applicant must show that any discharge or increased discharge will be of economic or social importance in the area. Where there are existing regulated sources located in the area, the department will assure that those sources are complying with applicable requirements prior to authorizing the proposed regulated activity. New sources of a particular parameter will not be allowed where there are existing unresolved compliance problems (involving the same parameter) in the zone of influence of the proposed activity. The "zone of influence" is determined as appropriate for the parameter of concern, the characteristics of the receiving water body (e.g., lake versus river, etc.), and other relevant factors. Where available, a total maximum daily load analysis or other watershed-scale plan will be the basis for identifying the appropriate zone of influence. The department may conclude that such compliance has not been achieved where existing sources are violating their North Dakota pollutant discharge elimination system permit limits. However, the existence of a compliance schedule in the North Dakota pollutant discharge elimination system permit may be taken into consideration in such cases. Required controls on existing regulated sources need not be finally achieved prior to authorizing a proposed activity provided there is reasonable assurance of future compliance.

Procedures for Category 2 Waters

Regulated activities that result in a permanent or temporary, new or expanded source of pollution to this category of water are permitted if the following conditions are met:

1. The classified uses of the water would be maintained.
2. The assimilative capacity of the water is available for the parameters that would be affected by the regulated activity, and existing uses would be protected as discussed in section II.

A decision will be made on a case-by-case basis, using available data and best professional judgment. The applicant may be required to provide additional information necessary for the department to characterize or otherwise predict changes to the physical, chemical, and/or biological condition of the water.

Procedures for Category 3 Waters

Outstanding state resource waters - Eligibility. Outstanding state resource waters may be designated category 3 waters only after they have been determined to have exceptional value for present or prospective future use for public water supplies, propagation of fish or aquatic life, wildlife, recreational purposes, or agricultural, industrial, or other legitimate beneficial uses. The factors that may be considered in determining whether a water body is eligible for inclusion in category 3 include the following: a) location, b) previous special designations, c) existing water quality, d) physical characteristics, e) ecological value, and f) recreational value.

Nomination. Any person may nominate any waters of the state for designation as outstanding state resource waters. The nomination must be made in writing to the department, must describe its specific location and present uses, and must state the reasons why the resource has exceptional value for present or prospective future beneficial use.

Review process. The department with cooperation of the state water commission shall review any nomination to determine whether the nominated waters of the state are eligible, clearly defined, and identify beneficial uses of exceptional value for present or prospective future use. The department of environmental quality with cooperation of the state water commission shall provide as a part of its assessment: 1) a verification of the uses, properties, and attributes that define the proposed "exceptional" value; 2) an evaluation of the current and historical condition of the water with respect to the proposed value using the best data available; and 3) an estimate of likely regulatory measures needed to achieve the desired level of protection. If the identified waters of the state are eligible, clearly defined, and appear to identify beneficial uses of exceptional value for present or prospective future use, the water pollution control board, the department, and the state water commission will solicit public comment and/or hold a public hearing regarding the nomination. The water pollution control board will review the application record and the public comments, and make a recommendation to the department. After reviewing the board's recommendation, the department jointly with the state water commission will make a decision on whether to designate the defined water body as an outstanding state water resource. If both the department and the state water commission agree that the defined water body should be designated as an outstanding state water resource, the department shall submit the recommendation to the environmental review advisory council as part of the water quality standard revision process. The designation, if made, may be reviewed on a periodic basis.

Implementation process. Effects on category 3 waters resulting from regulated activity will be determined by appropriate evaluation and assessment techniques and best professional judgment. Any proposed regulated activity that would result in a new or expanded source of pollutants to a segment located in or upstream of a category 3 segment will be allowed only if there are appropriate restrictions to maintain and protect existing water quality. Reductions in water quality may be allowed only if they are temporary and negligible. Factors that may be considered in judging whether the quality of a category 3 water would be affected include: a) percent change in ambient concentrations predicted at the appropriate critical conditions; b) percent change in loadings; c) percent reduction in available assimilative capacity; d) nature, persistence, and potential effects of the parameter; e) potential for cumulative effects; and f) degree of confidence in any modeling techniques utilized.

APPENDIX D

Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Liberty Midstream Residue Pipeline Project City/County: Mountrail Sampling Date: 10/2/2018
 Applicant/Owner: Liberty Midstream Solutions State: ND Sampling Point: DP1U
 Investigator(s): Megan Schwarz and Heather Doyle Section, Township, Range: S25, T158N, R95W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): <5%
 Subregion (LRR): F Lat: 48.485530 Long: -102.900440 Datum: NAD83
 Soil Map Unit Name: Williams-Zahl-Parnell Complex NWI classification: Freshwater Emergent

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (if needed, explain in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			

Remarks:
 No aquatic resource indicators observed. No soil pit dug due to lack of hydrophytic vegetation or hydrology present.

VEGETATION – Use scientific names of plants

	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u> (Plot size: <u>30</u>)				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)
1. _____				
_____ = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15</u>)				Prevalence Index Worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0%</u> x 1 <u>0.0%</u> FACW species <u>0%</u> x 2 <u>0.0%</u> FAC species <u>10%</u> x 3 <u>30.0%</u> FACU species <u>50%</u> x 4 <u>200.0%</u> UPL species <u>50%</u> x 5 <u>250.0%</u> Column Totals: <u>110.0%</u> (A) <u>480%</u> (B) Prevalence Index = B/A = <u>4.36</u>
1. _____				
_____ = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5</u>)				Hydrophytic Vegetation Indicators: _____ 1 - Rapid Test for Hydrophytic Vegetation _____ 2 - Dominance Test if >50% _____ 3 - Prevalence Index is ≤ 3.0 _____ 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation (Explain) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1. <u>Pascopyrum smithii</u>	<u>50%</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Thinopyrum intermedium</u>	<u>50%</u>	<u>Y</u>	<u>UPL</u>	
3. <u>Rumex crispus</u>	<u>10%</u>	<u>N</u>	<u>FAC</u>	
4. _____				
<u>110%</u> = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30</u>)				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum	<u>10.00%</u>			

Remarks:

SOIL

Sampling Point: DP1U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth (inches)	Matrix		Redox Features				Texture:	Remarks:
	Color:	%	Color:	%	Type:	Loc:		
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains							Location: PL=Pore Lining, M=Matrix	

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High PLains Depression (F16)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils

<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input type="checkbox"/> Coast Prarie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: No soil pit dug due to no hydrophytic vegetation or hydrology observed.

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes _____ No <u>X</u>	Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <u>X</u>
Water Table Present? Yes _____ No <u>X</u>	Depth (inches): _____	
Saturation Present? Yes _____ No <u>X</u>	Depth (inches): _____	

(includes capillary fringe)

Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Liberty Mistream Residue Pipeline Project City/County: Mountrail Sampling Date: 10/2/2018
 Applicant/Owner: Liberty Midstream Solutions State: ND Sampling Point: DP2U
 Investigator(s): Megan Schwarz and Heather Doyle Section, Township, Range: S25, T158N, R95W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): None Slope (%): <5%
 Subregion (LRR): F Lat: 48.482827 Long: -102.900126 Datum: NAD83
 Soil Map Unit Name: Zahl-Max-Bowbells Loams NWI classification: Freshwater Emergent

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No _____ (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (if needed, explain in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			
Remarks:					

VEGETATION – Use scientific names of plants

Stratum	Plot size	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u>	<u>(Plot size: 30)</u>				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)
1. _____					
_____ = Total Cover					
<u>Sapling/Shrub Stratum</u>	<u>(Plot size: 15)</u>				Prevalence Index Worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0%</u> x 1 <u>0.0%</u> FACW species <u>0%</u> x 2 <u>0.0%</u> FAC species <u>0%</u> x 3 <u>0.0%</u> FACU species <u>85%</u> x 4 <u>340.0%</u> UPL species <u>32%</u> x 5 <u>160.0%</u> Column Totals: <u>117.0%</u> (A) <u>500%</u> (B) Prevalence Index = B/A = <u>4.27</u>
1. <u><i>Symphoricarpos occidentalis</i></u>		<u>15%</u>	<u>Y</u>	<u>UPL</u>	
2. _____					
<u>15%</u> = Total Cover					
<u>Herb Stratum</u>	<u>(Plot size: 5)</u>				Hydrophytic Vegetation Indicators: _____ 1 - Rapid Test for Hydrophytic Vegetation _____ 2 - Dominance Test if >50% _____ 3 - Prevalence Index is ≤ 3.0 _____ 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation (Explain) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1. <u><i>Poa pratensis</i></u>		<u>70%</u>	<u>Y</u>	<u>FACU</u>	
2. <u><i>Cirsium arvense</i></u>		<u>15%</u>	<u>N</u>	<u>FACU</u>	
3. <u><i>Artemisia ludoviciana</i></u>		<u>10%</u>	<u>N</u>	<u>UPL</u>	
4. <u><i>Bromus inermis</i></u>		<u>7%</u>	<u>N</u>	<u>UPL</u>	
5. _____					
<u>102%</u> = Total Cover					
<u>Woody Vine Stratum</u>	<u>(Plot size: 30)</u>				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
1. _____					
_____ = Total Cover					
% Bare Ground in Herb Stratum		<u>0.00%</u>			
Remarks:					

SOIL

Sampling Point: DP2U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth (inches)	Matrix		Redox Features				Texture:	Remarks:
	Color:	%	Color:	%	Type:	Loc:		
0-2	10YR 3/3	100%					Sandy Clay Loam	
2-4	10YR 2/2	95%	10YR 3/6	5%	C	PL	Sandy Loam	
4-8	10YR 3/2	95%	10YR 3/6	5%	C	PL	Sandy Clay Loam	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 1 cm Muck (A9)(LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9)(LRR F, G, H)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No _____ X _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:	Wetland Hydrology Present?
Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____	Yes _____ No _____ X _____
Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____	
Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Liberty Midstream Residue Pipeline Project City/County: Mountrail Sampling Date: 10/2/2018
 Applicant/Owner: Liberty Midstream Solutions State: ND Sampling Point: DP3W
 Investigator(s): Megan Schwarz and Heather Doyle Section, Township, Range: S25, T158N, R95W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): <5%
 Subregion (LRR): F Lat: 48.482622 Long: -102.900157 Datum: NAD83
 Soil Map Unit Name: Zahl-Max-Bowbells Loams NWI classification: Freshwater Emergent

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (if needed, explain in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

Remarks:

VEGETATION – Use scientific names of plants

Stratum	Plot size	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: <u>30</u>)				
1. _____				
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15</u>)				
1. _____				
_____ = Total Cover				
Herb Stratum (Plot size: <u>5</u>)				
1. <u>Hordeum jubatum</u>		35%	Y	FACW
2. <u>Pascopyrum smithii</u>		30%	Y	FACU
3. <u>Carex nebrascensis</u>		25%	Y	OBL
4. <u>Cirsium arvense</u>		20%	N	FACU
5. <u>Rumex crispus</u>		10%	N	FAC
6. <u>Lepidium draba</u>		10%	N	UPL
7. _____				
130% = Total Cover				
Woody Vine Stratum (Plot size: <u>30</u>)				
1. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0.00%</u>				

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>25%</u>	x 1 <u>25.0%</u>
FACW species <u>35%</u>	x 2 <u>70.0%</u>
FAC species <u>10%</u>	x 3 <u>30.0%</u>
FACU species <u>50%</u>	x 4 <u>200.0%</u>
UPL species <u>10%</u>	x 5 <u>50.0%</u>
Column Totals: <u>130.0%</u> (A)	<u>375%</u> (B)
Prevalence Index = B/A = <u>2.88</u>	

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation
Y 2 - Dominance Test if >50%
Y 3 - Prevalence Index is ≤ 3.0
4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes No

Remarks:

SOIL

Sampling Point: DP3W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth (inches)	Matrix		Redox Features				Texture:	Remarks:
	Color:	%	Color:	%	Type:	Loc:		
2-14	10YR 3/2	100%					Loam	
2	10YR 3/1	100%		0%			Loam	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Loamy Mucky Mineral (F1)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High Plains Depression (F16)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils

<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Crayfish Burrows (C8)
	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
	<input checked="" type="checkbox"/> Geomorphic Position (D2)
	<input type="checkbox"/> FAC-Neutral Test (D5)
	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	

(includes capillary fringe)

Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Liberty Midstream Residue Pipeline Project City/County: Mountrail Sampling Date: 10/2/2018
 Applicant/Owner: Liberty Midstream Solutions State: ND Sampling Point: DP4W
 Investigator(s): Megan Schwarz and Heather Doyle Section, Township, Range: S25, T158N, R95W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): <5%
 Subregion (LRR): F Lat: 48.478949 Long: -102.897051 Datum: NAD83
 Soil Map Unit Name: Williams-Zahl-Parnell Complex NWI classification: Freshwater Emergent

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No _____ (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (if needed, explain in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	

Remarks:

VEGETATION – Use scientific names of plants

	Absolute % Cover	Dominant Species?	Indicator Status
<u>Tree Stratum</u> (Plot size: <u>30</u>)			
1. _____			
_____ = Total Cover			
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15</u>)			
1. _____			
_____ = Total Cover			
<u>Herb Stratum</u> (Plot size: <u>5</u>)			
1. <u>Carex nebrascensis</u>	30%	Y	OBL
2. <u>Cirsium arvense</u>	20%	Y	FACU
3. <u>Mentha arvensis</u>	15%	N	FACW
4. <u>Rumex crispus</u>	15%	N	FAC
5. <u>Pascopyrum smithii</u>	10%	N	FACU
6. _____			
_____ = Total Cover			
<u>Woody Vine Stratum</u> (Plot size: <u>30</u>)			
1. _____			
_____ = Total Cover			
% Bare Ground in Herb Stratum	<u>10.00%</u>		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	<u>1</u>	(A)
Total Number of Dominant Species Across All Strata:	<u>2</u>	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>50.0%</u>	(A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	<u>30%</u>	x 1	<u>30.0%</u>
FACW species	<u>15%</u>	x 2	<u>30.0%</u>
FAC species	<u>15%</u>	x 3	<u>45.0%</u>
FACU species	<u>30%</u>	x 4	<u>120.0%</u>
UPL species	<u>0%</u>	x 5	<u>0.0%</u>
Column Totals:	<u>90.0%</u>	(A)	<u>225%</u> (B)
Prevalence Index = B/A =			<u>2.50</u>

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
 ____ 2 - Dominance Test if >50%
Y 3 - Prevalence Index is ≤ 3.0
 ____ 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
 ____ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: DP4W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth (inches)	Matrix		Redox Features				Texture:	Remarks:
	Color:	%	Color:	%	Type:	Loc:		
0-2	10YR 2/1	100%					Clay Loam	
2-10	10YR 5/1	80%	10YR 5/8	20%	C	M	Clay Loam	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9)(LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input checked="" type="checkbox"/> X Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9)(LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> X Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High Plains Depression (F16)	Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)	

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No X

Remarks: Salts observed throughout soil profile.

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> X Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> X Presence of Reduced Iron (C4)
<input checked="" type="checkbox"/> X Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input checked="" type="checkbox"/> X Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Crayfish Burrows (C8)
	<input checked="" type="checkbox"/> X Saturation Visible on Aerial Imagery (C9)
	<input checked="" type="checkbox"/> X Geomorphic Position (D2)
	<input type="checkbox"/> FAC-Neutral Test (D5)
	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> X	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> X	Depth (inches): _____	
Saturation Present? Yes <input checked="" type="checkbox"/> X No _____	Depth (inches): 4	

(includes capillary fringe)

Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Liberty Midstream Residue Pipeline Project City/County: Mountrail Sampling Date: 10/2/2018
 Applicant/Owner: Liberty Midstream Solutions State: ND Sampling Point: DP5U
 Investigator(s): Megan Schwarz and Heather Doyle Section, Township, Range: S25, T158N, R95W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): <5%
 Subregion (LRR): F Lat: 48.479168 Long: -102.896918 Datum: NAD83
 Soil Map Unit Name: Williams-Zahl-Parnell Complex NWI classification: Freshwater Emergent

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No _____ (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (if needed, explain in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			
Remarks:					

VEGETATION – Use scientific names of plants

	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u> (Plot size: <u>30</u>)				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)
1. _____				
				Prevalence Index Worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0%</u> x 1 <u>0.0%</u> FACW species <u>0%</u> x 2 <u>0.0%</u> FAC species <u>0%</u> x 3 <u>0.0%</u> FACU species <u>70%</u> x 4 <u>280.0%</u> UPL species <u>40%</u> x 5 <u>200.0%</u> Column Totals: <u>110.0%</u> (A) <u>480%</u> (B) Prevalence Index = B/A = <u>4.36</u>
_____ = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15</u>)				Hydrophytic Vegetation Indicators: _____ 1 - Rapid Test for Hydrophytic Vegetation _____ 2 - Dominance Test if >50% _____ 3 - Prevalence Index is ≤ 3.0 _____ 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation (Explain)
1. _____				
				Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
_____ = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5</u>)				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
1. <u>Poa pratensis</u>	45%	Y	FACU	
2. <u>Bromus inermis</u>	20%	Y	UPL	
3. <u>Solidago canadensis</u>	15%	N	FACU	
4. <u>Ratibida columnifera</u>	10%	N	UPL	
5. _____				
_____ = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30</u>)				
1. <u>Symphoricarpos occidentalis</u>	10%	Y	UPL	
2. <u>Rosa acicularis</u>	10%	Y	FACU	
3. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>10.00%</u>				
Remarks:				

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth (inches)	Matrix		Redox Features				Texture:	Remarks:
	Color:	%	Color:	%	Type:	Loc:		
0-2	10YR 3/2	100%					Loam	
2-4	10YR 2/1	100%					Clay Loam	
4-5	10YR 3/1	99%	10YR 6/8	1%	C	M	Sand	
5-8	10YR 6/1	100%					Sand	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9)(LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9)(LRR F, G, H)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High PLains Depression (F16)	Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)	

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: _____

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____ (includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: _____

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Liberty Midstream Residue Pipeline Project City/County: Mountrail Sampling Date: 10/2/2018
 Applicant/Owner: Liberty Midstream Solutions State: ND Sampling Point: DP6U
 Investigator(s): Megan Schwarz and Heather Doyle Section, Township, Range: S25, T158N, R95W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <5%
 Subregion (LRR): F Lat: 48.477002 Long: -102.893407 Datum: NAD83
 Soil Map Unit Name: Williams-Zahl-Parnell Complex NWI classification: Freshwater Emergent

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No _____ (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (if needed, explain in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	

Remarks:
 No aquatic resource indicators present within survey area.

VEGETATION – Use scientific names of plants

	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u> (Plot size: <u>30</u>)				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)
1. _____				
_____ = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15</u>)				Prevalence Index Worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0%</u> x 1 <u>0.0%</u> FACW species <u>0%</u> x 2 <u>0.0%</u> FAC species <u>0%</u> x 3 <u>0.0%</u> FACU species <u>60%</u> x 4 <u>240.0%</u> UPL species <u>40%</u> x 5 <u>200.0%</u> Column Totals: <u>100.0%</u> (A) <u>440%</u> (B) Prevalence Index = B/A = <u>4.40</u>
1. _____				
_____ = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5</u>)				Hydrophytic Vegetation Indicators: _____ 1 - Rapid Test for Hydrophytic Vegetation _____ 2 - Dominance Test if >50% _____ 3 - Prevalence Index is ≤ 3.0 _____ 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation (Explain) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1. <u>Cirsium arvense</u>	60%	Y	FACU	
2. <u>Bromus inermis</u>	40%	Y	UPL	
3. _____				
_____ = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30</u>)				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
1. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum	<u>0.00%</u>			

Remarks:

SOIL

Sampling Point: DP6U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)							
Depth (inches)	Matrix		Redox Features			Texture:	Remarks:
	Color:	%	Color:	%	Type:		
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains						Location: PL=Pore Lining, M=Matrix	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)				Indicators for Problematic Hydric Soils			
___ Histosol (A1)			___ Sandy Gleyed Matrix (S4)			___ 1 cm Muck (A9)(LRR I, J)	
___ Histic Epipedon (A2)			___ Sandy Redox (S5)			___ Coast Prarie Redox (A16) (LRR F, G, H)	
___ Black Histic (A3)			___ Stripped Matrix (S6)			___ Dark Surface (S7) (LRR G)	
___ Hydrogen Sulfide (A4)			___ Loamy Mucky Mineral (F1)			___ High Plains Depressions (F16)	
___ Stratified Layers (A5) (LRR F)			___ Loamy Gleyed Matrix (F2)			___ (LRR H outside of MLRA 72 & 73)	
___ 1 cm Muck (A9)(LRR F, G, H)			___ Depleted Matrix (F3)			___ Reduced Vertic (F18)	
___ Depleted Below Dark Surface (A11)			___ Redox Dark Surface (F6)			___ Red Parent Material (TF2)	
___ Thick Dark Surface (A12)			___ Depleted Dark Surface (F7)			___ Very Shallow Dark Surface (TF12)	
___ Sandy Muck Mineral (S1)			___ Redox Depressions (F8)			___ Other (Explain in Remarks)	
___ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)			___ High PLains Depression (F16)			Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.	
___ 5 cm Mucky Peat or Peat (S3) (LRR F)			___ (MLRA 72 & 73 of LRR H)				
Restrictive Layer (if present):							
Type: _____							
Depth (inches): _____							
						Hydric Soil Present? Yes ___ No <u>X</u>	
Remarks:							

HYDROLOGY

Wetland Hydrology Indicators			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
___ Surface Water (A1)	___ Salt Crust (B11)	___ Surface Soil Cracks (B6)	
___ High Water Table (A2)	___ Aquatic Invertebrates (B13)	___ Sparsely Vegetated Concave Surface (B8)	
___ Saturation (A3)	___ Hydrogen Sulfide Odor (C1)	___ Drainage Patterns (B10)	
___ Water Marks (B1)	___ Dry-Season Water Table (C2)	___ Oxidized Rhizospheres on Living Roots (C3)	
___ Sediment Deposits (B2)	___ Oxidized Rhizospheres along Living Roots (C3)	___ (where tilled)	
___ Drift Deposits (B3)	___ (where not tilled)	___ Crayfish Burrows (C8)	
___ Algal Mat or Crust (B4)	___ Presence of Reduced Iron (C4)	___ Saturation Visible on Aerial Imagery (C9)	
___ Iron Deposits (B5)	___ Thin Muck Surface (C7)	___ Geomorphic Position (D2)	
___ Inundation Visible on Aerial Imagery (B7)	___ Other (Explain in Remarks)	___ FAC-Neutral Test (D5)	
___ Water-Stained Leaves (B9)		___ Frost-Heave Hummocks (D7) (LRR F)	
Field Observations:			
Surface Water Present? Yes ___ No <u>X</u>	Depth (inches): _____		
Water Table Present? Yes ___ No <u>X</u>	Depth (inches): _____	Wetland Hydrology Present? Yes ___ No <u>X</u>	
Saturation Present? Yes ___ No <u>X</u>	Depth (inches): _____		
(includes capillary fringe)			
Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Liberty Midstream Residue Pipeline Project City/County: Mountrail Sampling Date: 10/2/2018
 Applicant/Owner: Liberty Midstream Solutions State: ND Sampling Point: DP7U
 Investigator(s): Megan Schwarz and Heather Doyle Section, Township, Range: S25, T158N, R95W
 Landform (hillslope, terrace, etc.): alluvial fan Local relief (concave, convex, none): Concave Slope (%): <5%
 Subregion (LRR): F Lat: 48.476796 Long: -102.892475 Datum: NAD83
 Soil Map Unit Name: Williams-Zahl-Parnell Complex NWI classification: Freshwater Emergent

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (if needed, explain in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			

Remarks:

VEGETATION – Use scientific names of plants

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: <u>30</u>)			
1. _____			
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15</u>)			
1. _____			
_____ = Total Cover			
Herb Stratum (Plot size: <u>5</u>)			
1. <u>Cirsium arvense</u>	50%	Y	FACU
2. <u>Bromus inermis</u>	20%	Y	UPL
3. <u>Solidago missouriensis</u>	10%	N	UPL
4. <u>Solidago canadensis</u>	10%	N	FACU
5. <u>Persicaria amphibia</u>	10%	N	OBL
6. _____			
_____ = Total Cover			
Woody Vine Stratum (Plot size: <u>30</u>)			
1. _____			
_____ = Total Cover			
% Bare Ground in Herb Stratum <u>0.00%</u>			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	<u>0</u>	(A)
Total Number of Dominant Species Across All Strata:	<u>2</u>	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>0.0%</u>	(A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	<u>10%</u>	x 1	<u>10.0%</u>
FACW species	<u>0%</u>	x 2	<u>0.0%</u>
FAC species	<u>0%</u>	x 3	<u>0.0%</u>
FACU species	<u>60%</u>	x 4	<u>240.0%</u>
UPL species	<u>30%</u>	x 5	<u>150.0%</u>
Column Totals:	<u>100.0%</u>	(A)	<u>400%</u> (B)
Prevalence Index = B/A =			<u>4.00</u>

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
 ____ 2 - Dominance Test if >50%
 ____ 3 - Prevalence Index is ≤ 3.0
 ____ 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
 ____ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present?

Yes No

Remarks:

SOIL

Sampling Point: DP7U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth (inches)	Matrix		Redox Features				Texture:	Remarks:
	Color:	%	Color:	%	Type:	Loc:		
0-10	10YR 3/1	100%		0%			Sandy Clay Loam	
10-12	10YR 3/1	100%		0%			Sandy Loam	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9)(LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9)(LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High Plains Depression (F16)	Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)	

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes _____ No <u> X </u>	Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <u> X </u>
Water Table Present? Yes _____ No <u> X </u>	Depth (inches): _____	
Saturation Present? Yes _____ No <u> X </u>	Depth (inches): _____	

(includes capillary fringe)

Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Liberty Midstream Residue Pipeline Project City/County: Mountrail Sampling Date: 10/2/2018
 Applicant/Owner: Liberty Midstream Solutions State: ND Sampling Point: DP8W
 Investigator(s): Megan Schwarz and Heather Doyle Section, Township, Range: S25, T158N, R95W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): <5%
 Subregion (LRR): F Lat: 48.476732 Long: -102.892230 Datum: NAD83
 Soil Map Unit Name: Williams-Zahl-Parnell Complex NWI classification: Freshwater Emergent

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No X (if no, explain in Remarks.)
 Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation No , Soil No , or Hydrology No naturally problematic? (if needed, explain in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u> X </u> No <u> </u> Hydric Soil Present? Yes <u> X </u> No <u> </u> Wetland Hydrology Present? Yes <u> X </u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> X </u> No <u> </u>
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Remarks:

VEGETATION – Use scientific names of plants

	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u> (Plot size: <u> 30 </u>)				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u> 2 </u> (A) Total Number of Dominant Species Across All Strata: <u> 2 </u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u> 100.0% </u> (A/B)
1. _____ = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u> 15 </u>)				Prevalence Index Worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u> 45% </u> x 1 <u> 45.0% </u> FACW species <u> 80% </u> x 2 <u> 160.0% </u> FAC species <u> 0% </u> x 3 <u> 0.0% </u> FACU species <u> 0% </u> x 4 <u> 0.0% </u> UPL species <u> 0% </u> x 5 <u> 0.0% </u> Column Totals: <u> 125.0% </u> (A) <u> 205% </u> (B) Prevalence Index = B/A = <u> 1.64 </u>
1. _____ = Total Cover				
<u>Herb Stratum</u> (Plot size: <u> 5 </u>)				Hydrophytic Vegetation Indicators: <u> </u> 1 - Rapid Test for Hydrophytic Vegetation <u> Y </u> 2 - Dominance Test if >50% <u> Y </u> 3 - Prevalence Index is ≤ 3.0 <u> </u> 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation (Explain) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1. <u><i>Spartina pectinata</i></u> <u> 65% </u> <u> Y </u> <u> FACW </u>				
2. <u><i>Carex nebrascensis</i></u> <u> 35% </u> <u> Y </u> <u> OBL </u>				
3. <u><i>Phalaris arundinacea</i></u> <u> 15% </u> <u> N </u> <u> FACW </u>				
4. <u><i>Panicum amphibium</i></u> <u> 10% </u> <u> N </u> <u> OBL </u>				
5. _____ = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u> 30 </u>)				Hydrophytic Vegetation Present? Yes <u> X </u> No <u> </u>
1. _____ = Total Cover				
% Bare Ground in Herb Stratum <u> 0.00% </u>				

Remarks:

SOIL

Sampling Point: DP8W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth (inches)	Matrix		Redox Features				Texture:	Remarks:
	Color:	%	Color:	%	Type:	Loc:		
0-2	10YR 3/3	100%		0%			Loam	
2-8	10YR 3/2	100%		0%			Loam	
8-16	10YR 4/2	100%		0%			Loam	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9)(LRR I, J)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prarie Redox (A16) (LRR F, G, H)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)	
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)	
<input type="checkbox"/> 1 cm Muck (A9)(LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)	
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High PLains Depression (F16)	Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)		

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Crayfish Burrows (C8)
	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
	<input checked="" type="checkbox"/> Geomorphic Position (D2)
	<input type="checkbox"/> FAC-Neutral Test (D5)
	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (includes capillary fringe)	Depth (inches): 2	

Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Liberty Midstream City/County: Mountrail County Sampling Date: 10/29/2019
 Applicant/Owner: Kleinfelder State: ND Sampling Point: DP01W
 Investigator(s): Connor McCarty, Clayton Wammack Section, Township, Range: 33, 158 North, 94 West
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1%
 Subregion (LRR): LRR F Lat: 48.460037 Long: -102.834266 Datum: NAD83
 Soil Map Unit Name: Vallers Loam, moderately saline NWI classification: R4SBC

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (if needed, explain in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

Remarks: WET001B

VEGETATION – Use scientific names of plants

Stratum	Plot size	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u>	<u>(Plot size: 30)</u>				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50.0%</u> (A/B)
1. _____					
					Prevalence Index Worksheet: Total % Cover of: Multiply by: OBL species <u>0%</u> x 1 <u>0.0%</u> FACW species <u>55%</u> x 2 <u>110.0%</u> FAC species <u>0%</u> x 3 <u>0.0%</u> FACU species <u>20%</u> x 4 <u>80.0%</u> UPL species <u>0%</u> x 5 <u>0.0%</u> Column Totals: <u>75.0%</u> (A) <u>190%</u> (B) Prevalence Index = B/A = <u>2.53</u>
_____ = Total Cover					
<u>Sapling/Shrub Stratum</u>	<u>(Plot size: 15)</u>				
1. _____					
_____ = Total Cover					
<u>Herb Stratum</u>	<u>(Plot size: 5)</u>				
1. <u>Phalaris arundinacea</u>		<u>50%</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Elymus repens</u>		<u>20%</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Agrostis gigantea</u>		<u>5%</u>	<u>N</u>	<u>FACW</u>	
4. _____					
_____ = Total Cover					
<u>Woody Vine Stratum</u>	<u>(Plot size: 30)</u>				
1. _____					
_____ = Total Cover					
% Bare Ground in Herb Stratum		<u>20.00%</u>			
Remarks:					Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test if >50% <u>Y</u> <u>3</u> - Prevalence Index is ≤ 3.0 <u>4</u> - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation (Explain) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
Remarks:					Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

SOIL

Sampling Point: DP01W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth (inches)	Matrix		Redox Features				Texture:	Remarks:
	Color:	%	Color:	%	Type:	Loc:		
0-12	10YR 3/1	100%					Clay Loam	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9)(LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9)(LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High PLains Depression (F16)	Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)	

Restrictive Layer (if present):
 Type: None
 Depth (inches): N/A

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>6</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>2</u>	
Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>0</u>	

Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Liberty Midstream City/County: Mountrail County Sampling Date: 10/29/2019
 Applicant/Owner: Kleinfelder State: ND Sampling Point: DP02U
 Investigator(s): Connor McCarty, Clayton Wammack Section, Township, Range: 33, 158 North, 94 West
 Landform (hillslope, terrace, etc.): stream terrace Local relief (concave, convex, none): Linear Slope Slope (%): 1%
 Subregion (LRR): LRR R Lat: 48.460071 Long: -102.834628 Datum: NAD83
 Soil Map Unit Name: Vallers Loam, moderately saline NWI classification: None

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (if needed, explain in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			

Remarks: WET001B

VEGETATION – Use scientific names of plants

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: <u>30</u>)			
1. _____			
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15</u>)			
1. <u>Cirsium arvense</u>	20%	Y	FACU
2. <u>Rosa arkansana</u>	10%	Y	FACU
3. _____			
_____ = Total Cover			
Herb Stratum (Plot size: <u>5</u>)			
1. <u>Bromus inermis</u>	60%	Y	UPL
2. _____			
_____ = Total Cover			
Woody Vine Stratum (Plot size: <u>30</u>)			
1. _____			
_____ = Total Cover			
% Bare Ground in Herb Stratum <u>10.00%</u>			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:		
OBL species	0%	x 1	0.0%	
FACW species	0%	x 2	0.0%	
FAC species	0%	x 3	0.0%	
FACU species	30%	x 4	120.0%	
UPL species	60%	x 5	300.0%	
Column Totals:	<u>90.0%</u>	(A)	<u>420%</u>	(B)
Prevalence Index = B/A =			<u>4.67</u>	

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
 ____ 2 - Dominance Test if >50%
 ____ 3 - Prevalence Index is ≤ 3.0
 ____ 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
 ____ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes No

Remarks:

SOIL

Sampling Point: DP02U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)											
Depth (inches)	Matrix		Redox Features				Texture:	Remarks:			
	Color:	%	Color:	%	Type:	Loc:					
0-12	10YR 3/3	100%					Clay Loam				
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains											
Location: PL=Pore Lining, M=Matrix											
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)				Indicators for Problematic Hydric Soils							
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Muck Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)				<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High PLains Depression (F16) (MLRA 72 & 73 of LRR H)				<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.			
Restrictive Layer (if present):											
Type: None											
Depth (inches): N/A						Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>					
Remarks:											

HYDROLOGY

Wetland Hydrology Indicators			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	(where tilled)	
<input type="checkbox"/> Drift Deposits (B3)	(where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)	
Field Observations:			
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): N/A	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): N/A		
Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): N/A		
Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

APPENDIX E

Photographs of Project Area



Figure E-1. WET01 overview, facing west (photograph taken October 2, 2018).



Figure E-2. WV1 overview, facing south (photograph taken October 2, 2018).



Figure E-3. WET02 overview, facing north (photograph taken October 2, 2018).



Figure E-4. DP6U overview, point recorded to disprove NWI wetland, facing east-southeast (photograph taken October 2, 2018).



Figure E5. WET03 overview, facing southeast (photograph taken October 2, 2018).



Figure E6. WET001B overview, facing south (photograph taken October 29, 2019).

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