APPENDIX A. INTERGOVERNMENTAL COORDINATION, PUBLIC AND AGENCY PARTICIPATION

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Mailing List

Floyd Azure, Chairperson
Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation, Montana
PO Box 1027
Poplar, MT 59255

Reggie Wassana, Governor
Cheyenne and Arapaho Tribes
700 Black Kettle Blvd
Concho, OK 73022

Harold Frazier, Chairperson
Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota
PO Box 590
Eagle Butte, SD 57625

Harlan Baker, Chairperson
Chippewa Cree Indians of the Rocky Boy's Reservation, Montana
96 Clinic Road North
Box Elder, MT 59521

Peter Lengkeek, Chairperson
Crow Creek Sioux Tribe of the Crow Creek Reservation, South Dakota
PO Box 50
Fort Thompson, SD 57339-0050

Frank White Clay, Chairperson
Crow Nation
PO Box 159
Crow Agency, MT 59022-0159

Anthony Reider, President
Flandreau Santee Sioux Tribe of South Dakota
PO Box 283
Flandreau, SD 57028

Jeffrey "Jeff" Stiffarm, President
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana
656 Agency Main St
Harlem, MT 59526

Clyde Estes, Chairperson
Lower Brule Sioux Tribe of the Lower Brule Reservation, South Dakota
187 Oyate Circle
Lower Brule, SD 57548

Robert Larsen, President
Lower Sioux Indian Community Council
39527 Highway 1
Morton, MN 56270

Cathy Chavers, Chairperson
Bois Forte Band of Chippewa Indians
5344 Lakeshore Drive
PO Box 16
Nett Lake, MN 55772

Serena Wetherelt, President
Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation, Montana
PO Box 128
Lame Deer, MT 59043

Kevin Killer, President
Oglala Sioux Tribe
PO Box 2070
107 West Main Street
Pine Ridge, SD 57770

Darrell Seki, Chairperson
Red Lake Band of Chippewa Indians, Minnesota
15484 Migizi Drive
Red Lake, MN 56671

Rodney Bordeaux, President
Rosebud Sioux Tribe of the Rosebud Indian Reservation, South Dakota
PO Box 430
11 Legion Ave
Rosebud, SD 57570

Roger Trudell, President
Santee Sioux Nation, Nebraska
425 Frazier Ave N.
Suite 2
Niobrara, NE 68760

Keith B. Anderson, Chairperson
Shakopee Mdewakanton Sioux Community of Minnesota
2330 Sioux Trail NW
Prior Lake, MN 55372

Delbert Hopkins, Jr., Chairperson
Sisseton-Wahpeton Oyate of the Lake Traversed Reservation, South Dakota
PO Box 509
12254 BIA HWY 711
Agency Village, SD 57262-0509

Douglas Yankton, Sr., Chairperson
Spirit Lake Tribe, North Dakota
PO Box 359
Fort Totten, ND 58335-0359

Janet Alkire, Chairperson
Standing Rock Sioux Tribe
PO Box D
Fort Yates, ND 58538-0522

Mark Fox, Chairperson
Three Affiliated Tribes of the Fort Berthold Reservation, North Dakota
404 Frontage Road
New Town, ND 58763-9402

Jamie Azure, Chairperson
Turtle Mountain Band of Chippewa Indians of North Dakota
PO Box 900
4180 Highway 281
Belcourt, ND 58316

Kevin Jensvold, Chairperson
Upper Sioux Indian Community
5722 Travers Lane
Granite Falls, MN 56241

Robert Flying Hawk, Chairperson
Yankton Sioux Tribe of South Dakota
PO Box 1153
Wagner, SD 57380

Kevin Dupuis, Chairperson
Fond du Lac Band of Lake Superior Chippewa
1720 Big Lake Road
Cloquet, MN 55720

Robert Deschamp, Chairperson
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Grand Portage, MN 55605

Faron Jackson, Chairperson
Leech Lake Band of Chippewa Indians
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Cass Lake, MN 56633

Melanie Benjamin, Chief Executive
Mille Lacs Band of Ojibwe
43408 Oodena Dr
Onamia, MN 56359

Michael Fairbanks, Chairperson
White Earth Ojibwe
35500 Eagle View Rd
Ogema, MN 56569

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Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation, Montana
PO Box 1027
Poplar, MT 59255

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Flandreau Santee Sioux Tribe of South Dakota
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Lame Deer, MT 59043

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Pine Ridge, SD 57770

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Niobara, NE 68760

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Prior Lake, MN 55372

Dianne Desrosiers, THPO
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PO Box 907
205 Oak St E, Suite 121
Sisseton, SD 57262

Kenneth Graywater Jr., THPO
Spirit Lake Tribe, North Dakota
PO Box 189
Fort Totten, ND 58335

Jon Eagle, THPO
Standing Rock Sioux Tribe of North and South Dakota
PO Box D
Fort Yates, ND 58538

Allen Demeray, THPO
Three Affiliated Tribes of the Fort Berthold Reservation, North Dakota
MHA Complex
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New Town, ND 58763

Jeffrey Desjarlais, THPO
Turtle Mountain Band of Chippewa Indians of North Dakota
PO Box 900
4180 Highway 281
Belcourt, ND 58316

Samantha Odegard, THPO
Upper Sioux Indian Community
PO Box 147
Granite Falls, MN 56241

Galena Drapeau, THPO
Yankton Sioux Tribe of South Dakota
Box 1153
Wagner, SD 57380

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1720 Big Lake Rd
Cloquet, MN 55720

Rob Hull, THPO
Grand Portage Band of Lake Superior Chippewa
PO Box 428
Grand Portage, MN 55605

Gina Lemon, THPO
Leech Lake Band of Chippewa Indians
Leech Lake Historic Preservation Office
115 6th St, NW, Suite E
Cass Lake, MN 56633

Terry Kemper, THPO
Mille Lacs Band of Ojibwe
43408 Oodena Dr
Onamia, MN 56359

Jaime Arsenault, THPO
White Earth Ojibwe
PO Box 418
White Earth, MN 56591

Jeb Williams, Director
North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, ND 58501

North Dakota Department of Commerce - Division of Community Services
Century Center, 1600 East Century Avenue, Suite 2
PO Box 2057
Bismarck, ND 58503

Deb Thomas
Deputy Regional Administrator
USEPA Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

Tribal Historic Preservation Officer
Indian Affairs Commission
600 East Boulevard Avenue
Bismarck, ND 58505-0300

Andrew Stahl
State Health Officer
North Dakota Department of Health
600 East Boulevard Avenue
Bismarck, ND 58505-0200

U.S. Department of Agriculture - Natural Resources Conservation Service
4775 Technology Circle #1B
Grand Forks, ND 58203-5635

U.S. Army Corps of Engineers - North Dakota Regulatory Office
2219 University Drive
Bismarck, ND 58504

North Dakota State Water Commission
900 East Boulevard Ave, Dept 770
Bismarck, ND 58505-0850

Bill Peterson, SHPO
State Historical Society of North Dakota
State Historical Society of North Dakota
612 East Boulevard Ave
Bismarck, ND 58505

Jessica Johnson
U.S. Fish and Wildlife - North Dakota Field Office
3425 Miriam Avenue
Bismarck, ND 58501

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 319TH RECONNAISSANCE WING (ACC)
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

27 November 2023

319 CES/CD
525 Tuskegee Airmen Blvd.
Grand Forks AFB, ND 58205-6434

Jeb Williams
Director
North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck ND 58501

Dear Mr. Williams

The United States (US) Department of the Air Force (DAF) is preparing an Environmental Assessment (EA) to evaluate the potential environmental impacts associated with development at GrandSKY Business Park. GrandSKY Business Park is located in an enhanced use lease (EUL) parcel on the southwestern portion of Grand Forks Air Force Base (GFAFB), near Grand Forks, North Dakota, along US Highway 2. All development under the Proposed Action would occur within the 217-acre GrandSKY Business Park (**Attachment 1**).

Proposed Action

Grand Forks County proposes a full build-out and development of GrandSKY to accommodate existing and future demand for aviation mixed-use, light industrial, administrative, and commercial facilities. A full build-out of this property would include increased pavements, in addition to the existing paved taxiway, apron, and existing buildings, depending on prospective tenant needs. The Proposed Action would develop approximately 8,600,000 ft^2 of impervious surfaces across eight functional land use categories within the GrandSKY Business Park. This EA proposes to evaluate, where applicable, development, construction, and operation of the GrandSKY Business Park at GFAFB.

Purpose and Need

The purpose of the Proposed Action in this EA is to support mission objectives and accommodate the growing tenant desire to reside within the business park for uncrewed aircraft system (UAS)-related actions. The need for the Proposed Action is to support the DAF's strategic goal of optimizing the value of its existing real property assets at GFAFB. The Proposed Action is also needed to promote continued economic development within Grand Forks County by providing adequate space for increased commercial interest in UAS manufacturing, training, and development within proximity to an airfield.

Environmental Assessment

The EA will assess the potential environmental consequences of the Proposed Action and No Action Alternative. Potential impacts identified for evaluation in the EA include effects to noise; public health and safety; air quality/climate change; biological, water, soils, and geological

resources; land use and visual resources; cultural resources; environmental justice and protection of children; socioeconomics; hazardous materials and wastes, toxic substances, and contaminated sites; and infrastructure, including transportation and utilities. The EA will also examine the cumulative effects when combined with past, present, and reasonably foreseeable environmental trends and planned actions at GrandSKY and GFAFB. In support of this process, we request your input in identifying general or specific issues or areas of concern you believe should be addressed in the EA.

We intend to notify your agency when the Draft EA is completed and welcome comments and input at that time as well. Please inform us if someone else within your agency other than you should receive the Draft EA. So that we remain on schedule to complete the environmental impact analysis process in a timely manner, please provide your response no later than 30 days from receipt of this correspondence. Please send your response via postal mail or email (preferred) to:

ATTN: Robert Greene
ADDRESS: 525 Tuskegee Airmen Blvd
Phone: 701-747-4664
Email: robert.greene.13@us.af

The DAF appreciates your interest in and support of its military mission at GFAFB. We thank you in advance for your assistance and look forward to your response.

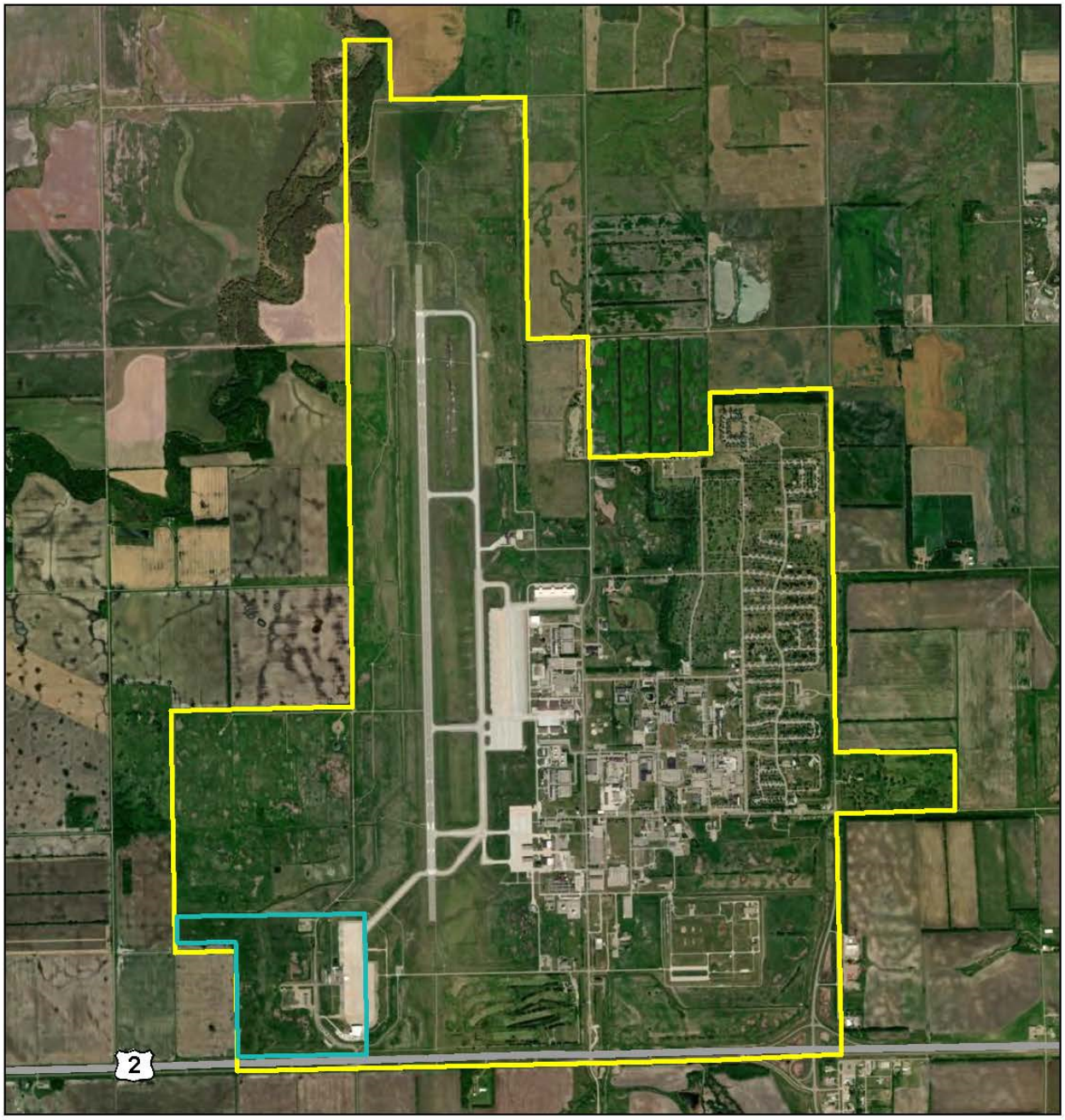
Sincerely

LANDON.LANCE.ERIC.1458635028 Digitally signed by LANDON.LANCE.ERIC.1458635028 Date: 2023.11.21 15:41:42 -06'00'

LANCE E. LANDON, GS-13, DAF
Deputy Base Civil Engineer

Attachment:
1. Map of Project Area (GrandSKY Business Park), October 2023

Attachment 1 – Map of Project Area (GrandSKY Business Park)



GrandSKY Business Park
Grand Forks Air Force Base

GrandSKY Business Park Boundary

Installation Boundary

N

0 0.5 Miles

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 319TH RECONNAISSANCE WING (ACC)
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

27 November 2023

319 CES/CD
Lance Landon
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

Robert Flying Hawk
Chairperson
Yankton Sioux Tribe
PO Box 1153
Wagner SD 57380-1153

Dear Chairperson Flying Hawk

Grand Forks Air Force Base (GFAFB) is proposing development actions within the GrandSKY Business Park, a 217-acre Enhanced Use Lease (EUL) area on GFAFB property in Grand Forks County, North Dakota. The development is needed to accommodate existing and future demand related to uncrewed aircraft system (UAS)-related actions, and to promote continued economic development within Grand Forks County by providing adequate space for increased commercial interest in UAS manufacturing, training, and development within proximity to an airfield.

GFAFB has determined the proposed development constitutes an undertaking as defined in 36 CFR §800.16(y). The frequency and type of UAS used will remain unchanged from the original design totals consulted with you in 2013. The Area of Potential Effect (APE) constitutes the 217 acres within the EUL (Atch 1).

The APE was previously inventoried for cultural resources in 1996 by Parsons Engineering Science; none were identified. As a result of the 2013 EUL tribal consultation, GFAFB signed a Memorandum of Understanding with the Cheyenne River Sioux Tribe, the Standing Rock Sioux Tribe, the Spirit Lake Tribe, and the Sisseton-Wahpeton Oyate regarding survey of the APE for Traditional Cultural Properties (TCPs). The MOU survey was conducted in May 2014 by Good Schliesman & Associates to include field personnel Kent N. Good, Jeff Hesla and Brad Cloud; no historic properties or TCPs were identified. Although the MOU remains in effect from the date executed by all parties until the end of the 10-year construction period (15 April 2014–15 April 2024) or any authorized extension of the construction period, the stipulations have been met and GFAFB does not anticipate amending or extending past the expiration date.

Should unexpected discovery of human remains, associated funerary objects, or archaeological materials occur during construction, GFAFB, Grand Forks County, and its subleasees would stop construction in the immediate area of the discovery and notify the State

Historic Preservation Office, Advisory Council on Historic Preservation, and federally recognized tribes affiliated with GFAFB within 48 hours of discovery in compliance with 36 CFR §800.13.

The United States Department of the Air Force (DAF) is preparing an Environmental Assessment (EA) to evaluate the potential environmental impacts associated with development at GrandSKY Business Park. Potential impacts identified for evaluation in the EA include effects to noise; public health and safety; air quality/climate change; biological, water, soils, and geological resources; land use and visual resources; cultural resources; environmental justice and protection of children; socioeconomic; hazardous materials and wastes, toxic substances, and contaminated sites; and infrastructure, including transportation and utilities. The EA will also examine cumulative effects when combined with past, present, and reasonably foreseeable environmental trends and planned actions at GrandSKY and GFAFB. The draft EA will be sent to your office for review and comment.

In consideration of the above and attached information, GFAFB determines the proposed undertaking will have no effect to historic properties. We request your concurrence in this determination as specified in 36 CFR §800.4(d)(1).

If you have any questions, please contact Ms. Kristen Rundquist, 319 CES/CEIE, kristen.rundquist@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you.

Sincerely

LANDON.LANCE.ERIC.1458635028

Digitally signed by LANDON.LANCE.ERIC.1458635028
Date: 2023.11.20 17:45:19 -06'00'

LANCE E. LANDON, GS-13, DAF
Deputy Base Civil Engineer

Attachments:
1. GrandSKY Business Park Area of Potential Effect
2. Distribution List

cc:
Colten Archambeau, Tribal Historic Preservation Officer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 319TH RECONNAISSANCE WING (ACC)
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

27 November 2023

319 CES/CD
Mr. Lance Landon
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

Dr. Bill Peterson
State Historic Preservation Officer
State Historical Society of North Dakota
North Dakota Heritage Center
612 East Boulevard Ave
Bismarck ND 58505

Dear Dr. Peterson

Grand Forks Air Force Base (GFAFB) is proposing development actions within the GrandSKY Business Park, a 217-acre Enhanced Use Lease (EUL) area on GFAFB property in Grand Forks County, North Dakota. The development is needed to accommodate existing and future demand related to uncrewed aircraft system (UAS)-related actions, and to promote continued economic development within Grand Forks County by providing adequate space for increased commercial interest in UAS manufacturing, training, and development within proximity to an airfield. GFAFB previously consulted with your office and culturally-affiliated Native American tribes in 2013 on the initial development of the 217-acre GrandSKY EUL; your office concurred with the determination of no effect to historic properties on 1 Nov 2013.

GFAFB has determined the proposed development constitutes an undertaking as defined in 36 CFR §800.16(y). The frequency and type of UAS used will remain unchanged from the original design totals consulted with you in 2013. The Area of Potential Effect (APE) constitutes the 217 acres within the EUL (Atch 1).

The APE was previously inventoried for cultural resources in 1996 by Parsons Engineering Science; none were identified. As a result of the 2013 EUL tribal consultation, GFAFB signed a Memorandum of Understanding with the Cheyenne River Sioux Tribe, the Standing Rock Sioux Tribe, the Spirit Lake Tribe, and the Sisseton-Wahpeton Oyate regarding survey of the APE for TCPs. The MOU survey was conducted in May 2014 by Good Schliesman & Associates to include field personnel Kent N. Good, Jeff Hesla and Brad Cloud; no historic properties or Traditional Cultural Properties were identified.

In consideration of the above and attached information, GFAFB determines the proposed undertaking will have no effect to historic properties. We request your concurrence in this determination as specified in 36 CFR §800.4(d)(1).

If you have any questions, please contact Ms. Kristen Rundquist, 319 CES/CEIE, kristen.rundquist@us.af.mil. Thank you in advance for your assistance in this effort and we look forward to hearing from you.

Sincerely

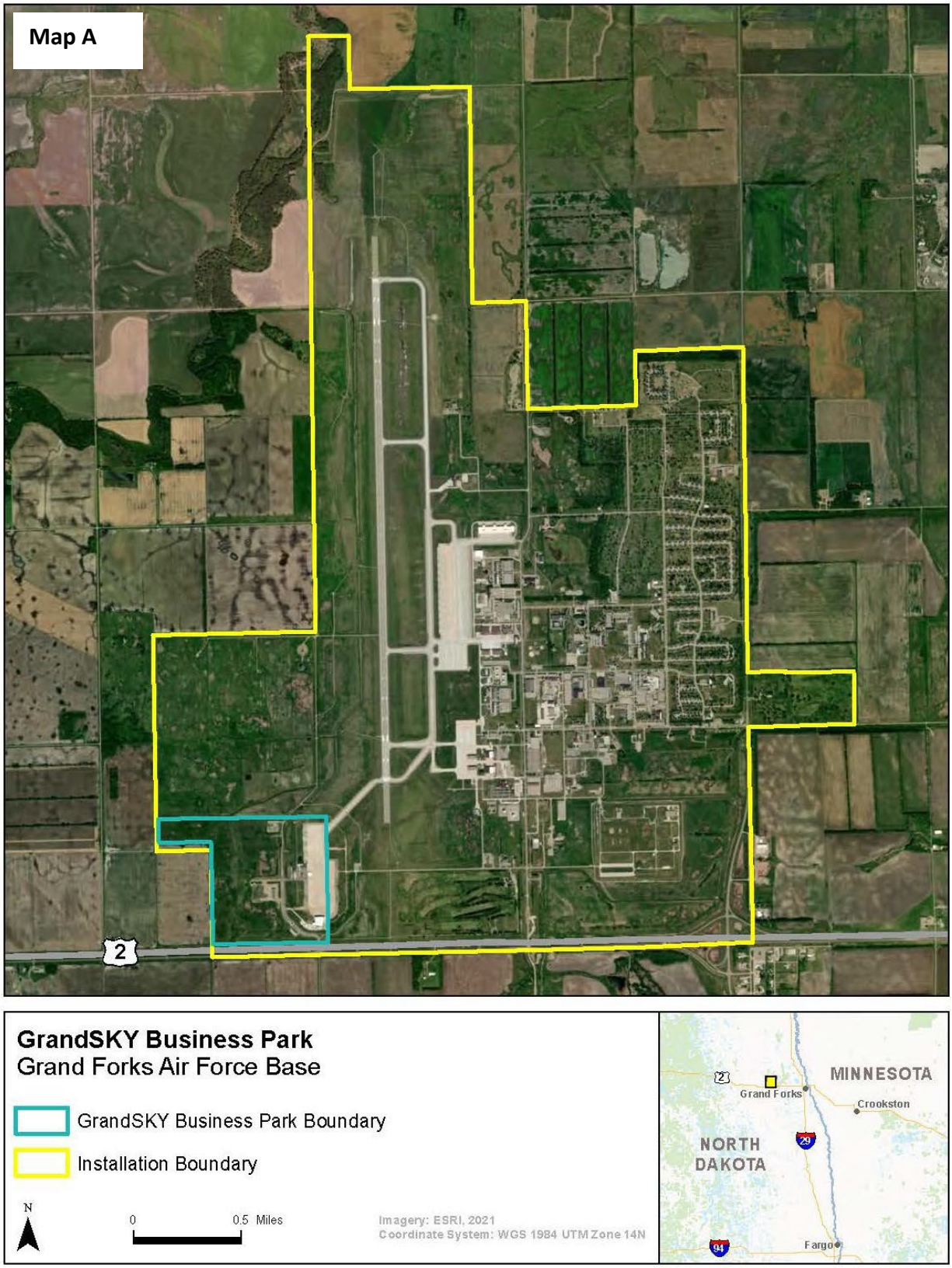
LANDON.LANCE.ERIC.1458635028

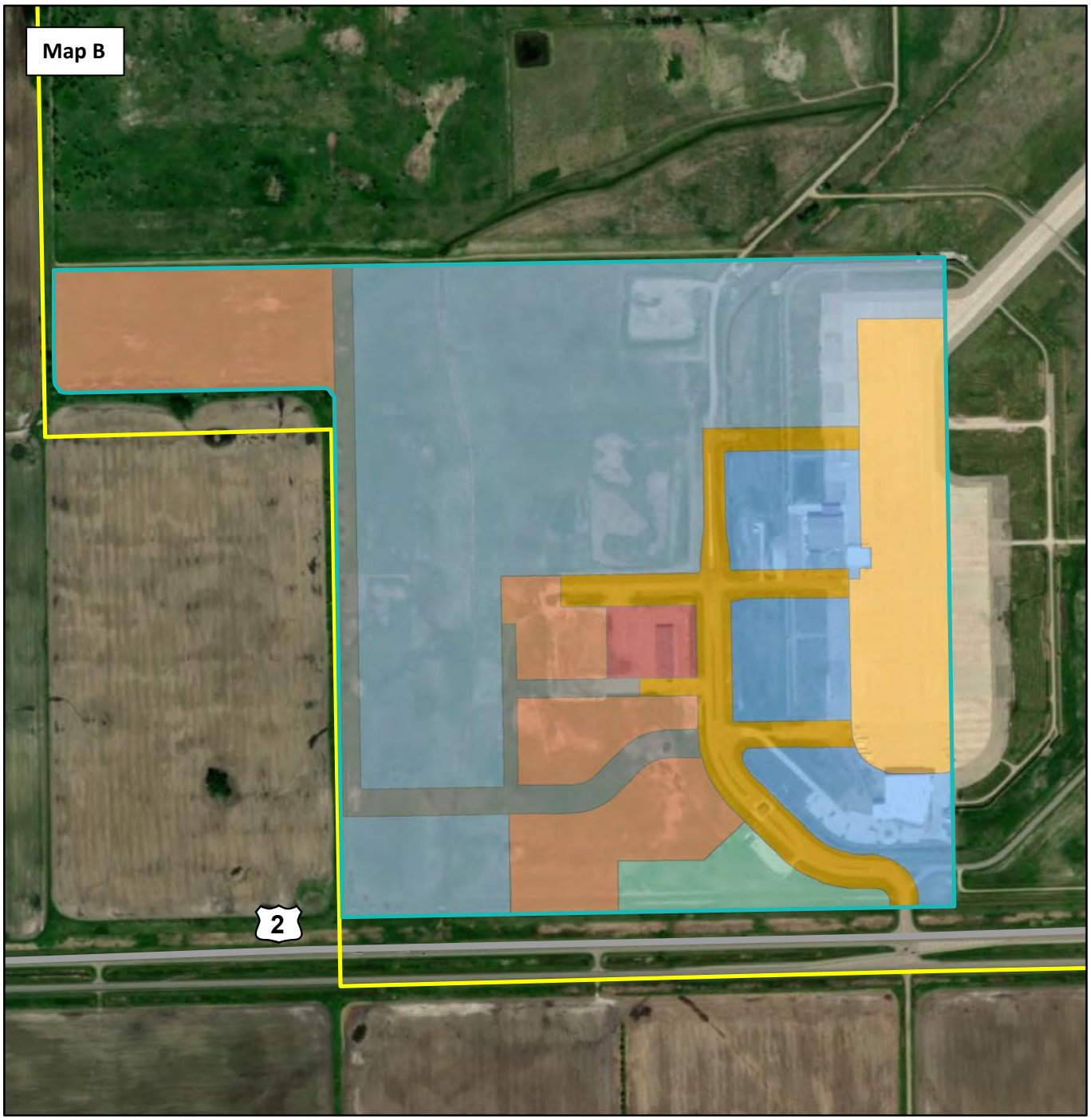
Digitally signed by LANDON.LANCE.ERIC.1458635028
Date: 2023.11.17 16:11:07 -06'00'

LANCE E. LANDON, GS-13, DAF
Deputy Base Civil Engineer

Attachments:
1. GrandSKY Business Park Area of Potential Effect
2. Distribution List

Attachment 1: Area of Potential Effects (Maps A and B)





Area of Potential Effect

Full Build-Out with Functional Land Use Categories

- GrandSKY Business Park Area of Potential Effect
- Grand Forks Air Force Base Boundary
- Aviation Mixed Use / Light Industrial
- Aviation Mixed Use / Light Industrial (Partially Developed)
- Commercial Mixed Use
- Existing Airfield Pavements
- Existing Roadways
- Office Mixed Use
- Office Mixed Use (Partially Developed)
- Roadway Corridors

N

0 0.2 Miles

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N

Attachment 2: Distribution List

North Dakota State Historic Preservation Officer
Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation
Bois Forte Band of Chippewa Indians of Minnesota Chippewa Tribe
Cheyenne and Arapaho Tribes
Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota
Chippewa Cree Indians of the Rocky Boy's Reservation, Montana
Crow Creek Sioux Tribe of the Crow Creek Reservation, South Dakota
Crow Tribe of Montana
Flandreau Santee Sioux Tribe of South Dakota
Fond du Lac Band of Lake Superior Chippewa of Minnesota Chippewa Tribe
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana
Grand Portage Band of Lake Superior Chippewa
Leech Lake Band of Chippewa Indians
Lower Brule Sioux Tribe of the Lower Brule Reservation, South Dakota
Lower Sioux Indian Community Council
Mille Lacs Band of Ojibwe of Minnesota Chippewa Tribe of Minnesota Chippewa Tribe
Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation, Montana
Oglala Sioux Tribe
Red Lake Band of Chippewa Indians, Minnesota
Rosebud Sioux Tribe of the Rosebud Indian Reservation, South Dakota
Santee Sioux Nation, Nebraska
Shakopee Mdewakanton Sioux Community of Minnesota
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota
Spirit Lake Tribe, North Dakota
Standing Rock Sioux Tribe of North and South Dakota
Three Affiliated Tribes of the Fort Berthold Reservation, North Dakota
Turtle Mountain Band of Chippewa Indians of North Dakota
Upper Sioux Indian Community
White Earth Ojibwe of Minnesota Chippewa Tribe
Yankton Sioux Tribe of South Dakota

December 5, 2023

Lance Landon
U.S. Air Force
319CES/CD
525 Tuskegee Airmen Blvd
Grand Forks AFB, ND 58206

ND SHPO Ref.: 24-9009, GrandSKY Business Park in portions of [T152N R53W Section 34] Grand Forks County, North Dakota

Dear Mr. Landon,

We have reviewed ND SHPO Ref.: 24-9009, GrandSKY Business Park in portions of [T152N R53W Section 34] Grand Forks County, North Dakota. It is our understanding that the proposed project is facility development related to UAS. We concur with a determination of "No Effect" for this project provided it takes place in the location and manner described in the documentation.

Thank you for the opportunity to review this project. If you have any questions please contact Lorna Meidinger, Lead Historic Preservation Specialist at (701) 328-2089, e-mail lbmeidinger@nd.gov

Sincerely,

for William D. Peterson PhD
State Historic Preservation Officer
(North Dakota)

cc: Kristen Rundquist

24-9009

United States Department of the Interior

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

In Reply Refer To: November 27, 2023
Project Code: 2024-0019635
Project Name: Enhanced Use Lease Development at GrandSKY Business Park

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

To Whom It May Concern:

Section 7 of the Endangered Species Act
The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).
New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.
The Act requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service *if they determine their project and associated actions "may affect" listed species or critical habitat*. If Federal agencies or their non-federal representatives determine their project and associated actions will have "no effect" on listed species, their habitats, or designated critical habitat, consultation is not required. However, if a "no effect" is determined, we recommend that you maintain a written record in support of your conclusion.
Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act
Additionally, while not all are listed as threatened or endangered, eagles and migratory birds

have protections under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). The BGEPA prohibits take which is defined as, “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb” (50 CFR 22.3). Disturb is defined in regulations as, “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) 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.”. The MBTA makes it unlawful without a waiver to pursue, hunt, take, capture, kill, or sell birds listed as migratory birds, including eagles. The statute does not discriminate between live or dead birds and also grants full protection to any bird parts including feathers, eggs, and nests.

Service Property Interests

As part of the National Wildlife Refuge System, the Service administers fee title Refuge and Waterfowl Production Areas, as well as wetland and grassland easements, throughout North Dakota. For exact locations of Service interest lands, please contact the appropriate Wetland Management Districts (WMD) for guidance regarding FWS easements.

Northwest ND WMD Complex: Kyle Flanery, (701) 768-2548
Eastern ND WMD Complex: Dave Azure, (701) 285-3341
Central ND WMD Complex (also covers south and west): Todd Luke, (701) 442-5474

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Wetlands

OFFICIAL SPECIES LIST

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

This species list is provided by:

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

PROJECT SUMMARY

Project Code: 2024-0019635
Project Name: Enhanced Use Lease Development at GrandSKY Business Park
Project Type: Mixed-Use Construction
Project Description: The Proposed Action would develop approximately 8,600,000 ft2 of impervious surfaces across eight functional land use categories within the GrandSKY Business Park. As described in Section 1.3, GrandSKY has experienced an increase in commercial interest for UAS-related tenants with need of proximity to the GFAFB airfield. The GFAFB airfield is required as increased tenant density seeks access to an expanded runway for UAS flights, aircraft hangar space, and airfield operations.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@47.93711175,-97.41265803412267,14z

Counties: Grand Forks County, North Dakota

ENDANGERED SPECIES ACT SPECIES

There is a total of 1 threatened, endangered, or candidate species on this species list.

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

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

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

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

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

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

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

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1A
- PEM1C

RIVERINE

- R4SBAx
- R4SBCx

IPAC USER CONTACT INFORMATION

Agency:	Private Entity
Name:	Nicholas Sutton
Address:	350 Hills St
Address Line 2:	Suite 112
City:	Richland
State:	WA
Zip:	99354
Email	nsutton@easbio.com
Phone:	6789382429

APPENDIX B. TRIBAL MEMORANDUM OF UNDERSTANDING

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MEMORANDUM OF UNDERSTANDING

AMONG

THE 319TH AIR BASE WING, GRAND FORKS AIR FORCE BASE,

THE CHEYENNE RIVER SIOUX TRIBE,

THE STANDING ROCK SIOUX TRIBE,

THE SPIRIT LAKE TRIBE,

AND

THE SISSETON-WAHPETON OYATE

REGARDING THE CONSTRUCTION OF AN AVIATION AND MIXED-USE BUSINESS PARK AT GRAND FORKS AFB

WHEREAS, the United States Air Force, represented by 319TH Air Base Wing (319 ABW) operates and maintains Grand Forks AFB (GFAFB) and has the authority under 10 U.S.C. § 2667 to lease property that is not presently needed for public use; and

WHEREAS, Grand Forks County (GFC) has submitted a proposal to lease 217 acres of GFAFB to develop that area as an Aviation and Mixed-Use Business Park; and

WHEREAS, 319 ABW is responsible for identifying and managing historic properties at GFAFB and identifying and considering effects of any undertakings to historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) (16 USC § 470f) and its implementing regulation, 36 CFR Part 800; and

WHEREAS, 319 ABW has defined the undertaking's area of potential effect (APE) as the 217 acres shown on the map in Attachment A; and the APE was inventoried as part of the *Grand Forks AFB Cultural Resources Survey, Class III Intensive Archaeological Inventory,* September 1996, which found no evidence of Native American remains or properties of religious and cultural significance on GFAFB; and during the inventory; and the Three Affiliated Tribes of the Fort Berthold Reservation, the Spirit Lake Tribe (Fort Totten Reservation), the Standing Rock Sioux Tribe, and the Turtle Mountain Band of Chippewa Indians were contacted, but these tribes did not identify any properties of religious and cultural significance on Grand Forks AFB; and

WHEREAS, the Cheyenne River Sioux Tribe, Standing Rock Sioux Tribe, Spirit Lake Tribe, and Sisseton-Wahpeton Oyate (Tribes) have requested an opportunity to survey the 217

acre site as weather conditions permit; and

WHEREAS, 319 ABW has fulfilled its obligations under NHPA Section 106 by concluding consultation with the North Dakota State Historic Preservation Office (SHPO) who concurred by letter dated 1 Nov 2013 that no historic properties would be affected; and

NOW, THEREFORE, 319 ABW, the Cheyenne River Sioux Tribe, the Standing Rock Sioux Tribe, the Spirit Lake Tribe, the Sisseton-Wahpeton Oyate, and any tribes that may later be added pursuant to Stipulation V.B below, agree that the undertaking shall be implemented in accordance with the following stipulations.

STIPULATIONS

I. PRE-CONSTRUCTION ACTIVITIES

A. Identifying Traditional Cultural Properties of Religious and Cultural Significance.

i. 319 ABW will provide access to the APE and allow the Tribes to conduct their own Traditional Cultural Property (TCP) survey prior to 15 May 2014. This survey gives the Tribes an opportunity to identify any properties of religious and cultural significance to them that may be present in the APE.

ii. The TCP survey will be conducted by Tribal representatives. The Tribes will designate their representatives, or determine who will conduct the survey on their behalf. The 319 ABW will assist the Tribe by providing personnel to map TCP features and boundaries as identified by Tribal representatives. 319 ABW personnel will enter the geographic data into a GIS system capable of rendering maps, but will not include descriptions of the TCPs, only their locations. Digital maps may be reviewed by the Tribes and 319 ABW on laptop computers equipped with appropriate software, if available. Printed maps will be produced for quality assurance and quality control purposes upon request by and for use by Tribal representatives. It will be the responsibility of the Tribes to document descriptions of observed TCPs in field notes, photographs, and/or sketches or by other means selected by the Tribes.

iii. If TCP locations are identified, the Tribal representatives will notify Tribal Elders at least one day prior to the last day of the survey, so that the Tribal Elders, if participating, can travel to the 217 acre site (or portion thereof) to participate in the survey. The Tribal representatives may revisit the locations of TCPs, if any, with the Tribal Elders as desired.

iv. 319 ABW will, upon completion of the survey, provide to the Tribes one CD or DVD containing the digital files for all mapped TCPs and buffers, if any. 319 ABW may retain data in its GIS system for project planning purposes (i.e., to provide a basis for

avoiding impacts to TCPs through micrositing) and share this information with Grand Forks County and its sublessees. The Tribes will identify what data on the CD or DVD, if any, they desire 319 ABW to withhold from public release. Such data will not be shared with the public, and is exempt from release under the Freedom of Information Act under exemption 3 and National Historic Preservation Act Section 304 (16 U.S.C. § 470w-3).

B. Evaluating Eligibility of TCPs for the National Register.

i. 319 ABW shall consider the information developed by the TCP survey, as well as any supplemental information provided by the Tribes, and shall apply 36 CFR § 60.4 criteria to determine whether any sites identified by the Tribes are eligible for listing on the National Register of Historic Places (NRHP). 319 ABW acknowledges and will take into account the special expertise of the Tribes for the identification and NRHP-eligibility assessment of TCPs that may possess religious and cultural significance to them.

ii. Any TCPs that 319 ABW, the Tribes, and SHPO agree meet 36 CFR § 60.4 criteria shall be considered eligible for the NRHP.

iii. If 319 ABW and the SHPO do not agree on an eligibility determination, or if the ACHP or the Secretary of the Interior so request, 319 ABW shall obtain a determination of eligibility from the Keeper of the NRHP pursuant to 36 CFR § 800.4(c)(2). If practicable, 319 ABW will instruct GFC to avoid start of construction at any site for which the Keeper's determination is pending, but the parties agree that construction may start if necessary to meet project schedules.

C. Avoiding and Mitigating Adverse Effects on NRHP-Eligible Properties.

i. 319 ABW shall determine whether the undertaking will have an adverse effect for each site found eligible for the National Register pursuant to Stipulation I.B above. 319 ABW will advise the Tribes of the determination. If any Tribe disagrees with the determination, it may within 30 days request the ACHP to review the finding.

ii. 319 ABW, in consultation with the SHPO and Tribes, shall ensure that adverse effects to properties determined to be eligible for listing in the NRHP shall be avoided whenever prudent and practicable.

iii. If it is not practicable to avoid adversely affecting a TCP that is eligible for listing on the NRHP, 319 ABW shall consult with the SHPO and Tribes to identify measures to resolve adverse effects pursuant to 36 CFR § 800.6 including, if necessary, the development of a data recovery plan for treatment of TCPs affected by the undertaking.

D. Information received after start of construction. The parties expect that the Tribes will be able to complete a TCP survey on the 217 acre parcel no later than 15 May 2014. 319

ABW will consider all available information, including that in a TCP survey or provided by the Tribes, when making decisions on eligibility, avoidance, and mitigation in accordance with paragraphs B and C above. Nevertheless, the parties agree that 319 ABW is not required to alter construction plans and schedules as a consequence of information received after start of construction (except for information relating to the unexpected discovery of archaeological materials, human remains, or associated funerary objects as described in Stipulation II.A below). When information is received after start of construction, 319 ABW will consult with the Tribes to explore ways to minimize impacts that will not impact construction plans and schedules.

II. CONSTRUCTION RELATED ACTIVITIES

A. Unexpected Discovery of Human Remains or Associated Funerary Objects. 319 ABW has no information indicating human remains or associated funerary objects are present in the APE. However, if such materials are discovered during construction, 319 ABW, GFC, and its sublessees shall stop construction in the immediate area of the discovery and notify the North Dakota State Department of Health and Consolidated Laboratories, Grand Forks County Sheriff's Office and the SHPO. Remains will be treated with respect to the deceased, and shall be protected, upon discovery, from further construction activities pending consultation to resolve treatment of such remains.

i. All human remains are to be considered Native American, until such time they are determined otherwise. If human remains are discovered, 319 ABW will notify the Tribes and other Federally recognized tribes affiliated with Grand Forks AFB. In accordance with Section 3(d)(1) of the Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. § 3002(d)(1)), construction may resume 30 days after the tribes certify that they have received notification.

ii. Whenever possible, Native American human remains and funerary objects will be preserved in place. When human remains and associated funerary objects cannot remain in place, disposition will comply with NAGPRA, 25 U.S.C. 3001 et seq., and implementing regulations at 43 CFR Part 10.

B. Unexpected Discovery of Archaeological Materials. If archaeological materials are discovered during construction, 319 ABW shall, pursuant to 36 CFR §800.13(b), make reasonable efforts to avoid, minimize, or mitigate adverse effects to such materials if found on a site that is eligible for the National Register. 319 ABW shall notify the SHPO, ACHP, the Tribes, and other Federally recognized tribes affiliated with Grand Forks AFB within 48 hours of the discovery.

III. CONFIDENTIALITY. 319 ABW acknowledges the need for confidentiality for certain tribal spiritual and cultural information. Pursuant to 36 CFR §§ 800.2(c)(2)(ii)(E), information provided by the Tribes or their members and identified as culturally sensitive will be kept confidential and be protected from public disclosure to the extent permitted by state and Federal law.

IV. DURATION

This MOU shall be in effect from the date executed by all parties until the end of the 10 year construction period, or any authorized extension of the construction period. Prior to such time, 319 ABW may consult with the other parties to reconsider the terms of the MOU and amend it in accordance with Stipulation V below.

V. AMENDMENTS

A. This MOU may be amended when such an amendment is agreed to in writing by all parties. The amendment will be effective on the date of the last signature and shall be appended to this MOU as an attachment.

B. Additional tribes may be added as parties to this MOU without amendment if 319 ABW notifies all existing parties in writing of the proposal and there is no objection from any existing party within thirty (30) days of 319 ABW's written notice. If no response is received within thirty (30) days of mailing, 319 ABW may assume concurrence with the addition of the tribe(s) to this MOU.

VI. WITHDRAWAL

If any party to this MOU determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation V, above. If within thirty (30) days (or another time period agreed to by the parties) an amendment cannot be reached, that party may withdraw from the MOU upon written notification to the other parties. The MOU will remain in effect among the remaining parties.

PARTIES:

319TH AIR BASE WING, GRAND FORKS AIR FORCE BASE

By: _____ **Date:** 4 APR 14

PAUL E. BAUMAN, Colonel, USAF
Commander

CHEYENNE RIVER SIOUX TRIBE

By: Wyz Dearmont, Vice Chairman **Date:** 4/20/04
for **KEVIN KECKLER, Chairman**

SISSETON-WAHPETON OYATE

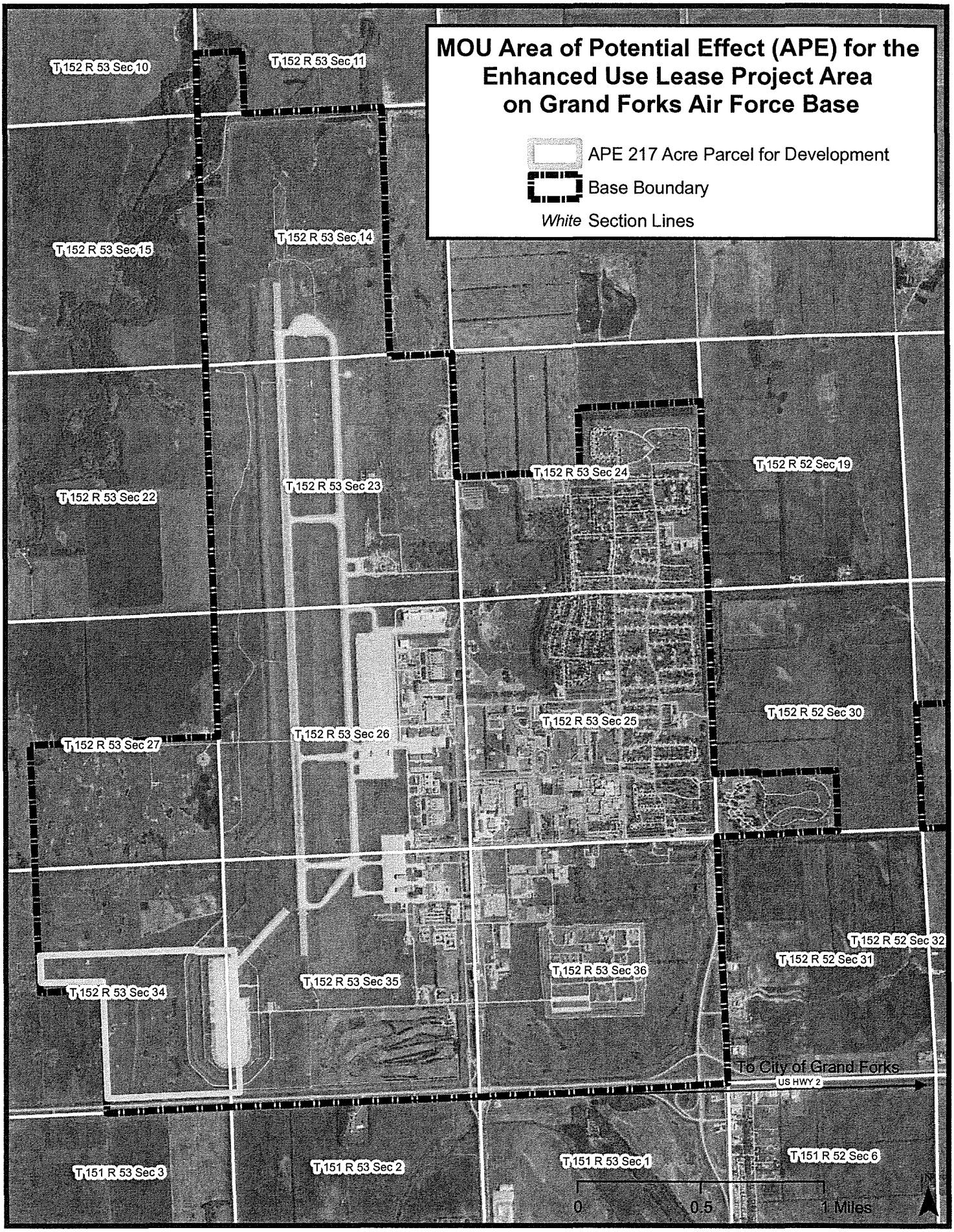
By: Robert Shepherd **Date:** 4-4-14
ROBERT SHEPHERD, Chairman

SPIRIT LAKE TRIBE

By: _____ **Date:** 4-15-14
ERICH LONGIE, Tribal Historic Preservation Officer

STANDING ROCK SIOUX TRIBE

By: _____ **Date:** 4/3/14
DAVE ARCHAMBAULT II, Chairman


MOU Area of Potential Effect (APE) for the Enhanced Use Lease Project Area on Grand Forks Air Force Base
APE 217 Acre Parcel for Development
Base Boundary
White Section Lines
T 152 R 53 Sec 10
T 152 R 53 Sec 11
T 152 R 53 Sec 14
T 152 R 53 Sec 15
T 152 R 53 Sec 22
T 152 R 53 Sec 23
T 152 R 53 Sec 24
T 152 R 52 Sec 19
T 152 R 53 Sec 25
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T 152 R 53 Sec 36
T 152 R 53 Sec 35
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APPENDIX C. PUBLIC NOTICES

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UND music groups to present free concerts Tuesday, Thursday on campus

The concerts will feature the UND Wind Ensemble, UND University Band and the Greater Grand Forks City Band

BY PAMELA KNUDSON
Grand Forks Herald

GRAND FORKS – UND music groups will present free concerts on Tuesday and Thursday, Nov. 28 and 30, on campus.

The UND Wind Ensemble will present a concert at 7:30 p.m. Tuesday, Nov. 28, at the Chester Fritz Auditorium. The concert will feature two major symphonies for bands: H. Owen Reed's classic "LaFiesta Mexicana," written in 1949, and "Give Us This Day," by contemporary composer David Maslanka.

A graduate student in music, Emily Chasowy, will lead the ensemble in Jack Stamp's "Gavorkna Fanfare" to open the concert. Also on the program is "Radiant Joy," composed by Steven Bryant.

On Thursday, Nov. 30, the UND University Band and special guests, the Greater Grand Forks City Band, will present a concert, "Sounds of the Season! A Holiday Concert," beginning at 7:30 p.m. at the UND Memorial Union Ballroom.

The concert will feature ensembles performing unique settings of holiday favorites, said James Popejoy, professor of music and director of bands at UND.

The performance by the Greater Grand Forks City Band, under the direction of Janelle Huber, will include "Blue Christmas," "Little Drummer Boy," "O Holy Night," and Gustav Holst's "In the Bleak Midwinter."

Popejoy will conduct the University Band's performance of "Jingle Bells March," "Fantasy on a Bell Carol" and Alfred Reed's classic setting of "Greensleeves," along with other songs.

Chasowy will lead the band in "Fantasy on Deck the Hall," Popejoy said.

The two ensembles will combine to close the program with performances of "Christmas 'Pop' Singalong," and Leroy Anderson's timeless "Sleigh Ride," he said.

Contributed / UND Music Department
James Popejoy, professor of music and director of bands at UND, conducts the UND University Band.

Both concerts will also be livestreamed on the UND music department's website, www.und.edu/music.

For more information about these concerts, call the UND Bands office at (701) 777-2815.

Knudson is a features reporter at the Herald. Call her at (701) 780-1107, (800) 477-6572 ext.1107 or email pknudson@gfherald.com.

HOUSING

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population is a major contributor to Grand Forks' higher-than-average renter-occupied rate.

"We're definitely a college town, so I would say you're going to see a higher percentage here versus other cities," he said. "The university still remains one of the higher areas for rentals – any college student is looking to get as close to the university as they can."

In addition to a large population of student renters, Brooks said rising home prices and interest rates have created a seller's market, which is incentivizing some homeowners to return to renting.

"As we've seen interest rates climb, there has been a trend of renting other units throughout town," he said. "I have heard a trend of some empty-nesters selling their single-family home as prices have become more favorable for them, and are deciding to rent so they don't have to do the maintenance. Maybe they don't want to move to a stacked-style apartment building, but they're renting a townhome or single-family home where somebody else does the maintenance."

Brooks' observations appear to be backed by economic data. According to the Federal Reserve Bank of St. Louis – one of 12 regional reserve banks making up the U.S. Federal Reserve system – the average interest rate on a 30-year fixed mortgage in August 2023 was 7.18%, up from 5.66% a year prior and the highest figure since December 2001. This also represents a marked increase from a 50-year low of 2.66% in December 2020.

Rates have decreased in the last month and a half, said Emily Hills Boyle and Eric Stringer, both of whom are mortgage lenders from Grand Forks' Gate City Bank. The rate dropped from 8% to 7% from mid-October to November, and was down to 6.5% to 6.75% as of Tuesday, Nov. 21.

"I think that it's still a good time to look at purchasing, especially for first time homeowners," Hills Boyle said. "We're seeing those rates are really good with some of the programs that (North Dakota Housing Finance Agency) offers."

Though interest rates are seeing a recent decline, Brooks also said a lack of affordable homes has kept some would-be home-buyers on the sidelines.

"I think there are people out there that are definitely looking," he said. "Monthly payments are definitely going up on a lot of homes, and that does obviously affect affordability. It's tough to find a home for under $150,000, or even $200,000, which most people would consider affordable."

For Gonser, the condo he's chosen fits within his wants for a home, but he does think the process would have been easier with a home that fit better into his price range.

"I think it might have been a little bit easier just because then I knew I would've been able to pre-approve, because the one I got was pretty much right at the top of my budget," he said. "It was kind of a little bit like, 'Do I want to? Because I'm not sure if I can fully afford it.' But, fortunately, I was approved for it."

While he's comfortable with the decision to move, he thinks other people might not be.

"I feel like there could be a lot of people trying to get a house before they get any higher," he said. "I think my interest rate is double what it was from my current house, so I could see a lot of people might not be willing to give up their current interest rate, even if that means they have to stay with a home that they're not necessarily enthused about."

Meanwhile, the number of homes on the market is increasing, mainly due to reduced demand as a result of high interest rates, said Mike Opp, owner of Grand Forks-based Oxford Realty.

"The supply of homes is climbing – better than it has been in the past six months," he said.

However, there are some residents who are holding onto the houses they live in. Hills Boyle said many homeowners redid their finances during COVID, when interest rates were low, and aren't keen on giving up that rate to move to a new house.

Opp has seen a trend of some homeowners turning their properties into short-term rentals, something he considers positive for the market.

"It's a good thing for affordable housing, because renting is more affordable," he said. "I would say it adds finance and liquidity to the market, which probably stabilizes price. Any time there's more money in a market, the market works better. If investors are going under, that's going to have the opposite effect."

"I would say percentage-wise – relative to the number of properties available north versus south – I would say inventory is equal," he said. "There's more total properties for sale in the south end, but it's a bigger area."

Not everyone is happy with the uptick in short-term rentals, though.

In a previous Herald story, longtime homeowners in areas where houses are being turned into rentals complained that these houses aren't available for purchase by young families, and that college-aged renters can be disrespectful neighbors.

Opp also said he is noticing homes remaining on the market longer than in previous months.

When it comes to the decision to buy versus rent, Hills Boyle and Stringer said to remember three key factors: equity, predictability and enjoyability.

"When you rent, your money really isn't going toward anything," Hills Boyle said. "Whereas if you own, each payment, assuming that your home is appreciating, you get a little bit more ownership."

For predictability, rent can increase at any time, while interest rates can't change for a homeowner. Enjoyability also matters, as a homeowner has more privacy and control over their home and can make it their own.

MEETING ANNOUNCEMENT
Grand Forks & GFAFB School Boards Joint Meeting
Monday, November 27, 2023
6:00pm @ Mark Sanford Education Center
2400 47th Avenue South, Grand Forks
The Notice of Meeting/agenda is found at:
www.gfschools.org > District > School Board
or at www.gfschools.org/Page/26

NOTICE OF EARLY PUBLIC REVIEW OF PROPOSED ACTIVITIES WITHIN FLOODPLAINS – UNITED STATES DEPARTMENT OF THE AIR FORCE

The United States (US) Department of the Air Force (DAF) is inviting early public input on proposed activities at GrandSKY Business Park at Grand Forks Air Force Base (GFAFB), North Dakota, with potential to affect floodplain and wetland resources. To comply with the *National Environmental Policy Act* (NEPA), the DAF is preparing an Environmental Assessment (EA) to evaluate, where applicable, development, construction, and operation at the GrandSKY Business Park at GFAFB.

The proposed development actions and improvements under consideration include new construction, which would include filling of wetlands. Because of this, the DAF is seeking early public input on practical alternatives to avoid or minimize adverse effects on this natural resource. The DAF will consider public input as practicable in the forthcoming Draft EA.

The DAF plans to use the NEPA process to comply with Executive Orders (EO) 11988, *Floodplain Management*; 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*; and 11990, *Protection of Wetlands*.

Accordingly, the DAF seeks your input on potential effects on floodplains and wetlands that could result from the proposed development actions at GrandSKY Business Park. Public comments received in response to this notice, as well as those received throughout the NEPA process, will assist the DAF in complying with its obligations under the EOs noted above.

Please address written comments to the Grand Forks County Administrator, ATTN: GrandSKY EA, PO Box 5726, Grand Forks North Dakota 58201, or via email (preferred) to: thomas.ford@gfcounty.org.

SHARE YOUR MILESTONES!

Weddings, engagements, milestone birthdays, anniversaries, births, all other special events and achievements are published each Saturday in the Grand Forks Herald's MILESTONES.

To place an announcement, go to grandforksherald.com. Click on the MENU link on the left side of the page. Scroll down to COMMUNITY, then click on the MILESTONES.

Deadline: Wednesday 4pm for the following Saturday publication. Questions - call: 701-241-5509 or email: info@modulist.news

Metalsmith creates annual 'heirloom' Christmas ornaments

BY KEVIN WALLEVAND
WDAY

Ryan Longnecker / WDAY News

Badman Design in Grand Forks has a loyal following that patiently waits every year for the annual unveiling of its handmade copper and brass Christmas ornaments.

GRAND FORKS — On Monday, Nov. 27, longtime businessman, metalsmith and designer Dave Badman was inside Badman Design in downtown Grand Forks, soldering two copper and brass halves together for another of his famous heirloom ornaments.

"I'm soldering the top to the ornament," Badman said Monday while he was working. "I had somebody else complete the ornament and I'm just putting the top on it right now."

Badman creates 200 each year. All are dated and many customers anticipate seeing each year's design.

"There's a population that waits for this, and I will not let anybody see it during production," Badman added.

Badman came to Grand Forks years ago when his father was stationed at Grand Forks Air Force Base. When everyone else moved, he stayed and went to the University of North Dakota, where as an art student, his work caught the eye of a professor who told him to pursue a career as a jeweler.

"I was wrong, but my response was, 'Jewelry is for women' and she (the teacher) fought me on it," Badman said.

Since the late 1990s, Badman has been creating all kinds of things, but his heirloom ornaments made of copper, brass and nickel sell out nearly every year. All 200 are handmade. Each year the design is different and many are custom-made for families.

"We call it an heirloom ornament because, since we've been doing it for so many years, it is being passed down from generation (to generation). Many of the original people purchasing them are no longer wanting to collect and they're giving to their children, or even their grandchildren," Badman said.

The handmade metal ornaments cost anywhere between $90 and $150.

Badman also creates 145 sets of three flat Christmas ornaments. He and metalsmith Hayes Muiderman will not only solder the spheres together, but put the polish on them. The duo prepares them for a special spot for them to hang on a tree, beginning or continuing a family tradition somewhere.

For more information, visit badman.com.

PROJECT

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of millions of dollars in future flood protection projects just by making some planning changes and improvements.

"(Once we have the models), I want to stress test them with 10% or 15% more precipitation than we receive now," Grasser said. "Since the Army Corps of Engineers did the original study, we've seen increased precipitation amounts, according to the National Weather Service."

According to the city, 2008 was the last time a comprehensive study was done for south-end drainage. After overland flooding in 2022, the city took a renewed look at the drainage issues on the southern end of Grand Forks.

The goal is to update the models and development plans for the watersheds, flood protection systems, and risks along the southern end of Grand Forks. The planning project focuses on the South End Drainway and English Coulee watersheds now and into the future.

The English Coulee Watershed encompasses most of the city west of Washington Street and into central Grand Forks County. The South End Drainway watershed encompasses the area between 32nd Avenue South, the levee, Merrifield Road and Interstate 29. Both are being evaluated for flood protection and stormwater mitigation in the projection. Potentially, Legal Drain No. 4, which parallels Merrifield Road, will be added into flood risk calculations during the course of this project.

"Fortunately and unfortunately, we didn't get any great gushers this summer," Shawn Gaddie of AE2S said. The city is using AE2S as the engineering consultant firm for the project. "In 2023, a big part was gathering data and computer modeling (and) also looking at build-out and intensity of development and (future) amounts of impervious surface."

Data collection will likely continue into 2024 if the council gives the amendments its full approval. Current findings recommend adding additional water storage capacity for the South End Drainway as its watershed's upper reaches are near capacity for summer rain events.

"It's already answered many tough questions," Grasser said about water drainage issues in the city.

The eventual master plan will guide Grand Forks' expected expansion on the south and west sides of the city. The plan also helps lessen the burden on Grand Forks properties. Because of the flood protection systems, most Grand Forks properties don't have to carry mandatory flood insurance like other properties in flood zones. Plans like this help the city maintain federal requirements so residents can save money on insurance.

In other news, the council:

- Approved an ordinance change to allow hotels to serve alcohol with room service and have mini and convenience bars in their establishments. It was previously struck from city code, but the city received a request from the Olive Ann Hotel as it wanted to offer such amenities.
- Recommended a budget for the Community Development Block Grant and Community Services Grant for 2024. Funds are sponsored by the U.S. Department of Housing and Urban Development to support community development through capital and operational grants.
- Had council members, along with the city auditor, city attorney and Mayor Brandon Bochenski canvass election results from the Nov. 14 special election, regarding extending a sales tax. The canvass resulted in only one changed ballot, adding one vote to the final "yes" tally. The official final vote is 2,359 "yes" votes and 1,190 "no" votes.

Grand Forks Herald NOVEMBER 2023 Bingo Numbers

SUNDAY, 11/5/23
O-65, I-30, B-10

MONDAY, 11/6/23
NO BINGO NUMBERS

TUESDAY, 11/7/23
N-41, O-64, O-69, I-27, I-26, N-43

WEDNESDAY, 11/8/23
O-70, B-14, N-33

THURSDAY, 11/9/23
O-66, B-5, G-57

FRIDAY, 11/10/23
G-59, N-40, I-18

SATURDAY, 11/11/23
G-56, I-28, O-62

SUNDAY, 11/12/23
N-31, G-53, G-52

MONDAY, 11/13/23
NO BINGO NUMBERS

TUESDAY, 11/14/23
N-35, B-1, G-51, B-8, I-22, B-15

WEDNESDAY, 11/15/23
B-12, O-61, I-23

THURSDAY, 11/16/23
G-48, I-17, G-47

FRIDAY, 11/17/23
B-9, I-16, G-54

SATURDAY, 11/18/23
O-73, G-60, G-46

SUNDAY, 11/19/23
B-11, G-55, O-71

MONDAY, 11/20/23
NO BINGO NUMBERS

TUESDAY, 11/21/23
I-20, N-42, B-3, O-74, I-21, O-63

WEDNESDAY, 11/22/23
I-29, I-19, G-58

THURSDAY, 11/23/23
O-72, B-2, O-67

FRIDAY, 11/24/23
B-7, N-44, N-32

SATURDAY, 11/25/23
N-36, G-49, G-50

SUNDAY, 11/26/23
N-45, O-68, O-75

MONDAY, 11/27/23
NO BINGO NUMBERS

TUESDAY, 11/28/23
I-25, N-38,N-34,B-13

NOVEMBER #s not called:
B-4, B-6, I-24, N-37, N-39

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NOTICE OF EARLY PUBLIC REVIEW OF PROPOSED ACTIVITIES WITHIN FLOODPLAINS – UNITED STATES DEPARTMENT OF THE AIR FORCE

The United States (US) Department of the Air Force (DAF) is inviting early public input on proposed activities at GrandSKY Business Park at Grand Forks Air Force Base (GFAFB), North Dakota, with potential to affect floodplain and wetland resources. To comply with the *National Environmental Policy Act* (NEPA), the DAF is preparing an Environmental Assessment (EA) to evaluate, where applicable, development, construction, and operation at the GrandSKY Business Park at GFAFB.

The proposed development actions and improvements under consideration include new construction, which would include filling of wetlands. Because of this, the DAF is seeking early public input on practical alternatives to avoid or minimize adverse effects on this natural resource. The DAF will consider public input as practicable in the forthcoming Draft EA.

The DAF plans to use the NEPA process to comply with Executive Orders (EO) 11988, *Floodplain Management*; 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*; and 11990, *Protection of Wetlands*.

Accordingly, the DAF seeks your input on potential effects on floodplains and wetlands that could result from the proposed development actions at GrandSKY Business Park. Public comments received in response to this notice, as well as those received throughout the NEPA process, will assist the DAF in complying with its obligations under the EOs noted above.

Please address written comments to the Grand Forks County Administrator, ATTN: GrandSKY EA, PO Box 5726, Grand Forks North Dakota 58201, or via email (preferred) to: thomas.ford@gfcounty.org.

APPENDIX D. AIR QUALITY ANALYSIS

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AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

a. Action Location:

Base: GRAND FORKS AFB
State: North Dakota
County(s): Grand Forks
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: Enhanced Use Lease Development at GrandSKY Business Park, Grand Forks Air Force Base, North Dakota

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2024

e. Action Description:

The Proposed Action would develop approximately 8,600,000 ft2 of impervious surfaces across eight functional land use categories within the GrandSKY Business Park.

f. Point of Contact:

Name: Ryan Sauter
Title: Senior Scientist
Organization: EAS
Email: ryan.sauter@easbio.com
Phone Number: 651.341.9955

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the GCR are:

____ applicable
__X__ not applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (hsba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the *USAF Air Emissions Guide for Air Force Stationary Sources*, the *USAF Air Emissions Guide for Air Force Mobile Sources*, and the *USAF Air Emissions Guide for Air Force Transitory Sources*.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (hsba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators*.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2024

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.437	250	No
NOx	3.840	250	No
CO	5.185	250	No
SOx	0.010	250	No
PM 10	31.835	250	No
PM 2.5	0.166	250	No
Pb	0.000	25	No
NH3	0.015	250	No

2025

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.754	250	No
NOx	5.535	250	No
CO	10.449	250	No
SOx	0.023	250	No
PM 10	31.962	250	No
PM 2.5	0.294	250	No
Pb	0.000	25	No
NH3	0.040	250	No

2026

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.068	250	No
NOx	7.326	250	No
CO	15.568	250	No
SOx	0.036	250	No
PM 10	32.095	250	No
PM 2.5	0.427	250	No
Pb	0.000	25	No
NH3	0.064	250	No

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

2027

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.373	250	No
NOx	9.147	250	No
CO	20.519	250	No
SOx	0.049	250	No
PM 10	32.231	250	No
PM 2.5	0.563	250	No
Pb	0.000	25	No
NH3	0.088	250	No

2028

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.675	250	No
NOx	10.992	250	No
CO	25.393	250	No
SOx	0.062	250	No
PM 10	32.368	250	No
PM 2.5	0.700	250	No
Pb	0.000	25	No
NH3	0.111	250	No

2029

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.978	250	No
NOx	12.837	250	No
CO	30.260	250	No
SOx	0.075	250	No
PM 10	32.507	250	No
PM 2.5	0.838	250	No
Pb	0.000	25	No
NH3	0.135	250	No

2030

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	6.282	250	No
NOx	14.716	250	No
CO	35.138	250	No
SOx	0.088	250	No
PM 10	32.648	250	No
PM 2.5	0.979	250	No
Pb	0.000	25	No
NH3	0.159	250	No

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

2031

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	6.587	250	No
NOx	16.590	250	No
CO	40.005	250	No
SOx	0.101	250	No
PM 10	32.790	250	No
PM 2.5	1.120	250	No
Pb	0.000	25	No
NH3	0.183	250	No

2032

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	6.890	250	No
NOx	18.460	250	No
CO	44.847	250	No
SOx	0.114	250	No
PM 10	32.929	250	No
PM 2.5	1.259	250	No
Pb	0.000	25	No
NH3	0.206	250	No

2033

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	7.196	250	No
NOx	20.349	250	No
CO	49.704	250	No
SOx	0.127	250	No
PM 10	33.069	250	No
PM 2.5	1.398	250	No
Pb	0.000	25	No
NH3	0.230	250	No

2034 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.179	250	No
NOx	19.577	250	No
CO	49.912	250	No
SOx	0.130	250	No
PM 10	1.447	250	No
PM 2.5	1.439	250	No
Pb	0.000	25	No
NH3	0.240	250	No

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

None of the estimated annual net emissions associated with this action are above the insignificance indicators; therefore, the action will not cause or contribute to an exceedance of one or more NAAQSs and will have an insignificant impact on air quality. No further air assessment is needed.

Ryan Sauter, Senior Scientist	Nov 29 2023
Name, Title	**Date**

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to estimate GHG emissions and assess the theoretical Social Cost of Greenhouse Gases (SC GHG) associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide. This report provides a summary of GHG emissions and SC GHG analysis.

a. Action Location:

Base: GRAND FORKS AFB
State: North Dakota
County(s): Grand Forks
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: Enhanced Use Lease Development at GrandSKY Business Park, Grand Forks Air Force Base, North Dakota

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2024

e. Action Description:

The Proposed Action would develop approximately 8,600,000 ft2 of impervious surfaces across eight functional land use categories within the GrandSKY Business Park.

f. Point of Contact:

Name: Ryan Sauter
Title: Senior Scientist
Organization: EAS
Email: ryan.sauter@easbio.com
Phone Number: 651.341.9955

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action start through the expected life cycle of the action. The life cycle for Air Force actions with "steady state" emissions (SS, net gain/loss in emission stabilized and the action is fully implemented) is assumed to be 10 years beyond the SS emissions year or 20 years beyond SS emissions year for aircraft operations related actions.

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (NO2). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected life cycle of the action.

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2024	1,443	0.04411068	0.01867903	1,446	68,039	No
2025	3,718	0.09961545	0.060493	3,726	68,039	No
2026	5,987	0.15390188	0.10208105	5,998	68,039	No
2027	8,250	0.20695348	0.1435102	8,265	68,039	No
2028	10,513	0.25951417	0.18485854	10,532	68,039	No
2029	12,776	0.31207143	0.22620594	12,798	68,039	No
2030	15,040	0.36463323	0.26755452	15,065	68,039	No
2031	17,303	0.41719503	0.3089031	17,332	68,039	No
2032	19,566	0.46975683	0.35025168	19,599	68,039	No
2033	21,830	0.52231863	0.39160026	21,866	68,039	No
2034 [SS Year]	22,669	0.53229891	0.41450052	22,706	68,039	No
2035	22,669	0.53229891	0.41450052	22,706	68,039	No
2036	22,669	0.53229891	0.41450052	22,706	68,039	No
2037	22,669	0.53229891	0.41450052	22,706	68,039	No
2038	22,669	0.53229891	0.41450052	22,706	68,039	No
2039	22,669	0.53229891	0.41450052	22,706	68,039	No
2040	22,669	0.53229891	0.41450052	22,706	68,039	No
2041	22,669	0.53229891	0.41450052	22,706	68,039	No
2042	22,669	0.53229891	0.41450052	22,706	68,039	No
2043	22,669	0.53229891	0.41450052	22,706	68,039	No
2044	22,669	0.53229891	0.41450052	22,706	68,039	No

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2024	65,566,755	277,200	45,032	65,888,988
2025	65,566,755	277,200	45,032	65,888,988
2026	65,566,755	277,200	45,032	65,888,988
2027	65,566,755	277,200	45,032	65,888,988
2028	65,566,755	277,200	45,032	65,888,988
2029	65,566,755	277,200	45,032	65,888,988
2030	65,566,755	277,200	45,032	65,888,988
2031	65,566,755	277,200	45,032	65,888,988
2032	65,566,755	277,200	45,032	65,888,988
2033	65,566,755	277,200	45,032	65,888,988

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2034 [SS Year]	65,566,755	277,200	45,032	65,888,988
2035	65,566,755	277,200	45,032	65,888,988
2036	65,566,755	277,200	45,032	65,888,988
2037	65,566,755	277,200	45,032	65,888,988
2038	65,566,755	277,200	45,032	65,888,988
2039	65,566,755	277,200	45,032	65,888,988
2040	65,566,755	277,200	45,032	65,888,988
2041	65,566,755	277,200	45,032	65,888,988
2042	65,566,755	277,200	45,032	65,888,988
2043	65,566,755	277,200	45,032	65,888,988
2044	65,566,755	277,200	45,032	65,888,988

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2024	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2025	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2026	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2027	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2028	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2029	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2030	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2031	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2032	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2033	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2034 [SS Year]	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2035	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2036	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2037	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2038	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2039	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2040	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2041	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2042	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2043	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2044	5,136,454,179	25,626,912	1,500,708	5,163,581,798

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	CH4	N2O	CO2e
2024-2044	State Total	1,376,901,860	5,821,205	945,676	1,383,668,742
2024-2044	U.S. Total	107,865,537,759	538,165,145	31,514,860	108,435,217,765
2024-2044	Action	365,783	8.705359	6.613643	366,395
Percent of State Totals		0.02656565%	0.00014955%	0.00069936%	0.02647994%
Percent of U.S. Totals		0.00033911%	0.00000162%	0.00002099%	0.00033789%

Climate Change Assessment (as SC GHG):

On a global scale, the potential climate change effects of an action are indirectly addressed and put into context through providing the theoretical SC GHG associated with an action. The SC GHG is an administrative and theoretical tool intended to provide additional context to a GHG's potential impacts through approximating the long-term monetary damage that may result from GHG emissions affect on climate change. It is important to note that the SC GHG is a monetary quantification, in 2020 U.S. dollars, of the theoretical economic damages that could result from emitting GHGs into the atmosphere.

The SC GHG estimates are derived using the methodology and discount factors in the "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990," released by the Interagency Working Group on Social Cost of Greenhouse Gases (IWG SC GHGs) in February 2021.

The speciated IWG Annual SC GHG Emission associated with an action (or alternative) are first estimated as annual unit cost (cost per metric ton, $/mton). Results of the annual IWG Annual SC GHG Emission Assessments are tabulated in the IWG Annual SC GHG Cost per Metric Ton Table below:

IWG SC GHG Discount Factor: 2.5%

IWG Annual SC GHG Cost per Metric Ton ($/mton [In 2020 $])			
YEAR	CO2	CH4	N2O
2024	$82.00	$2,200.00	$29,000.00
2025	$83.00	$2,200.00	$30,000.00
2026	$84.00	$2,300.00	$30,000.00
2027	$86.00	$2,300.00	$31,000.00
2028	$87.00	$2,400.00	$32,000.00
2029	$88.00	$2,500.00	$32,000.00
2030	$89.00	$2,500.00	$33,000.00
2031	$91.00	$2,600.00	$33,000.00
2032	$92.00	$2,600.00	$34,000.00
2033	$94.00	$2,700.00	$35,000.00

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

IWG Annual SC GHG Cost per Metric Ton ($/mton [In 2020 $])			
YEAR	**CO2**	**CH4**	**N2O**
2034 [SS Year]	$95.00	$2,800.00	$35,000.00
2035	$96.00	$2,800.00	$36,000.00
2036	$98.00	$2,900.00	$36,000.00
2037	$99.00	$3,000.00	$37,000.00
2038	$100.00	$3,000.00	$38,000.00
2039	$102.00	$3,100.00	$38,000.00
2040	$103.00	$3,100.00	$39,000.00
2041	$104.00	$3,200.00	$39,000.00
2042	$106.00	$3,300.00	$40,000.00
2043	$107.00	$3,300.00	$41,000.00
2044	$108.00	$3,400.00	$41,000.00

Action-related SC GHG were estimated by calendar-year for the projected action's lifecycle. Annual estimates were found by multiplying the annual emission for a given year by the corresponding IWG Annual SC GHG Emission value (see table above).

Action-Related Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2024	$118.33	$0.10	$0.54	$118.97
2025	$308.62	$0.22	$1.81	$310.65
2026	$502.93	$0.35	$3.06	$506.35
2027	$709.49	$0.48	$4.45	$714.42
2028	$914.65	$0.62	$5.92	$921.19
2029	$1,124.32	$0.78	$7.24	$1,132.34
2030	$1,338.53	$0.91	$8.83	$1,348.27
2031	$1,574.57	$1.08	$10.19	$1,585.85
2032	$1,800.09	$1.22	$11.91	$1,813.22
2033	$2,051.97	$1.41	$13.71	$2,067.09
2034 [SS Year]	$2,153.53	$1.49	$14.51	$2,169.53
2035	$2,176.20	$1.49	$14.92	$2,192.61
2036	$2,221.54	$1.54	$14.92	$2,238.00
2037	$2,244.21	$1.60	$15.34	$2,261.14
2038	$2,266.88	$1.60	$15.75	$2,284.22
2039	$2,312.21	$1.65	$15.75	$2,329.61
2040	$2,334.88	$1.65	$16.17	$2,352.70
2041	$2,357.55	$1.70	$16.17	$2,375.42
2042	$2,402.89	$1.76	$16.58	$2,421.22
2043	$2,425.56	$1.76	$16.99	$2,444.31
2044	$2,448.23	$1.81	$16.99	$2,467.03

The following two tables summarize the U.S. and State's Annual SC GHG by calendar-year. The U.S. and State's Annual SC GHG are in 2020 dollars and were estimated by each year for the projected action lifecycle. Annual SC GHG estimates were found by multiplying the U.S. and State's annual five-year average GHG emissions for a given year by the corresponding IWG Annual SC GHG Cost per Metric Ton value.

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

State's Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2024	$5,376,473.93	$609,840.49	$1,305,934.19	$7,292,248.61
2025	$5,442,040.69	$609,840.49	$1,350,966.40	$7,402,847.58
2026	$5,507,607.44	$637,560.52	$1,350,966.40	$7,496,134.36
2027	$5,638,740.95	$637,560.52	$1,395,998.61	$7,672,300.08
2028	$5,704,307.71	$665,280.54	$1,441,030.83	$7,810,619.07
2029	$5,769,874.46	$693,000.56	$1,441,030.83	$7,903,905.85
2030	$5,835,441.22	$693,000.56	$1,486,063.04	$8,014,504.82
2031	$5,966,574.73	$720,720.58	$1,486,063.04	$8,173,358.35
2032	$6,032,141.48	$720,720.58	$1,531,095.25	$8,283,957.32
2033	$6,163,274.99	$748,440.61	$1,576,127.47	$8,487,843.07
2034 [SS Year]	$6,228,841.75	$776,160.63	$1,576,127.47	$8,581,129.84
2035	$6,294,408.50	$776,160.63	$1,621,159.68	$8,691,728.81
2036	$6,425,542.02	$803,880.65	$1,621,159.68	$8,850,582.34
2037	$6,491,108.77	$831,600.67	$1,666,191.89	$8,988,901.34
2038	$6,556,675.53	$831,600.67	$1,711,224.11	$9,099,500.30
2039	$6,687,809.04	$859,320.70	$1,711,224.11	$9,258,353.84
2040	$6,753,375.79	$859,320.70	$1,756,256.32	$9,368,952.81
2041	$6,818,942.55	$887,040.72	$1,756,256.32	$9,462,239.58
2042	$6,950,076.06	$914,760.74	$1,801,288.53	$9,666,125.33
2043	$7,015,642.81	$914,760.74	$1,846,320.75	$9,776,724.30
2044	$7,081,209.57	$942,480.76	$1,846,320.75	$9,870,011.08

U.S. Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2024	$421,189,242.68	$56,379,205.70	$43,520,521.44	$521,088,969.82
2025	$426,325,696.86	$56,379,205.70	$45,021,229.08	$527,726,131.63
2026	$431,462,151.04	$58,941,896.86	$45,021,229.08	$535,425,276.98
2027	$441,735,059.39	$58,941,896.86	$46,521,936.72	$547,198,892.97
2028	$446,871,513.57	$61,504,588.03	$48,022,644.35	$556,398,745.96
2029	$452,007,967.75	$64,067,279.20	$48,022,644.35	$564,097,891.30
2030	$457,144,421.93	$64,067,279.20	$49,523,351.99	$570,735,053.12
2031	$467,417,330.29	$66,629,970.37	$49,523,351.99	$583,570,652.65
2032	$472,553,784.47	$66,629,970.37	$51,024,059.62	$590,207,814.46
2033	$482,826,692.83	$69,192,661.54	$52,524,767.26	$604,544,121.62
2034 [SS Year]	$487,963,147.01	$71,755,352.70	$52,524,767.26	$612,243,266.97
2035	$493,099,601.18	$71,755,352.70	$54,025,474.90	$618,880,428.78
2036	$503,372,509.54	$74,318,043.87	$54,025,474.90	$631,716,028.31
2037	$508,508,963.72	$76,880,735.04	$55,526,182.53	$640,915,881.29
2038	$513,645,417.90	$76,880,735.04	$57,026,890.17	$647,553,043.11
2039	$523,918,326.26	$79,443,426.21	$57,026,890.17	$660,388,642.63
2040	$529,054,780.44	$79,443,426.21	$58,527,597.80	$667,025,804.45
2041	$534,191,234.62	$82,006,117.38	$58,527,597.80	$674,724,949.80
2042	$544,464,142.97	$84,568,808.54	$60,028,305.44	$689,061,256.96
2043	$549,600,597.15	$84,568,808.54	$61,529,013.08	$695,698,418.77
2044	$554,737,051.33	$87,131,499.71	$61,529,013.08	$703,397,564.12

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

Relative Comparison of SC GHG:

To provide additional real-world context to the potential climate change impact associate with an action, a Relative Comparison of SC GHG Assessment is also performed. While the SC GHG estimates capture an indirect approximation of global climate damages, the Relative Comparison of SC GHG Assessment provides a better perspective from a regional and global scale.

The Relative Comparison of SC GHG Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the SC GHG as the degree (intensity) of the proposed action's effects. The Relative Comparison Assessment provides real-world context and allows for a reasoned choice among alternatives through a relative contrast analysis which weighs each alternative's SC GHG proportionally against (or relative to) existing global, national, and regional SC GHG. The below table provides a relative comparison between an action's SC GHG vs. state and U.S. projected SC GHG for the same time period:

Total SC-GHG ($K [In 2020 $])					
		CO2	**CH4**	**N2O**	**GHG**
2024-2044	State Total	$130,740,109.98	$16,133,053.05	$33,278,805.63	$180,151,968.66
2024-2044	U.S. Total	$10,242,089,632.93	$1,491,486,259.78	$1,109,022,943.00	$12,842,598,835.71
2024-2044	Action	$35,787.19	$25.22	$241.75	$36,054.16
Percent of State Totals		0.02737277%	0.00015634%	0.00072644%	0.02001319%
Percent of U.S. Totals		0.00034941%	0.00000169%	0.00002180%	0.00028074%

From a global context, the action alternative's total SC GHG percentage of total global SC GHG for the same time period is: 0.00003762%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

Ryan Sauter, Senior Scientist — Nov 29 2023

Name, Title — **Date**

APPENDIX E. WETLANDS MITIGATION PLAN

FINAL MITIGATION PLAN

1 INTRODUCTION

This mitigation plan was prepared to support the Environmental Assessment for Development of an Enhanced Use Lease (EUL) at the Grand Sky Business Park on Grand Forks Air Force Base (GFAFB) and proposed Finding of No Significant Impact (FONSI), and proposed Finding of No Practicable Alternative (FONPA) for the Proposed Action. The development plans used to assess the potential impacts of the Proposed Action are preliminary and may be modified. Before any changes can be made to the requirements in this Mitigation Plan, Grand Forks County will present the plans to the base Civil Engineer for review. For unavoidable impacts on jurisdictional wetlands, the County will apply for a Clean Water Act (CWA) Section 404 permit from the United States Army Corps of Engineers (USACE). Unavoidable impacts on non-jurisdictional wetlands will be mitigated in coordination with the Air Force.

1.1 Wetlands in the Project Area

Wetlands on GFAFB occur frequently in drainage ways, low-lying depressions, and potholes. Previous wetland assessments conducted at GFAFB include the following:

- 1999 - Wetland identification and delineation
- 2004 - Site-wide wetland assessment and summary
- 2005 - Site-specific wetland delineation of the new proposed fire station area
- 2006 - Select wetland delineation
- 2007 - Wetlands characterization project
- 2011 - Wetland inventory and assessment
- 2012 - Two project/site-specific wetland delineations conducted
- 2021 - Project-specific wetland delineation

Due to the presence of potential wetland features, a wetland delineation was conducted for the entire project area, consisting of the entire EUL area. The Wetland Delineation Report was submitted to USACE with a request to verify results and determine whether the features identified in the report as wetlands or other waters of the United States would fall under USACE jurisdiction and be subject to a CWA 404 permit for any the discharge of dredged or fill material into waters of the United States.

Wetland delineation field surveys were conducted on the 217-acre project area in September 2023. The 2023 wetland delineation survey used updated geographic information system software, aerial imagery, and fieldwork across the 217-acre parcel and identified 38 wetlands totaling approximately 25 acres, to be confirmed by a final USACE jurisdictional determination. However, exact estimates are not known at this time. Based on the functional land use approach of this project, and pending USACE's final jurisdictional wetland determination, it would be anticipated that up to 25 acres of jurisdictional wetlands would be filled under the Proposed Action.

1.2 Regulatory Requirement

Executive Order (EO) 11990, *Protection of Wetlands*, (May 24, 1977) directs agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands. In accordance with Air Force Manual (AFMAN) 32-7003, a FONPA must be included within the FONSI stating why there are no practicable alternatives to development within or affecting wetland areas. It is Department of Air Force (DAF) policy to avoid constructing new facilities within areas containing wetlands, where practicable (AFMAN 32-7003, Section 3.17). Proposed actions that could impact wetlands, even if the affected area is not within a jurisdictional wetland boundary, require an environmental impact analysis in accordance with the National Environmental Policy Act (NEPA) and the DAF Environmental Impact Analysis Process (32 Code of Federal Regulations [CFR] Part 989). The Proposed Action must include all practicable measures to minimize harm to wetlands.

Mitigation is required for potential project impacts on wetlands because there is no practicable alternative for the proposed EUL development project. Due to the location of several project components within existing wetland boundaries, the project cannot avoid directly impacting wetlands. As part of the USACE permitting process, compensatory mitigation would be provided for the unavoidable loss of jurisdictional wetlands to ensure the project would not result in a net loss of wetlands.

Design documents showing the extent of impacts to wetlands are not complete, therefore, the acreage of wetlands that would be potentially affected has not been determined, but would not exceed the 25 acres delineated in the project area. Based upon the expected impacts to wetlands, it is expected that a Section 404 CWA permit would be required prior to ground-disturbing activities. The acquisition of the Section 404 permit would be part of the design and construction process. Mitigation for wetlands impacts would be required.

This Mitigation Plan has been completed in accordance with USACE and Environmental Protection Agency's (EPA) Compensatory Mitigation Final Rule, 73 FR 19594, entitled *Compensatory Mitigation for Losses of Aquatic Resources* (USACE and EPA, 2008), which established a preference hierarchy for compensatory mitigation options.

1.3 Environmental Protection Measures for Wetlands or Other Waters of the United States

Because the project would potentially affect wetlands or other waters of the United States, a sequence of actions has been followed to offset effects, known as the mitigation sequence, to guide mitigation decisions and determine the type and level of mitigation required under the CWA Section 404. The sequence of steps is to avoid, minimize, and compensate, as appropriate. Because effects on wetlands cannot be avoided, they will be minimized. Following minimization, the remaining unavoidable impacts will be compensated. Compensation can include wetland restoration, creation, enhancement, or preservation.

2 MITIGATION

Mitigation consists of three factors: avoidance, minimization, and compensation. The purpose of compensatory mitigation is to offset unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

2.1 Avoidance

The proposed project includes additional development within the EUL area at GFAFB where wetlands are known to exist, therefore, complete avoidance of wetlands is not possible. Wetlands will be avoided as feasible during project design. Complete avoidance is not desirable, as the base is currently not in compliance with Air Force Instruction (AFI) 91-202, *The US Air Force Mishap Prevention Program*, and AFI 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Program*. The base has identified a need to reduce hazards associated with wetlands, which attract birds and other wildlife, in the vicinity of the airfield to establish a safer BASH environment. The filling of wetlands within the EUL would meet this need by reducing the amount of habitat for wildlife in the vicinity of the airfield and supporting compliance with the associated AFIs.

2.2 Minimization

Because impacts cannot be completely avoided, reduction of effects is evaluated based on the type and extent of the impact on wetlands or waters of the United States. Indirect effects could occur on wetlands or other waters of the United States that are in proximity to proposed project activities. Implementing the following construction and natural resources controls, where appropriate, would minimize potential indirect effects on wetlands or other waters of the United States that are adjacent to proposed activities.

2.2.1 Construction Controls

- Wetlands or other waters of the United States would be clearly flagged prior to the commencement of construction activities. This would prevent construction workers from entering these wetlands and potentially placing fill material within the wetlands or trampling wetland vegetation.
- Construction activities would be phased, if logically possible, so that smaller areas of land are disturbed at one period of time. This would result in less soil being exposed at one time and would reduce the potential for erosion and deposition of sediment into wetlands or other waters of the United States.
- Water quality-control features such as sedimentation basins and detention or retention ponds, if part of the design, would be installed as applicable prior to initiation of construction activities. Temporary basins and silt traps would be constructed as necessary to contain sediment and runoff on the construction area. Hay bales and silt fences would be used to minimize transport of sediments from the project area.
- All fuels and other potentially hazardous materials would be contained and stored appropriately. In the event of a spill, procedures outlined in the installation's Spill Prevention, Control, and Countermeasure Plan would be followed to quickly contain and clean up a spill.

- An erosion and sediment control plan, typically part of the Stormwater Pollution Prevention Plan (SWPPP), would be developed prior to initiation of construction activities, as required under the National Pollution Discharge Elimination System requirements, and adhered to during development.
- Erosion-control structures, if required in the SWPPP, would be installed downgradient of the construction site in sloped areas adjacent to wetlands and other water bodies. The structures would be regularly maintained and removed once vegetation has been reestablished. All stormwater controls will be approved through the installation Stormwater Program Manager.
- Site grading would be conducted in a manner that would direct stormwater runoff generated from construction activities away from nearby wetlands or other waters of the United States. Best management practices such as installation of silt fencing along wetland buffers would aid in prevention of siltation if natural site hydrology directs stormwater runoff to the wetlands.
- Crossing wetlands would be avoided to the extent possible. When crossing wetlands is unavoidable, access paths would be placed along high ground with appropriate mats, docks, or boardwalks as applicable, rather than filling a wetland to simply cover it. Stormwater runoff originating from the construction site should be diverted and sedimentation controls implemented to avoid discharging into the wetland.
- When wetland crossings cannot be avoided, the use of heavy machinery in wetlands would be minimized by installing construction barriers at the edge of the proposed disturbance area.
- Construction activities would be restricted to drier periods during the year, if possible. Minimum flows for the Turtle River occur in January and February.
- Construction debris would not be disposed of in wetlands. Debris and waste would be disposed of in accordance with all local, state, and federal laws.

2.2.2 Natural Resources Controls

A SWPPP would be developed and implemented to prevent surface water degradation of wetlands within close proximity of project sites. The following measures are expected to be part of the plan.

- Prevent erosion of exposed soil surfaces and trapping sediments being transported.
- Control stream bank and stream bed disturbances to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. Coordinate use of pesticides or herbicides with those accepted for use by GFAFB on the installation.
- Fill placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds. Debris and solid waste will be properly removed and impacted areas restored as nearly as possible to the original condition.
- Removal of vegetation would be minimized. In areas where excavation is not proposed but vegetation removal is necessary, vegetation would be cut at ground level, leaving roots

intact. Disturbed areas would be seeded, sodded, or planted with indigenous material as soon as possible after construction activities are completed, as appropriate.

- The spread of noxious weeds would be controlled by avoiding activities in or adjacent to heavily infested areas, removing seed sources and propagules from the site prior to conducting activities or limiting operations to non-seed producing seasons. Following activities that expose the soil, mitigation can be achieved by covering the area with weed-seed-free mulch or by seeding the area with native species. Soil would be covered to reduce the germination of weed seeds, maintain soil moisture, and minimize erosion.

2.3 Compensatory Mitigation

Following avoidance and minimization, the remaining unavoidable impacts would be compensated. Compensation can include wetland restoration, creation, enhancement, or preservation, and is expected to be provided at a ratio of 1:1. Compensation can be provided via any of the following options:

- Permittee-responsible Mitigation.
- Mitigation Bank credits, which are typically completed in advance of permitted impacts.
- In-lieu Fee Program credits (often involving large, more ecologically valuable compensatory mitigation projects as compared to permittee-responsible mitigation).

Compensatory mitigation would be accomplished mainly off base because wetland creation, restoration, or preservation would conflict with GFAFB's desire to reduce the BASH risk. USACE maintains a Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) website that tracks available in-lieu fee programs by state (USACE, 2023). As of the date of this report, several of these programs have credits available. The compensatory mitigation will be coordinated with and approved by the USACE.

3 DESIGN AND PERMITTING PHASE

Design documents will avoid wetlands if possible. When direct wetland effects cannot be avoided, correspondence with regulatory and resource agencies regarding mitigation will commence, and a permit application will be submitted. Additional specifications would be developed as appropriate. The final specifications could include specific minimization techniques and the development of management plans for stormwater runoff, vegetation, and grading.

References

U.S. Army Corps of Engineers (USACE) and Environmental Protection Agency (EPA). 2008. *Compensatory Mitigation for Losses of Aquatic Resources*. USACE 33 CFR Parts 325 and 332 and EPA 40 CFR Part 230. 10 April 2008.

USACE. 2023. Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) – search results for Grand Forks County, North Dakota. Accessed on 17 October 2023 at <https://ribits.ops.usace.army.mil/ords/f?p=107:2:667292370864::NO>.

Final

Grand Sky Business Park Wetland Delineation Report

Grand Forks Air Force Base, North Dakota

January 2024

Prepared for:
319th Reconnaissance Wing
Grand Forks Air Force Base, North Dakota

Prepared by:
Versar, Inc.
1025 Vermont Ave.
NW Suite 500
Washington, DC 20005

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Final

GRAND SKY BUSINESS PARK WETLAND DELINEATION REPORT

Grand Forks Air Force Base, North Dakota

January 2024

Prepared for:
319th Reconnaissance Wing
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EXECUTIVE SUMMARY

SR CAMPUS, LLC contracted Versar, Inc. (Versar) to conduct a wetland delineation for a 217-acre project area (Wetland Delineation Project Area; [Project Area]) consisting of land located within the Grand Sky Business Park on Grand Forks Air Force Base (GFAFB), located 14 miles west of Grand Forks, North Dakota. This delineation report is an integral part of an Environmental Assessment analyzing an Enhanced Use Lease at GFAFB. The proposed area of development will be used to support aerial systems and/or remotely piloted aircraft related to intelligence, surveillance, and reconnaissance activities, consisting of mixed-use facilities such as aviation-related light-industrial uses, hangars, classroom and training facilities, administrative offices, and data centers.

Versar conducted an offsite assessment and onsite field assessment to delineate wetlands The offsite assessment included gathering, organizing, and reviewing all relevant existing data including geographic information system (GIS) data, available reports, and trustworthy web resources. It also included time series analysis using the Antecedent Precipitation Tool and corresponding aerial photography to inform the field investigation.

Versar conducted field investigations between September 23 and 28, 2023, to delineate wetlands following the methods outlined in the 1987 U.S. Army Corps of Engineers *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region Version 2.0*. Two field teams, each composed of a wetland scientist and a field technician, completed the investigation over 6 consecutive days. The survey teams evaluated wetlands, documented conditions and wetland indicators, and recorded boundaries using the geographic positioning system (GPS). Versar completed data forms and took site photographs to document site conditions at representative wetland and non-wetland boundary locations. The GPS-collected data and field observations were used to determine wetland location and area and develop maps in the GIS.

This wetland investigation identified the extent of 38 separate wetland polygons comprising 24.57 acres of wetlands. Palustrine emergent wetlands accounted for 100 percent of the delineated wetlands. This report provides the documentation to inform an Environmental Assessment and support necessary regulator coordination for the EUL at GFAFB.

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LIST OF ACRONYMS AND ABBREVIATIONS

°F	degree(s) Fahrenheit
APT	Antecedent Precipitation Tool
CWA	Clean Water Act
DAF	Department of the Air Force
DoD	Department of Defense
DoDI	Department of Defense Instruction
EO	Executive Order
EUL	Enhanced Use Lease
FEMA	Federal Emergency Management Agency
GFAFB	Grand Forks Air Force Base
GIS	geographic information system
GPS	global positioning system
LiDAR	light detection and ranging
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
PDSI	Palmer Drought Severity Index
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
WOTUS	Waters of the United States

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1.0 INTRODUCTION

1.1 BACKGROUND

Versar, Inc. (Versar) was contracted by SR CAMPUS, LLC to conduct a wetland delineation for a 217-acre project area (Wetland Delineation Project Area; [Project Area]) consisting of land located within the Grand Sky Business Park on Grand Forks Air Force Base (GFAFB), located 14 miles west of Grand Forks, North Dakota. The Grand Sky Business Park is in the southwestern portion of GFAFB. The Project Area is designated as the Grand Sky Business Park Enhanced Use Lease (EUL) (**Figure 1-1**).

This delineation report is part of an Environmental Assessment analyzing an EUL at GFAFB. The proposed area of development will be used to support aerial systems and/or remotely piloted aircraft related to intelligence, surveillance, and reconnaissance activities, consisting of mixed-use facilities such as aviation-related light-industrial uses, hangars, classroom and training facilities, administrative offices, and data centers.

This report describes the methods and results of investigations conducted for this project and includes all documentation necessary to support a request for a preliminary jurisdictional determination from U.S. Army Corps of Engineers (USACE) by the Department of the Air Force (DAF).

1.2 WETLAND POLICY

1.2.1 The Clean Water Act

The Federal Water Pollution Control Act (33 United States Code § 1251 et seq.), commonly known as the Clean Water Act (CWA), is the primary federal authority regulating activities that impact waters of the United States (WOTUS), including wetlands. Section 404 of the CWA authorizes USACE to issue permits for the discharge of dredged or fill material into WOTUS, including wetlands. The selection and use of disposal sites must be conducted in accordance with Section 404(b)(1), *Guidelines for Specification of Disposal Sites for Dredged or Fill Material*. The USACE Wetland Delineation Manual describes wetlands as areas that have positive indicators for hydrophytic vegetation, wetland hydrology, and hydric soils, as well as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (USACE 1987).

WOTUS is not defined in the CWA. Since the 1970s, the U.S. Environmental Protection Agency (USEPA) and USACE have defined WOTUS by regulations. Three Supreme Court cases (1985, 2001 and 2006) have addressed the definition of WOTUS, particularly regarding the extent of jurisdiction. After the Rapanos v. United States case in 2006, the agencies developed a set of guidance to implement WOTUS as defined in the four-Justice plurality opinion or that met the significant nexus conditions included in Justice Kennedy's concurring opinion.

During the Obama administration, USEPA and USACE published a joint rule to refine the definition of WOTUS, known as the 2015 Clean Water Rule. Subsequently, the Trump administration repealed and replaced it with the Navigable Waters Protection Rule. In early 2020 during the Biden administration, the agencies halted implementation of the Navigable Waters Protection Rule and interpreted WOTUS consistent with the pre-2015 regulatory regime. In December 2022, USEPA finalized a new regulatory definition, updating protections of the pre-2015 rule. In February of 2023, 24 states sued USEPA and USACE, arguing the 'final rule' was unlawful. In April 2023, three more states joined to block the final WOTUS rule, including North Dakota, bringing the total states to 27. The District of North Dakota ruled in favor of the states, ultimately blocking the USEPA from enforcing the final WOTUS rule. In August 2023, USEPA and USACE issued final conforming rule amendments to the "Revised Definition of 'WOTUS'", conforming to *Sackett v. EPA, No. 21-454*. In North Dakota, USACE and USEPA are interpreting WOTUS consistent with the pre-2015 regulatory regime consistent with the *Sackett* decision until further notice (USEPA 2023).

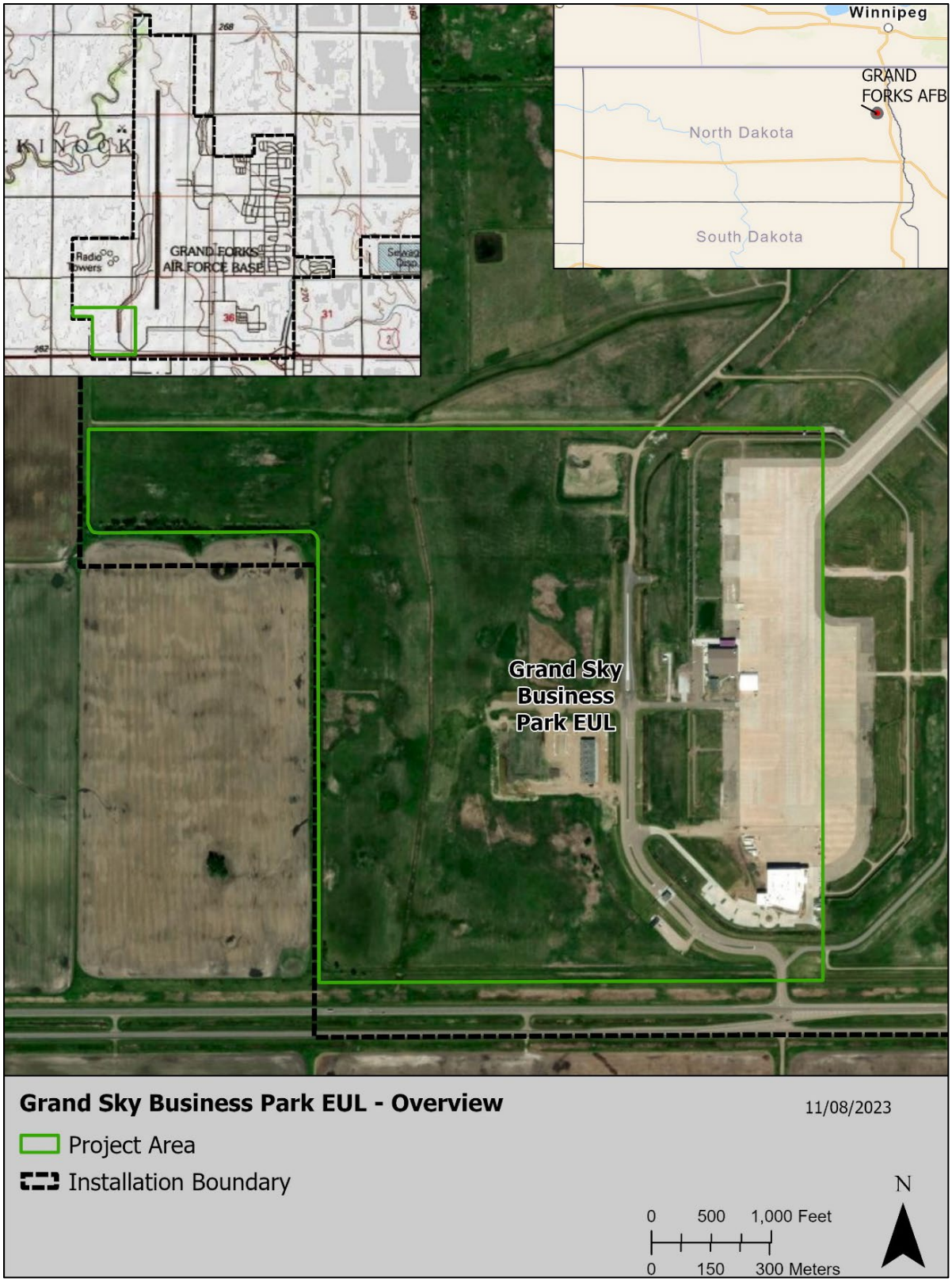

Figure 1-1 Grand Sky Business Park Wetland Delineation Project Area

Based on implementing guidance during the pre-2015 regulatory regime, the following waters are protected by the CWA:

- Traditional navigable waters.
- Interstate waters.
- Wetlands adjacent to either traditional navigable waters or interstate waters.
- Non-navigable tributaries to traditional navigable waters that are relatively permanent, meaning they contain water at least seasonally.
- Wetlands that directly abut relatively permanent waters.

In addition, the following waters are protected by the CWA if a fact-specific analysis determines they have a "significant nexus" to a traditional navigable water or interstate water:

- Tributaries to traditional navigable waters or interstate waters.
- Wetlands adjacent to jurisdictional tributaries to traditional navigable waters or interstate waters.
- Waters that fall under the "other waters" category of the regulations. The guidance divides these waters into two categories, those that are physically proximate to other jurisdictional waters and those that are not, and discusses how each category should be evaluated.

The following aquatic areas are generally not protected by the CWA:

- Wet areas that are not tributaries or open waters and do not meet the agencies' regulatory definition of "wetlands."
- Waters excluded from coverage under the CWA by existing regulations.

1.3 OTHER POLICY AND GUIDANCE

1.3.1 Executive Order 11990

In accordance with Executive Order (EO) 11990 (Protection of Wetlands, 24 May 1977), federal agencies performing activities located in or affecting wetlands, and or "providing federally undertaken, financed, or assisted construction", must ensure that their activities do not result in a net loss of wetlands. Compliance with EO 11990 necessitates knowledge of the types and locations of wetlands. This wetland delineation was performed to help GFAFB comply with EO 11990 by providing a current inventory of wetland resources in the Project Area. Under the definition provided in the EO, wetland areas should be protected if the wetland supports a prevalence of vegetative life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Even when wetlands are not determined as "jurisdictional" under USACE's regulation definition, these non-jurisdictional wetlands are still protected under EO 11990. The purpose of EO 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands." To meet these objectives, the EO requires federal agencies, in planning their actions to consider alternatives to federal actions impacting wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided.

1.3.2 Department of Defense Instruction 4715.03 Natural Resources Conservation Program

Department of Defense Instruction (DoDI) 4715.03 establishes policy for compliance with applicable federal, state, and local statutory and regulatory requirements, EOs, Presidential memorandums, and other DoD policies for the integrated management of natural resources including lands, air, waters, coastal, and nearshore areas managed or controlled by DoD.

According to the Instruction, the principal purpose of DoD lands, waters, airspace, and coastal resources is to support mission-related activities. Natural resources conservation programs must guarantee DoD continued access to its land, air, and water resources for realistic military training and testing. DoD installations must also demonstrate stewardship of natural resources in their trust by protecting and

enhancing those resources for mission support, biodiversity conservation, and maintenance of ecosystem services. The lands, waters, airspace, and coastal resources must be managed for multiple uses when appropriate, including sustainable yield of all renewable resources, scientific research, education, and recreation.

DoD installations, such as GFAFB, are directed to use a watershed-based approach to manage operations, activities, and lands to avoid or minimize impacts to wetlands, groundwater, and surface waters on or adjacent to installations. With respect to wetlands, DoDI 4715.03 states the following:

- DoD installations shall ensure no net loss of size, function, and value of wetlands, and will preserve the natural and beneficial values of wetlands in carrying out activities in accordance with EO 11990 and the White House Office on Environmental Policy Protecting America's Wetlands: A Fair, Flexible, and Effective Approach, issued 24 August 1993.
- When avoidance of wetlands and other waters of the United States is not practicable, and impacts have been minimized, participation in an approved off-site mitigation bank or in-lieu fee instrument is encouraged as sound conservation planning. Off-site mitigation may provide a preferred alternative to meet watershed protection and ecosystem goals and meet future mission requirements. The enhancement, creation, or restoration of wetlands or streams on DoD property may also be an acceptable means for mitigating mission impacts on wetlands.
- In the event that discharges of pollutants into wetlands or other U.S. waters are necessary, DoD installations must obtain appropriate permits and complete mitigation.

2.0 WETLAND DELINEATION PROJECT AREA

2.1 SITE DESCRIPTION

GFAFB is in Grand Forks County, North Dakota (Latitude 47.959330, Longitude -97.398814) and appears on U.S. Geological Survey 7.5' Quadrangle Arvilla, ND 2020. Grand Forks County lies near the North Dakota-Minnesota state line at the junction of Red Lake River and the Red River of the North. The base is located 14 miles west of the city of Grand Forks and adjacent to the city of Emerado, an incorporated municipality in Grand Forks County. The primary highway access to the base consists of U.S. Highway 2, along the southern boundary of the base, and North Dakota County Road B-3, which borders the base on the east. U.S. Highway 2 can be used to directly access Grand Sky Boulevard and the controlled access gate to the Grand Sky Business Park without going through the GFAFB via the Main Gate.

The 217-acre Project Area is located in the southwestern portion of GFAFB within the Grand Sky Business Park EUL (**Figure 1-1).** The Grand Sky Business Park EUL is defined by the installation boundary fence line to the south, west, and north, and overlaps with the aircraft ramp and hangars to the east. Certain areas within the eastern half of the Grand Sky Business Park have been regraded in the initial phase of development to establish enhanced stormwater management around Grand Sky Boulevard, the gated entrance and one primary building, with the remaining lands to the north, west, and south primarily maintained as open space grasslands.

2.2 GENERAL PHYSIOGRAPHY AND TOPOGRAPHY

GFAFB is located within the Lake Agassiz Plain Level III Ecoregion (Omernik 1987). Glacial Lake Agassiz was the last in a sequence of proglacial lakes to fill the Red River Valley since the beginning of the Pleistocene. It is composed of thick lacustrine sediments underlain by glacial till left behind by glacial movement. The Lake Agassiz Plain is very flat and does not support as many lakes and pothole wetlands as neighboring ecoregions. The tallgrass prairie, which once thrived in this ecoregion, has been replaced by intensive agriculture.

The Project Area is generally level with elevations ranging from 900 to 920 feet above mean sea level (**Figure 2-1**). The Project Area drains from south to north toward the Turtle River. The Turtle River flows west to east-northeast into the Red River of the North, which eventually drains north to Canada.

2.3 WATERSHED AND FLOODPLAIN

GFAFB is in the headwaters of Turtle River watershed (Hydrologic Unit Code 09002030702), which is approximately 198 square miles in area. The Turtle River is 74.9 miles long and flows largely eastward in a highly meandering course through Turtle River State Park and past GFAFB, turns north, flows into the Red River of the North, which ultimately drains to Hudson Bay in Canada.

The Federal Emergency Management Agency (FEMA) defines the 100-year flood plain as an area within which there is a 1 percent chance of inundation by a flood event in a given year, or a flood event in the area once every 100 years. According to the FEMA Flood Insurance Rate Map Number 38035C0525E, Panel 525 (effective December 17, 2010), the Project Area is not within the 100-year flood plain (FEMA 2023). A copy of the Flood Insurance Rate Map is provided in **Attachment A**.

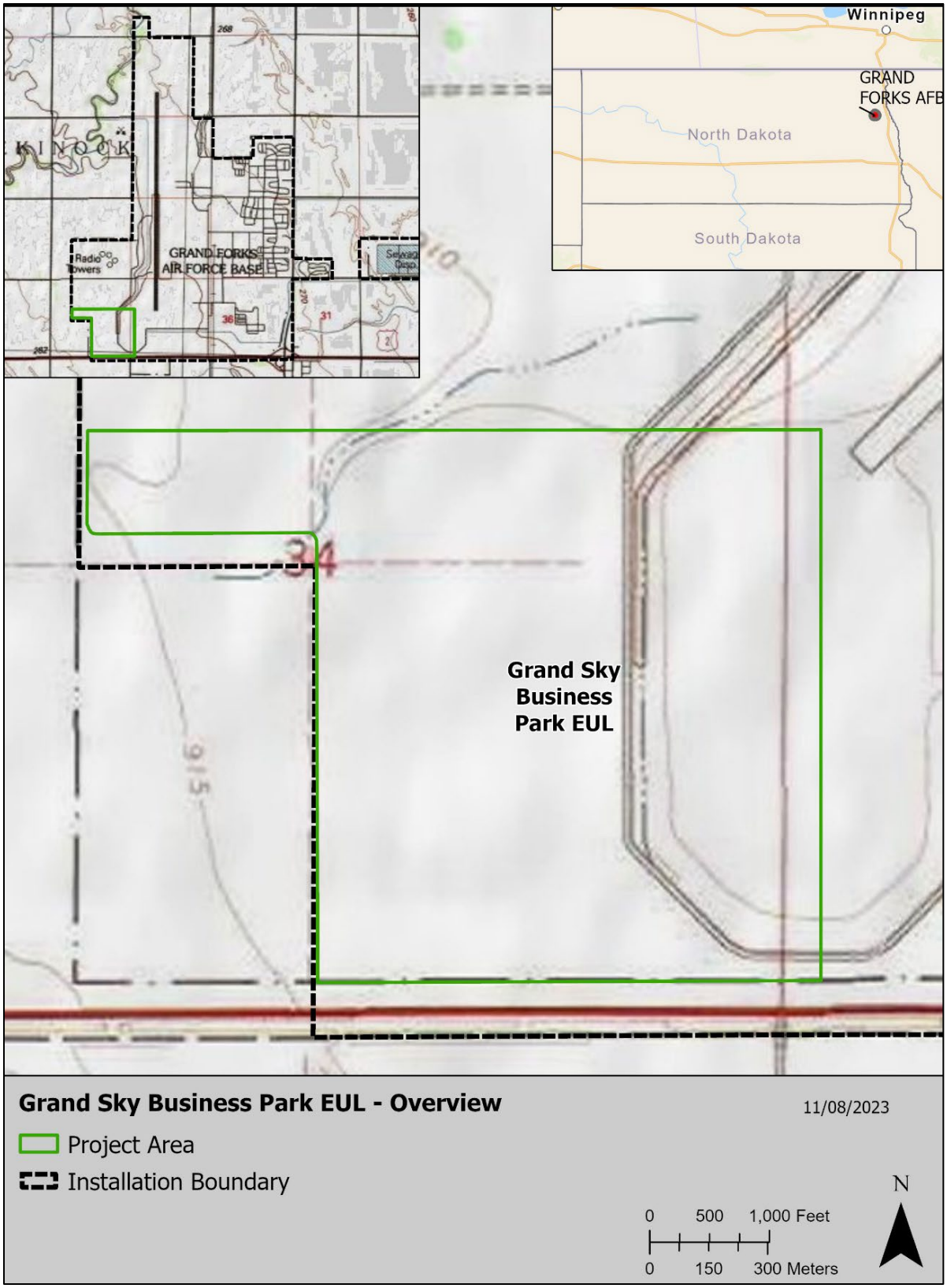

Figure 2-1 Project Area Topography

2.4 CLIMATE

The Northern Plains are characterized by a wide temperature range and frequent, extreme weather changes. The climate is typified by short, humid summers with frequent thunderstorms, and by long, severe winters associated with almost continuous snow cover and ice storms. The spring and fall seasons are generally short transition periods. According to the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), Climate Analysis for Wetlands for the Grand Forks International Airport, North Dakota, the average annual temperature for GFAFB is 41 degrees Fahrenheit (°F) and monthly average temperatures vary from 8° F in January to 70° F in July (USDA NRCS 2023a). The mean annual precipitation is 19.6 inches, much of which occurs in the summer months. The growing season encompasses 159 days and extends from April 29 to October 10. These dates correspond to a 50 percent probability that temperatures will not drop to 28°F or lower, which is generally used for regulatory purposes (USDA NRCS 2023a).

2.5 SOILS

Soils data and descriptions were obtained from the USDA NRCS Web Soil Survey (USDA NRCS 2023b, USDA NRCS 2023c) and from geographic information system (GIS) files provided by GFAFB (**Attachment B**). As indicated in **Table 2-1**, approximately 56 acres (26 percent) of the Project Area are underlain by soil units with hydric ratings of partially hydric. The remaining 161 acres (74 percent) have a hydric rating ranging between 10 percent and 15 percent qualifying as predominantly non-hydric (**Table 2-1**; **Figure 2-2**).

Table 2-1 Soil Series Mapping for Wetland Delineation Project Area

I155A	Grimstad fine sandy loam, 0 – 2% slopes	20	10
I157A	Antler, moderately saline-Mustinka silty clay loams, 0 – 2 % slopes	2	
I199A	Antler-Mustinka silt loams, 0 – 2% slopes	54	
I400A	Gilby loam, 0 – 2% slopes	141	15

Predominantly Non-Hydric (1 to 32%)

Source: USDA NRCS Web Soil Survey 2020

The USDA NRCS defines the hydric rating as the percentage of a map unit that meets the criteria for hydric soils. Map units are comprised of one or more map unit components or soil types, each of which is rated as hydric soil or nonhydric. Map units that are made up dominantly of hydric soils may have small areas of minor non-hydric components in the higher positions on the landform, and map units that are made up dominantly of non-hydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit. The map unit class ratings based on the hydric components present are: Hydric, Predominantly Hydric, Partially Hydric, Predominantly Nonhydric, and Nonhydric (USDA NRCS 2023b).

Figure 2-2 Map of the Soil Series Within the Project Area

Three mapped soil series account for 100 percent of the Project Area. The Official Soil Series Description is provided for each of the major soil series below (USDA NRCS 2023c).

- The Grimstad series consists of very deep, somewhat poorly drained soils that formed in a dominantly sandy mantle of glacial lacustrine or outwash sediments over loamy glacial till or silty glacial lacustrine sediments. These soils are on glacial lake plains and moraines. Permeability is moderate to rapid in the upper part and moderate in the lower part. Slopes range from 0 to 3 percent.
- The Antler series consists of very deep, somewhat poorly drained soils that formed in silty lacustrine sediments over loam or clay loam glacial till. Permeability is moderate or moderately slow in the upper lacustrine sediments and moderately slow or slow in the underlying till. The hydric soil rating is predominantly non-hydric.
- The Gilby series consists of very deep, somewhat poorly drained, moderately slowly permeable soils that formed in loamy lacustrine sediments 20 to 40 inches thick over glacial till. These soils are on lake plains and interbeach areas and have slopes of 0 to 3 percent. The hydric soil rating is predominantly non-hydric.

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3.0 WETLAND DELINEATION METHOD

3.1 PROJECT APPROACH

In preparation for field surveys, an offsite assessment was conducted to gather, organize, and review all relevant existing data. This included geospatial information, available reports, and trustworthy web resources. In addition to the typical mapping resources consulted for wetland delineations, an analysis was conducted using the Antecedent Precipitation Tool (APT) to determine antecedent climatic conditions both for the field investigation and for comparison with aerial photography.

In 2013, a wetland delineation was completed on this same 217-acre Project Area, to support establishment of the Grand Sky Business Park. These results are reflected in the Wetland_A GIS feature noted below. The resources and analyses of the desktop assessment were used to update the existing wetland GIS layer (Wetland_A) to reflect current field conditions as observed in a time series of aerial imagery. This updated GIS mapping layer was used to prioritize field effort in areas with the greatest potential for significant wetland occurrence. Methods and results for the desktop analysis and APT are presented in **Sections 3.2** through **3.4** of this report.

In the second phase, wetland scientists conducted field work at GFAFB following the methods outlined in the 1987 USACE *Wetland Delineation Manual* (USACE 1987); *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region Version 2.0* (USACE 2010) to delineate wetland areas in the field. Detailed methods and results are outlined in **Sections 3.3** and **3.4** of this report.

3.2 OFFSITE ASSESSMENT

Several planning-level and field investigation efforts have been completed at GFAFB spanning the last two decades to allow the base to manage wetland resources and to maintain compliance with applicable laws, regulations, and instructions (see **Section 1-2**). Prior to engaging in field surveys, a comprehensive review of existing data was conducted. Data provided by GFAFB and reviewed included:

- Previously completed wetland investigations including Wetland Inventory & Assessment at GFAFB (North Wind 2011) which incorporated information from wetland reports in 1999 and 2004, a site-specific wetland delineation of the new proposed fire station area in 2005, an updated selected wetland delineation in 2006, and a wetlands characterization project in 2007. In 2013, a wetland delineation was completed on a 217-acre area, which is now the Grand Sky Business Park. In 2021, a wetland delineation was completed for a 1,291-acre project area consisting of land surrounding the runway on GFAFB with minor overlap of the Grand Sky Business Park EUL area. These results are reflected in the Wetland_A GIS feature noted below.
- The most updated geodatabase feature classes provided by GFAFB in files Grand_forks_afb_23apr2020_cip311.gdb and GrandForksAFB_3_1_1.gdb. The pertinent feature classes are as follows:
- Wetland_A: This feature class contains all wetlands polygons for GFAFB and is referred to as the “existing wetland GIS layer” throughout this report. It includes data fields that can be used to differentiate past on-site investigations and assessments as well as off-site planning-level efforts;
- Installation_A: This feature class contains a polygon of the installation boundary;
- SoilSurveyArea_A: This feature class contains polygons of soils coverage across GFAFB (NRCS SSURGO 2015);
- PavementsBranch_A: This feature class contains the footprint (polygons) of impervious surfaces including roads, runways, taxiways, and other airfield surfaces; and
- Building_A: This feature class contains the footprint (polygons) of buildings.
- The following additional datasets were obtained from public sources and reviewed:

- North Dakota Historical Map and Aerial Photography Dissemination Service (URL: https://aerial.dwr.nd.gov/). Multiple years of available high-quality imagery (true color and CIR) were selected for review.
- North Dakota light detection and ranging (LiDAR) Dissemination MapService (URL: https://lidar.dwr.nd.gov/). LiDAR was acquired with 3.28 feet vertical resolution. The individual LiDAR tiles were merged and processed to create elevation contours at a 1-foot contour interval and a hillshade digital elevation model.
- U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) Wetlands Mapper (URL: https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/); NWI GIS
- FEMA National Flood Hazard Layer Viewer, Map Number 38035C0525, Panel 525 (effective December 17, 2010).
- Google Earth Pro time series of aerial photographs: September 2023; July 2020; September 2015; September 2012; October 2011; December 2010; May 2010; August 2009; April 2007; July 2005; and October 1997.
- Navigable and Non-navigable Waters of the State of North Dakota (2016)
- USACE 2020 National Wetland Plant List Version 3.5 (URL: https://cwbi-app.sec.usace.army.mil/nwpl_static/v34/home/home.html)

3.2.1 Antecedent Precipitation and Time Series Analysis of Aerial Imagery

The APT (Version 2.0) is a publicly available computer software tool developed by USACE to simplify the review of climate data, which supports decision-making related to wetland delineations. The APT software allows for quick comparison of previous (antecedent) or recent rainfall conditions for a given location to the range of normal rainfall conditions that occurred during the preceding 30 years. The APT provides a standardized methodology to evaluate normal precipitation conditions.

The APT can be used to determine if a site is experiencing a dry season, drought conditions, lower than normal antecedent precipitation, or greater than normal antecedent precipitation. Each of these conditions influence wetland delineation investigations. In addition to informing wetland delineations, the APT can also be used to assist in determining whether prior observations (e.g., aerial photography) were made under normal, wet, or dry climatic conditions. The APT also includes related climate data such as the Palmer Drought Severity Index (PDSI). According to the National Oceanic and Atmospheric Administration, PDSI measures the duration and intensity of the long-term drought-inducing circulation patterns. Because long-term drought is cumulative, the intensity of drought during the current month is dependent on the current weather patterns plus the cumulative patterns of previous months. Weather patterns can change quickly; therefore, the PDSI was designed to respond rapidly.

The APT was utilized to achieve two primary objectives: determine the antecedent conditions at GFAFB prior to the on-site wetland investigations and conduct a time series analysis comprised of 8 years of APT data with corresponding aerial photography (2005, 2009, 2012, 2014, 2018, 2020, 2022 and 2023) to allow for improved characterization of features within GIS such as depressional wetlands, which vary in size and aerial signature depending upon climatic conditions.

This time series analysis of aerial imagery was used by wetland scientists to interpret signatures. For example, during a wetter than normal year, there is often a greater extent and more distinct signature of saturated soils and/or inundation that can be observed in aerial photography (**Figure 3-1**, left). Conversely, in drier than normal years wet areas may appear smaller in area and/or the boundaries between upland and wetland may appear less distinct (**Figure 3-1**, right).

The APT output for August 23, 2023, approximately one month prior to the wetland delineation field investigation, indicated that “drier than normal” conditions were present based on the preceding three 30-day periods (**Table 3-1**). Further, the PDSI indicated that the region was in a “severe drought” due to annual rainfall totals that were much lower than normal.

Figure 3-1 Comparison of Aerial Photography for GFAFB Wetland FLN-09 in 2016 (left; wet) and 2019 (right; dry)

Taken together, these results suggested that certain primary hydrology indicators such as inundation or a high-water groundwater table may not be present. Therefore, the wetland scientists focused on other wetland indicators such as algal mats, water-stained leaves, FAC-neutral test for vegetation, and geomorphic position that would be present in the absence of a high groundwater table.

The APT analysis provided a range of conditions for both the rainfall prior to the aerial photograph acquisition dates and for the PDSI (**Table 3-1**). This broad range of conditions facilitated comparison and further evaluation of the existing wetland base layer (Wetland_A). The addition of LiDAR data allowed a more robust comparison to the landform in GIS and aided the later in determining potential surface water connectivity (**Figure 3-2**).

Table 3-1 Aerial Imagery and Corresponding APT Information

Aerial Imagery Evaluated				Antecedent Precipitation Tool (APT)		
Year	**Date Taken**	**Image Source**	**Type***	**APT Date**	**APT Product**	**APT PDSI**
2023	na	na	na	9/23/2023	Normal (10)	Severe drought
2022	8/23/2022	USDA NAIP	TC; CIR	8/23/2022	Normal (11)	Normal
2020	8/3/2020	USDA NAIP	TC; CIR	8/3/2020	Wetter than normal (16)	Severe wetness
2020	6/13/2020	Maxar	na	6/13/2020	Drier than normal (9)	Severe wetness
2018	9/1/2018	USDA NAIP	TC; CIR	9/1/2018	Normal (10)	Moderate drought
2014	9/7/2014	USDA NAIP	TC; CIR	9/7/2014	Normal (13)	Normal
2012	7/7/2012	USDA NAIP	TC; CIR	7/7/2012	Drier than normal (9)	Moderate drought
2009	8/11/2009	USDA NAIP	TC; CIR	8/11/2009	Drier than normal (8)	Extreme wetness
2005	6/24/2005	USDA NAIP	TC	6/24/2005	Wetter than normal (16)	Extreme wetness

Notes:
*TC = true color; CIR = color infrared; na = not available
PDSI = Palmer Drought Severity Index; USDA NAIP = U.S. Department of Agriculture National Agriculture Imagery Program

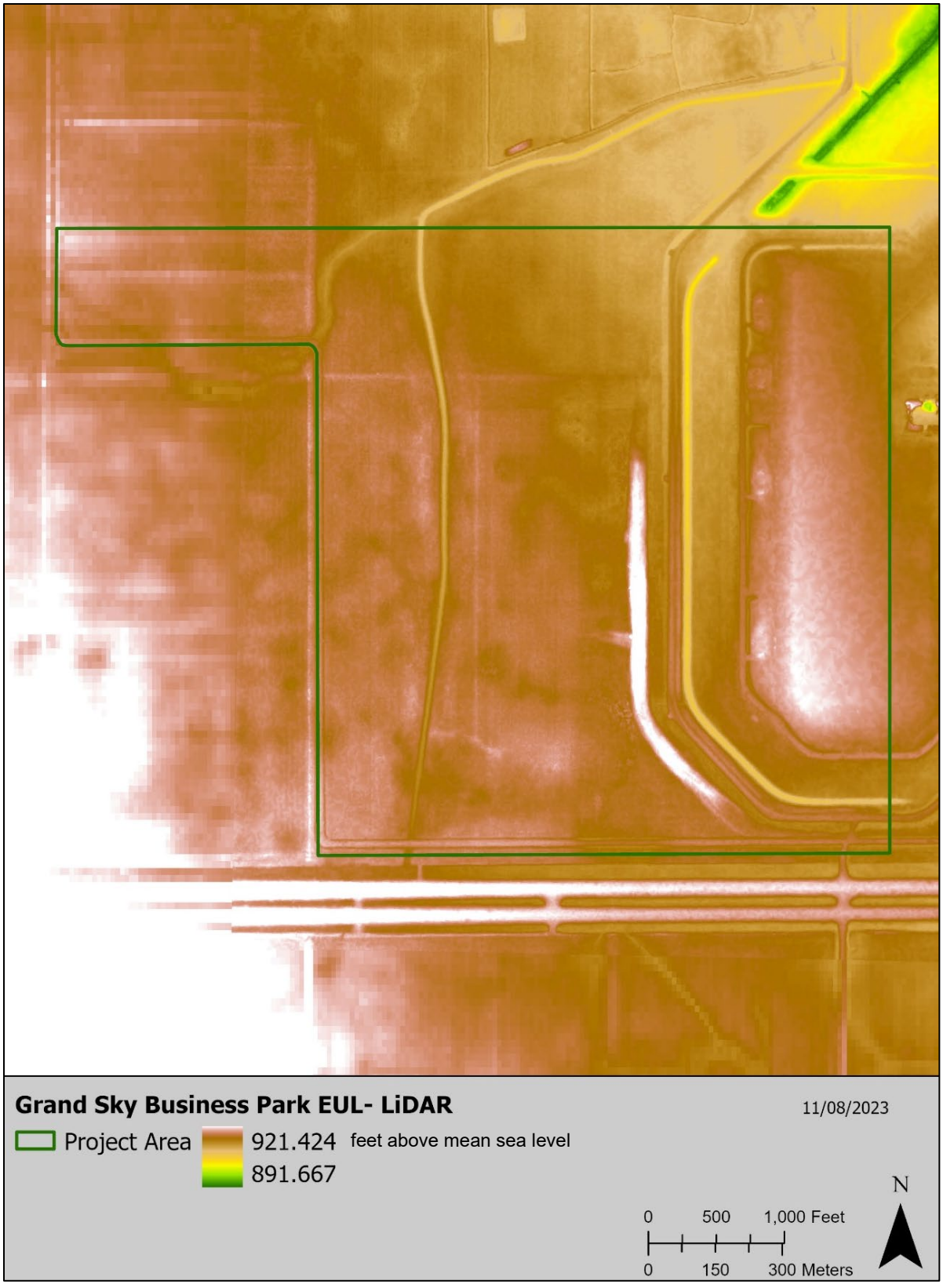

Figure 3-2 Map of the Local Relief of the Project Area

3.2.2 Development of Updated GIS Wetland Layer and Field Maps

As noted, the existing GIS wetland layer (Wetland_A) contained information gathered from a several sources and investigations ranging from 1999 to 2023. The offsite analysis was used to revise and update a copy of the GIS wetland layer.

Efforts focused on wetlands that were created from newer source materials (e.g., 2013 and 2021). Those areas were analyzed, and the upland/wetland boundary was adjusted, when necessary to account for altered site conditions. In cases where an aerial wetland signature was consistent across several years, but was different than or not present in the existing GIS wetland layer, the polygon was altered or a new polygon was added and given a field ID.

This updated GIS layer was used to develop wetland field maps that displayed the extent of wetland polygons with symbology that allowed for identification of the sources. That allowed the user to differentiate between field-delineated wetlands and those that were developed using other methods. The updated GIS layer was also uploaded to two global positioning systems (GPS) to assist navigation and to allow for direct comparison during the field investigation.

3.3 WETLAND DELINEATION FIELD INVESTIGATION

Field investigations were conducted by Versar wetland scientists between September 23 and 28, 2023. Two field teams, each composed of a wetland scientist and a field technician, completed the investigation over 6 consecutive days. The Grand Sky Business Park is a controlled access area. Access was coordinated with a designated GFAFB point of contact, Kevin Knaus.

Previously delineated and potentially new wetlands were evaluated for inclusion by walking previously delineated wetland boundaries, visual identification of hydrophytic vegetation, geomorphic position, and evaluation of soil cores. Modification to previously delineated wetlands and new wetlands were delineated in accordance with the 1987 Manual and the Great Plains Regional Supplement. The location of wetland boundary flags was recorded using the ArcGIS Field Maps application (ESRI 2023) connected to a Juniper Systems Inc. Geode GNS2 Single Frequency GNSS Receiver (Juniper Systems 2021).

Wetland Determination Data Forms from the Great Plains Regional Supplement (data forms) were completed within plots at representative wetland and non-wetland boundary locations. In instances where several wetlands were within close proximity to one another and of similar composition, one upland point was recorded as a representative sample for the grouped wetlands. The data forms correspond to specifically numbered plot locations and provide a quantitative description of how the wetland boundary was identified. Copies of the data forms and site photographs are presented in **Attachment C**.

Determination of wetland hydrology at each plot required documentation of at least one of the 17 primary indicators of hydrology or a minimum of two of the nine secondary indicators of hydrology described in the Great Plains Regional Manual.

Wetland scientists recorded the plant species observed in each vegetative stratum at each of the representative locations. A 5-foot circular plot was used for herbs, a 15-foot circular plot was used for shrubs, and a 30-foot circular plot was used for trees and vines when necessary. The plot dimensions were adjusted where necessary to remain within small or linear wetland features. Plants were identified and each species was assigned a wetland indicator status using the 2020 National Wetland Plant List V3.5 (USACE 2020). The 2020 National Wetland Plant list is the result of a synthesis of the best available scientific and technical information for improving precision in determining the vegetation factor when delineating upland/wetland boundaries for purposes of Section 404 of the CWA. As described in the Great Plains Regional Supplement, if the plant community passed Indicator 1 (Rapid Test for Hydrophytic Vegetation) or Indicator 2 (Dominance Test), then the area was determined to have hydrophytic vegetation. If a plant community passed Indicator 3 (Prevalence Index) and had indicators of hydric soil and wetland hydrology, then the area was determined to have hydrophytic vegetation.

Soil test pits and borings were used to determine hydric/non-hydric soil type. The Great Plains Regional Supplement provides updated information on 28 hydric soil indicators, including technical notes regarding application. Soil profiles were sampled to determine if they matched the description of any indicators. This information was used to determine if the plot contained hydric soils. The Project Area is in Land Resource

Region F, Northern Great Plains; therefore, care was taken to ensure that the indicators used were applicable to this specific region (USACE 2010).

During post-processing in GIS, each wetland was assigned a mapping code(s) corresponding to the following categories:

- Mapping code 1 indicates that a new wetland was identified and delineated in the field. A wetland label was created in the SDSFEATURE GIS field consisting of the next consecutive label number for that area. For example, FLS-08C was the last wetland polygon label in the existing wetland GIS layer (Wetland_A); therefore, FLS-08D was assigned to the first new wetland identified in that area during the investigation.
- Mapping code 2 indicates that a previously identified wetland was adjusted in field. No label change was necessary in some cases. However, when larger wetlands were separated into multiple smaller wetlands, letters were added as a suffix to the preexisting wetland label. For example, wetland FLS-02 became FLS-02a through FLS-02b. In a few cases two smaller polygons were joined. In those cases, the larger polygon label was used.
- Mapping code 3 indicates that a combination of field observations, LiDAR and aerial imagery was used to adjust boundary. This was almost exclusively used for linear wetlands (ditches) with distinct boundaries because of excavation. For larger linear wetland features, GPS points were taken at the wetland / upland boundary at representative locations to compare to the mapped GIS boundary. Adjustments to the width were completed based on a combination of the wetland / upland boundary points and examination of the time series aerial photography (**Table 3-1**). No label changes necessary.
- Mapping code 4 indicates that a previously identified wetland boundary was verified during the investigation. No label changes necessary.

3.4 WETLAND DELINEATION RESULTS

In 2015, construction began for the Grand Sky Business Park, located centrally within the Project Area. Certain areas within the eastern half of the Grand Sky Business Park have been regraded in the initial phases of development resulting in changes to previously delineated wetlands. Grand Sky Blvd, running north to south, splitting the parcel, has been widened and stormwater management features have been regraded as necessary to accommodate the changes. The remainder of the Project Area is undeveloped and maintained as mowed hay fields, ditches, or wetland basins.

The Project Area has undergone several months of unseasonably dry conditions. The area received 0.72 inches of rainfall in the 4 weeks prior to, and 0.75 inches during in the first 2 days, of the delineation. Consequently, standing water was present in a few of the wetlands but most were still relatively dry. The APT output for September 23 indicated that “normal” conditions were present based on the preceding three 30-day periods (**Table 3-1**). Further, the PDSI indicated that the region was in a “severe drought” due to annual rainfall totals that were much lower than normal.

This wetland investigation identified and verified the extent of 38 separate wetland polygons comprising 24.57 acres of wetlands (**Table 3-2; Figures 3-3** through **3-8**). The results and observations are described in the following section.

Table 3-2 Wetlands Identified in the Project Area

Wetland ID	Type	Cowardin*	Area (acres)	Mapping Code**	Connectivity	Latitude	Longitude
FLS-01a	Freshwater emergent; ditch	PEM	0.27	2	Potentially connected	47.9414	-97.4109
FLS-01b	Freshwater emergent; ditch	PEM	0.34	2	Potentially connected	47.9390	-97.4109
FLS-01c	Freshwater emergent; ditch	PEM	0.41	2	Potentially connected	47.9370	-97.4110
FLS-01d	Freshwater emergent; ditch	PEM	0.15	2	Potentially connected	47.9355	-97.4106
FLS-01e	Freshwater emergent; ditch	PEM	0.53	2	Potentially connected	47.9344	-97.4086
FLS-01f	Freshwater emergent; ditch	PEM	0.004	1	Potentially connected	47.9381	-97.4109
FLS-01g	Freshwater emergent; ditch	PEM	0.008	1	Potentially connected	47.9380	-97.4106
FLS-01h	Freshwater emergent; ditch	PEM	0.006	1	Potentially connected	47.9380	-97.4103
FLS-02	Freshwater emergent	PEM	4.71	2	Potentially isolated	47.9390	-97.4130
FLS-07a	Freshwater emergent; ditch	PEM	2.28	3	Potentially connected	47.9364	-97.4161
FLS-07b	Freshwater emergent	PEM	7.37	2	Potentially connected	47.9340	-97.4118
FLS-08d	Freshwater emergent; ditch	PEM	0.06	1	Potentially connected	47.9378	-97.4118
FLS-10a	Freshwater emergent; ditch	PEM	0.44	3	Potentially connected	47.9407	-97.4220
FLS-10b	Freshwater emergent; ditch	PEM	2.28	3	Potentially connected	47.9418	-97.4180
FLS-10c	Freshwater emergent; ditch	PEM	0.01	3	Potentially connected	47.9399	-97.4183
FLS-10d	Freshwater emergent	PEM	2.09	3	Potentially connected	47.9377	-97.4178
FLS-10e	Freshwater emergent	PEM	0.12	2	Potentially connected	47.9380	-97.4167
FLS-10f	Freshwater emergent	PEM	0.18	3	Potentially connected	47.9353	-97.4182
FLS-10g	Freshwater emergent; ditch	PEM	0.006	3	Potentially connected	47.9340	-97.4183
FLS-13a	Freshwater emergent; ditch	PEM	0.11	3	Potentially connected	47.9338	-97.4168
FLS-13b	Freshwater emergent; ditch	PEM	0.45	3	Potentially connected	47.9338	-97.4122
FLS-13c	Freshwater emergent; ditch	PEM	0.22	3	Potentially connected	47.9338	-97.4088
FLS-17	Freshwater emergent; ditch	PEM	0.01	2	Potentially isolated	47.9341	-97.4071
FLS-31a	Freshwater emergent; ditch	PEM	0.18	2	Potentially connected	47.9419	-97.4076
FLS-31b	Freshwater emergent; ditch	PEM	0.11	2	Potentially connected	47.9418	-97.4096
FLS-31d	Freshwater emergent; ditch	PEM	0.04	2	Potentially connected	47.9361	-97.4098
FLS-31h	Freshwater emergent; ditch	PEM	0.03	2	Potentially connected	47.9407	-97.4098
FLS-52	Freshwater emergent	PEM	0.13	2	Potentially isolated	47.9413	-97.4196
FLS-53	Freshwater emergent	PEM	0.82	2	Potentially isolated	47.9417	-97.4195
FLS-55	Freshwater emergent	PEM	0.05	2	Potentially isolated	47.9389	-97.4168

Table 3-2 Wetlands Identified in the Project Area

Wetland ID	Type	Cowardin*	Area (acres)	Mapping Code**	Connectivity	Latitude	Longitude
FLS-57	Freshwater emergent	PEM	0.11	2	Potentially isolated	47.9370	-97.4170
FLS-58	Freshwater emergent	PEM	0.29	2	Potentially isolated	47.9364	-97.4169
FLS-59	Freshwater emergent	PEM	0.12	2	Potentially isolated	47.9356	-97.4173
FLS-60	Freshwater emergent	PEM	0.03	2	Potentially isolated	47.9353	-97.4168
FLS-61a	Freshwater emergent	PEM	0.08	2	Potentially isolated	47.9346	-97.4157
FLS-61b	Freshwater emergent	PEM	0.35	2	Potentially isolated	47.9345	-97.4152
FLS-62	Freshwater emergent	PEM	0.15	2	Potentially isolated	47.9383	-97.4143
FLS-63	Freshwater emergent	PEM	0.03	2	Potentially isolated	47.9390	-97.4146
		Total	**24.57**				

Notes:

*PEM = Palustrine Emergent (Cowardin et al. 1979)

**1 = New wetland identified in field; 2 = Previously identified wetland adjusted in field; 3 = Combination of field observations, LiDAR and aerial imagery used to adjust boundary.

Figure 3-3 Index of Grand Sky Business Park Wetland Delineation Results Maps

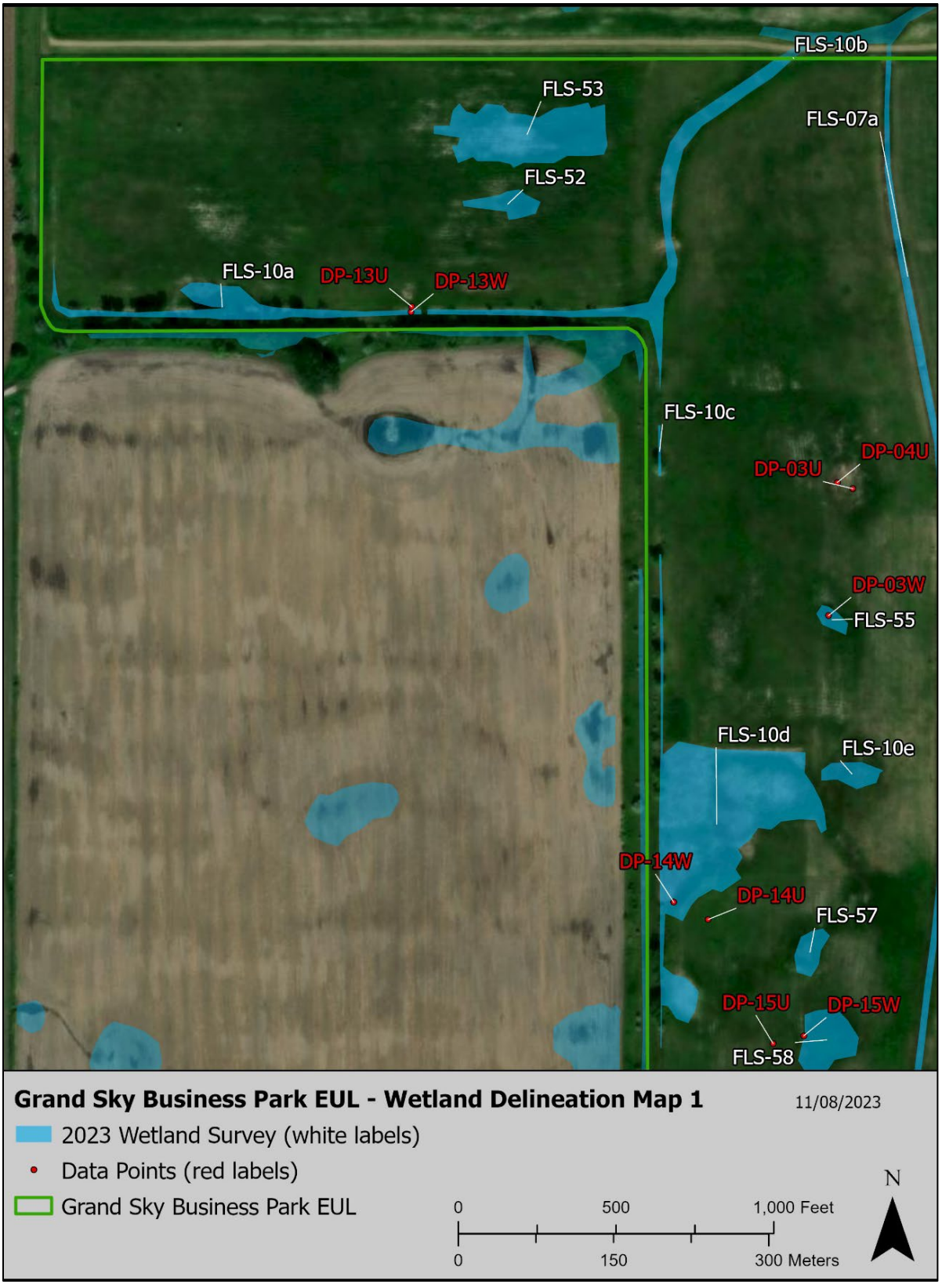

Figure 3-4 2023 Wetland Survey: Detail Map 1

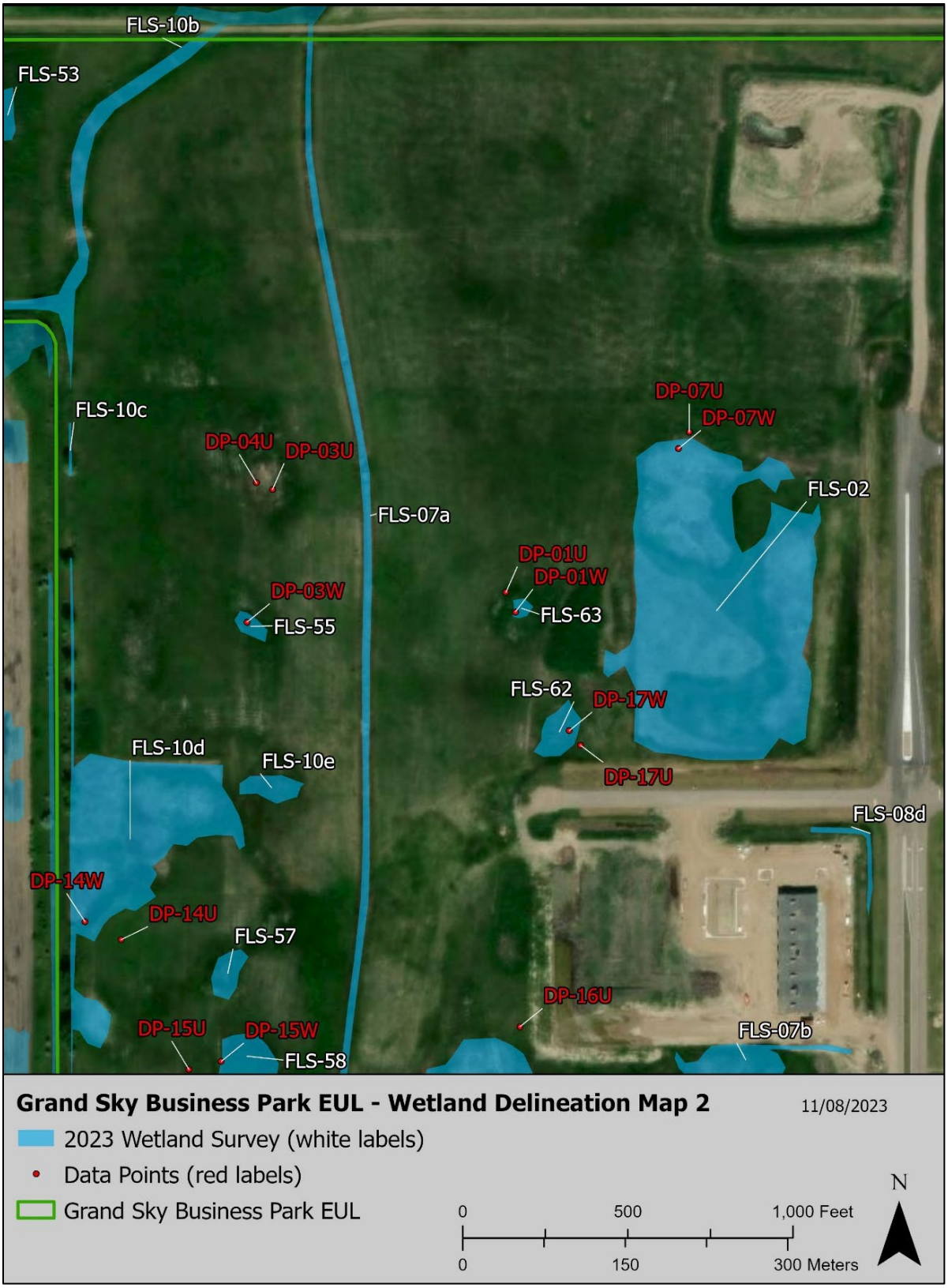

Figure 3-5 2023 Wetland Survey: Detail Map 2

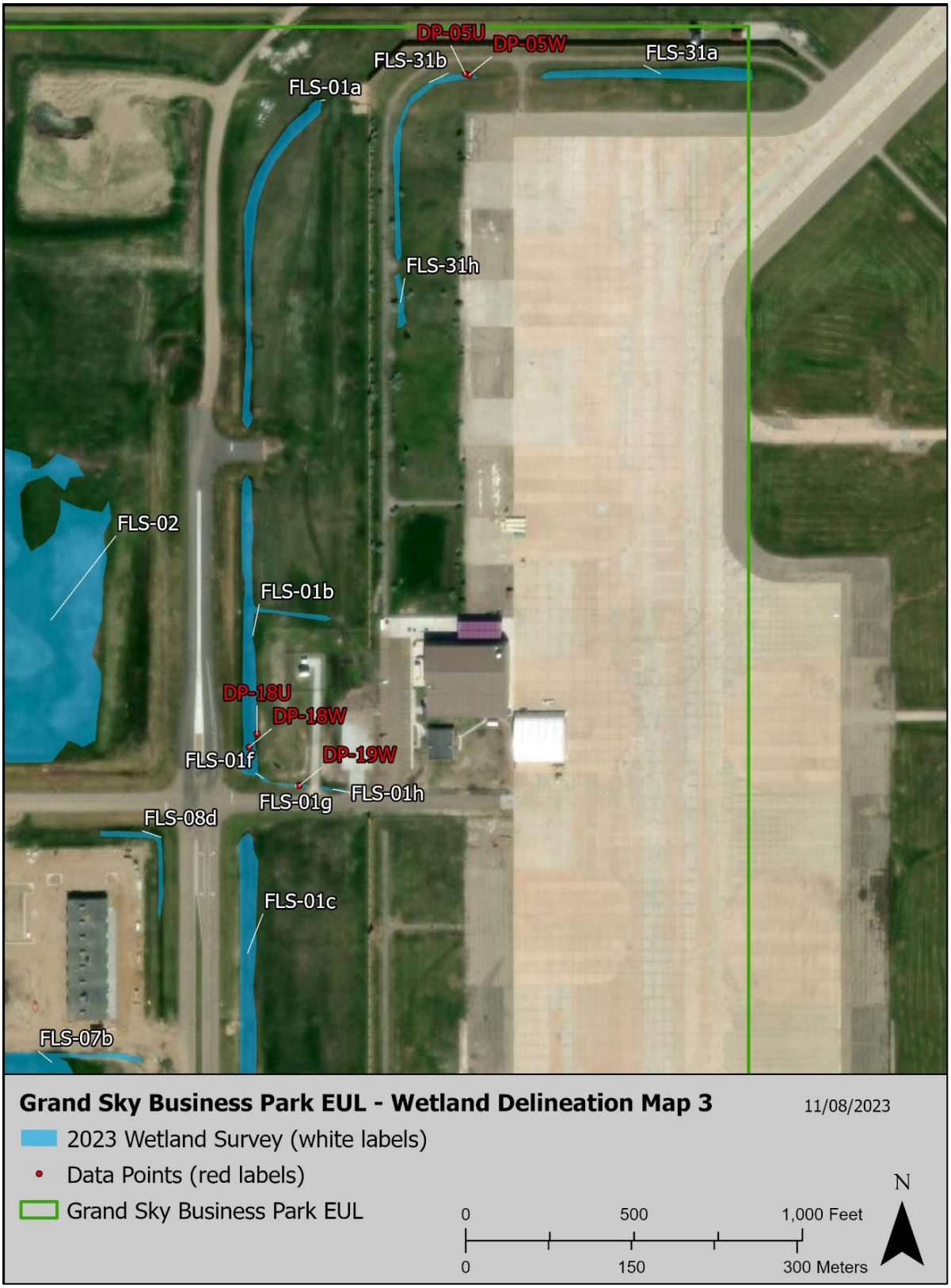

Figure 3-6 2023 Wetland Survey: Detail Map 3

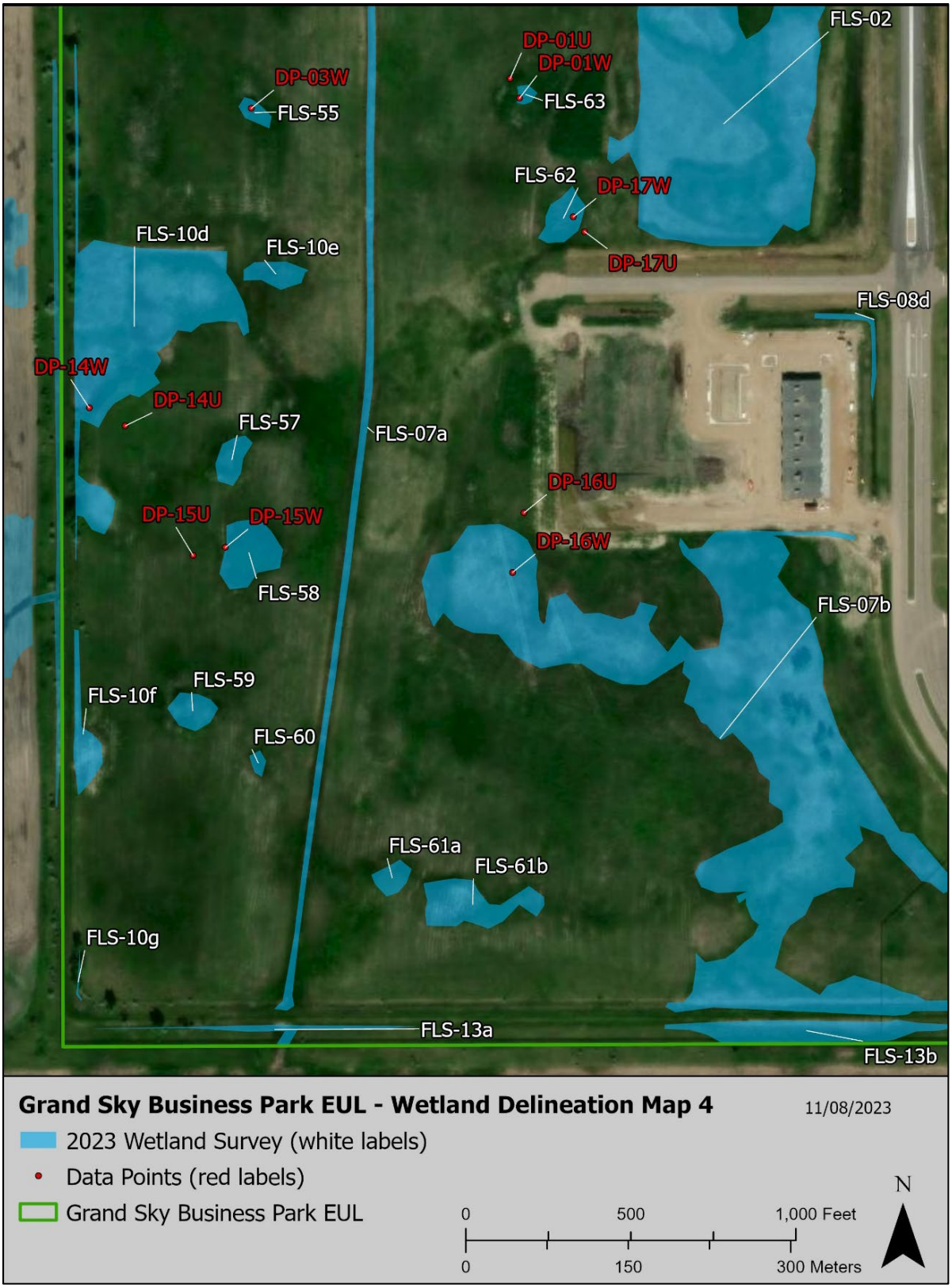

Figure 3-7 2023 Wetland Survey: Detail Map 4

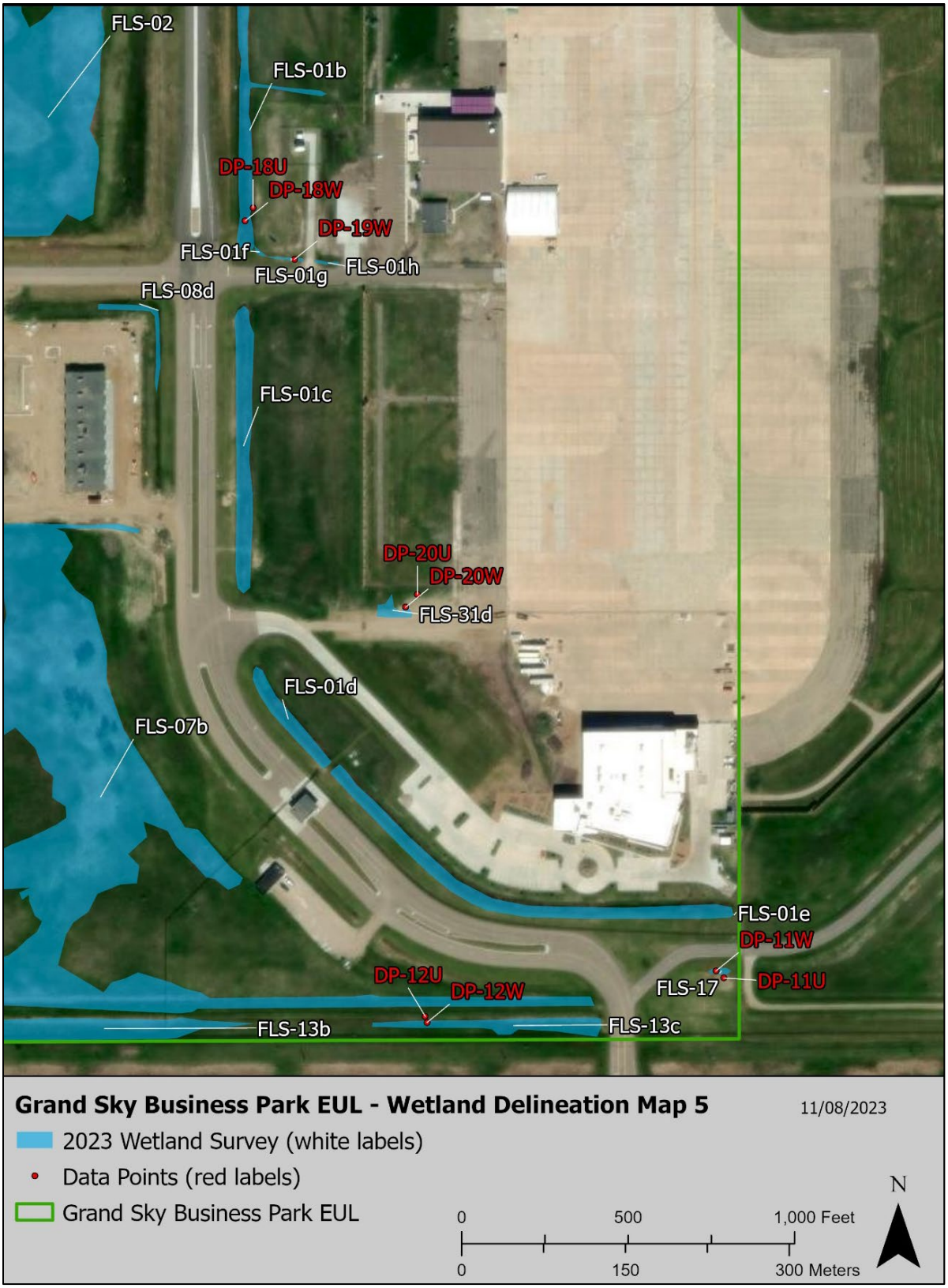

Figure 3-8 2023 Wetland Survey: Detail Map 5

3.4.1 Wetland Descriptions

FLS-01, FLS-01b, FLS-01c, FLS-01d, FLS-01e, FLS-01f, FLS-01g, and FLS-01h are a linear series of vegetated wetlands, connected by culverts, within a drainage ditch for stormwater conveyance, totaling 1.713 acres (**Figure 3-6** and **Figure 3-8**). FLS-01 appears to have a surface water connection to the Turtle River via a system of ditches and culverts that drain to the north. There was water in the ditch during the investigation despite the current drought conditions. Predominant vegetation within the ditch includes cattail (*Typha* sp.), spikerush (*Eleocharis palustris*), Northwest Territory sedge (*Carex ultriculata*), softstem bulrush (*Schoenoplectus tabernaemontani*), and foxtail barley (*Hordeum jubatum*). Data forms DP-18W and DP-18U were collected for this wetland within along the lower and upper side slope of the ditch, respectively, to document conditions on either side of the delineated line. While the soil indicator for the data point was Thick Dark Surface (A12), the Depleted Matrix (F3) soils indicator was used to delineate the wetland boundary along the side slope.

FLS-02 is the second largest single wetland in the Project Area at 4.71 acres (**Figure 3-5**). This wetland is a concave emergent marsh area, underlain by Gilby loam, which may be a relic prairie pothole. This wetland was noted in 2013 to have water depths of up to 1 foot, providing habitat for various waterfowl species. However, the extent of this wetland has changed significantly since 2013 due to excavation resulting in a larger extent. Reed canary grass and cattail were the dominant vegetation in this wetland creating alternating homogenous patches of one or the other throughout most of the area. This wetland is adjacent to the regraded stormwater conveyance but separated by a dike with no apparent drainage occurring through underground seepage. Surface flow would be expected as precipitation causes overflowing. Due to unseasonably dry conditions, there was no surface water present during this investigation and saturation was limited to the lowest elevations of the wetland. Data forms DP-07U and DP-07W were collected for this wetland along the northern wetland / upland boundary.

FLS-07a is a 2.28-acre linear drainage channel that bisects the Project Area (**Figure 3-7**). FLS-07 was divided into two wetlands, FLS-07a and FLS-07b, because of the distinct vegetative composition between the southern portion of both wetlands. This linear wetland drainage serves as a primary connection to the Turtle River. Predominant vegetation within the channel was cattail, reed canary grass (*Phalaris arundinacea*) with willows, peachleaf willow (*Salix amygdaloides*) and bay willow (*Salix pentandra*) distributed along the channel length.

FLS-07b is the largest delineated wetland with the Project Area at 7.37 acres (**Figure 3-7**). As mentioned above, FLS-07 was divided into two wetlands due to distinct vegetative features. This wetland is underlain by Gilby loam and is comprised of several deeper pothole-like wetlands connected within an overall larger depression. In 2013, FLS-07 was noted as having up to 0.5 feet of water, providing habitat for various waterfowl species. There was no water present during this investigation due to unseasonably dry conditions. Data forms DP-16W and DP-16U were collected for this wetland in the northwest corner along the wetland / upland boundary, respectively.

FLS-08d and FLS-17 are wetland features identified within mowed, linear stormwater conveyance ditches that were recontoured during the initial phase of the development. They are 0.06 acre and 0.01 acre in size, respectively (**Figure 3-8**). Data forms DP-11W and DP-11U were collected at FLS-17. DP-11W was taken at the lowest point by the culvert, where vegetation is exclusively *Eleocharis sp.*, a facultative wetland species. FLS-17 drains off property to the east while FLS-08d drains to the north through a culvert that connects to FLS-01.

FLS-10 is a series of freshwater emergent wetlands totaling 5.12-acres occurring in and adjacent to a linear ditch that runs along the western boundary of the property (**Figure 3-7**). In 2013, FLS-10 showed evidence of being one contiguous wetland, however vegetative and soil indicators were lacking between the individual segments. Therefore, it was delineated into smaller individual wetlands named FLS-10a through FLS-10g. Data forms DP-14U and DP-14W were collected for FLS-10 at the wetland / upland boundary on the south end. This ditch drains north to FLS-52 and ultimately off the property to larger features that drain to the Turtle River. Dominant vegetation observed at DP-14W included hybrid cattail and Northwest Territory sedge, with pioneering species such as perennial sow thistle, leafy spurge (*Euphorbia esula*), and field thistle (*Circium arvense*) creeping in along the edges. These weedy species likely persist due to ongoing drought conditions.

FLS-13 is a 0.78-acre wetland broken into three smaller wetlands based on distinct vegetative composition between them: FLS-13a, FLS-13b, and FLS-13c (**Figure 3-7** and **Figure 3-8**). These wetlands are linear drainage ditches located south of the perimeter road that collect water, flow west, and drain north into FLS-07a via a culvert, ultimately flowing north to the Turtle River. Data forms DP-12U and DP-12W were collected for FLS-13 from the southeast corner of the wetland. Dominant vegetation within these wetlands included Northwest Territory sedge, dogbane (*Apocynum cannabinum*), perennial sow thistle (*Sonchus arvensis*), and hybrid cattail (*Typha x glauca*).

FLS-31a, FLS-31b, FLS-31h are a series of mowed, linear, vegetated drainage ditches for stormwater conveyance, totaling 0.36 acre (**Figure 3-6**). FLS-31h connects to FLS-31b which drains into a drop inlet to an underground stormwater drain. FLS-31a also drains to a drop inlet, presumably to the same system. These ditches are separated from FLS-01 by underground culverts. Data forms DP-05W and DP-05W were collected at the eastern end of FLS-31b. Within the drainage ditch, *Eleocharis sp.* was the only species within the wetland sampling point, with a turf grass, hard fescue (*Festuca trachyphylla*) dominant within the upland sampling point. Despite overall drought conditions, rain from the previous day resulted in some standing water within the ditch.

FLS-31d (**Figure 3-8**) is a 0.04-acre remnant depressional area formed by the grading during the initial phase of development. While the feature retained the name of the previous ditch feature that occurred in the same proximity, it is distinct from the other FLS-31 ditches. Data forms DP-20U and DP-20W were collected for FLS-31d. FLS-31d consists of a community of weedy herbaceous species, including the facultative wetland species foxtail barley and quaking aspen and willow species. This wetland drains by surface flow along a roadside swale to FLS-01.

FLW-52 and FLW-53 are depressional wetlands located in the northwest section of the Project Area encompassing 0.13 acre and 0.82 acre, respectively (**Figure 3-4**). These wetlands have no discernible physical connection to neighboring wetlands. Wetland boundaries for both of these wetlands were changed slightly from the 2013 delineation based on field analysis of vegetative composition, geomorphic position, and soil core samples taken at various points. These wetlands are located within an area that is mowed for hay.

FLS-55 is a small, 0.05-acre, pothole depression with no discernible physical connection to neighboring wetland systems (**Figure 3-5**). Data forms DP-03U, at the center of previously delineated FLS-54, and DP-04U were used as representative upland points and DP-03W was collected within the basin of FLS-55. At DP-03W, dominant vegetation included quack grass and Northwest Territory sedge. The presence of Northwest Territory sedge, and soil indicators were used to discern the boundary of the wetland. Areas previously delineated as FLS-54 and FLS-56 lacked these vegetation and soils indicators and were not delineated as wetlands. Boundaries for FLS-55 were adjusted slightly from the 2013 delineation based on field analysis of vegetative composition. FLS-55 is located within an area that is mowed for hay.

FLS-57, FLS-58, FLS-59, and FLS-60 are small, depressional emergent wetlands, encompassing 0.55 acre (**Figure 3-7**). These wetlands are surrounded by uplands, with no discernible physical connection to neighboring wetland systems. Data forms DP-15W and DP-15U were collected at FLS-58 as representative for this group of wetlands in close proximity to one another. Dominant vegetation within DP-15W included reed canary grass, Northwest Territory sedge, and cattail. The wetlands described above are surrounded by uplands, with no discernible physical connection to neighboring wetland systems. Further, boundaries for each of the wetlands above were changed slightly from the 2013 delineation based on field analysis of vegetative composition and geomorphic position at various points. These wetlands are located within an area that is mowed for hay.

FLS-61 was divided into two distinct wetlands due to distinct vegetative features between two distinct basins (**Figure 3-7**). FLS-61a and FLS-61b are small, depressional emergent wetlands, encompassing 0.08 and 0.35 acre, respectively. These wetlands are surrounded by uplands, with no discernible physical connection to neighboring wetland systems. Further, boundaries for each of the wetlands above were changed slightly from the 2013 delineation based on field analysis of vegetative composition and geomorphic position at various points. These wetlands are located within an area that is mowed for hay.

FLS-62 and FLS-63 are small depressional wetlands, 0.15 and 0.03 acre, respectively, that are centrally located within the Project Area, adjacent to FLS-02 (**Figure 3-5**). Data forms DP-01W and DP-01U were

collected at FLS-63 and DP-17W and DP-17U were collected at FLS-62. Reed canary grass was the dominant vegetation within FLS-63 and was used as the primary indicator for wetland extent. Due to long-term drought conditions, the normal plant community was not present at the time of delineation. FLS-62 drains into FLS-02, however, the area between the two did not have sufficient indicators to meet wetland status, likely due to drought conditions. Dominant vegetation within FLS-62 included reed canary grass and Northwest Territory sedge. Wetland boundaries for both of these wetlands were changed slightly from the 2013 delineation based on field analysis of vegetative composition, geomorphic position, and soil core samples taken at various points. These wetlands are located within an area that is mowed for hay.

3.4.2 Other Observations

The following species were observed utilizing wetlands on and near the Project Area:

- Mammals: white-tailed jackrabbit (*Lepus townsendii*).
- Birds: sharp-tailed grouse (*Tympanuchus phasianellus*), marsh wren (*Cistothorus palustris*), and Wilson's snipe (*Gallinago delicata*), American goldfinch (*Spinus tristis*), western meadowlark (*Sturnella neglecta*), savannah sparrow (*Passerculus sandwichensis*).
- Reptiles and amphibians: plains gartersnake (*Thamnophis radix*), *boreal* chorus *frog* (*Pseudacris maculata*).
- Insects: leafy spurge hawk moth caterpillar (*Hyles euphorbiae*).
- Plants: Forty-five plant species were identified while completing the wetland/upland data forms (**Table 3-3**). Many other species were noted on the site, but were not recorded in plot data.

Table 3-3 Plant Species Identified in Plots

Scientific Name	Common Name	Indicator Status	Stratum
Andropogon gerardii	big bluestem	FACU	H
Apocynum cannabinum	Indian hemp	FAC	H
Artemisia biennis	biennial wormwood	FACU	H
Beckmannia syzigachne	American slough grass	OBL	H
Bromus inermis	smooth brome	UPL	H
Carex utriculata	Northwest Territory sedge	OBL	H
Cirsium arvense	Canada thistle	FACU	H
Cirsium flodmanii	Flodman's thistle	FAC	H
Elaeagnus angustifolia	Russian-olive	FACU	SH
Eleocharis palustris	common spike-rush	OBL	H
Elymus repens	creeping wild rye (quackgrass)	FACU	H
Elymus trachycaulus	slender wild rye	FACU	H
Eragrostis pectinacea	purple love grass	FAC	H
Euphorbia escula	leafy spurge	UPL	H
Festuca trachyphylla	hard fescue	UPL	H
Fraxinus pennsylvanica	green ash	FAC	T
Grindelia squarrosa	curly-cup gumweed	UPL	H
Helianthus maximiliani	Maximilian sunflower	FACU	H
Hordeum jubatum	fox-tail barley	FACW	H
Medicago lupulina	black medick	FACU	H
Medicago sativa	alfalfa	UPL	H

Table 3-3 Plant Species Identified in Plots

Scientific Name	Common Name	Indicator Status	Stratum
Melilotus officinalis	yellow sweet-clover	FACU	H
Mentha arvensis	American wild mint	FACW	H
Phalaris arundinacea	reed canary grass	FACW	H
Plantago major	great plantain	FAC	H
Populus deltoides	eastern cottonwood	FAC	T
Rosa arkansana	prairie rose	FACU	S
Rumex crispus	curly dock	FAC	H
Salix amygdaloides	peach-leaf willow	FACW	T
Salix pentandra	bay leaf willow	FACW	T
Scoenoplectus tabernaemontani	softstem bulrush	OBL	H
Solidago canadensis	Canadian goldenrod	FACU	H
Solidago gigantea	late goldenrod	FAC	H
Sonchus arvensis	field sow-thistle	FAC	H
Sorghastrum nutans	yellow Indian grass	FACU	H
Spartina pectinata	freshwater cord grass	FACW	H
Suaeda calceoliformis	paiuteweed	FACW	H
Symphoricarpos occidentalis	western snowberry	UPL	SH
Symphyotrichum ericoides	white heath American-aster	FACU	H
Symphyotrichum lanceolatum	white panicled American-aster	FACW	H
Taraxacum officinale	common dandelion	FACU	H
Teucrium canadense	American germander	FACW	H
Trifolium repens	white clover	FACU	H
Typha angustifolia	narrow leaf cattail	OBL	H
Typha X *glauca*	hybrid cattail	OBL	H

Notes:
FAC = facultative; FACU=facultative upland; FACW =facultative wetland; H = herbaceous; OBL = obligate; SH = shrub; T=tree; UPL =upland;

4.0 CONCLUSION

During the 2023 wetland field investigation, 24.57 acres of wetlands were identified in 38 separate wetland polygons within the Project Area. Of the 38 delineated wetlands, 26 (17.698 acres) had apparent connections to downstream WOTUS and 13 (6.88) did not appear to have a downstream connection to WOTUS (**Figure 4-1**).

This field investigation adjusted the boundaries of previously delineated wetlands, and excluded nine wetlands that were previously delineated in 2013. The following wetlands were excluded:

- FLS-01h
- FLS-06
- FLS-07b
- FLS-08a
- FLS-08b
- FLS-08c
- FLS-09
- FLS-54
- FLS-56

FLS-01h did not meet all criteria required to qualify as a wetland. FLS-06 was delineated prior to the Grand Sky Business Park occupancy of the area; this area is now a building complex and parking lot. Similarly, excavation and grading of the area likely altered hydrology patterns of FLS-07b, FLS-08a, FLS-08b, and FLS-08c. FLS-54 and FLS-56 likely did not exhibit wetland characteristics due to persistent drought in the region over several months.

Several depressional wetland boundaries were reduced or eliminated based on the combined off-site and on-site assessments. In 2011, the western part of the Project Area was tilled/reseeded in a one-time event. The area is currently managed for noxious and invasive weeds by spot-spraying applicable herbicides. The hay lease is used as a conservation management tool to generate income that is further utilized for conservation projects. Birds are protected in this area because mowing is not authorized until after July 15. A hay lease is conducted on part of the area on an annual basis in order to sustain a uniform vegetation height and for weed control in order to deter use by birds as recommended for bird aircraft strike hazard management. At the time of delineation, the area had been recently mowed. Additionally, recent dry conditions have resulted with an altered the plant communities in these wetlands consisting of primarily reed canary grass within the wetland and smooth brome outside the wetland. Despite the dry conditions, these results were consistent with previously identified wetlands.

The DAF is directed through DoDI 4715.03 to ensure no net loss of size, function, and value of wetlands, and to preserve the natural and beneficial values of wetlands. An accurate aquatic resources delineation provides crucial base line information for the planning effort. This report provides the documentation necessary to obtain a preliminary jurisdictional determination from the USACE Omaha District.

Air Force Manual 32-7003, *Environmental Conservation*, states that, “the proponent of any activity that may affect known or suspected WOTUS should conduct a jurisdictional delineation utilizing the criteria approved by the USEPA and affirmed by USACE. The Air Force will refer to and accept as determinative the current USACE definitions for WOTUS under USACE jurisdiction. Jurisdictional delineations are valid for a limited period of time, as established by the USACE district regulatory office. Installations are not required to update an expired jurisdictional delineation unless there exists a proposed mission activity that necessitates an updated demarcation of jurisdictional WOTUS boundaries by the proponent activity.” The DAF will provide this report to USACE and request a formal jurisdictional delineation that will be included in the Environmental Assessment.

The USACE Omaha District website indicates that information associated with a new request, such as a request to verify an aquatic resources delineation, should be submitted via email to CENWO-OD-RND@usace.army.mil for initial in-processing. The email subject line should include the name of the applicant, name of the project, and name of the county in which the project is proposed (e.g., GFAFB-EUL EA-Grand Forks). This may be accessed online at the following URL:
https://www.nwo.usace.army.mil/Missions/Regulatory-Program/North-Dakota/

Figure 4-1 2023 Wetland Survey: Potentially Isolated Wetlands

5.0 REFERENCES

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ATTACHMENT A

FEMA FLOOD INSURANCE RATE MAP AND APT OUTPUT DATA

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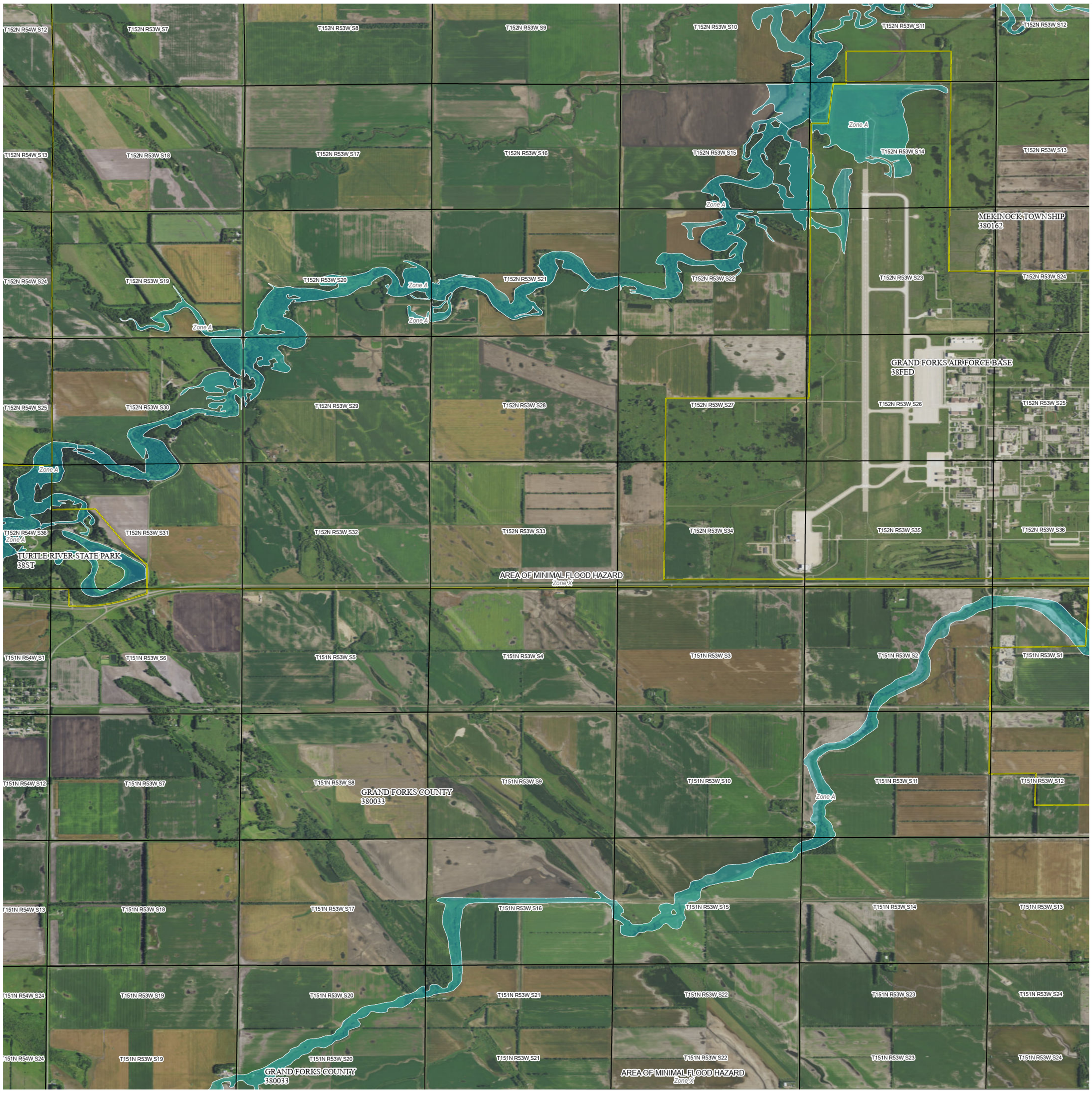
97°30'1.75"W 48°0'26.38"N



97°22'28.32"W 47°52'3.67"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **10/27/2023 3:49 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: No elevation features on this FIRM
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

N

1 inch = 2,000 feet 1:24,000

0 1,000 2,000 4,000 6,000 8,000 Feet

0 210 420 840 1,260 1,680 Meters

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

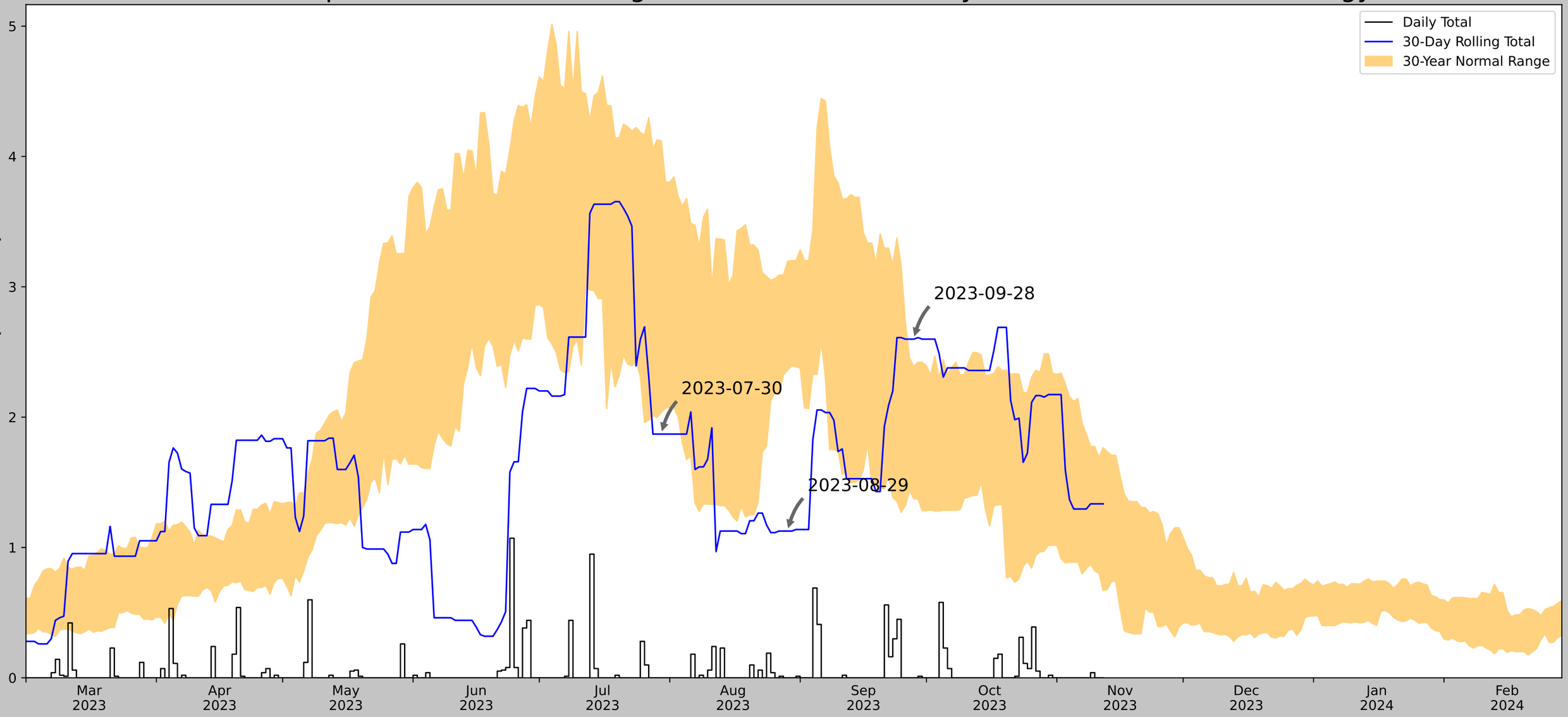
PANEL **525** OF **1045**

Panel Contains:

COMMUNITY	NUMBER	PANEL
CITY OF EMERADO	380034	0525
TURTLE RIVER STATE PARK	38ST	0525
GRAND FORKS COUNTY	380033	0525
PRAIRIE CHICKEN STATE GAME MANAGEMENT AREA	38ST	0525
MEKINOCK TOWNSHIP	380162	0525
HEGTON TOWNSHIP	380112	0525
GRAND FORKS AIR FORCE BASE	38FED	0525

MAP NUMBER
38035C0525E
EFFECTIVE DATE
December 17, 2010

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	47.93510, -97.4127
Observation Date	2023-09-28
Elevation (ft)	914.048
Drought Index (PDSI)	Severe drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-09-28	1.372835	2.390158	2.598425	Wet	3	3	9
2023-08-29	2.361811	3.195276	1.125984	Dry	1	2	2
2023-07-30	2.035827	4.120079	1.870079	Dry	1	1	1
Result							Normal Conditions - 12

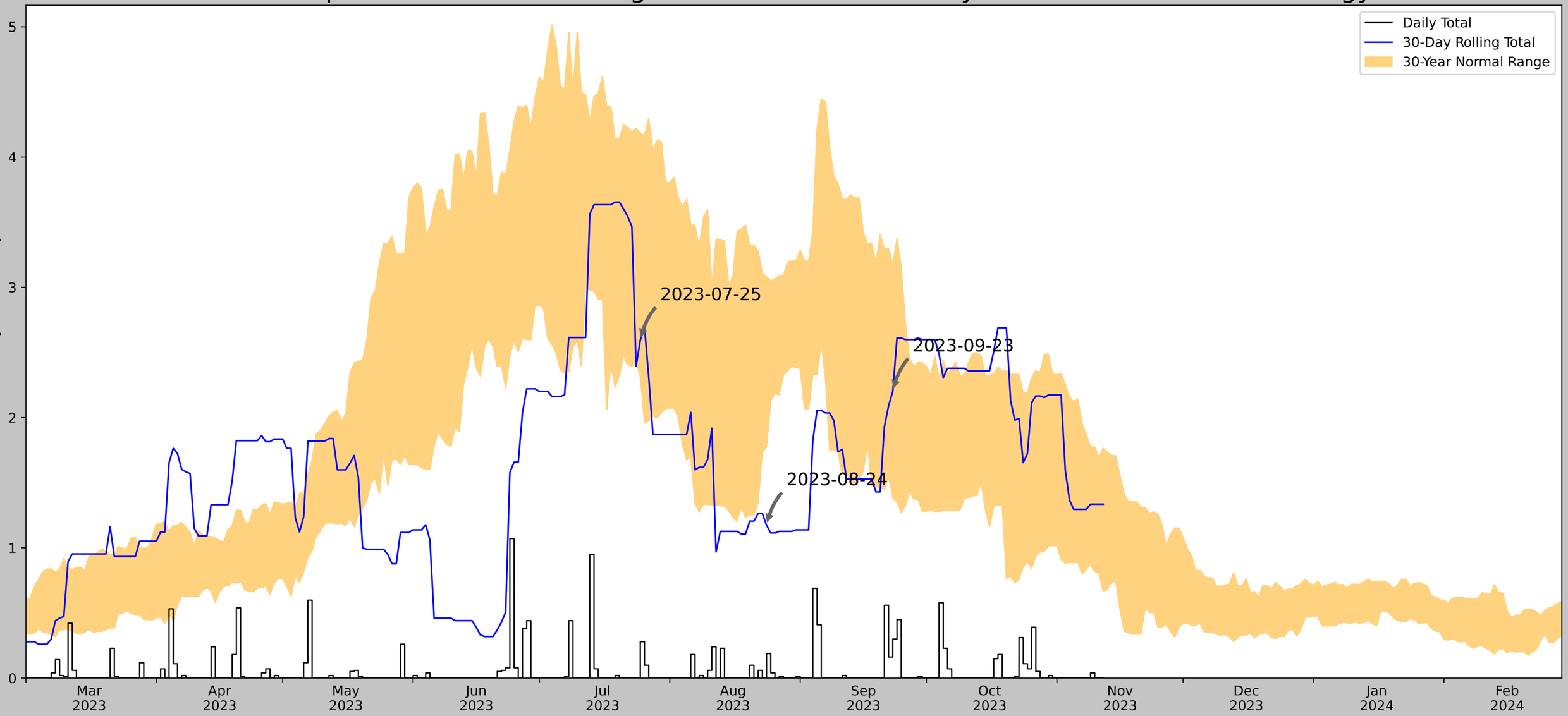
US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
GRAND FORKS INTL AP	47.9428, -97.1831	837.927	10.641	76.121	5.598	11233	90
GRAND FORKS UNIV (NWS)	47.9217, -97.0975	830.053	4.222	7.874	1.933	120	0



Coordinates	47.93510, -97.4127
Observation Date	2023-09-23
Elevation (ft)	914.048
Drought Index (PDSI)	Severe drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-09-23	1.384646	3.172441	2.200787	Normal	2	3	6
2023-08-24	1.775984	3.080709	1.173228	Dry	1	2	2
2023-07-25	2.31378	4.185433	2.594488	Normal	2	1	2
Result							Normal Conditions - 10

US Army Corps of Engineers

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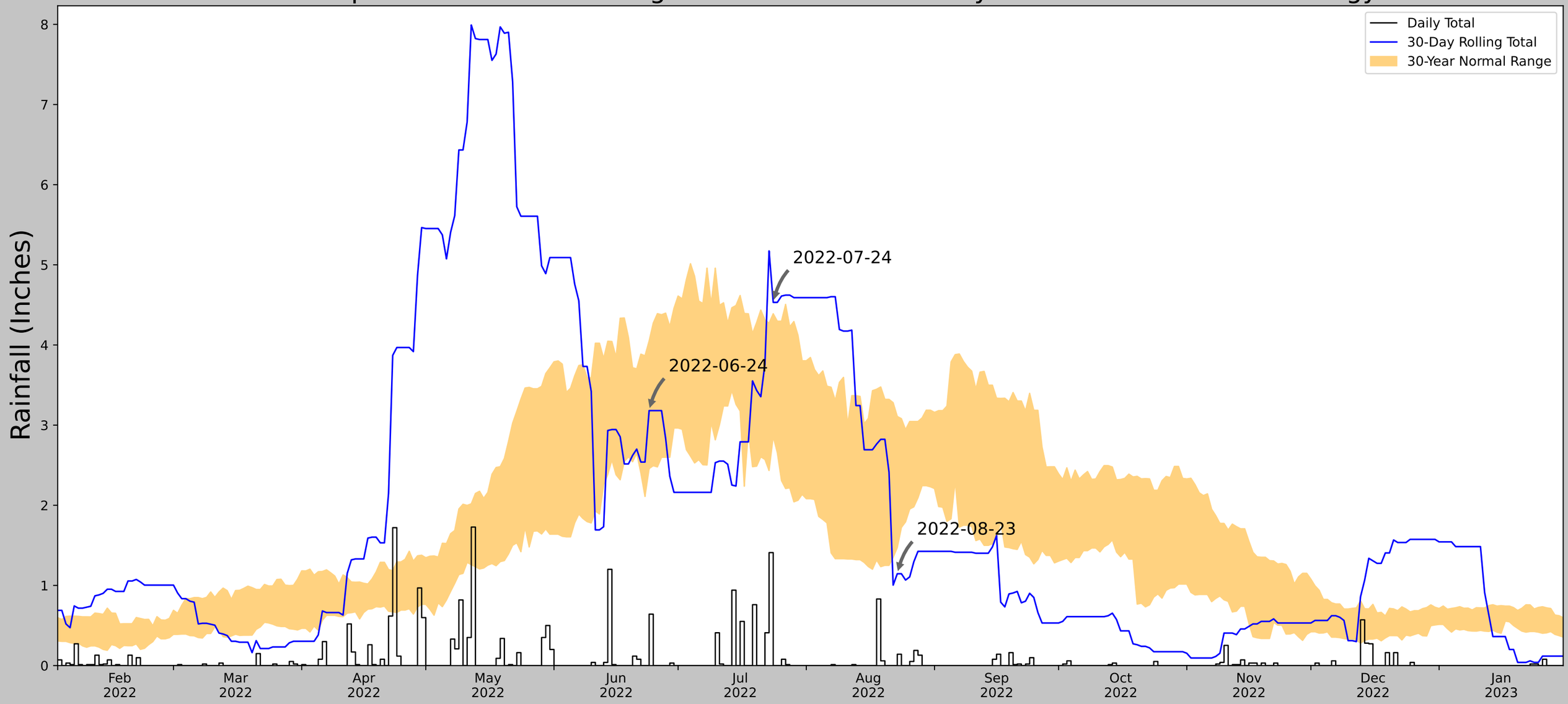
Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
GRAND FORKS INTL AP	47.9428, -97.1831	837.927	10.641	76.121	5.598	11233	90
GRAND FORKS UNIV (NWS)	47.9217, -97.0975	830.053	4.222	7.874	1.933	120	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	47.93511, -97.4127
Observation Date	2022-08-23
Elevation (ft)	914.18
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-08-23	1.472047	3.108268	1.145669	Dry	1	3	3
2022-07-24	2.858662	4.390158	4.531496	Wet	3	2	6
2022-06-24	2.457874	4.050394	3.181102	Normal	2	1	2
Result							Normal Conditions - 11

US Army Corps of Engineers

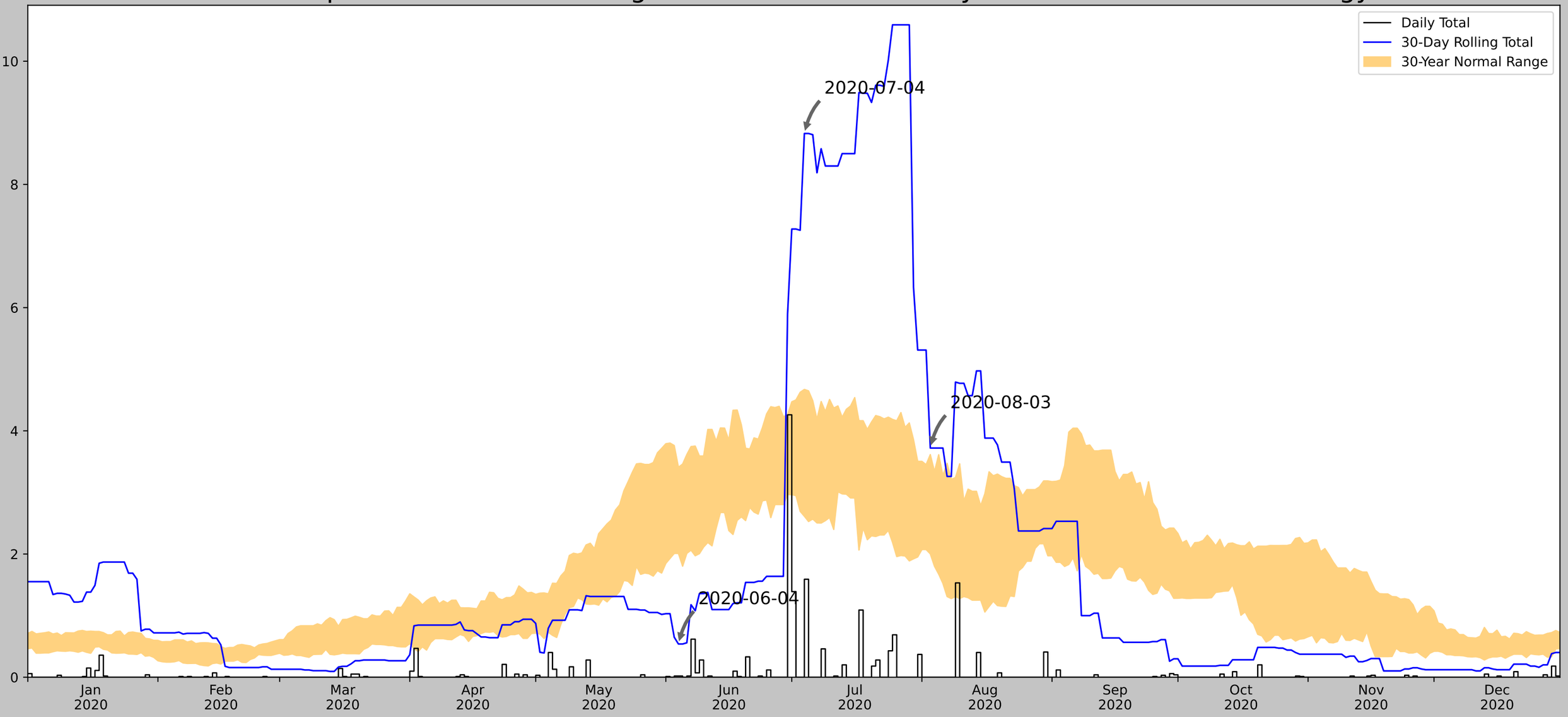
ERDC ENGINEER RESEARCH & DEVELOPMENT CENTER

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
GRAND FORKS INTL AP	47.9428, -97.1831	837.927	10.641	76.253	5.6	11233	90
GRAND FORKS UNIV (NWS)	47.9217, -97.0975	830.053	4.222	7.874	1.933	120	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	47.93511, -97.4127
Observation Date	2020-08-03
Elevation (ft)	914.18
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-08-03	2.002362	3.614961	3.720473	Wet	3	3	9
2020-07-04	2.613386	4.672441	8.826772	Wet	3	2	6
2020-06-04	2.009449	3.408662	0.53937	Dry	1	1	1
Result							Wetter than Normal - 16

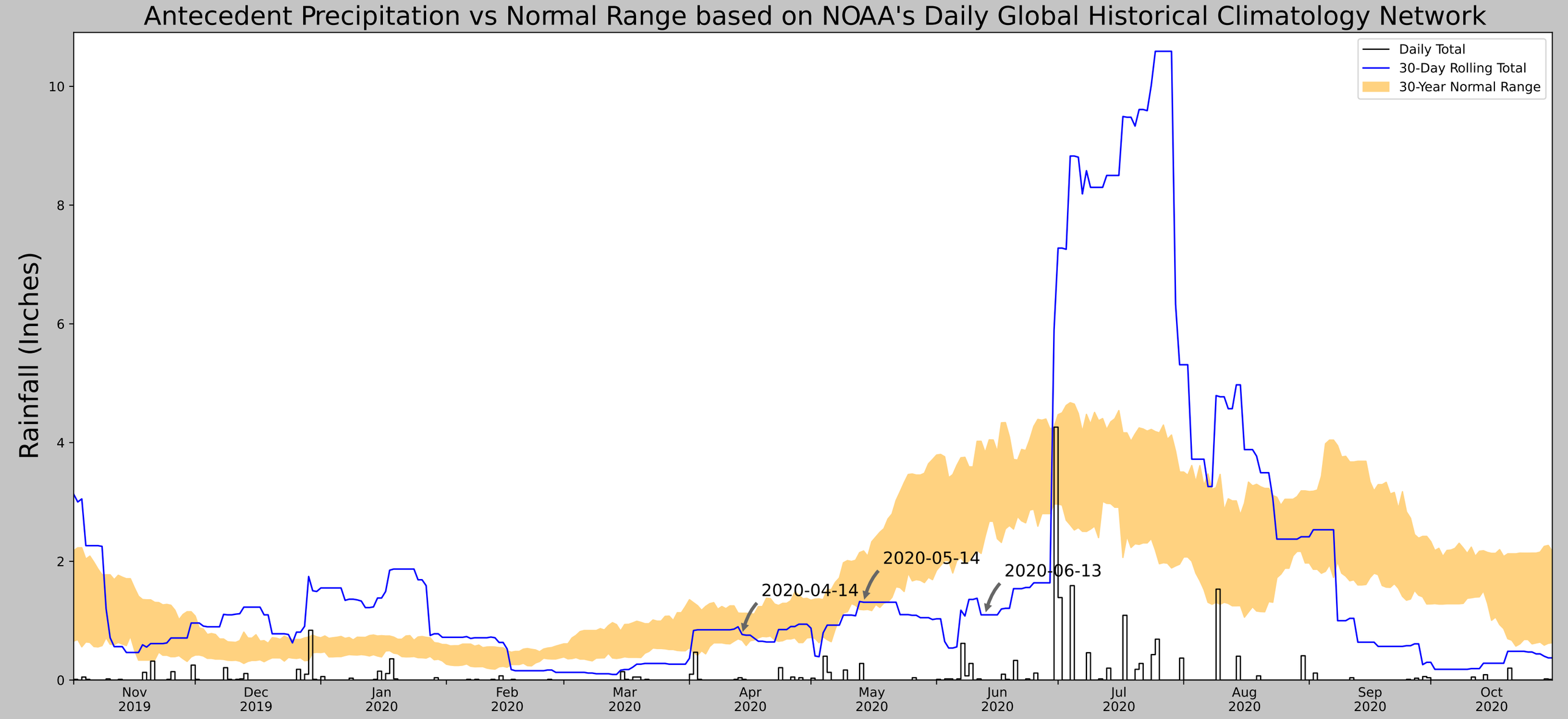
US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
GRAND FORKS INTL AP	47.9428, -97.1831	837.927	10.641	76.253	5.6	11232	90
GRAND FORKS UNIV (NWS)	47.9217, -97.0975	830.053	4.222	7.874	1.933	120	0



Coordinates	47.93511, -97.4127
Observation Date	2020-06-13
Elevation (ft)	914.18
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-06-13	2.420473	3.833071	1.098425	Dry	1	3	3
2020-05-14	1.183858	2.175197	1.311024	Normal	2	2	4
2020-04-14	0.670079	1.125984	0.767717	Normal	2	1	2
Result							Drier than Normal - 9

US Army Corps of Engineers

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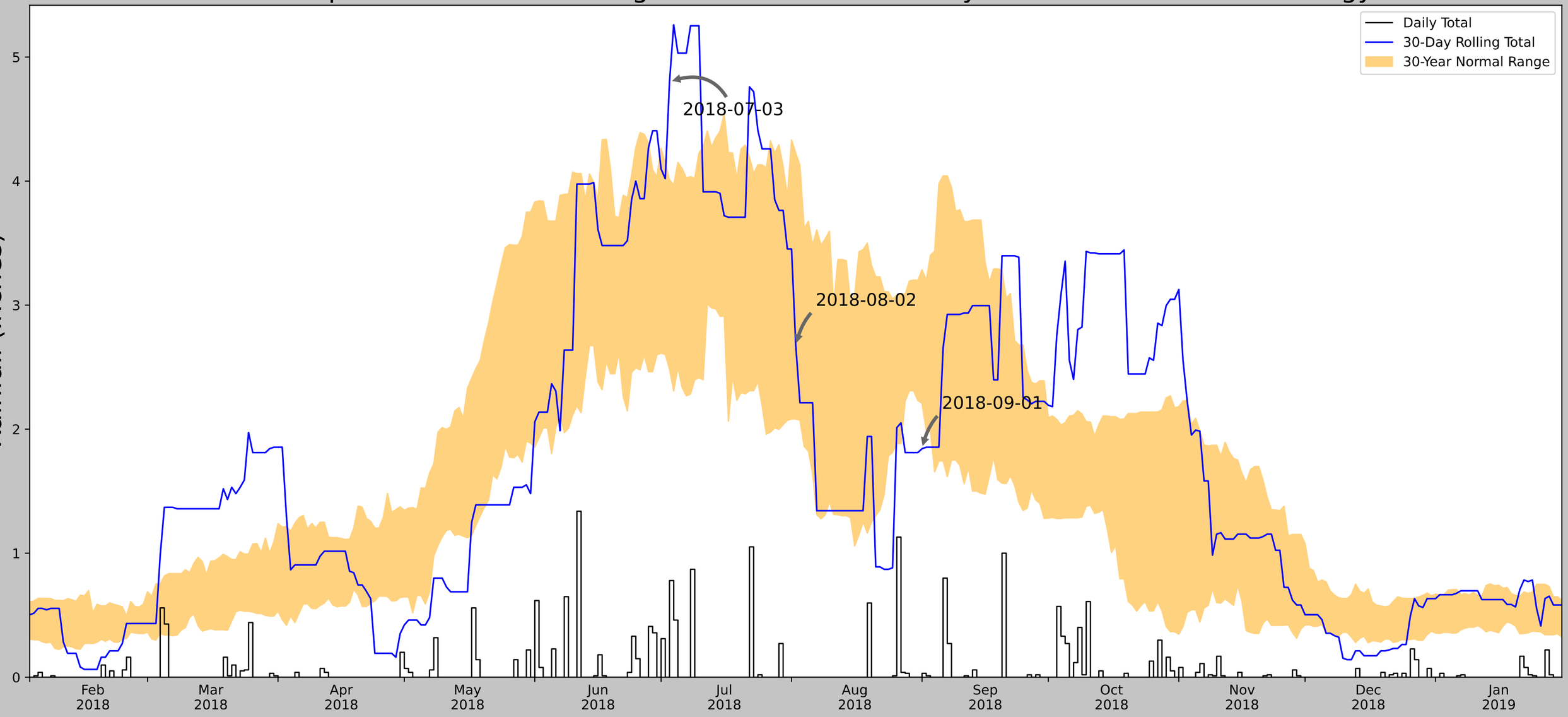
Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
GRAND FORKS INTL AP	47.9428, -97.1831	837.927	10.641	76.253	5.6	11232	90
GRAND FORKS UNIV (NWS)	47.9217, -97.0975	830.053	4.222	7.874	1.933	120	0



Coordinates	47.93511, -97.4127
Observation Date	2018-09-01
Elevation (ft)	914.18
Drought Index (PDSI)	Moderate drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2018-09-01	2.208661	3.285039	1.84252	Dry	1	3	3
2018-08-02	2.081496	4.227165	2.673228	Normal	2	2	4
2018-07-03	2.484252	4.012205	4.799213	Wet	3	1	3
Result							Normal Conditions - 10

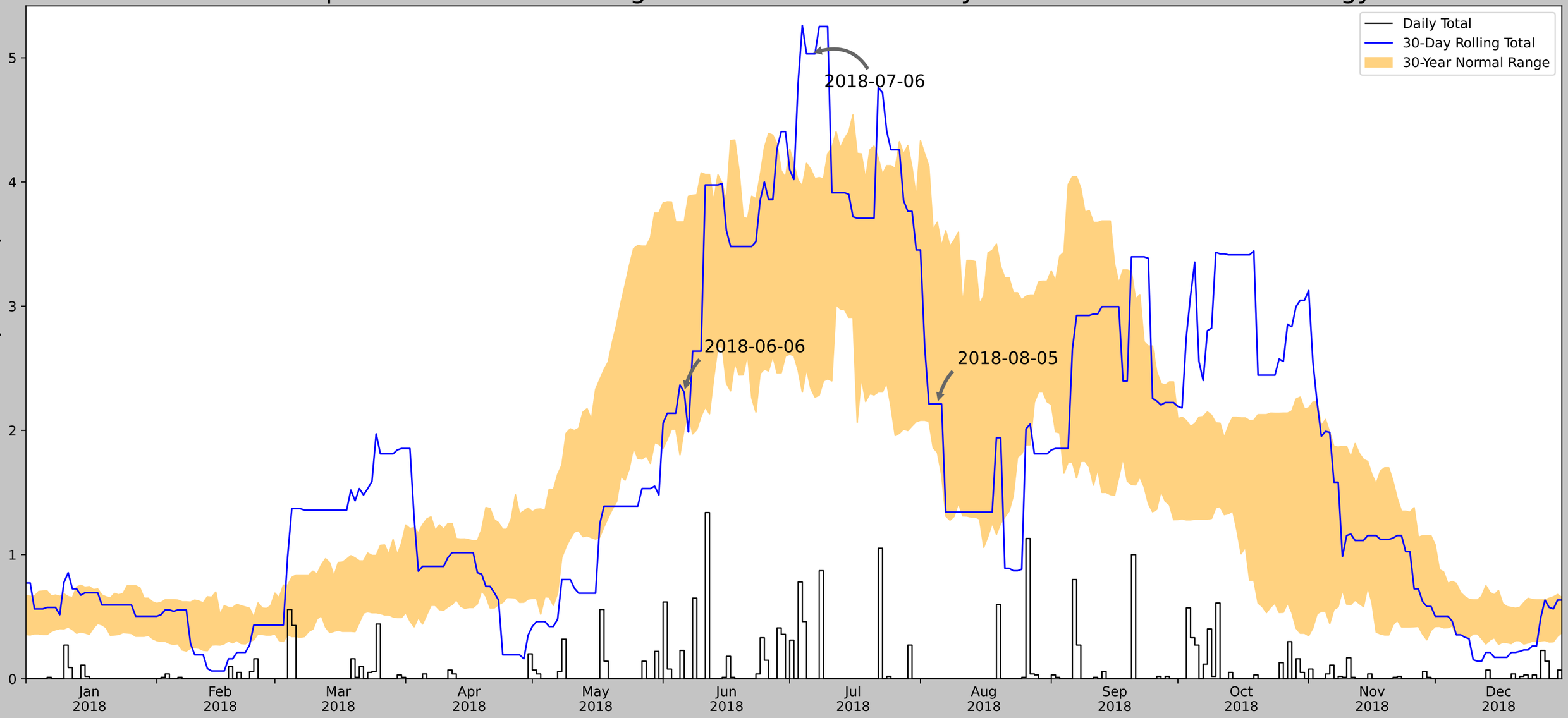
US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
GRAND FORKS INTL AP	47.9428, -97.1831	837.927	10.641	76.253	5.6	11233	90
GRAND FORKS UNIV (NWS)	47.9217, -97.0975	830.053	4.222	7.874	1.933	120	0



Coordinates	47.93511, -97.4127
Observation Date	2018-08-05
Elevation (ft)	914.18
Drought Index (PDSI)	Severe drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2018-08-05	1.822835	3.676772	2.212598	Normal	2	3	6
2018-07-06	2.336221	4.101181	5.031496	Wet	3	2	6
2018-06-06	2.01063	3.678347	2.307087	Normal	2	1	2
Result							Normal Conditions - 14

US Army Corps of Engineers

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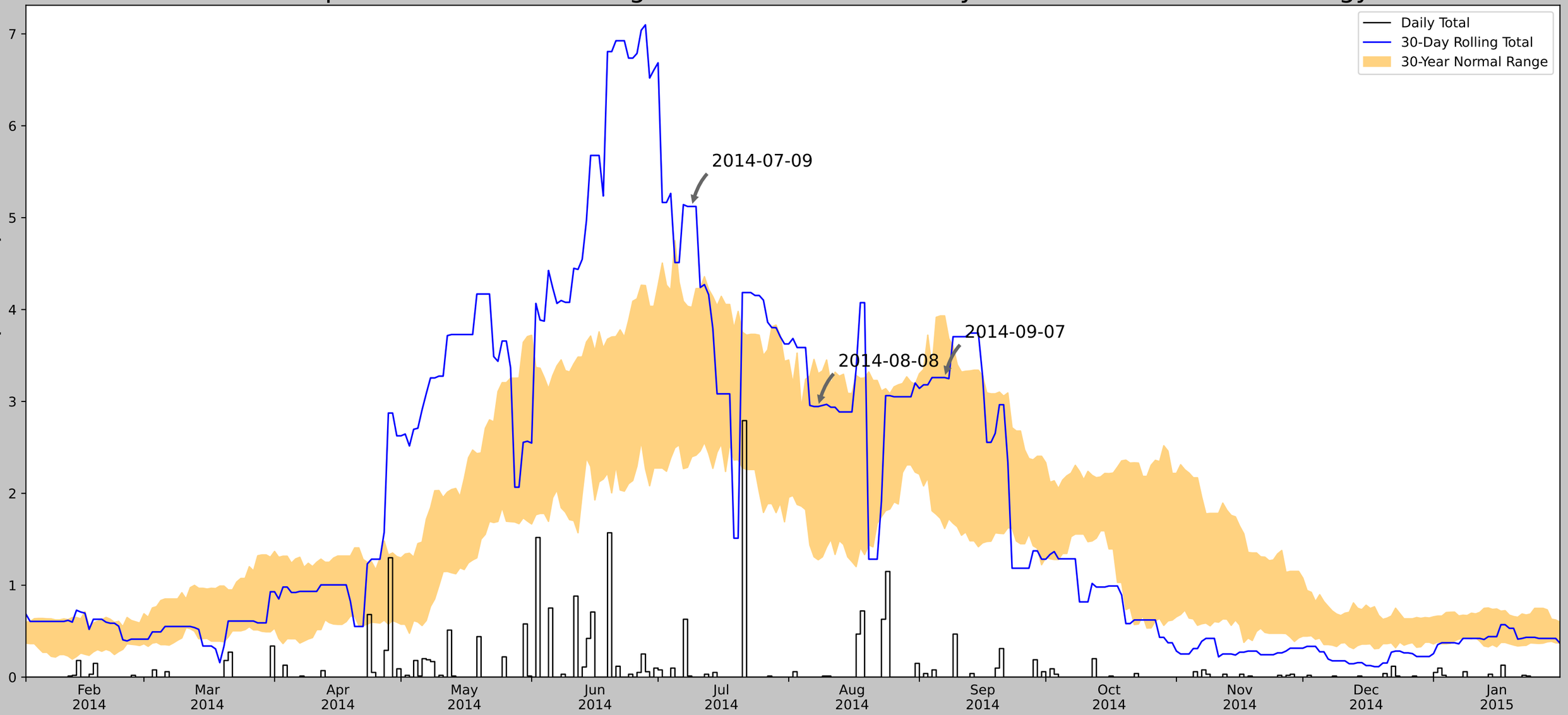
Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
GRAND FORKS INTL AP	47.9428, -97.1831	837.927	10.641	76.253	5.6	11233	90
GRAND FORKS UNIV (NWS)	47.9217, -97.0975	830.053	4.222	7.874	1.933	120	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	47.93511, -97.4127
Observation Date	2014-09-07
Elevation (ft)	914.18
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2014-09-07	1.617323	3.931496	3.259843	Normal	2	3	6
2014-08-08	1.276772	3.302756	2.944882	Normal	2	2	4
2014-07-09	2.398032	4.024016	5.122047	Wet	3	1	3
Result							Normal Conditions - 13

US Army Corps of Engineers

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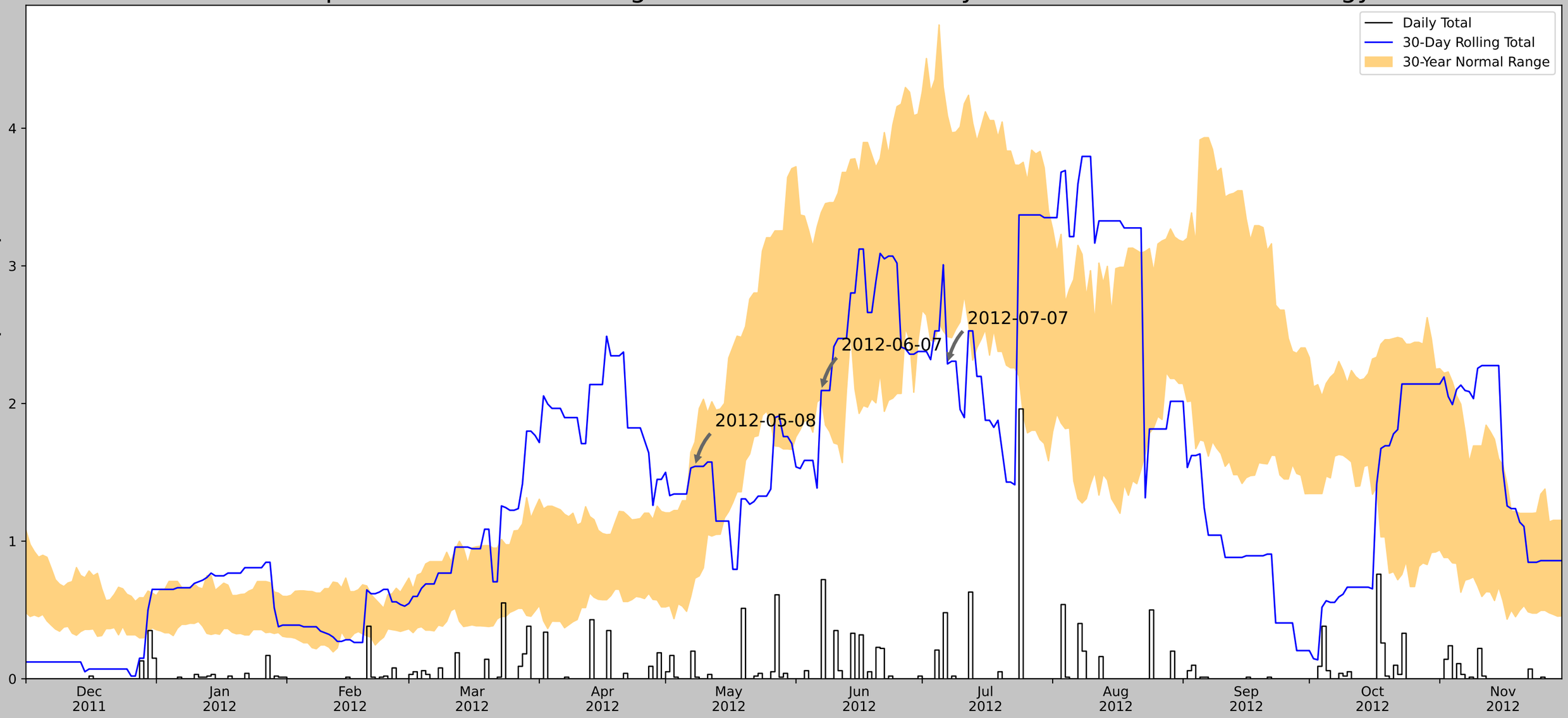
Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
GRAND FORKS INTL AP	47.9428, -97.1831	837.927	10.641	76.253	5.6	11233	90
GRAND FORKS UNIV (NWS)	47.9217, -97.0975	830.053	4.222	7.874	1.933	120	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	47.93510, -97.4127
Observation Date	2012-07-07
Elevation (ft)	914.048
Drought Index (PDSI)	Moderate drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2012-07-07	2.486221	4.090945	2.287402	Dry	1	3	3
2012-06-07	2.036614	3.387795	2.094488	Normal	2	2	4
2012-05-08	0.730709	1.72126	1.543307	Normal	2	1	2
Result							Drier than Normal - 9

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
GRAND FORKS INTL AP	47.9428, -97.1831	837.927	10.641	76.121	5.598	11232	90
GRAND FORKS UNIV (NWS)	47.9217, -97.0975	830.053	4.222	7.874	1.933	120	0

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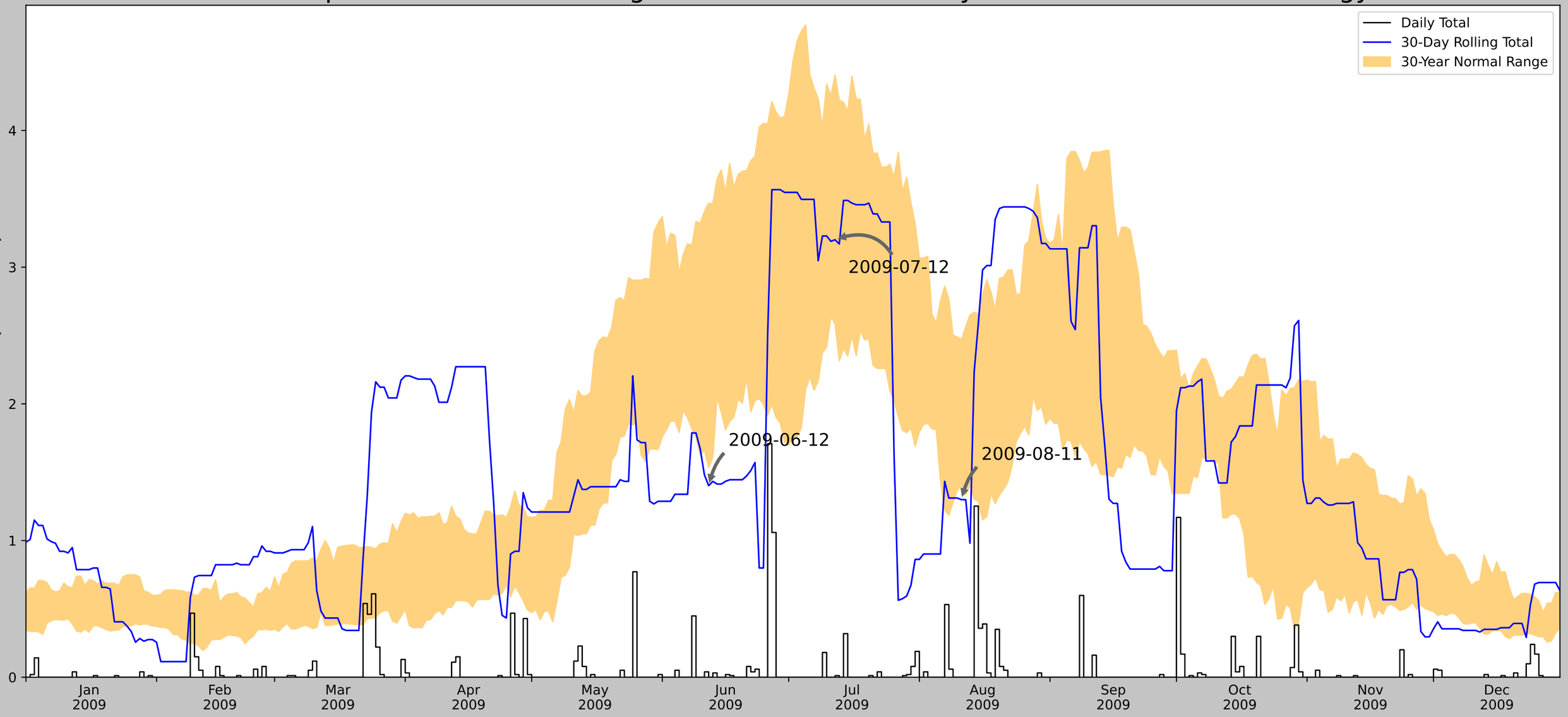

Coordinates	47.93510, -97.4127
Observation Date	2009-08-11
Elevation (ft)	914.048
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2009-08-11	1.405906	2.468898	1.299213	Dry	1	3	3
2009-07-12	2.583465	4.404725	3.200788	Normal	2	2	4
2009-06-12	1.534646	3.465748	1.401575	Dry	1	1	1
Result							Drier than Normal - 8

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

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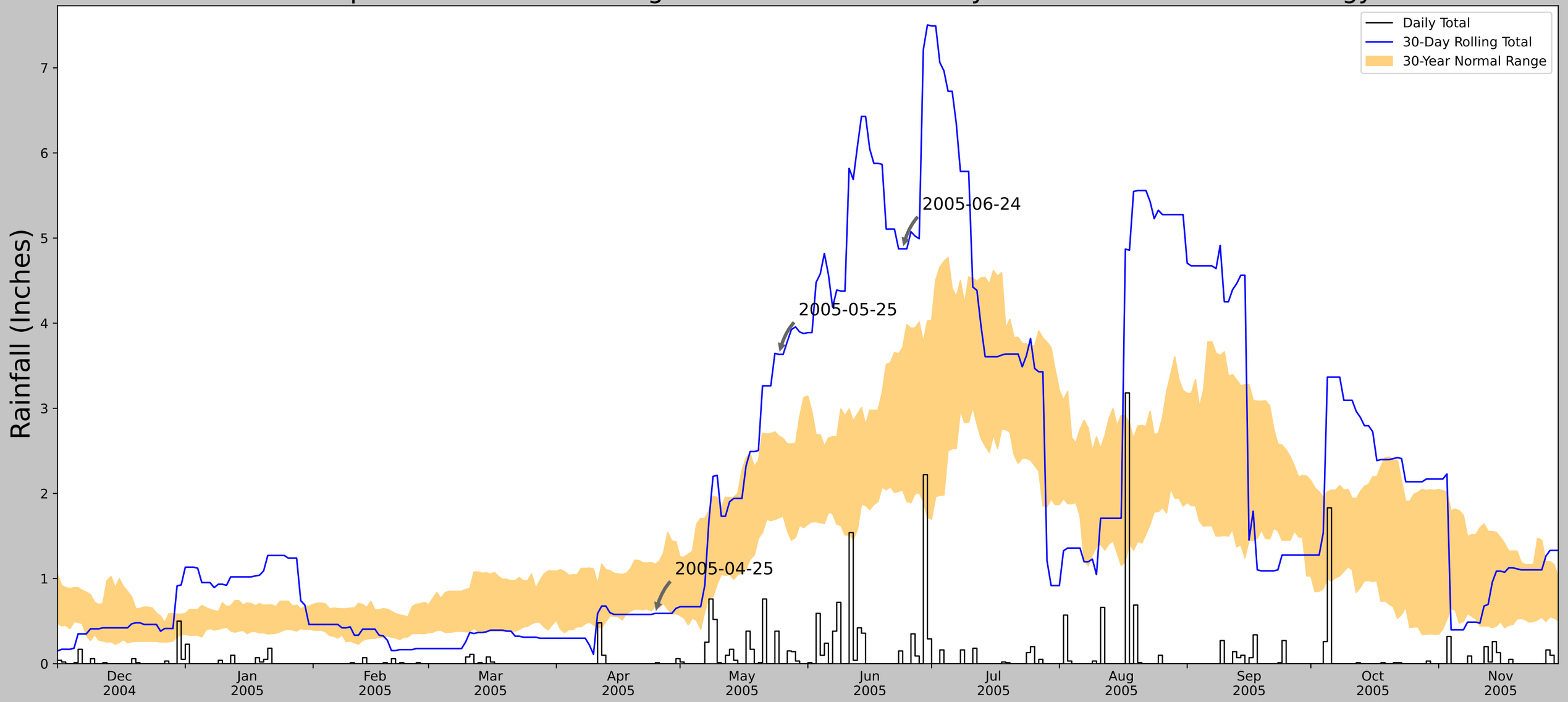
Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
GRAND FORKS INTL AP	47.9428, -97.1831	837.927	10.641	76.121	5.598	11233	90
GRAND FORKS UNIV (NWS)	47.9217, -97.0975	830.053	4.222	7.874	1.933	120	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	47.93510, -97.4127
Observation Date	2005-06-24
Elevation (ft)	914.048
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2005-06-24	2.039764	3.711811	4.874016	Wet	3	3	9
2005-05-25	1.715354	2.674016	3.633858	Wet	3	2	6
2005-04-25	0.674016	1.169291	0.590551	Dry	1	1	1
Result							Wetter than Normal - 16

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
GRAND FORKS INTL AP	47.9428, -97.1831	837.927	10.641	76.121	5.598	11233	90
GRAND FORKS UNIV (NWS)	47.9217, -97.0975	830.053	4.222	7.874	1.933	120	0

ATTACHMENT B

SOIL SURVEY FOR GRAND FORKS PROJECT AREA

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United States Department of Agriculture

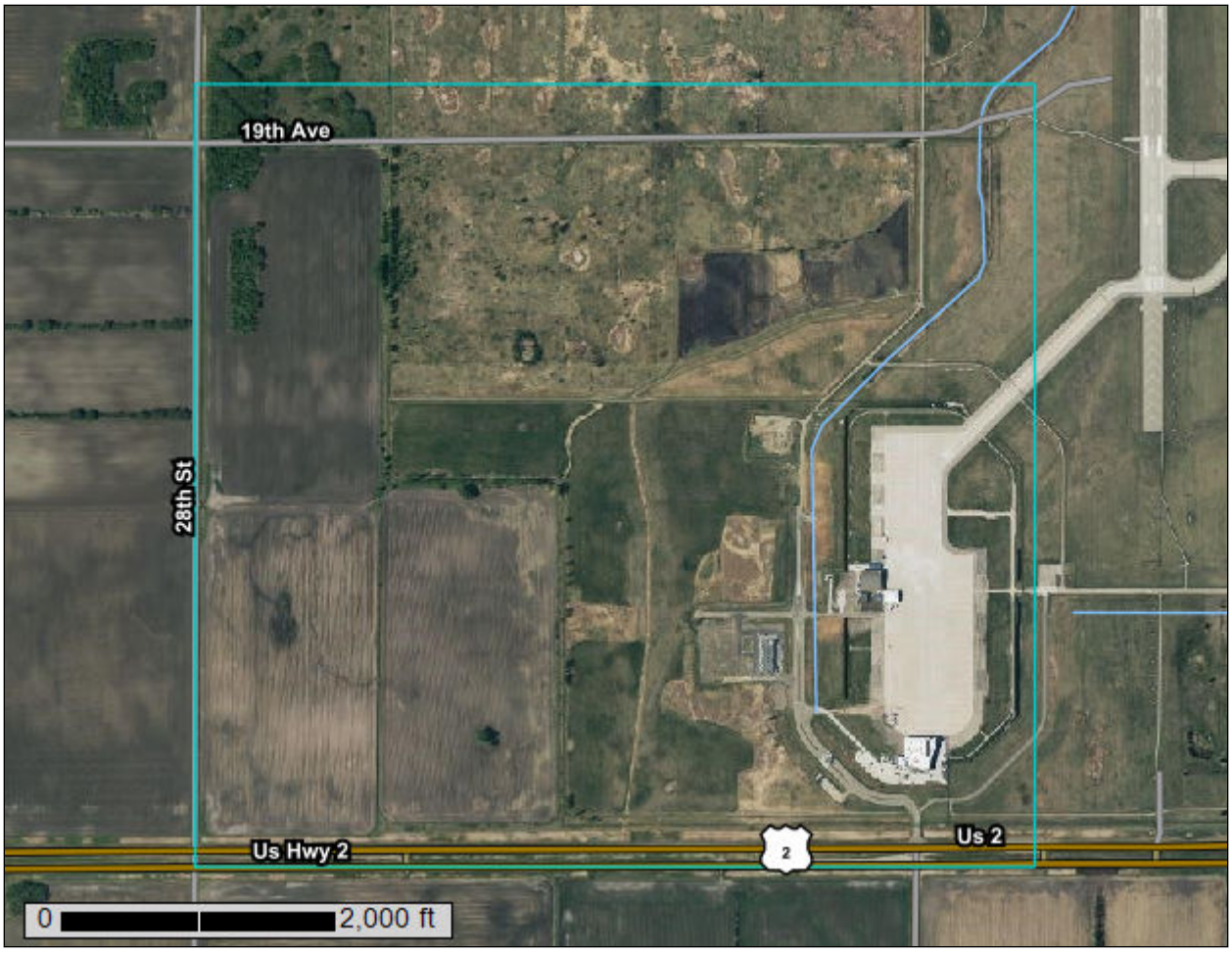
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Grand Forks County, North Dakota

Grand Sky EUL 2023



September 20, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

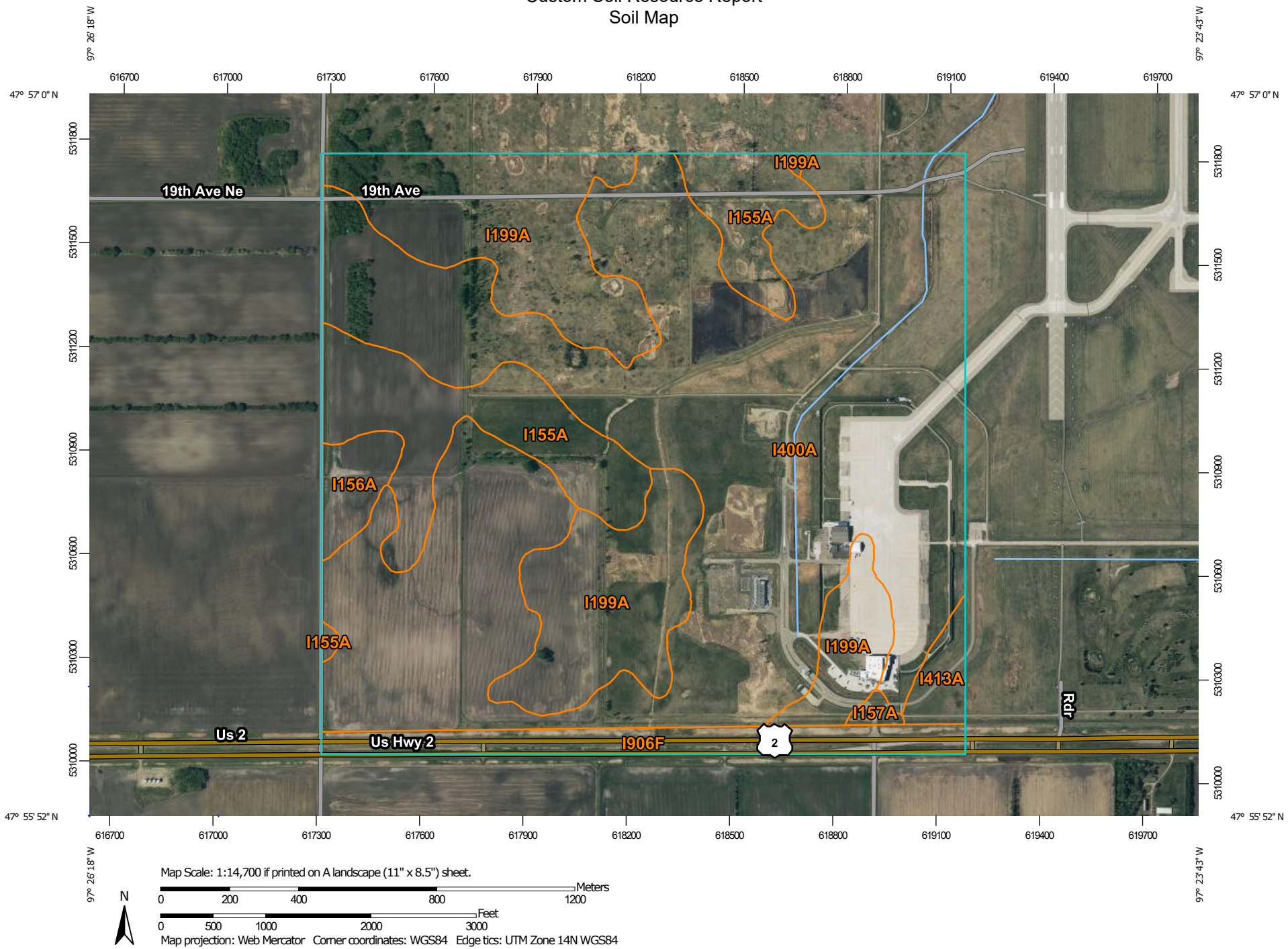
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Grand Forks County, North Dakota
Survey Area Data: Version 26, Sep 8, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 28, 2021—Jul 1, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
I155A	Grimstad fine sandy loam, 0 to 2 percent slopes	91.4	11.3%
I156A	Antler silt loam, 0 to 2 percent slopes	14.0	1.7%
I157A	Antler, moderately saline-Mustinka silty clay loams, 0 to 2 percent slopes	2.5	0.3%
I199A	Antler-Mustinka silt loams, 0 to 2 percent slopes	161.8	20.0%
I400A	Gilby loam, 0 to 2 percent slopes	491.8	60.9%
I413A	Lankin loam, 0 to 2 percent slopes	10.2	1.3%
I906F	Orthents-Aquents-Urban Land, highway complex, 0 to 35 percent slopes	35.4	4.4%
Totals for Area of Interest		**807.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a

given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Grand Forks County, North Dakota

I155A—Grimstad fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2mbkq
Elevation: 750 to 1,250 feet
Mean annual precipitation: 19 to 24 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Grimstad and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grimstad

Setting

Landform: Deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy outwash over loamy till

Typical profile

Ap - 0 to 9 inches: fine sandy loam
Bk - 9 to 22 inches: loamy fine sand
C1 - 22 to 32 inches: loamy fine sand
2C2 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 3.9 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: R056AY087ND - Limy Subirrigated
Forage suitability group: Subirrigated (G056XY700ND)
Other vegetative classification: Subirrigated (G056XY700ND)

Hydric soil rating: No

Minor Components

Arveson

Percent of map unit: 10 percent
Landform: Deltas
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R056AY102ND - Wet Meadow
Other vegetative classification: Wet (G056XY900ND)
Hydric soil rating: Yes

Ulen

Percent of map unit: 5 percent
Landform: Deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R056AY087ND - Limy Subirrigated
Other vegetative classification: Subirrigated (G056XY700ND)
Hydric soil rating: No

I156A—Antler silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2mb9g
Elevation: 750 to 1,480 feet
Mean annual precipitation: 20 to 26 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Antler and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Antler

Setting

Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty glaciolacustrine deposits over loamy till

Typical profile

Ap - 0 to 12 inches: silt loam
Ak - 12 to 15 inches: clay loam

Bk1 - 15 to 25 inches: clay loam
2Bk2 - 25 to 28 inches: gravelly clay loam
2C1 - 28 to 35 inches: clay loam
2C2 - 35 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R056AY087ND - Limy Subirrigated
Forage suitability group: Subirrigated (G056XY700ND)
Other vegetative classification: Subirrigated (G056XY700ND)
Hydric soil rating: No

Minor Components

Lankin

Percent of map unit: 5 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R056AY094ND - Loamy
Other vegetative classification: Overflow (G056XY500ND)
Hydric soil rating: No

Antler, moderately saline

Percent of map unit: 5 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R056AY089ND - Saline Lowland
Other vegetative classification: Saline (G056XY895ND)
Hydric soil rating: No

Mustinka

Percent of map unit: 5 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear

Ecological site: R056AY084ND - Clayey
Other vegetative classification: Clayey Subsoil (G056XY210ND)
Hydric soil rating: Yes

Winger

Percent of map unit: 5 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R056AY102ND - Wet Meadow
Other vegetative classification: Wet (G056XY900ND)
Hydric soil rating: Yes

l157A—Antler, moderately saline-Mustinka silty clay loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2mb9h
Elevation: 750 to 1,480 feet
Mean annual precipitation: 20 to 26 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Antler, moderately saline, and similar soils: 55 percent
Mustinka and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Antler, Moderately Saline

Setting

Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty glaciolacustrine deposits over loamy till

Typical profile

Ap - 0 to 12 inches: silty clay loam
Ak - 12 to 15 inches: clay loam
Bk1 - 15 to 25 inches: clay loam
2Bk2 - 25 to 28 inches: clay loam
2C1 - 28 to 35 inches: clay loam
2C2 - 35 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Gypsum, maximum content: 6 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: C
Ecological site: R056AY089ND - Saline Lowland
Forage suitability group: Saline (G056XY895ND)
Other vegetative classification: Saline (G056XY895ND)
Hydric soil rating: No

Description of Mustinka

Setting

Landform: Till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Silty and clayey glaciolacustrine deposits over loamy till

Typical profile

Ap - 0 to 9 inches: silty clay loam
A - 9 to 14 inches: silty clay loam
Btg - 14 to 19 inches: silty clay
Bkg - 19 to 41 inches: silty clay loam
2Cyg - 41 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R056AY084ND - Clayey
Forage suitability group: Clayey Subsoil (G056XY210ND)
Other vegetative classification: Clayey Subsoil (G056XY210ND)

Hydric soil rating: Yes

Minor Components

Antler

Percent of map unit: 5 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R056AY087ND - Limy Subirrigated
Other vegetative classification: Subirrigated (G056XY700ND)
Hydric soil rating: No

Winger, moderately saline

Percent of map unit: 5 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R056AY089ND - Saline Lowland
Other vegetative classification: Saline (G056XY895ND)
Hydric soil rating: Yes

Lankin

Percent of map unit: 5 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R056AY094ND - Loamy
Other vegetative classification: Overflow (G056XY500ND)
Hydric soil rating: No

I199A—Antler-Mustinka silt loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2l6w9
Elevation: 750 to 1,480 feet
Mean annual precipitation: 20 to 26 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Antler and similar soils: 55 percent
Mustinka and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Antler

Setting

Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty glaciolacustrine deposits over loamy till

Typical profile

Ap - 0 to 12 inches: silt loam
Ak - 12 to 15 inches: clay loam
Bk1 - 15 to 25 inches: clay loam
2Bk2 - 25 to 28 inches: gravelly clay loam
2C1 - 28 to 35 inches: clay loam
2C2 - 35 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R056AY087ND - Limy Subirrigated
Forage suitability group: Subirrigated (G056XY700ND)
Other vegetative classification: Subirrigated (G056XY700ND)
Hydric soil rating: No

Description of Mustinka

Setting

Landform: Till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Silty and clayey glaciolacustrine deposits over loamy till

Typical profile

Ap - 0 to 14 inches: silt loam
Btg - 14 to 24 inches: silty clay
Bkg - 24 to 36 inches: silty clay loam
2Cyg - 36 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R056AY084ND - Clayey
Forage suitability group: Clayey Subsoil (G056XY210ND)
Other vegetative classification: Clayey Subsoil (G056XY210ND)
Hydric soil rating: Yes

Minor Components

Antler, moderately saline

Percent of map unit: 5 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R056AY089ND - Saline Lowland
Other vegetative classification: Saline (G056XY895ND)
Hydric soil rating: No

Winger

Percent of map unit: 5 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R056AY102ND - Wet Meadow
Other vegetative classification: Wet (G056XY900ND)
Hydric soil rating: Yes

Lankin

Percent of map unit: 5 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R056AY094ND - Loamy
Other vegetative classification: Overflow (G056XY500ND)
Hydric soil rating: No

l400A—Gilby loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1nyyv
Elevation: 750 to 1,480 feet
Mean annual precipitation: 20 to 26 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Gilby and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gilby

Setting

Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciolacustrine deposits over loamy till

Typical profile

Ap - 0 to 10 inches: loam
Bk - 10 to 24 inches: loam
2C - 24 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R056AY087ND - Limy Subirrigated

Forage suitability group: Subirrigated (G056XY700ND)
Other vegetative classification: Subirrigated (G056XY700ND)
Hydric soil rating: No

Minor Components

Mustinka
Percent of map unit: 8 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R056AY084ND - Clayey
Other vegetative classification: Clayey Subsoil (G056XY210ND)
Hydric soil rating: Yes

Winger
Percent of map unit: 7 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R056AY102ND - Wet Meadow
Other vegetative classification: Wet (G056XY900ND)
Hydric soil rating: Yes

Gilby, moderately saline
Percent of map unit: 5 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R056AY089ND - Saline Lowland
Other vegetative classification: Saline (G056XY895ND)
Hydric soil rating: No

l413A—Lankin loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 1nyz9
Elevation: 750 to 1,480 feet
Mean annual precipitation: 20 to 26 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Lankin and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lankin

Setting

Landform: Till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciolacustrine deposits over loamy till

Typical profile

Ap - 0 to 7 inches: loam
A - 7 to 11 inches: loam
Bw1 - 11 to 18 inches: loam
2Bw2 - 18 to 25 inches: loam
2Bk - 25 to 34 inches: clay loam
2C - 34 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: C
Ecological site: R056AY094ND - Loamy
Forage suitability group: Overflow (G056XY500ND)
Other vegetative classification: Overflow (G056XY500ND)
Hydric soil rating: No

Minor Components

Fordville

Percent of map unit: 10 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R056AY094ND - Loamy
Other vegetative classification: Droughty Loam (G056XY120ND)
Hydric soil rating: No

Wyard

Percent of map unit: 8 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Concave

Across-slope shape: Linear
Ecological site: R056AY095ND - Subirrigated
Other vegetative classification: Subirrigated (G056XY700ND)
Hydric soil rating: No

Bohnsack

Percent of map unit: 4 percent
Landform: Till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R056AY087ND - Limy Subirrigated
Other vegetative classification: Subirrigated (G056XY700ND)
Hydric soil rating: No

Tonka

Percent of map unit: 3 percent
Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R056AY102ND - Wet Meadow
Other vegetative classification: Wet (G056XY900ND)
Hydric soil rating: Yes

I906F—Orthents-Aquents-Urban Land, highway complex, 0 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2qktx
Elevation: 750 to 1,250 feet
Mean annual precipitation: 19 to 24 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Orthents and similar soils: 30 percent
Aquents and similar soils: 25 percent
Orthents and similar soils: 25 percent
Urban land, highway: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Orthents

Setting

Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Glaciofluvial deposits and/or glaciolacustrine deposits

Typical profile

A - 0 to 5 inches: silty clay loam
AC - 5 to 9 inches: silty clay loam
C - 9 to 60 inches: silty clay loam

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R056AY088ND - Loamy Overflow
Forage suitability group: Loam (G056XY100ND)
Other vegetative classification: Loam (G056XY100ND)
Hydric soil rating: No

Description of Aquents

Setting

Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Fine-silty glaciolacustrine deposits over clayey glaciolacustrine deposits

Typical profile

A - 0 to 5 inches: silty clay loam
AC - 5 to 9 inches: silty clay loam
Cg1 - 9 to 52 inches: silt loam
2Cg2 - 52 to 81 inches: silty clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R056AY102ND - Wet Meadow
Forage suitability group: Wet (G056XY900ND)
Other vegetative classification: Wet (G056XY900ND)
Hydric soil rating: Yes

Description of Orthents

Setting

Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Glaciofluvial deposits and/or glaciolacustrine deposits

Typical profile

A - 0 to 5 inches: silty clay loam
AC - 5 to 9 inches: silty clay loam
C - 9 to 60 inches: silty clay loam

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R056AY088ND - Loamy Overflow
Forage suitability group: Loam (G056XY100ND)
Other vegetative classification: Loam (G056XY100ND)
Hydric soil rating: No

Description of Urban Land, Highway

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Not suited (G056XY000ND)
Other vegetative classification: Not suited (G056XY000ND)

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ATTACHMENT C

WETLAND DATA FORMS AND REPRESENTATIVE PHOTOGRAPHS

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Grand Sky | City/County: Grand Forks | Sampling Date: September 23, 2023
Applicant/Owner: US Air Force, GFAFB | State: ND | Sampling Point: DP-01W
Investigators: C. Lotts; M. Hayes; K. Erwin; M. Correiro | Section, Township, Range:
Landform: flat prairie | Local relief (concave,convex,none): concave | Slope (%): 0 - 2
Subregion (LRR or MLRA): LRR F | Lat: | Long: | Datum: NAD83
Soil Map Unit Name: Antler-Mustinka silt loams, 0 to 2 percent slopes | NWI classification:
Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)
Are Vegetation X Soil X or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soils Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: All parameters met.
Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.
FLS-63. Meadow mowed for hay.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-01W

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)			
1. *Phalaris arundinacea*	95%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95% = Total Cover		
50% of total cover: 48%	20% of total cover: 19%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	0%	x 1 =	0	
FACW species	95%	x 2 =	1.9	
FAC species	0%	x 3 =	0	
FACU species	0%	x 4 =	0	
UPL species	0%	x 5 =	0	
Column Totals:	95%	(A)	1.9	(B)
Prevalence Index = B/A =			2.00	

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Used reed canary grass (Phalaris arundinacea) as primary indicator of extent. Normal plant community not present due to long term drought.

SOIL

Sampling Point: DP-01W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					silty clay loam	
5-10	10YR 3/2	60					loam	
5-10	10YR 6/2	39	10YR 5/6	1	C	M	loam	oxidized rhizospheres on roots
10-19	10YR 7/2	70	10YR 4/6	1	C	M	sandy loam	gravel layer at 20 inches
10-19	10YR 3/1	29					sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- X Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR I & J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ V. Shallow Dark Surf. (TF12)
- ___ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

Gravel layer at 20 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >19

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest dri

DP-01-W: Dominant vegetation, *Phalaris arundinacea* (FACW), FLS-63 wetland

DP-01-W: Soil meeting F3 & F7 indicators

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Grand Sky | City/County: Grand Forks | Sampling Date: September 23, 2023
Applicant/Owner: US Air Force, GFAFB | State: ND | Sampling Point: DP-01U
Investigators: C. Lotts; M. Hayes; K. Erwin; M. Correiro | Section, Township, Range:
Landform: side slope | Local relief (concave,convex,none): none | Slope (%): 0 - 2
Subregion (LRR or MLRA): LRR F | Lat: | Long: | Datum: NAD83
Soil Map Unit Name: Antler-Mustinka silt loams, 0 to 2 percent slopes | NWI classification:
Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)
Are Vegetation X Soil X or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks: All parameters not met.
Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.
FLS-63. Meadow mowed for hay.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-01U

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum	(Plot size: 30' Radius)			
1.				
2.				
3.				
4.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum	(Plot size: 15' Radius)			
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum	(Plot size: 5' Radius)			
1.	*Sorghastrum nutans*	80%	Y	FACU
2.	*Elymus repens*	10%		FACU
3.	*Phalaris arundinacea*	5%		FACW
4.	*Euphorbia escula*	2%		UPL
5.				
6.				
7.				
8.				
9.				
10.				
		97%	= Total Cover	
	50% of total cover: 49%	20% of total cover: 19%		
Woody Vine Stratum	(Plot size: 15' Radius)			
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	0%	x 1 =	0	
FACW species	5%	x 2 =	0.1	
FAC species	0%	x 3 =	0	
FACU species	90%	x 4 =	3.6	
UPL species	2%	x 5 =	0.1	
Column Totals:	97%	(A)	3.8	(B)
Prevalence Index = B/A =			3.92	

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks: Area mowed for hay but plants present.
Vegetation parameter not met.

SOIL Sampling Point: DP-01U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					silt loam	
16-18	10YR 6/2	60					loam	
16-18	10YR 3/1	40					loam	
18-22	10YR 2/1	80	10YR 6/2	19	D	M	loam	
18-22			10YR 3/6	1	C	M	loam	
22-32	10YR 3/1	98	10YR 7/1	2	D	M	loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR F)
___ 1 cm Muck (A9) (LRR F, G, H)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1) (LRR O, S)
___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
___ 5 cm Mucky Peat or Peat (S3) (LRR F)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ LoamyralMucky Minea (F1)
___ Loamy Gleyed Martix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

__ 1 cm Muck (A9) (LRR I & J)
__ Coast Prairie Redox (A16) (LRR F, G, H)
__ Dark Surface (S7) (LRR G)
__ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ V. Shallow Dark Surf. (TF12)
__ Other (Explain in Remarks)

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

Retrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soils Present? Yes ___ No **X**

Remarks: Soil parameter not met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerials (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Aquatic Fauna (B13)
___ Marl Deposits (B15) (LRR U)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

_____ Surface Soil Cracks (B6)
_____ Sparsely Vegetated Concave Surface (B8)
_____ Drainage Patterns (B10)
_____ Oxidized Rhizospheres on Living Roots (C3)
_____ Crayfish Burrows (C8)
_____ Saturation Visible on Aerial Imagery (C9)
_____ Geomorphic Position (D2)
_____ FAC-Neutral Test (D5)
_____ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____
Water Table Present? Yes ___ No X Depth (inches): >32
Saturation Present? Yes ___ No X Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes ___ No **X**

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

Remarks: Hydrology parameter not met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions. Recent rain.

DP-01-U: Dominant vegetation, *Sorghastrum nutans* (FACU)

DP-01-U: Soil did not meet indicators

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 23, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-03U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	prairie, flat	Local relief (concave,convex,none):	none	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Antler-Mustinka silt loams, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-54. Not a wetland. Point is within a wetland that was delineated in 2003. Vegetation and soil do not meet indicators.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-03U

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)			
1. *Elymus repens*	80%	Y	FACU
2. *Sorghastrum nutans*	10%		FACU
3. *Phalaris arundinacea*	5%		FACW
4. *Sonchus arvensis*	4%		FAC
5. *Mentha arvensis*	3%		FACW
6. *Medicago lupulina*	1%		FACU
7.			
8.			
9.			
10.			
	103% = Total Cover		
50% of total cover: 52%	20% of total cover: 21%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:			
OBL species	0%	x 1 =	0
FACW species	8%	x 2 =	0.16
FAC species	4%	x 3 =	0.12
FACU species	91%	x 4 =	3.64
UPL species	0%	x 5 =	0
Column Totals:	103% (A)		3.92 (B)
Prevalence Index = B/A =			3.81

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks: Vegetation community affected by severe drought and not normal presence.

Vegetation parameter not met.

SOIL

Sampling Point: DP-03U

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					silt loam	
12-19	10YR 3/2	90	10YR 6/2	10	D	M	sandy loam	
19-29	2.5Y 5/3	95	10YR 4/8	5	C	M	sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ___ No **X**

Remarks: Soil parameter not met.
Depleted redox too deep for F4, and not enough for 3/2.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >29

Saturation Present? Yes ___ No X Depth (inches): ___
(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-03-U : Dominant vegetation, *Elymus repens (FACU)*

DP-03-U: Soil lacks enough redox features to meet indicators

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Grand Sky | City/County: Grand Forks | Sampling Date: September 23, 2023
Applicant/Owner: US Air Force, GFAFB | State: ND | Sampling Point: DP-03W
Investigators: C. Lotts; M. Hayes; K. Erwin; M. Correiro | Section, Township, Range:
Landform: pothole depression | Local relief (concave,convex,none): concave | Slope (%): 0 - 2
Subregion (LRR or MLRA): LRR F | Lat: | Long: | Datum: NAD83
Soil Map Unit Name: Antler-Mustinka silt loams, 0 to 2 percent slopes | NWI classification:
Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)
Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation X Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soils Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: All parameters met.
Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.
FLS-54. Mowed for hay.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-03W

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)			
1. *Carex utriculata*	50%	Y	OBL
2. *Elymus repens*	40%	Y	FACU
3. *Cirsium arvense*	5%		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95% = Total Cover		
50% of total cover: 48%	20% of total cover: 19%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	50%	x 1 =	0.5	
FACW species	0%	x 2 =	0	
FAC species	0%	x 3 =	0	
FACU species	45%	x 4 =	1.8	
UPL species	0%	x 5 =	0	
Column Totals:	95%	(A)	2.3	(B)
Prevalence Index = B/A =			2.42	

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Under normal climatic conditions the plant community would be hydric. C. utriculata was used as primary vegetation indicator. During severe drought conditions thr
Vegetation parameter met.

SOIL

Sampling Point: DP-03W

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					loam	
10-19	10YR 3/1	100					sandy loam	
19-25	10YR 4/2	97	10YR 7/6	1	C	M	sandy loam	Gravel layer at 25 inches
19-25			2.5YR 4/8	2	C	M	sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >25

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-03-W: FLS-55

DP-03-W: Soil meeting A12 soil indicator, in FLS-55 wetland

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 23, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-04U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	level plain	Local relief (concave,convex,none):	concave	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	
Datum:	NAD83				
Soil Map Unit Name:	Grimstad fine sandy loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-54. Point is within wetland delineated in 2013, mowed for hay but plants present.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-04U

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)			
1. *Carex utriculata*	50%	Y	OBL
2. *Sonchus arvensis*	20%	Y	FAC
3. *Mentha arvensis*	10%		FACW
4. *Teucrium canadense*	5%		FACW
5. *Sorghastrum nutans*	3%		FACU
6. *Elymus repens*	2%		FACU
7.			
8.			
9.			
10.			
	90% = Total Cover		
50% of total cover: 45%	20% of total cover: 18%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	50%	x 1 =	0.5	
FACW species	15%	x 2 =	0.3	
FAC species	20%	x 3 =	0.6	
FACU species	5%	x 4 =	0.2	
UPL species	0%	x 5 =	0	
Column Totals:	90%	(A)	1.6	(B)
Prevalence Index = B/A =			1.78	

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes **X** No ____

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter met.

SOIL

Sampling Point: DP-04U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	95	10YR 6/2	55	D	M	loam	
12-24	2.5YR 5/2	99	5YR 5/8	1	C	M	sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ___ No **X**

Remarks: Soil parameter not met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >24

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-04-U: Dominant hydrophytic vegetation, *Carex utriculata (OBL)* and *Sonchus arvensis* (FAC) and hydrology present

DP-04-U: Soil lacks enough redox features to meet indicators

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Grand Sky | City/County: Grand Forks | Sampling Date: September 24, 2023
Applicant/Owner: US Air Force, GFAFB | State: ND | Sampling Point: DP-05W
Investigators: C. Lotts; M. Hayes; K. Erwin; M. Correiro | Section, Township, Range:
Landform: drainage ditch | Local relief (concave,convex,none): concave | Slope (%): 0 - 2
Subregion (LRR or MLRA): LRR F | Lat: | Long: | Datum: NAD83
Soil Map Unit Name: Gilby loam, 0 to 2 percent slopes | NWI classification:
Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)
Are Vegetation X Soil ___ or Hydrology ___ signficantly disturbed? Are "Normal Circumstances" present? Yes ___ No X
Are Vegetation X Soil ___ or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** Yes X No ___
Hydric Soils Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes X	No ___	

Remarks: All parameters met.
Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.
FLS-31B, representative for 31A and 31B. Mowed drainage ditch.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-05W

			Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30' Radius)					
1.					
2.					
3.					
4.					
			0%		= Total Cover
50% of total cover: 0%			20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)					
1.					
2.					
3.					
4.					
5.					
			0%		= Total Cover
50% of total cover: 0%			20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)					
1.	*Eleocharis sp.*	*	80%	Y	OBL
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
			80%		= Total Cover
50% of total cover: 40%			20% of total cover: 16%		
Woody Vine Stratum (Plot size: 15' Radius)					
1.					
2.					
			0%		= Total Cover
50% of total cover: 0%			20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	80%	x 1 =	0.8	
FACW species	0%	x 2 =	0	
FAC species	0%	x 3 =	0	
FACU species	0%	x 4 =	0	
UPL species	0%	x 5 =	0	
Column Totals:	80%	(A)	0.8	(B)
Prevalence Index = B/A =			1.00	

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: All *Eleocharis* species are FACW or OBL. Linear feature regular mowed so no trees, shrubs, vines present.
Vegetation parameter met.

SOIL

Sampling Point: DP-05W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100					loam	
4-10	10YR 4/1	80	10YR 6/6	10	C	M	clay loam	
4-10	10YR 3/1	10					clay loam	
10-16	10YR 3/1	80	10YR 6/6	10	C	M	clay loam	
10-16	10YR 4/1	10					clay loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR I & J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ V. Shallow Dark Surf. (TF12)
- ___ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present?	Yes	X	No	Depth (inches):	2 in.
Water Table Present?	Yes		No	X Depth (inches):	>16
Saturation Present? (includes capillary fringe)	Yes	X	No	Depth (inches):	16 in.

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

Recent rainfall in last day.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-05-W: Wetland ditch FLS-31b dominant vegetation Eleocharis sp.

DP-05-W: Soil meeting F3 indicator

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 24, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-05U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:		Local relief (concave,convex,none):	convex	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Gilby loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?**	Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-31B, representative for 31A and 31B. Side slope or drainage ditch, regular mowed and seeded with lawn grasses.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-05U

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Rosa arkansana*	1%	Y	FACU
2.			
3.			
4.			
5.			
	1% = Total Cover		
50% of total cover: 1%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)			
1. *Festuca trachyphylla*	95%	Y	UPL
2. *Symphyotrichum ericoides*	1%		FACU
3. *Apocynum cannabinum*	1%		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	97% = Total Cover		
50% of total cover: 49%	20% of total cover: 19%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

Prevalence Index worksheet:

Total % Cover of:			
OBL species	0%	x 1 =	0
FACW species	0%	x 2 =	0
FAC species	1%	x 3 =	0.03
FACU species	2%	x 4 =	0.08
UPL species	95%	x 5 =	4.75
Column Totals:	98%	(A)	4.86 (B)
Prevalence Index = B/A =			4.96

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks: Regularly mowed lawn adjacent to drainage ditch.

Vegetation parameter not met.

SOIL

Sampling Point: DP-05U

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 2/2	100					loam	
9-15	10YR 2/2	70	10YR 4/3	30	C	M	loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR I & J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ V. Shallow Dark Surf. (TF12)
- ___ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present?

Yes ___ No X

Remarks: Soil parameter not met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >15

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present?

Yes ___ No X

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

Remarks: Hydrology parameter not met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-05-U: Hydrology, Vegetation, and Soils not meeting indicators

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 24, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-07U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	hillslope	Local relief (concave,convex,none):	none	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Gilby loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?**	Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-02. Point is in an area mowed for hay but vegetation is present.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-07U

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30' Radius)				
1.				
2.				
3.				
4.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:		0%
Sapling/Shrub Stratum (Plot size: 15' Radius)				
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:		0%
Herb Stratum (Plot size: 5' Radius)				
1.	*Sorghastrum nutans*	57%	Y	FACU
2.	*Phalaris arundinacea*	28%	Y	FACW
3.	*Typha X glauca*	5%		OBL
4.	*Medicago sativa*	10%		UPL
5.				
6.				
7.				
8.				
9.				
10.				
		100%	= Total Cover	
	50% of total cover: 50%	20% of total cover:		20%
Woody Vine Stratum (Plot size: 15' Radius)				
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:		0%

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	5%	x 1 =	0.05	
FACW species	28%	x 2 =	0.56	
FAC species	0%	x 3 =	0	
FACU species	57%	x 4 =	2.28	
UPL species	10%	x 5 =	0.5	
Column Totals:	100%	(A)	3.39	(B)
Prevalence Index = B/A =			3.39	

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks: Mowed.

Vegetation parameter not met.

SOIL

Sampling Point: DP-07U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					loam	
16-21	10YR 4/1	100					sandy loam	
21-26	10YR 3/2	40					sandy loam	coarse gravel approximate 60% g

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ___ No **X**

Remarks: Soil parameter not met.
Lacking redox necessary to meet indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	
Water Table Present?	Yes ___	No X	Depth (inches):	>26
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	

Wetland Hydrology Present? Yes ___ No **X**

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

Remarks: Hydrology parameter not met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-07-U: Vegetation outside wetland boundary of FLS-02 dominated by *Sorghastrum nutans* (FACU) and *Phalaris arundinacea* (FACW)

DP-07-U: Soil not meeting soil indicators

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Grand Sky | City/County: Grand Forks | Sampling Date: September 24, 2023
Applicant/Owner: US Air Force, GFAFB | State: ND | Sampling Point: DP-07W
Investigators: C. Lotts; M. Hayes; K. Erwin; M. Correiro | Section, Township, Range:
Landform: depression | Local relief (concave,convex,none): concave | Slope (%): 0 - 2
Subregion (LRR or MLRA): LRR F | Lat: | Long: | Datum: NAD83
Soil Map Unit Name: Gilby loam, 0 to 2 percent slopes | NWI classification:
Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)
Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X No ____
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters met.
Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.
FLS-02. Wetland dominated by cattail and reed canary grass.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-07W

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)			
1. *Phalaris arundinacea*	60%	Y	FACW
2. *Typha angustifolia*	35%	Y	OBL
3. *Rumex crispus*	3%		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	98% = Total Cover		
50% of total cover: 49%	20% of total cover: 20%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:			
OBL species	35%	x 1 =	0.35
FACW species	60%	x 2 =	1.2
FAC species	3%	x 3 =	0.09
FACU species	0%	x 4 =	0
UPL species	0%	x 5 =	0
Column Totals:	98% (A)		1.64 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
Vegetation parameter met.

SOIL Sampling Point: DP-07W

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					silt loam	
16-26	10YR 4/2	98	10YR 3/4	2	C	M	sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >26

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-07-W: Wetland vegetation at north boundary of FLS-02

DP-07-W: Soil meeting A12 indicator

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 27, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-11U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	hillslope	Local relief (concave,convex,none):	none	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Gilby loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation X Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation X Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-17. Mowed lawn drainage to wetland..

VEGETATION - Use scientific names of plants.

Sampling Point: DP-11U

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30' Radius)				
1.				
2.				
3.				
4.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)				
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)				
1.	*Festuca trachyphylla*	95%	Y	UPL
2.	*Elymus repens*	5%		FACU
3.	*Taraxacum officinale*	2%		FACU
4.	*Trifolium repens*	1%		FACU
5.				
6.				
7.				
8.				
9.				
10.				
		103%	= Total Cover	
	50% of total cover: 52%	20% of total cover: 21%		
Woody Vine Stratum (Plot size: 15' Radius)				
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:			
OBL species	0%	x 1 =	0
FACW species	0%	x 2 =	0
FAC species	0%	x 3 =	0
FACU species	8%	x 4 =	0.32
UPL species	95%	x 5 =	4.75
Column Totals:	103%	(A)	5.07 (B)
Prevalence Index = B/A =			4.92

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks: Mowed lawn.

Vegetation parameter not met.

SOIL

Sampling Point: DP-11U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/2	100					loam	
16-20	10YR 3/2	95	10YR 5/3	5	C	M	loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present?

Yes ___ No **X**

Remarks: Soil parameter not met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >20

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present?

Yes ___ No **X**

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

Remarks: Hydrology parameter not met.

Mowed lawn.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-11-U: Non-hydric soil

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 27, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-11W
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	basin/stormwater swale	Local relief (concave,convex,none):	concave	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Gilby loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation X Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X No ____
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-17. Area is a swale in a mowed lawn.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-11W

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30' Radius)				
1.				
2.				
3.				
4.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)				
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)				
1.	*Eleocharis palustris*	90%	Y	OBL
2.	*Elymus repens*	10%		FACU
3.	*Sonchus arvensis*	1%		FAC
4.				
5.				
6.				
7.				
8.				
9.				
10.				
		101%	= Total Cover	
	50% of total cover: 51%	20% of total cover: 20%		
Woody Vine Stratum (Plot size: 15' Radius)				
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:			
OBL species	90%	x 1 =	0.9
FACW species	0%	x 2 =	0
FAC species	1%	x 3 =	0.03
FACU species	10%	x 4 =	0.4
UPL species	0%	x 5 =	0
Column Totals:	101% (A)		1.33 (B)
Prevalence Index = B/A =			1.32

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Swale in lawn - lawn grasses stop and are replaced by quack grass. Point is at lowest by culvert. Center has only Eleocharis sp. (all sp. Are FACW or OBL).

Vegetation parameter met.

SOIL

Sampling Point: DP-11W

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	98	10YR 5/4	2	C	M	loam	
10-15	10YR 6/2	100					loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR I & J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ V. Shallow Dark Surf. (TF12)
- ___ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >15

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

Lowest point in drainage swale.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-11-W: Depleted Matrix hydric soil indicator (F3), FLS-17

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Grand Sky | City/County: Grand Forks | Sampling Date: September 27, 2023
Applicant/Owner: US Air Force, GFAFB | State: ND | Sampling Point: DP-12U
Investigators: C. Lotts; M. Hayes; K. Erwin; M. Correiro | Section, Township, Range:
Landform: berm crest | Local relief (concave,convex,none): convex | Slope (%): 0 - 2
Subregion (LRR or MLRA): LRR F | Lat: | Long: | Datum: NAD83
Soil Map Unit Name: Antler-Mustinka silt loams, 0 to 2 percent slopes | NWI classification:
Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)
Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks: All parameters not met.
Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.
Berm between ditches. FLS-13b and FLS-07b.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-12U

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)			
1. *Bromus inermis*	90%	Y	UPL
2. *Solidago canadensis*	3%		FACU
3. *Grindelia squarrosa*	3%		UPL
4. *Euphorbia escula*	1%		UPL
5. *Apocynum cannabinum*	1%		FAC
6. *Sonchus arvensis*	1%		FAC
7. *Symphyotrichum ericoides*	1%		FACU
8. *Eragrostis pectinacea*	1%		FAC
9.			
10.			
	101% = Total Cover		
50% of total cover: 51%	20% of total cover: 20%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	0%	x 1 =	0	
FACW species	0%	x 2 =	0	
FAC species	3%	x 3 =	0.09	
FACU species	4%	x 4 =	0.16	
UPL species	94%	x 5 =	4.7	
Column Totals:	101%	(A)	4.95	(B)
Prevalence Index = B/A =			4.90	

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks: Purple lovegrass.
Vegetation parameter not met.

SOIL

Sampling Point: DP-12U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/1	100					loam	
14-16	10YR 3/1	90					loam	
14-16	10YR 3/2	10					loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present?

Yes ___ No **X**

Remarks: Soil parameter not met.
Vegetated berm between wetlands.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >16

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present?

Yes ___ No **X**

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

Remarks: Hydrology parameter not met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-12-U: Non-hydric soils in upland data point

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 27, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-12W
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	ditch	Local relief (concave,convex,none):	concave	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Antler-Mustinka silt loams, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X No ____
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

Vegetated drainage ditch, also representative for FLS-07b ditch portion (FLS-13b and FLS-07b).

VEGETATION - Use scientific names of plants.

Sampling Point: DP-12W

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species	Indicator Status
1. *Fraxinus pennsylvanica*	5%	Y	FAC
2.			
3.			
4.			
	5% = Total Cover		
50% of total cover: 3%	20% of total cover: 1%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)			
1. *Carex utriculata*	85%	Y	OBL
2. *Euphorbia escula*	50%	Y	UPL
3. *Apocynum cannabinum*	20%		FAC
4. *Sonchus arvensis*	20%		FAC
5. *Typha X glauca*	15%		OBL
6. *Phalaris arundinacea*	2%		FACW
7.			
8.			
9.			
10.			
	192% = Total Cover		
50% of total cover: 96%	20% of total cover: 38%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

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:	67%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	100%	x 1 =	1	
FACW species	2%	x 2 =	0.04	
FAC species	45%	x 3 =	1.35	
FACU species	0%	x 4 =	0	
UPL species	50%	x 5 =	2.5	
Column Totals:	197%	(A)	4.89	(B)
Prevalence Index = B/A =			2.48	

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Not mowed.

Vegetation parameter met.

SOIL

Sampling Point: DP-12W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	100					loam	
8-15	10YR 7/2	80					loam	
8-15	10YR 3/1	20					loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.
Vegetated berm between wetlands.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >15

Saturation Present? Yes ___ No X Depth (inches): ___
(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.
Snails with conical shell.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-12-W: Dominant vegetation *Carex utriculata* and *Euphorbia escula* in FLS-13b

DP-12-W: Depleted Matrix hydric soil indicator (F3) in FLS-13b

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 27, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-13U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	crest of berm	Local relief (concave,convex,none):	convex	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Grimstad fine sandy loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?**	Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

Upland near FLS-10a.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-13U

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum	(Plot size: 30' Radius)			
1.				
2.				
3.				
4.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:	0%	
Sapling/Shrub Stratum	(Plot size: 15' Radius)			
1.	*Symphoricarpos occidentalis*	20%	Y	UPL
2.				
3.				
4.				
5.				
		20%	= Total Cover	
	50% of total cover: 10%	20% of total cover:	4%	
Herb Stratum	(Plot size: 5' Radius)			
1.	*Elymus repens*	90%	Y	FACU
2.	*Bromus inermis*	10%		UPL
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
		100%	= Total Cover	
	50% of total cover: 50%	20% of total cover:	20%	
Woody Vine Stratum	(Plot size: 15' Radius)			
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:	0%	

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

Prevalence Index worksheet:

Total % Cover of:			
OBL species	0%	x 1 =	0
FACW species	0%	x 2 =	0
FAC species	0%	x 3 =	0
FACU species	90%	x 4 =	3.6
UPL species	30%	x 5 =	1.5
Column Totals:	120%	(A)	5.1 (B)
Prevalence Index = B/A =			4.25

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter not met.

SOIL

Sampling Point: DP-13U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					loam	
12-19	10YR 4/2	100					sandy loam	no redox features
19-25	10YR 6/3	100					sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ___ No **X**

Remarks: Soil parameter not met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	
Water Table Present?	Yes ___	No X	Depth (inches):	>25
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	

Wetland Hydrology Present? Yes ___ No **X**

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

Remarks: Hydrology parameter not met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-13-U: Non-hydric soils at upland data point

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 27, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-13W
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	ditch bottom	Local relief (concave,convex,none):	concave	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Grimstad fine sandy loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X No ____
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-10a.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-13W

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum	(Plot size: 30' Radius)			
1.	*Fraxinus pennsylvanica*	10%	Y	FAC
2.				
3.				
4.				
		10%	= Total Cover	
	50% of total cover: 5%	20% of total cover:		2%
Sapling/Shrub Stratum	(Plot size: 15' Radius)			
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:		0%
Herb Stratum	(Plot size: 5' Radius)			
1.	*Carex utriculata*	70%	Y	OBL
2.	*Phalaris arundinacea*	60%	Y	FACW
3.	*Typha angustifolia*	10%		OBL
4.	*Cirsium arvense*	1%		FACU
5.				
6.				
7.				
8.				
9.				
10.				
		141%	= Total Cover	
	50% of total cover: 71%	20% of total cover:		28%
Woody Vine Stratum	(Plot size: 15' Radius)			
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:		0%

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:			
OBL species	80%	x 1 =	0.8
FACW species	60%	x 2 =	1.2
FAC species	10%	x 3 =	0.3
FACU species	1%	x 4 =	0.04
UPL species	0%	x 5 =	0
Column Totals:	151%	(A)	2.34 (B)
Prevalence Index = B/A =			1.55

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter met.

SOIL

Sampling Point: DP-13W

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/1	100					loam	
3-6	10YR 4/2	100					sandy loam	
6-12	10YR 7/2	97	10YR 5/6	3	C	M	sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR I & J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ V. Shallow Dark Surf. (TF12)
- ___ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present?

Yes **X** No ___

Remarks: Soil parameter met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >12

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present?

Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-13-W: Depleted Matrix hydric soil indicator (F3) in FLS-10a

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 27, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-14U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	level plain	Local relief (concave,convex,none):	none	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Antler-Mustinka silt loams, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?**	Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

Upland near FLS-10d.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-14U

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum	(Plot size: 30' Radius)			
1.				
2.				
3.				
4.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:	0%	
Sapling/Shrub Stratum	(Plot size: 15' Radius)			
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:	0%	
Herb Stratum	(Plot size: 5' Radius)			
1.	*Cirsium flodmanii*	70%	Y	FAC
2.	*Sorghastrum nutans*	50%	Y	FACU
3.	*Euphorbia escula*	5%		UPL
4.				
5.				
6.				
7.				
8.				
9.				
10.				
		125%	= Total Cover	
	50% of total cover: 63%	20% of total cover:	25%	
Woody Vine Stratum	(Plot size: 15' Radius)			
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:	0%	

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:			
OBL species	0%	x 1 =	0
FACW species	0%	x 2 =	0
FAC species	70%	x 3 =	2.1
FACU species	50%	x 4 =	2
UPL species	5%	x 5 =	0.25
Column Totals:	125% (A)		4.35 (B)
Prevalence Index = B/A =			3.48

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter not met.

SOIL

Sampling Point: DP-14U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 2/1	100					loam	
7-10.5	10YR 4/1	100					sandy loam	no redox
10.5-13	10YR 3/1	100					sandy loam	
13-16	10YR 6/3	60					sandy loam	not fully reduced
13-16	10YR 8/1	40					sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present?

Yes ___ No **X**

Remarks: Soil parameter not met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- _____ Surface Soil Cracks (B6)
- _____ Sparsely Vegetated Concave Surface (B8)
- _____ Drainage Patterns (B10)
- _____ Oxidized Rhizospheres on Living Roots (C3)
- _____ Crayfish Burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Geomorphic Position (D2)
- _____ FAC-Neutral Test (D5)
- _____ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): >16

Saturation Present? Yes ___ No X Depth (inches): _____

(includes capillary fringe)

Wetland Hydrology Present?

Yes ___ No **X**

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

Remarks: Hydrology parameter not met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-14-U: Dark surface with chroma too high to be considered reduced

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 27, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-14W
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	depression	Local relief (concave,convex,none):	concave	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Antler-Mustinka silt loams, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation X Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X No ____
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-10d.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-14W

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species	Indicator Status
1. *Fraxinus pennsylvanica*	20%	Y	FAC
2.			
3.			
4.			
	20% = Total Cover		
50% of total cover: 10%	20% of total cover: 4%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Rosa arkansana*	15%	Y	FACU
2.			
3.			
4.			
5.			
	15% = Total Cover		
50% of total cover: 8%	20% of total cover: 3%		
Herb Stratum (Plot size: 5' Radius)			
1. *Typha X glauca*	80%	Y	OBL
2. *Euphorbia escula*	50%	Y	UPL
3. *Cirsium arvense*	40%		FACU
4. *Carex utriculata*	40%		OBL
5. *Symphyotrichum lanceolatum*	2%		FACW
6. *Apocynum cannabinum*	1%		FAC
7.			
8.			
9.			
10.			
	213% = Total Cover		
50% of total cover: 107%	20% of total cover: 43%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	2%	x 1 =	0.02	
FACW species	1%	x 2 =	0.02	
FAC species	2%	x 3 =	0.06	
FACU species	2%	x 4 =	0.08	
UPL species	1%	x 5 =	0.05	
Column Totals:	8%	(A)	0.23	(B)
Prevalence Index = B/A =			2.88	

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Point is in the edge between 100 percent stand of Typha sp. and fringe vegetation dominated by Carex utriculate. Several weedy species with UPL and FACU indic

Vegetation parameter met.

SOIL Sampling Point: DP-14W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR 2/1	100					loam	
13-18	10YR 3/1	100					loam	
18-25	10YR 5/2	97	10YR 4/4	3	C	M	sandy loam	distinct redox features

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >25

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-14-W: Mix of vegetation with varying indicator status within FLS-10d

DP-14-W: Hydric soil indicator (Thick Dark Surface – A12)

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 27, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-15U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	level plain	Local relief (concave,convex,none):	none	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Antler-Mustinka silt loams, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?**	Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

Upland near FLS-58. Representative for upland around FLS-57, -58 -59 -60.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-15U

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum	(Plot size: 30' Radius)			
1.				
2.				
3.				
4.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:	0%	
Sapling/Shrub Stratum	(Plot size: 15' Radius)			
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:	0%	
Herb Stratum	(Plot size: 5' Radius)			
1.	*Bromus inermis*	40%	Y	UPL
2.	*Sorghastrum nutans*	30%	Y	FACU
3.	*Helianthus maximiliani*	10%		FACU
4.	*Rosa arkansana*	10%		FACU
5.	*Euphorbia escula*	5%		UPL
6.				
7.				
8.				
9.				
10.				
		95%	= Total Cover	
	50% of total cover: 48%	20% of total cover:	19%	
Woody Vine Stratum	(Plot size: 15' Radius)			
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:	0%	

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

Prevalence Index worksheet:

Total % Cover of:				
OBL species	0%	x 1 =	0	
FACW species	0%	x 2 =	0	
FAC species	0%	x 3 =	0	
FACU species	50%	x 4 =	2	
UPL species	45%	x 5 =	2.25	
Column Totals:	95%	(A)	4.25	(B)
Prevalence Index = B/A =			4.47	

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter not met.

SOIL Sampling Point: DP-15U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					loam	
16-19	10YR 3/1	98	10YR 5/1	2	RM	M	sandy loam	
19-25	10YR 5/2	100	10YR 3/6	1	C	M	sandy loam	gravel at 23 inches

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: Fragmental

Depth (inches): 23 inches

Hydric Soils Present? Yes ___ No **X**

Remarks: Soil parameter not met.

Would possibly meet A12 indicator if dug additonal depth. Unable due to restrictive layer of gravel at 23 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >23

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes ___ No **X**

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

Remarks: Hydrology parameter not met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-15-U: Dark surface with low chroma but not enough Redox Features to be considered reduced matrix

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Grand Sky | City/County: Grand Forks | Sampling Date: September 27, 2023
Applicant/Owner: US Air Force, GFAFB | State: ND | Sampling Point: DP-15W
Investigators: C. Lotts; M. Hayes; K. Erwin; M. Correiro | Section, Township, Range:
Landform: depression | Local relief (concave,convex,none): concave | Slope (%): 0 - 2
Subregion (LRR or MLRA): LRR F | Lat: | Long: | Datum: NAD83
Soil Map Unit Name: Antler-Mustinka silt loams, 0 to 2 percent slopes | NWI classification:
Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)
Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soils Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: All parameters met.
Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.
FLS-58. Representative for FLS-57, -58, -59 and -60.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-15W

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)			
1. *Phalaris arundinacea*	80%	Y	FACW
2. *Carex utriculata*	80%	Y	OBL
3. *Typha angustifolia*	70%	Y	OBL
4. *Plantago major*	2%		FAC
5. *Cirsium flodmanii*	1%		FAC
6. *Mentha arvensis*	1%		FACW
7. *Euphorbia escula*	1%		UPL
8.			
9.			
10.			
	235% = Total Cover		
50% of total cover: 118%	20% of total cover: 47%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	150%	x 1 =	1.5	
FACW species	81%	x 2 =	1.62	
FAC species	3%	x 3 =	0.09	
FACU species	0%	x 4 =	0	
UPL species	1%	x 5 =	0.05	
Column Totals:	235%	(A)	3.26	(B)
Prevalence Index = B/A =			1.39	

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (If observed, list morphological adaptations below.)
Vegetation parameter met.

SOIL

Sampling Point: DP-15W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					loam	
12-16	10YR 3/1	98	10YR 4/4	2	C	M	loam	
16-25	10YR 5/2	98	10YR 4/6	2	C	M	sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

Would possibly meet A12 indicator if dug additonal depth. Unable due to restrictive layer of gravel at 23 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >25

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-15-W: Hydric soil indicator (Thick Dark Surface – A12)
FLS-58. Representative for FLS-57, -58, -59 and -60.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 27, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-16U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	level plain	Local relief (concave,convex,none):	none	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Gilby loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soils Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.
FLS-07b.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-16U

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30' Radius)				
1.				
2.				
3.				
4.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:		0%
Sapling/Shrub Stratum (Plot size: 15' Radius)				
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:		0%
Herb Stratum (Plot size: 5' Radius)				
1.	*Solidago gigantea*	60%	Y	FAC
2.	*Andropogon gerardii*	15%		FACU
3.	*Sorghastrum nutans*	10%		FACU
4.	*Solidago canadensis*	5%		FACU
5.	*Apocynum cannabinum*	5%		FAC
6.	*Symphyotrichum ericoides*	3%		FACU
7.	*Rosa arkansana*	2%		FACU
8.				
9.				
10.				
		100%	= Total Cover	
	50% of total cover: 50%	20% of total cover:		20%
Woody Vine Stratum (Plot size: 15' Radius)				
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:		0%

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:			
OBL species	0%	x 1 =	0
FACW species	0%	x 2 =	0
FAC species	65%	x 3 =	1.95
FACU species	35%	x 4 =	1.4
UPL species	0%	x 5 =	0
Column Totals:	100%	(A)	3.35 (B)
Prevalence Index = B/A =			3.35

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter met.

SOIL

Sampling Point: DP-16U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					loam	
10-19	10YR 4/2	100					loam	no redox
19-21	10YR 5/1	100					loam	
21-30	10YR 5/2	100					sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ___ No **X**

Remarks: Soil parameter not met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >30

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes ___ No **X**

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

Remarks: Hydrology parameter not met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-16-U: Dominant vegetation *Solidago gigantea* and upland grasses

DP-16-U: Dark surface with low chroma but not enough Redox Features to be considered reduced matrix

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 27, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-16W
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	basin	Local relief (concave,convex,none):	concave	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Gilby loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X No ____
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-07b.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-16W

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30' Radius)				
1.	*Salix amygdaloides*	5%	Y	FACW
2.	*Salix pentandra*	6%	Y	FACW
3.				
4.				
		11%	= Total Cover	
	50% of total cover: 6%	20% of total cover:	2%	
Sapling/Shrub Stratum (Plot size: 15' Radius)				
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:	0%	
Herb Stratum (Plot size: 5' Radius)				
1.	*Phalaris arundinacea*	100%	Y	FACW
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
		100%	= Total Cover	
	50% of total cover: 50%	20% of total cover:	20%	
Woody Vine Stratum (Plot size: 15' Radius)				
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover:	0%	

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	0%	x 1 =	0	
FACW species	111%	x 2 =	2.22	
FAC species	0%	x 3 =	0	
FACU species	0%	x 4 =	0	
UPL species	0%	x 5 =	0	
Column Totals:	111%	(A)	2.22	(B)
Prevalence Index = B/A =			2.00	

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter met.

SOIL

Sampling Point: DP-16W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					loam	
10-18	10YR 2/1	50					loam	
10-18	10YR 3/1	50					sandy loam	with gravel approx. 50%
18-23	10YR 4/1	98	10YR 3/6	2	C	M	sandy loam	
23-28	2.5 Y 6/2	95	10YR 6/8	5	C	M	sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR I & J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ V. Shallow Dark Surf. (TF12)
- ___ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >28

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-16-W: Dominant vegetation *Phalaris arundinacea* at FLS-07b

DP-16-W: Hydric soil indicator (Thick Dark Surface – A12) in FLS-07b

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 28, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-17W
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	depression	Local relief (concave,convex,none):	concave	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Gilby loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X No ____
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-62. This wetland drains to wetland FLS-02 but the area between did not have indicators to meet wetland status.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-17W

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species	Indicator Status
1. *Salix pentandra*	10%	Y	FACW
2.			
3.			
4.			
	10% = Total Cover		
50% of total cover: 5%	20% of total cover: 2%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)			
1. *Phalaris arundinacea*	60%	Y	FACW
2. *Carex utriculata*	15%		OBL
3. *Symphyotrichum lanceolatum*	10%		FACW
4. *Elymus repens*	10%		FACU
5. *Spartina pectinata*	5%		FACW
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
50% of total cover: 50%	20% of total cover: 20%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	15%	x 1 =	0.15	
FACW species	85%	x 2 =	1.7	
FAC species	0%	x 3 =	0	
FACU species	10%	x 4 =	0.4	
UPL species	0%	x 5 =	0	
Column Totals:	110%	(A)	2.25	(B)
Prevalence Index = B/A =			2.05	

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter met.

SOIL

Sampling Point: DP-17W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					loam	
10-15	10YR 2/1	98	10YR 3/6	2	C	M	loam	
15-21	10YR 4/2	95	2.5YR 4/6	5	C	M	sandy loam	
21-25	10YR 6/2	95	5YR 5/8	5	C	M	sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >25

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-17-W: Dominant vegetation *Phalaris arundinacea* at FLS-62

DP-17-W: Hydric soil indicator (Thick Dark Surface – A12)

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 28, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-17U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	level plain	Local relief (concave,convex,none):	concave	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Gilby loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

Upland near FLS-62. This data point was taken adjacent to wetland. Under normal conditions, the soils may develop indicators of hydrology.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-17U

Tree Stratum (Plot size: 30' Radius)		Absolute % Cover	Dominant Species	Indicator Status
1.				
2.				
3.				
4.				
		0%	= Total Cover	
50% of total cover:	0%	20% of total cover:	0%	
Sapling/Shrub Stratum (Plot size: 15' Radius)				
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
50% of total cover:	0%	20% of total cover:	0%	
Herb Stratum (Plot size: 5' Radius)				
1.	*Carex utriculata*	40%	Y	OBL
2.	*Phalaris arundinacea*	30%	Y	FACW
3.	*Sorghastrum nutans*	10%		FACU
4.	*Solidago canadensis*	10%		FACU
5.	*Andropogon gerardii*	5%		FACU
6.	*Helianthus maximiliani*	3%		FACU
7.	*Symphyotrichum ericoides*	2%		FACU
8.				
9.				
10.				
		100%	= Total Cover	
50% of total cover:	50%	20% of total cover:	20%	
Woody Vine Stratum (Plot size: 15' Radius)				
1.				
2.				
		0%	= Total Cover	
50% of total cover:	0%	20% of total cover:	0%	

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	40%	x 1 =	0.4	
FACW species	30%	x 2 =	0.6	
FAC species	0%	x 3 =	0	
FACU species	30%	x 4 =	1.2	
UPL species	0%	x 5 =	0	
Column Totals:	100%	(A)	2.2	(B)
Prevalence Index = B/A =			2.20	

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes **X** No ____

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter met.

SOIL

Sampling Point: DP-17U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					loam	
12-16	10YR 4/1	99	10YR 4/4	1	C	M	loam	
16-22	10YR 6/2	99	10YR 4/4	1	C	M	loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ___ No **X**

Remarks: Soil parameter not met.

The 12-16 inch layer does not have enough redox features to be considered reduce, long-term drought may have affected soil conditions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >22

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-17-U: Vegetation and hydrology meets wetland indicators with dominant *Carex utriculata* and *Phalaris arundinacea* and non-dominant facultative upland species present at Wetland FLS-62

DP-17-U: Dark surface with low chroma but not enough Redox Features to be considered reduced matrix

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 28, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-18U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	hillslope	Local relief (concave,convex,none):	none	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Gilby loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?**	Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-01b. Side slope of large vegetated ditch. Side slope is not mowed, hower, adjacent lawn is mowed.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-18U

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum	(Plot size: 30' Radius)			
1.				
2.				
3.				
4.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum	(Plot size: 15' Radius)			
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum	(Plot size: 5' Radius)			
1.	*Festuca trachyphylla*	80%	Y	UPL
2.	*Melilotus officinalis*	10%		FACU
3.	*Medicago lupulina*	2%		FACU
4.	*Sonchus arvensis*	2%		FAC
5.	*Hordeum jubatum*	2%		FACW
6.	*Helianthus maximiliani*	1%		FACU
7.	*Symphyotrichum lanceolatum*	1%		FACW
8.				
9.				
10.				
		98%	= Total Cover	
	50% of total cover: 49%	20% of total cover: 20%		
Woody Vine Stratum	(Plot size: 15' Radius)			
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	0%	x 1 =	0	
FACW species	3%	x 2 =	0.06	
FAC species	2%	x 3 =	0.06	
FACU species	13%	x 4 =	0.52	
UPL species	80%	x 5 =	4	
Column Totals:	98%	(A)	4.64	(B)
Prevalence Index = B/A =			4.73	

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter not met.

SOIL

Sampling Point: DP-18U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 5/4	80					clay loam	
0-10	10YR 4/2	20					loam	
10-12	10YR 2/1	100					clay loam	
12-18	10YR 5/4	45	10YR 3/6	10	C	M	clay loam	
12-18	10YR 5/1	45					clay loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR F)
___ 1 cm Muck (A9) (LRR F, G, H)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1) (LRR O, S)
___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
___ 5 cm Mucky Peat or Peat (S3) (LRR F)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ LoamyralMucky Minea (F1)
___ Loamy Gleyed Martix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

__ 1 cm Muck (A9) (LRR I & J)
__ Coast Prairie Redox (A16) (LRR F, G, H)
__ Dark Surface (S7) (LRR G)
__ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ V. Shallow Dark Surf. (TF12)
__ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soils Present?

Yes ___ No X

Remarks: Soil parameter not met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerials (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Aquatic Fauna (B13)
___ Marl Deposits (B15) (LRR U)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)
___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): >18
Saturation Present? Yes ___ No X Depth (inches): ___
(includes capillary fringe)

Wetland Hydrology Present?

Yes ___ No X

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

Remarks: Hydrology parameter not met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-18-U: View of typical boundary between wetland and upland along Wetland FLS-01

DP-18-U: Non-hydric soils in upland data point

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 28, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-18W
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	hillslope	Local relief (concave,convex,none):	concave	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Gilby loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X No ____
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

FLS-01b. Large vegetated ditch and primary stormwater conveyance.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-18W

		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30' Radius)				
1.				
2.				
3.				
4.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: 15' Radius)				
1.				
2.				
3.				
4.				
5.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)				
1.	*Eleocharis palustris*	60%	Y	OBL
2.	*Carex utriculata*	10%		OBL
3.	*Phalaris arundinacea*	10%		FACW
4.	*Elymus repens*	5%		FACU
5.	*Solidago gigantea*	5%		FAC
6.	*Hordeum jubatum*	3%		FACW
7.	*Cirsium flodmanii*	3%		FAC
8.	*Symphyotrichum lanceolatum*	2%		FACW
9.	*Symphyotrichum ericoides*	2%		FACU
10.				
		100%	= Total Cover	
	50% of total cover: 50%	20% of total cover: 20%		
Woody Vine Stratum (Plot size: 15' Radius)				
1.				
2.				
		0%	= Total Cover	
	50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	70%	x 1 =	0.7	
FACW species	15%	x 2 =	0.3	
FAC species	8%	x 3 =	0.24	
FACU species	7%	x 4 =	0.28	
UPL species	0%	x 5 =	0	
Column Totals:	100%	(A)	1.52	(B)
Prevalence Index = B/A =			1.52	

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter met.

SOIL Sampling Point: DP-18W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5Y 4/3	100					loam	
3-13	10YR 2/1	100					clay loam	
13-20	10YR 2/1	30					clay loam	
13-20	10YR 5/1	60	10YR 4/6	10	C	M	clay loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR F)
___ 1 cm Muck (A9) (LRR F, G, H)
___ Depleted Below Dark Surface (A11)
X Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1) (LRR O, S)
___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
___ 5 cm Mucky Peat or Peat (S3) (LRR F)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ LoamyralMucky Minea (F1)
___ Loamy Gleyed Martix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

__ 1 cm Muck (A9) (LRR I & J)
__ Coast Prairie Redox (A16) (LRR F, G, H)
__ Dark Surface (S7) (LRR G)
__ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ V. Shallow Dark Surf. (TF12)
__ Other (Explain in Remarks)

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

Retrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

Data point meets A12. Delineated line used F3 indicator on foot of side slope.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

X Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerials (B7)
X Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Aquatic Fauna (B13)
___ Marl Deposits (B15) (LRR U)
___ Hydrogen Sulfide Odor (C1)
X Dry-Season Water Table (C2)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

_____ Surface Soil Cracks (B6)
_____ Sparsely Vegetated Concave Surface (B8)
_____ Drainage Patterns (B10)
_____ Oxidized Rhizospheres on Living Roots (C3)
_____ Crayfish Burrows (C8)
_____ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
X FAC-Neutral Test (D5)
_____ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 1.5 in.
Water Table Present? Yes X No ___ Depth (inches): 1 in.
Saturation Present? Yes X No ___ Depth (inches): 1 in.
(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-18-W: Dominant vegetation *Eleocharis palustris* in Wetland FLS-01b

DP-18-W: Hydric soil indicator (Thick Dark Surface – A12) in Wetland FLS-01b; the Depleted Matrix indicator (F3) was used for delineating

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 28, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-19W
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	ditch bottom	Local relief (concave,convex,none):	concave	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Gilby loam, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X No ____
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

Bottom of drainage swale. Area is regularly mowed. This portion is relatively level. The slope that connects to FLS-01g is steeper and does not hold water.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-19W

Tree Stratum (Plot size: entire wetland)	Absolute % Cover	Dominant Species	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Sapling/Shrub Stratum (Plot size: entire wetland)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: entire wetland)			
1. *Eleocharis palustris*	70%	Y	OBL
2. *Festuca trachyphylla*	30%	Y	UPL
3. *Suaeda* sp.	10%		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	110% = Total Cover		
50% of total cover: 55%	20% of total cover: 22%		
Woody Vine Stratum (Plot size: entire wetland)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	1%	x 1 =	0.01	
FACW species	1%	x 2 =	0.02	
FAC species	0%	x 3 =	0	
FACU species	0%	x 4 =	0	
UPL species	1%	x 5 =	0.05	
Column Totals:	3%	(A)	0.08	(B)
Prevalence Index = B/A =			0.38	

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

X 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Suaeda calceoliformis is FACW, Suaeda nigra is OBL. Area is a mowed lawn. Area in ditch has distinctly different vegetation community.

Vegetation parameter met.

SOIL Sampling Point: DP-19W

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/1	95	10YR 4/4	5	C	M	silty loam	
4-12	10YR 5/1	60	10YR 3/6	5	C	M	loam	
4-12	10YR 5/3	35					loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR I & J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ V. Shallow Dark Surf. (TF12)
- ___ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- X Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 1

Water Table Present? Yes X No ___ Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): ___

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-19-W: Problematic vegetation in mowed lawn swale, Presence of lawn grass *Festuca trachyphylla* as a dominant prevents meeting vegetation indicators; many hydrology indicators present

DP-19-W: Hydric soil indicator (Depleted matrix – F3)

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 28, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-20W
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	depression	Local relief (concave,convex,none):	concave	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Antler-Mustinka silt loams, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X No ____
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: All parameters met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

Remnant depression FLS-31d in swale; connects to FLS-01c by surface flow/swale. This is a weedy area that is not regulary mowed.

VEGETATION - Use scientific names of plants.

Sampling Point: DP-20W

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species	Indicator Status
1. *Populus tremuloides*	40%	Y	FAC
2. *Salix bebbiana*	20%	Y	FACW
3. *Salix amygdaloides*	5%		FACW
4.			
	65%	= Total Cover	
50% of total cover: 33%	20% of total cover:		13%
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
	0%	= Total Cover	
50% of total cover: 0%	20% of total cover:		0%
Herb Stratum (Plot size: 5' Radius)			
1. *Hordeum jubatum*	40%	Y	FACW
2. *Melilotus officinalis*	20%	Y	FACU
3. *Elymus trachycaulus*	10%		FACU
4. *Bromus inermis*	1%		UPL
5. *Plantago major*	1%		FAC
6. *Artemisia biennis*	1%		FACU
7.			
8.			
9.			
10.			
	73%	= Total Cover	
50% of total cover: 37%	20% of total cover:		15%
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0%	= Total Cover	
50% of total cover: 0%	20% of total cover:		0%

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	75%	(A/B)

Prevalence Index worksheet:

Total % Cover of:				
OBL species	0%	x 1 =	0	
FACW species	65%	x 2 =	1.3	
FAC species	41%	x 3 =	1.23	
FACU species	31%	x 4 =	1.24	
UPL species	1%	x 5 =	0.05	
Column Totals:	138%	(A)	3.82	(B)
Prevalence Index = B/A =			2.77	

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter met.

SOIL

Sampling Point: DP-20W

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	90	10YR 7/1	5	RM	M	loam	
0-8			10YR 5/6	5	C	M	loam	
8-14	10YR 7/2	95	10YR 5/6	5	C	M	sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR I & J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ V. Shallow Dark Surf. (TF12)
- ___ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes **X** No ___

Remarks: Soil parameter met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >14

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No ___

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

Remarks: Hydrology parameter met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-20-W: Hydrophytic vegetation in Wetland FLS-31d

DP-20-W: Hydric soil indicator (Depleted matrix – F3) and Redox Dark Surface (F6)

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site:	Grand Sky	City/County:	Grand Forks	Sampling Date:	September 28, 2023
Applicant/Owner:	US Air Force, GFAFB	State:	ND	Sampling Point:	DP-20U
Investigators:	C. Lotts; M. Hayes; K. Erwin; M. Correiro	Section, Township, Range:			
Landform:	hillslope	Local relief (concave,convex,none):	none	Slope (%):	0 - 2
Subregion (LRR or MLRA):	LRR F	Lat:		Long:	Datum: NAD83
Soil Map Unit Name:	Antler-Mustinka silt loams, 0 to 2 percent slopes	NWI classification:			

Are climatic/hydrolgoic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ signficantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ Soil ____ or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?**	Yes ____ No **X**
Hydric Soils Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks: All parameters not met.

Climatic/hydrologic conditions are not typical for this time of year. The Antecedent Precipitation Tool (APT) reported below normal rainfall for the Grand Forks area in the weeks prior to the survey and normal rainfall conditions the week prior and week of the field visit . However PSDI indicated severe drought for preseeding two months (August and September 2023) and moderate drought from May to July 2023. On-site observations suggest drier than normal conditions that affected vegetation phenology, soil indicators, and hydrology.

This is a previously disturbed area with lots of weeds. FLS-31d

VEGETATION - Use scientific names of plants.

Sampling Point: DP-20U

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species	Indicator Status
1. *Elaeagnus angustifolia*	5%	Y	FACU
2.			
3.			
4.			
	5% = Total Cover		
50% of total cover: 3%	20% of total cover: 1%		
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		
Herb Stratum (Plot size: 5' Radius)			
1. *Bromus inermis*	80%	Y	UPL
2. *Solidago canadensis*	10%		FACU
3. *Symphyotrichum ericoides*	5%		FACU
4. *Melilotus officinalis*	2%		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	97% = Total Cover		
50% of total cover: 49%	20% of total cover: 19%		
Woody Vine Stratum (Plot size: 15' Radius)			
1.			
2.			
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

Prevalence Index worksheet:

Total % Cover of:			
OBL species	0%	x 1 =	0
FACW species	0%	x 2 =	0
FAC species	0%	x 3 =	0
FACU species	22%	x 4 =	0.88
UPL species	80%	x 5 =	4
Column Totals:	102%	(A)	4.88 (B)
Prevalence Index = B/A =			4.78

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks: (If observed, list morphological adaptations below.)

Vegetation parameter not met.

SOIL

Sampling Point: DP-20U

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	80	10YR 6/4	10	C	M	loam	
0-14	10YR 4/3	10					loam	
14-20	10YR 5/4	100					sandy loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR O, S)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G & H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ LoamyralMucky Minea (F1)
- ___ Loamy Gleyed Martix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (MLRA 72 &73 LRR H)

Indicators for Prob. Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR I & J)
- __ Coast Prairie Redox (A16) (LRR F, G, H)
- __ Dark Surface (S7) (LRR G)
- __ High Plains Depressions (F16) (MLRA 72 &73 LRR H)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ V. Shallow Dark Surf. (TF12)
- __ Other (Explain in Remarks)

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

Retrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present?

Yes ___ No **X**

Remarks: Soil parameter not met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerials (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >20

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present?

Yes ___ No **X**

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

Remarks: Hydrology parameter not met.

The Antecedent Precipitation Tool (APT) reported normal rainfall conditions for the Grand Forks area. PSDI indicated extreme drought. On-site observations suggest drier than normal conditions.

DP-20-U: Upland vegetation next to Wetland FLS-31d

DP-20-Non-hydric soils in upland data point